Deloitte & Touche

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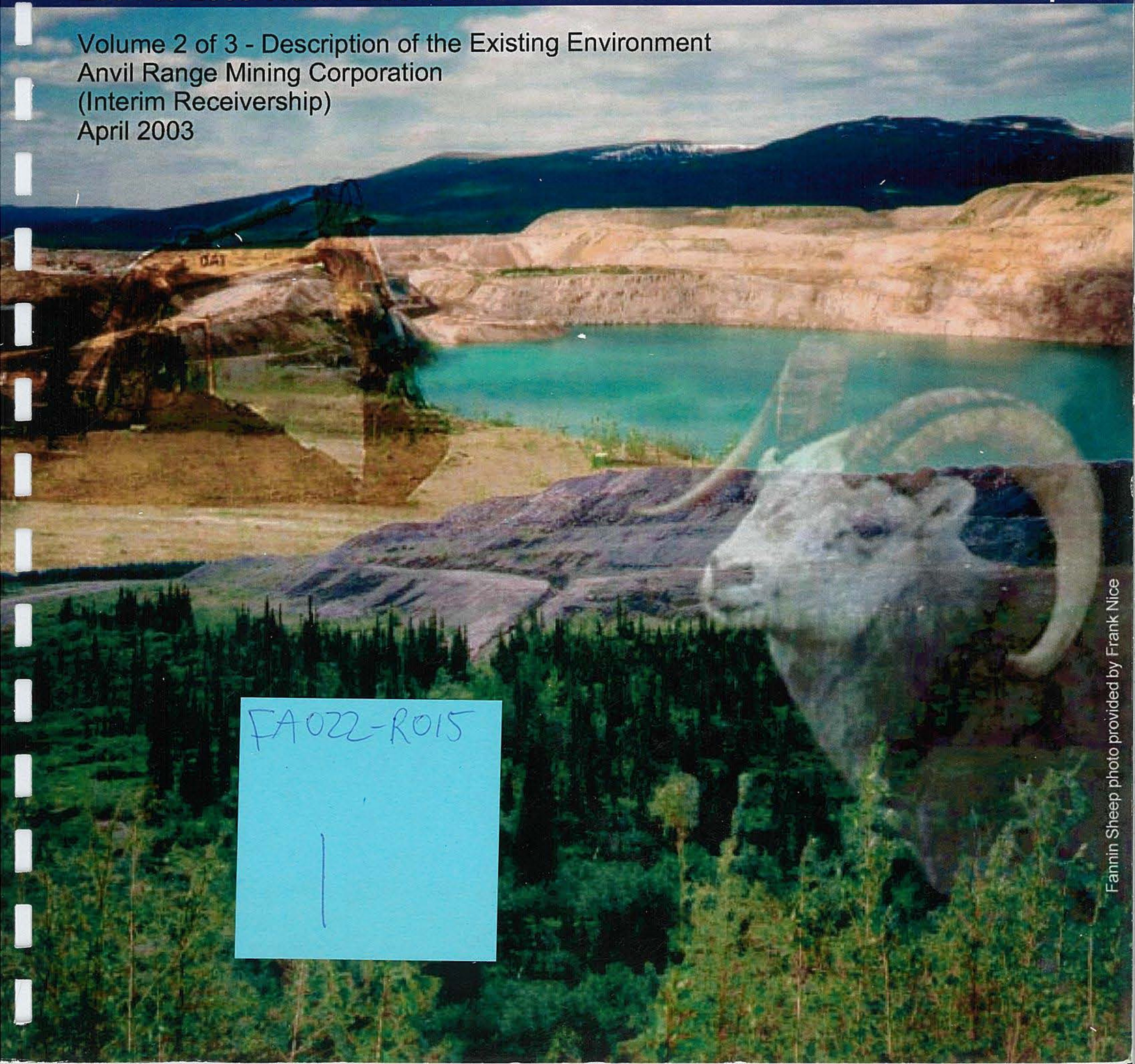
Anvil Range Mine Complex

2004 to 2008 Water Licence Renewal - Environmental Assessment Report

Volume 2 of 3 - Description of the Existing Environment
Anvil Range Mining Corporation
(Interim Receivership)
April 2003



Fannin Sheep photo provided by Frank Nice

Volume II

Description of the Existing Environment

Anvil Range Mining Corporation (Interim Receivership)
2004 to 2008 Water Licence Renewal
Environmental Assessment Report

Submitted by:

Deloitte & Touche Inc.
In its capacity as Interim Receiver for Anvil Range Mining Corporation

in association with:

Gartner Lee Limited

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1 INTRODUCTION

1.1 INTRODUCTION TO THE ENVIRONMENTAL ASSESSMENT REPORT

The Anvil Range Mine Complex, located in Faro, Yukon, operated from 1969 to 1998 inclusive of several temporary closures. Mining and milling operations permanently ceased in early 1998 shortly after the owner, Anvil Range Mining Corporation ("Anvil Range"), filed for creditor protection under the Companies' Creditor Arrangement Act. Deloitte & Touche Inc. was appointed Interim Receiver ("Interim Receiver") of Anvil Range pursuant to an order ("Interim Receivership Order") of the Ontario Court (General Division) ("the Court") (now the Superior Court of Justice) in April 1998.

The site is managed by the Court Appointed Interim Receiver, Deloitte & Touche Inc.

The Interim Receiver has overseen the management of the property under the terms of the water licences in addition to the Interim Receiver's mandate to receive, preserve, protect and realize upon Anvil Range's assets. The Interim Receiver has worked with the Department of Indian Affairs and Northern Development ("DIAND"), the Yukon Territorial Government ("YTG"), the Town of Faro, the Ross River Dena Council, and other stakeholders to manage environmental programs that are required to protect the receiving environment.

The mine complex is currently regulated under two water licences, which specify the terms and conditions under which the licence holder (i.e. Anvil Range) can discharge water into the natural environment. The Faro mine site operates under licence QZ95-003 (formerly IN89-001) and the Vangorda Plateau mine site operates under licence IN89-002. The water licences were granted by the Yukon Territory Water Board under the Yukon Waters Act. Both licences will expire December 31, 2003.

The Interim Receivership Order grants the Interim Receiver the authority to "apply for any permits, licences, approvals or permissions on behalf of [Anvil Range] as may be required by any government or regulatory authority". In order to ensure that regulatory licencing that allows for the continued performance of necessary environmental protection activities, remains in place, the Interim Receiver filed documents, in May 2002, to initiate the process for application to the Yukon Territory Water Board for a single integrated licence for the mine complex for the period from January 1, 2004 to December 31, 2008 (5 years).

Steps to renew a licence include CEAA and licence application

Two overall steps are involved in the renewal and integration of the water licences:

1. A review process under the Canadian Environmental Assessment Act ("CEAA") which is required, in part, due to the disbursement of federal funds for the maintenance of this property. The review is focussed on the activities described in an Environmental Assessment Report ("EAR") that is submitted by the proponent following guidelines provided by DIAND; and

2. An application to the Yukon Territory Water Board for a water licence renewal.

The CEAA process was initiated with a Project Description submitted in May 2002

To initiate the CEAA process, the Interim Receiver submitted a Project Description in May 2002 that described the proposed activities for the proposed licence period. A Project Description Supplement was submitted in September 2002 in response to questions raised regarding the Project Description. At that time, preparation of a Final Closure and Reclamation Plan ("FCRP") for the mine complex was included into the Interim Receiver's scope of work.

Guidelines for preparation of the EAR were issued by DIAND in March 2003. The final scope of the project, as described in the Guidelines focussed solely on care and maintenance activities and excluded the development of a Final Closure Plan. This change was based on the announcement by DIAND in January 2003 that the development of a FCRP would be undertaken by the closure Project Team that would be formed for this specific purpose.

This EAR has been prepared to comply with the Guidelines provided by DIAND and to provide the information necessary to enable a screening decision per the CEAA.

This Environmental Assessment Report (EAR) is presented in three volumes plus a standalone EAR summary document and a companion document being the new mechanism for development of a closure plan

The EAR is a three volume document:

1. Volume I provides a description of the existing facilities, a description of the proposed activities and a description of the adpative management program.
2. Volume II describes the current environmental conditions at the mine site.
3. Volume III describes the impacts of the proposed activities on the existing conditions at the mine site.

A general reference between the information requested in the Guidelines and location of that information in the EAR is provided in the table below. A detailed conformity table is appended to each volume (Appendix A).

Information Reference Locations

Guideline Reference	EAR Reference
2.0 Executive Summary	Volume I
2.1 Project Summary	Volume I
2.2 Project Description	Volume I
2.3 Environmental Setting	Volume II
3.0 Environmental Effect Assessment	Volume III

The three-volume EAR is summarized in a standalone summary document, which provides a summary of the information and conclusions of the EAR.

While closure planning is not a specific, integral part of the Environmental Assessment Report, a document titled Anvil Range Mine Complex: Closure Planning Project Management, designed to address the planning process for the final closure of the site, will be submitted by the closure Project Team at a later date.

1.2 INTRODUCTION TO VOLUME II – DESCRIPTION OF THE EXISTING ENVIRONMENT

1.2.1 OVERVIEW

The context that overarches both the selection of the proposed care and maintenance activities and the development of the environmental assessment (and the assessment framework) is that the Anvil Range property exists as a property resulting from former mining and milling activities. This property has recognized environmental liabilities. The proposed care and maintenance activities and the timeframe of the proposed licence were selected to allow the property to be maintained while allowing sufficient time for a FCRP to be developed. As such, the assessment framework described below was developed on the basis that the proponent of the proposed project (the Interim Receiver) is not proposing to start a new mine in the next five years, nor to close the property in the next licence term. As mentioned in the introduction to the EAR, closure planning is the responsibility of the government and will be addressed in a subsequent document entitled "Anvil Range Mine Complex: Closure Planning Project Management".

The premises described above drove the development of the following environmental assessment framework:

- The **spatial boundaries** of the assessment follow standard environmental assessment methodology. The effects assessment is based on two spatial scales: a local scale, the local study area; and at a regional scale, the regional study area.

- The **temporal boundary** for the project, scoped as a care and maintenance project in the March 11 2002 Guidelines from DIAND Environment Directorate, is defined as the five-year timeframe from 2004 to 2008. The effects assessment for the project is based on this timeframe and compares the project to conditions existing during the 1998 to 2002 care and maintenance timeframe. This point of comparison was chosen because a comparison to pre-mining condition would be a hypothetical one and would not reflect the reality that this site currently exists and that care and maintenance activities are on-going. The assessment of care and maintenance effects on the environment is therefore aimed at determining whether the proposed care and maintenance activities are adequate for the next five years and can maintain the property in a state comparable to that achieved over the 1998-2002 timeframe, where the site monitoring information demonstrated that regulatory limits were consistently achieved (as per the water licence).

The implication of the chosen environmental assessment framework is that effects being evaluated are relative rather than absolute in nature. As such, the proposed care and maintenance activities should, by definition, result in a neutral impact on the environment in comparison to 1998-2002.

The information presented in Volume II of the EAR (Description of Existing Environment) is primarily intended to support the determination of environmental effects according to the framework described above. These effects are presented in Volume III (Environmental Effects Assessment).

In addition, the information presented in Volume II was designed to support additional objectives. It is the understanding of the Interim Receiver that the Responsible Authorities, as well as other interested parties, may review the information available around pre-mining, historical and existing conditions with the intent of understanding the impacts of the property itself on the environment in comparison to the pre-mining conditions. It is the understanding of the Interim Receiver that the driver behind this broadened review focus is to underscore the need for closure planning and implementation, by referencing closure planning and implementation as required additional mitigation for this project. As mentioned above, this additional mitigation (closure planning) is the responsibility of the closure Project Team.

As such, the information presented in Volume II was researched and presented with the following objectives in mind:

1. respect the requirements of the March 11, 2003 Guidelines issued by the DIAND Environment Directorate.
2. support the assessment of effects related to the proposed care and maintenance activities for 2004-2008 in comparison to those occurring the 1998-2002 time frame.
3. support the additional review objectives that reviewers of this document may have (as described above).

The May 2002 Baseline report may be taken as a general reference for the information presented in this report

The information, as it is available, that may be needed to support the third objective is included in both Volume II of the EAR, as well as in Volume II of the original Project Description filed with the then DIAND Environment Directorate in May 2002. This information includes data about pre-mining, historical and existing conditions, as well as site-characterization as it is currently understood. The bulk of the information that could be required for this type of review, if undertaken by the reviewers, is found in Volume II of the original Project Description (May 2002). The present Volume II of the Environmental Assessment Report, as mentioned above, is primarily intended to support the assessment of effects relating to care and maintenance activities in relation to 1998-2002. However, this volume also provides additional historical or site characterization information that would have been either researched or collected in the summer of 2002 that was not included in Volume II of the original Project

Description (May 2002). A "road map" to this information is described in the next section.

1.2.2 INFLUENCE OF PAST MINING ACTIVITIES ON THE DESCRIPTION OF THE EXISTING ENVIRONMENT

The amassed environmental information, as described both in this volume and in the 2002 Baseline Report, clearly indicates that past (i.e. pre-1998) mining activities have had a demonstrable impact on the aquatic and terrestrial receiving environments. Furthermore, in some cases, the environmental information demonstrates that some of the mine facilities that were operated or created prior to 1998 (such as the Rose Creek Tailings Facility, for example) continue to have an ongoing impact on the receiving environments.

These historical (i.e. pre-1998) environmental impacts can be summarized as:

Air Quality: There is no scientific baseline data on historical air quality but traditional knowledge, experience at similar projects and indirect evidence from other studies indicate that effects would have occurred due to mine operating activities. *(Volume II Section 2.1.3)*
Streamflow in the Receiving Environment: Construction and operation of mine facilities, diversion and interception of surface water and discharge of water from treatment systems substantially altered streamflow in the receiving environment. *(Volume II Section 2.5.2; 2002 Baseline Report Section 4.2.4)*
Surface Water Quality in the Receiving Environment: Runoff from rock dumps, the plantsite, roads and other developed areas, groundwater discharge to surface in some areas, discharge of (generally compliant) water from water treatment systems and spills and other unforeseen events have resulted in degraded water quality in Rose and Vangorda Creeks as compared to upstream reference locations and general guidelines. *(Volume II Section 2.5.4; 2002 Baseline Report Sections 4.2.6 and 4.2.8)* A preliminary contaminant loading model has been developed that identifies contaminant source areas. *(Volume II Section 3.3; 2002 Baseline Report Appendix A)*
Groundwater Flow in the Receiving Environment: Interception of subsurface flow in pits and ditches, changes to groundwater recharge and discharge areas (either increasing or decreasing rates) and active pumping to surface for water supply altered groundwater flow patterns substantially within the immediate mine area *(Volume II Section 2.5.3; 2002 Baseline Report Section 4.2.5)*
Groundwater Quality in the Receiving Environment: Seepage to ground from mine facilities such as rock dumps and tailings impoundments has had a negative impact on groundwater quality in the immediate mine area. *(Volume II Section 2.5.5; 2002 Baseline Report Sections 4.2.7 and 4.2.9)* Comprehensive investigations into groundwater quality in the Rose Creek Valley aquifer have been carried out in 2001 and 2002. *(Volume II Sections 2.5.5 and 3.4; 2002 Baseline Report Section 4.2.7)*
Fish Habitat Integrity: Construction of mine facilities such as the Fresh Water Supply Dam, the Rose Creek Diversion Canal and the North Fork Rock Drain substantially altered the fish habitat in Rose Creek. Fish habitat in Vangorda

Creek has not been similarly altered because the habitat is restricted to the lower reaches downstream of mine facilities. *(Volume II Section 2.5.2; 2002 Baseline Report Section 4.2.4)*

Fish Population Health: There is no scientific baseline data on historical fish health or quality, however traditional knowledge, experience at similar projects and indirect evidence from other studies indicate that effects would have occurred due to mine operating activities. *(Volume II Section 2.1.3)*

Wildlife Habitat Integrity: Construction of mine facilities altered or removed wildlife habitat from use by occupying the land. Further, While there is *(Volume II Section 2.7.4; 2002 Baseline Report Section 4.3)*

Wildlife Population Health: There is no scientific baseline data on historical wildlife health, however traditional knowledge, experience at similar projects and indirect evidence from other studies indicate that effects may have occurred due to mine operating activities. Nonetheless, the information indicates that the local population of Fannin Sheep remained healthy throughout the mine operating period. *(Volume II Sections 2.7.4 and 2.9; 2002 Baseline Report Section 4.3)*

The proposed care and maintenance activities, as described in Volume 1 of this report, are aimed at mitigating in a short-term context the impacts related to past mining activities. In addition, the proposed care and maintenance activities includes 1) monitoring of effects, and 2) an Adaptive Management Plan that provides a response framework that will be implemented if issue-specific triggers are activated.

Future mitigation of environmental effects related to past mining activities will be the focus of the FCRP that is to be developed by the closure Project Team.

1.2.3 INTEGRATION OF TRADITIONAL KNOWLEDGE

1.2.3.1 Overview

The CEAA and the project specific Information Guidelines require that First Nations traditional knowledge is to be integrated into the EA. The existing body of traditional knowledge related to the Faro mine complex was supplemented, for this EA report, by additional knowledge gathering interviews. The pre-existing body of information consists of two sets of interviews, described below, as well as previously conducted studies described in Volume II, Section 2.9.2.1. Per Sections 1.2.3.1 and 1.2.3.2. below, this information is included in Volume II, Description of the Existing Environment, and in Volume III, Environmental Effects Assessment. In addition, consultation was undertaken during the environmental assessment process regarding the proposed care and maintenance activities. The consultation activities, the identified issues and their integration into the proposed project are described in Volume 3, Section 3 (First Nations and Public Consultation).

A series of interviews were conducted by anthropologist Sheila Greer with selected elders of the Ross River Dena community in December of 1999 to confirm if the findings of the Weinstein study were still considered valid and to record any additional information regarding land use (Greer 2000).

During the week of March 24, 2003, further interviews were conducted with Ross River Dena members to document current traditional use patterns in the study area, as well as traditional knowledge related to environmental concerns that might be related to the mine. These interview sessions also sought permission to use or share with a wider audience, through the EA process, earlier documented use of and traditional knowledge regarding the Faro mine area, particularly that recorded by Greer in 1999.

The 2003 interviews were conducted by Doris Dreyer, in her capacity as a researcher for the RRDC, and Testloa George Smith, RRDC member and researcher. Anthropologist Sheila Greer assisted with the initial three interview sessions, with Ms. Dreyer and Mr. Smith carrying out the balance of the interviews. An Information Sharing Protocol outlining the terms by which any traditional knowledge data assembled by the project would be shared was put in place in order for the interview work to proceed. As well, both Ms. Greer and Ms. Dreyer signed letters of confidentiality acknowledging that the knowledge and information they were collecting was privileged and the property of the Ross River Dena Council.

The traditional knowledge available for consideration in this assessment includes (1) a report titled *Ross River Dena Traditional Use Study for the Faro Mine Water License Application (2004 to 2008)* prepared by Doris Dreyer and Testloa George Smith (excluding transcripts or interview notes); (2) one of the 1999 interviews conducted by Ms. Greer, for which permission to share the knowledge released was granted on March 26, 2003; and (3) that which Ms. Greer heard during the interviews she participated in on March 25th & 26th. In these sessions the interview participants indicated their willingness to have the information they were providing (and had provided in the case of one of the 1999 interview) shared with a wider audience. Note that, as per the terms of the Information Sharing Protocol, the individuals who provided the information are not identified, and that in respect of the protocol, Ms. Greer did not take notes during these sessions.

1.2.3.2 Description of the Existing Environment

Traditional knowledge has been incorporated into the Description of the Existing Environment described in Volume 2 of this report, as it became available.

The discussion of wildlife communities in the study area resulting from the 2003 interviews provided information regarding wildlife health and movements related to activities at the mine site.

Additionally, the 2002 preliminary study of effects in the terrestrial environment was motivated, in part, by issues raised by the community of Ross River regarding the potential effects of wind blown contaminants on wildlife and vegetation. The follow up studies that are proposed for 2003 to 2005 (described in Section 10, Volume I) are a direct continuation of this collection of scientific data that is required to produce a mitigation plan (as proposed to be completed by the end of 2005).

1.2.3.3 Effects Assessment

The accumulated traditional knowledge was considered along with scientific data in the selection of VECC's and indicators, in the assessment of effects and significance and in the proposed follow up studies. This is described in Volume 3, Environmental Effects Assessment.

1.2.4 LOCAL AND REGIONAL STUDY AREAS

The LSA extends from the background water quality sites upstream of each mine to the first monitoring point downstream of where the effluent stream enters receiving waters

The local study area (LSA) is based on the physical and hydrologic footprint of both mine sites, including the Haul Road (Figure 2), as this is the area of immediate influence on the environment as a result of care and maintenance activities and the area of interest as per the water licences. The LSA extends from the site-specific background water quality sites upstream of each mine to the first monitoring point downstream of where the effluent stream specified in the existing water licence enters receiving waters.

RSA's have been defined for the environmental and social components where an impact assessment is completed

The LSA includes Faro Creek and the North and South Forks of Rose Creek and extends downstream to Site X14, where effluent discharged from Sites X5 and X13 mixes with Rose Creek downstream of the Faro mine site (Figure 3). As well, the LSA extends from the background water quality site (V1) on Vangorda Creek upstream of the Vangorda mine site, to the main stem of Vangorda Creek downstream of the mine, just upstream of the confluence with the West Fork (Figure 3). All water from the major project activities reports to this site. This LSA will apply to all discipline components.

A regional study area ("RSA") is defined to incorporate data outside of the project footprint that may be important to the determination of direct effects on an environmental component and to allow for examination of potential cumulative effects where project effects extend beyond the study area boundary. The boundaries of a RSA are established based on geographical or social boundaries as well as the "zone of influence" beyond which the effects of a care and maintenance activity have diminished to an acceptable or trivial state. As the geographical or social boundary and the zone of influence will vary depending on the environmental component (e.g. wildlife, fish, water quality), RSAs have been defined for the environmental and social components where an impact assessment is completed (in Volume III), as outlined in Table 1. Each study area is discussed in more detail in the component section of Section 2.

Table 1. Component Regional Study Areas

Component	Regional Study Area	Figure
Air quality	Bounded by the height of land surrounding the Rose and Vangorda watersheds (to capture both watersheds) plus water sampling sites in Anvil Creek at the mouth of Rose Creek	3
Water resources (hydrology, hydrogeology and water quality)	Bounded by the height of land surrounding the Rose and Vangorda watersheds (to capture both watersheds) plus water sampling sites in Anvil Creek at the mouth of Rose Creek (for the Faro site) and in Vangorda Creek at the confluence with the Pelly River (for the Vangorda Plateau site)	3
Aquatic resources (sediment quality, benthic invertebrates and fish	Bounded by the height of land surrounding the Rose and Vangorda watersheds (to capture both watersheds) plus water sampling sites in Anvil Creek at the mouth of Rose Creek (for the Faro site) and in Vangorda Creek at the confluence with the Pelly River (for the Vangorda Plateau site)	3
Terrestrial resources (soil, vegetation, wildlife)	Bounded by the Pelly River to the south, Rose Mountain to the west, Mount Aho to the north and Mount Mye and Sheep Mountain to the east	4
Socio-economics, traditional use and heritage resources	Bounded by the Pelly River to the south, Anvil Creek to the west and the height of land defining the Rose Creek watershed to the north and Blind Creek to the east	5

1.2.5 TEMPORAL BOUNDARIES

The current environmental and social conditions are those that have occurred during the care and maintenance phase (1998-2002)

The environmental effects assessment is to be based on existing environmental and social conditions. As these conditions have changed substantially from pre-mine development through mine operations to the existing care and maintenance status, the existing environmental and social conditions are considered to be those that have occurred during the care and maintenance phase between 1998 and 2002.

The description of the existing environment that is provided in this volume includes a discussion, where appropriate, of the historical (pre-1998) and existing (1998 to 2002) conditions for each environmental and social component. In this context, data collected prior to 1998 is considered historical and is presented in a summary format to provide context for a more detailed description of the existing conditions (1998 and 2002). In some cases such as hydrology and vegetation where the available information is descriptive rather than a series of discrete study points, changes to the natural environment that resulted from mine development and operation are discussed as a historical context and the available information is then discussed under existing conditions.

2 ENVIRONMENTAL AND SOCIAL SETTING

2.1 METEOROLOGY

2.1.1 METEOROLOGICAL DATA SOURCES

The data was collected from the Anvil Range station and the Rose Creek station.

Meteorological data that is applicable for the local study area of the Anvil Range Mine Complex has been collected since 1967. The station locations, information collected at each one and the period of collection record is outlined below in Table 2.

Table 2. Climate Stations

Station ID	Location	Temp	Precip	Snowpack	Wind	Lake Evaporation	Evapotrans-piration	From	To
Anvil	Faro Mine site	✓						1967	1980
Rose Creek	Faro Mine site			✓				1975	1985
Faro Airport	Faro Airport		✓					1978	2001
Faro Airport	Faro Airport				✓			1975	1985
Whitehorse Airport	Whitehorse Airport				✓	✓	✓	not in ICAP.	not in ICAP

Data for this meteorological section have been compiled from the following sources:

Meteorological data sources

- Environment Canada, Atmospheric Environment Service. 1982. Canadian Climate Normals, Temperature and Precipitation. 1951-1980, The North - Yukon Territory and Northwest Territory (From the Integrated Comprehensive Abandonment Plan (ICAP).
- BGC Engineering Inc., 2002. 2001 Annual Inspection of Facilities at the Faro Mine Site. Report prepared for Deloitte & Touche Inc.
- Andrew Pape-Salmon, P.Eng., MRM Sustainergy Consulting, Jean-Paul Pinard, P.Eng., M.Sc., Ph.D. Candidate. 2002. Report on Renewable Energy Opportunities for the Operations of the Interim Receivership of Anvil Range Mining Corporation.

2.1.2 METEOROLOGY DATA

2.1.2.1 Temperature

The Anvil (Environment Canada) climate station was located at an elevation of 1158 mASL at the mine site. The station is no longer operable but temperatures were recorded from 1967 to 1980 (RGC 1996). The mean monthly temperatures are shown in Figure 6, and listed in Table 3 below.

Table 3. Mean Monthly Temperatures (°C) at Anvil Climate Station (1967-1980)

Parameter	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Daily Max. Temp. (°C)	-15.1	-8.3	-5.3	2.2	9.3	16.0	17.5	15.2	9.6	1.6	-7.0	-12.6	1.9
Daily Min. Temp (°C)	-24.9	-18.8	-17.3	-8.7	-1.8	3.0	5.0	3.3	-0.9	-8.1	-16.7	-22.4	-9.0
Daily Temp. (°C)	-19.8	-13.9	-11.2	-3.2	4.0	9.9	11.5	9.5	4.6	-3.1	-11.6	-17.5	-3.4

Mean and extreme temperatures

The 1967 to 1980 temperature normals for the Anvil station show a mean annual temperature of -3.4°C. July is the warmest month, with a mean daily temperature of 11.5°C, and January is the coldest month, with a mean daily temperature of -19.8°C. Over the period of record, temperature extremes of 29.4 and -46.1°C have been measured.

2.1.2.2 Precipitation

Mean, maximum and minimum precipitation

The mean annual precipitation at the Faro airport station is 304.7 mm, according to the 1978-2001 period of record (BGC, 2002). This total comprises roughly equal proportions of rainfall and snowfall as water equivalent. The mean monthly distribution of precipitation is plotted in Figure 7 and is listed in Table 4 below. The driest and wettest months are typically April and July, respectively, over the period of record. The greatest monthly precipitation measured over the period of record was 116.2 mm in August 2000.

Table 4. Monthly Mean Precipitation (mm) at Faro Airport, Yukon (1978-2001)

Month	Mean (mm)
January	14.3
February	12.1
March	10.5
April	7.2
May	24.3
June	35.8
July	58.9
August	46.8
September	38.2
October	24.9
November	17.2
December	14.6
Annual Total	304.7

2.1.2.3 Snowpack

Location, elevation, snow accumulation and density snow pack

The Rose Creek snow course at the site was operated by DIAND from 1975 to 1985. The snow course was located near and at a similar elevation (1080 m) as the Rose Creek Tailings Facility. The accumulation of snow at this location typically begins in October, and the snow has generally melted by the end of April, although in 1985 it persisted into May. At maximum snowpack in March or April the density of the snowpack is about 200 kg/m^3.

2.1.2.4 Wind

The prevailing wind direction is from the southeast.

Using wind data measured at the Faro airport, and weather balloon data from the Whitehorse station, wind speeds at the Faro Mine Site and Vangorda Mine Site (at Mt Mye shelf and Grum Rock Dump) were estimated. Wind data from the Faro airport indicates that the prevailing wind direction is from the southeast, following the Tintina Trench. Table 5 and Figure 8 (RGC 1996) show the long-term monthly mean wind speed data collected at the Faro airport. The wind data was collected from an anemometer on a 10m tower near the airport terminal. The data is measured at each hour of the day, 365 days of the year. (dates not provided).

Table 5. Long-term Monthly Mean of Wind Speed (m/s) at the Faro Airport

Month	Mean (m/s)
January	1.4
February	1.7
March	2.2
April	2.6
May	2.7
June	2.7
July	2.6
August	2.1
September	2.1
October	2.2
November	1.7
December	1.5

2.1.2.5 Lake Evaporation and Evapotranspiration

Evaporation was arbitrarily selected to represent conditions at the mine and evapotranspiration rates were adopted from the highest elevation station.

Lake evaporation refers to evaporation from a free-water surface. The rate of lake evaporation was estimated from meteorological data using a computer program known as WREVAP which was developed by the National Hydrology Research Institute (Morton 1985). Since no trend in lake evaporation with elevation was evident, the calculated lake evaporation at the Whitehorse Airport was arbitrarily selected to represent conditions at the mine site. The average lake evaporation was determined to be 490 mm.

Evapotranspiration refers to evaporation from a land surface including transpiration from plants, and appears to decrease with increasing elevation. The rate of evapotranspiration was also estimated from meteorological data using a computer program known as WREVAP, developed by the National Hydrology Research Institute. As the best estimate, the calculated evapotranspiration values of 190 mm per annum, or 38% of lake evaporation, at the highest elevation station, Whitehorse Airport, were adopted for the mine site. Insufficient information is available, however, to extrapolate this trend to the mine site with more than a low degree of certainty.

2.1.3 AIR QUALITY

2.1.3.1 Historical Air Quality

All of the activities associated with mining and milling were sources of air emissions

There is no historical monitoring data available to characterize either background air quality or air quality during mining operations.

Mining, milling and all of the associated activities were a source of air emissions throughout the operating period from 1969 to 1998. In general these sources can be characterized as follows:

Source	Characteristics
Mobile sources including mining machinery and transport vehicles	• Source of NOx, CO_2/CO and particulate emissions from internal combustion engines • Fugitive dust emissions from site preparation and construction activities (overburden stripping, road and impoundment construction) • Fugitive dust emissions from roadways during transport of ore and concentrate • Fugitive dust associated with ore and concentrate handling and transport
Open pit and rock dumps	• Source of wind-blown particulate emissions with characteristics similar to waste minerals (parent rock)
Milling operations	• Fugitive dust emissions from ore crushing operations – characteristics similar to ore body • Fugitive dust emissions from concentrate drying and handling operations – high Pb and Zn concentration • Stationary sources of combustion gases (NOx, CO_2/CO and particulate) associated primarily with boilers
Tailings impoundments	• Source of wind-blown particulate – characteristics generally similar to ore body and entriched in Pb and Zn relative to natural conditions

No data is available on the magnitude of atmospheric emission sources, or on ambient contamination levels inside mill buildings

There were no licences for atmospheric emissions from the mine and there is no historical data available on the magnitude of these sources. Source controls were employed to minimize dust emissions from significant sources. For example, a baghouse was employed to control dust emissions from the ore crushing operation and a wet scrubber was used on the discharge from the concentrate dryer. Although these controls would have reduced emission levels, there is no performance data available and no record of stack surveys being conducted. The main stationary combustion source (mill boilers) were initially fired with coal and later converted to oil. Waste oil generated on the mine site was used to supplement fuel requirement and processed in the boilers. There were no emission controls employed on the boiler stacks.

Occupational health and safety sampling was conducted, generally inside mill buildings. However, there is no data available on ambient contaminant levels.

Changes in the source of emissions are generally associated with changes in mining activities

Changes in the source of emissions would have occurred throughout the life of the mine. These would generally be associated with changes in mining activities and the excavation of the various pits over time. In addition, the location of tailings disposal also changed. For example, open pit mining shifted from the Faro open pit to the Grum and Vangorda open pits in 1992. The tailings disposal location was also changed at this time from the Rose Creek Tailings Facility to the Faro Main Pit. The Rose Creek Tailings Facility would likely become a more significant source of fugitive (wind-blown) emissions following the cessation of active tailings deposition in each of the three impoundments. In recent years, fugitive (wind-blown) emissions are visible primarily from the Intermediate Impoundment and this would likely have become more significant after the cessation of active tailings deposition in 1992.

2.1.3.2 Existing Air Quality

The contribution to ambient air quality from activities on the site post mine closure have not been assessed

When active mining was terminated in 1998, operational atmospheric emission sources would have been eliminated. This would include all mill sources (crushing and concentrate production and boiler operation) and mine sources (ore removal). Activities on the site are currently restricted to care and maintenance of the tailings impoundments and transfer and treatment of water. These activities do not have the potential to generate significant atmospheric emissions. However, the open pits, rock dumps and tailings impoundments will continue to be a potential source of fugitive dust through wind erosion. No ambient air monitoring has been conducted during the 1998 to 2002 care and maintenance phase and the contribution of these sources to ambient air quality have not been assessed.

2.2 TERRAIN

2.2.1 PHYSIOGRAPHY

The Faro area physiography is divided into three areas: Tintina Trench, Swim Basin uplands areas, and the Anvil Range mountains

The physiography of the Faro area can be broadly divided into three main areas (Bond 2001) and these are illustrated on Figure 9:

1. The broad, linear southeast-northwest trending Tintina Trench. The Trench is the dominant structural feature of the area and is occupied by the northward flowing Pelly River. The Pelly River floodplain has an elevation of approximately 600 mASL.

2. The upland areas of the Swim Basin (not shown) and the Vangorda Plateau. The bulk of the mine facilities are located on the Plateau. The Plateau generally parallels the Tintina Trench and is drained by the Vangorda Creek watershed to the south and Rose Creek to the northwest. The Plateau ranges in elevation from 1,000 to 1,400 mASL. A ridge of hills and mountains divide the Plateau from the Tintina Trench, most significant of these is Sheep Mountain to the southeast and Faro Peak to the northwest.

3. The third physiographic region is the Anvil Range mountains. The Anvil Range is located to the northeast of the Vangorda Plateau and rises to a series of peaks over 2000 mASL. The Range is characterized by steep, U-shaped alpine valleys terminating in cirques, and shattered rock and felsenmeer above 1770 m. Major summits in the Anvil range include Mount Mye, east of the Grum and Vangorda open pits and Mount Aho, north of the Faro Main Pit.

2.2.2 SURFICIAL GEOLOGY

Most of the Faro area landforms are attributed to the McConnell glaciation

The landforms and surficial deposits of the Vangorda Plateau have been shaped and are attributable to the last ice age which is estimated to have existed in the Yukon between 35,000 and 10,000 years ago. The southern Yukon was covered by at least four Cordilleran (i.e. mountain) ice sheets. These glaciations, from oldest to the youngest, are named the Nansen, the Kalza, the Reid and the McConnell (Bond 2001). The landforms of the Faro area are for the most part attributed to the youngest of the Yukon glaciations, the McConnell.

Significant surficial material in the study area consists of bedrock and associated colluvium, glacial till, and glaciofluvial outwash sands and gravels (Figure 10). Glaciolacustarine, modern alluvial and organic deposits, are found sporadically but are not discussed in detail herein. The following discussion of surficial materials is derived from the *Quaternary geology and till geochemistry of the Anvil district, central Yukon Territory* (Bond 2001):

The surficial material mainly consists of bedrock, and associated colluvium, glacial till, and glaciofluvial outwash sands and gravels

Bedrock – bedrock and/or frost shattered bedrock (felsenmeer) is frequently found at surface in the alpine areas of the Anvil Range. Elsewhere, mountain slopes are covered in thin veneer of colluvium (materials derived from slope movement processes) derived from the local bedrock. Glacial deposits are relatively absent above 1,500 m, although meltwater channels were identified as high as 1,700 m. Solifluction is common above the tree line.

Morainal Deposits (Till) – glacial till is poorly sorted deposits of clay, silt, sand, gravel and angular boulders which is deposited directly from glacial ice. A thick blanket of till is found covering the Vangorda Plateau. In some locations where pre-glacial valley existed, the till deposits can be over 100 m thick (e.g. Grum valley). Generally till deposits thin to a veneer (<1 m) along the valley walls and are generally absent above 1,500 m. Till also commonly underlies glaciofluvial deposits in areas of former meltwater drainage. The area surrounding the Grum and Vangorda Deposits is characterized by a thick till blanket overlying bedrock.

MEC Ltd. identified six major landforms: morainal; glaciofluvial; organic; alpine colluvial; steepland colluvial; and alluvial

Glaciofluvial Deposits – during the retreat of the glaciers, melting water derived from the decaying ice transported and deposited sand and gravel in the valley bottoms and associated lateral meltwater channels. These deposits are typically stratified to crudely stratified deposits varying from sand with some silt to cobble gravels. These materials are found as significant valley fills as in the Rose Creek valley, as kame terraces at the mouth of alpine valleys or as glacial terraces and complexes associated with the Vangorda Creek valley and the Tintina Trench. Glaciofluvial deposits host the Rose Creek aquifer which underlies the Faro Mine tailings facility. The Faro townsite is located on a major glaciofluvial (and glaciolacustarine) terrace with a well developed stagnant ice (i.e. hummocky terrain) glacial fluvial complex to the northwest of the townsite. The valley bottom glaciofluvial deposits are frequently covered by silts, sands and gravel derived from contemporary stream.

2.3 GEOLOGY

2.3.1 REGIONAL GEOLOGY

The lower part of the Anvil District geological sequence is the most important with respect to the ore bodies and is represented by the Mt. Mye and Vangorda Formations

The geology of the Anvil District has been described in detail in RGC 1996. A regional geology map, repeated from RGC 1996, is provided in Figure 11.

The stratigraphy of the Anvil District consists of regionally metamorphosed sedimentary bedrock, ranging in age from late Precambrian to Permian (approximately 900 to 250 million years ago). The degree of metamorphism ranges from moderate (schist) to low (phyllite). The lower part of the sequence, Silurian aged and earlier, as represented primarily by the Mt. Mye and Vangorda Formations, is the most important with respect to the Anvil Range ore bodies. During the Cretaceous, the meta-sediments were intruded by the Anvil Batholith, a granitic pluton that varies in composition from granite to granodiorite to quartz monzonite. A higher degree of metamorphism is generally observed near the Anvil Batholith contact. The meta-sediment rocks dip northeast and southwest, away from the Batholith.

The Mt. Mye Formation is represented by schists and the Vangorda Formation is represented by calcareous phyllites.

The Mt. Mye Formation is represented by schists, with the dominant rock type being grey, non-calcareous, weakly carbonaceous phyllite with lesser interlayered black carbonaceous phyllite and schists. Mafic meta-igneous rocks, now amphibolites, are present locally but are volumetrically minor. A white, calc-silicate and marble marker horizon occurs about 500 to 700 m below the top of the Mt. Mye Formation, which has a structural thickness of at least 2,000 m (the base is not exposed).

The Vangorda Formation is represented by light to medium grey to greenish-grey calcareous phyllites. At higher metamorphic grade (amphibolite facies), the calcareous phyllite is transformed to calc-silicate rocks. Major interbanded units in the Vangorda Formation include meta–igneous greenstone, which is more common near the top of the Formation, and carbonaceous pelite. The Vangorda Formation varies from 0.5 to 2 km in apparent thickness.

Five ore deposits have been identified.

Five ore deposits have been identified in the Anvil Range area: Faro, Grum, Vangorda, Grizzly (previously DY) and Swim. Mining is complete (depletion of known economic reserves) in Faro and Vangorda deposits, partially complete in Grum and has not occurred in Grizzly or Swim. The three deposits at which mining has taken place are described below.

2.3.2 FARO ORE BODY

Rocks of the Faro Mine site were metamorphosed in the amphibolite facies of regional metamorphism. The result is that schists are more important at Faro than elsewhere, and the calc-silicate gneiss, a rock type not seen at other sites, is widespread as the major rock of the Vangorda Formation. The increased metamorphism generally tended to coarsen mineral grain sizes, including sulphide minerals.

The ore body consists of a stratiform zinc-lead-silver massive sulphide deposit, offset by faults with two main deposits, Zones 1 and 3 and a satellite deposit, Zone 2

Deformation is so complex and flattening into the metamorphic foliation is so pronounced at the Faro site that the geology appears to be a simple layer cake of stratigraphy. The ore-body is concordant to formational boundaries and is stratigraphically approximately 75 m below the top of the Mt. Mye Formation. It consists of a gently dipping, stratiform zinc-lead-silver massive sulphide deposit, offset by faults. The main deposit (Zones 1 and 3) was approximately 1.5 km long, 500 m wide and averaged 46 m thick. The satellite Zone 2 deposit was approximately 300 m long, 180 m wide and average 24 m thick.

The main ore body was composed of two zones (Zones 1 and 3) vertically offset by a normal fault as illustrated on Figure 12. This northeast trending fault, the Faro fault, is sub-vertical and bisects the main ore-body. The east block is down dropped approximately 50 m. A diorite dyke is intruded along the fault zone. The satellite Zone 2 ore body was geologically part of the same sulphide lens but was separated by normal fault offset. The Big-Indian – North Fork fault system separates Zone 2 from Zone 3. This fault set consists of several strands with a throw of roughly 75 m, west block down.

The Zone 2 Pit was one of the few areas where the Faro deposit was exposed on surface. Thus, a weathered mantle was present over part of the deposit. The Zone 2 ore body was at the edge of the overall Faro deposit and was rich in ribbon banded quartzite ore. Massive sulphide was limited and the ore grade was low compared to Zone 1 and 3 in the Main Pit. Anvil Batholith instrusives were found along the northeast side of the Zone 2 ore body.

2.3.3 VANGORDA ORE BODY

The Vangorda deposit has unusual orebody characteristics.

The Vangorda deposit was a small deposit for this area and had a number of characteristics that made it unusual. These included:

1. Shallow depth and a greater degree of weathering;
2. Abundance of foot wall sulphides; and

3. Degree of development of strongly altered phyllites.

The Vangorda deposit was relatively close to the ground surface and was more affected by weathering than the other ore deposits of the district. The thickest part of the ore body occurred below a ridge of highly compacted till east of Vangorda Creek.

The Vangorda deposit consists of one major sulphide horizon and there is a major fault at the northwest end of the Pit

The Vangorda deposit consisted of one major sulphide horizon located about 50 to 120 m beneath the basal carbonaceous member of the Vangorda Formation. The host rocks for the deposit were dominantly non-calcareous phyllites. A number of thin horizons occurred above the sulphide horizon. These horizons were too thin or of too low a grade to be economically mineable, with the exception of the south-east end of the deposit where the ore horizons were shallow (resulting in a low stripping ratios). The deposit itself contains the same sulphide rock types as the other deposits in the Anvil District.

A major fault is found at the northwest end of the Vangorda Pit as illustrated in Figure 13. This fault truncated the ore body and juxtaposed the black graphitic phyllite of the basal member of the Vangorda Formation against the ore body.

2.3.4 GRUM ORE BODY

Characteristics unique to the Grum deposit

The Grum Deposit, with mineable reserves of approximately 25 million tonnes, has a number of characteristics that make it unique. These include:

1. The high proportion of disseminated sulphide ore types compared to massive ores;
2. The generally weak alteration overprint.; and
3. The complex, large scale, fold structure.

The deposit was covered by up to 100 m of till and glaciofluvial silt, sand and gravel. The material fills a buried channel trending north-south through the southeast pit area. No notable weathering features are present at Grum as were observed at Vangorda.

Quartoze ore types form 50% of the Grum orebody reserves

The Grum deposit consists of three to five highly contorted layers of massive and disseminated sulphide mineralization within a 150 m thick section of phyllite. The most important mineralized horizon occurs just beneath the basal carbonaceous member of the Vangorda Formation. There are thin low-grade horizons with the Vangorda Formation and more important horizons in the upper part of the Mt. Mye Formation. A unique feature of the geology of the Grum ore body is the presence of quartoze ore types, which formed up to 50% of the reserves. The other ore types are similar to the other deposits.

The Vangorda Formation and the Mt. Mye formation are composed of phyllites

The Vangorda Formation at the Grum Deposit consists primarily of soft calcareous phyllites. They are not as strongly altered as at the Vangorda Deposit and are strongly calcareous. The Mt. Mye Formation at the Grum Deposit also consists of phyllites, which are non-calcareous and less distinctly banded than those of the Vangorda Formation.

Grum deposit faults

There are several important faults at the Grum Deposit. The largest displacements occur on moderately dipping structures that truncate the deposit at both its northwest and southeast ends but do not crop out in the pit. A steeply north-west dipping fault set down drops the deposit about 60 m on the north-west. A myriad of smaller steeply dipping faults has also been mapped both underground and in the pit. Figure 14 illustrates geology for the ultimate design Grum Pit, which is larger than the existing excavation.

2.3.5 ROSE VALLEY GEOLOGY

The mine is situated within an area of discontinuous permafrost

The mine area is situated within an area of discontinuous permafrost. At the mine site, north facing slopes and areas with older forest cover are more likely to contain permafrost. Permafrost ground, with varying degrees of ground ice content, was encountered during the construction of the Cross Valley Dam and the Rose Creek Diversion Channel. Felsenmeer is formed near the top of high hills due to frost action effects on exposed bedrock.

The surficial geology of the Rose Creek valley generally consists of colluvial, fluvial and morainal deposits forming a discontinuous cover over the bedrock. On the valley sides, bedrock is discontinuously covered with a veneer of morainal and colluvial deposits that increases in thickness towards Rose Creek. A complex assemblage of fan and outwash sand and gravels, dissected by stream channel and lacustrine materials fill Rose Creek Valley. Terraces and fans are prominent on the north side of the valley, where they, in part, underlie the existing tailings area.

Bedrock underlying the Rose Creek Valley and bedrock in the Vangorda and Grum Pits consists of Cambrian to Ordovician rocks of the Vangorda Formation

Bedrock underlying the Rose Creek valley consists primarily of the Cambrian to Ordovician rocks of the Vangorda Formation. This formation is described as a "soft silvery grey calcareous phyllite with interbands of medium crystalline grey marble" (RGC 1996). This formation has been locally intruded by granodiorites and quartz monzonites of the Anvil Batholith. Foliation in the bedrock underlying the Rose Creek valley is mapped as generally parallel with the valley axis (west northwest to east southeast and dipping shallowly to the southwest (15 to 30 degrees) (Pigage 2001). The competence of the bedrock varies but in most cases is poor. Exposures were found to be easily eroded by freeze –thaw and stream flow processes. In places, the schist is reported as being weathered up to 2 m depth (Golder 1980).

2.4 GEOLOGICAL HAZARDS AND SEISMICITY

2.4.1 GEOLOGICAL HAZARDS OVERVIEW

BGC described an assessment of hazards based on a review of geological information and an assessment of mine infrastructure

Geological hazards resulting from natural conditions have the potential to significantly impact facilities and infrastructure at a mine site. An assessment of hazards at the Anvil Range Mine Complex was described by BGC based on a review of surficial and bedrock geological information coupled with an assessment of climatic and topographic conditions related to mine infrastructure locations. The assessment utilized information provided in BGC 2001, which was a qualitative risk assessment for structures situated in the Rose Creek valley.

Some potential geological hazards that may exist at the Anvil Range Mine Complex consist of the following:

1. Landslides, in either soil or rock.;
2. Falls;
3. Debris torrents; and
4. Fault movements.

Consequences of landslides, falls and debris torrents

The three types of slope movements: landslides, falls and debris torrents, have essentially similar consequences. Failure debris that travels into the mine complex area may impact either a pond of water, a water channel, the access roads or some other component of the mine infrastructure such as a pipeline, dam or treatment facility. If the debris falls into a pre-existing body of water, a wave could be generated that would overtop the water retention structure (a dam or dike). If the debris falls into a channel, then the channel could be blocked, or if the volume of debris is small, the hydraulic capacity of the channel will be changed. If the debris falls on the road, then access could be blocked. Other component specific consequences (e.g. complete damage to a water treatment pipeline) are possible as well.

Fault movements, a hazard related to the seismic risk assessment for a site, consists of the rapid movement of the ground beneath one of the site structures or channels. Fault movements, if severe, could potentially result in deformations or failure of dams or other earth structures.

2.4.2 SLOPE MOVEMENT AND FALLS

Slope stability issues are confined to local failures

The majority of the natural soil located in the Anvil Range Mining Complex consist of granular soils; *i.e.* locally derived tills, glacial outwash deposits and fluvial deposits. These soils are not particularly prone to slope stability hazards, except for the mechanism of river erosion and within active fluvial fans. Even in these two cases, slope stability issues will likely be confined to local failures due to oversteepening and eroding water.

Colluvial deposits could provide erratic rockfalls or local slides

The colluvial deposits that have been mapped at the Faro Mine are either soils that are actively moving or soils that have moved downslope into their current position. The colluvial soils should be considered to be quasi-stable or in an active state of movement. These materials are typically located on the steeper sections of the surrounding Rose Creek or Vangorda Creek valleys and could provide erratic rockfalls into the valley or local small slides.

The areas most likely to experience rockfalls are the exposures located above the FWSD reservoir and the Rose Creek Diversion Canal.

Unless in very weak rock masses, rockslides are controlled by the discontinuities within the rock mass. Most rock slopes failures can be classified as either: planar failures, wedge failures, toppling failures or circular failures. The initiation of failures would be dependent upon site-specific geological controls (foliation planes, joints, etc.) and the orientation and height of exposed surfaces.

For rock falls to occur, there needs to be exposed rock faces, steep slopes on the exposed faces and adverse geological controls. The areas of the Faro Mine site that are the most likely candidates for exposure to rock fall hazards are the exposures located above the Fresh Water Supply Dam ("FWSD") Reservoir (which is scheduled for removal by March 2004 as described in Volume 1) and the Rose Creek Diversion Canal. The steepness of the overall slopes in the area of the Anvil Range Complex range up to 30 degrees (based on Figure 10). Some local oversteepening in the area surrounding the creeks and rivers is likely. In addition, the exposed rock slopes are likely locally steeper than the general overall slope angles.

Earthquake loading should also be considered as part of any slope stability assessment. Earthquakes can have two main effects on the stability of the slopes; increased horizontal force in the slope that decreases the stability and liquefaction of soil within the slope or at the foundation. As noted for soil slides, the addition of earthquake loading will adversely affect the stability of rock slopes.

2.4.3 DEBRIS FLOWS

This may occur in the upper reaches of the surrounding mountains along some headwaters of the creeks.

Debris flows consist of a spatially continuous movement where the soil/rock moves as a viscous liquid. This type of failure may occur in the upper reaches of the surrounding mountains and feed soil and rock into the Anvil Range Mine Complex. This type of failure would require steep slopes and debris within the steep area. It is envisioned that only in the high altitudes along some headwaters of the creeks that this type of failure could occur.

2.4.4 FAULT MOVEMENTS

The hazards include impacts to structures and slopes and rock slides.

Faults occur throughout the Anvil Range Complex site area. A major regional fault is the Tintina Trench, located close to the study area. The major geological hazard related to faults is related to fault movements that induce earthquakes. If the fault is located in the immediate vicinity, then the direct movements of the fault can impact structures and slopes. The secondary geological hazard related to faults is in the local control of slides within the rock mass. The rockmass, located at a fault zone, can generally be recognized by a zone of intense shearing, fracturing and brittleness of the rock. These factors combine to potentially form the boundaries of rock slides or falls.

Known faults within the Mine complex include the Rose Creek Fault, Vangorda Fault, Blind Creek Fault, and the Tie Fault.

2.4.5 SEISMICITY

Earthquakes can produce both ground ruptures and seismic shaking of the ground, depending upon the magnitude (M) of the earthquake, the distance from the epicenter and the local site-specific conditions. Both of these resultant occurrences have potential impacts on engineered structures, such as dams and other water diversion structures. Before any impact analyses can be undertaken on the various engineered structures, it is necessary to estimate the level of seismic shaking that a structure may undergo. This task is generally referred to as a seismic hazard assessment. Peak ground acceleration (PGA) values resulting from seismic events are stated as a percentage of gravity (g).

A number of studies of seismicity relevant to the Faro mine complex have been conducted over the life of the mine.

There are three approaches to seismic risk assessment that result in different site acceleration estimates

Vick (1983) noted that there are three main approaches to seismic risk assessment that will likely result in different estimates of potential site acceleration values:

1. Historical seismicity approach – examination and summary of the historic earthquake record proximal to the site in question.
2. Probabilistic approach – refinement of the historical approach where the historical record is the basis of a probabilistic analyses to determine a unique probability of occurrence for each possible level of seismic acceleration.
3. Deterministic approach – where an estimate of the maximum seismic acceleration is based on an assessment of available geological data without regard for past historic events. The geological data is used to determine the nearest fault and then to estimate the magnitude of the earthquake that would result on this fault. This approach is commonly applied in areas where active earthquake-generating faults exist. Generally, the acceleration estimated by this method is termed as "maximum" or "maximum credible".

A range of PGA's have been used for designing various facilities at the Anvil Range Mine Complex. In the "Abandonment Plan for Faro Mine Tailings" report, dated September 1981, Klohn Leonoff (Klohn) estimated PGA values based on two different approaches as follows:

1. 0.07g for a 475 year return period;
2. 0.10g for a 900 year return period;
3. 0.32g for a 10,000 year return period; and
4. 0.40g for Maximum Credible Earthquake (MCE).

It was recommended that the MCE be used as the closure design criteria

Klohn noted that the closure design criteria would be much different than the values used for an operating mine. Therefore, Klohn recommended that the MCE be used for the design criteria. The data available at that time was limited and a conservative approach was taken.

Statistical and historical analyses were used to estimate the MCE

Based on the historical movement rates within the Tintina Trench, Klohn estimated that an earthquake with a magnitude of M6.5 could occur. Using an empirical formula that included the distance from the site to the location of the earthquake, a peak ground acceleration of 0.40g was estimated. Using the same methodology and an estimated M6.0 earthquake within the local faults of the Rose Creek Valley, a peak ground acceleration of 0.36 g was estimated for the site facilities.

Statistical analysis was also performed by Klohn, based on earthquake analysis provided by GSC Pacific Geoscience Centre (PGC). The 10,000-year event resulted in a peak ground acceleration of 0.32 g. The analysis was also performed to estimate the 475-year return period earthquake, which was determined to be 0.07g. The report noted that one method used to estimate the MCE was by doubling the magnitude of the 475-year event and that this would result in an MCE of 0.14 g.

In a Dome Petroleum memo dated September 1984, based on information supplied by the PGC, the seismic risk for the Faro area was calculated to be 0.063g for a 475-year return period and 0.08g for the 1,000-year return period event.

Various studies have been conducted to estimate the PGA and seismic risk.

In a report dated March 1986, "Report on design and proposed construction, Rose Creek Water Reservoir Dam Raising" Kilborn Engineering performed pseudo-static analysis on the proposed dam raise. It was noted that the analysis was performed using a "conservative design earthquake" value of 0.15g. No quantification of the method used to determine this earthquake loading was made, nor was the return period for this earthquake mentioned.

In a report dated February 1989, Appendix I of the report entitled "1988 Performance Monitoring and Additional work on the Down Valley Tailings project: Faro Mine", Golder Associates Ltd. used a PGA value of 0.08g (475-year return period) as part of an analysis of the geotechnical stability of the FWSD. It was noted that the earthquake parameters used for this analysis of the FWSD were based on the values employed in the 1980 design of the Down Valley Tailings containment project. The design earthquakes for that project were a PGA of 0.052 g (100-year return period) and 0.097g (200-year return period). The determination of these design earthquakes were based on a statistical analysis of historical earthquakes, based on data provided from the Pacific Geoscience Centre.

In a report dated November 1996, Appendix A of the report "Anvil Range Mining Complex – Integrated Comprehensive Abandonment Plan (ICAP)"

Robertson Geoconsultants had an assessment of the seismic ground motions for the Faro area performed. This was based on historical data and the assumption that earthquake loading would be transmitted through rock. The PGA was estimated as follows:

1. 0.05g for a 475 year return period; and
2. 0.13g for a 10,000 year return period event.

The Robertson report noted that "there is no evidence of more recent displacement along the Tintina Fault and the fault is not included as an earthquake source zone in either the H or R zonations given in the GSC report, i.e. the fault is not considered active and no maximum magnitude has been defined for the fault. Thus, it is unrealistic to consider a deterministic estimate of seismic ground motions at Faro in which an earthquake is assumed to occur on the Tintina." This suggests the Klohn value for the MCE is larger than can be generated by the existing tectonic conditions.

In a report dated November 2001, entitled "Physical Stability Assessment of the Fresh Water Supply Dam" undertaken by BGC, the seismic loading values were as follows:

1. 0.063g for 475 year return period; and
2. 0.080g for 1,000 year return period.

Klohn Crippen, as part of a dam safety review at the Faro site in 2002, undertook a seismic hazard assessment using the computer program, EZ-FRISK®. Two seismo-tectonic models were used, namely the GSC-R model, which is based on historical seismicity and regional tectonics, and the GSC-H model, which is based on historical seismicity. The resulting PGA values were as follows:

1. 0.05g and 0.06g (GSC-R and GSC-H, respectively), for the 475 year return period;
2. 0.09g and 0.11g (GSC-R and GSC-H, respectively), for the 2,500 year return period;
3. 0.15g and 0.16g (GSC-R and GSC-H, respectively), for the 10,000 year return period;

SRK (2003) recently completed a seismic hazard assessment and arrived at the following estimates of the PGA:

1. 0.05g for 475 year return period; and
2. 0.15g for 10,000 year return period.

The deterministic analysis resulted in a much larger PGA than any of the statistical analyses.

The majority of the analyses performed in order to determine the seismic design parameters for the Faro Mine were based on historical records (statistical method) and probabilistic determinations. The only deterministic estimation of the earthquake risk was performed by Klohn (1981). As listed in Table 6, the deterministic analysis resulted in a much larger PGA than any of the statistical analyses.

Table 6. Summary of Earthquake Loadings

	Return Period Event				
Study	**475**	**1,000**	**10,000**	**Estimated MCE (based on twice the 475 Year Event)**	**MCE**
Klohn Leonoff (1981)	0.07g	0.10g	0.32g (probabilistic)	0.14g	0.40g (deterministic)
Dome/PGC (1984)	0.063g	0.08g		0.126g	
Golder (1989)	0.08g			0.16g	
Robertson (1996)	0.05g		0.13g	0.10g	
BGC/PGC (2001)	0.063g	0.08g		0.126g	
Klohn Crippen (2002)	0.05-0.06g		0.15 – 0.16g		
SRK (2003)	0.05g		0.15g		

The above information indicates that the seismic loading design criteria have been quite variable in the 20 years that have been reviewed for the Faro area. It should be noted that the design horizontal acceleration determined for the 475-year return period has been relatively consistent in this period from 0.05g to 0.08g. Using the suggestion provided in Klohn 1981 that the maximum credible earthquake (MCE) is twice the magnitude of the 475-year event, relatively consistent values emerge for the magnitude of this event, from 0.10g to 0.16g even though the single deterministic analysis resulted in a larger magnitude.

Two significant seismic events were measured at the Anvil Range Mine Site in 2002. On November 3, 2002 a magnitude 7.9 earthquake occurred approximately 120 km south of Fairbanks, Alaska. A second seismic event occurred on November 5, 2002 when a magnitude 4.6 earthquake occurred approximately 50 km south of Faro. Both events were felt by the mine staff at the mine site and it was noted that numerous aftershocks associated with both events could be felt in Faro. There were no impacts to site facilities as a result of these events. These events add to the earthquake record but they do not change the conclusions provided above in relation to earthquake return periods.

2.5 WATER RESOURCES

2.5.1 WATER RESOURCE STUDY AREA

The water resource study area includes the Rose Creek and Vangorda Creek watersheds

Water resources include hydrology, hydrogeology and water quality environmental components. The water resource RSA is watershed based and includes both the Rose Creek and Vangorda Creek watersheds as shown in Figure 3. The existing conditions upon which the environmental effects assessment is based is data available from 1998 to 2002, during care and maintenance activities. Historical information is also available and is presented under each component section below, to provide information and perspective on changes to each component, over time, as a result of mine activities.

The RSA for the Faro Mine Site is defined by all catchment areas upstream of the confluence of Rose Creek with Anvil Creek. This allowed assessment of any effects of mining activity on the Rose Creek to be assessed for impacts to Anvil Creek, the next receiving water body downstream. It also allows consideration of any effects at this point in the watershed in a cumulative effects assessment for activities in the Anvil Creek watershed and, ultimately, in the Pelly River.

The Vangorda Mine site RSA is defined by all catchment areas upstream of the confluence of Vangorda Creek with the Pelly River. This boundary allows the assessment of any mine effects on fish and fish habitat in lower Vangorda Creek. Any detectable aquatic effects at this point would need to be included in a cumulative effects assessment for activities in the Pelly River.

2.5.2 HYDROLOGY

2.5.2.1 Watershed Description

The Faro Mine site facilities are located within the Rose Creek watershed and the Vangorda Plateau Mine site is located within the Vangorda Creek watershed.

Anvil Creek (including Rose Creek drainage) and Vangorda Creek are both tributaries to the Pelly River. The Rose Creek watershed is approximately 340 km^2 and flows to the 980 km^2 Anvil Creek watershed, which drains the southeast slopes of the Anvil Range Mountains to the Pelly River. The Faro Mine site facilities are within the Rose Creek watershed.

Vangorda Creek drains an area of approximately 90 km^2 via an east (mainstem) and west fork. Drainage from the south slope of Mount Mye flows into the main stem and drainage from the northwest slope flows into the west fork. The two forks join together just above the Town of Faro. The Vangorda Plateau Mine site is located within the Vangorda Creek watershed.

2.5.2.2 Historical Hydrological Changes

Initial development and on-going surface water management has changed the site hydrology

Development of the complex resulted in significant changes to surface hydrology both during the initial development stages and on an ongoing basis as additional surface water management structures were constructed or existing structures were modified. These changes relate primarily to the interception and rerouting of surface flows in constructed diversion channels or the construction of surface water barriers that altered the downstream flow.

Initial construction of the Faro Mine Site (1968/1969) and subsequent activities involved construction of the facilities (listed in Table 7) that changed the surface hydrology.

Table 7. Hydrological Changes Resulting from Construction at the Faro Mine Site

Timeframe	Facility	Change to Hydrology
Initial Construction	Fresh Water Supply Dam South Fork of Rose Creek	Introduction of manual control over winter flow rate in Rose Creek; delay in the release of freshet flows to Rose Creek
	Pumphouse Pond	Removal of water from Rose Creek to the mill
	Faro Creek Diversion	Rerouting of most flow from tributary to Rose Creek to tributary to North Fork of Rose Creek
	Original Tailings Impoundment	Addition of tailings supernatant into Rose Creek at an artificial (i.e. not natural) flow schedule
	Faro Main Pit	Interception of surface runoff and rerouting to various outflow pumping locations
	Mine Access Road	Consolidation of possible surface sheet flow and ground infiltration into discreet streams at culvert crossings
Mine Life	Rerouting of Faro Creek Diversion	Change of entry into North Fork of Rose Creek to current location
	North Fork of Rose Creek Diversion	Change of location of confluence with the South Fork and possible change to groundwater recharge characteristics
	Groundwater recharge ponds in North Fork of Rose Creek	Possible increase of surface water losses to ground
	Upper leg of Rose Creek Diversion Canal	Rerouting of Rose Creek through a constructed channel
	Second Tailings Impoundment	Change of location of entry of tailings supernatant into Rose Creek
	North Wall Interceptor Ditch	Rerouting of water from Guardhouse Creek drainage into a constructed channel and change of entry location into Rose Creek
	Intermediate and Cross Valley Dams	Change of entry of tailings supernatant into Rose Creek and change of flow schedule to accommodate water treatment processes; local changes to surface water/groundwater interactions
	Lower leg of Rose Creek Diversion Canal	Rerouting of an additional length of Rose Creek through a constructed channel
	Rock Dumps	Changes to surface infiltration/runoff characteristics and routing of surface runoff flows
	Zone II Pit	Interception of surface runoff and rerouting to various outflow pumping locations
	Faro Main Pit as tailings disposal facility	Decrease in water (tailings supernatant) entering Rose Creek taken up as storage in Main Pit
	Faro Main Pit pumping/ recycle system	Periodic releases of high flows into Rose Creek via Cross Valley Pond

Initial construction of the Vangorda Plateau mine site (1989/1990) and subsequent activities involved construction of the facilities that changed the surface hydrology as listed in Table 8.

Table 8. Hydrological Changes Resulting from Construction at the Vangorda Plateau Mine Site

Timeframe	Facility	Change to Hydrology
Initial Construction	Rock Drain in North Fork Rose Creek	Delay of passage of high flow events (i.e. freshet) to Rose Creek and possible changes to local surface water/groundwater interactions
	Haul Road	Consolidation of possible surface sheet flow and infiltration to ground into discreet streams at culvert crossings
	Mine Access Road ("Grum turnoff")	Consolidation of possible surface sheet flow and infiltration to ground into discreet streams at culvert crossings
	Grum Interceptor Ditch	Rerouting of surface flows to Grum Creek around the Grum pit
	Vangorda Creek Diversion Flume	Rerouting of Vangorda Creek into a constructed channel
	Grum and Vangorda Pits	Interception of surface runoff for storage or rerouting to water treatment plant
	Vangorda Pit interceptor ditches	Rerouting of surface flows and consolidation of possible surface sheet flow into discreet streams
	Water Treatment Plant	Periodic releases of high flows into Grum Creek (pre-1995) and Vangorda Creek via the Grum Interceptor Ditch (post 1995)
Mine Life	Overburden dump, rock dumps and ore transfer pad	Changes to surface infiltration/runoff characteristics and routing of surface runoff flows
	Vangorda Rock Dump collector ditch/Little Creek Dam	Interception of surface runoff for storage or rerouting to water treatment plant
	Rerouting of Grum Interceptor Ditch to Sheep Pad Pond	Rerouting of surface flows from tributary to Grum Creek to tributary to Vangorda Creek
	Moose Pond	Rerouting of partial surface flow from Grum Creek to ground

2.5.2.3 Hydrologic Investigations

The majority of hydrological investigations have focussed on one area only

Hydrological investigations that have been undertaken throughout the mine life have generally focussed on the mine sites and their immediate receiving environments. The majority of these studies focussed on one area only, such as the design flood for a proposed diversion channel or the minimum size of reservoir required to provide a reliable water supply to the Faro Mill.

Streamflow monitoring

The streamflow monitoring network in the vicinity of the Anvil Range Mining Complex was increased beginning around 1990 with the installation of automatic water level recorders and by expanding the number of flow measurement stations. As well, the Yukon Territory Government added three new stations (Drury Creek, Tay River and Blind Creek) in the mine region. Drury Creek is located approximately 50 km west of the mine area. Tay River shares its catchment divide (on the north side) with Anvil Creek and Vangorda Creek, and Blind Creek shares its catchment (on the south side) with Vangorda Creek.

Two hydrological studies are most relevant to the site:

1. 1996 Integrated Comprehensive Abandonment Plan ("ICAP") Study (RGC 1996); and
2. 2002 Water Balance and Contaminant Loading Study (Gartner Lee Limited, 2002b).

Mean Annual Runoff

The ICAP study (RGC 1996) provided a comprehensive hydrological assessment of the Faro and Vangorda Plateau Mine site areas. Flows were measured using a variety of techniques (weir, bucket and stopwatch, current meter, staff gauge, and pressure transducer). The following sources of information were used in the 1996 hydrological assessment:

Sources of information for the 1996 ICAP study

1. The series of Annual Reports prepared for Water Licence IN89-001 (water quality and quantity data presented and evaluated at the Faro Mine and area).
2. The series of Annual Reports prepared for Water Licence IN89-002 (water quality and quantity data presented and evaluated at the Vangorda Plateau development).
3. Streamflow records collected by the Water Survey of Canada (WSC) at 16 streamflow gauging stations.
4. Streamflow records collected at 3 hydrometric stations operated by the Water Resources Division of DIAND.
5. Records of spot flow measurements made by DIAND personnel at water quality monitoring sites throughout both Faro and Vangorda Plateau developments.
6. Environmental reports prepared by Steffen Robertson Kirsten (Canada) Inc. (SRK) and Laberge Environmental Services.
7. Unpublished data gathered by mine personnel, such as raw data extracted from the mine's automatic water level recorders.

Flows were estimated at ungauged points around the mine sites

For the 1996 hydrological assessment, data collected by the WSC and DIAND were used to characterize the minesite hydrology by employing a regional analysis technique which involved deriving empirical relationships between the measured streamflow of the regional stations and the physical characteristics of the catchments which generated the streamflow. These empirical relationships then formed the basis for estimating flows at ungauged points around the Faro and Vangorda Plateau Mine sites.

The relationship between elevation and mean annual runoff was determined

Elevation generally accounts for a large proportion of the variation in mean annual precipitation within a mountainous region; hence, mean annual runoff (MAR) was also assumed to be a function of elevation. The following sources of data were assembled to determine this relationship:

1. Nineteen pairs of MAR and median elevation data provided by the WSC and DIAND stations.

2. Four pairs of MAR and median elevation values provided by four incremental catchments monitored by the WSC.

To assemble data source 1, the streamflow records with missing data were patched, then the series of annual average discharges for each station were averaged to arrive at a preliminary estimate of MAR. Next, the preliminary MAR estimates were adjusted so they were representative of a common 30-year period from 1966 to 1995. Finally, the median elevations for all the stations were measured from topographic maps.

The second source of data was obtained from those streams in the region that are monitored by two streamflow gauging stations. The data from these paired stations were collectively used to characterize the MAR and median elevation of the intervening catchment between the stations.

Once all the data were assembled and processed, a curve was fitted to the data to develop a relationship that was believed to represent hydrological conditions for various median elevations at the mine site (Figure 15).

Extreme Flood Estimation

Flood estimates provide the basis for conceptual design of spillways and diversion channels. They were examined for the 500 year peak instantaneous flood and the PMF.

Flood estimates were developed in 1996 for several key points around the mine sites to provide the basis for the conceptual design of spillways and diversion channels.

Two extreme flood events were examined for each point of interest, namely the 500-year peak instantaneous flood and the Probable Maximum Flood (PMF). The former is a rare event which is expected to only be exceeded once every 500 years on average (or roughly once in 6 lifetimes). The latter event is defined as "the flood that may be expected from the most severe combination of meteorologic and hydrologic conditions that are considered to be reasonably possible in the geographical region encompassing the basin under study" (USACE 1980). The PMF for the study area has a likely return period in excess of several thousand years.

The magnitude of a 500-year peak instantaneous flood was estimated using the Rational Method. The magnitude of PMF events was estimated using the Creager Curve. Results of these analyses are presented in Table 9.

Table 9. Estimated Peak Instantaneous Flood Discharges for Various Structures

Structure	Catchment Area (km^2)	500-Year Return Period (m^3/s)	Probable Maximum Flood (m^3/s)
Faro Creek Diversion Channel	15.3	27	150
Intermediate Dam Spillway	221	190	840
Vangorda Creek Diversion Channel	20.1	31	180

2.5.2.4 Water Balance Methodology

A complete water balance for the Rose and Vangorda catchments was developed in 1996 for the Integrated Comprehensive Abandonment Plan (RGC, 1996). This work was subsequently updated in 2001 based largely on the collection of additional flow data via a set of on-site continuous data loggers.

The 1996 water balance covered the Anvil Creek and Vangorda Creek watersheds

To complete the 1996 water balance, the mine complex was described as a system of elements and associated flow paths between the elements. The amount of water generated by each element and the amount of water flowing along each flow path was then quantified. The coverage of the water balance was extended over the entire watersheds of Anvil Creek and Vangorda Creek. The outlets of the subcatchments were dictated by the locations of water quality monitoring stations, tributary confluences, open pits, and dams.

A total of 36 subcatchment areas, 20 for Anvil Creek and 16 for Vangorda Creek, were identified. Table 10 provides a description of each subcatchment, together with its measured drainage area and estimated mean annual runoff for its median elevation for the period 1990 to 1995. The subcatchment areas are illustrated on Figures 16, 17 and 18.

New data obtained from the installation of new streamflow recorders helped to create a new water balance in 2002

The installation of several continuous streamflow recorders from 1996 to 2002 provided additional data that was combined with the results of the 1996 water balance study to create new water balances for Rose and Vangorda Creeks (GLL, 2002b). The new data collected from 1996 to 2000 included spot flow measurements around the minesite and, most importantly, three new flow recorders (pressure transducers with dataloggers) as follows:

Seasonal effects were presented

1. At location R7 in the North Fork of Rose Creek, installed in 1996;
2. At location X14 in Rose Creek below the tailings facility, installed in 1998 as a replacement to an older, malfunctioning unit; and
3. At location V8 in lower Vangorda Creek, installed in 1998.

New water balances were described for the 1996 subcatchment areas (Figures 16 to 18) that were based on the actual measurements to as great a degree as practical. Flows at ungauged locations were extrapolated from gauged locations in proportion to the MAR's calculated in 1996 (Table 9). The water balance was presented in terms of two seasons (winter and fall) defined as November to April and May to October as a means of capturing seasonal effects.

Table 10. Details of Subcatchments for Historical Water Balance Analysis

Subcatchment ID No.	Subcatchment Description	Catchment Area (km2)	Median Elevation (m)	MAR for Period 1990-1995* (mm)
ANVIL CREEK WATERSHED				
1	Faro Creek at Diversion Inlet	13	1540	396
2	Faro Valley Interceptor Ditch at outlet	1.28	1420	342
3	Incremental catchment of Faro creek Division Channel (FCD)	1.94	1370	320
4	Main Pit catchment (zone I/III)	2.15	1260	270
5	Zone II Pit catchment (excluding area commanded by Zone II interceptor ditch)	0.33	1170	230
6	North Fork of Rose Creek above Faro Creek Diversion Channel (station R7)	95	1470	365
7	North Fork catchment above X2 and below R7 and FCD	9.1	1220	252
8	Incremental Catchment of North Fork Diversion Channel	1.04	1110	203
9	South Fork of Rose Creek at Fresh Water Reservior Dam	67	1420	342
10	Incremental catchment of Pumphouse Reservior	8.6	1230	257
11	Old Faro Creek channel above X23 (incremental)	0.9	1160	225
12	Old Faro Creek Channel above X7 and X23	0.9	1160	225
13	Incremental catchment of Down Valley Tailings Impoundment	4.3	1050	176
14	Incremental catchment of Rose Creek Diversion Channel	17.6	1300	288
15	Gaurdhouse Creek below wast rock dumps	1.86	1480	369
16	Incremental catchment of North Wall Interceptor Ditch (NWID)	4.5	1190	239
17	Rose Creek above X14 and below NWID, X5 and X10	2.1	1130	212
18	Rose Creek between mouth and Station X14	105	1280	279
19	Anvil Creek above Rose Creek	322	1450	356
20	Anvil Creek between mouth and Rose Creek	321	1170	230
VANGORDA CREEK WATERSHED				
21	Vangorda Creek above station V1	18.7	1590	419
22	Subcatchment of Blind Creek road	1.4	1330	302
23	Subcatchment of Vangorda Northeast interceptor ditch	0.6	1200	243
24	Subcatchment of Vangorda Pit	0.8	1160	225
25	Subcatchment of Little Creek Dam	0.44	1130	212
26	Subcatchment of Vangorda Waste Dump	0.28	1130	212
27	Subcatchment of Grum Northeast Interceptor Ditch	1.8	1350	311
28	Subcatchment of Grum Pit	1	1300	288
29	Subcatchment of Overburden Dump	1.4	1240	261
30	Grum Creek between V2 and the haul road	1.2	1200	243
31	Vangorda creek above V27 and below V2 and the plunge pool	3.7	1160	225
32	Shrimp Creek between V4 and V20	12.6	1150	221
33	AEX Creek above V6A	4.4	1360	315
34	West Fork Vangorda Creek between V5and V6A	27	1190	239
35	Vangorda Creek above 29BC003 and below V27, V4 and V5	12.7	960	135
36	Vangorda Creek between V8 and 29BC003	12	700	18
PELLY RIVER WATERSHED				
37	Blind Creek above DIAND Station 29BC004	618	1180	231
38	Pelly River above WSC Station 09BC004 and below 29BC004 and V8	21400	1210	318
39	Pelly River between Anvil Creek and WSC Station 09BC004	454	800	63
40	Tay River above WSC Station 09BC005	3810	1160	228
41	MacMillan River above WSC Station 09BB002	13800	1130	336
42	Pelly River above 09BC001 and below Anvil Creek, 09BC005 and 09BB002	7860	880	109

* MAR = mean annual runoff. The period 1990-1995 was relatively wet (approximately 10% greater than the MAR experienced in the preceding 25 years).

Streamflow Record – Rose Creek

The streamflow record for location R7 in the North Fork of Rose Creek upstream of mine activities (Figure 3) provides the most continuous recording of local flow in recent years. These data were measured by a datalogger and pressure transducer installed in September 1996.

A stage discharge curve was used to convert pressure transducer readings to equivalent flow rates

A stage-discharge curve was developed for location R7 based on available spot flow measurements. The curve was used to convert the pressure transducer readings (height of water) to equivalent flow rates. These pressure readings were monitored by the datalogger at 45-minute intervals. To compute an accurate daily flow record, these readings were first converted into 45-minute flows and subsequently compiled into daily (24-hour) averages.

Daily flow rates were screened for anomalous readings and for the effects of ice

The daily flow rates at location R7 were screened for anomalous readings and, specifically, for artificial effects of ice. This was accomplished by overlaying the streamflow record for location R7 with a streamflow record operated by the Water Survey of Canada (WSC) on the Ross River at Ross River. This was a useful comparison because the WSC employs special processing techniques that account for the effect of ice on their stage measurements. Furthermore, the Ross River exhibits a similar streamflow pattern as the North Fork, as evidenced by a correlation of coincidental flow data at the two streams.

An early winter spike in the Rose Creek data was revealed

The overlay of data revealed a consistent early winter spike in the Rose Creek (R7) data that does not appear in the Ross River record. These peaks are attributed, at this time, to the effects of early freezing and ice formation and were removed from the database for Rose Creek such that the two flow records showed similar seasonal patterns. The patched R7 streamflow record was subsequently used as the primary reference for flows in the mine area.

The streamflow record at location X14 (noted on Figure 3) is recorded by a datalogger and pressure transducer. However, the data record is not as continuous as at location R7. Replacement data loggers and transducers have been installed periodically due to damage. The rating curve that is used to convert the pressure transducer readings into flow rates was applied to hourly data which was subsequently compiled into daily (24-hour) averages.

Water Balance – Rose Creek

The North Fork of Rose Creek is defined in this study as the area upstream of location X2 (noted on Figure 3). The North Fork was selected as a distinct component of Rose Creek because of the important source terms in the drainage area and because the available monitoring data was sufficient to support the assessment of these specific source terms.

The interactions between source terms to the North Fork of Rose Creek are illustrated in Figure 19. The resulting water balance is listed in Table 11. Some general comments that apply to development of the water balance are as follows:

Comments that apply to development of the water balance for the North Fork of Rose Creek.

1. Two seasonal periods (summer and winter) were selected in order to identify significant seasonal trends and in order to provide a flexible model for future sensitivity analyses.
2. The water balance was constructed beginning in winter 1995/1996 in order to correspond to the available flow data. Eleven time steps were defined to represent winter and summer seasons to winter 2000/2001.
3. Flows for ungauged subcatchments were extrapolated from the R7 streamflow record in proportion to the catchment areas and mean annual runoffs listed in Table 9.
4. The combined Faro Valley and Faro Creek diversion system was assumed to pass 76% of its flow into the North Fork of Rose Creek (i.e. leaks 24% into Faro Main Pit).
5. The quantity of seepage from the Zone II Pit into the North Fork of Rose Creek is based upon calculations developed for the ICAP study.
6. No direct seepage from the Faro Main Pit into the North Fork of Rose Creek is considered.

The water balance for Rose Creek (downstream of the Rose Creek Tailings Facility at location X14 as illustrated in Figure 3) incorporates all of the known source terms from the mine site. The interactions between source terms to Rose Creek at location X14 are illustrated in Figure 20. The resulting water balance is listed in Table 12. Some general comments that apply to development of the water balance are as follows:

Comments that apply to the water balance for Rose Creek at location X14.

1. Two seasonal periods (summer and winter) were selected in order to identify significant seasonal trends and in order to provide a flexible model for future sensitivity analyses.
2. The water balance was constructed beginning in winter 1995/1996 in order to correspond to the available flow data. Eleven time steps were defined to represent winter and summer seasons to winter 2000/2001.
3. Flows for ungauged subcatchments were extrapolated from the R7 streamflow record in proportion to the catchment areas and mean annual runoffs listed in Table 9.
4. Flow from the North Fork of Rose Creek is represented as one source term taken from Table 11.
5. The rate of recharge to groundwater upstream of the tailings facility and beneath the Cross Valley Pond and the rate of groundwater discharge downstream of the Cross Valley Pond are taken from the 2001 hydrogeological model described in *Rose Creek Tailings Facility, 2001 Hydrogeological and Geochemical Investigation*, Gartner Lee, 2002c.
6. Surface release from the Cross Valley Pond (X5) and seepage from the Cross Valley Pond (X13) are taken from Annual Environmental Reports for the

Table 11. Water Balance Calculations for North Fork Rose Creek

Catchment	Component	Time Step Season From To	1 W Nov-95 Apr-96	2 S May-96 Oct-96	3 W Nov-96 Apr-97	4 S May-97 Oct-97	5 W Nov-97 Apr-98	6 S May-98 Oct-98	7 W Nov-98 Apr-99	8 S May-99 Oct-99	9 W Nov-99 Apr-00	10 S May-00 Oct-00	11 W Nov-00 Apr-01	Average of 11 Periods
		No. days	182	184	181	184	181	184	181	184	182	184	181	
			Average Discharge for period (m^3/s):											
North Fork above R7	Local runoff (6)		0.245	1.587	0.172	1.454	0.298	1.113	0.224	1.829	0.255	2.010	0.324	0.865
Faro Creek Diversion	Local runoff (1+2+3)		0.044	0.284	0.031	0.260	0.053	0.199	0.040	0.327	0.046	0.360	0.058	0.155
	- Groundwater to Main Pit		0.011	0.068	0.007	0.062	0.013	0.048	0.010	0.079	0.011	0.086	0.014	0.037
	= Discharge to North Fork		0.033	0.216	0.023	0.198	0.041	0.151	0.030	0.249	0.035	0.273	0.044	0.118
NE Dump	Local runoff (7a)		0.00074	0.00481	0.00052	0.00441	0.00090	0.00337	0.00068	0.00554	0.00077	0.00609	0.00098	0.00262
Zone II Pit and Dump	Local runoff (5)		0.00051	0.00333	0.00036	0.00305	0.00063	0.00234	0.00047	0.00384	0.00054	0.00422	0.00068	0.00182
	- Estimated seepage to NF		0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058
	= Pumped to Main Pit (net)		0	0.00268	0	0.00225	0	0.00180	0	0.00315	0	0.00359	0	0.00122
Intermediate Dump	Local runoff (7b)		0.0011	0.0071	0.0008	0.0065	0.0013	0.0050	0.0010	0.0082	0.0011	0.0090	0.0015	0.0039
Remainder of NF catchment	Local runoff (7c)		0.014	0.092	0.010	0.084	0.017	0.065	0.013	0.106	0.015	0.117	0.019	0.050
North Fork at X2	**Total**		**0.295**	**1.908**	**0.207**	**1.748**	**0.358**	**1.338**	**0.270**	**2.199**	**0.307**	**2.416**	**0.389**	**1.039**

Notes:

1) The Faro Ck Diversion controls a total area of 16.2 km2. An estimated 24% of the yield from this catchment bypasses the diversion channel and reports to the Main Pit.
2) RGC estimated seepage from Zone II Pit to North Fork to be 18,400 m3/y with a water level in pit of 1110 m. No allowance made for overland flow from Zone II Dump to North Fork.
3) Some flow bypasses R7 and X2 in the stream alluvium. This flow was assumed to be negligible.
4) Local runoff = combination of groundwater, interflow and overland flow.

Table 12. Water Balance Calculations for Rose Creek

Measured Flow Stream (1000 m^3)	From To	Nov-95 Apr-96	May-96 Oct-96	Nov-96 Apr-97	May-97 Oct-97	Nov-97 Apr-98	May-98 Oct-98	Nov-98 Apr-99	May-99 Oct-99	Nov-99 Apr-00	May-00 Oct-00	Nov-00 Apr-01
Dewatering of Main Pit		0	0	0	646	1011	2007	78	982	0	1800	0
Surface release from tailings impoundments (X5)		2319	772	1015	2164	2497	3922	0	1760	400	3000	1000
Measured seepage at toe of Cross Valley Dam (X13)		610	964	737	1256	1031	1273	759	978	700	800	700
Extractions from Pumphouse Reservoir to mill		5401	5198	5145	36	175	0	0	0	0	0	0
Extractions from Pumphouse Wells to Pumphouse Reservoir		1719	0	1565	0	0	0	0	0	0	0	0
	No. days	182	184	181	184	181	184	181	184	182	184	181

Average Discharge for period (m^3/s):

Catchment or Aquifer	Component	Time Step Season From To	1 W Nov-95 Apr-96	2 S May-96 Oct-96	3 W Nov-96 Apr-97	4 S May-97 Oct-97	5 W Nov-97 Apr-98	6 S May-98 Oct-98	7 W Nov-98 Apr-99	8 S May-99 Oct-99	9 W Nov-99 Apr-00	10 S May-00 Oct-00	11 W Nov-00 Apr-01	Average of 11 Periods
North Fork above R7	Reference flow record		0.245	1.587	0.172	1.454	0.298	1.113	0.224	1.829	0.255	2.010	0.324	0.865
Main Pit	Local runoff (4a+4b)		0.004	0.027	0.003	0.025	0.005	0.019	0.004	0.031	0.004	0.034	0.006	0.015
	+ Leakage from Faro Ck Diversion		0.011	0.068	0.007	0.062	0.013	0.048	0.010	0.079	0.011	0.086	0.014	0.037
	+ Pumped from Zone II Pit (net)		0.0000	0.0027	0.0000	0.0023	0.0000	0.0018	0.0000	0.0031	0.0000	0.0036	0.0000	0.0012
	+ Liquid fraction of tailings slurry		0.321	0.305	0.307	0.002	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.0861
	- Pumped to tailings impoundment		0.000	0.000	0.000	0.041	0.065	0.126	0.005	0.062	0.000	0.113	0.000	0.037
	= Change in storage of pit		0.336	0.403	0.317	0.051	-0.036	-0.058	0.008	0.051	0.015	0.011	0.019	0.102
NW & Main Dumps	To North Wall Interceptor Ditch (16a)		0.0005	0.0030	0.0003	0.0028	0.0006	0.0021	0.0004	0.0035	0.0005	0.0038	0.0006	0.0016
	+ To tailings impoundment (11+12+13a)		0.004	0.023	0.002	0.021	0.004	0.016	0.003	0.026	0.004	0.029	0.005	0.012
	+ To Rose Ck Diversion (8a)		0.00019	0.00121	0.00013	0.00111	0.00023	0.00085	0.00017	0.00139	0.00019	0.00153	0.00025	0.00066
	= Total runoff (8a+11+12+13a+16a)		0.004	0.027	0.003	0.025	0.005	0.019	0.004	0.031	0.004	0.034	0.005	0.015
North Fork above X2	Discharge at X2 (surface flow and gdw in alluvium)		0.295	1.908	0.207	1.748	0.358	1.338	0.270	2.199	0.307	2.416	0.389	1.039
	- Recharge to Rose Ck aquifer		0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
	= Discharge to Rose Ck Diversion Channel		0.255	1.868	0.167	1.708	0.318	1.298	0.230	2.159	0.267	2.376	0.349	0.999
South Fork	Local runoff (9+10)		0.177	1.149	0.124	1.053	0.216	0.806	0.162	1.324	0.185	1.455	0.234	0.626
	- Mill supply from reservoir and wells		0.343	0.327	0.329	0.002	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.092
	- Recharge to Rose Ck alluvium aquifer		0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039
	- Change in storage (reservoir + aquifer)		-0.206	0.206	-0.245	0.245	0	0	0	0	0	0	0	0.000
	= To Rose Ck Diversion		0.001	0.577	0.001	0.767	0.165	0.767	0.123	1.285	0.146	1.416	0.195	0.495
North Wall Interceptor	Local runoff (15+16b)		0.012	0.078	0.008	0.071	0.015	0.055	0.011	0.090	0.013	0.098	0.016	0.042
	+ Runoff from part of NW Dump		0.0005	0.0030	0.0003	0.0028	0.0006	0.0021	0.0004	0.0035	0.0005	0.0038	0.0006	0.0016
	= Total discharge at ditch outlet		0.012	0.081	0.009	0.074	0.015	0.057	0.011	0.093	0.013	0.102	0.016	0.044
Rose Ck Diversion	Local runoff (8b+14+17)		0.040	0.260	0.028	0.238	0.049	0.183	0.037	0.300	0.042	0.330	0.053	0.142
	+ Runoff from part of Main Dump		0.00019	0.00121	0.00013	0.00111	0.00023	0.00085	0.00017	0.00139	0.00019	0.00153	0.00025	0.00066
	+ North Fork at X2 (excl. recharge to Rose Ck aquifer)		0.255	1.868	0.167	1.708	0.318	1.298	0.230	2.159	0.267	2.376	0.349	0.999
	+ South Fork runoff		0.001	0.577	0.001	0.767	0.165	0.767	0.123	1.285	0.146	1.416	0.195	0.495
	- Leakage to tailings impoundments (estimated)		0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
	Proportion of leakage originating from N Fork		*86%*	*69%*	*85%*	*63%*	*60%*	*58%*	*59%*	*58%*	*59%*	*58%*	*58%*	
	Proportion of leakage originating from S Fork		*0%*	*21%*	*1%*	*28%*	*31%*	*34%*	*32%*	*34%*	*32%*	*34%*	*33%*	
	Proportion of leakage originating from local runoff		*14%*	*10%*	*14%*	*9%*	*9%*	*8%*	*9%*	*8%*	*9%*	*8%*	*9%*	
	= Total discharge at channel outlet		0.201	2.612	0.101	2.619	0.438	2.153	0.295	3.650	0.360	4.028	0.503	1.542
Rose Creek Tailings	Local runoff (13b) (yield assumed 50% > natural)		0.008	0.050	0.005	0.046	0.009	0.035	0.007	0.058	0.008	0.063	0.010	0.027
Facility (excluding	+ Pumped from Main Pit		0.000	0.000	0.000	0.041	0.065	0.126	0.005	0.062	0.000	0.113	0.000	0.037
underlying alluvial	+ Runoff from NW & Main Dumps		0.004	0.023	0.002	0.021	0.004	0.016	0.003	0.026	0.004	0.029	0.005	0.012
aquifer)	+ Emergency release from mill (estimated)		0.022	0.022	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
	+ Leakage from Rose Ck Div. (to make inflows match outflows)		0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
	- Surface release at X5		0.147	0.049	0.065	0.136	0.160	0.247	0.000	0.111	0.025	0.189	0.064	0.108
	- CVD seepage originating from Polishing Pond (part of X13)		0.032	0.054	0.040	0.072	0.059	0.073	0.042	0.055	0.038	0.043	0.038	0.049
	- Recharge to Rose Creek alluvial aquifer		0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
	= Change in storage (to smooth leakage from Rose Ck Div.)		-0.071	0.068	0.000	-0.026	-0.065	-0.068	0.049	0.055	0.024	0.048	-0.012	0.000
Rose Ck alluvial aquifer	Recharge from North Fork (estimated)		0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
	+ recharge from South Fork (estimated)		0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039
	+ recharge from Rose Creek Tailings Facility (estimated)		0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
	- discharge at toe of CV Dam (remainder of flow at X13)		0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	- discharge to Old Faro Creek Channel below CVD		0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
	= groundwater flow in aquifer below X14		0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
Rose Creek at X14	**Total estimated surface flow (sum of component flowlines)**		**0.412**	**2.814**	**0.234**	**2.920**	**0.691**	**2.549**	**0.367**	**3.928**	**0.455**	**4.382**	**0.640**	**1.763**
	Total observed surface flow			**2.264**	**0.560**	**3.008**					**0.350**	**4.550**	**0.890**	
	Surface flow + groundwater in underlying aquifer		**0.492**	**2.894**	**0.314**	**3.000**	**0.771**	**2.629**	**0.447**	**4.008**	**0.535**	**4.462**	**0.720**	**1.843**

Notes:

1) Net pumpage from Zone II Pit to Main Pit was estimated by water balance analysis. It excludes volume of water that seeps from Main Pit to Zone II Pit.

2) Influence of storage in Fresh Water Reservoir and the Rose Ck alluvium aquifer is simplified. Also, some of the mill supply was obtained from North Fork flows diverted into Pumphouse Reservoir. This diversion was not directly accounted for in this spreadsheet

3) The measured and estimated outflows from the Rose Ck Tailings Facility exceeded the estimated inflows to this facility by an average of 95 L/s over the complete simulation period. This missing inflow was assumed to originate as ditch leakage from the Rose Creek Diversion Channel. As a first approximation, this ditch leakage was assumed to not exhibit a seasonal pattern.

4) The Gartner Lee groundwater investigation (2001) estimated the groundwater flux in the Rose Creek alluvium aquifer to be about 79 L/s upstream of the tailings facility. For the purpose of this water balance, this groundwater was assumed to originate roughly half from the North Fork and half from the South Fork. The tailings facility itself was estimated to contribute 20 L/s to the underlying aquifer, largely from the the Intermediate and Polishing Ponds (under shutdown conditions). The aquifer was estimated to discharge approximately 12 L/s to Rose Creek between the CVD and Station X14.

5) Some problems exist with observed X14 record. In early record, spot measurements are about 80% of computed flows. Also, erroneous peaks due to ice effects have not been removed.

Faro Mine Site for the years 1995 to 2001 as filed with the Yukon Territory Water Board.

Streamflow Record - Vangorda Creek

A datalogger and pressure transducer were installed at location V8 in lower Vangorda Creek (Figure 3) in 1999. DIAND has operated a seasonal flow gauging station in lower Vangorda Creek in previous years. The datalogger recordings were used exclusively for this study.

A stage discharge curve was used to convert the pressure transducer readings to flow rates

A stage discharge curve was developed for location V8 based on available spot flow measurements. The curve was used to convert the pressure transducer readings (height of water) to flow rates. The datalogger records the pressure data at 30-minute intervals. These raw pressure data were converted to equivalent flow rates and then averaged to compute a record of daily average flow rates. The data record contains gaps related to readings that are unusable due to unknown effects.

The daily flow rates were asses for anomalous readings and for the effects of ice

The daily flow rates at location V8 were assessed for anomalous readings and, specifically for artificial effects of ice. This was accomplished by overlaying the streamflow record for location V8 with the streamflow record for the Ross River at Ross River. These two streams exhibit similar seasonal flow patterns, as evidenced by a correlation between the coincidental daily flows at V8 and Ross River.

The overlay of data does not display any discrepancies in the record for location V8 for the periods where usable data was collected.

Because of the substantial gaps in the data record for location V8, the streamflow record for location R7 was subsequently used as the primary reference for flows in the Vangorda Creek catchment.

Water Balance - Vangorda Creek

The water balance for Vangorda Creek at location V8 incorporates all of the known source terms from the mine site. The interactions between source terms to Vangorda Creek at location V8 are illustrated on Figure 21. The resulting water balance is listed in Table 13. Some general comments that apply to development of the water balance are as follows:

Comments that apply to the development of the Vangorda Creek water balance

1. Two seasonal periods (summer and winter) were selected in order to identify significant seasonal trends and in order to provide a flexible model for future sensitivity analyses.
2. The water balance was constructed beginning in winter 1997/1998 (Time Step 5 of the Rose Creek water balance) to be representative of existing conditions during the care and maintenance phase.

Table 13. Water Balance Calculations for Vangorda Creek

	Average Discharge for period (1000 m^3):							
	Time Step	5	6	7	8	9	10	11
	Season	W	S	W	S	W	S	W
	From	Nov-97	May-98	Nov-98	May-99	Nov-99	May-00	Nov-00
	To	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	30-Apr
Measured Flow Stream								
Flows pumped from Little Creek Dam to Vangorda Pit		0	38	0	44	0	53	0
Flows siphoned from Sheep Pad Pond to Vangorda Pit		0	0	0	20	0	30	0
Approximate total inflow to Vangorda Pit		40	198	40	272	40	860	40
	No. days	181	184	181	184	182	184	181

Catchment	Component	Average Discharge for period (m^3/s):								
		Time Step	5	6	7	8	9	10	11	Average
		Season	W	S	W	S	W	S	W	of 7
		From	Nov-97	May-98	Nov-98	May-99	Nov-99	May-00	Nov-00	Periods
		To	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	
North Fork above R7 (Reference)	Local runoff (6)		0.298	1.113	0.224	1.829	0.255	2.010	0.324	0.865
Vangorda Creek Diversion Channel	Local runoff (21+22)		0.071	0.266	0.054	0.437	0.061	0.480	0.077	0.207
	- Leakage to Vangorda Pit		0.001	0.004	0.001	0.003	0.001	0.035	0.001	0.007
	+ Recovered from pit cachment (partial 10)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	= Flows diverted around Vangorda Pit		0.070	0.262	0.052	0.434	0.060	0.445	0.077	0.200
Vangorda NE Interceptor Ditch	Local runoff (23)		0.0016	0.0061	0.0012	0.0101	0.0014	0.0111	0.0018	0.0048
	- Leakage to Vangorda Pit		0.0000	0.0001	0.0000	0.0001	0.0000	0.0012	0.0000	0.0002
	= Flows diverted to Shrimp Creek		0.0016	0.0060	0.0012	0.0100	0.0014	0.0099	0.0018	0.0045
Vangorda Pit	Local runoff (24)		0.002	0.006	0.001	0.010	0.001	0.010	0.002	0.0045
	+ Seepage from Vangorda Ck Diversion		0.001	0.004	0.001	0.003	0.001	0.035	0.001	0.0066
	+ Seepage from Till Dump catchment		0.0001	0.0003	0.0001	0.0002	0.0001	0.0023	0.0001	0.0004
	+ Seepage from Vangorda NE Interceptor		0.0000	0.0001	0.0000	0.0001	0.0000	0.0012	0.0000	0.0002
	+ Siphoned from Sheep Pad Pond		0.0000	0.0000	0.0000	0.0013	0.0000	0.0019	0.0000	0.0004
	+ Pumped from Little Creek Dam		0.0000	0.0024	0.0000	0.0028	0.0000	0.0033	0.0000	0.0012
	= Change in storage of pit		0.003	0.012	0.003	0.017	0.003	0.054	0.003	0.0134
Vangorda Dump & Little Creek Dam	Local runoff (25+26)		0.001	0.005	0.001	0.008	0.001	0.009	0.001	0.0038
	- Pumped to Vangorda Pit		0.0000	0.0024	0.0000	0.0028	0.0000	0.0033	0.0000	0.0012
	- Seepage to Vangorda/Shrimp Creeks		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	- Seepage from LCD to Vangorda Ck		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	= Unaccounted loss (storage in voids?)		0.0003	0.0015	0.0000	0.0043	0.0001	0.0045	0.0004	0.0016
Grum & Till Dump Interceptor Ditch	Local runoff (27+29)		0.008	0.030	0.006	0.049	0.007	0.054	0.009	0.023
	- Seepage to Vangorda Pit		0.0001	0.0003	0.0001	0.0002	0.0001	0.0023	0.0001	0.0004
	- Siphoned to Vangorda Pit		0.0000	0.0000	0.0000	0.0013	0.0000	0.0019	0.0000	0.0004
	- Seepage to Grum Pit		0.0005	0.0018	0.0004	0.0030	0.0004	0.0033	0.0005	0.0014
	= Flows diverted to Vangorda Creek		0.007	0.028	0.006	0.045	0.006	0.047	0.008	0.021
Grum Pit	Local runoff (28)		0.002	0.009	0.002	0.015	0.002	0.017	0.003	0.007
	+ Seepage from Grum Interceptor Ditch		0.0005	0.0018	0.0004	0.0030	0.0004	0.0033	0.0005	0.0014
	= Change in storage of pit		0.003	0.011	0.002	0.018	0.003	0.020	0.003	0.0086
Grum Dump	To West Fork Vangorda Ck (34a)		0.0006	0.0023	0.0005	0.0038	0.0005	0.0042	0.0007	0.0018
	+ To Vangorda Ck (30+31a+31b)		0.006	0.023	0.005	0.038	0.005	0.042	0.007	0.018
	= Total yield from Grum Dump		0.007	0.026	0.005	0.042	0.006	0.046	0.007	0.020
Shrimp Creek	Local runoff (32)		0.023	0.086	0.017	0.141	0.020	0.155	0.025	0.067
	+ Flows from Vangorda NE Interceptor		0.002	0.006	0.001	0.010	0.001	0.010	0.002	0.005
	+ Seepage from Vangorda Dump		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	= Flow to Vangorda Creek		0.025	0.092	0.019	0.151	0.022	0.165	0.027	0.072
West Fork Vangorda Creek	Local runoff (33+34b)		0.066	0.248	0.050	0.408	0.057	0.448	0.072	0.193
	+ Runoff from a portion of Grum Dump		0.0006	0.0023	0.0005	0.0038	0.0005	0.0042	0.0007	0.0018
	= Flow to Vangorda Creek		0.067	0.251	0.050	0.412	0.057	0.452	0.073	0.195
Lower Vangorda Ck Catchment	Local runoff (31c+35+36)		0.020	0.075	0.015	0.123	0.017	0.135	0.022	0.058
	+ Runoff from West Fork Vangorda Ck		0.067	0.251	0.050	0.412	0.057	0.452	0.073	0.195
	+ Runoff from majority of Grum Dump		0.006	0.023	0.005	0.038	0.005	0.042	0.007	0.018
	+ Outflow from Grum Interceptor Ditch		0.007	0.028	0.006	0.045	0.006	0.047	0.008	0.021
	+ Outflow from Vangorda Ck Diversion		0.070	0.262	0.052	0.434	0.060	0.445	0.077	0.200
	+ Seepage from Little Creek Dam		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	+ Outflow from Shrimp Creek		0.025	0.092	0.019	0.151	0.022	0.165	0.027	0.072
	= Total flow at V8		**0.197**	**0.731**	**0.148**	**1.203**	**0.168**	**1.287**	**0.214**	**0.564**

Notes:

1) Total seepage into Vangorda Pit was estimated by subtracting i) an estimate of local runoff, ii) measured LCD flows and iii) measured Sheep Pad Pond diversions from measured annual accumulation of water in pit.
2) Total seepage into Vangorda Pit was apportioned to three sources (Vangorda Creek Diversion, Vangorda NE Interceptor and Till Dump catchment) according to their respective estimated long-term yields.
3) Leakages from LCD and Vangorda Dump Collection Ditch are crude estimates not based on data.
4) The volume of water pumped from the LCD is significantly less than the estimated yield of the Vangorda Dump catchment. The difference may be attributed to the filling of void space within the Vangorda Dump and/or the dump results in enhanced evaporation.
5) Seepage from Grum Interceptor Ditch assumed to equal 10% of yield from Subcatchment 27.

3. Flows for ungauged subcatchment areas were extrapolated from the verified R7 streamflow record in proportion to the catchment areas and mean annual runoffs listed in Table 9.
4. Seepage losses from the Vangorda Creek Diversion Flume to the Vangorda Pit are estimated based on the observed inflow rates into the pit.
5. Volumes extracted from the Sheep Pad Pond to the Vangorda pit are taken from the Annual Environmental Reports for the Vangorda Plateau mine site.
6. Seepage rates from Little Creek Dam and from the Vangorda Rock Dump to Shrimp and Vangorda Creeks are estimated based on judgement only.

2.5.2.5 Water Balance Study Results

Observations from the 2002 water balance for the North Fork of Rose Creek, the mainstem of Rose Creek, and for the Vangorda Creek

The 2002 water balance for the North Fork of Rose Creek provides the following observations for the period from November 1995 to April, 2001.

- An estimated 83% of the flow in the North Fork of Rose Creek originates from natural runoff upstream of the mine site.

The 2002 water balance for the mainstem of Rose Creek provides the following observations for the period from November 1995 to April 2001:

- Of the flow in Rose Creek below the tailings facility, an average of 55% originated from the North Fork of Rose Creek, 25% originated from the South Fork (drainage area above the tailings facility) and 9% originated from effluent released from the Cross Valley Pond (toe seepage and surface outflow).

The 2002 water balance for Vangorda Creek provides the following observations for the period from November 1997 to April 2001:

- The flow in lower Vangorda Creek originates, on average, 34% from the West Fork and 66% from the main stem (drainage including most mine facilities).
- Of the flow in the main stem, an average 54% originates from natural runoff in Vangorda Creek unaffected by mine activities (drainage area upstream of the mine site).

2.5.3 HYDROGEOLOGY

2.5.3.1 Historical Hydrogeological Changes

Mining activities have affected the local groundwater flow in several ways, including the following:

Mining activities that have affected the local groundwater flow

1. Interception of groundwater in open pits.
2. Increased permeability in the rock mass through blasting of open pit walls.
3. Interception of groundwater in diversion ditches.
4. Alterations to the Rose Valley aquifer from development and operation of the Rose Creek Tailings Impoundments.
5. Increased infiltration through unvegetated and poorly drained areas (e.g. free dumps) as well as leakage from diversions.

The Faro Main Pit groundwater interception

The Faro Main Pit was developed on the north side of the Rose Creek valley. Much of the area was covered by a thin layer of compacted till over bedrock. The pit was excavated to a depth of approximately 365 metres below the original ground surface at its deepest point and now intercepts both shallow groundwater flow at the soil/bedrock interface and deeper groundwater flow in faults and fractures. Leakage from the Faro Creek Diversion Ditch into the pit via the northeast pit wall is known to contribute to groundwater inflows. Groundwater inflow rates are not specifically monitored and separated from surface inflows. However, mine dewatering pumping records indicate pumping rates between 40 and 55 L/s were required to keep the pit drained from 1986 to 1990 (RGC 1996).

The Faro Zone 2 Pit groundwater interception

The Faro Zone II Pit similarly intercepts both shallow and deeper groundwater flow, although at a smaller scale than the Faro Main Pit. The presence of substantial faulting in the southern area of the Main pit creates the possibility for subsurface flow of water from the Main Pit into the Zone II Pit. Annual monitoring of volumes dewatered for the Zone II Pit, as reported in annual environmental reports, indicates that seepage from the Main Pit did not increase substantially with an increase in the water level in the Main Pit. The groundwater inflows into the Zone II Pit were estimated at 13 L/s during mine operations (RGC 1996).

Vangorda Pit groundwater interception

The Vangorda Pit is located on a south side of Vangorda Creek. The overburden encountered consisted primarily of compacted glacial till up to approximately 30 metres in thickness. Groundwater inflow into the Vangorda Pit was estimated at 0.14 L/s during mine operations (RGC 1996). A net inflow of groundwater into the Vangorda Pit was also suggested by a geochemical study conducted in 2000 (SRK, 2000b) that indicated an unidentified source of alkalinity that could be attributed to groundwater influx.

Grum Pit groundwater interception

The Grum Pit is located on the north side of Vangorda Creek and was developed in a small depression in the hillside. A small lake (Doal Lake) was present prior to the development of the pit. The surficial deposits at the Grum Pit were thicker than at the other pits. A north-south trending bedrock valley was intersected in the southeast corner of the pit that was filled with approximately 100 m of glacial till over a basal layer of sand and gravel. This aquifer was dewatered by pumping wells during mine operations prior to 1997 and has subsequently flowed directly into the Grum Pit. The effect of the interception of this flow is also observed in changes observed in the degree of saturation of surface soils downgradient of the Grum Pit in the Grum Creek area. Prior to development of the Grum Pit, this area was observed to be largely saturated near surface with some test pits reported as filling with water during excavation whereas the area is currently observed to be drier near surface (Anvil Range, pers. comm.).

Other effects of open pits may relate to the increased permeability (compared to natural bedrock) of blasted rock walls which may allow increased passage of groundwater.

Diversion ditches may alter pre-existing flows or result in groundwater recharge

Diversion ditches that are seated in bedrock, or that intersect other shallow groundwater zones, will alter the pre-existing flow regime. For example, the Rose Creek Diversion Canal is interpreted to largely intercept and re-direct shallow groundwater flow from the south side of the Rose Creek Valley that previously flowed into the valley aquifer (GLL 2002c).

Alternately, diversion ditches may result in groundwater recharge (through ditch leakage). For example, the Faro Creek diversion ditch is known to leak water into the shallow aquifer above the Faro Main Pit.

A confining surface layer, additional groundwater recharge and surface ponds have effected the local groundwater flow

Prior to development of the tailings impoundments, the local Rose Creek Valley hosted an unconfined aquifer that produced an estimated 3,000 to 4,000 m^3 of groundwater per day (GLL 2002c). Development of the tailings impoundments introduced a confining surface layer (tailings), additional groundwater recharge (tailings slurry water) and surface ponds that have had a substantial effect on local groundwater flow. An interpretation and numerical model of the existing groundwater flow regime are described in GLL 2002c.

Some rock dumps may promote increased infiltration (groundwater recharge) compared to the original ground conditions where free dump piles or other lose materials are present.

Rock dumps may increase infiltration or increase surface runoff

Alternately, hard packed and compacted surfaces of rock dumps may restrict groundwater recharge and promote increased surface runoff compared to the original ground conditions.

2.5.3.2 Regional Hydrogeology

Predicting groundwater flow through the rock in the Anvil Range mine sites is difficult

The area surrounding the Anvil Range Mine Complex (Figure 3) is underlain by metamorphic and volcanic bedrock. The Proterozoic and Paleozoic schists and phyllites were intruded by the Anvil Batholith, which consists of granite, granodiorite and quartz monzonite. The crystalline nature of these rocks typically creates a very low primary porosity (0-10%), therefore and groundwater flow through the bedrock likely occurs along planes of weakness or deformation, such as fractures, faults or shear zones. Predicting the occurrence of groundwater and its flow direction in this type of rock is difficult at best, and there is little information available for the Anvil District.

Bedrock is overlain by various types of surficial deposits (or overburden) consisting primarily of glacial till, glaciofluvial sediments and alluvium. In topographically elevated areas, these surficial deposits are thin and irregularly distributed. Surficial deposits are generally thickest in the valley bottoms, although significant thicknesses of till have been documented in the uplands of the Vangorda Plateau.

Groundwater flow path, flow direction and recharge

The presence, characteristics and thickness of surficial deposits are likely to be the primary control to the occurrence and flow of groundwater in the study area. Known groundwater flow occurs primarily in the overburden, or through the upper most weathered surface of the bedrock. Flow direction is controlled mainly by surficial and bedrock topography. Recharge occurs via infiltration of precipitation and the groundwater migrates downward, following topography to discharge zones into local creeks or shallow depressions. The bedrock valley sides act as recharge sites and groundwater flow progresses to the valley floors as a discharge zone. Recharge to valley aquifers may also occur locally through the beds of streams occupying the valley.

Valley aquifers

Large glaciated valleys, including the Pelly River, Rose Creek, and Blind Creek valleys, have been filled with significant thickness of glacial sediments. Where these deposits are primarily glaciofluvial sands and gravel, they represent relatively high yield aquifers. Valley aquifers are usually unconfined, with shallow depths to water and significant groundwater yields. However, if confining layers, such as glacial till or other fine-grained deposits extend across the valley floor and partially up the valley sides, confined aquifers, with significant hydraulic heads may be encountered.

2.5.4 SURFACE WATER QUALITY

2.5.4.1 Overview

The intent of this description of surface water quality is to describe the water quality conditions from 1987 – 2002. The water quality baseline for the reference areas, discharge points and receiving waters are described for the historic period of record (1987 – 1998) as narrative summaries taken from the 2002 Baseline Report. Data for the 1998-2002 period are then presented to describe the existing environmental conditions which form the baseline for the current assessment.

Water quality summaries were based only on measurable data points

Interpretation of water quality data included a number of samples which had no detectable concentrations and was hampered by changes in analytical methodology and detection limit over the period of record. Although suitable statistical methods exist to account for "censored" data (those values which are below the detection limit), there is no acceptable means for statistical interpretation where the detection limit has changed over the period of record. These factors prevented statistical comparisons of data over time or between sites. Comparisons therefore relied on qualitative comparisons between sites and the weight of evidence guiding conclusions. Water quality summaries were based only on measurable data points. For all cases where "Non detects" were present, the data summaries recorded the total number of samples and the numbers of samples which contained detectable quantities. "Non detects" were not included in the statistical summaries.

Interpretation of effects of the mine on surface water quality were guided by a) comparisons between sites and b) comparisons of water quality against CCME (1999) Guidelines for protection of freshwater aquatic life.

2.5.4.2 Monitoring Sites

The sampling period covers mine operation, mine development, and mine closure

Surface water quality at the Faro and Vangorda Plateau mine sites has been characterized by samples taken at a variety of stations from 1987 to 2002. This period of record covers mine operation, mine development (Vangorda Plateau) and closure periods and includes data that reflect a variety of water treatment and management systems at both sites. The water quality conditions for the period 1987-2001 is presented in the May 2002 Baseline Report. Water quality information for 2002 is provided in the annual Environmental Reports required under the existing water licences for the sites: for the Faro Site in GLL 2003a and for the Vangorda Plateau Site in GLL 2003b.

The surface water quality baseline includes data from 29 different locations for the Faro site and 21 for the Vangorda Plateau site

Surface water quality for the 1987-2001 period includes data from a total of 29 different stations for the Faro site and 21 for the Vangorda Plateau site. These include reference locations showing no mine influence, effluent streams and seepages within the mine site itself, compliance points for effluent discharge, sites where effluent has mixed with receiving waters immediately off of the site and receiving waters downstream of the mine.

Not all of these monitoring sites provide information that is useful for environmental assessment and, therefore, data from a smaller number of selected sites were used to describe existing water quality conditions. The most important requirements are for:

- Reference water quality for comparison against potentially impacted sites;
- Effluent water quality to assess compliance and to assess loadings to the natural environment; and
- Receiving water quality to assess potential effects on water quality.

The number of sampling sites was reduced to describe the environmental baseline

The total of 50 water quality sites was therefore reduced to 19 (10 for Faro and 9 for Vangorda Plateau) for the purposes of the environmental assessment. The stations which were omitted describe internal water on the site and specific sources of runoff or seepage. Water quality stations are described in Table 14 and located on Figure 3. A complete listing of water quality data for these locations is provided in Appendix B.

Rose Watershed / Faro Mine Site

Sites that represent reference water quality for the assessment

Faro Creek, upstream of the diversion (Site FDU), the North Fork of Rose Creek, upstream of the mine (R7) and Upper Guardhouse Creek (Site W10) receive surface runoff which has had no direct contact with mine activities at the Faro

Table 14. Water Quality Stations Selected for the Environmental Assessment

Station Function	Station I.D.	Station Description
Faro Site		
Reference - Local Study Area	FDU	Faro Creek - Upstream of Diversion
	W10	Upper Guardhouse Creek
	R7	North Fork Rose Creek - upstream of Mine
Mine Impact	X5	Cross Valley Pond Outflow
	X13	Cross Valley Dam Seepage
Receiver - Local Study Area	X14 / R2	Rose Creek - downstream of diversion channel
	R3	Rose Creek - mid way to Anvil Creek
	R4	Rose Creek at Anvil Creek
Reference - Regional Study Area	R6	Anvil Creek - upstream of confluence with Rose Creek
Receiver - Regional Study Area	R5	Anvil Creek - downstream of confluence with Rose Creek
Vangorda Plateau Site		
Reference - Local and Regional Study Area	V1	Vangorda Creek above mine
	V4	Shrimp Creek
Mine Impact	V25BSP	Vangorda Creek - below Sheep Pad Pond
	V2	Grum Creek
	V6A	AEX Creek
	V27	Vangorda Creek, Main Stem, downstream of mine
Receiver - Local Study Area	VGMain	Vangorda Creek, above confluence with West Stem
	V5	West Stem Vangorda Creek
Receiver - Regional Study Area	V8	Vangorda Creek at Faro

site. They represent reference water quality for purposes of this environmental assessment.

Water from sites that have had contact with mining activities

Water which has had contact with mining activities is treated and discharged from the site via outflow from the Cross Valley Pond (Site X5) or seepage from the Cross Valley Dam (X13). These two water streams mix with water from the Rose Creek Diversion Channel (which contains diverted clean water and water which may have interacted with mine activities) and are sampled at Sites X14 and R2, to represent the net effect of the Faro Site on water quality at the boundary of the local study area.

Receiving water quality sampling sites

Receiving water quality was sampled in Rose Creek at Site R3, midway to Anvil Creek, and at R4, where Rose Creek meets Anvil Creek, the downstream boundary of the Regional Study Area. Effects on Anvil Creek were determined by comparison of water quality upstream of the confluence with Rose Creek (R6) with that after mixing of Anvil and Rose Creeks (R5).

Vangorda Watershed / Mine Site

Sites that represent reference water quality for the assessment

Vangorda Creek upstream of the mine site (Site V1) and Shrimp Creek (Site V4) both convey surface runoff which has had no direct contact with mine activities at the Vangorda Plateau site. They represent reference water quality for purposes of the assessment.

Water from sites that have had contact with mining activities

Water from the mine site, prior to discharge to off site receiving waters was characterized by measurements made at the outflow from the Sheep Pad Pond (inclusive of treated mine water, V25BSP), Grum Creek (site runoff, V2) and AEX Creek (site runoff, V6A). Water quality in Vangorda Creek upstream of the confluence with Shrimp Creek (V27) represents the net receiver of all mine activities, prior to mixing with reference water.

Receiving water quality sites

Receiving water quality for the local study area was assessed using data from Vangorda Creek, upstream of the confluence with the West Fork (Station VGMain) and from the West Fork, upstream of its confluence with Vangorda Creek (V5). These two sites defined the downstream boundary of the Local Study Area. Water quality at the downstream boundary of the Regional Study Area was characterized by measurements made at the mouth of Vangorda Creek, upstream of its confluence with Pelly River (V8).

2.5.4.3 Rose Watershed Surface Water Quality

Reference Water Quality

Alkalinity, sulphate and zinc concentrations in the Faro area during mining operations

Reference stream water quality in the Faro area during the period of mine operations was consistently neutral to alkaline (pH 7.5 – 8.0) with low sulphate concentrations (<6 mg/L). Total zinc concentrations were also low, generally ranging from 0.007 to < 0.005 mg/L. Zinc, sulphate and alkalinity levels were higher in the North Fork of Rose Creek than in Faro and Guardhouse Creeks during the period of mine operations.

Trace metal concentrations

Trace metal concentrations in reference waters indicate mineralized geology, with detectable concentrations of most trace metals (Tables 15 and 16). Trace metal levels in the reference streams for Al, As, Cd, Cr, Cu and Pb generally exceeded CCME (1999) guidelines for protection of aquatic life while levels for Ag, Fe, Hg, Ni and Zn generally did not. A total hardness of 60 mg/L was used for those metals where the CCME guidelines are hardness dependent.

Effluent Water Quality

The discharge of water from the Faro site occurs as seasonal discharge over the Cross Valley Dam (Site X5) or as seepage through the dam (Site X13). The discharge consists of treated pit water and overland runoff from the mine site, which is treated in the Intermediate Pond.

Water quality has been sampled on a regular basis since 1986

Water quality at these sites was sampled on a regular basis starting in 1986. This information was summarized from the "Anvil Range Mine Complex 2002 Baseline Environmental Information. Volume 2" Report (GLL 2002a), but additional details may be found in the annual monitoring reports that are filed with the Yukon Territory Water Board. Prior to 1992, water quality in the Cross Valley Pond was controlled primarily by the characteristics of the settled tailings supernatant from upstream deposition of mill tailings. Zinc and sulphate concentrations averaged 0.24 and 436 mg/L, respectively, and pH ranged from 6.7 to 9.6. Seepage from the pond had lower pH levels (6.1 – 7.8) and Zn levels ranged from 0.01 to 0.167 mg/L. Iron levels in the seepage averaged 2.0 mg/L.

Discharge water quality conditions from 1998 to 2002 showed high levels of Ca (180-217 mg/L, Table 17) as a result of lime treatment upstream. Sulphate levels exceeded those recorded historically (532-582 mg/L). The ponds were effective in settling solids, as TSS levels averaged 4 – 10 mg/L. A pH of 7.3 in the main discharge remained within the slightly alkaline ranges reported historically but was lower than the pH of the reference streams, suggesting some acid generation on site. Zinc concentrations in the Cross Valley Pond seepage were reduced following mine closure. They averaged 0.039 mg/L between 1998 and 2002 (Table 18), approximately 15% of the levels recorded during mine operations. Zinc increased (average = 0.334 mg/L) in the dam discharge during the care and maintenance phase, compared to 0.24 mg/L during operations, likely related to the periodic introduction of a relatively large volume of water pumped from the Faro Main pit beginning in 1998, which was ultimately released to Rose Creek as treated and compliant effluent via location X5.

Receiving Water Quality

Concentrations of Fe and Mn in the mine discharge water were elevated by several orders of magnitude over concentrations in the reference streams and the concentration of zinc at X5 (but not at X13) was elevated by one order of

Table 15. Water Quality at Rose Creek Reference Sites, 1998-2002

Site	Parameter	Alk mg/L	Cond u/S	Hardness mg/L	Ca mg/L	NH3-N mg/L	pH	SO4-T mg/L	TSS mg/L
FDU/W10/R7	n	4	2	8	29	9	23	28	19
	Mean	81.5	156	66	19.1	<0.05	7.82	9.0	5.3
	Median	79	156	58	16.8	<0.05	7.97	7.0	3.0

Table 16. Trace Metal Concentrations at Faro Reference Sites, 1998-2002

Site	FDU/W10/R7					
Parameter	n=	D.L.	# > D.L.	Mean	Median	CCME
Ag	29	0.003	0	<0.003	<0.003	0.1
Al	29	0.05	26	0.169	0.140	0.100
As	29	0.001	4	0.027	0.016	0.005
Cd	29	0.001	6	0.006	0.003	0.00001
Co	29	0.001	6	0.007	0.003	
Cr	29	0.005	9	0.021	0.020	0.010
Cu	29	0.001	25	0.015	0.011	0.002
Fe	29	0.01	28	0.328	0.148	0.300
Hg	2	0.0001	0	<0.0001	<0.0001	0.0001
Mn	29	0.01	23	0.030	0.020	
Ni	29	0.005	8	0.008	0.005	0.025
Pb	29	0.01	6	0.019	0.018	0.001
V	29	0.005	8	0.015	0.010	
Zn	29	0.01	21	0.032	0.030	0.03

Table 17. Water Quality at Faro Mine Site Discharge Sites, 1998-2002

Site	Parameter	Ca mg/L	NH3-N mg/L	pH	SO4 mg/L	TSS mg/L
X13	n	63	60	98	63	63
	Mean	220	0.75	7.25	564	10
	Median	217	0.79	7.30	582	10
X5	n	63	59	40	52	55
	Mean	167	0.73	8.14	480	5
	Median	180	0.79	8.20	532	4

Table 18. Trace Metal Concentrations at Faro Mine Site Discharge Sites, 1998-2002

Site			X13			X5		
Parameter	n=	D.L.	# > D.L.	Mean	Median	# > D.L.	Mean	Median
Ag	63	0.003	10	0.006	0.005	6	0.006	0.005
Al	63	0.05	47	0.241	0.180	52	0.219	0.145
As	63	0.001	19	0.019	0.020	12	0.012	0.009
Cd	63	0.001	10	0.003	0.003	13	0.003	0.002
Co	63	0.001	44	0.016	0.011	35	0.011	0.007
Cr	63	0.005	22	0.051	0.018	22	0.086	0.028
Cu	64	0.001	54	0.038	0.029	56	0.026	0.025
Fe	63	0.01	63	2.117	2.140	61	0.366	0.174
Mn	63	0.01	63	9.695	9.590	63	3.158	3.080
Ni	63	0.005	53	0.018	0.016	44	0.012	0.012
Pb	63	0.01	12	0.039	0.020	9	0.024	0.020
V	64	0.005	18	0.015	0.009	20	0.015	0.007
Zn	64	0.01	46	0.039	0.022	62	0.334	0.320

magnitude (Table 18). For the other metals, concentrations were increased by approximately two-fold over reference levels, with the exception of As and Cd, which were not elevated in the mine discharge waters compared to the reference sites.

On-going metals loadings were high but discharge concentrations were within the Water Licence limits on almost all occasions for all licenced parameters

The existing water quality conditions at the discharge therefore reflect ongoing metals loadings to the receiving environment even though discharge concentrations were within the water licence limits on almost all occasions for all licenced parameters. Of most concern are Zn and Ag, because of a combination of high loadings and their relatively high toxicity (see CCME Guidelines in Table 15). High levels of sulphate are also discharged. These serve as a good indicator of mine discharge, but are not toxic. High levels of Fe and Mn are also discharged but these are of lower toxicity.

Water quality downstream of the mine site is influenced by the discharge of treated, compliant effluent from the Cross Valley Dam, seepage from the dam, and by mixing with water from the Rose Creek diversion channel. Prior to 1998, water quality at this site was variable: sulphate ranged from 4 – 762 mg/L, pH from 5.9 to 8.6 and Zn from 0.01 to 0.64 mg/L (average = 0.08).

Comparison of water quality in Rose Creek with that in the discharge water showed dilution and assimilation of mine water in the receiving environment during the baseline period

During the 1998-2002 care and maintenance period, the receiving waters continued to show elevated levels of Ca, sulphate, Zn and other trace metals from the discharge of treated mine water. Comparison of water quality in Rose Creek (Tables 19 and 20) with that in the discharge water (Tables 17 and 18) showed substantial dilution and assimilation of mine water in the receiving environment. Nevertheless, receiving water quality was impaired when compared with CCME Guidelines for protection of aquatic life for Al, As, Cd, Cu, Fe, Pb and Zn at Sites X14 and R2, immediately downstream of the Cross Valley Dam. The area of concern represents approximately 100 m of stream reach immediately downstream of the Cross Valley Dam, which is functioning as a mixing zone. Ammonia levels exceeded concentrations in reference creeks (Table 19) but cool waters (maximum recorded temperature of 12°C) and moderate pH (maximum recorded pH of 8.6) limited the average concentration of the toxic, un-ionized fraction to less than the CCME Guideline of 19 ug/L.

Although metal levels downstream of the mine exceeded CCME Guidelines, some appear to reflect natural mineralization of surface water near the mine. Concentrations of Al, As, Cd, Cr, Cu, and Pb downstream of the mine were the same as, or less than, concentrations at the reference water quality sites that were not influenced by mine drainage (Table 20). Nickel concentrations were elevated above reference levels, but were below CCME guidelines. In summary, receiving water quality contained elevated concentrations of Fe, NH_3, Mn, Zn and SO_4, when compared to reference water quality and CCME Guidelines. No CCME Guidelines exist for sulphate and Mn, as these substances are of low toxicity.

The CCME Guidelines represent water quality conditions that assure indefinite survival of the most sensitive life stages of sensitive aquatic species. Most exceedances would have occurred during discharge periods and were therefore short-term events. The water quality data do not indicate any conditions which are acutely lethal to aquatic life. This is supported by the acceptable toxicity testing reported in annual reports for the site (i.e. GLL, 2003a).

Regional Study Area Water Quality

The water quality data for the baseline period is limited in its utility for comparisons with other sites

The RSA downstream of the immediate receiving waters for the Faro site is described by water quality at sites R3 and R4 in Rose Creek. The existing conditions for the RSA are described by comparison of reference water quality in Anvil Creek (R6) with water quality in Anvil Creek downstream of the confluence with Rose Creek (Site R5). No water quality data were collected at these sites during the period of mine operation.

Existing water quality data in the RSA is limited: only four samples were collected for the period 1998 – 2002. This limits their utility for comparisons with other sites. Ca and SO_4 concentrations were elevated at the mouth of Rose Creek in response to mine water discharge (Table 21). Ca concentrations were double those at reference sites and SO_4 levels were higher by more than one order of magnitude. Total Suspended Solids and ammonia concentrations had decreased to background at this point.

No evidence suggests that the aquatic community in Rose Creek has been impaired by the mine discharge.

Concentrations of Zn remained at levels of 0.05 mg/L at the mouth of Rose Creek and exceeded both reference levels and the CCME Guideline by a factor of two (Table 22). Mn concentrations declined by a factor of three along the length of Rose Creek, although they remained one order of magnitude higher than reference levels. There is no CCME Guideline for Mn and it has very low toxicity. Fe concentrations declined to background levels along Rose Creek.

In summary, at Site R4 existing water quality conditions are distinguished by elevated levels of Ca, SO_4, Zn and Mn. Of these, Zn is the only pollutant of potential concern, based on comparison with the CCME Guideline. There is no evidence, however, to suggest that the aquatic community in Rose Creek has been impaired by the mine discharge as described in existing information for the Rose Creek aquatic environment (Section 2.6).

Anvil Creek, immediately downstream of its confluence with Rose Creek, marks the downstream extent of the Regional Study Area. Upstream of Rose Creek, Anvil Creek is characterized by moderate levels of Ca and SO_4 (Table 23), indicating a more alkaline system than the reference areas of Rose Creek. Metal concentrations (Table 24) are similar to those in the Rose Creek reference areas (Table 16). Downstream of the confluence, Mn concentrations are greater than background as a result of the inflow of Rose Creek. This is the only measurable response to the Faro Mine Site at the edge of the Regional Study Area. All other water quality indicators of the Faro Mine discharge were not measurably different from reference water quality at this point.

Table 19. Water Quality in Rose Creek Local Study Area (Station X14/R2), 1998-2002

Parameter	Ca mg/L	NH3-N mg/L	pH	SO4 mg/L	TSS mg/L
n	68	31	48	64	56
Mean	64	0.21	7.71	121	6
Median	60	0.13	7.83	100	4

Table 20. Trace Metal Concentrations in Rose Creek Local Study Area (Station X14/R2), 1998-2002

Parameter	n	D.L.	# > D.L.	Mean	Median	CCME	Reference
Ag	68	0.003	5	0.006	0.005	0.1	<0.003
Al	68	0.050	55	0.181	0.140	0.100	0.140
As	68	0.001	9	0.011	0.010	0.005	0.016
Cd	68	0.000	8	0.003	0.002	0.00001	0.003
Co	68	0.001	16	0.012	0.007		0.003
Cr	68	0.005	30	0.030	0.009	0.010	0.020
Cu	55	0.001	38	0.014	0.011	0.002	0.011
Fe	68	0.010	68	0.431	0.346	0.300	0.148
Mn	68	0.010	68	1.090	0.858		0.020
Ni	68	0.005	34	0.012	0.009	0.025	0.005
Pb	68	0.010	16	0.020	0.015	0.001	0.018
V	68	0.005	20	0.013	0.008		0.010
Zn	68	0.010	68	0.080	0.060	0.03	0.030

Table 21. Water Quality in Rose Creek, 1998-2002

Site	Parameter	Ca mg/L	NH3-N mg/L	pH	SO4 mg/L	TSS mg/L
R3	n	4	4	4	4	4
	Mean	44.9	0.09	8.11	59	2
	Median	47.4	0.09	8.12	56	2
R4	n	4	4	4	4	4
	Mean	57.5	<0.05	8.32	104	2
	Median	52.0	<0.05	8.32	93	3

Table 22. Trace Metal Concentrations in Rose Creek, 1998-2002

Site		R3				R4				
Parameter	n=	D.L.	# > D.L.	Mean	Median	# > D.L.	Mean	Median	CCME	Reference
Ag	4	0.003	0	<0.003	<0.003	1	0.001	0.001	0.1	<0.003
Al	4	0.05	4	0.081	0.067	4	0.119	0.093	0.100	0.140
As	4	0.001	0	<0.003	<0.003	0	<0.001	<0.001	0.005	0.016
Cd	4	0.001	1	0.001	0.001	2	0.001	0.001	0.00001	0.003
Co	4	0.001	3	0.002	0.001	0	<0.001	<0.001		0.003
Cr	4	0.005	1	0.058	0.058	2	0.122	0.122	0.010	0.020
Cu	4	0.001	4	0.017	0.011	4	0.022	0.025	0.002	0.011
Fe	4	0.01	4	0.228	0.237	4	0.133	0.169	0.300	0.148
Mn	4	0.01	4	0.505	0.521	4	0.274	0.263		0.020
Ni	4	0.005	2	0.006	0.006	3	0.008	0.008	0.025	0.005
Pb	4	0.01	1	0.020	0.020	1	0.003	0.003	0.001	0.018
V	4	0.005	2	0.004	0.004	1	0.001	0.001		0.010
Zn	4	0.01	4	0.064	0.043	4	0.066	0.050	0.03	0.030

Table 23. Water Quality in Anvil Creek, 1998-2002

Site	Parameter	Ca mg/L	NH3-N mg/L	pH	SO4 mg/L	TSS mg/L
R5	n=	4	4	4	4	4
	Mean	38	<0.05	8.36	20	3
	Median	37	<0.05	8.36	19	3
R6	n=	4	4	4	4	4
	Mean	37	<0.05	8.15	15	2
	Median	36	<0.05	8.39	17	2

Table 24. Trace Metal Concentrations in Anvil Creek, 1998-2002

Site			R5			R6		
Parameter	n=	D.L.	# > D.L.	Mean	Median	# > D.L.	Mean	Median
Ag	4	0.003	0	<0.003	<0.003	1	0.001	0.001
Al	4	0.05	4	0.080	0.080	4	0.095	0.096
As	4	0.001	0	<0.001	<0.001	1	0.003	0.003
Cd	4	0.001	0	<0.001	<0.001	1	0.002	0.002
Co	4	0.001	1	0.001	0.001	1	0.002	0.002
Cr	4	0.005	2	0.012	0.012	2	0.026	0.026
Cu	4	0.001	4	0.014	0.009	4	0.016	0.011
Fe	4	0.01	4	0.156	0.114	4	0.180	0.128
Mn	4	0.01	4	0.043	0.046	3	0.012	0.013
Ni	4	0.005	4	0.004	0.003	3	0.003	0.003
Pb	4	0.01	0	<0.01	<0.01	1	0.030	0.030
V	4	0.005	1	0.001	0.001	1	0.001	0.001
Zn	4	0.01	4	0.027	0.015	4	0.023	0.015

Rose Watershed Surface Water Quality Summary

The existing water quality for the Faro Mine Site was described by:

Summary of the Faro Mine Site water quality baseline.

- Alkaline conditions, low solids and concentrations of trace metals (except for Zn and Hg) which exceeded CCME guidelines in reference waters isolated from mine influence;
- Discharge of mine waters from Cross Valley Pond which contained Ca, Zn, SO_4, Fe, Mn at concentrations which were several orders of magnitude above reference levels and of trace metals (except for As and Cd) which exceeded reference levels by a factor of two;
- Water quality in Rose Creek immediately downstream of the Cross Valley Pond discharge which reflected discharge of high levels of Fe, NH_3, Mn, Zn and SO_4 from the mine;
- Assimilation of all mine influences except for Ca, Mn and Zn in Rose Creek upstream of Anvil Creek; and
- Mn as the only measurable mine influence in Anvil Creek downstream of its confluence with Rose Creek.

These conditions describe the existing water quality against which the proposed project activities (Project Description, Volume I) have been assessed for the 2004 – 2008 time period (Environmental Effects Assessment, Volume III).

2.5.4.4 Vangorda Watershed Surface Water Quality

Reference Water Quality

Alkalinity, sulphate and zinc concentrations in Vangorda and Shrimp Creeks during mine operations.

Reference stream water quality in Vangorda and Shrimp Creeks during the period of mine operations was consistently neutral to alkaline (pH 6.7 to 8.6). Sulphate concentrations were lower at location V1 in upper Vangorda Creek (1-26 mg/L) than at location V4 in Shrimp Creek (7-134 mg/L). This has been attributed to the presence of different rock types in the respective drainage areas (Gartner Lee 2003b). Total zinc concentrations generally ranged from 0.08 to <0.002 mg/L.

1998-2002 water quality.

Reference stream water quality for 1998-2002 was also slightly alkaline (pH 8.04) and of low to moderate hardness (Ca = 19 mg/L, conductivity = 156 uS and total hardness = 62 mg/L). Ammonia levels were not detectable, sulphate was low and the stream waters were clear, with total suspended solids levels of 2 mg/L. Reference site water quality data are provided in Table 25.

Trace metal concentrations.

Trace metal concentrations in reference waters indicate mineralized geology, with detectable concentrations of most trace metals (Table 26). Trace metal levels in the reference streams for Al, As, Cd, Cr, Cu, Fe and Pb generally exceeded CCME (1999) guidelines for protection of aquatic life while levels for Ag, Ni and Zn generally did not. A total hardness of 60 mg/L was used for those metals where the CCME guidelines are hardness dependent.

Table 25. Water Quality at Vangorda Creek Reference Sites, 1998-2002

Site	Parameter	Ca mg/L	Cond u/S	Hardness mg/L	NH3-N mg/L	pH	SO4-T mg/L	TSS mg/L
V1/V4	n=	30	2	28	17	23	29	15
	Mean	38	156	154	<0.05	7.83	29	5
	Median	19	156	62	<0.05	8.04	14	2

Table 26. Trace Metal Concentrations at Vangorda Creek Reference sites, 1998-2002

Site	V1/V4					
Parameter	n=	D.L.	# > D.L.	Mean	Median	CCME
Ag	30	0.003	2	0.003	0.003	0.1
Al	30	0.05	27	0.217	0.150	0.100
As	30	0.001	5	0.015	0.019	0.005
Cd	30	0.001	9	0.003	0.001	0.00001
Co	30	0.001	9	0.011	0.006	
Cr	30	0.005	14	0.079	0.016	0.010
Cu	30	0.001	28	0.023	0.018	0.002
Fe	30	0.01	29	0.645	0.309	0.300
Mn	30	0.01	21	0.038	0.030	
Ni	30	0.005	15	0.009	0.008	0.025
Pb	30	0.01	8	0.524	0.014	0.001
V	30	0.005	5	0.009	0.008	
Zn	27	0.01	23	0.037	0.020	0.03

Mine Runoff and Effluent

Mine runoff water and effluent from the Vangorda Plateau enters Vangorda Creek at three locations.

Mine runoff water and effluent from the Vangorda Plateau enter the receiving water, Vangorda Creek, at three locations:

1. Location V25BSP is the outlet of the Grum Interceptor Ditch, which includes periodic or seasonal release of effluent from the Grum/Vangorda water treatment plant. There is typically no flow at this location in the winter season.
2. Location V2 is the outlet of Grum Creek that includes runoff from the Grum rock dump.
3. Location V6A is the outlet of AEX Creek that includes runoff from the ore transfer pad.

Water quality at these three sites was sampled on a regular basis starting in 1996, 1988 and 1989, respectively. It is summarized from the "Anvil Range Mine Complex 2002 Baseline Environmental Information. Volume 2" Report (GLL 2002a), but additional details may be found in the annual monitoring reports that are filed with the Yukon Territory Water Board. Data for these three sites for the 1998 to 2002 timeframe is summarized on Tables 27 and 28.

Grum Interceptor Ditch

Sulphate and zinc concentrations and pH were higher corresponding to periods of effluent release from the Water

Location V25BSP was created in 1995 as part of the sediment mitigation activities that rerouted the Grum Interceptor Ditch into the Sheep Pad Pond. Prior to mine shut down in 1998, total zinc generally ranged from 0.28 to 0.01 mg/L, sulphate generally ranged from 641 to 10 mg/L and pH generally ranged from 8.40 to 6.65. Sulphate and zinc concentrations and pH fluctuated widely with periods of higher concentrations and higher pH corresponding to periods of effluent release from the Water Treatment Plant.

Water quality during the baseline period for the current environmental assessment

During the 1998 to 2002 timeframe, water quality at location V25BSP was slightly alkaline (pH 7.78) and of high hardness (Ca = 53 mg/L and total hardness = 739 mg/L, although the median value for total hardness is skewed high due to the greater frequency of analysis in 2002 as compared to 1998 to 2001). Ammonia levels were detectable but low (0.10 mg/L), sulphate was moderate (127 mg/L) and the stream waters were clear, with total suspended solids levels of 6 mg/L (Table 27). The concentration of total zinc was moderately elevated (for a mine runoff/effluent stream) at 0.11 mg/L.

2002 data is interesting as it was the only year of operation of the Grum/Vangorda Water Treatment Plant as is planned for the proposed term of the licence renewal

It is of interest to separate out the year 2002 data from the overall 1998 to 2002 timeframe because the year 2002 was the only year of operation of the Grum/Vangorda Water Treatment Plant, as is planned for the proposed term of the licence renewal. In general, water quality at location V25BSP was harder and contained higher concentrations of sulphate and zinc corresponding to the periods of effluent release from the treatment plant. For example, in 2002 water

Table 27. Water Quality at Vangorda Mine Site Runoff and Effluent Discharge Sites, 1998-2002

Site	Parameter	Ca mg/L	Hardness mg/L	NH3-N mg/L	pH	SO4-T mg/L	TSS mg/L
V25BSP	n=	37	11	11	19	37	36
	Mean	97	484	0.32	7.79	280	22
	Median	53	739	0.10	7.78	127	6
V2	n=	28	2	2	18	27	27
	Mean	163	919	0.09	7.68	379	9
	Median	163	919	0.09	7.78	380	7
V6A	n=	20	n/a	20	16	20	18
	Mean	47		<0.05	7.71	73	9
	Median	28		<0.05	7.69	21	4

Table 28. Trace Metal Concentrations at Vangorda Mine Site Runoff and Effluent sites, 1998-2002

Site	V25BSP					V2					V6A				
Parameter	n=	D.L.	# > D.L.	Mean	Median	n=	D.L.	# > D.L.	Mean	Median	n=	D.L.	# > D.L.	Mean	Median
Ag	37	0.003	7	0.007	0.001	28	0.003	6	0.002	0.001	20	0.003	0		
Al	37	0.05	33	1.112	0.250	28	0.05	26	0.292	0.155	20	0.05	18	0.260	0.150
As	37	0.001	13	0.014	0.008	28	0.02	10	0.034	0.037	20	0.001	2	0.015	0.015
Cd	37	0.001	14	0.003	0.001	28	0.001	4	0.003	0.003	20	0.001	5	0.002	0.001
Co	37	0.001	14	0.015	0.007	28	0.005	5	0.009	0.009	20	0.001	3	0.010	0.007
Cr	37	0.005	17	0.045	0.012	28	0.005	8	0.069	0.017	20	0.005	8	0.066	0.014
Cu	37	0.001	35	0.025	0.020	28	0.002	26	0.021	0.017	20	0.001	19	0.015	0.012
Fe	37	0.01	35	1.672	0.127	28	0.01	24	0.375	0.190	20	0.01	19	0.367	0.250
Mn	28	0.01	28	0.123	0.103	26	0.01	18	0.062	0.022	20	0.01	14	0.027	0.016
Ni	37	0.005	18	0.015	0.008	27	0.005	16	0.034	0.022	20	0.005	5	0.011	0.006
Pb	37	0.01	19	1.828	0.020	27	0.02	13	58.781	0.030	20	0.01	6	0.039	0.017
V	34	0.005	13	0.005	0.002	27	0.005	9	0.008	0.005	20	0.005	4	0.014	0.012
Zn	29	0.01	29	0.144	0.110	21	0.01	18	0.384	0.080	19	0.01	18	0.049	0.025

quality at location V25BSP contained up to 810 mg/L sulphate and 0.184 mg/L total Zn and hardness was as high as 847 mg/L.

The signature of treated effluent is apparent in existing water quality, and particularly during the year 2002, as compared to water quality at the reference locations. The concentration of Ca is more than doubled and hardness is increased by an order of magnitude. Ammonia is increased slightly and sulphate is also increased by one order of magnitude. Concentrations of Mn and Zn were elevated by an order of magnitude over concentrations in the reference streams. Concentrations of Ag, As and Fe were reduced by several times, however from the reference locations. Concentrations of Cd and Ni were not changed compared to the reference locations.

Ongoing metal loadings to the receiving environment are high, but discharge concentrations from the water treatment plant were within the Water Licence limits

Existing water quality conditions at location V25BSP therefore reflect ongoing metals loadings to the receiving environment. Although loadings are elevated, discharge concentrations from the Water Treatment Plant (in 2002) were within the Water Licence limits on all occasions for all licenced parameters. Of most concern is Zn because of a combination of elevated loadings and relatively high toxicity (see CCME Guidelines in Table 26). High levels of sulphate are also discharged. These serve as a good indicator of mine discharge, but are not toxic. High levels of Mn are also discharged but these are of lower toxicity.

Grum Creek

Rerouting of the Grum Interceptor ditch improved water quality at V2 in 1995

Water quality improved substantially at location V2 in 1995 through reduced concentrations of total suspended solids and some metals due to the rerouting of the Grum Interceptor Ditch away from Grum Creek and into the Sheep Pad Pond. Over the entire period of record to mine closure in 1998, total zinc generally ranged from 0.91 to 0.001 mg/L, sulphate generally ranged from 328 to 24 mg/L and pH generally ranged from 7.0 to 8.6.

1998-2002 water quality

From 1998 to 2002, water quality at location V2 was slightly alkaline (pH 7.78) and of high hardness (Ca = 163 mg/L and total hardness = 919 mg/L). Ammonia levels were detectable but low (0.09 mg/L), sulphate was moderately high (380 mg/L) and the stream waters were clear, with Total Suspended Solids levels of 7 mg/L. The concentration of total zinc was slightly elevated (for a mine runoff stream) at 0.08 mg/L.

The effects of runoff and seepage from the Grum Rock dump on baseline period water quality

The signature of runoff and seepage from the Grum Rock Dump is apparent in existing water quality at location V2 as compared to water quality at the reference locations. The concentrations of Ca and hardness are increased by one order of magnitude. Ammonia is increased slightly and sulphate is also increased by one order of magnitude. Concentrations of As, Cd, Ni, Pb and Zn were at least doubled over concentrations in the reference streams. Concentrations of Ag, Fe and Mn are reduced, however from the reference locations. Concentrations of Cr and Cu are not changed compared to the reference locations.

Grum Creek water quality reflects ongoing metals loadings to the receiving environment

The existing water quality conditions in Grum Creek therefore reflect ongoing metals loadings to the receiving environment. Of most concern are As, Cd, Ni and Zn because of a combination of elevated loadings (due to the release of compliant effluent) and their relatively high toxicity (see CCME Guidelines in Table 26). High levels of sulphate are also present. These serve as a good indicator of mine discharge, but are not toxic.

AEX Creek

Zinc and sulphate concentrations

At location V6A, AEX Creek, over the entire period of record to mine closure in 1998, total zinc generally ranged from 0.28 to 0.001 mg/L, sulphate generally ranged from 79 to 3 mg/L and pH generally ranged from 7.0 to 8.1.

1998-2002 water quality

From 1998 to 2002, water quality at location V6A was slightly alkaline (pH 7.69) and of moderate hardness (Ca = 28 mg/L). Ammonia levels were non detectable, sulphate was low (21 mg/L) and the stream waters were clear, with Total Suspended Solids levels of 4 mg/L. The concentration of total zinc was low at 0.025 mg/L.

Mine-related metal loadings are absent in the baseline water quality conditions

Water quality at location V6A in AEX Creek is very similar to that at the reference locations. This indicates that runoff from the ore transfer pad and haul road (in the AEX Creek drainage area) are not having an observable effect in AEX Creek.

The existing water quality conditions in AEX Creek therefore reflect the absence of mine-related metals loadings to the receiving environment.

Receiving Water Quality

Zinc variability at V27 is attributed to the Grum/Vangorda water treatment plant discharge

Location V27 is in the Main Stem of Vangorda Creek is immediately below the mine site and immediately upstream of the confluence with Shrimp Creek (reference location V4). This location is internal to the local study area but is influenced by the discharge of treated and compliant effluent and other runoff waters and by mixing with water from the Vangorda Creek Diversion Flume. From 1991 to 1998, water quality at this site was variable: sulphate ranged from 20 to 127 mg/L, pH from 7.33 to 8.24 and Zn generally from 0.02 to 0.164 mg/L (average = 0.05). The variability in zinc is attributed to the influence of a period of high volume discharge from the Grum/Vangorda Water Treatment Plant during the summer of 1997.

Location VGMAIN is at the extent of the local study area on the Main Stem of Vangorda Creek immediately upstream of the confluence with the West Fork. This includes water from the Main Stem via location V27 plus water from Shrimp Creek via reference location V4 plus natural runoff into the creek below Shrimp Creek. Routine sampling was introduced here in 1997. From 1997 to 1998, water quality at this site was variable: sulphate ranged from 23 to 233 mg/L, pH from 7.9 to 8.2 and Zn generally from 0.02 to 0.13 mg/L (average = 0.06). The variability in sulphate has been attributed to a natural seasonal cycle wherein higher concentrations are present in the winter season (Gartner Lee 2003b – Vangorda Annual Env. report). The variability in zinc is attributed to the influence of a period of high volume discharge from the Grum/Vangorda Water Treatment Plant during the summer of 1997.

Comparison of water quality in Vangorda Creek with that in the mine runoff water show dilution and assimilation of mine water in the receiving water during the baseline period

During the 1998-2002 care and maintenance phase, the receiving waters at both locations V27 and VGMAIN (Tables 29 and 30) continued to show elevated levels of some metals as compared to the CCME guidelines and to the reference locations. Comparison of water quality in Vangorda Creek with that in the mine runoff water showed substantial dilution and assimilation of mine water in the receiving environment. Further, comparison of water quality at locations V27 and VGMAIN shows that most metals were reduced in concentration along the length of the Main Stem, with the exceptions of Mn, Ni and Pb. Nevertheless, receiving water quality was impaired when compared with CCME Guidelines for protection of aquatic life for Al, As, Cd, Cr, Cu, Pb and Zn at both locations.

Concentrations of Al, As, Fe, Mn, Ni and Pb were the same as, or less than, concentrations at the reference water quality sites at one or both of the receiving water locations V27 and VGMAIN. Concentrations of Cd, Cr, Cu, Ni, Pb and Zn were greater than the upstream reference sites at one or both of receiving water locations V27 and VGMAIN.

Most CCME exceedances would have occurred during discharge periods and do not indicate acutely lethal conditions to aquatic life

In summary, receiving water quality in the main stem of Vangorda Creek contained elevated concentrations of Cd, Cr, Cu, Pb, Zn and SO_4 when compared to reference water quality and CCME Guidelines. No CCME Guidelines exists for sulphate as it is of low toxicity. The CCME Guidelines represent water quality conditions that assure indefinite survival of the most sensitive life stages of sensitive aquatic species. Most exceedances would have occurred during discharge periods and were therefore short-term events. The water quality data do not indicate any conditions which are acutely lethal to aquatic life. This is supported by the acceptable toxicity testing reported in annual reports for the site (i.e. GLL, 2003b).

Zinc and sulphate concentrations and pH. Zinc variability is attributed to initial clearing and construction work

Location V5 is at the extent of the local study area in the West Fork of Vangorda Creek immediately upstream of the confluence with the Main Stem. This includes runoff water from AEX Creek plus a portion of the Grum Rock Dump (excluding the sulphide cell) plus natural runoff into the creek below the mine access road. Routine sampling was introduced here in 1991. From 1991 to 1998, water quality at this site was variable: sulphate ranged from 15 to 319 mg/L, pH from 7.2 to 8.8 and Zn generally from 0.001 to 0.29 mg/L (average = 0.04). The variability in sulphate has been attributed to a natural seasonal cycle wherein higher concentrations are present in the winter season (Gartner Lee 2003b). The variability in zinc is attributed to the influence of initial clearing and construction work in 1992. Sediment loading was also very high, on occasion, at location V5 (range from 2 to 1,020 mg/L total suspended solids), which is attributed primarily to initial construction and clearing work in 1992.

1998-2002 water quality

During 1998-2002, the receiving waters at locations V5 (Tables 29 and 30) continued to show elevated levels of some metals as compared to the CCME guidelines and to the reference locations. Receiving water quality was impaired when compared with CCME Guidelines for protection of aquatic life for Al, As, Cd, Cr, Cu, Pb and Zn. Concentrations of Ag, Cd, Co, Cr, Fe and Mn were the same as, or less than, concentrations at the reference water quality sites.

Concentrations of Al, As, Cu, Ni, Pb and Zn were slightly greater than the reference sites. Sediment loading was also very high, on occasion, at location V5 (range up to 731 mg/L total suspended solids) which is attributed primarily to natural events downstream of the mine facilities.

A debris flow entered the creek in the summer of 2000

A significant natural sedimentation event occurred in summer of 2000 in the West Fork wherein a debris flow entered the creek from the north side upstream of location V5 and downstream of the mine access road. This event resulted in high initial sediment loads in the creek (251 mg/L total suspended sediment) and is considered to be contributing to an annual spring peak in total suspended sediments.

In summary, during the existing environment timeframe (1998 to 2002), receiving water quality in the West Fork of Vangorda Creek contained elevated concentrations of Al, As, Cu, Pb, Zn and TSS when compared to reference water quality and CCME Guidelines.

Regional Study Area Water Quality

The Town of Faro water supply is taken from groundwater wells locate at the entry of Vangorda Creek into the Pelly River

The RSA downstream of the immediate receiving waters for the Vangorda Plateau site, is described by water quality at location V8, immediately upstream of entry into the Pelly River. This includes flow from the Main Stem via location VGMAIN plus flow from the West Fork via location V5 plus natural runoff into the creek below the confluence of the Main Stem and West Fork along the north perimeter of the Town of Faro. The Town of Faro water supply is taken from groundwater wells located at the entry of Vangorda Creek into the Pelly River.

1989-1998 water quality was variable at this site

Routine sampling was introduced at location V8 in 1989. From 1989 to 1998, water quality at this site was variable: sulphate ranged from 12 to 199 mg/L, pH from 7.0 to 8.5 and Zn generally from 0.006 to 0.36 mg/L (average = 0.05). The variability in sulphate has been attributed to a natural seasonal cycle wherein higher concentrations are present in the winter season (Gartner Lee 2003b). The variability in zinc is attributed to the influence of initial clearing and construction work in 1991. Sediment loading was also very high, on occasion, at location V8 (range from 4 to 590 mg/L total suspended solids), which is attributed primarily to initial construction and clearing work in 1991.

From the1998 to 2002, the receiving waters at location V8 (Tables 31 and 32) continued to show elevated levels of some metals as compared to the CCME guidelines and to the reference locations. Receiving water quality was impaired when compared with CCME Guidelines for protection of aquatic life for Al, As,

Table 29. Water Quality in Vangorda Creek Local Study Area, 1998-2002

Site	Parameter	Ca mg/L	Hardness mg/L	NH3-N mg/L	pH	SO4-T mg/L	TSS mg/L
V27	n=	14	12	8	9	13	12
	Mean	21	82	<0.05	7.93	37	3
	Median	16	72	<0.05	7.97	37	2
VGMAIN	n=	47	45	2(13 < d.l.)	32	47	38
	Mean	53	217	0.065	7.98	90	11
	Median	56	220	0.065	8.01	82	3
V5	n=	62	58	1 (23<d.l.)	45	62	59
	Mean	79	347	0.070	8.05	125	42
	Median	69	305	0.070	8.04	89	13

Table 30. Trace Metal Concentrations in Vangorda Creek Local Study Area, 1998-2002

	V27					VGMAIN					V5						
Parameter	n=	D.L.	# > D.L.	Mean	Median	n=	D.L.	# > D.L.	Mean	Median	n=	D.L.	# > D.L.	Mean	Median	CCME	Reference
Ag	14	0.003	0	<0.003	<0.003	47	0.003	5	0.001	0.001	62	0.003	8	0.002	0.001	0.1	0.003
Al	14	0.05	13	0.187	0.130	47	0.05	39	0.225	0.110	62	0.05	60	0.782	0.275	0.100	0.150
As	14	0.001	2	0.008	0.008	47	0.001	4	0.008	0.007	62	0.001	8	0.021	0.021	0.005	0.019
Cd	14	0.001	4	0.002	0.002	47	0.001	12	0.001	0.001	62	0.001	11	0.003	0.001	0.00001	0.001
Co	14	0.001	5	0.010	0.006	47	0.001	9	0.008	0.005	62	0.001	11	0.007	0.002		0.006
Cr	14	0.005	7	0.079	0.033	47	0.005	22	0.029	0.014	62	0.005	32	0.054	0.014	0.010	0.016
Cu	14	0.001	13	0.016	0.017	47	0.001	40	0.020	0.015	62	0.001	58	0.020	0.019	0.002	0.018
Fe	14	0.01	14	0.283	0.192	47	0.01	42	0.312	0.100	62	0.01	61	1.287	0.290	0.300	0.309
Mn	14	0.01	6	0.027	0.017	47	0.01	27	0.032	0.020	62	0.01	46	0.052	0.030		0.030
Ni	14	0.005	5	0.006	0.004	47	0.005	20	0.012	0.010	62	0.005	33	0.015	0.009	0.025	0.008
Pb	14	0.01	4	0.012	0.011	47	0.01	11	12.735	0.020	62	0.01	19	11.223	0.018	0.001	0.014
V	14	0.005	2	0.010	0.010	45	0.005	6	0.012	0.013	62	0.005	19	0.012	0.009		0.008
Zn	13	0.01	13	0.066	0.050	30	0.01	32	0.053	0.040	48	0.01	38	0.067	0.026	0.03	0.020

Table 31. Water Quality Concentrations in Vangorda Creek Regional Study Area, 1998-2002.

Site	Parameter	Ca mg/L	Hardness mg/L	NH3-N mg/L	pH	SO4-T mg/L	TSS mg/L
V8	n=	65	61	31	45	65	59
	Mean	65	263	<0.05	7.96	112	15
	Median	65	271	<0.05	8.00	98	6

Table 32. Trace Metal Concentrations in Vangorda Creek Regional Study Area, 1998-2002.

Site	V8					CCME	Reference
Parameter	n=	D.L.	# > D.L.	Mean	Median		
Ag	65	0.003	7	0.0020571	0.0006	0.1	0.003
Al	65	0.05	58	0.3556897	0.145	0.100	0.150
As	65	0.001	10	0.018	0.016	0.005	0.019
Cd	65	0.001	14	0.1581286	0.002	0.00001	0.001
Co	65	0.001	17	0.0236	0.007		0.006
Cr	65	0.005	33	0.0322727	0.014	0.010	0.016
Cu	65	0.001	59	0.0175508	0.016	0.002	0.018
Fe	65	0.01	60	0.4964667	0.1605	0.300	0.309
Mn	65	0.01	60	0.4102467	0.04		0.030
Ni	65	0.005	34	0.0230588	0.009	0.025	0.008
Pb	65	0.01	26	9.9380769	0.02	0.001	0.014
V	63	0.005	13	0.0133077	0.012		0.008
Zn	41	0.01	45	0.0395644	0.03	0.03	0.020

Cd, Cr, Cu and Pb. Concentrations of Ag, Al, As, Cr, Cu and Fe were the same as, or less than, concentrations at the reference water quality sites. Concentrations of Cd, Co, Mn, Ni, Pb and Zn were slightly greater than the reference sites. Sediment loading continued to be elevated during freshet at location V8 (range up to 184 mg/L total suspended solids), which is attributed primarily to the influence of a natural debris flow that occurred in the West Fork in 1991.

1998-2000 baseline period water quality

In summary, receiving water quality contained elevated concentrations of Cd, Pb and TSS when compared to reference water quality and CCME Guidelines.

Vangorda Watershed Surface Water Quality Summary

The existing water quality for the Vangorda Plateau Mine Site was described by:

Description of the Vangorda Plateau mine site water quality

- Alkaline conditions, low solids and concentrations of some metals which exceeded CCME guidelines in reference waters isolated from mine influence;
- Entry into Vangorda Creek of mine runoff and effluent waters from the Grum Interceptor Ditch and Grum Creek which contained Ca, hardness, Zn, SO_4 and Mn at concentrations which were an order of magnitude above reference levels and of trace metals which exceeded reference levels by a factor of two;
- Water quality in the main Stem of Vangorda Creek downstream of the mine facilities, which reflected the influence of the mine facilities as elevated levels of Cd, Cr, Cu, Pb, Zn and SO_4;
- Water quality in the West Fork of Vangorda Creek downstream of the mine facilities which reflected the influence of the mine facilities as elevated levels of Al, As, Cu, Pb and Zn; TSS was also elevated between 1998-2002 and this was attributed to a natural debris flow; and
- Assimilation of all mine influences but Cd and Pb in Vangorda Creek upstream of the Pelly River.

These conditions describe the existing water quality against which the proposed project activities (Project Description, Volume I) have been assessed for the 2004 - 2008 time period (Environmental Effects Assessment, Volume III).

2.5.5 GROUNDWATER QUALITY

2.5.5.1 Overview

The baseline groundwater quality includes data from 38 locations, most containing 2 or more nested piezometers

Groundwater quality for the 1987-2002 period includes data from a total of 38 regularly monitored locations, most of which contain two or more nested piezometer screens, on the Faro and Vangorda Plateau sites (Figures 22 and 23). These include locations designed to monitor subsurface seepage from the Vangorda Rock Dump, the Grum Rock Dump, the Faro Rock Dumps along the

North Fork of Rose Creek, the Old Faro Creek channel below the Faro Rock Dumps and the Rose Creek Tailings Facility.

The monitoring wells have varying periods of record due to a number of discreet installation programs

A management approach and considerations on possible degraded groundwater quality in these areas are described in the Adaptive Management Plan that is provided in Volume 1 of this report.

There have been a number of discreet piezometer installation programs over the mine life and, therefore, the monitoring wells discussed here have varying periods of record. The most recent programs were in 2001, focussed in the Rose Creek Tailings Facility and the Vangorda rock dump and in 1996, focussed on the Rose Creek Tailings Facility and the Faro rock dumps.

The number of sampling sites was reduced to describe the environmental baseline for the Rose Creek Tailings Facility

Some of the groundwater monitoring wells associated with the Rose Creek tailings facility provide information useful for detailed monitoring for the pathways of contaminants released from the tailings but do not provide information that is useful for environmental assessment (i.e. they are internal to the facility). Therefore, a smaller number of selected sites were used to describe the existing environmental conditions for the Rose Creek Tailings Facility. Additional details are provided in this volume under the topic of Mine Characterization. The most important groundwater quality requirement is to document the existing (defined as 1998 to 2002) groundwater quality. Groundwater quality data from 1998 to 2002 for the Faro and Vangorda Mine sites are provided in Appendix C.

2.5.5.2 Seepage from Faro Rock Dumps to the North Fork of Rose Creek

Groundwater seepage quality from the Faro Rock Dumps to the North Fork of Rose Creek is sampled at monitoring wells at the toe of the northeast rock dump (BH12, BH13 and BH14), at the toe of the Zone II Rock Dumps (BH1, BH2, BH4) and at the toe of the Intermediate Rock Dump (P96-6, S1, S2, S3) as illustrated on Figures 5 and 6 in Volume I. These monitoring wells vary in depth from 2.84 m to 20.85 m. Monitoring for surface water effects in the North Fork of Rose Creek is conducted at a series of surface sampling stations in the North Fork as described in Gartner Lee 2003a.

Baseline groundwater quality at wells at the toe of the NE rock dumps is impacted by seepage from the NERock Dumps

Monitoring wells BH12, BH13 and BH14 at the toe of the northeast rock dumps consist of two installations each (one of the BH13 installations is currently inoperable) that vary in depth from 2.85 m to 10.0 m. These wells were installed in 1994. Groundwater quality was sampled once or twice per year from 1994 to 1998 and displayed measurable zinc concentrations (generally ranging from <0.01 to 0.12 mg/L) and variable sulphate (ranging from 93 to 883 mg/L) at neutral pH (ranging from 6.8 to 7.9). During 1998 to 2002, groundwater quality contained 0.05 mg/L zinc (median value) and 678 mg/L sulphate (median value) at continued neutral pH (7.31 median value). Therefore, existing groundwater quality in these monitoring wells is impacted by seepage from the northeast rock dumps as displayed by elevated zinc and sulphate. The possible effects of this groundwater on surface water in Rose Creek is described in Gartner Lee 2003a.

Groundwater quality slightly improved over the historical period in wells at the toe of the Zone II Rock Dumps

Monitoring wells BH1, BH2 and BH4 at the toe of the Zone II Rock Dumps consist of one installation each that vary in depth from 3.20 to 5.55 m. These wells were installed in 1991. Groundwater quality was sampled nearly monthly from 1991 to 1998 except for 1992 to 1994 when only a few samples were collected. Groundwater quality from 1991 to 1998 displayed highly variable zinc concentrations (generally ranging from 0.02 to 184 mg/L), highly variable sulphate (ranging from 34 to 9050 mg/L) at variable and occasionally acidic pH (ranging from 2.6 to 8.5). During the 1998 to 2002 timeframe, groundwater quality was sampled approximately quarterly and contained 4.45 mg/L zinc (median value) and 184 mg/L sulphate (median value) at continued neutral pH (7.31 median value). Although existing groundwater quality continued to be highly variable, groundwater quality was slightly improved over the historical (1991 to 1998) period.

Baseline groundwater quality in wells BH 1,2,& 4 is impacted by historical events and possibly seepage from the Zone II Rock Dumps

The poor groundwater quality in monitoring wells BH1, BH2 and BH4 has been attributed to the location of the wells within surficial soils that have been contaminated from historical events such as the initial routing of the Faro Creek Diversion over erodable gossan material to this general location and an overflow from the Zone II Pit through this location. Therefore, the high concentrations and low pH may not be directly related to ongoing seepage from the Zone II Rock Dumps. Additionally, the measured high concentrations and low pH do not have a demonstrable effect in the surface water of Rose Creek (Gartner Lee 2003a). Therefore, existing groundwater quality in these wells is impacted by historical events and, possibly, by ongoing seepage from the Zone II Rock Dumps as displayed by elevated zinc and sulphate and depressed pH.

Baseline groundwater quality at the toe of the Main/Intermediate Rock Dumps is impacted by seepage from the Main/Intermediate Rock Dumps and/or natural mineralization in the flow path

Monitoring wells P96-6, S1, S2 ands S3 at the toe of the Main/Intermediate rock dumps consist of one or two installations each (P96-6 and S3 have only one installation) that vary in depth from 5.37 to 20.85 m. Routine monitoring results are available from 1996. Groundwater quality was sampled once or twice per year from 1996 to 1998 and displayed variable zinc concentrations (ranging from <0.01 to 3.73 mg/L) and variable sulphate (ranging from 85 to 1,372 mg/L) at neutral pH (ranging from 6.0 to 6.6). During the 1998 to 2002, groundwater quality was sampled once or twice per year and contained 0.22 mg/L zinc (median value) and 1,300 mg/L sulphate (median value) at continued neutral pH (6.3 median value). Therefore, existing groundwater quality in these monitoring wells is impacted by seepage from the Main/Intermediate Rock Dumps and/or natural mineralization in the flow path as displayed by elevated zinc and sulphate. The possible effects of this groundwater on surface water in Rose Creek is described in Gartner Lee 2003a.

2.5.5.3 Seepage from Faro Rock Dumps to the Rose Creek Tailings Facility

A large portion of groundwater flow from the Faro Rock Dumps is thought to report to the surface ponds of the tailings facility

Groundwater seepage quality from the Faro Rock Dumps to the Rose Creek Tailings Facility is sampled at monitoring wells at the toe of the Main/Intermediate Rock Dumps (P96-7 and P96-8) as illustrated on Figures 5 and 6 of Volume 1. These monitoring wells vary in depth from 4.87 to 9.90 m.

A large portion of this groundwater flow is thought to report to the surface ponds of the tailings facility but some goes into the tailings.

Baseline groundwater quality at wells at the toe of the Main/Intermediate Rock Dumps are impacted by seepage from the Main/Intermediate rock dumps

Monitoring well P96-7 (9.90 m depth) at the toe of the Main/Intermediate Rock Dumps was installed in 1996. Groundwater quality was sampled once or twice per year from 1996 to 1998 and displayed highly variable zinc concentrations (generally ranging from <0.01 to 1.55 mg/L) and variable sulphate (ranging from 362 to 662 mg/L) at neutral pH (ranging from 7.4 to 7.6). From 1998 to 2002, groundwater quality contained relatively low zinc (0.03 mg/L median value) and 1,226 mg/L sulphate (median value) at continued neutral pH (7.06 median value). Therefore, existing groundwater quality in this monitoring well is impacted by seepage from the Main/Intermediate rock dumps as displayed by elevated sulphate.

Baseline groundwater quality near the old Faro Creek Channel is impacted by seepage from the Main/Intermediate Rock Dumps

Monitoring wells P96-8A and 8B (4.87 and 9.30 m depths) are located near the old Faro creek channel at the toe of the Main/Intermediate rock dumps and were installed in 1996. The old Faro creek channel is thought to be a natural conduit for seepage from the rock dumps and there is a small surface discharge at this location also. Groundwater quality was sampled once or twice per year from 1996 to 1998 and displayed highly variable zinc concentrations (generally ranging from 0.94 to 16.1 mg/L) and stable sulphate (generally ranging from 2,118 to 2,576 mg/L) at neutral pH (ranging from 6.3 to 7.7). During the 1998 to 2002 environmental assessment, groundwater quality contained relatively low zinc (16.6 mg/L median value) and elevated sulphate (3,244 mg/L median value) at continued neutral pH (6.47 median value). Therefore, existing groundwater quality in this monitoring well is impacted by seepage from the Main/Intermediate rock dumps as displayed by elevated zinc and sulphate.

2.5.5.4 Seepage from the Rose Creek Tailings Facility

Groundwater seepage quality from the Rose Creek Tailings Facility is sampled at monitoring wells located downgradient of the Cross Valley Dam. Monitoring wells X16 A/B, X17 A/B and X18 A/B were installed in 1981 and have a long period of record. Monitoring well P01-02 was installed in 2001. These wells range in depth from 5.0 to 35.5 m in depth and the locations are illustrated on Figures 5 and 6 of Volume I. There are numerous additional wells associated with the Rose Creek Tailings Facility that are described in this volume under the topic of Mine Characterization. The downgradient wells listed here provide the information appropriate for the environmental assessment.

Baseline groundwater quality near the valley centre can be characterized by low zinc and sulphate concentrations

Monitoring wells X16 A/B and X17 A/B are located near the valley centre and routine monitoring data is available since 1994 although a few data points are available to 1981. Groundwater quality from 1990 to 1998 displays low but variable zinc concentrations (generally ranging from <0.01 to 0.15 mg/L) and low but variable sulphate (ranging from 9 to 143 mg/L) at neutral pH (ranging from 6.9 to 7.9). During the 1998 to 2002 environmental assessment, groundwater quality contained relatively low zinc (0.03 mg/L median value) and sulphate (30 mg/L median value) that displays a slight increasing trend over time at continued neutral pH (7.52 median value). Therefore, existing groundwater quality in these monitoring wells can be characterized by low zinc and sulphate concentrations.

Baseline groundwater quality at the north side of the valley bottom can be characterized by low zinc and elevated sulphate concentrations

Monitoring wells X18 A/B are located on the north side of the valley bottom and routine monitoring data is available since 1994 although a few data points are available to 1981. Groundwater quality from 1990 to 1998 displays low but variable zinc concentrations (generally ranging from <0.002 to 0.15 mg/L) and elevated but variable sulphate (ranging from 40 to 424 mg/L) at neutral pH (ranging from 6.7 to 7.6). During the 1998 to 2002 environmental assessment, groundwater quality contained relatively low zinc (0.02 mg/L median value) and elevated sulphate (422 mg/L median value) that displays an increasing trend over time at continued neutral pH (7.1 median value). Therefore, existing groundwater quality in these monitoring wells can be characterized as distinct from the valley centre (i.e. wells X16 and X17) with low zinc and elevated sulphate concentrations.

2.5.5.5 Seepage from Grum Rock Dump at Grum Creek

Baseline groundwater quality in the Grum Creek channel is impacted by seepage from the Grum Rock Dumps

Groundwater seepage quality from the Grum rock dumps at Grum Creek is sampled at monitoring wells P96-09 A/B as illustrated on Figures 5 and 6 of Volume 1. These wells were installed in 1996 in the Grum Creek channel in a bedrock valley that is at least 20 m deep. This drainage path is thought to collect seepage from the sulphide cell area of the Grum rock dump. The deeper well (P96-09B at 18.0 m) was initially artesian during spring and fall but is currently inoperable due to downhole soil compaction or movement.

Groundwater quality was sampled once or twice per year from 1996 to 1998 and displayed relatively low and stable zinc concentrations (ranging from 0.04 to 0.07 mg/L) and variable sulphate (generally ranging from 52 to 432 mg/L) at neutral to slightly alkaline pH (ranging from 7.1 to 8.0). From 1998 to 2002, groundwater quality contained low zinc (0.03 mg/L median value) and moderately elevated sulphate (180 mg/L median value) that displays and increasing trend at continued neutral pH (7.4 median value). Therefore, existing groundwater quality in this monitoring well is impacted by seepage from the Grum rock dumps as displayed by elevated sulphate.

2.5.5.6 Seepage from Vangorda Rock Dump

Groundwater seepage quality from the Vangorda rock dump is sampled at monitoring wells GW94-01 through GW94-04 as illustrated on Figures 5 and 6 of Volume I. These wells were installed in 1994 around the perimeter of the dump. Two additional monitoring wells were installed in 2001.

Baseline groundwater quality around the perimeter of the dump is slightly impacted by seepage from the Vangorda Rock Dump

Groundwater quality was sampled once or twice per year from 1994 to 1998 and displayed relatively low and variable zinc concentrations (ranging from 0.01 to 0.13 mg/L) and variable sulphate (ranging from 12 to 342 mg/L) at neutral to slightly alkaline pH (ranging from 7.0 to 8.8). From 1998 to 2002, groundwater quality contained low zinc (0.02 mg/L median value) and moderately elevated sulphate (144 mg/L median value) at continued neutral pH (7.4 median value). Therefore, existing groundwater quality in this monitoring well is slightly impacted by seepage from the Vangorda rock dump or natural mineralization in the area as displayed by elevated sulphate.

2.5.5.7 Summary of Groundwater Quality

Description of the groundwater quality baseline

The groundwater quality is characterized by:

- Groundwater seepage from Faro rock dumps to the North Fork of Rose Creek is characterized by elevated zinc and sulphate and, below the Zone II rock dumps, occasional acidic pH;
- Groundwater seepage from Faro rock dumps to the Rose Creek Tailings Facility via the old Far Creek channel is characterized by very high zinc and sulphate concentrations at neutral pH;
- Groundwater seepage immediately downgradient of the Rose Creek Tailings facility is characterized by low sulphate that displays a slight increasing trend and low zinc concentrations in the valley centre and by low zinc and elevated sulphate concentrations on the north side of the valley;
- Groundwater seepage form the Grum rock dump in the Grum Creek valley is characterized by low zinc concentrations and elevated sulphate that displays an increasing trend; and
- Groundwater seepage from the Vangorda rock dump is characterized by low zinc concentrations and elevated but variable sulphate concentrations.

These conditions describe the existing water quality against which the proposed project activities (Project Description, Volume I) have been assessed for the 2004 – 2008 time period (Environmental Effects Assessment, Volume III).

2.6 AQUATIC RESOURCES

2.6.1 AQUATIC STUDY AREA

The aquatic resources regional study area is identical to the water resources study area

Water resources discussed here include sediment quality, benthic invertebrates (communities and metal concentrations), fish (species distribution and metal concentrations) and fish habitat. The aquatic resource regional study area is identical to the water resource study area, which is watershed based and includes both the Rose Creek and Vangorda Creek watersheds as shown in Figure 3. Data has been collected from Anvil, Rose, Vangorda, and Blind Creeks and the existing conditions upon which the environmental effects assessment is based is data available from 1998 to 2002, during care and maintenance activities. Historical information is also available and is summarized under each component section, below to provide information and perspective on changes to each component, over time, as a result of mine activities.

Benthic community structure and metals in sediment have been the subject of sampling

Aquatic resource studies in Rose and Vangorda regional study areas (Figure 3) have been completed over time as both routine sampling required under the water licenses and on a less routine basis for additional purposes. Benthic community structure and metals in sediment have been the subject of sampling and analysis as required under the current water licenses.

Metals in stream sediment data and benthic invertebrate community data exists from 1973 to 2002, while fish presence and metals in fish tissue data exists from 1974 to 2002 and metals in benthic invertebrate data was collected only in 2002. Table 33 outlines the aquatic resource studies that have been completed within the regional watershed study areas. Anvil Creek sampling is included within the Rose Creek watershed for the purpose of the table.

Table 33. Aquatic Resource Studies Completed

Study Topic	Watershed	Study Date	Reference
Metals in stream sediment	Rose	1973	Hoos & Holman (Env. Can), 1973
Metals in stream sediment	Rose	1985	Godin & Osler (Env. Can), 1985
Metals in stream sediment	Vangorda	1993	Laberge, 1993
Metals in stream sediment	Vangorda	1996	Davidge (Env. Can.), 1996
Metals in stream sediment	Vangorda	1996	Laberge, 1996
Metals in stream sediment	Vangorda	1997	Laberge, 1997
Metals in stream sediment	Vangorda	1999	Laberge, 1999
Metals in stream sediment	Rose	1999	Env. Can. Unpublished
Metals in stream sediment	Vangorda	2001	Laberge, 2001
Metals in stream sediment	Rose, Vangorda	2002	Gartner Lee, 2003
Benthic invertebrate sampling	Rose	1973	Hoos & Holman, 1973
Benthic invertebrate sampling	Rose	1974	S.A. Baker, 1979
Benthic invertebrate sampling	Rose	1975	S.A. Baker, 1979
Benthic invertebrate sampling	Rose, Vangorda	1975	Mtl. Engineering Co., 1976
Benthic invertebrate sampling	Rose	1976	S.A. Baker, 1979
Benthic invertebrate sampling	Rose, Vangorda	1976	Mtl. Engineering Co., 1977
Benthic invertebrate sampling	Rose	1977	K. Weagle, 1981
Benthic invertebrate sampling	Rose, Vangorda	1977	Mtl. Engineering Co., 1978
Benthic invertebrate sampling	Rose	1978	K. Weagle, 1980
Benthic invertebrate sampling	Rose, Vangorda	1980	K. Weagle, 1980
Benthic invertebrate sampling	Rose	1981	K. Weagle, 1981
Benthic invertebrate sampling	Rose	1982	K. Weagle, 1982
Benthic invertebrate sampling	Rose	1983	B. Gotin & T. Osler, 1985
Benthic invertebrate sampling	Rose	1983	K. Weagle, 1983
Benthic invertebrate sampling	Rose	1984	K. Weagle, 1984
Benthic invertebrate sampling	Rose	1986	Leverton & Associates, 1987
Benthic invertebrate sampling	Rose	1986	EPS, unpublished
Benthic invertebrate sampling	Rose	1988	Laberge, 1989
Benthic invertebrate sampling	Rose, Vangorda	1990	P.A. Harder & Associates, 1992
Benthic invertebrate sampling	Vangorda	1991	Laberge, 1991
Benthic invertebrate sampling	Rose	1992	P.A. Harder & Associates, 1993
Benthic invertebrate sampling	Vangorda	1993	Laberge, 1993
Benthic invertebrate sampling	Rose	1994	Laberge, 1994

Study Topic	Watershed	Study Date	Reference
Benthic invertebrate sampling	Vangorda	1995	Laberge, 1995
Benthic invertebrate sampling	Rose	1996	Laberge, 1996
Benthic invertebrate sampling	Vangorda	1997	Laberge, 1997
Benthic invertebrate sampling	Rose	1998	Laberge, 1998
Benthic invertebrate sampling	Vangorda	1999	Laberge, 1999
Benthic invertebrate sampling	Rose	2000	Laberge, 2000
Benthic invertebrate sampling	Vangorda	2001	Laberge, 2002
Metals in benthic invertebrates	Rose, Vangorda	2002	Gartner Lee, 2003
Fish presence, metal in fish tissue	Rose	1974	S.A. Baker, 1979
Fish presence, metal in fish tissue	Rose	1975	S.A. Baker, 1979
Fish presence, metal in fish tissue	Rose, Vangorda	1975	Mtl. Engineering Co., 1976
Fish presence, metal in fish tissue	Rose	1976	S.A. Baker, 1979
Fish presence, metal in fish tissue	Vangorda	1976	Mtl. Engineering Co., 1977
Fish presence, metal in fish tissue	Vangorda	1977	Mtl. Engineering Co., 1978
Fisheries impact of Rose diversion	Rose	1981	K. Weagle, 1981a
Arctic grayling survey	Rose	1981	K. Weagle, 1981b
Fisheries	Rose	1986	Leverton & Associates, 1986
Fish presence and habitat	Vangorda	1987	P.A. Harder & Associates, 1987
Fish spawning survey	Rose	1988	P.A. Harder & Associates, 1988
Fish production and overwintering	Vangorda	1989	P.A. Harder & Associates, 1989
Fish habitat, production and feeding	Rose	1989 / 1990	P.A. Harder & Associates, 1991
Fish feeding, growth and population	Vangorda	1990	P.A. Harder & Associates, 1992
Fish habitat, metal in fish tissue	Rose	1992	P.A. Harder & Associates, 1993
Fish habitat use	Vangorda	1996	P.A. Harder & Associates, 1996
Metal in fish tissue		1997	Yukon Territorial Government
Fish habitat associated with FWSD	Rose	2000	Gartner Lee Ltd., 2000
Fish habitat, some fish presence and metals in fish tissue	Rose, Vangorda	2002	Gartner Lee Ltd., 2003c

2.6.2 CREEK SEDIMENT QUALITY

2.6.2.1 Historical Sediment Quality

Copper, lead and zinc are found in the ore deposits, can be toxic to aquatic organisms and have existing sediment quality guidelines

Sediment sampling in Vangorda Creek and analyses for metals have been conducted every two years since 1993 as required by the Water Licence (plus during 1996). Samples have been collected as part of additional studies between 1973 and 2002 in Rose Creek. Sampling sites are indicated on Figure 3. A discussion of historical results for copper, lead and zinc in both watersheds is included in the 2002 baseline report and is summarized below. These three compounds are found in the ore deposits, can be toxic to aquatic organisms at high concentrations and have sediment quality guidelines available for comparison.

The 1973, 1983 and 1996 (historical data) results for Rose Creek sediments indicate that copper concentrations exceed the 35.7 ug/g Interim Sediment Quality Guideline ("ISQG") in most impact area and some reference area samples. Lead concentrations in sediment exceed the 91.3 ug/g Probable Effects

Level ("PEL") in most impact and reference area samples. Some zinc concentrations exceed the 123 ug/g ISQG while the remainder exceed the 315 ug/g PEL at impact and reference area samples. Spatial trends in the data set are not apparent and temporal trends indicate highest values for the three metals in 1983 samples from the impacted area (following a 1975 tailings spill into Rose Creek) as compared to 1973 and 1996 values.

The highest metal concentrations in sediment are found at site V27, and an increasing trend is evident

The 1991, 1993, 1995 and 1997 (historical data) results for Vangorda Creek sediments indicate that the highest copper, lead and zinc concentrations are in sediments from the impacted site V27. Metal concentrations at site V5 on the West Fork are the lowest and comparable to reference site V1 results, while concentrations at the Creek mouth (V8) are between the results of the V27 and V5 site, on either creek branch. Copper levels exceeded the 35.7 ug/g ISQG for some V27 and V8 sample results. Lead levels exceeded the 91.3 ug/g PEL in all V27 and V8 results, while zinc levels exceeded the 315 ug/g PEL in all V27 and some V8 sample results. Increasing levels of all three metals at site V27 over time is an evident data trend.

2.6.2.2 Existing Sediment Quality

All Rose Creek and Rose tributary sample results exceeded the ISQG for copper

Results of sediment sample analyses from 1999, 2001 and 2002 are reported for copper, lead and zinc in Table 34. This table also compares the concentrations of copper, lead and zinc to the corresponding CCME (1999) interim freshwater sediment quality guidelines (ISQG) and to the probable effects level (PEL). In general, concentrations greater than the PEL have a 50% incidence of creating adverse biological effects on aquatic life.

Results of copper in six Rose Creek samples collected from between site R2 and R4 were 44 to 87 ug/g (plus an outlier of 182 ug/g). Results of copper in three Rose tributary reference samples collected in 1999 were 42 to 81 ug/g; within the range of the Rose Creek sample results from 1999 to 2002, while copper in 2002 Anvil reference site R6 sediment was 29 ug/g. All Rose Creek and Rose tributary sample results exceeded the 35.7 ISQG for copper. This indicates that copper in sediment is higher than the ISQG in reference locations.

Nearly all Rose Creek and Rose tributary sample results exceeded the ISQG's for lead and zinc

Results of lead in seven Rose Creek samples collected from between site R2 and R4 were 156 to 364 ug/g. Results of lead in three Rose tributary reference samples collected in 1999 were 54 to 202 ug/g; while lead in 2002 Anvil reference site R6 sediment was <30 ug/g. All Rose Creek and two of three Rose tributary sample results exceeded the 91.3 ug/g PEL for lead.

Results of zinc in seven Rose Creek samples collected from between site R2 and R4 were 489 to 1,603 ug/g. Results of zinc in three Rose tributary reference samples collected in 1999 were 156 to 489 ug/g; while zinc in 2002 Anvil reference site R6 sediment was 117 ug/g. All Rose Creek and one of three Rose tributary sample results exceeded the 315 ug/g PEL for zinc.

Table 34. Copper, Lead and Zinc Concentrations in Creek Sediment (1999 - 2002 data)

Creek	Station	Copper (ug/g) ISQG=35.7 PEL=197			Lead (ug/g) ISQG=35 PEL=91.3			Zinc (ug/g) ISQG=123 PEL=315		
		1999	2001	2002	1999	2001	2002	1999	2001	2002
Rose Cr.	R2	**63 / 182**		**83**	**164 / 788**		**364**	**517 / 1,603**		**1,583**
Rose Cr.	4398	**67**			**198**			**629**		
Rose Cr.	4396	**87**			**260**			**1,064**		
Rose Cr.	4395	**84**			**262**			**716**		
Rose Cr.	R4			**44**			**156**			**489**
Rose Tributary (R)	4394	**81**			**202**			**489**		
Rose Tributary (R)	4397	**45**			**54**			**156**		
Rose Tributary (R)	4399	**42**			**95**			**203**		
Anvil Cr. (R)	R6			29			<30			117
Vangorda Cr. (R)	V1	**39**	19		**45**	18		**141**	88	
Vangorda Cr.	V27	**129**	**102**		**2,069**	**2,801**		**921**	**868**	
Vangorda West Fork	V5	25	28		30	32		81	116	
Vangorda Cr.	V8	29	34	24	**89**	**110**	**66**	**148**	**248**	**219**

Bold	exceeds Interim Freshwater Sediment Guideline (ISQG)
Bold	exceeds Probable Effects Level (PEL)

(R) - reference station

Copper from sediment at V27 exceeded the ISQg. Lead from sediment at V27 and V8 exceeded the PEL, and zinc from sediments at V27 and V8 exceeded the PEL and ISQG respectively

Results of copper in Vangorda Creek sediment was similar in samples from V5 and V8, at between 24 and 35 ug/g, within the 19 and 39 ug/g range at reference site V1. Copper was highest in site V27 sediment at 102 and 129 ug/g; in exceedance of the 35.7 ug/g ISQG.

Lead was highest in Vangorda Creek samples from V27 and at 2,069 and 2,801 ug/g, results greatly exceeded the 91.3 ug/g PEL. Results were 30 and 32 ug/g in V5 samples; within the 45 and 18 ug/g reference site V1 results. At V8, results from 66 to 110 ug/g exceeded the ISQG or PEL.

Zinc was highest in Vangorda Creek samples from V27 and at 921 and 868 ug/g, results exceeded the 315 ug/g PEL. Results were 81 and 116 ug/g in V5 samples; even lower that the 141 and 88 ug/g reference site V1 results. At V8, results from 148 to 248 ug/g exceeded the 123 ug/g ISQG and are mid-range for the watershed.

2.6.3 BENTHIC INVERTEBRATES

2.6.3.1 Historical Benthic Community Structure

Benthic invertebrates, including insects, crustaceans, and aquatic worms can be used as a measure of ecosystem health

Benthic invertebrates include insects, crustaceans, aquatic worms and mollusks that reside in stream bottoms. Benthic invertebrate community structures are often used as measure of ecosystem health. Impacts to watercourses such as substrate composition, water flows and, in particular, water and sediment quality can affect benthic organisms. Sampling has been conducted at the following stations in the Anvil and Vangorda watersheds (Figure 3):

1. R1 - Rose Creek south fork d/s of FWSD Reservoir
2. R2 - Rose Creek at confluence of diversion channel and tailings outlet
3. R3 - Rose Creek between tailings and Anvil Creek
4. R4 - Rose Creek at mouth
5. R5 - Anvil Creek d/s of Rose Creek
6. R6 - Anvil Creek u/s of Rose Creek, a reference site
7. V1 - Vangorda Creek upstream of diversion a reference site
8. V5 - Vangorda Creek west fork downstream of mine activity
9. V27 - Vangorda Creek downstream of mine activity
10. V8 - Vangorda Creek at mouth

Benthic invertebrate population monitoring has been conducted every second year since 1991

Sampling was initiated at some of these sites in 1973 within the Anvil/Rose watershed and in 1975 within the Vangorda watershed. From 1991 on benthic invertebrate population monitoring has been conducted at each of these sites every second year as per the requirements of the water licences. Artificial substrates were used for the majority of the sampling events, allowing consistency across much of the data set. Triplicate samples were collected at each site during each sampling event and the results pooled to report community structure.

Sampling results have been summarized in terms of abundance (total number of organisms) and richness (number of taxa), as a means of comparing the benthic invertebrate community health over time and throughout the watersheds. The 1973 to 1997 data is detailed in the 2002 baseline report (GLL, 2002a) and is outlined below.

Measures of abundance and richness have fluctuated at each sampled site over time. This fluctuation may be attributed to natural factors including climate, water flow, species life cycles, sample timing as well as differences in sampling methodology and changes in water quality. No statistical analysis has been applied to the benthic data. The following observations can be drawn for the Rose / Anvil Creek data:

Observations of historical abundance and richness at Rose/ Anvil Creek and Vangorda Creek

1. With some fluctuation, the overall trend is an increase in abundance over time (1973 to 1997) at reference sites R1, R7 and R6;
2. Abundance and richness at R2 and R4 have fluctuated over time with no increasing or decreasing trend;
3. Abundance and richness at R3 and R5 have exhibited a slight increasing trend over the 1973 to 1997 time period; and
4. Abundance and richness were typically lowest at R2, immediately downstream of the tailings.

The following observations can be drawn for the Vangorda Creek data:
1. There is an increasing trend in abundance at V27 over time, while richness fluctuates. This does not indicate an effect from the increasing level of metals (cooper, lead and zinc) at this site from 1975 to 1997;
2. Community abundance and richness fluctuate over time at V5 and V8; and
3. Abundance is lowest in samples from V1 (reference site), where there is a slight increase in richness over time.

2.6.3.2 Existing Benthic Invertebrate Structure

The greatest abundance in the Rose watershed samples was noted at locations R1 and R5

Abundance results from Vangorda Creek were less differentiating

Recent 1998 to 2002 benthic invertebrate community data is available for 1998, 2000 and 2002 for Rose Creek and 1999 and 2001 for Vangorda Creek. Abundance and richness for each site are summarized on Table 35.

Community abundance ranged from 1,200 to close to 67,000 individuals in the Rose watershed samples. The greatest abundance was found in a sample from R1 and a sample from R5. Samples from R2 and R4 in generally had the lowest abundance with R3 also relatively low, indicating the lower Rose Creek samples to contain less abundant communities than the remaining sites. The lowest taxonomic richness was between 36 and 60 communities in the samples from the Rose watershed, with samples expressing the highest richness in site R1 and sites R3 and R7 expressing the lowest. There is no impact-reference pattern in the richness data.

Table 35. Benthic Invertebrate Community Abundance and Richness, 1998 to 2002

Site	Year	Total Abundance (organisms/m^2)	Taxonomic Richness
R1	1998	50,808	57
	2000	5,386	57
	2002	9,988	60
R2	1998	1,945	47
	2000	6,611	48
	2002	11,639	54
R3	1998	13,491	39
	2000	18,929	42
	2002	1,808	40
R4	1998	8,148	48
	2000	na	-
	2002	4,430	52
R5	1998	7,974	44
	2000	66,975	54
	2002	15,088	45
R6	1998	26,944	43
	2000	39,344	56
	2003	1,232	36
R7	1998	39,292	44
	2000	4,574	40
	2002	10,965	37
V1	1999	1,025	20
	2001	707	21
V27	1999	1,061	23
	2001	3,698	24
V5	1999	1,284	32
	2001	17,232	40
V8	1999	1,061	28
	2001	5,867	28

Abundance in 1999 benthic samples from Vangorda Creek were very similar from all four sites. The 2001 samples varied with the site V5 sample the highest abundance with 17,232 individuals and site V1 the lowest with 707 individuals. Taxonomic richness was between 20 and 40 communities in the samples from the Vangorda watershed, with site V5 samples expressing the highest richness. There is no impact-reference pattern in the data, and in fact, the data shows reference site V1 as the least healthy community. These results do not reflect a linkage to an effect of metals in sediment as the data collected simultaneously shows the highest copper, lead and zinc levels in V27 sediment.

2.6.3.3 Metals in Benthic Invertebrates

Analysis of metal in the tissue of benthic invertebrates was conducted to determine the pathway for bioaccumulation in larger invertebrates

Benthic invertebrates were collected for the analysis of metal in tissue for the first time around the Anvil Range Mine Complex in 2002. The analysis was initiated to determine the extent to which metals are accumulating in the benthic invertebrates (benthos) and thus the pathway for bioaccumulation in aquatic vertebrates (slimy sculpin and Arctic grayling). While most metals do no biomagnify between trophic levels, small invertebrates tend to accumulate greater concentrations of metals than large invertebrates, and therefore, early-lifestage fish (which eat smaller invertebrates) may be exposed to a larger dose of metals than adults (which eat larger invertebrates; Fareg *et al* 1998). Benthos were collected at the same sites as the sediment samples at R2, R4, R6 and V8 (sampling sites noted on Figure 3).

Chironimids made up 49% and 40% of the total biomass in the invertebrate collection from sites R2 and R4, respectively. At R4, there were only three *Hydropsychidae* individuals forming the majority of the biomass, although there were approximately 150 chironomids. Table 36 outlines the results of selected metals (arsenic, cadmium, copper, mercury, lead and zinc) in benthic invertebrate tissue.

Table 36. Summary of Metal Concentrations in Benthic Invertebrate Tissue (ug/g)

Creek	Site	Arsenic	Cadmium	Copper	Mercury	Lead	Zinc
Rose Creek	R2	0.35	0.075	12.8	0.011	6.42	50.6
Rose Creek	R4	0.25	0.055	4.7	0.006	3.14	34.2
Anvil Creek	R6	1.32	0.141	4.7	0.007	1.35	39.4
Vangorda Creek	V8	0.30	0.117	4.8	0.009	1.86	50.8

Sites R2 and R6 had the highest concentrations of metals in tissue

Concentrations of copper, mercury and lead are highest in benthos collected from site R2, while concentrations of arsenic and cadmium are the highest in benthos collected from the reference site R6. This correlates with the 2002 stream sediment results where sediment collected from R2 also contained the highest concentrations of copper, mercury and lead. Zinc concentrations are similar in benthos collected from R2 and V8. This does not correlate with the 2002 sediment sample results where the zinc concentration in V8 sediment is lower than R2 sediment.

2.6.4 FISH

2.6.4.1 Historical Fish Habitat

Description of alterations to Rose Creek

The Faro Mine Site is located entirely within the Rose Creek watershed and construction and operations have altered the creek to result in the following:

- diversion of Faro Creek around the Faro Pit to enter the north fork of Rose Creek, rather than flowing directly into the main stem of Rose Creek;
- diversion of the main stem (reach 3) around the tailings impoundment facilities;
- creation of the pumphouse pond at the junction of the north and south forks;
- two alternative routes for the lower 500 m of the North Fork – one is the original channel with a series of excavated ponds, with a culvert at the upstream end preventing upstream fish migration and the other is a boulder-lined channel;
- construction of the Fresh Water Supply Dam converting approximately 1500 m length of stream habitat into lake habitat;
- creation of a barrier on the south fork of Rose Creek through the installation of hanging culverts just downstream of the FWSD spillway; and
- a fish migration barrier on the North Fork at the haul road crossing; and
- fish migration barriers on the South Fork at the haul road and mine road crossings.

2.6.4.2 Existing Fish Habitat

Juvenile or spawning, Arctic grayling is the predominant species in Rose Creek

The following details of fish habitat in Rose Creek are based on the reporting of P.A. Harder & Associates (1991a, 1991b, 1993) and field assessments by Gartner Lee during July and August of 2002 (GLL 2002c). Except for the construction of the haul road over the North and South Forks during the early 1990s, fish habitat observations have been consistent over this time period (studies completed between 1988 and 2002). A habitat summary of Rose and Vangorda Creeks, by stream reach (a fairly homogenous channel section), is outlined in Table 37 and subjective habitat values for juvenile and spawning Arctic grayling (the predominant species in Rose Creek) as well as habitat available in summer and winter, are shown on Figure 24.

Lower Rose Creek (reaches 1 and 2) consists of high quality habitat suitable for spawning and rearing Arctic grayling and moderate habitat for adults during both summer and winter. Flow is expected here in the winter. Rose Creek is meandering in this section and contains diverse habitat including spawning gravel as well as deep pools and side channels. Based on Harder (1988), Arctic grayling spawn in this reach. Next Creek flows from the north into reach 2 of Rose Creek. Next Creek is narrow with little flow over a relatively steep gradient (>10%) of step-pools resulting in low value for all life stages of Arctic grayling.

Table 37. Fish Habitat in Rose and Vangorda Watersheds

Watercourse	Reach	Arctic Grayling Habitat Rating				Channel Width	Gradien (%)	Channel Type	Bed Materiala	Cover	Barriers	Other
		Spawning	Rearing	Summer	Winter							
Rose Cr.	1	high	high	moderate	moderate	25	1.5	riffle (pool, run)	gravel (cobble, fine)			side channels, flows in winter
Rose Cr.	2	high	high	moderate	moderate	13	1	run (riffle, pool)	cobble, gravel (boulder, fines)	20% - pools, cutbanks, boulder, little wood debris		side channels, flows in winter
Rose Cr.	3	moderate	low	moderate	moderate	20	1.5	run (riffle, step pool sections)	gravel, cobble (boulders in steps)	5% - boulders	step sections a potential juvenile barrier	flows in winter
Rose South Fork	1	moderate	high	high	high	10	1.2	riffle (pool, run) and pond	cobble (boulder, gravel)			pumphouse pond
Rose South Fork	2	low	high	high	high	6	0.5	pool (run)	fines			beaver dams, multiple channels
reservoir	3	low	high	high	high						spillway culverts	
North tributary	1	low	moderate	moderate	low	3.5	10	riffle (step, pool)	boulder (cobble)	boulder	mine road culvert	
Southeast tributary	1	low	moderate	low	low	2	4	glide	fines (boulder at mouth)	vegetation	low flow	
Rose South Fork	4	moderate	moderate	moderate	moderate	7	2.2	riffle (pool, run)	boulder (cobble, gravel)	20% - boulder, pools, vegetation, cutbanks		
Rose South Fork	5	low	low	moderate	low	7	4.3	riffle (pool, run)	boulder		mine road culvert, haul road and steep section	
Rose South Fork	6	moderate	low	low	low	5	5	riffle (run, step, pool)	boulder, cobble	20% - boulder, vegetation, cutbank		
Rose South Fork	7	low	high	moderate	moderate			Dixon Lake	fines			Dixon Lake
Rose North Fork	1	moderate	moderate	moderate	moderate	7	1.4	pool (riffle, run)	boulder (cobble, gravel, fine)	ponds, pools	mine road culvert (on one of the two lower channel options)	two options for water flow below mine road - through boulder channel or series of ponds
Rose North Fork	2	moderate	moderate	moderate	low	10	2	riffle (pool, run)	cobble (gravel, fines)	20% - pools, cutbanks, boulder	haul road	side channels
Rose North Fork	3	moderate	high	moderate	moderate	9	2	run (riffle, pool)	cobble (fines, gravel)			side channels, ponds
Rose North Fork	4	low	low	low	low			ponds	fines			ponds and small lake but very low pH (3) noted
Vangorda Cr.	1	moderate	low	low	low	20	1	riffle (pool)	gravel (cobble)			
Vangorda Cr.	2	low	moderate	moderate	moderate	13	2	riffle	boulder (cobble)	wood debris		
Vangorda Cr.	3	low	moderate	moderate	moderate	13	2.5	riffle (pool)	boulder (cobble)	wood debris	mine road u/s end	no fish upstream

Notes:

a. fines = <2mm, gravel = 2-64mm, cobble = 64-256mm, boulder = 256-4,000mm; sub-dominant substrate in brackets

See Figure 3 for reach location

The diversion channel (reach 3) is considered to have little rearing habitat and moderate value spawning, winter and summer habitat. The upper two-thirds of the diversion is a wide (20 m) channel with predominantly gravel and cobble substrate. The lower one-third contains steps of boulders and pools. Velocities in the lower section may make it difficult for juvenile grayling passage. Based on Harder (1988), Arctic grayling spawn in the upper portion of this reach. Flow has been expected here in the winter due to release from the reservoir.

Reaches 1 and 2 of the south fork of Rose Creek feature moderate spawning and high value rearing and over-wintering habitat

Reach 1 of the South Fork of Rose Creek includes the Pumphouse pond and a natural channel that is predominantly riffle over cobble. Due to this habitat combination and the augmented winter flows from water releases from the reservoir, the habitat value is moderate for spawning and high for rearing and over-wintering habitat. Reach 2 is a meandering section with numerous side channels created by beaver dams and a substrate dominated by fines. The deep water and augmented overwinter flows provide high value habitat for rearing, and over-wintering but the reach is low value for spawning.

Reach 3 provides high quality rearing and over-wintering habitat

Reach 3, south fork Rose Creek is the Fresh Water Supply Reservoir. At spillway capacity, the maximum depth is 16.1 m, the average depth 7.5 m. The water volume was calculated to be 4,065,500 m^3 and the surface area 514,960 m^2. Information on substrate was collected during 2002 (GLL, 2003c) and was predominantly fines with cobble, boulder, angular rock, flooded willow shrubs and spruce present. The reservoir does not provide spawning habitat but provides high quality habitat for rearing and over-wintering grayling.

There are two culverts under an access road at the lower end of the FWSD spillway, which form a drop of approximately 8 m creating an impassable barrier for fish movement from Rose Creek upstream into the Fresh Water Supply Reservoir during flow periods over the spillway (typically late spring and summer). During the remainder of the year, water is released from the reservoir via a low-level pipe.

Reach 4 is considered moderate value habitat

Reach 4 of the South Fork is predominantly riffle channel over boulder and cobble with some beaver dams in the upper end. Habitat is considered to be of moderate value for all grayling life stages. Reach 5 contains three fish passage barriers at the lower end: a culvert under the mine access road, the rock drain under the haul road and a steep gradient section (>20%) upstream of the haul road. Fish cannot move upstream or downstream from this section. There is moderate value rearing habitat and low habitat for all other life stages in reach 5. Reach 6 is predominantly riffle over boulders at a 5% slope, with habitat considered moderate for spawning (grayling have been observed spawning at the upper end) and low for all other life stages. Dixon Lake is a shallow basin in reach 7, which offers low quality spawning habitat but high value habitat for rearing, and moderate value over-wintering habitat.

The lower end of reach 1 of the North Fork of Rose Creek consists of two channels. The original channel has been converted to a series of ponds that flow to the pumphouse pond and a boulder-lined diversion channel directed

Reaches 1 and 2 of the north fork of Rose Creek provide moderate to low value habitat. Reach 3 contains diverse habitat, while Reach 4 ponds have low habitat value

downstream of the pumphouse pond was created. Prior to 1996, flow was directed through the original channel during the winter season to augment flow to the Pumphouse Pond and through the diversion during the summer to prevent possible sedimentation in the pond. Since 1996, all flow is directed through the series of ponds with high flow events spilling partially into the diversion. The culvert directing flows to the series of ponds is a barrier to upstream fish passage. The series of ponds and natural channel above it, provide habitat of moderate value to all life stages of grayling. Where the haul road crosses the north fork (designated as the downstream end of reach 2), a rock drain passes the creek under the road creating an impassable barrier to fish passage in either direction. Reach 2 is a diverse stream section that provides low winter habitat and moderate spawning, rearing and summer habitat.

Reach 3 of the North Fork contains diverse habitat with beaver ponds and riffle sections resulting in high rearing and moderate spawning, summer and winter habitat. Grayling are known to spawn in the upper section of this reach. A series of ponds are located in reach 4. However, these have been measured as acidic with low dissolved oxygen, which would result in low habitat for all life stages (Harder 1988).

Faro Creek is considered low habitat. The Vangorda Creek contains some important rearing and over-wintering habitat as well as some spawning and rearing habitat

Faro Creek originally flowed in to the mainstem of Rose Creek but in order to develop the open pit the creek was diverted around the Faro Pit and now flows into reach 1 of the north fork. Faro Creek carries low flows and is a step-pool channel greater than 10% slope at the North Fork. The entire creek is considered low habitat for Arctic grayling and is not likely accessible from the north fork under most flow conditions due to low flow and steep grade.

The Vangorda Mine Site is located within the Vangorda watershed. Vangorda Creek contains two upper branches that meet to form the mainstem plus a major tributary called the West Fork. The mainstem has been diverted around the various pits and dumps and the mine haul road crosses this branch. The mine access road crosses the west fork in three locations and a culvert under the Town of Faro access road crosses the main stem. Lower Vangorda Creek (reaches 1, 2 and 3 on Figure 24) is low gradient (1.5% to 2.7%) with large gravels, cobbles and boulders that provide important rearing habitat for chinook and some overwintering habitat for the resident Arctic grayling. Some spawning habitat is available in this section (reach 1) and rearing and summer habitat is offered by the pools and in-stream cover (reaches 2 and 3).

Above reach 3, the culvert under the Town of Faro access road and waterfalls just upstream are barriers to upstream fish migration. The channel gradient becomes progressively steeper upstream (4% in the mid-section and 6% in the headwaters) with larger substrate and log debris from adjacent burn areas (Harder 1987).

2.6.4.3 Fish Presence

Several isolated fish populations exist in Rose Creek

Fish species present in the upper Pelly River watershed include chinook and chum salmon, lake trout, lake, broad, humpback and round whitefish, least cisco, inconnu, Arctic grayling, northern pike, burbot, longnose sucker and slimy sculpin. Arctic grayling (*Thymallus arcticus*), burbot (*Lota lota*), slimy sculpin (*Cottus cognatus*), longnose sucker (*Catastomas catostomus*) and round whitefish (*Prosopium cylindraceum)* have been captured during sampling studies in the Rose Creek watershed (Figure 24). In addition to these species, juvenile chinook salmon (*Oncorohynchus tshawytscha*) have been captured in lower Vangorda Creek (reaches 1, 2 and 3). As noted in Table 33, reported fish studies have been conducted between 1974 and 2002 in the regional aquatic study area.

Due to barriers in the system (noted above and indicated on Figure 24), the following isolated populations exist in Rose Creek:

- North fork reaches 2, 3 and 4;
- South fork reaches 3 and 4 (downstream movement possible); and
- South fork reaches 6 and 7.

Fish within the main stem of Rose Creek, reach 1 of the north fork and reaches 1 and 2 of the South Fork can also move into Anvil Creek. Culverts on one flow option of lower reach 1 of the North Fork (series of ponds) limit upstream movement when all flows are diverted this route rather than via the diversion channel. No fish have been captured during sampling upstream of a culvert and falls barrier in Vangorda Creek.

Arctic grayling

Arctic grayling are the predominant species captured in the Rose Creek watershed and have been captured in all reaches sampled (distribution noted on Figure 24). Grayling is the only species fished for sport in Rose Creek and fishing is most popular in the lower end of the south fork and within the reservoir (Harder 1991a). Once they reach maturity (age three to four in the study area), Arctic grayling spawn annually between early May and early June in the Rose Creek drainage (Weagle 1981, Harder 1988). Spawning grayling have been observed in reach 3, reaches 1, 4 and 6 of the south fork and reach 3 of the north fork. This is not likely the limit of spawning areas as spawning high value spawning habitat is located in additional reaches, as noted in the previous section. Although juveniles have only been captured in one study within the D Reservoir (reach 3 of south fork, P.A. Harder 1991a), the presence of adults and spawning throughout the drainage indicate that all life phases must be present. Grayling are also located in lower (reaches 1 to 3) of Vangorda Creek, downstream of culvert and falls barriers. Information such as fish sex, catch per unit area and comparisons of grayling weight vs. length and age was collected in early studies by P.A. Harder and Associates. Some length, weight, sex and age data is available from the 2002 sampling and is presented on Table 38.

Slimy sculpin have also been captured in reaches sampled within Rose Creek and within lower Vangorda Creek. Burbot have been captured in lower

Table 38. Summary of 2002 Fish Sampling Activities and Results

Watercourse	Reach	Site	Date	Sampling Methods	Species Number	Length (mm) average (range)	Weight (g) average (range)	Sex	Age (yrs) average (range)	Capture Method
Rose Creek	2	R1	Aug 8 / 02	spot shocked 70 m long x 10 m wide (264 sec)	no fish					electrofish
Rose Creek	2	R2	Aug 8 / 02	spot shocked 65 m length (288 sec)	no fish					electrofish
Rose Creek	2	R2b	Aug 7 / 02	set 5 MT for 18 hrs - captured 2 BB	2 BB	151 - 261				minnow trap
				3 rod hours captured 2 AG	AG	320	365.4	F		angling
					AG	260	167.4	M		angling
				spot shocked 160 m by 10 m (913 sec)	no fish					
Rose Creek (Diversion)	3	R3	Aug 7 / 02	shocked 50 m (180 sec)	AG	~150				observed
					SS	~40				observed
				fish observed in shallows	no fish					electrofish
N Fork Rose Creek	2	N4	Aug 8 / 02	spot shocked 100 m length x 6 m wide (405 sec)	SS	100	9.9			electrofish
N Fork	3	N5	Aug 8 / 02	spot shocked 90 m x 5 m (685 sec)	26 SS	80 (55 - 106)	6.1 (3.5 - 10.1)			electrofish
Reservoir	3	RES MT	Aug 9 / 02	10 traps set for 25 hours	6 SS	70 (50 - 110)	3.5 (1.2 - 10.1)			minnow trap
Reservoir	3	RES 1	Aug 9 / 02	90 m floating net set for 75 mins	AG	275	215.3	M	3	gill net
					AG	294	275.7	M	-	gill net
Reservoir	3	RES 1	Aug 9-10 / 02	15 m floating net set for 13 hours	10 AG	268 (175 - 311)	222 (59 - 337)	F	3 (1 aged)	gill net
					5 AG	226 (180 - 300)	127.2 (73.2 - 286.5)	M	2, 2, 5	gill net
					BB	260				gill net
Reservoir	3	RES 2	Aug 9 / 02	90 m floating net set for 30 mins	no fish					gill net
Reservoir	3	RES 3	Aug 9 / 02	90 m set floating set for 90 mins	AG	275	212	F	-	gill net
Reservoir	3	RES 2		15 m sinking net set for 13 hours	20 AG	295 (270 - 330)	265 (181 - 387)	M	4.5 (3-6), 8 fish	gill net
					19 AG	285 (270 - 324)	269 (181 - 365)	F?	4 (2-6), 8 fish	gill net
					7 AG	184 (175 - 205)	67.2 (65 - 94)	im	2.4 (2-3), 4 fish	gill net
S Fork Rose Creek	4	S6	Aug 7 / 02	spot shocked 50 m x 5 m (381 sec)	2 SS	35 - 90				electrofish
S Fork Rose Creek	6	S8	Aug 8 / 02	spot-shocked 50 m (160 sec)	no fish					
Vangorda Creek	1	V8	Aug 7 / 02	single pass 100 m x 5 m wide (344 sec)	20 SS	68 (58 - 85)	3.3 (2 - 6.2)			electrofish
					45 CH	60 (54 - 66)	2.5 (1.7 - 4.2)			electrofish
				3 seine hauls - 15 to 30 m^2 each	AG	285	219.9	M		seine
					64 CH					seine
					SS					seine
				4 traps set for 27.5 hours	4 AG	juvenile				minnow trap
					81 CH					minnow trap
				1 rod hour	AG	255	154.9	F		angling
					5 AG	182 (160 - 215)	55.1 (42.1 - 90.2)	im		angling
Blind Creek	1	BC	Aug 7 / 02	1 rod hour	4 AG	277.5 (225 - 340)	230.2 (116 - 398)	F		angling
					2 AG	225, 300	150.4, 307	M		angling
					AG	255	153.1	im		angling
			Aug 8 / 02	4 traps set for 22 hours	SS	70	3.2			minnow trap
					37 CH		1.6			minnow trap
				20 seine hauls - 50 to 150 m^2 each	8 SS	44 (15 - 78)	1.4 (0.1 - 2.7)			seine
					2 AG	68	2.7			seine
				captured 2 AG, 90 CH, 4 RW, 8 SS	90 CH	fry	1.5			seine
					4 RW	40	0.6			seine

AG - arctic grayling
BB - burbot
CH - chinook salmon
RW - round whitefish
SS - slimy sculpin

Slimy sculpin, burbot and round whitefish presence

Vangorda Creek and reach 2 of Rose Creek, reach 1 on the north fork and reaches 2, 3 and 4 of the south fork. Round whitefish have been noted in lower Vangorda Creek, reach 3 of Rose Creek and reach 1 of the north fork. Longnose sucker have been captured in lower Vangorda Creek and reach 1 of the North Fork. Other than capture information, including location, length and in some cases, weight, little information has been collected for these species in the regional study area.

Chinook salmon fry in lower Vangorda Creek

Chinook salmon fry are present in large numbers in lower Vangorda Creek (at the mouth) each year from the spring or early summer where they rear until outmigration in the fall. These fish are migrating from spawning grounds, including Blind Creek. DFO has collected information on the Blind Creek chinook stocks over a number of years. During aerial surveys and sampling, a few chinook spawners and chinook fry have been noted in Anvil Creek. As access is possible to Rose Creek, chinook may enter the lower end of the creek.

During the 2002 field visit, fish tissue samples were collected for metals analyses

Table 38 summarizes fish sampling and catches from the 2002 field visit, which was conducted primarily to collect metals in fish tissue data and confirm habitat for mapping. Therefore, not all sites sampled in the past were sampled during this trip. No fish were captured during electrofishing at sites R1, R2 and R2b of reach 2 in Rose Creek. Minnow trapping at R2b captured two burbot and angling captured two grayling. Arctic grayling and sculpin were observed in reach 3 (R3, diversion channel) during electrofishing.

Within the North Fork, slimy sculpin were captured during electrofishing in reaches 2 (site N4, 1 fish) and 3 (site N5, 26 fish), with the highest sculpin numbers (as compared to all other 2002 sites) per electrofishing effort at site N5. Electrofishing in the south fork reaches 4 (site S6) and 6 (site S8), resulted in the capture of two sculpin at S6. Minnow trapping in the reservoir captured six slimy sculpin and gill netting captured 63 Arctic grayling and one burbot.

Electrofishing, beach seining, minnow trapping and angling efforts were undertaken at site V8 on Vangorda Creek to collect fish for metals analyses. A total of 21 sculpin, 11 grayling and 190 chinook salmon fry were captured. Blind Creek sampling (outside of the study area) was conducted to collect reference site fish for metals analyses. Grayling, sculpin, chinook and round whitefish were captured during the multiple method efforts.

2.6.4.4 Historical Metals in Fish Tissue

The analysis of metals in fish tissue has been carried out in 1975, 1976, 1977, 1989, 1992, 1997 and 2002 within the regional aquatic study area and reference site in Anvil and Blind creeks. The sampling locations, species, tissue type and metals analyses were not consistent in the historical (1975 to 1997 data) and therefore temporal and spatial trends are difficult to determine. Chinook, Arctic grayling, slimy sculpin, longnose sucker, round whitefish and burbot have all been collected for tissue analyses, which have been conducted on whole body, liver or muscle tissue.

No trends of higher metal levels were noted in fish collected from Rose Creek downstream of the tailings (site R2b) as compared to fish from the FWSD Reservoir during 1997. Likewise, there is no consistent trend in the metals data collected in fish from Vangorda Creek (site V8) during 1975, 1976 and 1997. Values that stand out in the dataset (one or two orders of magnitude higher than others) include higher values of both lead in sculpin (23 mg/kg) and whitefish from Vangorda Creek during 1992.

2.6.4.5 Existing Metals in Fish Tissue

The 2002 sampling program for metals in fish tissue revealed no trend for arsenic. Cadmium concentrations were greatest at the reference site and V8

The 2002 sampling program following a control/impact sampling layout. Five samples from each site were targeted to provide data for comparison between and within sites. Slimy sculpin and arctic grayling were targeted as they have previously been collected at each of the Rose, Vangorda and Blind sampling sites and they represent a bottom-feeding species (sculpin) that may show accumulation of any heavy metals present in sediment and benthic invertebrates as well as a species consumed by humans (grayling). Sculpins were analyzed as whole body samples while muscle and liver tissue were used from Arctic grayling (muscle to represent the tissue generally consumed by humans and liver to represent the tissue where some metals are known to concentrate). Fish collection for metals analysis was successful at:

- Rose Creek just below the tailings facility (site R2b);
- The freshwater supply reservoir (site RES);
- Upper north fork above mine activity as a reference site for the Faro Mine Site (site N5);
- Lower Vangorda Creek (site V8); and
- Lower Blind Creek as reference site for the Vangorda Mine Site (site BC).

At each site (noted on Figure 24) the capture of between five and ten fish was targeted in order to have sufficient fish tissue to make up five samples weighing 5 grams (as required by the lab for low detection) of liver and muscle tissue. In some cases the fish were too small to provide the required amount of tissue and tissue from two or more fish was composited. Due to very low catch success at some sites, five to ten samples per site were not achieved in all cases. Table 39 outlines the results of key metals (arsenic, cadmium, copper, lead, zinc and mercury) of interest in fish tissue. Details are provided in the 2002 aquatic studies technical memorandum (GLL 2002c).

There is no increasing trend in metals in fish tissue within waters draining the Faro and Vangorda Plateau mine sites

No trend is evident in arsenic concentration between sites. Whole body sculpin contained greater concentrations of arsenic than Arctic grayling muscle and liver (by an order of magnitude). This difference could be attributed to the differences of tissue types in concentrating metals. Cadmium levels were noticeably highest in all Blind Creek (reference site) Arctic grayling liver samples and one V8 sample. Levels in both slimy sculpin and Arctic grayling muscle were greatest at V8.

Table 39. Selected Metal Concentrations in Fish Tissue Collected during 2002

Tissue type	Slimy Sculpin whole body													
Sample ID	N5-1	N5-2	N5-3	N5- 4	N5-7	N5 average	RES MT- 5	RES MT- 3,4	RES MT- 1,2,6	RES average	BC- 9	BC-8,10	BC average	V8-1
Arsenic	0.12	0.2	0.23	0.17	0.21	0.186	0.12	0.4	0.16	0.23	0.16	0.12	0.14	0.11
Cadmium	0.02	0.029	0.03	0.022	0.021	0.0244	0.024	0.037	0.028	0.030	0.147	0.086	0.1165	0.453
Copper	0.56	0.71	0.78	0.6	0.68	0.666	1.41	1.26	0.87	1.18	1.35	0.65	1	0.73
Lead	0.03	0.04	0.05	0.05	0.03	0.04	0.16	1.32	0.37	0.62	0.04	0.03	0.035	0.27
Mercury	0.023	0.025	0.031	0.02	0.028	0.0254	0.056	0.018	0.021	0.032	0.038	0.031	0.0345	0.046
Zinc	33.5	32.6	29.2	26.2	19.4	28.18	36.3	41.4	34.4	37.37	19	27.6	23.3	71.4

Tissue type	Arctic Grayling Muscle																			
Sample ID	RES 2-18	RES 2-19	RES 2-20	RES 2-21	RES 1-1	**RES average**	R2b-3	R2b-4	**R2b average**	BC-1	BC-2	BC-3	BC-4	BC-6	**BC average**	**V8-17**	**V8-18**	V8-20	V8-22	**V8 average**
Arsenic	0.03	0.02	0.03	0.03	0.03	0.028	0.05	0.04	0.045	0.03	0.05	0.03	0.03	0.05	0.038	0.03	0.03	0.03	0.06	0.0375
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.013	0.01	0.02	0.008	0.008	0.009	0.01	0.011	1.35	0.018	0.013	0.022	0.3508
Copper	0.73	0.53	0.51	0.62	0.69	0.616	0.76	0.69	0.725	0.32	0.4	0.24	0.23	0.32	0.302	3.07	0.5	0.53	0.5	1.15
Lead	0.13	0.04	0.1	0.09	0.02	0.076	0.07	0.08	0.075	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.09	0.03	0.02	0.04	0.045
Mercury	0.053	0.058	0.055	0.064	0.034	0.0528	0.025	0.02	0.0225	0.03	0.018	0.024	0.02	0.02	0.0224	0.094	0.027	0.019	0.021	0.0403
Zinc	11.1	10.3	8.7	9	15.9	11	15.7	13.5	14.6	8.7	14.7	11.9	8.1	12.3	11.14	28.9	17.7	21.8	28.7	24.28

Tissue type	Arctic Grayling Liver											
Sample ID	RES 2-18,20	RES 2-22,24	RES 2-19,21	RES 1-1,2; 2-23	**RES average**	R2b-3,4	BC-1,3	BC-2,4,6,7	**BC average**	V8-17 to 23	V8-18 to 22	**V8 average**
Arsenic	0.04	0.05	0.04	0.04	0.043	0.05	0.04	0.03	0.035	0.02	0.03	0.03
Cadmium	0.156	0.071	0.237	0.132	0.149	1.25	1.22	1.48	1.35	0.039	1.62	0.83
Copper	2.08	2.04	2.57	1.87	2.14	5.32	2.21	3.4	2.81	0.3	3.39	1.85
Lead	0.23	0.18	0.08	0.06	0.138	0.18	<0.02	<0.02	<0.02	0.02	0.04	<0.02
Mercury	0.131	0.069	0.083	0.078	0.0903	0.054	0.05	0.051	0.0505	0.032	0.061	0.0465
Zinc	25.9	20.8	21.5	23.1	22.83	28.8	22.8	27.2	25.0	9.7	30.1	19.9

collected August 7 to 10, 2002
Metals results expressed as milligrams per wet kilogram.
< = Less than the detection limit indicated.
averages calculated using 1/2 the detection limit where values are less than detection

Copper levels are generally greatest in Arctic grayling liver but the data does not indicate a spatial trend. Lead levels are greatest in sculpin and grayling liver samples from the FWSD Reservoir and sculpin from V8. Sculpin samples from the FWSD Reservoir exhibit higher levels of lead and copper than sculpin from N5, however the copper levels are similar to sculpin from the Blind Creek reference site.). Results from one of the four Arctic grayling muscle samples from Vangorda Creek (V8) are 10 times the levels of copper and lead results in grayling muscle samples from Blind Creek.

Mercury levels are similar in fish tissue types at all sites with slight elevations (much less than an order of magnitude) apparent in grayling liver as compared to sculpin and grayling muscle. Health Canada has set a consumption guideline at 0.5 mg/kg mercury per day in fish tissue. The highest mercury value in the sample set is 0.131 mg/kg wet weight, the result of two composite livers collected from Arctic grayling in the freshwater reservoir. The highest sample value is approximately 26% of the consumption guideline. Based on this data set, four or more fish from the sampling sites could be consumed by one person each day without risks associated with mercury.

Zinc levels are within the same range in all tissue types from the various sampling locations, with the level in the one V8 sculpin sample slightly elevated (much less than an order of magnitude). In summary, the results do not indicate a trend of increased levels of metals in sculpin or Arctic grayling within waters draining the Faro and Vangorda Plateau mine sites relative to the reference sites (N5 and BC) or the FWSD Reservoir.

2.7 TERRESTRIAL RESOURCES

2.7.1 TERRESTRIAL STUDY AREA

Definition of the terrestrial resources regional study

Terrestrial resources include vegetation, wildlife habitat and wildlife environmental components. A wildlife study area is usually delineated by the extent of the wildlife population under study. These data are not available for all local species; there are no population distribution data available for moose, stone sheep or grizzly bears. The terrestrial resources regional study area is bounded by the Pelly River to the south, Mount Mye to the north, with Rose Mountain to the west and Sheep Mountain to the east (Figure 4), which captures the local Fannin sheep population. Vegetation and wildlife studies completed within the study area are included in Table 40.

Table 40. Wildlife and Vegetation Studies Completed

Study Topic	Location	Study Date	Reference
Terrain and vegetation mapping (1:10,000)	Anvil Range Mine Complex	1976	Montreal Engineering Company Ltd., 1976
Regional ecosystem mapping (1:250,000)	Yukon Plateau area containing Anvil Mine Complex and Town of Faro	2002	AEM, 2002
Wildlife habitat mapping (1:20,000)	Sheep Mountain (42.7 Km^2)	1990-1998	Staniforth (YTG), 1998
Wildlife Habitat	Includes Faro area	1999	YTG Renewable Resources
Metals in vegetation	Anvil Range Mine Complex	2002	CE Jones & Associates Ltd., 2003
Wildlife	Vangorda Mine Site	1971	Montreal Engineering Co. 1971
Sheep population inventory	Sheep Mountain, Mount Mye, Rose Mountain	1975	Studds, 1975
Sheep population inventory	Sheep Mountain, Mount Mye, Rose Mountain	1976	Montreal Engineering Company Ltd., 1976
Sheep migration	Mt. Mye	1981	McCleod, 1981
Sheep migration	Vangorda Mine Site	1987	Curragh Resources Inc. 1987
Sheep impact assessment	Vangorda Mine Site	1988	Horesji, 1988
Sheep winter and summer range inventories, including habitat and forage	Faro area (Sheep Mountain, Mount Mye, Rose Mountain)	1980, 1987 1988, 1989 1990, 1991	YTG Renewable Resources – Hoeffs, Horejsi, Lortie, Schweinsburg
Moose Survey	Faro area	Dec 1997	YTG Renewable Resources – Ward, 1997
Moose Survey	Faro area and area adjacent to GMS 4-45	Nov 1998 and Dec 1999	YTG Renewable Resources - Ward, 1998 and 1999
Caribou Census	Faro and surrounding area	1991	Kuzyk at al, 1997

2.7.2 SOILS / TERRAIN

Significant surficial material in the study area consists of bedrock, glacial till, and glaciofluvial deposits

The landforms and surficial deposits of the Vangorda Plateau have been shaped and are attributable to the last ice age which is estimated to have existed in the Yukon between 35,000 and 10,000 years ago. The southern Yukon was covered by at least four Cordilleran (i.e. mountain) ice sheets. These glaciations, from oldest to the youngest, are named the Nansen, the Kalza, the Reid and the McConnell. (Bond 2001). The landforms of the Faro area are for the most part attributed to the youngest of the Yukon glaciations, the McConnell.

Significant surficial material in the study area consists of bedrock and associated colluvium, glacial till, and glaciofluvial outwash sands and gravels (Figure 10). Glaciolacustarine, modern alluvial and organic deposits, are found sporadically but are not discussed in detail herein. The following discussion of surficial materials is derived from the *Quaternary geology and till geochemistry of the Anvil district, central Yukon Territory* (Bond 2001):

Bedrock – bedrock and/or frost shattered bedrock (felsenmeer) is frequently found at surface in the alpine areas of the Anvil Range. Elsewhere, mountain slopes are covered in thin veneer of colluvium (materials derived from slope movement processes) derived from the local bedrock. Glacial deposits are relatively absent above 1,500 m, although meltwater channels were identified as high as 1,700 m. Solifluction is common above the tree line.

Morainal Deposits (Till) – glacial till is poorly sorted deposits of clay, silt, sand, gravel and angular boulders which is deposited directly from glacial ice. A thick blanket of till is found covering the Vangorda Plateau. In some locations where pre-glacial valley existed, the till deposits can be over 100 m thick (e.g. Grum valley). Generally till deposits thin to a veneer (<1 m) along the valley walls and are generally absent above 1,500 m. Till also commonly underlies glaciofluvial deposits in areas of former meltwater drainage. The area surrounding the Grum and Vangorda Deposits is characterized by a thick till blanket overlying bedrock.

Glaciofluvial Deposits – during the retreat of the glaciers, melting water derived from the decaying ice transported and deposited sand and gravel in the valley bottoms and associated lateral meltwater channels. These deposits are typically stratified to crudely stratified deposits varying from sand with some silt to cobble gravels. These materials are found as significant valley fills as in the Rose Creek valley, as kame terraces at the mouth of alpine valleys or as glacial terraces and complexes associated with the Vangorda Creek valley and the Tintina Trench. Glaciofluvial deposits host the Rose Creek aquifer which underlies the Faro Mine tailings facility. The Faro townsite is located on a major glaciofluvial (and glaciolacustarine) terrace with a well developed stagnant ice (i.e. hummocky terrain) glacial fluvial complex to the northwest of the townsite. The valley bottom glaciofluvial deposits are frequently covered by silts, sands and gravel derived from contemporary stream.

The majority of the natural soil located in the Anvil Range Mining Complex consist of granular soils; *i.e.* locally derived tills, glacial outwash deposits and fluvial deposits. The region is within an area of discontinuous permafrost.

2.7.3 VEGETATION

2.7.3.1 Historical Vegetation Disturbance

Permanent clearing of vegetation occurred over the course of mine development

Over the course of mine site development, permanent clearing of vegetation was required. Roughly 1,460 hectares of vegetation was removed for the development of the Faro and Vangorda Plateau mine sites and the haul road. Portions of the following vegetation communities were included in the clearing: subalpine transition, floodplain forest (riparian zones), and upland forest. Vegetation was also cleared for the purposes of developing access roads in the vicinity of the mine complex, including the main mine access road between the Town of Faro and the Faro Mine site, the Blind Creek access road to the Vangorda site, and the various accesses on the mine sites themselves. Most of these access roads extend through upland forest and subalpine transition communities, according to the MEC Ltd. 1976 1:10,000 mapping (Figure 25). Vegetation removal was also required for the network of exploratory cutlines to the north and northeast of the Faro mine site through out the subalpine transition vegetation community. The development of the Fresh Water Supply dam caused eventual flooding of 51 ha plus earth fill of 5 ha of what was likely floodplain forest (riparian zones).

Indirect impacts to vegetation likely also took place during development and operation of the mine sites. For example, soil compaction due to heavy machinery can potentially impact adjacent root zones, local drainage changes can potentially impact the composition of local plant populations, contaminated seepage zones have potential to affect plant growth and health and plant species composition, and dusting from the mine site can potentially cause elevated metal concentrations in vegetation.

2.7.3.2 Existing Vegetation Communities

Six vegetation zones were identified within the study area

The regional study area is located within the Yukon Plateau (North) Ecoregion, in the Boreal Cordillera Ecozone (ESWG 1995). The region lies within the zone of discontinuous, widespread permafrost. Depressional areas consist of peat bogs, fens and local palsas. Lowlands frequently contain hummocks and sedge tussocks. Upland areas commonly include scree slopes and steep south-facing slopes with vegetation dominated by grasses. Treeline occurs at 1350 to 1500 mASL.

Six vegetation zones were mapped within the study area at a scale of 1:10,000 based on the field studies and mapping undertaken by Montreal Engineering Company (MEC) Ltd. in 1976 (Figure 25). The vegetation zones include flood plain forest, upland forest, bog forest, alpine tundra, subalpine transition, and alluvial plain shrub. The structure and species composition of these vegetation zones are outlined below.

Flood Plain Forest

The flood plain forest zone represents the most developed forest stands in the study area

The flood plain forest zone in the study area is restricted to the alluvial landforms along the Pelly River and the lower reaches of Blind Creek, and represents the most developed forest stands in the study area. White spruce (*Picea glauca*) forests occur where flooding is less common and subalpine fir (*Abies lasiocarpa*) stands occur in frequently flooded areas. Lodgepole pine (*Pinus contorta*), balsam poplar (*Populus balsamifera*), trembling aspen (*Populus tremloides*) and paper birch (*Betula papyrifera*) also occur in the flood plain forest zone. Dense shrub stands, consisting primarily of willow (*Salix* spa.) and balsam poplar, are common in riparian zones where active deposition is occurring. Feathermoss layers are extensive within the older stands of white spruce.

Upland Forest

The upland forest zone is dominated by either white spruce, lodgepole pine, or subalpine fir

Upland forests are found on the morainal landforms above the Pelly River and the upper Vangorda Creek area. Much of this forest was burned in a 1969 fire. Upland forest is also found on the glaciofluvial landforms along Rose Creek. The upland forest zone is dominated by stands of either white spruce, lodgepole pine, or subalpine fir. A well developed layer of tall and medium shrubs includes trembling aspen, shrub birch (*Betula glandulosa*), Scouler's willow (*Salix scouleriana*), and other willow species. The dwarf shrub strata of the upland forest consists of dwarf dogwood (*Cornus canadensis*), crowberry (*Empetrum nigrum*), Labrador tea (*Ledum groenlandicum*), blueberry (*Vaccinium uliginosum*), low-bush cranberry (*Vaccinium vitis-idaea*), prickly rose (*Rosa acicularis*), arctic willow (*Salix arctica*) and net-veined willow (*Salix reticulata*). Herb development is not extensive in the upland forest zone. Herb species in this zone include fireweed (*Epilobium angustifolium*), arctic lupine (*Lupinus arcticus*), arrow-leafed coltsfoot (*Patentees sagittatus*), and sedges (*Carex spp.*). The moss layer, particularly feathermoss, is extensive in the closed-canopy portions of the upland forest. Lichens include spotted dog lichen (*Peltigera aphthosa*), coral lichen (*Stereocaulon paschale*) and *Cladonia spp.*

Bog Forest

The bog forest zone is located adjacent to the Pelly River

The bog forest is limited to the organic landforms adjacent to the Pelly River. It is characterized by peat accumulation and stunted black spruce (*Picea mariana*). Black spruce is commonly the only tree species found in the bog forest. Shrub species include shrub birch, northern Labrador tea (*Ledum decumbens*) and cloudberry (*Rubus chamaemorous*). The herb layer is poorly developed in the bog forest zone. It consists mainly of sedges. A characteristic feature of the bog forest is the extensive layers of moss, usually *Sphagnum* spp. It is these moss layers that accumulate into peat. Bog forests are commonly underlain by permafrost.

Alpine Tundra

The alpine tundra vegetation zone occurs above the treeline

The alpine tundra vegetation zone occurs above the treeline, primarily on the upper slopes of Mt. Mye and Rose Mountain. Smaller communities of alpine tundra vegetation are found in areas such as Sheep Mountain (the mountain just north of the Blind Creek Bridge). Alpine tundra consists of vegetation communities dominated by dwarf shrubs and lichens. Shrubs include dwarf birch (*Betula pumila*), mountain avens (*Dryas octopetala* and *Dryas integrifolia*), crowberry, low-bush cranberry, blueberry, arctic willow, snow-bed willow (*Salix polaris*) and other willow species. Lichens, predominantly *Cetraria spp.*, are prevalent in well-drained rocky sites. A variety of herb species occur in the alpine tundra zone, including arctic lupine, Langsdorf's lousewort (*Pedicularis langsdorffii*), alpine harebell (*Campanula lasiocarpa*), black-tipped groundsel (*Senecio lugens*), wormwood (*Artemisia sp.*) grass (*Arctagrostis latifolia*) and sedges.

Subalpine Transition

The subalpine transition zone occurs in steep mountain slopes with shallow soil

The subalpine transition, associated with colluvial landforms, occurs on the steep upper mountain slopes between the upland forest and the alpine tundra. It is also found at lower elevations where there are steep slopes and shallow soil. The mid-slopes of Mt. Mye and Rose Mountain (below the treeline), as well as the uplands adjacent to Rose Creek alluvial plain, are included in this zone. Well developed forests of white spruce and feathermoss occur at lower elevations in the subalpine transition zone. Tall and medium shrubs in these lower elevation forests include shrub birch and Scouler's willow, and the dwarf shrub layer consists of arctic willow, crowberry, Labrador tea and blueberry. The herb layer, not well developed at lower elevations, is limited to sedges and shade-tolerant species such as arctic lupine and bluebell (*Mertensia paniculata*).

At higher elevations in the subalpine transition zone, vegetation is dominated by tall and medium shrub strata containing such as species as trembling aspen, shrub birch, Scouler's willow and other willow species. Alpine fir, lodgepole pine, white spruce and black spruce are also found in the upper subalpine transition zone. Dwarf shrubs include crowberry, Labrador tea, blueberry, net-veined willow and kinnikinick (*Arctostaphylos uva-ursi*). The herb layer at higher elevations in the subalpine transition zone is much more developed. It includes fireweed, arrow-leafed coltsfoot, Labrador lousewort (*Pedicularis labradorica*), dwarf dogwood, one-sided wintergreen (*Pyrola secunda*), rayless alpine butterweed (*Senecio pauciflorus*), aster (*Aster sp.*), running clubmoss (*Lycopodium clavatum*), grass (*Arctagrostis latifolia*), and sedges. Lichens in the subalpine transition zone include spotted dog lichen and *Cladonia* spp.

Alluvial Plain Shrub

The alluvial plain shrub zone includes the upper reaches of the Vangorda Creek valley and the south fork of Rose Creek and its tributaries

The upper reaches of the Vangorda Creek valley and the south fork of Rose Creek and its tributaries are included in the alluvial plain shrub vegetation zone. Shrub birch, shrubby cinquefoil *(Potentilla fruiticosa)*, Scouler's willow and other willow species dominate the vegetation communities in the alluvial plain shrub zone. Scattered stands of white spruce and alpine fir also occur. Dwarf shrubs consist of crowberry, Labrador tea, low-bush cranberry, dwarf dogwood, dwarf blueberry (*Vaccinium caespitosum*) and arctic willow. Herbs species include arrow-leafed senecio (*Senecio triangularis*), tall Jacob's ladder (*Polemonium acutiflorum*), sweet coltsfoot (*Petasites hyperboreus*), alpine harebell, wormwood, arctic lupine, clubmoss, common horsetail (*Equisetum arvense*), grass (*Arctagrostis* sp.) and sedges. Feathermoss may form extensive mats in the alluvial plain shrub zone. Lichens, not well represented in this zone, include *Cladonia alpina* and other *Cladonia* species.

Additional mapping was conducted in 2002 by AEM

Additional mapping has been completed within the regional study area since the Montreal Engineering study (MEC Ltd. 1976). Staniforth (1998) described vegetation communities on Sheep Mountain to 1:20,000 scale. AEM (2002) described regional ecosystem types within the Yukon Plateau - North ecoregion at a 1:250,000 scale (Figure 26) within the regional study area.

The ecosystem mapping coverage describes the land base by ecozone (boreal, subalpine or alpine), landscape position (upland or lowland) and landscape type (depressional, riparian or terraced). Within the regional study area, the boreal zone contains forested, low elevation valley bottoms and low-lying terrain. Most waterbodies and wetlands are associated with this zone. The subalpine zone refers to the zone between the relatively closed-canopy forests in the boreal zone and the dwarf shrub, herb and non-vegetated rock areas in the alpine zone. The subalpine zone represents a broad gradient between low and high elevation conditions. The subalpine zone is dominated by tall shrub vegetation with scattered spruce and fir forests at its lower limits, grading into lower stature shrub and herb communities at upper elevations. The alpine zone is defined by treeless conditions with rock, low shrub and herb communities being characteristic features.

The available mapping can provide information on the types of habitat and foods that may be available to wildlife within the regional study area. However, it has limitations to its application as an empirical tool for wildlife habitat evaluation and assessment of impacts.

2.7.3.3 Metals in Vegetation

Study Objectives

A field program was conducted to determine if soils and plants near the mine have elevated elemental concentrations in comparison to background levels

In 2002, C.E. Jones and Associates Ltd. designed and implemented a field program to determine if soils and plants in the vicinity of the Anvil Range Mine Complex have elevated elemental concentrations in comparison to reference levels from the Faro area (C.E. Jones and Associates Ltd. 2003). The study was intended primarily as a preliminary investigation to determine whether any identifiable airborne contamination of soils and vegetation has occurred as a result of mine development and operation. The sampling design of this study was based on the premise that the probable primary mine-site sources for airborne contaminants were the Rose Creek Tailings Facility, with contaminant delivery to off-site areas through dusting. However, it should be emphasized that there are additional potential dust-borne contaminant sources, including the mill/crusher site, concentrate load-out facility and open pits.

This study included reconnaissance-level sampling on areas adjacent or within both the Faro and Vangorda Plateau Mine sites, as well as more intensive sampling centred on the Faro (Rose Creek) tailings impoundments, and reference sampling. This study area is shown in Figure 27. The field component of the study was conducted on August 11-17, 2002. The sampling program included four primary components:

Four components of the sampling program

1. Reference sampling (shown as black diamonds in Figure 27). Included nine (9) sample points to the southeast of the mine complex, from which 45 vegetation samples and 18 soil samples were collected.

2. Rose Creek Tailings Transect sampling (shown as purple triangles in Figure 27). Included 33 sample points centred on the Rose Creek intermediate tailings impoundment, from which 140 vegetation samples and 68 soil samples were collected.
3. Additional Mine Area sampling (shown as black stars in Figure 27). Included 17 sample points on the Faro and Vangorda mine sites, from which 57 vegetation samples and 8 soil samples were collected.

Composite foliar samples were collected at each sampling point

At each sampling point, composite foliar samples were collected from scrub birch (*Betula glandulosa*), grey-leaved willow (*Salix glauca*), Altai fescue (*Festuca altaica*), and green reindeer lichen (*Cladina mitis*). On tailings transects, reference, and selected mine-affected sample points the following additional samples were collected: a root sample of grey-leaved willow; a surface soil sample (0-2 cm depth from soil surface); and a sub-surface soil sample (5-10 cm depth from soil surface).

Overview Results

Study results show soil and vegetation concentrations elevated above background levels for arsenic, silver, cadmium, chromium, copper, mercury, nickel, lead and zinc. Lead and zinc had the largest magnitudes of elevation (over two orders of magnitude greater than maximum background concentrations for soil and lichen) and had elevated levels furthest from the mine site, in comparison to other analyzed elements. Examination of collected data indicates that the probable origin of these elevated concentrations is airborne dust contamination from mine site sources. The spatial distribution of elevated elemental concentrations shows that metals transport and deposition has been concentrated from northwest to north of the mine complex and Rose Creek drainage. Elemental concentrations in surface soil and lichen samples on transects to the southeast to west-southwest of the tailings impoundments are substantially lower than those across the valley, and elevated concentrations are clustered closer to contaminant sources, indicating that there has been less airborne contamination in these directions. However, even on these transects, soil and lichen lead (and frequently zinc) levels on the furthest points from the mine site (approximately 2-3 km) remain well above the study background concentrations. In synthesis, the spatial distribution data indicate that elevated elemental levels (particularly lead and zinc) resulting from airborne contamination occur in a zone that extends at minimum 2-3 km in all directions from potential mine-site contaminant dust sources, and that is concentrated and extended to the northwest to north of the tailings impoundments and mill complex. This finding of elevated soils and vegetation metals levels is not unexpected, given that mining and milling operations were conducted on a large scale at the Anvil Range site for almost 30 years, and that other studies of airborne contamination from lead-zinc mining/milling activities have documented similar off-site impacts.

It should be emphasized that while this study clearly indicates that mine development and operations at the Anvil Range mine complex have resulted in metals contamination of mine-area soils and vegetation, further work would be required to refine study conclusions, such as definition of the full areal extent of contamination. Data collected in this study do not allow determination or speculation on the specific sources of documented contamination. Therefore, results should be generally interpreted as being indicative of the occurrence of mine-site contamination of off-site (non-mine or undisturbed) areas, but not of the specific source(s) of this contamination. Likewise, the temporal nature of contamination cannot be determined, and it is unknown whether all dust contamination has been historic (due to active mining operations), or whether there are remaining contaminant sources still contributing to off-site metals additions.

Detailed Results and Discussion

Particular emphasis is placed on lead and zinc in this discussion

Although metals analyses were conducted on a suite of metals, summary results here focus on lead and zinc as they are the primary metals associated with the deposits and those that were mined. In general, other analyzed metals (including silver, arsenic, cadmium copper, mercury and nickel) show similar trends.

With the exception of selenium (possibly marginally elevated), all elements in soil samples collected in the Swim reference sampling location are within published normal ranges (see Table 41). Analytical results for vegetation samples taken in the Swim Lake reference sampling site are presented in Table 41, and compared to cited levels for normal background elemental concentrations. The majority of reported results for elemental concentrations in vegetation at the Swim Lake reference area are within published normal ranges.

Table 41. Reference Vegetation Elemental Concentrations (mg/kg)

		Lichen (n=6)	Willow Foliage (n=7)	Willow Root (n=7)	Birch (n=7)	Cited Normal Background Concentrations
Silver	Range	-	0.01 - 0.03	0.01 - 0.05	0.01 - 0.02	0.03 - 0.5[a]
	Mean	0.01	0.01	0.02	0.01	
Arsenic	Range	-	-	-	-	0.009 - 1.5[a]
	Mean	1	1	1	1	
Cadmium	Range	0.02 - 0.13	1.16 - 6.13	0.61 - 5.72	0.02 - 0.15	0.03 - 0.5[b]
	Mean	0.04	2.73	2.04	0.10	
Chromium	Range	0.14 - 0.27	0.05 - 0.22	0.05 - 0.99	0.06 - 0.18	0.02 - 0.2[a]
	Mean	0.21	0.12	0.35	0.12	
Copper	Range	0.60 - 1.04	2.56 - 6.00	3.39 - 8.79	3.92 - 6.13	2 – 30[b]
	Mean	0.89	3.38	5.39	4.76	
Mercury	Range	0.01 - 0.02	-	0.01 - 0.04	0.01 - 0.03	0.01 - 0.4[b]
	Mean	0.01	0.01	0.02	0.02	
Nickel	Range	0.1 - 0.4	0.2 - 2.9	0.1 - 1.5	0.1 - 1.8	0.1 – 4[b]
	Mean	0.2	1.1	0.7	0.6	
Lead	Range	0.7 - 1.6	0.2 - 0.5	0.3 - 2.2	0.3 - 0.8	0.1 – 10[a]
	Mean	1.2	0.3	1.2	0.4	
Selenium	Range	-	1 - 2	-	1 - 2	0.002 - 2.9[a]
	Mean	1	1	1	1	
Zinc	Range	15 – 24	27 - 243	76 – 167	115 - 390	15 – 150[b]
	Mean	19	154	122	242	

[a] Kabata-Pendias, 2001 [b] Jones *et al.*, unpublished

Data from surface soil sampling show elevated elemental concentrations on the tailings transects in comparison to background data

Data from surface soil sampling show higher elemental concentrations from the Faro Mine Site transects in comparison to the Swim Lake reference data. For all analyzed elements, mean concentrations and observed maxima are higher for the Faro Mine Site transect area than for the reference sampling area. Greater concentrations of lead and zinc (as compared to the reference data) are more widespread, and extend further from the intermediate tailings impoundment than other measured elements. Elemental concentrations in sub-surface soil samples from the Faro Site transect area were generally more similar to the Swim Lake reference concentrations and, with the exceptions of lead and zinc, were within published normal ranges.

Statistical analysis of vegetation sampling results versus background data shows no significant differences between sites

Results of vegetation sampling on the Faro Mine Site transects are presented in Table 42. Statistical analysis of these data versus the Swim Lake reference data for vascular plants (willow and birch) shows no significant differences between sites, with the exception of nickel in birch foliage. Comparison of transect elemental concentration means for vascular plants versus published normal levels (also means) indicates that the majority of elements in these samples were within normal ranges.

Locations where lead or zinc levels exceed published normal concentrations for willow and birch were generally confined to the transects to the north and east of the Faro Mine Site, and/or directly adjacent to the mine site, or along the downstream Rose Creek drainage transect (note that all transect data for shrub species exceed the appropriate Swim lake maxima). To demonstrate this finding, concentration ranges of zinc in willow foliage in the transect samples are shown in Figure 28.

Lichen are valuable bioindicators of contaminants

Lichen are susceptible to accumulation of airborne contaminants over time, and are valuable bioindicators of contamination (Conti and Cecchetti, 2001). Results presented in Table 42 for elemental concentrations in lichen samples on the Faro Mine Site transect area show higher concentrations for all elements, in comparison to the Swim Lake reference samples. The majority of elements are approximately one order of magnitude higher in samples from the transects than reference levels. Lead concentrations in the transects samples were approximately two orders of magnitude higher than lead in reference samples. Statistical comparison of Faro Mine Site transect elemental concentrations in lichen versus the Swim Lake reference data indicates that cadmium, chromium, nickel, lead, and zinc concentrations are significantly higher than reference levels.

The majority of elements from lichen samples are one order of magnitude higher on the tailings transect samples than background levels

The spatial distribution of elevated metals concentrations in lichen samples on the tailings is similar to that in surface soil samples

As would be expected, the spatial distribution of metal concentrations in lichen samples from the Faro Mine Site transects in comparison to Swim Lake reference site concentrations is similar to that in surface soil samples. The highest concentrations were located either at sample locations adjacent to the mine site, north of the tailings impoundments (transects 4 and 5) and downstream on the Rose Creek drainage (transect 3). This is illustrated in Figure 29, which show ranges of lichen lead concentrations on the transects radiating from the Rose Creek Tailings Facility.

Table 42. Transect Vegetation Elemental Concentrations (mg/kg)

		Lichen (n=24)	Willow Foliage (n=31)	Willow Root (n=29)	Birch (n=31)	Grass (n=13)	Cited Normal Background Concentrations
Silver	Range	0.01 - 1.83	0.01 - 0.20	0.01 - 1.24	0.01 - 0.08	0.01 - 0.34	0.03 - 0.5[a]
	Mean	0.36	0.04	0.17	0.02	0.05	
Arsenic	Range	1 - 24	1 – 2	1 - 28	-	-	0.009 - 1.5[a]
	Mean	3	1	2	1	1	
Cadmium	Range	0.02 - 1.39	0.31 - 15.73	0.12 - 8.86	0.02 - 0.69	0.02 - 0.43	0.03 - 0.5[b]
	Mean	0.37	2.82	1.81	0.12	0.12	
Chromium	Range	0.29 – 4.60	0.05 - 3.69	0.19 - 20.48	0.06 - 3.56	0.01 - 2.11	0.02 - 0.2[a]
	Mean	1.26	0.40	3.77	0.29	0.40	
Copper	Range	1.51 - 35.40	2.07 - 8.54	2.07 - 101.17	3.19 - 6.86	1.99 - 4.30	2 – 30[b]
	Mean	8.37	4.56	14.45	5.05	2.61	
Mercury	Range	0.01 - 0.51	0.01 - 0.03	0.01 - 0.51	0.01 - 0.05	0.01 - 0.04	0.01 - 0.4[b]
	Mean	0.09	0.02	0.06	0.02	0.03	

		Lichen (n=24)	Willow Foliage (n=31)	Willow Root (n=29)	Birch (n=31)	Grass (n=13)	Cited Normal Background Concentrations
Nickel	Range	0.4 - 4.6	0.4 - 12.2	0.3 - 19.9	0.6 - 3.9	0.4 - 2.7	0.1 – 4[b]
	Mean	1.2	2.9	3.9	1.8	1.4	
Lead	Range	16.7 - 747.7	0.5 - 34.6	1.3 - 566.4	0.9 - 61.7	0.8 - 30.0	0.1 – 10[a]
	Mean	168.5	4.7	72.6	10.4	6.8	
Selenium	Range	1 - 5	1 – 3	1 - 3	1 – 3	-	0.002 - 2.9[a]
	Mean	1	1	1	1	1	
Zinc	Range	35 - 1043	52 – 828	58 - 802	107 – 656	11 - 143	15 – 150[b]
	Mean	232	231	252	301	78	

[a] Kabata-Pendias, 2001 [b] Jones *et al.*, unpublished

Bulk surface soil samples from the Vangorda Mine site indicate that elemental levels are comparable to background levels. Elevated concentrations for several elements are shown from the Faro Mine site

In addition to the transects, surface soils samples (0-10 cm) were collected at two sample points on the Vangorda Mine Site (sites Van 7 and 8), and three points on near the Faro Mine Site (Faro 4, 5 and 7; see Figure 27). Results from the Van 7 sample (overburden capping near the Vangorda/Grum treatment plant) and Van 8 (undisturbed ground near the Vangorda/Grum treatment plant site) indicate that elemental levels are generally comparable to Swim Lake reference levels. Results from the samples taken at the Faro Mine Site (adjacent to the older tailings impoundments [Faro 4 and 7] or the concentrate load-out facility [Faro 5]) show higher concentrations (than reference) for several elements. Arsenic, copper, mercury, lead, and zinc concentrations in these samples exceed Swim Lake reference data and published normal ranges.

Results of lab analyses of vegetation samples show elevated elemental concentrations at potentially mine affected sampling points

Results of laboratory analyses of **foliar vegetation samples** taken from these mine site areas are presented in Table 43. These results show that silver, cadmium, chromium, copper, mercury, lead, nickel and zinc concentrations in vegetation at these points are generally greater than Swim Lake reference concentrations for at least one vegetation species, and are within the reference range for other vegetation species samples. Lead and zinc are consistently greater than reference and published normals, with maximum concentrations approximately two orders of magnitude higher than those at Swim Lake for lead and one order higher for zinc.

Table 43. Mine-Area Vegetation Elemental Concentrations (mg/kg)

		Lichen (n=6)*	Willow Foliage (n=12)	Birch (n=12)	Grass/Legume (n=12)	Published Normal Background Concentrations
Silver	Range	0.01 - 0.61	0.01 - 0.22	0.01 - 0.12	0.01 - 0.09	0.03 - 0.5[a]
	Mean	0.14	0.08	0.03	0.03	
Arsenic	Range	1 - 6	1 - 11	1 – 6	1 - 3	0.009 - 1.5[a]
	Mean	2	2	1	1	
Cadmium	Range	0.02 - 0.53	1.13 - 12.66	0.02 - 0.73	0.02 - 0.32	0.03 - 0.5[b]
	Mean	0.20	1.97	0.23	f0.14	
Chromium	Range	0.97 - 3.07	0.18 - 1.27	0.16 - 0.71	0.18 - 0.80	0.02 - 0.2[a]
	Mean	1.92	0.52	0.31	0.41	
Copper	Range	2.08 - 16.57	2.65 - 10.94	3.92 - 10.01	2.08 - 13.12	2 – 30[b]
	Mean	5.82	6.23	5.76	5.12	
Mercury	Range	0.01 - 0.04	0.01 - 0.07	0.01 - 0.13	0.01 - 0.06	0.01 - 0.4[b]
	Mean	0.02	0.02	0.03	0.02	
Nickel	Range	0.6 - 2.6	0.7 - 7.5	0.9 - 3.6	0.6 - 4.2	0.1 – 4[b]
	Mean	1.5	3.4	2.0	1.9	
Lead	Range	12.2 - 411.3	1.1 - 115.0	1.0 - 126.5	0.4 - 85.5	0.1 – 10[a]
	Mean	96.5	25.8	28.2	19.2	
Selenium	Range	1 - 2	-	1 – 3	1 - 2	0.002 - 2.9[a]
	Mean	1	1	1	1	
Zinc	Range	38 - 414	43 - 2350	126 – 1120	10 - 1040	15 – 150[b]
	Mean	120	607	478	173	

[a] Kabata-Pendias, 2001 [b] Jones *et al.*, unpublished

The highest and most consistently elevated elemental concentrations occur at points Faro 1,2,4,5,6 and at Vangorda 2 and 3

Soils and vegetation data from individual sample points within the footprint of the mine (additional mine-area sample sites) show increased concentrations of metals (Faro 1, 2, 4, 5, 6 and 7 and Van 2 and 3). In some cases, sites had no living moss or lichen layer, and there was visual evidence of phytotoxicity (chlorosis).

It is worth noting that analytical data from the vegetation samples collected on revegetated till-capped sites (Van 6 and 7) showed only marginal or no elevation in elemental concentrations in comparison to reference data and published normals. This finding is supported by soils data showing concentrations similar to reference on one of these sites.

2.7.4 WILDLIFE

2.7.4.1 Fannin Sheep

Population Status and Characteristics

The stone sheep found within the regional study area are distinctly coloured, and have been termed Fannin sheep

Stone sheep (*Ovis dalli stonei*) are known to occur within the RSA. The stone sheep that occur in this area are a colour morph distinct from other stone sheep. They have been termed Fannin sheep and characteristically paler than stone sheep elsewhere within their range. Dark markings on Fannin sheep are normally confined to the saddle, tail and lower legs. Fannin sheep have not been classified as a subspecies separate from other stone sheep.

Stone sheep are valued as a food source by resident hunters and members of the Ross River Dene First Nation. Stone sheep, in particular the Fannin colour morph are highly valued by resident and non-resident hunters as trophy animals and are of significant economic value to outfitters. Stone sheep, especially Fannins, have high non-consumptive value for wildlife viewing and generate significant levels of tourism in the Yukon in general and in Faro specifically.

Historical Data (pre-1998)

Population surveys indicate the sheep population on Sheep Mountain has remained relatively stable between 1980 and 1990

Table 44 summarizes the population surveys conducted within the regional study area between 1980 and 1998. The number of sheep counted within each area varies greatly depending on a number of factors including: survey date; technique and weather conditions. Since many of the surveys summarized above were not conducted for the sole purpose of population inventory, few are consistent in technique and date of survey. Monthly variations in the number of sheep observed in any one area are influenced by the timing of migration. Sheep migrate between their summer and winter ranges between mid-September and mid-October; nursery herds migrating earlier than rams (Schweinsburg 1990a). Therefore, sheep counts during September and October on Mount Mye and Sheep Mountain are low. This would likely also be the case between May and June (since spring migration occurs between mid-May and late June).

It is believed that the sheep population on Sheep Mountain has remained relatively stable between 1980 and 1990 (Schweinsburg 1990a) at between 60 and 80 individuals (YTG 1987). Variations in the number of sheep counted is thought be more a factor of survey conditions than changes in population status (YTG 1987). Observed recruitment levels (indicated by proportion of lambs/yearling in the population) are considered to be indicative of a growing population (Schweinsburg 1990a). There are no data available for the period between 1990 and 1998.

Table 44. Summary of Sheep Counts within the Regional Study Area between 1980 and 1988 (adapted from Schweinsburg 1990a).

Season/ Month	Location	Ewes	Lambs/ Yearlings	Rams	Total	Source
Spring	Mount Mye	35		15	50	Studds, 1975
August	Mount Mye	22		-	22	MEC Ltd., 1976
August	Mount Mye	43	17	2	61	McLeod, 1981
July	Mount Mye	35	18	24	77	Hoeffs, 1988
September	Mount Mye				13	Horejsi, 1988
August	Mount Mye	53	15	19	87	Hoeffs, 1989
Winter	Sheep Mountain				60 – 80	YTG, 1980
Winter	Sheep Mountain	35	6	14	55	YTG, 1987
September	Sheep Mountain				37	Horejsi, 1988
April	Sheep Mountain	36	22	13	71	Lortie, 1988
April	Sheep Mountain	28	21	23	72	Schweinsburg, 1989
October	Sheep Mountain	34	14	5	53	Hoeffs, 1989
April	Sheep Mountain	40	18	24	76	Schweinsburg, 1990a
Fall	Sheep Mountain	37	18	11	66	Schweinsburg, 1990b
July	Rose Mountain	19	-	9	28	McLeod, 1981
September	Rose Mountain				14	Horejsi, 1988

The following summary comments are noted from this data:

- There is no evidence to suggest a historical population decline or a significant change in the population characteristics of stone sheep within the regional study area; the population appears to have remained relatively stable prior to 1998 (Schweinsburg 1990a). The establishment of no hunting areas within much of the known range of these animals within the regional study area (Game Management Subzones (GMS) 4-46, 4-47 and 4-51, noted on Figure 4) undoubtedly contributed to the stability of this population;
- Sheep remain vulnerable to poachers within the regional study area, especially on the winter range where they are seasonally concentrated and in exposed terrain; and
- There is the potential for uptake of metals by stone sheep, however risks are unknown.

Existing (1998-2002) Data

Data from 1998-2002 suggests a stable sheep population

Table 45 summarizes the population surveys conducted within the regional study area between 1998 and 2002. The observed ratio of lambs to nursery sheep in GMS 4-41 (33:100) and on Rose Mountain (38:100) indicates a stable population (J. Carey *et al.* unpub. report). The ratio of rams to nursery sheep in 4-41 (60:100) is higher than would be expected for a hunted population (J. Carey *et al.* unpub. report). Rose Mountain is known as a nursery area; the absence of rams in this survey is therefore not unexpected since rams move to Mount Mye during summer (J. Carey *et al.* unpub. report). Numbers of stone sheep observed on Rose Mountain between 1981 and 2002 (Table 45) are considered to be stable (J.

Carey *et al.* unpub. report). The observed increase in the number of nursery sheep on Rose Mountain between 1981 and 2002, is believed to be due to animal movements at the time of the survey and not only the result of increased recruitment (J. Carey *et al.* unpub. report).

Table 45. Summary of Sheep Counts within the Regional Study Area between 1998 and 2002 (Carey *et al.* unpublished data).

Season/ Month	Location	Nursery Sheep (ewes & yearlings)	Lambs	Rams	Total Sheep	Source
July	Mount Mye	28	7	37	72	Hoeffs 1999
June	GMS 4-41	94	31	58	183	Carey *et al.* unpub. data from 2002
June	Rose Mountain	45	17	11	73	Carey et al. unpub. data from 2002

Wintering areas have been found on the Pelly River Bluff and other areas of winter range are suspected to exist

It is not certain that sheep counts conducted on Sheep Mountain are indicative of the entire population of sheep that inhabit the regional study area. Although sheep that winter on Sheep Mountain can be found on either Sheep Mountain, Mt. Mye, Rose Mountain or on the mine site during summer, there appears to be a group of sheep independent of the Mount Mye/Sheep Mountain group that summer in areas around Blind and Swim Lakes and winter on windswept slopes near to their summer range. Wintering areas have also been found on the Pelly River Bluff (2.5km east of Faro) and it is suspected that areas northeast of Faro on Vangorda Creek may provide additional winter range (Schweinsburg 1990a). Given this variation in range use it is difficult to be certain that sheep counts conducted over the years on Mount Mye, Sheep Mountain or Rose Mountain are representative of one sheep population. Although surveys conducted on Sheep Mountain during the winter may act as an indicator of population status of the larger population, sheep movement to other winter ranges could affect this sampling technique. There are currently no data available on the distribution and extent of the population of stone sheep within the regional study area.

Habitat/Range Use

Three winter habitat units were identified at Sheep Mountain

The southern slopes of Sheep Mountain have been identified as an area of sheep winter range (MEC Ltd. 1976; YTG 1980; McLeod 1981; YTG 1987; Schweinsburg 1990a). Schweinsburg (1990a) determined through telemetry and field observations that nursery sheep (ewes, lambs and yearlings) spent early winter on the upper slopes of Sheep Mountain while rams spent this time on the western edge of Sheep Mountain. Later these sheep are found on the lower slopes of Sheep Mountain to feed on sage (*Artemesia frigida*) and later on new herbaceous growth and aspen (*Populus tremuloides*) leaves (Schweinsburg 1990a). Additional wintering areas include: the windswept slopes near Blind and Swim Lakes (Schweinsburg 1990a), Pelly River Bluff, 2.5km east of Faro (Schweinsburg 1990a) and potentially areas north-east of Faro on Vangorda Creek (McLeod 1981; Schweinsburg 1990a).

Habitat mapping of Sheep Mountain classified three habitat units significant to sheep during winter (Staniforth 1998):

- Sage-Graminoid community occurs on the open windswept south-facing slopes and is considered to be the most important winter habitat as it would be the relatively snow-free during winter;
- Rose/Forb community is found mainly at the edges of south-facing aspen groves, in low-lying gullies and high snow accumulation areas; and
- Grass-Forb community occurs at the edge of the aspen groves but on the more northerly aspects.

Rocky outcrops occur in association with all three of the important winter range communities outlined above. Rocky outcrops increase the habitat quality of these areas by providing escape terrain. The three vegetation communities (including rocky outcrops) were therefore grouped into one habitat type: Rock/Grass/Forb. This unit covered a total of 4.9 km^2 or 11% of the Sheep Mountain Study Area (Staniforth 1998).

The habitat unit used during lambing is likely similar to that used during early winter

Initial studies indicated that lambing areas on Sheep Mountain were found downslope of the early winter range (Studds and Hoeffs 1975). Schweinsburg (1990a) has since determined that ewes move from the lower slopes of Sheep Mountain in late winter to lamb at higher elevations. There is also some indication that ewes may lamb on Mount Mye (Schweinsburg 1989). Lambing areas were not identified during the habitat mapping study conducted on Sheep Mountain (Staniforth 1998). Through interpretation of habitat descriptions made by Schweinsburg (1990a), the habitat unit used during lambing is likely similar to that used during early winter, i.e., Rock/Grass/Forb.

A large area has been identified as summer range

Sheep generally dispersed more widely over their summer range than the winter range. Therefore a larger area has been identified as summer range and includes Mount Mye (MEC Ltd. 1976; McLeod 1981; Hoeffs 1988; Hoeffs 1989; Schweinsburg 1990a); Rose Mountain (McLeod 1981); Blind Creek and Swim Lakes area (Schweinsburg 1990a); Sheep Mountain and the Anvil Mine Complex (Schweinsburg 1989, 1990a; 1990b). Both Mount Mye and Rose Mountain are composed of upland land-types within the alpine, subalpine and boreal zones (AEM 2002). Sheep Mountain is composed of upland and lowland-riparian land types within the boreal zone (AEM 2002). The area around Blind and Swim Lakes is comprised of upland land types in the boreal zone (AEM 2002). The area around the Anvil Mine Complex is comprised of upland land types in the boreal zone (AEM 2002). The majority of Sheep Mountain, the western slopes above Blind Creek and the Vangorda – Grum deposits were burned during a fire in 1969 (Fire History Database).

Spring migration occurs between mid-May and the end of June (McLeod 1981; Schweinsburg 1990a). Fall migration occurs between mid-September and mid-October. Nursery herds migrate earlier in mid-September and rams later in early October (Schweinsburg 1990b). A number of migration routes have been identified and are indicated on Figure 30:

Various sheep migration routes have been identified within the regional study area

- Migration route E (after McLeod 1981) was identified as the main migration route between Mount Mye and Sheep Mountain during spring and fall (MEC Ltd. 1976; McLeod 1981; Horejsi 1988; Schweinsburg 1990b). From Sheep Mountain, this route goes to the confluence of Shrimp Lake and Vangorda Creek, crosses the Haul Road 1 km west of Vangorda Creek and then continues to the base of Mount Mye. This route therefore passes between the Vangorda and Grum deposits.
- Migration route F (after McLeod 1981) was also identified as a significant migration route between Sheep Mountain and Mt. Mye during spring and fall (MEC Ltd. 1976; McLeod 1981; Schweinsburg 1990b). From Sheep Mountain, this route goes to the confluence of Shrimp Lake and Vangorda Creek, it then follows a small road, crosses the airstrip to the site of the proposed Vangorda Pit and then continues to Mt. Mye via the west side of Vangorda Creek.
- Migration route D (after McLeod 1981) was also identified as a significant migration route between Sheep Mountain and Mt. Mye during spring and fall (McLeod 1981; Horejsi 1988; Schweinsburg 1990b). From Mount Mye, this route goes south from Mount Mye and crosses the haul road 1 km east of the Grum Camp. The route then follows down to the confluence of Shrimp Lake and Vangorda Creek on to Sheep Mountain.
- McLeod (1981) also identified one addition migration route (route A) which follows west from Sheep Mountain along the ridge to Rose Mountain.

Rams have been observed rutting on Sheep Mountain (Schweinsburg 1990a) presumably during fall/early winter.

2.7.4.2 Moose

Population Status and Characteristics

Moose (*Alces alces*) occur throughout the regional study area. The subalpine plateau of Game Management Subzone ("GMS") 4-45 is recognized to have one of the highest seasonal densities of moose in the Yukon (Ward 1999) and is acknowledged as a significant rutting and post-rutting area of territorial significance (Ward 1997). Moose are highly valued as a food source by members of the Ross River Dene First Nation, Faro residents and non-resident hunters. Moose have economic value for outfitters and are highly valued as a food source for grizzly bears in early spring when other food sources are limited.

Historical (pre-1998) Data

A summary of the number of moose hunted within one outfitter's territory within the Faro region between 1963 and 1974 shows that the number of guided moose hunts increased by an order of four following the establishment of the Town of Faro and the Mine development (MEC Ltd. 1976). Prior to 1969, 3.8 moose were successfully hunted by non-resident hunters per year, after 1969, 15.5 moose were taken on average per year.

In 1998, there was no evidence to suggest that the moose population had declined; however, the bull:cow ratio within area GMS 4-45 reached the lowest acceptable level for moose

Survey results indicate that moose density within GMS 4-45 has not changed significantly between 1997 and 1998 (Table 46). However, the low bull to cow ratios observed in 1997 (30:100) and 1998 (45:100) are cause for concern (Ward 1997; Ward 1998). The bull:cow ratio has reached the lowest acceptable level for moose; where this sex ratio has been observed elsewhere in the territory, e.g., Haines Junction and south of Whitehorse, it has been followed by a population decline. Below this level there is a possibility that there are insufficient numbers of bulls to breed every female. True harvest levels (i.e., including some unreported mortalities) have reached the sustainable harvest limit for this population, i.e., 20-25 moose taken in GMS 4-45 each year (Ward 1997). The ratio of calves to cows is not high in 1997 (35:100) or 1998 (26:100) but is considered sufficient to maintain a stable population (Ward 1997; R. Ward, pers. comm.).

Table 46. Summary of Moose Surveys Conducted within GMS 4-45 near Faro and Anvil Mine (1997 – 1998)

	Within GMS 4-45	
	1997	**1998**
Survey Timing	Dec 8th – 13th	Nov 23rd – 28th
Area Surveyed (km^2)	967	1034
Moose Density/1000km^2	586	483
Bull: Cow	30:100	45:100
Calf: Cow	35:100	26:100

The following comments are of note regarding moose data during the pre-1998 period:

- There is currently no evidence to suggest that the population of moose within the regional study area has declined. However, the bull:cow ratio observed in GMS 4-45 has reached the lowest acceptable level for moose (Ward 1999). Where this sex ratio has been observed elsewhere in the territory, e.g., Haines Junction and south of Whitehorse, it has been followed by a population decline. Below this level there is a possibility that there are insufficient numbers of bulls to breed every female.
- True harvest levels (i.e., including some unreported mortalities) have already reached the sustainable harvest limit for this population, i.e., 20-25 moose taken in GMS 4-45 each year (Ward 1997) and these areas have remained open to the hunting of bulls.
- Potential for habitat displacement and extent are unknown.
- There is the potential for uptake of metals by moose. However, the risk is unknown. Available data suggest that concentrations of metals in moose tissues within the regional study area are not noticeably higher than elsewhere in Yukon (P. Roach, pers. comm., 7th October 2002). However it was recognized that sample size was low, n = 4 (P. Roach, pers. comm., 7th October 2002).

Existing (1998-2002) Data

Mature bulls likely travel from outside the study area to congregate during the rut

The density of moose observed in 1999 within GMS4-45 (Table 47) is roughly seven times higher than the Yukon average and indicates the importance of this area for post-rutting moose (Ward 1999). This seasonally high moose density indicates that mature bulls likely travel from outside of this area to congregate during the rut. There is evidence from telemetry studies conducted elsewhere (Liard River) that moose may disperse during the summer up to 80 km from their winter concentrations (J. Adamczewski, pers. comm., September 2002).

Table 47. Summary of Moose Surveys Conducted within GMS 4-45 near Faro and Anvil Mine (1999)

	Within GMS 4-45
	1999
Survey Timing	Dec 13th – 19th
Area Surveyed (km^2)	218
Moose Density/1000km^2	1358
Bull: Cow	30:100
Calf: Cow	18:100

It is likely that harvest levels have been increased due to increased hunter access associated with mine developments

The low bull:cow ratio observed in 1999 (30:100) is confounded by survey timing and conditions and cannot be compared to previous years. However, the low bull to cow ratios observed in 1997 (30:100) and 1998 (45:100) remain a cause for concern (R. Ward, pers. comm). There has been a voluntary harvest restriction in place in GMS 4-45 since 1999 but the effectiveness of this measure is unknown and suspected to be negligible (R. Ward, pers. comm.). It is believed that increased hunter access associated with mine developments, has increased harvest levels and has consequently impacted the moose population in the Faro area (Ward 1999).

The ratio of calves to cows is low in 1999 but may have been affected by survey technique and conditions. The proportion of calves within moose populations fluctuates naturally from year to year such that the ratio must be compared over a longer time period (R. Ward, pers. comm.).

Habitat/Range Use

The floodplain of the Pelly River is suspected to provide significant winter and summer habitat for moose (MEC Ltd. 1976). Areas within the 1969 burn and areas of alluvial plain shrub are suspected to be significant summer habitat for moose (MEC Ltd. 1976). In 1999 YTG delineated an area of high moose abundance during the rutting and post-rutting season within GMS 4-45 (Ward 1999). Within an area of 218 km^2 moose density was observed to be roughly seven times higher than the Yukon average. The area corresponds to the subalpine plateau of GMS 4-45 (Ward 1999). There is no data available on the current calving, summer and winter habitat use and movement patterns of moose within the regional study area.

2.7.4.3 Woodland Caribou

The Tay River herd of caribou is found within the regional study area

Woodland caribou (*Rangifer tarandus caribou*) herds are defined as a group of caribou that share a common winter range that is geographically distinct from neighbouring herds (Edmonds 1988; Farnell *et al.* 1996). Caribou within the immediate vicinity of Anvil Range Mine are considered to be members of the Tay River woodland caribou herd (Kuzyk and Farnell 1997). Woodland caribou from the Redstone Herd appear to overlap at the northeastern extent of the Tay River Herd annual range, i.e., near Mac Pass (Kuzyk and Farnell 1997). This area of overlap is outside the regional study area and does not overlap with the winter range of the Tay River Herd. For the purposes of this project, data will be presented only on the Tay River Herd.

Woodland caribou are listed as a special species of concern and are found mostly along the Tay River and the South Macmillan River within the regional study area

Woodland caribou within the northern mountain ecotype found in the vicinity of the Anvil Range Mine are listed as a species of special concern by the Committee on the Status of Endangered Species in Canada (COSEWIC, May 2002). This designation is reserved for a population that is particularly sensitive to human activities or natural events but is currently not endangered or threatened (COSEWIC). Woodland caribou are valued as a food source by Yukon residents, non-resident hunters and members of the Ross River Dene First Nation and have economic value for outfitters. Woodland caribou calves are a valued food source for grizzly bears in early spring when other food sources are limited.

Historical (pre-1998) Data

A population survey of the Tay River Herd was conducted between 23rd and 27th March 1991 (Table 48). A total of 3,758 caribou (± 571) were estimated to occur within the 1,266 km^2 survey area (Kuzyk and Farnell 1997). Caribou were found mostly along the Tay River and the South Macmillan River.

Table 48. Summary of Caribou Survey Data and Population Estimate for the Tay River Herd (after Kuzyk and Farnell 1997)

Strata	Units Surveyed	Area Surveyed (km^2)	Total Caribou	Expanded Population Estimate*	Corrected Population Estimate**
Primary	31	845	3,091	3,091	
Secondary	15	421	53	185	
Total	46	1,266	3,144	3,276	3,758

* Population extrapolated from density estimates of caribou within surveyed secondary units to un-surveyed secondary units.
** Calculated using a sightability correction factor of 1.14.

The fall composition studies of the Tay River Herd indicate that the herd is stable; there were approximately 30 calves for every 100 cows and >35 bulls for every 100 cows (Kuzyk and Farnell 1997). The caribou harvest between 1990 and 1994 is considered sustainable at approximately 1% of the population of the Tay River Herd (Kuzyk and Farnell 1997). Between 35 and 43 caribou are harvested by licensed hunters during fall (residents and non-residents).

The population of woodland caribou appears relatively stable from 1991-1998

The following comments can be made based on data from this period:

- There is no evidence to suggest a historical population decline or a significant change in population characteristics of woodland caribou within the regional study area; the population appears to have remained relatively stable prior to 1998 (Kuzyk and Farnell 1997).
- Potential for habitat displacement, extent unknown.
- There is potential for uptake of metals by woodland caribou. However the risk is unknown.

Existing (1998-2002) Data

No data on the current population status of the Tay River herd is available

There are no data available on the current population status and characteristics of the Tay River Herd. The population estimate obtained during the study conducted by Kuzyk and Farnell (1997) can be used as a benchmark for management purposes (Kuzyk and Farnell 1997). It has been suggested that a repeat census be conducted to monitor this population and determine the current population abundance and composition of the Tay River Herd (Kuzyk and Farnell 1997; R. Farnell, pers. comm. 9th September 2002).

Habitat/Range Use

Range use varies according to season (i.e. calving, post-calving, or rutting)

The calving and post-calving areas of the Tay River Herd have been documented south of the upper Stewart River and north of the Pelly River (Kuzyk and Farnell 1997). Calving and post-calving areas include areas in the vicinity of the Anvil Range Mine in alpine areas within GMSs 4-41 and 4-43, Figure 4 (Kuzyk and Farnell 1997). Caribou from the Tay River Herd are documented to be widely distributed during the rut especially to the north and east of the Anvil Range Mine. Rutting areas include areas in the vicinity of the Anvil Range Mine within GMSs 4-41, 4-43 and 4-45. In early winter, caribou descend from alpine areas into the lowland areas of the forested river drainages north of Faro. At this time of year, the herd is in close proximity to the Anvil Range Mine and has been observed in GMSs 4-41, 4-45, 4-46 and 4-47. In late winter, caribou are confined to the valley bottoms of the forested river drainages north of Faro. At this time of year, the herd is in closest proximity to the Anvil Range Mine and has been observed in GMSs 4-41, 4-45, 4-46 and 4-47. In 1991 caribou were observed within 10 km of the Town of Faro during late winter (Kuzyk and Farnell 1997).

2.7.4.4 Grizzly Bear

Population Status and Characteristics

Grizzly bears are listed as a special species of concern

Grizzly bears occur throughout the regional study area. Grizzly bears (*Ursus arctos*) are listed as a species of special concern by the Committee on the Status of Endangered Species in Canada (COSEWIC, May 2002). This designation is reserved for a population that is particularly sensitive to human activities or natural events but is currently not endangered or threatened (COSEWIC).

Grizzly bears are vulnerable to the impacts of human activities for many reasons, including their specialist habitat requirements, large home range sizes, displacement from areas of human use; vulnerability to mortality due to food conditioning and low fecundity rates. For the reasons described above and the broad ecological amplitude grizzly bears possess as omnivorous animals, grizzly bears are considered indicators of ecosystem health. Grizzly bears are valued by resident and non-resident hunters as trophy animals and in some cases for food and have economic value for outfitters. Grizzly bears have high non-consumptive value and generate significant levels of tourism in the Yukon.

Historical (pre-1998)

There is indication that the grizzly bear population has experienced some stress from increased hunting but no empirical data exists

There have been no telemetry studies or population estimates conducted on the grizzly bears within the regional study area and therefore no empirical data are available to assess population status and characteristics. There is indication that the grizzly bear population within the regional study area has experienced some stress (MEC Ltd. 1976; Yukon Biological Submission Forms, YTG). The level of grizzly bear harvest in the area increased markedly following the establishment of the Town of Faro and the Anvil Mine (MEC Ltd. 1976). A summary of the number of grizzly bears hunted within one outfitter's territory within the Faro region between 1963 and 1974 shows that the number of guided grizzly bear hunts increased by an order of three following the establishment of the town of Faro and the Mine development. Prior to 1969, 2.3 grizzly bears were successfully hunted by non-resident hunters per year, after 1969, 7.2 grizzly bears were taken on average per year. A total of 76 grizzly bear mortalities (47 males and 29 females) have been reported within the regional study area between 1980 and 1997 (Yukon Biological Submission Forms, YTG). This translates to an annual harvest of 4.22 grizzly bears / year or 0.95 grizzly bears / year / 1000 km^2. Highest mortality rates were observed in GMS 4-44 (3.38 grizzly bears / year / 1000 km^2) and GMS 4-51 (4.21 grizzly bears / year / 1000 km^2). GMS 4-44 is accessible from trails originating from the Anvil Range Mine and from the town of Faro. GMS 4-51 contains the town of Faro, portions of the Anvil Range Mine and many access roads and trails. The observed mortality rates are considered to be an underestimate of true mortality (K. Meister, pers. comm., September 2002). In the absence of empirical data on grizzly bear population status and characteristics and/or on home range size and the extent of home range overlap, the sustainability of the observed mortality rates cannot be empirically determined.

The following summary comments can be noted from data during this time period:

Comments noted from data during the historical period

- There are no empirical data available to assess population status and characteristics of grizzly bears within the regional study area.
- There is evidence from the literature and records of mortality to suggest that grizzly bears within the regional study area may have experienced a decline. The supporting literature defines a strong correlation between the persistence of grizzly bears, the presence of roads/trails and the behaviour of humans on these roads/trails, i.e., hunting pressure. There is an extensive network of roads and trails leading from the mine complex into previously inaccessible

or less accessible areas within the study area and there is indication that hunting pressure within these areas has been high. There have also been an unknown number of grizzly bears killed in control actions within the study area.

- There is the potential that mine development has removed valuable feeding habitat and/or displaced grizzly bears from valuable feeding habitat. The extent and significance of this remains unknown in the absence of a comprehensive ecosystem map of the area.
- There is the potential for uptake of metals by grizzly bears. Grizzly bears are vulnerable to the bioaccumulation of contaminants in their tissues due to their position in the aquatic food chain, i.e., salmon eaters and the terrestrial food chain i.e., predators. Grizzly bears are also vulnerable to contamination due to their hyperphagic feeding habits, e.g., consuming up to 40 kg (fresh weight) of berries in a day (Welch *et al.* 1997).

2.7.4.5 Existing (1998-2002) Data

There is indication that the grizzly bear population has experienced stress historically and that hunter success has since declined

There have been no telemetry studies or population estimates conducted on the grizzly bears in the area of Faro and the Anvil Range Mine and therefore there are no empirical data available to assess population status and characteristics. There is indication that the grizzly bear population within the regional study area has experienced stress historically (MEC Ltd. 1976; Yukon Biological Submission Forms, YTG) and that hunter success has since declined. A total of 12 grizzly bear mortalities (9 males and 3 females) have been reported within the regional study area between 1998 and 2002 (Yukon Biological Submission Forms, YTG). This translates to an annual harvest of 3.00 grizzly bears / year or 0.67 grizzly bears / year / 1000 km^2. Hunter success has most noticeably declined within those GMSs where grizzly bears experienced highest mortality rates historically; there have been no grizzly bears harvested or controlled within GMS 4-44 or 4-51 since 1998 (Yukon Biological Submission Forms, YTG). In the absence of empirical data on grizzly bear population status and characteristics and/or on home range size and the extent of home range overlap, the sustainability of the observed mortality rates cannot be empirically determined.

Habitat Use

Habitat use patterns of grizzly bears in the area were not determined in previous studies. However, seasonal food habits and habitat use patterns can be inferred from the results of studies of grizzly bears in ecologically similar areas

The habitat use patterns of grizzly bears in the Anvil Range Mine area were not determined during previous studies. However, grizzly bear seasonal food habits and habitat use patterns can be inferred from the results of studies of grizzly bears in ecologically similar areas (Pearson 1976; McCann in prep). These data were interpreted to provide a summary of likely food habits and habitat use patterns for the grizzly bears within the regional study area.

During spring prior to vegetation green-up, grizzly bears in the regional study area are likely to feed on the roots of *Hedysarum spp.,* in disturbed, snow free areas at lower elevations; winter weakened ungulates, particularly moose, in lowland riparian areas such as the Pelly River floodplain and overwintered berries, such as *Artcostaphylus sp.* and *Empetrum sp.* on south facing, windswept subalpine slopes. Later in the spring when new vegetation growth has appeared, grizzly bears will feed on grasses, sedges, horsetails and forbs as well as on willow catkins and ungulate calves (particularly moose and potentially caribou). Late spring habitats will include valley bottom riparian areas and seepage slopes.

During summer grizzly bears will likely feed on the berries of *Shepherdia canadensis* and *Vaccinium spp.*. These berries are particularly abundant in areas burned by wildfire. The wildfire that burned a significant portion of the area around the Anvil Mine in 1969 may be on the cusp of becoming less valuable for bears. The abundance of berries in areas burned by wildfires tends to be highest 15 – 35 years post fire, depending upon growing conditions. Berry abundance will vary with habitat type and site characteristics within the burn. Berry abundance can also be high under relatively open, floodplain forests. Some grizzly bears (especially females) may continue feeding on herbaceous vegetation at higher elevations in the subalpine during summer. Some bears will also hunt for rodents, particularly ground squirrels (*Spermophilus sp.*) in subalpine meadows.

Grizzly bears will continue to feed on the berries of *Shepherdia canadensis* and *Vaccinium spp.* in burns and some in floodplain forests during fall. *Empetrum sp.* and *Artcostaphylus sp.* will also become more significant during this season and bears will find these berries on dry, south facing, subalpine upland slopes. Some bears may also feed on the roots *Hedysarum spp.* wherever this plant occurs. The distribution of *Hedysarum spp.* is fairly ubiquitous and access to roots is less limited by snow and ground conditions at this time of year. Grizzly bears that occupy home ranges that contain Blind Creek and Tay River will likely feed on spawning chinook salmon (*Oncorhynchus tshawytscha*) on the floodplains of these valley bottoms. Some bears may stay active late in the fall and feed on rut weakened ungulates, particularly moose, where these animals are found, i.e., the subalpine areas of GMS 4-45.

Grizzly bears will spend winter hibernating in dens at higher elevation in the subalpine and alpine areas. Dens may be found on steep slopes of any aspect (although there is some evidence to suggest that the excavation of dens at northerly latitudes on north facing slopes may be impeded by ground conditions, Pearson 1975). Dens tend to be excavated in soil and may or may not be associated with the root systems of trees or shrubs. On rare occasion grizzly bears may hibernate in caves.

2.7.4.6 Black Bear

Population Status and Characteristics

Black bears occur throughout the study area and are vulnerable to harvesting

Black bears (*Ursus americanus*) occur throughout the regional study area. Black bears are valued by resident and non-resident hunters as trophy animals and in some cases for food and have economic value for outfitters. Black bears have high non-consumptive value and generate significant levels of tourism in the Yukon. Black bears are vulnerable to illegal harvesting for gall bladders, as part of the international and domestic trade in bear parts.

Historical (pre-1998) Data

There is indication that the black bear population has experienced some stress from increased hunting but no empirical data exists

There have been no telemetry studies or population estimates conducted on black bears within the regional study area and therefore no empirical data available to assess population status and characteristics. There is indication that the black bear population within the regional study area has experienced some stress (MEC Ltd. 1976; Yukon Biological Submission Forms, YTG). The level of black bear harvest in the area increased markedly following the establishment of the town of Faro and the Anvil Mine (MEC Ltd. 1976). A summary of the number of black bears hunted within one outfitter's territory within the Faro region between 1963 and 1974 shows that the number of guided black bear hunts increased by an order of six following the establishment of the town of Faro and the Mine development.

Prior to 1969, 0.3 black bears were successfully hunted by non-resident hunters per year, after 1969, 1.8 black bears were taken on average per year. A total of 93 black bear mortalities (74 males and 19 females) have been reported within the regional study area between 1980 and 1997 (Yukon Biological Submission Forms, YTG). This translates to an annual harvest of 5.17 black bears / year or 1.16 black bears / year / 1000 km^2. Highest mortality rates were observed in GMS 4-47 (4.23 black bears / year / 1000 km^2) and GMS 4-43 (3.26 black bears / year / 1000 km^2). GMS 4-47 contains an extensive network of roads and trails and is in close proximity to the town of Faro and the Robert Campbell Highway. Mostly resident hunters hunt this area (Yukon Biological Submission Forms, YTG). GMS 4-43 does not contain surveyed roads or trails but is immediately accessible from the Pelly River. Mostly non-resident hunters hunt this area (Yukon Biological Submission Forms, YTG). The observed mortality rates are considered to be an underestimate of true mortality (K. Meister, pers. comm., September 2002). In the absence of empirical data on black bear population status and characteristics and/or on home range size and the extent of home range overlap, the sustainability of the observed mortality rates cannot be empirically determined.

Comments on the historical data

The following summary comments can be made from data based on this time period:

- There is no empirical data available to assess population status and characteristics of black bears within the regional study area.
- There is the potential for overharvesting of black bears within the regional study area. Mortality associated with hunting and control actions has been high within the regional study area.
- There is the potential that mine development has removed valuable feeding habitat and/or displaced black bears from valuable feeding habitat. The extent and significance of this remains unknown in the absence of a comprehensive ecosystem map of the area.
- There is the potential for uptake of metals by black bears. Black bears are vulnerable to the bioaccumulation of contaminants in their tissues due to their position in the aquatic food chain, i.e., salmon eaters and the terrestrial food chain i.e., predators. Black bears are also vulnerable to contamination due to their hyperphagic feeding habits.

Existing (1998-2002) Data

There is no empirical data available to assess the population status and characteristics but current mortality rates within the study area remain high

There have been no telemetry studies or population estimates conducted on the black bears in the area of Faro and the Anvil Range Mine and therefore there are no empirical data available to assess population status and characteristics. There is indication that the black bear population within the regional study area has experienced some stress historically (MEC Ltd. 1976; Yukon Biological Submission Forms, YTG). Current mortality levels within the study area remain high; a total of 23 black bear mortalities (17 males and 6 females) have been reported within the regional study area between 1998 and 2002 (Yukon Biological Submission Forms, YTG). This translates to an annual harvest of 5.75 black bears / year or 1.29 black bears / year / 1000km^2. Mortality rates remain highest in GMS 4-47 (4.16 black bears / year / 1000km^2). Harvest rates have declined in GMS 4-43 from 3.26 to 1.47 black bears / year / 1000km^2. In the absence of empirical data on black bear population status and characteristics and/or on home range size and the extent of home range overlap, the sustainability of the observed mortality rates cannot be empirically determined.

Habitat Use

Since habitat use patterns of black bears were not determined in previous studies, food habits and habitat use patterns are based on the occurrence of potential bear foods and habitats within the regional study area

The habitat use patterns of black bears in the Anvil Range Mine area were not determined during previous studies. There are little data available on black bear seasonal food habits and habitat use patterns areas ecologically similar to the regional study area. Food habits and habitat use patterns were therefore inferred from general food habits and habitat use patterns of black bears based on the occurrence of potential bear foods and habitat within the regional study area.

During the spring, black bears will likely feed on grasses, sedges, horsetails, forbs, the catkins of willow (*Salix spp.*) and balsam poplar (*Populus balsamifera*) in valley bottom riparian areas and on seepage slopes. During the summer, black bears will likely feed on a diversity of berry species including *Vaccinium uliginosum, Vaccinium vitis-idaea*, *Shepherdia canadensis* and potentially *Rosa acicularis* typically in lower elevation forested areas. Black bears will likely continue to feed on these berry species into the fall but may also feed on *Empetrum nigrum*, *Arctostaphylos spp.*, and *Vaccinium caespitosum* at higher elevation forested areas. Black bears may also feed on grasses and sedges at this time of the year. Black bears that occupy home ranges that contain Blind Creek and Tay River may also feed on spawning chinook salmon (*Oncorhynchus tshawytscha*) on the floodplains of these valleys. Black bears will spend winter hibernating in dens at mid to high elevations in subalpine forests. Dens tend to be excavated under the root systems of trees.

2.7.4.7 Raptors

Bald eagles are known to occur and peregrine falcons may occur within the study area. Peregrine Falcons are listed as a threatened species in the Yukon

There have been no empirical studies conducted on raptors within the regional study area (D.Mossop, pers. comm., 2nd October 2002). Bald eagle (*Haliaeetus leucocephalus*) is known to occur and peregrine falcon (*Falco peregrine anatum*) may occur within the regional study area (D.Mossop, pers. comm., 2nd October 2002). Peregrine falcon are listed as threatened in Yukon (COSEWIC, May 2000). This designation is reserved for a population that is likely to become endangered if limiting factors are not reversed (COSEWIC). Short-eared owl (*Asio fammeus*) likely occur within the regional study area. This species is listed as a species of special concern by the Committee on the Status of Endangered Species in Canada (COSEWIC, April 1994). This designation is reserved for a population that is particularly sensitive to human activities or natural events but is currently not endangered or threatened (COSEWIC).

There is no empirical data available to assess population status and characteristics of bald eagles, peregrine falcons and short-eared owls within the regional study area. Contamination: bald eagles are vulnerable to the bioaccumulation of contaminants in their tissues due to their position in the aquatic food chain, i.e., fish eaters (D. Mossop, pers. comm., 2nd October 2002).

2.7.4.8 Furbearers and Small Mammals

Red fox, marten, lynx, least weasel, ermine, mink, snow shoe hare, and wolf likely occur within the regional study area. Wolverine is listed as a species of special concern

There have been no empirical studies conducted on furbearers within the regional study area. Red fox (*Vulpes vulpes*), marten (*Martes americana*), lynx (*Lynx canadensiis*), ermine (*Mustela erminea*), least weasel (*Mustela nivalis*), mink (*Mustela vison*), snow-shoe hare (*Lepus americanus*), wolf (*Canis lupus*) likely occur within the regional study area. Wolverine is listed as a species of special concern by the Committee on the Status of Endangered Species in Canada (COSEWIC, April 1989). This designation is reserved for a population that is particularly sensitive to human activities or natural events but is currently not endangered or threatened (COSEWIC). Members of the Ross River Dene First Nation are known to trap marten, wolverine, lynx and wolves within the regional study area (K. Meister pers. comm., September 2002).

There are no empirical data available to assess population status or health of furbearers within the regional study area. There have been no empirical studies conducted on small mammals within the regional study area (C. Hubert, pers. comm. 13th September 2002).

2.7.4.9 Amphibians and Reptiles

No empirical data on amphibians exists for the regional study area

There have been no empirical studies conducted on amphibians or reptiles within the regional study area (J. Adamczewski pers. comm., September 2002). Wood frog (*Rana sylvatica*) is likely the only amphibian to occur within the regional study area. Wood frogs can be found as far north as Old Crow YT and can inhabit forests, meadows, muskegs and alpine areas (YTG Renewable Resources & Environment Canada). Reptiles are not documented to occur within the regional study area. There are no empirical data available to assess population status and characteristics of amphibians within the regional study area.

2.8 SOCIO-ECONOMICS

2.8.1 SOCIO-ECONOMIC STUDY AREA

Potential socio-economic impacts caused by the project are assessed when they arise from a change in the environment caused by the project. This indirect consideration of socio-economic impacts does not, however, preclude the consideration of potential direct socio-economic impacts of the project.

Definition of socio-economic study area.

The RSA for socio-economic conditions is broadly defined as the Anvil Range area, with the Pelly River and Campbell Highway the southern boundaries, the Ross River the eastern boundary and the Tay River the western and northern boundaries (Figure 5). Thus, it includes anthropogenic features including the mine sites, the Faro townsite area and various roads on the north side of the Pelly River. The area includes the lands within the Rose, Anvil and Vangorda watersheds and parts of the Blind Creek watershed. A broadly defined study area was necessary as the resources upon which socio-economic conditions are based (i.e. caribou, sheep, moose) can be widely scattered across the landscape.

2.8.2 GENERAL SOCIO-ECONOMIC CONDITIONS

The RSA is a significant area of use for residents from the Town of Faro, the community of Ross River and other Yukon communities. Residents from as far away as Whitehorse travel to the region to hunt and fish. In addition, the Town of Faro is taking action in "selling" the region as a target market for Yukoners and travelers from neighboring jurisdictions (e.g. Alaska and British Columbia) as well as international travelers, such as Germany.

Summary information regarding the Town of Faro is provided in the subsequent sections. Information regarding historical and current activities by the Ross River Dena people is described in Section 2.9 of this volume.

2.8.2.1 Town of Faro

History

The Town of Faro has experienced significant population shifts from the time of its construction in 1968 when Anvil Mining Corporation established a community for employees of its lead-zinc- Faro Mine. Faro was developed as a mining town to house workers and provide services for the Faro Mine.

Town infrastructure was installed to service a population of approximately 3,000. In 1981, the population reached a peak of around 2,800 residents. In 1991, Faro's population was approximately 1,500.

Since the mine shut down, the population of Faro decreased significantly

The Faro Mine shut down in 1998 and since then Faro's population has declined significantly. According to Statistics Canada, in 2001, the population of Faro was 313; these statistics also reveal 469 private dwellings. The statistics for December 2002 show the population increased to 375 (Yukon Bureau of Statistics) and is projected to grow to approximately 475 by the summer of 2004 (interview with Town Councilor, Michelle Vainio).

Infrastructure

Faro community infrastructure includes:

- the Municipal Hall;
- Municipal Works Yard;
- Del Van Gorder School;
- Faro campus of the Yukon College;
- Faro Nursing Station;
- Union Hall;
- Government of Yukon (YTG) Health and Social Services;
- Recreational Centre (with a full range of facilities);
- Indoor ice arena;
- Community library;
- Royal Canadian Mounted Police (RCMP) detachment;
- Canada Post (full-service post office);
- Retail mall;
- Two churches;
- Hotel and restaurant;
- Service station; and
- Airport (4,000 foot gravel runway with lights).

2004-2008 "Vision"

An official community plan for Faro has been drafted and encourages a more sustained sense of growth and direction

The elected Council for the Town of Faro has initiated a number of steps for the continued viability of the community. Much of the vision is based on the strength of the local businesses and attractiveness of the community as a recreational center of significance (hiking, hunting and fishing values), as well as a tourism destination.

The current draft of the Official Community Plan (OCP), 2003-2008 (anticipated to go to public hearing in April before being accepted by Town Council and forwarded to the Yukon Minister responsible), reveals an aggressive development and diversification plan relying on the continued inflow of population, and general interest in the region. The draft OCP describes the existing economy as an amalgam of the following activities:

- Small business sector (the mainstay of the Faro economy);
- Home based businesses (B&Bs, arts and crafts etc);
- Mine care and maintenance and reclamation opportunities;
- Government employment (local, territorial and federal);
- Wilderness tourism (fishing, recreational and guided hunting, canoeing, cross country skiing, hiking etc.)
- Cultural events (e.g. Farrago Music Festival and Ice Worm Squirm Winter Carnival);
- Robert Campbell Highway tourism; and
- Home base for those working away.

There is also an increasing population of retired people moving to Faro for the modest housing prices and lifestyle, and their activities provide economic stimulus to the local economy. The relationship between the Town's efforts and the Ross River Dena Council also figures prominently in the draft Plan.

Generally, the draft OCP "vision" for the economy over the next five years revolves around policies and actions in the following seven areas:

- Faro mine reclamation activities (priorities around health and safety and maximum community employment);
- Wilderness tourism (based on proximity to viewing opportunities, and natural "infrastructure");
- Retirement community (based on quality life style, low crime rate, affordable housing, excellent services);
- Artistic community (encourage more immigration to Faro of talent from other parts of Yukon and beyond);
- Government decentralization (movement of appropriate government operations to Faro given "level playing field");

- Home-based business (increase zoning flexibility to accommodate activities); and
- Mining history tourism (to capitalize on the existing knowledge base of residents).

Although the current mine site figures prominently in this draft OCP "vision" for the community and its economy, the Town is moving to a more sustained sense of direction, less dependent on the "boom-bust" cycles it has experienced during its history.

2.8.3 GENERAL LAND/RESOURCE USE

Hunting and fishing are popular activities in the area.

The regional study area encompasses parts of, or all of five, hunting sub-zones in the Yukon's Zone 4 (noted on Figure 4). Although one of the five is closed completely to hunting (sub-zone 4-51 in and around the Town of Faro), the other four allow hunting of male moose and caribou, sheep (except sub-zone 4-46 just south of the Grum and Vangorda pits), spring and fall black bear, spring and fall grizzly bear, wolverine, wolf and coyote. This hunting capacity attracts both local hunters and hunters from elsewhere in the Yukon. The annual take is on average significant (e.g. in 2001 24 moose, 7 caribou and 2 sheep were taken from sub-zones 4-44, 45 and 46).

No land use plan has been established to date.

Hunting is facilitated by continued access to Faro Mine lands for activities and for commuting to hunting areas (for instance, a ramp is provided over the main haul road. Although the Interim Receiver will maintain the right to close the mine site in part or in total for public health and safety reasons, there is presently no intention to restrict this current level of land access and use. Fishing is also a lifestyle choice of many of the local population, with the Rose Creek providing attractive fishing locations.

To date, no Land Use Plan has been established for the regional study area as envisioned by Chapter 11 of the Yukon Land Claim Umbrella Final Agreement (there is no land claim in place as of the date of this EAR that provides for a Regional Land Use Plan for part or all of this regional study area).

In addition, as per the official position of YTG, the Yukon Protected Areas Strategy is discontinued, and therefore no new protected areas will be established in the regional study area in the foreseeable future through this process. Furthermore, there are no land claims special management areas under consideration for the regional study area; at this point in time, negotiations are formally off among the Ross River Dena Council, and the governments of Canada and Yukon (Government of Yukon Land Claims Secretariat, pers. comm, 2003).

2.9 TRADITIONAL USE

2.9.1 TRADITIONAL USE STUDY AREA

Traditional use, also referred to as the subsistence economy, refers to First Nations activities such as hunting, trapping, fishing, gathering of plant resources, and travel. Social activities such as gatherings, teaching of skills and cultural values, are also part of traditional use activities.

Anthropologist M. Weinstein, who documented the historic and current traditional use of Ross River Dena in the early 1990s, defined the subsistence economy as "food production (hunting, fishing and plant gathering); fur production; the use of natural materials as tools, for structural purposes; and non-food resources; the distribution and consumption of these resources; and the set of social relations, specific to native communities, through which the production, distribution and consumption of these resources are organized" (Weinstein, 1992).

Traditional land use practices are generally considered to be more than just food collecting or harvesting of resources that can be sold for money; they are critical activities that reflect the health of the community and its members.

Traditional land use practices are more than just food collecting or harvesting

The regional geographical area for traditional use is broadly defined as the Anvil Range area, with the Pelly River and Campbell Highway the southern boundaries, the Ross River the eastern boundary and the Tay River the western and northern boundaries (Figure 5). Thus, it includes anthropogenic features including the mine sites, the Faro townsite area and various roads on the north side of the Pelly River. The area includes the lands within the Rose, Anvil and Vangorda watersheds and parts of the Blind Creek and Tay Creek watersheds. A broadly defined study area was necessary as the resources upon which traditional land use is based (i.e. caribou, sheep, moose) can be widely scattered across the landscape.

2.9.2 HISTORIC AND EXISTING TRADITIONAL USE DATA

2.9.2.1 Overview

While the following summary of traditional use data for the study area includes historic as well as current (1998-2002) data, the bulk of the discussion refers to the time before the mine was developed and the period of mine operation.

The sources for information on traditional use in the study areas are:

- Data from the Council for Yukon Indians (CYI) Resource Atlas for map sheet 105K (Tay River) assembled in the 1970s for land claims purposes;
- An anthropology thesis (McDonnell, 1975) that discusses the traditional land use activities of the Ross River people;

- A retrospective study completed by anthropologist Martin Weinstein (1992) that is a detailed reconstruction of traditional land use in the mine area and changes to the traditional land use that occurred as a result of the mine;
- Aboriginal language toponyms (place names) for features on map sheet 105K (Tay River);
- A series of interviews conducted by anthropologist Sheila Greer with selected elders of the Ross River Dena community in December of 1999 to confirm if the findings of the Weinstein study were still considered valid and to record any additional information regarding land use (Greer 2000).
- A series of interviews conducted in the week of March 24th, 2003 as part of the current Water License EA by RRDC researchers Doris Dreyer and George Smith. Anthropologist Sheila Greer assisted with the first two days of these interview sessions. During these sessions, permission to release the information pertinent to the E.A. process with a wider audience was granted. Although transcripts of the interview sessions were not provided, a summary report titled "Ross River Dena Traditional Use Study for the Faro Mine Water License Application (2004 to 2008)" was prepared and provided by Ms. Dreyer and Mr. Smith. The discussion of current traditional use activities that follows herein is based on the Dreyer/Smith summary report as well as on Ms. Greer's personal notes. Further details regarding the interview process are given in Section 1.2.3 of this volume.

2.9.2.2 Historical Use Data

The oldest data set with any level of locational detail is the Council for Yukon Indians Resource Atlas material (Table 49). It includes details on two gravesite locations, and four cabin sites in the regional study area. All are situated outside the "local study area" or mine footprint area. Those within the regional study area are noted in the table and on Figure 5.

The Council for Yukon Indians data set cannot be taken as complete or necessarily locationally accurate; it was assembled to demonstrate occupancy and was not intended for land or resource management purposes. Cabin locations, for example, do not represent the geographic limit of land use activities. Rather they functioned as strategically located base camps from which land use activities would have taken place across the land.

Table 49. Council for Yukon Indians Land Use Data (1970s)

#	Location	Description
G-1	Pelly River, at Blind Creek area, within RSA	Gravesite, there are 6 to 7 people resting here
G-2	Pelly River, below Rose Mountain, within RSA	Gravesite, there are several people resting here
C-1	Cabin, mouth of Tenas Creek, on Pelly River	Arthur John, fishing and trapping
C-2	Cabin, Pelly River, below Rose Mountain, within RSA	Sid Atkinson, old trapping cabin
C-3	Cabin, Pelly River, below Rose Mountain, within RSA	Rose cabin, built by a white man
C-4	Cabin, Pelly River, at Van Gorder Creek, within RSA	Arthur John, trapping

C-5	Cabin, Pelly River, at Blind Creek, within RSA	Hoole McLeod and Jack Sterriah
C-6	Cabin, Pelly River, at Grew Creek	Jack Ladue, located on Blind Creek
C-7	Cabin, Blind Lake	Arthur John
C-8	Cabin, Blind Lake area	4 cabins, located on the mountain creek, the people used to hunt sheep from these cabins
C-9	Cabin, Orchay Lake	"Old Jules" very old site
C-10	Cabin, lake on Orchay system	Trapping
Source: CYI Resource Atlas, files RRDC Land Claims Office		

The Weinstein study is the most detailed source on historic traditional use activities in the study area.

The McDonnell anthropology thesis (1975) helps outsiders understand organizational principles of social groups, the importance of food and resource sharing within the society and how and why family groups moved throughout the course of a year. However, it does not feature detailed spatial data on traditional land use data, showing the areas used, which families were using these areas, when they were using them and for what purposes. Nor does it consider in any detail how land use patterns changed for the Ross River people with the opening of the Faro Mine.

The 1992 Weinstein study is the most detailed available source on historic traditional use activities in the study area, as it includes both data and analysis of land use activities. In the Weinstein study, land use at different periods is mapped to build a composite picture of changes to use of the area during the second half of the 20th century. Due to a lack of other information sources, recall information was the main way by which land use data were gathered. Many members of the Ross River Dena ("RRD") community, representing a range of ages, completed extensive questionnaires on individual land use patterns during the 1980s and early 1990s. Detailed maps of land use activities and patterns for 1990 were assembled. The study also incorporated in-depth map data collected during an earlier land use and occupancy study of the Ross River Dena traditional use area (Dimitrov *et al.*, 1984).

Locational data on cabins, salmon fishing camps, and main trails, some of which fall within the RSA, that were used prior to mine development are summarized in Tables 50, 51 and 52 (Weinstein 1992).

Table 50. Cabins - Pre Mine Development

Location	Description
Mouth of Blind Creek, on the Pelly River, within the RSA	Associated with Blind Creek salmon fishery; cabins belonging to Jack Sterriah and Old Man Jules; latter now decayed.
Present Faro Bridge Site, on the Pelly River, within the RSA	At the time of Faro fire, 3 cabins, belonging to Joe Ladue, Joe Etzel, Arthur John burned. After fire, cabins rebuilt by Lydia Glada, Gordon Etzel and Arthur John.
Fish Hook, near mouth of Anvil Creek on the Pelly River, within the RSA	Home base for the Ladue family; cabins belonging to Arthur John, Peter Ladue, Jack Ladue and Joe Ladue.
Swim Lake	There had been a complex of 3 cabins at Swim Lake, but they were destroyed during a fire. Mid-century, tent camps in area.
Blind Lake	Cabin belonging to Joe Ladue.

Location	Description
Tay Lake	Three cabins, belonging to Jack Ollie, Arthur John and Jack Sterriah.
Poison Lake	Two cabins, belonging to Jack Sterriah and Long Hair John.
Lake Near Tenas Creek	Cabin belonging to Duck Johnnie.
Near Tenas Creek	Cabin belonging to Old Johnnie.
Northeast slope of Mount Mye, within the RSA	Cabins belonging to Long Hair John and Jack Sterriah.
West slopes of Dzel Jede; (mountain north of Mt. Mye, spelled Ktl Jhet by Weinstein)	Cabins belonging to Joe Ladue and Pat Pelly.
Laforce Lake	Cabin belonging to Jack Ollie.
Source: Weinstein 1992	

Table 51. Fish Camps - Pre Mine Development

Location	Description
Blind Creek, within the RSA	Salmon fishing; used extensively by Hoole McLeod and family, Joe Ladue and family, Sid Atkinson and family, Oldman Jules and family, Arthur John and family, Jack Ladue and family, Jack Sterriah and family, Alec Shorty and family, Jack Ollie and family, and Skumballah Jack.
Faro Bridge Site, within the RSA	Salmon fishing.
Old Rose Creek, within the RSA	Salmon fishing.
Source: Weinstein 1992	

Table 52. Trails - Pre Mine Development

Anvil Creek, from mouth at Pelly River to Rose Creek, within the RSA.
Anvil Creek, upstream from junction with Rose Creek.
Rose Creek, upstream from mouth at Anvil Creek, southeast and over to Blind Creek, within the RSA.
Pelly River, downstream from Pelly, north through valley on west side of Mount Mye to upper Anvil Creek, within the RSA.
Pelly River, near Faro, north over Mount Mye and continuing north to upper Anvil Creek and DzeÂ Jede area, within the RSA.
Blind Creek, from near mouth on the Pelly, up the south face of Mount Mye and north to upper Blind Creek area, within the RSA.
Blind Creek, upstream to Swim Lakes and northeast to Blind Lakes area and beyond.
Swim Lake, southeast to Orchay Lakes, to Tenas Creek.
Source: Weinstein 1992

Several key sources drew the Ross River people to the area, including salmon fishing, sheep, caribou, moose, and fur-bearers. Several families were directly affected by the development

According to Weinstein (1992), prior to the development of the Faro mine, the Anvil Range and Mount Mye area was one of two focal land use areas for the Ross River people. Several key resources were drawing the Ross River people to the area. These included the salmon fishery at tributaries of the Pelly River; sheep, which were found at various places around Mount Mye; caribou, which were also found in the Anvil Range and Mount Mye area; moose, which was found across the study area; and fur-bearers, the trapping of which tended to be focused on the valley bottom areas of the Pelly River and Blind, Anvil and Rose Creeks. The families who traditionally used the area directly affected by the development were the families of Selkirk Billy, Aklack, Billy Atkinson, Long Hair John, Gumbala, Nahlier, Pat Johnnie, Sue Bill, Joe Ladue, Hoole McLeod, Jack Sterriah, Old Man Jules and Jack Ollie's wife (Weinstein 1992: 88).

Mine development resulted in some disturbances to the Ross River people

Weinstein noted that although the Ross River people persisted with traditional use activities in the Faro area, the intensity of use changed as harvesters encountered the impacts of mine development. These included problems of restricted access with security gates and fencing and firearms use prohibitions; declines in local animal populations which resulted from disturbance, habitat loss and degradation, and increased competition from recreational hunters and fishers; fears of health risks from consumption of wild meat exposed to toxic substances; and increased amounts of disturbance. Disturbance ranged from simple curiosity of Faro residents, for whom the activities of Ross River Dena on the land were interesting anachronisms, to the malicious destruction of trapping sets, poaching of furs, theft of gear and vandalism of cabins (Weinstein 1992).

Trapping at a decreased level has continued in the study area

The Weinstein study noted that the geographic focus of traditional land use by the Ross River people changed significantly with the development of the Faro mine. It was reported that most individuals whose family lands were located in the mine and town development areas shifted their primary harvest effort to other accessible western areas of the band's territory (Weinstein 1992). This geographic shift meant that other parts of the traditional territory of the Ross River people became more heavily used.

The Weinstein study indicated trapping as one traditional use activity that has continued in the study area since mine development. It was noted that fewer individuals were participating in this activity, however.

Aboriginal language place names are another key source for information on traditional land use activities. Place names, or toponyms as they are also called, document key land use activities and often encode historical data. Important resource locales are also usually named (Cruikshank, 1990; Hanks and Winters, 1983). Toponymic data for map sheet 105K have been published (Kaska Tribal Council, 1997; Moore, 1999), and are reproduced on Figure 5. This list of names is an indication of the Ross River peoples' intimate relationship with the study area, and is suggested to be most useful for providing insight into the land use patterns of the Ross River people prior to the development and operation of the Faro mine complex.

Another data set for information on traditional use activities in the study are the 1999 interview sessions conducted by Greer with Ross River Elders. This work was a post-impact assessment, overview level rather than detailed, of the Faro and Ketza mines. The sessions recorded additional information on land use patterns for the period prior to mine development, as well as during the interval of mine operation.

The information shared by the individuals interviewed in 1999 concurred with the Weinstein conclusions. These are, that the presence of the mine resulted in community members shifting their harvesting activities out of the mine site area, and that trapping was one activity that continued to take place during the period of mine operation. Reference was also made in the 1999 interviews to hunting activities in the general study area during the period since the mine was developed. These activities were mentioned in reference to concerns individuals shared about the health of the environment, as it was noted that diseased animals have been harvested here since the mine began operating.

Current Use Data

Members from all parts of the Ross River Dena community are reported to be using the mine area for traditional use activities since the mine closed.

The 2003 interviews with members of the RRD community documented details on the current (1998-2002 or post mine-shut down) traditional use activities in the general study area, as well as additional information on historic land use activities. The sessions also documented traditional knowledge data on the region's environment, which is presented elsewhere in this report. The summary presented here focuses on the current land use activities and is shared with the permission of the land users who provided the information on their activities. Maps depicting the locations of current traditional land use activities, e.g., berry harvesting sites, moose harvesting locales, trap set locations, trails, etc. were not made available in the Dreyer/Smith summary report.

A considerable number of RRD community adult members are reported to be carrying out traditional use activities in either the regional or local study areas. The number of land users, even an approximate number, cannot be specified from the available information, however. Individuals from all parts of the Ross River Dena traditional territory, not just members of certain families, are reported to now be using the study area. Users include Elders as well as younger community members.

Available information does not suggest that sheep hunting, a traditional use activity that was common prior to mine development, is presently taking place in the regional study area. At least some RRD community members are aware of their right to hunt sheep and of the presence of a healthy, abundant stone sheep population, and they indicated they desired sheep meat. These same individuals reported that they do not carry out this activity because they do not want to have the larger (non-native) community think negatively of Dena people. It was noted that with the development of the Blind Creek sheep wildlife viewing area, this species has been (re)defined by the non-native community as a local tourist attraction. For the RRD community members who talked about this issue, sheep are a source of country food and a species with which their people have had a long and intimate relationship. They reported that they believe they are being watched as they hunt sheep in the regional study area, and that they as individuals and as a community would be viewed negatively if they took this species.

Available information suggests that sheep, caribou, gophers and marmots are not being taken in the area

Available information suggests that caribou hunting, a common activity in the RSA prior to mine development, is no longer taking place here for the simple reason that there are no caribou here. This animal, represented by the large sub-species that was resident in the Mount Mye area, is reported to have moved out when mine development began.

Hunting of gophers (ground squirrels) and groundhogs (marmots) took place in the mine site area prior to mine development. These animals used to be snared in the high country in the late summer/fall, and were then dried and cached for later retrieval. Despite its importance in prior times, the information that is available suggests that the harvesting of gophers and groundhogs is not currently taking place in the study area. This is because the two species, like caribou, moved out of the area when the mine was developed and they have not returned.

It is uncertain where trapping and berry & plant collecting activities are taking place

A couple of RRD community members are reported to be trapping in the RSA. No harvest statistics are available (species and numbers taken), however, nor are the locations of their lines and trap-sets known.

Available information suggests that some berry and plant collecting is taking place presently in the RSA, but the location of these activities is unknown. The specific locational data that is available suggests that berry collecting may be restricted to the most southern parts of the RSA, around the town of Faro, the Campbell Highway and the Pelly River.

One Ross River Dena family fishes in the mine area; most avoid it because of environmental concerns

One Ross River Dena family is reported as fishing in the mine site area. Others noted that they do not fish in the mine area because of concerns over the quality of the water and hence the fish. Fish continue to be taken at other locales in the RSA. Drinking water is reported to be collected at various creeks in the RSA, but information on the location of the creeks where water is collected has not been made available.

Good moose habitat is reported in the mine site area. Moose hunting appears to be the predominant traditional use activity current taking place in the study area

Moose hunting, including spotting or searching for the species, is believed to be the predominant traditional use activity in the study area. No details (number, age, sex) are available on the moose taken, nor on the ratio of successful to unsuccessful hunting events. This activity is reported to be taking place at all times of year.

At least some of the individuals interviewed reported that the plateau area where the mine site complex is situated is good moose habit, noting as well, that moose have been appearing in increasing numbers here since the mine shut down. These same individuals reported that moose hunting is taking place along the south flank of the Anvil Range, and further west, up Rose (North Fork), Faro and Next

Creeks, as well as in the Mount Mye area, that is north, south and east, of the Grum and Vangorda Pits.

Various historic aboriginal trails once crisscrossed the RSA (Table 5.5), with a couple running right through or across the LSA. The Vangorda and Grum Pits and the undeveloped Grizzly ore body for example, are situated right where the trail that ran from the Blind Creek valley up to the hunting country of Mount Mye was located. Some current land users reported that the landscape within the LSA has changed so much that they are no longer able to recognize the old trails that they walked on as youths, or even segments of the old trails, should they even still exist. The network of old trails in the RSA has been completely destroyed and they no longer form the basis of travel through the area.

The loss of the aboriginal trail system coupled with the introduction of roads and access routes has changed the way in which hunting takes place in this part of Ross River Dena traditional territory

The loss of the trail system with the development of the mine, coupled with the introduction of a road and access route network is believed to have had considerable impact on the pattern of land use activities in the local study area. Road accessibility is suggested to be an important variable when community members select the mine area for hunting. Available information suggests that individuals drive as far as they can on the mine road system i.e., until a gate or road block is encountered and then proceed further either on foot, or by snow machine or ATV. Difficulty in use of the latter equipment, however, was noted by RRD community Elders and request has been made to allow Elders to drive their vehicles beyond control gates for hunting purposes.

The importance of road accessibility to hunting in this area reflects how land use patterns have changed since the mine was developed. Prior to mine development, extended multi-day hunting trips out on the land, using the traditional trails to access preferred hunting areas, were the norm in this part, as it was in all other parts, of the Ross River Dena traditional territory. Available information suggests that many of the hunting trips now taken in the mine site area are day trips, where an individual or a small group of hunters travel into the mine site area, from a home base that is located elsewhere, such as Ross River. Hunting trips of longer duration, lasting up to two weeks, are noted as occurring, but the location of these trips is not known. At least some RRD community members noted, however, that overnight hunting trips in the study area are less desirable given the extent of disturbance and the area's heavy use by non-natives.

Traditional use activities are believed to have increased in the mine area since operation ceased; they are expected to further increase as environmental conditions improve

To conclude, available information suggests that while the range of traditional use activities that are currently taking place in the study area is certainly reduced from pre-mine times, the frequency of traditional use activities appears to have increased from that which took place during the years of mine operation and even since the 1999 interviews were conducted. Details are lacking, however, on specifically where the traditional use activities of trapping, berry and plant collecting, and water collecting are taking place within the regional study area. Moose hunting, is believed to be the predominant current traditional use activity, and moose hunting appears to be taking place in the local (mine footprint) and regional study areas. Fishing within the local study area (mine footprint) appears to be an activity of limited appeal within the RRD community, being carried out by only one family.

2.10 HERITAGE RESOURCES

2.10.1 HERITAGE STUDY AREAS

In considering the potential for impacts to heritage resources both a local (mine footprint) and a RSA approach are employed. The LSA, the area of project activities, includes the footprint of the mine pits, tailings piles, diversion ditches and flumes, waste dumps, landfill sites and access roads. This study area is used when considering the potential for direct impacts to heritage resources, that is, disturbance or destruction of the resource.

The RSA for traditional use is broadly defined as the Anvil Range area, with the Pelly River and Campbell Highway the southern boundaries, the Ross River the eastern boundary and the Tay River the western and northern boundaries (Figure 5). Thus, it includes anthropogenic features including the mine sites, the Faro townsite area and various roads on the north side of the Pelly River. The area includes the lands within the Rose, Anvil and Vangorda watersheds and parts of the Blind Creek watershed. A broadly defined study area was necessary as the resources upon which traditional land use is based (i.e. caribou, sheep, moose) can be widely scattered across the landscape.

The RSA is employed when considering the potential for indirect impacts to heritage resources. It incorporates the Anvil Range and all of the Vangorda and Rose Creek Watersheds, and small parts of the Blind Creek and Tay Creek watersheds. The RSA thus includes the following anthropogenic features: the mine sites, the Faro townsite area and the various roads on the north side of the Pelly River.

Indirect impacts refer to the pilfering of moveable heritage resources (artifacts) from heritage sites through illegal collecting, or the unintentional destruction or vandalism of sites in the region, through increased human presence in the general project area. Another example of an indirect impact might be destruction of grave fences at gravesites located off the project property.

The potential for direct impacts to heritage resources is considered to be higher than the potential for indirect impacts, and therefore the potential for the former are examined more closely in an environmental assessment. Consideration of direct impacts to Heritage Resources is limited to the local study area, whereas for consideration of indirect impacts the regional study area is being used. This differential treatment is justified because the scale of proposed project activities is limited in nature i.e., care and maintenance, rather than extensive new development. Indirect impacts such as artifact pilfering and structure vandalism are more typical with a larger development projects in pristine or undisturbed contexts. Similarly, the extent of human presence in the local and regional study areas in the period between when the mine was first developed to when it closed in 1998 is much larger by many orders of magnitude that which is expected to take place during the period of project operation. A larger population using the area would mean a greater chance of indirect impacts, and the anticipated small population means significantly less chance of indirect impacts.

2.10.2 CHARACTERIZATION/DEFINITION OF HERITAGE RESOURCES

The term heritage resource is used most often to refer to material remains that relate to human history. Of present concern are locale-specific resources, or heritage sites, where heritage structures or moveable heritage resources (artifacts) or structures are found. Natural landscape features, such as legend places and named places that are of historic or cultural significance can also be considered heritage resources or sites, even though they do not have material remains. This might be the case if such locales have heritage value to a group, such as the First Nations, who have traditionally lived in the area.

Archaeological sites are the most commonly recognized type of locale-specific heritage resource in Yukon. They are an important part of the Territory's record of human history since they are the material remains that represent the precontact (or prehistoric) way of life of the ancestors of the Territory's First Nations. Some prehistoric sites include above ground structures such as caches and hunting blinds.

Historic sites, featuring buildings or above-ground structures, as well as buried archaeological deposits, are another type of commonly recognized heritage site in the Territory. The upper cut-off or most recent date for historic sites varies; the Yukon Heritage Branch currently uses a date of ca. 1950.

In the Yukon, while paleontological finds are also considered Heritage Resources, impacts to paleontological sites are not considered as part of project development impact assessment studies. Nonetheless, it is worth noting that while there are no known paleontological sites in the RSA, a significant paleontological find area is located just outside of Ross River.

While the Ross River Dena Council are not signatory to the Yukon Umbrella Land Claim Agreement, this Constitutional document formally recognizes First Nations' interests in the Territory's heritage resources. First Nations own all heritage resources on Settlement Lands and all ethnographic moveable heritage resources that are found in their respective Traditional Territories that are directly related to the culture and history of Yukon First Nations people.

2.10.3 HISTORIC AND EXISTING DATA ON HERITAGE RESOURCES

For heritage resources, historic and current data are one and the same.

Information on heritage resources prior to, during and following the facility operation within the regional study area has been collected from the following sources:

- The Canadian Heritage Inventory Network database, which is the register for archaeological sites maintained by the Canadian Museum of Civilization (available at the Yukon Heritage Branch);
- The Yukon Historic Sites Inventory database, which is maintained by the Yukon Heritage Branch; and
- Existing sources on the history and traditional land use patterns of the Ross River people, including interviews with selected elders of the Ross River Dena community in Ross River conducted by S. Greer in December of 1999, and the more recent interviews conducted in 2003.

Review of the data in the Canadian Heritage Inventory Network shows that there are no registered archaeological sites within the RSA. Archaeological sites have been identified only a short distance outside the RSA boundary as well as around the Ross River settlement and elsewhere along the Campbell Highway.

There are no historic sites registered in the Yukon Historic Sites Inventory database. Review of the site files shows six historic sites, listed in Table 53, identified just outside the RSA boundary (also noted on Figure 5).

Table 53. Registered Historic Sites Located Just Outside Study Area

YHSI #	Name/Label	Location	Description/Comment*
105K/03/001	Pelly River Cabin Remains	Pelly River at Blind Creek	Believed to be associated with nearby Sawmill
105K/03/002	Pelly River Sawmill Remains	Pelly River at Blind Creek	Heavy timber frames
105K/03/003	Blind Creek Cabin & Dog Houses	Pelly River at Blind Creek	Abandoned; may have belonged to either Joe Ladue or Jack Sterriah
105K/03/004	Sawmill Buildings	Pelly River at Blind Creek	Equipment shed, 2 residence buildings
105K/03/005	Pelly River Foundation	Pelly River at Blind Creek	Related to lumbering, milling activities
105K/03/006	Blind Creek Grave Site	Pelly River at Blind Creek	5 standing grave fences, and "as many as 25 grave mounds"

Source: Yukon Heritage Branch, Historic Sites Office. * Note: little or no oral history research regarding these sites has been completed.

A significant collection of aboriginal language toponyms has been assembled by the Kaska Tribal Council (1997). The named landscape features within the regional study area are shown on Figure 5. There is no information in the available sources to indicate if any natural landscape features in the study area might be considered heritage resources by the Ross River people.

More detailed examination of the existing heritage resource data sources and related documentation shows, however, that:

- No archaeological or historic site inventory work has ever been completed in either the local (mine footprint) or regional study areas. That is, no information was collected on heritage resources in the mine area prior to development.
- Traditional Use data, recorded in interviews with selected Ross River Elders in 1999, as well as that which appears in earlier sources, and in the Dreyer/Smith summary report on the 2003 interviews, suggests that the RSA should have heritage site potential, since prior to the mine development it was a key land use area of the Ross River people. This means it was likely used in earlier times as well, and archaeological evidence of such prior use can be expected.
- A collection of Kaska language toponyms (place names) exists for the RSA, which suggests that there may be natural landscape features or specific locales in the RSA that might be considered heritage resources by the Ross River people.
- Two Ross River Dena gravesites are located in the regional study area. One of these gravesites (the Blind Creek graves) has been registered as a historic or heritage site (105K/03/006), but the second gravesite, located at Rose Creek along the Pelly River (see Table 5.1 in Traditional Use section) is not registered in any government heritage site database (either historic sites or archaeological sites database). Both gravesites are located outside the local study area.

In summary, it is reasonable to conclude that the lack of registered heritage sites in the LSA and RSA can be attributed to the lack of field research and inventory work, rather than the non-existence of heritage resources of interest. The presence of known archaeological and historic sites just outside the RSA is further support for the potential existence of heritage sites within the RSA or within the LSA. There could well be heritage sites within the Local Study area that have not yet been documented.

2.11 VALUED ECOSYSTEM AND CULTURAL COMPONENTS

2.11.1 RATIONALE

Definition of VECC

The detection of environmental effects from a project is complicated by the number of environmental components, vegetation and wildlife species, as well s the natural changes within locations of component study areas. CEAA recognizes that it is not possible, nor particularly useful, to measure effects on all possible receptors (at the component or species level); rather, it is advantageous to focus a limited number of locally significant and measurable receptors that will serve as surrogates for the environmental components as a whole. The same can be said for the social context.

This process involved the selection of a few Valued Ecosystem and Cultural Components (VECCs) for each environmental and social component (such as aquatic resources and traditional use). VECCs can be defined as features of the regional environmental and social setting selected to be a focus of an environmental assessment because of their ecological, social and economic value and their potential vulnerability to effects of the project. VECCs can then be used as a focus of the environmental assessment, as is done in Volume III – Effects Assessment.

In addition, for each VECC, indicators have been identified that can be used to measure changes in that VECC. Detailed descriptions of the selected VECCs and indicators are provided below.

2.11.2 Integration of Traditional Knowledge

Traditional knowledge is acquired by indigenous people over time through direct experience with the environment, and is considered equal to scientific knowledge in EA

As defined under CEAA, Traditional Knowledge is the knowledge base acquired over hundreds of years by indigenous peoples through direct experience and contact with the environment. It takes several forms:

- An intimate and detailed knowledge of the environment including plants, animals and natural phenomena;
- The development and use of appropriate technologies and methods for hunting, fishing agriculture and forestry; and
- A holistic world view that parallels the scientific discipline of ecology.

Traditional knowledge carries the same weight in environmental assessment as scientific knowledge.

For this project, the descriptions of information for traditional land use and heritage resources (areas where traditional knowledge is essential) both identified information gaps that limited the ability to fully describe the conditions. Nonetheless, the information that is available on these topic areas is sufficient to allow for the assessment of the proposed project activities because of the limited scope of the activities (i.e. care and maintenance only).

The gathering and integration of traditional knowledge specific to this project is described in Section 1.2.3 of this volume. The consultation that took place during the environmental assessment process and the integration of the results of the consultation into the Project Description are described in Section 3 of Volume III.

2.11.3 VECCS AND INDICATORS

The selected VECCs and indicators are identified in Table 54. The indicators were selected based on the following selection criteria:

- presence in the regional study area;
- ecological importance;
- existing monitoring where a baseline is available;
- degree of exposure to stressors produced by the project;
- sensitivity to stressors produced by the project;
- socio-economic importance;
- traditional use importance; and
- heritage importance.

VECC indicators were selected as a means of measuring change in the VECC. These were selected based on the existence of data at established locations and the ability to detect measurable changes.

In total, 14 VECCs and 26 indicators were developed (as noted on Table 54). These are used in Volume III, Environmental Effects to determine where project activities will interact with the environmental and social components and to determine what effect, if any, these interactions will result in on the indicator and VECC.

Table 54. Valued Ecosystem and Cultural Components Defined for the Environmental Assessment

Component	VECC	Indicator
Air Quality	air quality in the airshed	maintain air quality within territorial objectives (CCME CWS objective for particulate)
Water Resources	stream flow in the receiving environment	maintain pit elevations within desired range
	stream flow in the receiving environment	maintain site water flow patterns
	stream flow in the receiving environment	maintain water flow patterns off site
	surface water quality in the receiving environment	zinc, sulphate and pH in Rose Creek at R2/X14
	surface water quality in the receiving environment	zinc, sulphate and pH in Vangorda Creek at V8
	groundwater flow in the receiving environment	maintain pit and pond surface water elevations within desired range
	groundwater flow in the receiving environment	construction of new facilities or alterations to existing facilities that would result in changes to groundwater recharge or discharge areas
	groundwater quality in the receiving environment	subsurface zinc, sulphate and pH measured at site X16
	groundwater quality in the receiving environment	subsurface zinc, sulphate and pH measured along the North Fork of Rose Creek
	groundwater quality in the receiving environment	subsurface zinc, sulphate and pH measured below the Vangorda rock dump
	groundwater quality in the receiving environment	subsurface zinc, sulphate and pH measured below the Grum rock dump
Aquatic Resources	fish habitat	metals in sediment in Rose Creek (R2 to R5) compared to reference levels and CCME
	fish habitat	metals in sediment in Vangorda Creek (V5, V27, V8) compared to reference levels and CCME
	fish habitat	benthic invertebrate community structure (abundance and richness) in Rose Creek (R2 to R5) compared to reference communities
	fish habitat	benthic invertebrate community structure (abundance and richness) in Vangorda Creek (V5, V27, V8) compared to reference communities
	fish population health	metals in fish tissue (Arctic grayling liver and muscle, slimy sculpin whole body)
	fish population health	fish presence and abundance
Terrestrial Resources	wildlife habitat integrity	metals in vegetation
	wildlife habitat integrity	vegetation community (structure, diversity)
	wildlife population health	wildlife presence and abundance
Socio-economics	commercial, subsistence and recreational use	Continued use opportunities
Traditional Use	Aboriginal fishery	Continued fish harvesting opportunities
	wildlife harvesting	Continued wildlife harvesting opportunities
	plant harvesting	Continued plant harvesting opportunities
Heritage Resources	heritage sites	No disturbance of heritage sites

3 SITE CHARACTERIZATION

3.1 OVERVIEW OF SITE CHARACTERIZATION

A characterization of the environmental effects of the previous mining activities is not a direct input into the assessment of effects related to the proposed care and maintenance activities. However, such a characterization of historical effects does provide context for understanding the general conditions at the mine sites.

A comprehensive site characterization that describes the historical trends in environmental data and the impacts that the mine has had in the environment was compiled and submitted as Volume 2 of the May 2002 Project Description. Some information from that report is brought forward here for ease of reference, but readers are referred to that report for a more comprehensive description of the historical environmental impacts related to previous (i.e. pre-1998) mining activities.

Additionally, a summary of information that was gathered in 2002 regarding the rock piles around the mine site is summarized herein, with readers referred to the original report (SRK 2003) for more comprehensive descriptions.

3.2 SOIL QUALITY

3.2.1 PHASE 1 ESA METHODOLOGY

Soil samples were collected and analyzed to assess potential contaminants of concern at the site

A Phase 1 Environmental Site Assessment was conducted in the fall of 1999 (GLL 2001) that included the collection and analysis of 58 surficial soil samples from various locations on the Faro and Vangorda Plateau Mine sites (noted on Figures 31 and 32). On the basis of known industrial activities that have occurred at the site, the potential chemicals of concern and their sources were identified as follows:

1. *Petroleum Hydrocarbons* from diesel fuel, gasoline, hydraulic and lubricating oils from the storage, use and disposal of fuels and oils;
2. *Mill and Laboratory Chemicals* from cyanide, xanthates, glycols and others;
3. *Heavy Metals* from mining, milling and processing of mineralized rock as well as naturally occurring concentrations due to natural geochemistry; and
4. *Transformer and Capacitor Fluids* potentially contributed from the former presence of PCB-containing electrical equipment.

Soil samples were collected as surface grab samples. The majority of the soil samples were analyzed to determine concentrations of extractable petroleum hydrocarbons (EPHs) and heavy metals (lead and zinc) with selected soil samples analyzed to determine concentrations of non-halogenated volatiles (BTEX compounds and VPH) polycyclic aromatic hydrocarbons (PAHs), metals and PCBs. One soil sample, collected beneath an area of treated timber storage, was analyzed to determine the concentration of chlorinated phenols and PAHs.

Samples were submitted for chemical analysis to provide confirmation for contaminant observations during the site inspection.

3.2.2 PHASE 1 ESA RESULTS

3.2.2.1 Petroleum Hydrocarbons

Details of elevated petroleum hydrocarbon concentration locations

As indicated on Tables 55 and 56, elevated concentrations of petroleum hydrocarbons were noted in soil samples collected at the following locations:

1. *Faro mill site*: volatile petroleum hydrocarbon (VPH) and xylene from one sample of the berm, which are indicative of gasoline contamination;
2. *The Emergency Diesel Generator and Fuel Supply:* LEPH from one surface soil sample collected downslope of a historical fuel spill and two surface soil samples collected near the pumphouse and fuelling nozzle for the primary fuel tank, also evidence of small scale spills;
3. *Faro Lube Building*: LEPH concentrations in all of four samples and HEPH in one sample, with the source likely being diesel and heavy oils;
4. *Diesel Storage Tanks for Lube Shack Fuel Pump*: Samples LEPH in samples collected from the west side of the gravel berm and at the NE corner of the bermed area;
5. *Historic Fuel Storage Near the Core Shacks and at Scrap Area to NW of Faro Pit*: LEPH in samples collected directly adjacent to the tank pads and dispensing area;
6. *Waste Oil Handling Area*: LEPH and HEPH in the sample collected at the shipping container;
7. *Partially Buried Waste Oil Tank and Washbay Diesel Tank*: LEPH in the sample taken at the front of the washbay;
8. *Reagent Mix Building*: HEPH in one sample taken in front of the loading doors for the building;
9. *Grum Ore Haul Maintenance Shop*: LEPH in samples from the weigh scale and the east exit of the area; and
10. *Grum Lube Shop and Diesel Storage Tanks*: LEPH in two of the soil samples collected in the near a former aboveground fuel tank location at the lube shop and downslope of the lube shop area in the direction of surface runoff.

3.2.2.2 Lead and Zinc

The highest concentrations of lead and zinc were found near the concentrate load-out on the Faro Mine site

Lead and zinc concentrations were also determined in selected soil samples collected from various areas. Metal concentrations in soil samples were determined from the old tailings spill area downstream of the Rose Creek tailing facility. Generally, the concentrations of lead and zinc detected in the soil samples are indicative of metal contamination from historical mining and milling activities.

Table 55. Extractable Petroleum Hydrocarbons and BTEX Compounds in Soil (ug/g)

Sample Location	CCME[a]	YCSR[b]	Truck Laydown Area			Temporary Drum Storage			Waste Oil Handling Area		Tank Cradle	Tank & Pumphouse		Emergency Generator &	
Location Number			1			2			2a		3	4		5	
Sample ID			TLA 1	TLA 2	TLA 3	TDS 1A	TDS 2A	TDS 3A	WHA 2	WHA 3	TC 2	TP 1	TP 2	EG 1	EG 2
Sample Depth (m)			0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Extractable Hydrocarbons															
EPH (C10-19)	-	2000	<200	<200	<200	<200	<200	<200	569	**7940**	<200	**30500**	<200	<200	**5400**
EPH (C19-32)	-	5000	556	272	732	512	<200	<200	2810	**9340**	306	3480	<200	<200	1310

Sample Location	CCME[a]	YCSR[b]	Reagent Mix Bldg.		Waste Oil & Wash Bay Tanks			Lube Bldg.		Gasoline Tank Near Guardhouse			
Location Number			6		7			8		10			
Sample ID			RMB 1	RMB 2	WOT 1	WOT 2	WOT 3	LB 1	LB 2	GT 1A	GT 1B	GT 2A	GT 3A
Sample Depth (m)			0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Extractable Hydrocarbons													
EPH (C10-19)	-	2000	227	<200	<200	<200	**4640**	788	298	-	1340	-	-
EPH (C19-32)	-	5000	**5350**	1200	251	920	310	3990	4100	-	<200	-	-
Non-halogenated Volatiles													
Benzene	5	8	-	<0.04	-	-	-	-	-	0.08	-	0.14	0.97
Ethylbenzene	20	50	-	<0.05	-	-	-	-	-	4.89	-	0.09	0.89
Styrene	50	50	-	<0.05	-	-	-	-	-	<0.05	-	<0.05	<0.05
Total Xylenes	20	50	-	0.09	-	-	-	-	-	**95.4**	-	0.51	7.84
VPH	-	200	-	-	-	-	-	-	-	**741**	-	<100	<100

Sample Location	CCME[a]	YCSR[b]	Faro Lube Shack				Tank Farm				Coreshack Area		Tank Pad	
Location Number			11				12				13		14	
Sample ID			FLS 1	FLS 2	FLS 3	FLS 4	TF 1	TF 2	TF 3	TF 4	CA 1	CA 3	TAP 1	TAP 2
Sample Depth (m)			0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Extractable Hydrocarbons														
EPH (C10-19)	-	2000	**2300**	**3690**	**10000**	**3480**	**9340**	<200	<200	**26200**	**12400**	**2540**	404	1870
EPH (C19-32)	-	5000	1070	1490	4670	**6790**	1420	463	<200	737	3570	2310	<200	254
Non-halogenated Volatiles														
Benzene	5	8	-	-	0.01	-	-	-	-	-	-	-	-	-
Ethylbenzene	20	50	-	-	<0.01	-	-	-	-	-	-	-	-	-
Styrene	50	50	-	-	<0.01	-	-	-	-	-	-	-	-	-
Toluene	0.8	30	-	-	0.04	-	-	-	-	-	-	-	-	-
Total Xylenes	20	50	-	-	0.09	-	-	-	-	-	-	-	-	-
VPH	-	200	-	-		-	-	-	-	-	-	-	-	-

Notes: *"<" = less than the analytical detection limit*

[a] CCME. 1999. Canadian Soil Quality Guidelines for Protection of Environmental Quality and Human Health

[b] Government of Yukon. 1997. Contaminated Sites Regulation. Generic and Matrix Numerical Soil Standards

Bold *Exceeds the Yukon CSR standards for industrial land use*

Table 55. Extractable Petroleum Hydrocarbons and BTEX Compounds in Soil (ug/g)

Sample Location	CCME[a]	YCSR[b]	Grum Orehaul Maintenance Area			Grum Administration Area		Lube Shop & Diesel Tanks				Old Shop & Grum Portal	
			15			16		17				18	
Sample ID			OMS 2	OMS 3	OMS 4	GAA 2	GAA 3	GLS 1	GLS 2	GLS 3	GLS 5	OS 1	OS 4
Sample Depth (m)			0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Extractable Hydrocarbons													
EPH (C10-19)	-	2000	1980	**7980**	**4150**	-	<200	248	<200	**3550**	**9280**	<200	<200
EPH (C19-32)	-	5000	2870	4070	2250	-	<200	<200	<200	376	444	<200	<200
Non-halogenated Volatiles													
Benzene	5	8	-	-	-	<0.04	<0.04	-	-	-	-	-	-
Ethylbenzene	20	50	-	-	-	<0.05	<0.05	-	-	-	-	-	-
Styrene	50	50	-	-	-	<0.05	<0.05	-	-	-	-	-	-
Toluene	0.8	30	-	-	-	<0.05	<0.05	-	-	-	-	-	-
Total Xylenes	20	50	-	-	-	<0.05	<0.05	-	-	-	-	-	-
VPH	-	200	-	-	-	<100	<100	-	-	-	-	-	-

Notes: *"<" = less than the analytical detection limit*

[a] *CCME. 1999. Canadian Soil Quality Guidelines for Protection of Environmental Quality and Human Health*

[b] *Government of Yukon. 1997. Contaminated Sites Regulation. Generic and Matrix Numerical Soil Standards*

Bold (boxed) *Exceeds the Yukon Exceeds CCME Industrial Guidelines*

Table 56. PAHs, PCBs and Chlorinated Phenols in Soil (ug/g)

Sample Location	CCME[a] Industrial Guideline	YCSR[b] Industrial Standard	Old Shop & Grum Portal		Faro Lube Shack	Orehaul Maintenance Shop
Location Number			18		11	15
Sample ID			OS 3	OS 4	FLS 3	OMS 1
Physical Tests						
pH			7.94	7.87	-	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	-	-	0.01	-	<0.8	-
Acenaphthylene	-	-	0.01	-	<0.2	-
Anthracene	-	-	0.03	-	0.3	-
Benz(a)anthracene	10	10	0.01	-	<0.1	-
Benzo(a)pyrene	0.7	10	<0.01	-	0.02	-
Benzo(b & k)fluoranthene	10	10	0.01	-	<0.01	-
Dibenz(a,h)anthracene	10	10	<0.01	-	<0.01	-
Benzo(g,h,i)perylene	-	-	<0.01	-	<0.01	-
Benzo(k)fluoranthene	-	10	0.12	-	<0.1	-
Chrysene	-	-	<0.01	-	<0.01	-
Fluoranthene	-	-	0.17	-	0.1	-
Fluorene	-	-	0.05	-	1.2	-
Indeno(12,3)pyrene	10	10	<0.01	-	<0.01	-
Naphthalene	22	50	<0.01	-	<0.8	-
Phenanthrene	50	50	1.15	-	2.2	-
Pyrene	100	100	0.55	-	0.8	-
Total Polychlorinated Biphenyls	33	15	-	-	-	<0.05
Chlorinated Phenolics						
2,3,4-Trichlorophenol	5	5	<0.02	-	-	-
2,3,5-Trichlorophenol	5	5	<0.02	-	-	-
2,4,5-Trichlorophenol	5	5	<0.02	-	-	-
2,4,6-Trichlorophenol	5	5	<0.02	-	-	-
2,3,4,5-Tetrachlorophenol	5	5	0.08	-	-	-
2,3,4,6-Tetrachlorophenol	5	5	0.2	-	-	-
2,3,5,6-Tetrachlorophenol	5	5	0.08	-	-	-
Pentachlorophenol	7.6	50	**24.5**	-	-	-

Notes: "<" = denotes less than the analytical detection limit

[a] CCME. 1999. Canadian Soil Quality Guidelines for Protection of Environmental Quality and Human Health.

[b] Government of Yukon. 1997. Contaminated Sites Regulation. Generic and Matrix Numerical Soil Standards

Bold	*Sample exceeds CCME Industrial Guideline*
Bold	*Sample exceeds Yukon CSR Industrial Standard*

As noted on Table 57 soil samples collected at the Faro Mine site contain higher concentrations of lead and zinc than samples collected at the Grum mine site due, likely to the presence of milling operations and the longer operating history. The highest concentrations of lead and particularly zinc were found in soil samples collected near the concentrate load-out on the Faro Mine site. The major source of metal contamination in surface soils within the Faro mill area was attributed to the presence of concentrate storage areas and vehicle tracking within the mine and mill site areas.

3.2.2.3 Summary

The following summary regarding surficial soil quality are repeated from GLL 2001:

In terms of surficial soil quality, several localized areas of concern were identified

1. Petroleum hydrocarbon contamination appears to be localized within the source areas for storage and dispensing of fuel and oil products;
2. Concentrations of LEPH were greatest at several fuel and oil storage and dispensing areas at the Faro and Vangorda Plateau Mine sites. PAHs and BTEX compounds were not present at elevated concentrations;
3. Levels of petroleum hydrocarbon contamination in soils are higher at the Faro Mine site than at the Vangorda Plateau, likely due to the longer history of mine operations; and
4. High concentrations of residual oils in surface soils were noted at the Faro Pit Lube Shop and Grum Lube Shop, which may be migrating from the source area via surface runoff.

The concentrate load-out area represents an area of concern with respect to the presence of residual concentrate and the associated elevated metal concentrations in surficial soils.

3.3 CONTAMINANT LOADING

3.3.1 METHODOLOGY

Contaminant loadings were calculated using 'predicted' and 'observed' loadings

A preliminary contaminant loading study was completed in 2002 for sulphate and total zinc in Rose Creek (GLL 2002b). The results of water balances for the North Fork of Rose Creek, Rose Creek at X14 and Vangorda Creek were combined with measured and extrapolated concentrations of sulphate and zinc to provide calculated loadings for each of the time steps defined in the water balances. Total zinc was used for this study (rather than dissolved zinc) because the record of analysis for total zinc is much more extensive.

Loadings for the three areas were calculated in two ways:

- A "predicted" loading was calculated as the sum of the individual source terms; and

Table 57. Metal Concentrations in Soil (ug/g)

Sample Location	CCME[a] Industrial Guideline	YCSR[b] Industrial Standard	Historical Rose Creek Tailings Facility Spill Area			Emergency Tailings Disposal Area			Truck Laydown Area		Temporary Drum Storage Area	Emergency Generator	Reagent Mix Bldg.	Lube Bldg.
Location Number						20			1		2	5	6	8
Sample ID			RC#1	RC#2	RCB#3	TD#1	TD#2	TD#3	TLA 1	TLA 3	TDS 3A	EG 2	RMB 2	LB 1
Sample Depth (m)											0.1-0.2m			
Physical Tests														
pH			3.06	3.67	5.52	8.09	2.16	3.21			6.23			
Total Metals														
Antimony	40	40	<20	<20	<20	<20	<40	<20			26			
Arsenic	12	60	**53**	**18**	**16**	**16**	**346**	**16**			**53**			
Barium	2000	2000	146	669	362	178	4	373			34			
Beryllium	8	8	1.2	0.8	0.8	0.7	<1	<0.5			0.6			
Cadmium	22	8-650[c]	<0.5	<0.5	1.2	1.9	2.1	0.9			14.1			
Chromium	87	60	55	36	56	40	8	12			23			
Cobalt	300	300	11	10	14	10	103	4			10			
Copper	91	250	**95**	36	38	52	**864**	64			**195**			
Lead	600	2000	**723**	98	60	**1240**	209	553	**3530**	**2110**	**9550**	164	492	**2210**
Mercury	50	10	0.553	0.094	0.052	0.95	8.23	0.252			5.87			
Molybdenum	40	40	<4	<4	4	<4	<8	<4			<4			
Nickel	50	500	35	25	50	29	<10	8			22			
Selenium	10	10	<2	<2	<2	<2	<2	<2			<2			
Silver	40	20	<2	<2	<2	<2	16	<2			12			
Tin	300	300	<10	<10	<10	<10	<20	<10			<10			
Vanadium	130	-	64	46	75	37	20	27			34			
Zinc	360	600	**433**	108	198	**1280**	**2670**	**568**	**4760**	**2730**	**10500**	**4590**	**16600**	**3250**

Notes: "<" = denotes less than the analytical detection limit

[a] CCME. 1999. Canadian Soil Quality Guidelines for Protection of Environmental Quality and Human Health.

[b] Government of Yukon. 1997. Contaminated Sites Regulation. Generic and Matrix Numerical Soil Standards.

[c] Standard varies with soil pH

Bold	*Sample exceeds CCME Industrial Guideline*
Bold	*Sample exceeds Yukon CSR Industrial Standard*

Table 57. Metal Concentrations in Soil (ug/g)

Sample Location	CCME[a] Industrial Guideline	YCSR[b] Industrial Standard	Waste Oil & Wash Bay Tanks	Gasoline Tank Near Guardhouse	Faro Lube Shack		Oil Tank Farm	Coreshack Area	Orehaul Maintenance Shop	Grum Lube Shop & Diesel Tanks		Old Shop & Grum Portal
Location Number			7	10	11		12	13	15	17		18
Sample ID			WOT 2	GT 3B	FLS 1	FLS 4	TF 2	CA 3	OMS 4	GLS 1	GLS 2	OS 4
Sample Depth (m)				0.2-0.3								
Physical Tests												
pH												7.87
Total Metals												
Antimony	40	40										<20
Arsenic	12	60										**52**
Barium	2000	2000										224
Beryllium	8	8										0.5
Cadmium	22	8-650[c]										1.4
Chromium	87	60										44
Cobalt	300	300										16
Copper	91	250										47
Lead	600	2000	81	**4800**	**1140**	**2370**	**805**	**1220**	**636**	547	152	257
Mercury	50	10										**0.264**
Molybdenum	40	40										<4
Nickel	50	500										48
Selenium	10	10										<2
Silver	40	20										<2
Tin	300	300										<10
Vanadium	130	-										35
Zinc	360	600	223	**4150**	**1890**	**10100**	**2340**	**1150**	**1220**	**825**	174	**570**

Notes: "<" = denotes less than the analytical detection limit

[a] CCME. 1999. Canadian Soil Quality Guidelines for Protection of Environmental Quality and Human Health.

[b] Government of Yukon. 1997. Contaminated Sites Regulation. Generic and Matrix Numerical Soil Standards.

[c] Standard varies with soil pH

Bold	*Sample exceeds CCME Industrial Guideline*
Bold	*Sample exceeds Yukon CSR Industrial Standard*

- An "observed" loading was calculated from sulphate and zinc concentrations and extrapolated flows at the downstream monitoring location for each area: location X2 for the North Fork of Rose Creek, location X14 for Rose Creek and location V8 for Vangorda Creek.

The predicted and observed loadings were compared as a means of assessing the ability of the model to adequately predict the actual loadings.

3.3.2 ROSE CREEK METAL CONCENTRATIONS

The following notes apply to the concentrations used for the North Fork of Rose Creek:

1. Concentrations for location R7 were applied to runoff areas unaffected by mine developments such as runoff from the south side of the North Fork valley;
2. Concentrations from database station FAROCR were applied to flow from the Faro Creek Diversion;
3. Concentrations for groundwater wells BH12, BH13 and BH14 were applied to flow from the Northeast Rock Dump. The shallow groundwater flow was used because this has been regularly collected (twice per year) whereas some intermittent freshet surface flows have been sampled in recent years but this data are sparse and irregular;
4. Concentrations for groundwater wells BH1, BH2 and BH4 were applied to seepage from the Zone II Pit;
5. Concentrations for groundwater wells P96-6, S1, S2 and S3 were applied to runoff from the Intermediate Rock Dump; and
6. Concentrations for database station X2 were applied to the combined flow at location X2.

For the time steps incorporated into this study, three sulphate concentrations and two zinc concentrations were extrapolated from neighbouring data to "patch" the record in places where no data was available.

The following notes apply to the concentrations used for Rose Creek:

1. Flow from the North Fork of Rose Creek was treated as a single source using the measured concentrations at location X2 (i.e. corresponding to the "observed" loadings per section 4.2);
2. Concentrations for location R7 were applied to runoff areas unaffected by mine contaminants such as runoff from the South Fork of Rose Creek, the North Wall Interceptor Ditch and runoff from the south side of the Rose Creek Diversion Canal;
3. Concentrations for location X5 were applied to surface release from the Cross Valley Pond;
4. Concentrations for location X13 were applied to seepage at the toe of the Cross Valley Dam;

5. Groundwater concentrations in the aquifer as presented in the 2001 Tailings Investigation Study (GLL, 2002) were applied to groundwater discharge to surface between the Cross Valley Dam and location X14;
6. Surface runoff between the Cross Valley Dam and location X14 was provided as a separate line item to provide flexibility for future sensitivity analyses with respect to the 1975 tailing spill; concentrations for location R7 were applied to this flow in this study;
7. Concentrations for database station X14 were applied to the combined flow at location X14; and
8. One sulphate concentration for location X14 was increased slightly because the data set excluded samples during a period of release of higher sulphate water from the Cross Valley Pond.

3.3.3 ROSE CREEK LOADINGS

The loading calculations for the North Fork of Rose Creek provide the following observations:

The models for the North Fork of Rose Creek and Rose Creek predicted the largest sources of sulphate and zinc loadings

1. The model predicts 111% of the observed sulphate loading at location X2, which is considered to be a good correlation for this stage of study;
2. The model predicts 77% of the observed zinc loading at location X2; however, the model predicts 90% of the observed loading when one poorly correlated time step (time step no. 10) is excluded, which is considered to be a good correlation for this stage of study;
3. The largest source sulphate loading (over the entire period of study) was natural runoff upstream of location R7 (43% of total) followed by the Faro Creek Diversion and the Intermediate Rock Dump (23% and 22%); and
4. Given item no. 2 above, the largest source of zinc loading (over the entire period of study) was natural runoff upstream of location R7 (52% of total) followed by the Faro Creek Diversion (31%).

The loading calculations for Rose Creek at location X14 provide the following observations:

1. The model predicts 61% of the observed sulphate loading and 68% of the observed zinc loading at location X14, which suggests an imprecise or unknown source term that requires further investigation;
2. The trends in loadings indicate summer peaks corresponding to periods of surface release from the Cross Valley Pond (X5);
3. The largest source of predicted sulphate loading (over the entire period of study) was surface release from the Cross Valley Pond (47%) followed by seepage from the Cross Valley Dam (29%); and
4. The largest source of predicted zinc loading (over the entire period of study) was the North Fork of Rose Creek (50%) followed by surface release from the Cross Valley Pond (32%).

3.3.4 VANGORDA CREEK METAL CONCENTRATIONS

The following notes apply to the concentrations used for Vangorda Creek:

- Concentrations for location V1 were applied to runoff areas unaffected by mine contaminants such as the Vangorda Creek Diversion Flume and runoff from into Vangorda Creek below Shrimp Creek;
- Concentrations for location V25BSP were applied to flow from the Grum Interceptor Ditch;
- Concentrations for location V2 were applied to runoff from the majority of the Grum Rock Dump (approximating Grum Creek drainage area);
- Line items for seepage from the Vangorda Rock Dump and Little Creek Dam were incorporated into the study to allow flexibility in future sensitivity analyses and assumed concentrations were applied for this study;
- Concentrations for database location V4 were applied to flows from Shrimp Creek; and
- Concentrations for database stations V5 and V8 were applied to flow from the West Fork of Vangorda Creek and Lower Vangorda Creek, respectively.

One sulphate concentration for location V4 (Shrimp Creek) was extrapolated from other data for a time step where no data were available.

3.3.5 VANGORDA CREEK LOADINGS

The model for Vangorda Creek showed the largest source for sulphate and zinc loadings was the west fork of the Vangorda Creek

The loading calculations for Vangorda Creek at location V8 provide the following observations:

1. The model predicts 73% of the observed sulphate loading at location V8, which is considered adequate for this stage of study but should be followed with further investigation;
2. The model predicts 74% of the observed zinc loading at location V8, which is considered adequate for this stage of study but should be followed with further investigation;
3. The largest source of sulphate loading (over the entire period of study) was the West Fork of Vangorda Creek (56%) followed by the Grum Rock Dump via Grum Creek (18%); and
4. The largest sources of zinc loading (over the entire period of study) were the West Fork of Vangorda Creek (25%) and the Grum Rock Dump via Grum Creek (23%) followed by the Vangorda Creek Diversion Channel (19%) and the Grum Interceptor Ditch (17%).

3.4 ROSE CREEK TAILINGS FACILITY

3.4.1 SUMMARY OF ACID GENERATING POTENTIAL

The Rose Creek Tailings Facility contains tailings demonstrating strong acid generating potential

The Rose Creek Tailings Facility contains tailings with demonstrated strong acid generating potential (i.e. surface tailings with pH less than 1.5). Oxidation of the exposed tailings over the life of the mine has produced a store of soluble oxidation products, including sulphates, soluble metal salts and acidity. A large portion of the oxidation products appear to be stored in the tailings, due to the buffering of underlying unoxidized tailings.

A comprehensive hydrogeological and geochemical investigation of the tailings facility was conducted in 2001 (GLL 2002c) that included the collection of in-situ samples of tailings and subsequent analysis by static and kinetic test procedures. The study included a comparison of the 2001 information to similar geochemical information that had been collected 11 to 15 years earlier (1986 to 1990) through several studies. A summary of the conclusions of the 2001 geochemical interpretation as repeated from GLL 2002c is as follows:

A summary of the conclusions of the 2001 geochemical interpretations

1. Oxidation of tailings in the unsaturated zone has increased since the 1988-1990 studies as displayed primarily by lower paste pH to greater depths;
2. The water level within the tailings controls the extent of oxidation. This is an important consideration for reclamation since lowering the water elevation in the Intermediate Pond will lower the water level in the tailings upgradient of the pond;
3. Oxidation products (represented by sulphate and zinc) have reached the tailings/native soil interface at most locations. The sulphate "front" has migrated deeper than the zinc "front". This is interpreted to be due to attenuation of zinc enabled by neutral pH within the saturated zone of tailings;
4. Tailings in the southeast end of the Second Impoundment and unsaturated tailings in the northern area of the Original Impoundment are highly oxidized relative to other areas. This is considered to be due to the predominantly coarse particle size and well-drained, unsaturated conditions that have existed at times over the life of the operation; and
5. The southeast end of the Second Impoundment and the northern area of the Original Impoundment are calculated to be the source of approximately 75% of the sulphate load in the aquifer. These two areas occupy only approximately 20% of the total surface area of the tailings impoundments. This suggests that surface remediation of these areas may represent an efficient means of substantially reducing contaminant loading to the aquifer.

3.4.2 SUMMARY OF WATER QUALITY

3.4.2.1 Overview of Available Groundwater Quality Information

Eleven wells were installed within each of the impoundments as part of a hydrogeological and geochemical investigation of the tailings facility

A series of groundwater wells were installed in 2001 as part of a comprehensive hydrogeological and geochemical investigation of the tailings facility: P01-01 to P01-11. These wells are located within each of the impoundments, at the toe of the Intermediate Dam and downgradient of the Cross Valley Dam. These monitoring wells complement the information collected from older wells that were installed in 1981 and 1996.

Three data sets are available for the complete set of 2001 and older monitoring wells: fall (September) 2001 (at the completion of the 2001 drilling activities), spring (June) 2002 and fall (September) 2002. The fall 2001, spring 2002 and fall 2002 data are tabularized and provided in Appendix D. A summary comparison of select parameters for the three recent data sets is also presented in Appendix D.

3.4.2.2 Summary of Observations

Summary observations of the 2001 and 2002 groundwater quality information

The 2001 and 2002 groundwater quality information provides these summary observations:

1. Contaminants leached from the tailings are present at depth in the native aquifer beneath the tailings impoundments and, in some locations, contaminant concentrations increase with depth;
   This is a somewhat unexpected observation and the precise mechanism for dispersion of contaminants to depth has not been identified given the verification by the hydrogeological model that contaminants would be generally expected to travel in the upper zone of the aquifer.
2. Tailings porewater migration within the aquifer does not transport zinc to downgradient areas in substantial concentrations that would allow zinc to be utilized as an indicator of the extent of porewater migration;
   This is not unusual for groundwater migration from sulphidic materials due to chemical and physical mechanisms within the tailings and aquifer that can attenuate the mobility of zinc.
3. Based on observed concentrations of SO_4, porewater migration extends downgradient of the tailings deposit to the toe of the Cross Valley Dam and may have reached the furthest downgradient monitoring wells in the valley centre (locations X17 and X16); and
   Additional investigation and sampling may be beneficial to more precisely determine the "background" level. The current conclusion is based on comparison to sampling upstream of the tailings impoundments.
4. A concentration gradient appears to exist across the width of the valley with greater concentrations of SO_4 observed along the north side.
   This gradient has been evident since around 1987 at location X18 (as compared to locations X16 and X17). Although the root cause is not clearly understood, the lateral gradient may extend upstream into the Intermediate

Impoundment where greater concentrations of SO_4 in tailings and in the shallow aquifer are observed on the north side of the valley (locations P01-06 and X21) than in the valley centre (location P01-05)

3.4.3 HYDROGEOLOGICAL MODEL

3.4.3.1 Approach

Tasks related to groundwater modelling

A hydrogeological model for the Rose Creek Tailings facility was completed as part of the 2001 comprehensive hydrogeological investigation. The following four tasks related to groundwater modeling were completed:

1. Review of hydrogeologic data to be used in model development;
2. Development and calibration of the groundwater flow model;
3. Model analyses to demonstrate flow paths, travel times and contaminant loadings; and
4. Presentation.

3.4.3.2 Review of Hydrogeologic Data

Key factors determining flow paths, travel time and contaminant loadings

Several key factors determine flow paths, travel times and contaminant loadings. These include local stratigraphy, the hydraulic properties of the water-bearing units on-site (i.e. the various types of tailings, native soils, and upper bedrock), rates of recharge, and rates of groundwater discharge to the lower reaches of Rose Creek. A great deal of data was available from historical investigations and from the 2001 field investigation and was compiled into a Microsoft Access and ViewLog geologic database system. The data was analyzed to refine the understanding of the stratigraphy within the Rose Creek valley and estimates of aquifer properties that were needed for development of the groundwater flow model were derived.

3.4.3.3 Development and Calibration

A conceptual model was formulated including an evaluation of the key factors affecting groundwater flow

A conceptual model was formulated as an interpretation of the hydrogeological setting of the study area that included an evaluation of the key factors affecting groundwater flow. Model geometry, boundaries, and initial values for aquifer properties were determined based on the review of existing data and analysis of new information.

MODFLOW was used to transform the conceptual model into a detailed numerical model

The conceptual model was transformed into a detailed numerical model for the Rose Creek valley utilizing the U.S. Geological Survey MODFLOW code ("MODFLOW"). MODFLOW is a three-dimensional, finite-difference code capable of simulating transient and steady-state flow in multi-layered, confined and unconfined, aquifer systems. The computer code is recognized worldwide and has been extensively tested and verified. The code is ideally suited to simulate the highly variable tailings and overburden materials in the study area.

An MS-Access database contains information from wells and test holes

Information from wells and test holes related to stratigraphy, formation properties, and observed water levels and water quality data are contained in an MS-Access database base linked to ViewLog for graphical display and analysis. Model development is made easier through special geostatistical analysis functions used to interpolate hydrogeologic data to the model grids.

A finite difference grid was designed to represent the study area

A finite-difference grid was designed to represent the study area. Model layers were used to represent the various hydrogeologic units (i.e. tailings, sand and gravel, basal till, upper bedrock). Estimates for soil and tailing properties and recharge and discharge rates were used in the initial model runs. Model calibration was conducted by adjusting the initial estimates of aquifer properties and recharge rates until a close match with observed water levels and flow directions was achieved. Sensitivity analyses were conducted to verify the accuracy of the calibration. The particle tracking model, MODPATH, was used to illustrate flow paths and the location of recharge and discharge zones.

3.4.3.4 Analyses

The model was run for various test cases and scenarios with the intent of characterizing the existing subsurface flow regime in the Rose Creek valley. Various scenarios of source terms for particle tracking were analyzed and several selected for presentation that were considered to most clearly characterize the system

3.4.3.5 Presentation

Modelling input data and results are presented in Gartner Lee 2003d.

The raw stratigraphic information used to develop the conceptual model, the parameters used to develop and calibrate the model and the results of model runs that characterize the existing subsurface flow regime are presented in Gartner Lee 2003d. Model input data is presented in tabular format, contour maps or cross sections, as appropriate. Model results, including modeled potentials, drawdowns, and groundwater flow paths under existing hydrogeologic conditions are presented along with an analysis of model results. Stratigraphic sections and borehole logs were provided from the database and presented with geophysical and groundwater quality data as an aid in interpretation of those data.

3.5 ROCK DUMPS

3.5.1 1996 STUDIES – FARO SITE

The geochemistry and ARD potential of the Faro Rock Dumps (see Volume I for a discussion of the dumps and detailed locations) was evaluated as part of the development of the 1996 closure plan (RGC 1996). The evaluation consisted of both a static and kinetic testing program. A summary of the geochemical information, as repeated from RGC 1996, is provided below.

The 5 main rock units identified in the Faro Main pits

The five main rock units identified in the Faro Main Pits and, thereby, in the rock dumps were as follows:

1. Non-Calcareous Schists (Unit 1): includes schist and altered schist from Faro, phyllite from Vangorda Plateau, and carbonaceous phyllite and schist;
2. Sulphides (Unit 2): includes massive and disseminated sulphides and also ribbon banded graphic quartzite from Faro;
3. Calc-Silicate (Unit 3): includes calc-silicate found primarily at Faro but elsewhere in the district and calcareous phyllite from Vangorda Plateau but also elsewhere in the district;
4. Intrusives (Unit 4): includes both intrusives from Faro and meta-intrusives which can be massive or foliated; and
5. Overburden (Unit 5).

Conclusions of the static and kinetic well testing program

Based upon the results of the static and kinetic cell testing programs the following was concluded:

1. The Unit 1 rock type (i.e., non-calcareous schists) could be initially classified as a potentially weak acid generator. However, based on the results of the static and kinetic testing programs it is unclear if this rock type will become significantly acidic in the future. Further kinetic cell testing is required to determine the long-term pH drainage characteristics of this rock type. The testing also indicated that long-term metal leaching, primarily zinc, would occur from this material;
2. The Unit 2 rock type (i.e., sulphide and pyritic quartzite) could be characterized as a relatively strong acid generator with significant levels of associated metal production. Production of acid and various metals from this rock type was considered likely to be rapid due to the high levels of contained sulphur and the lack of any significant levels of neutralizing capacity;
3. The Unit 3 rock type (i.e., calc-silicate) could be classified as a relatively strong acid consumer with the potential for the long-term release of low levels of soluble zinc; and
4. The Unit 4 rock type (i.e., intrusives) could be classified as generally inert. No significant levels of acid producing or acid consuming minerals were present in the intrusives. In addition, no significant levels of leachable metals were present in this rock type.

Strong acid generation is only anticipated from approximately 10% of the total waste rock in the Faro Rock dumps

In summary, strong acid generation is only anticipated from approximately 10% to the total waste rock in the Faro Rock Dumps (i.e., sulphides). The potential for weak acid generation from the schists is a possibility and could potentially increase the acid drainage problem at the site if it were to occur. Metal leaching, primarily zinc, is anticipated to occur at various rates from greater than 90% of the waste rock in the Faro Area.

From an ARD point of view the intrusives appear to be the best material available for construction at the site due to their minimal acid generating and metal leaching characteristics.

3.5.2 1989 AND 1996 STUDIES – VANGORDA PLATEAU SITE

Two acid rock drainage assessment programs were conducted that characterized rock groups mined in the Grum and Vangorda Pits. The 1989 Initial Environmental Evaluation (IEE) report (Curragh 1989) that was prepared as part of the water licensing process included a geochemical characterization of sulphides and phyllites. The 1996 ICAP study (RGC 1996) included geochemical testing that was intended to complement the earlier work and fill in data gaps. The ICAP study included a summary presentation of the earlier test results that was used for this overview. Both studies included both static and kinetic testing.

The following are the primary observations provided in RGC 1996 regarding the available geochemical information:

Primary observations provided by RGC 1996 on available geochemical information.

1. Sulphides from both the Grum and Vangorda Rock Dumps are potentially acid generating and capable of releasing metals over a wide pH range including neutral pH;
2. Vangorda phyllites are slightly acid generating and capable of releasing metals over a wide pH range;
3. Test results for Vangorda Pit phyllites are not directly applicable to the Grum Rock Dump but a correction factor of 12.5% may be appropriate; and
4. Application of the suggested correction factor to Vangorda phyllite test results suggests that Grum phyllites might not be acid generating and might not release metals in significant quantities.

The Vangorda rock dump oxidized fines contain a relatively high acid production potential.

The oxidized fines (Vangorda rock dump, see Volume I for discussion and location) is completely depleted of neutralization potential and contains a relatively high acid production potential, in a range similar to sulphides. The oxidized fines contain a ready store of soluble oxidation products and extraction testing confirmed that metals are readily leached from this material in high concentrations. Several metals were extracted from the oxidized fines in concentrations at least one order of magnitude higher than extracted from a sample of fresh (unoxidized) massive sulphide.

3.5.3 2002 STUDIES

A geochemical study of the Faro and Vangorda Plateau rock dumps was undertaken in 2002 to update the existing body of information and to assess how contaminant loadings from the dumps might change over time (SRK 2002). The 2002 work included:

1. data review;
2. two detailed surface seep sampling surveys (spring and fall);
3. surface mapping and test pitting on rock dumps;
4. drilling and sampling of boreholes with installation of downhole oxygen and temperature probes; and

5. initiation of laboratory testing for acid rock drainage characterization (intended to be ongoing).

The following is the Executive Summary of the 2002 project report provided by SRK Consulting (pers. comm., S. Day):

"The Anvil Range Mining Complex, 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 Interim Receiver has overseen the management of the property under the terms of two water licenses since that time. SRK Consulting is evaluating various aspects of the site as part of closure planning for the complex. This report describes progress on the investigation of the geochemical stability of waste rock.

Mining in both areas of the complex (Faro Site and Vangorda Plateau) was dominantly by open pit. Both areas involved significant pre-stripping of overburden and rock, and ongoing waste rock stripping as mining proceeded. At both sites, several hundred million tonnes of waste rock were produced and placed in nearly 40 dumps, fill areas and stockpiles.

Waste rock in both areas comprises rock types with geochemical characteristics that range from already acid generating to potentially acid generating and acid consuming. Monitoring data indicates generally that seepage is non-acidic, with some exceptions, but often contains elevated concentrations of zinc and cadmium. The long-term trend in seepage chemistry is an important consideration for remedial planning. 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.

This report reviews the existing information (Phase 1) and the programs implemented in 2002 to collect additional information and samples for testing (Phase 2). The testing program (Phase 3) is currently underway.

A bibliography of more than 250 reports was compiled based on existing document lists at SRK Consulting, Deloitte & Touche Inc., Access Consulting Group (ACG) in Whitehorse, the Yukon Water Board and Indian and Northern Affairs Canada. These reports were ranked according to title and four individuals at SRK and ACG reviewed the 140 top-ranked documents. Review comments were compiled using a standard template. The documents were reviewed to evaluate the adequacy of the existing geochemical database, operational procedures for managing waste rock, the inventory of rock in the waste rock dump and the loading of acidity from various sources. The main conclusions of the review were: (1) the extensive water quality database is not easily accessed due to the version of software used to manage the data; (2) the rock geochemical database is useful but more testing will be needed to link the data to field conditions; (3) no documents describing operational procedures are in the public domain; and (4) a detailed inventory of rock types for the Faro waste rock dumps has been completed, but the degree to which different rock types were mixed is not well known.

Field work completed in 2002 included two seepage surveys (June and September), surface waste rock mapping of several waste rock dumps in both mining areas, excavation of 100 test pits and trenches (including five along the Vangorda Plateau Haul Road), drilling and instrumentation of seven holes in waste rock and collection of bulk water samples from the pit lakes.

The seepage surveys showed that a wide range of water chemistry exists in the Faro area with water chemistry broadly correlated to surface waste rock type. Seepage chemistry at the Grum and Vangorda waste rock dumps showed that zinc and sulphate concentrations are probably increasing.

Surface mapping identified sulphide-rich waste rock placed outside areas designated for this type of rock. Field leach tests showed that any rock mixture can be acidic. Sulphide pockets in the Faro waste rock may be present at scales up to 10 of metres. During mapping, three warm air vents were found in the Faro site waste rock.

Test pits and trenches documented the degree of local mixing of waste rock and evaluated the current weathering condition in near-surface materials. Only a few test pits in the Faro area encountered pockets of sulphide rock that were not apparent on surface. In the Grum area, sulphide rock was found in several test pits outside the designated sulphide area and in the uppermost lift of the waste rock dump and few samples had low pH. At Vangorda Pit, test pits indicated that several materials had low pH. A few test pits along the Vangorda Plateau Haul Road identified sulphide rock mixed in with the non-acid generating rock fill. This indicated that rock used for road construction may be a source of acidity and metal leaching.

Sulphide waste rock was confirmed at the location of sulphide rock cells in the Intermediate Dump (Faro) and Grum Dump by drilling. In addition, sulphide waste rock was also encountered in the Intermediate Dump outside the area designed for sulphide waste rock.

The laboratory testing program is based on the information gaps identified by the review and the needs for eventual revision of the site wide water quality predictions and assessment of remedial measures. It is likely that the static testing will be completed by early to mid-January. Kinetic testing, which will follow the static testing, will continue well into 2003."

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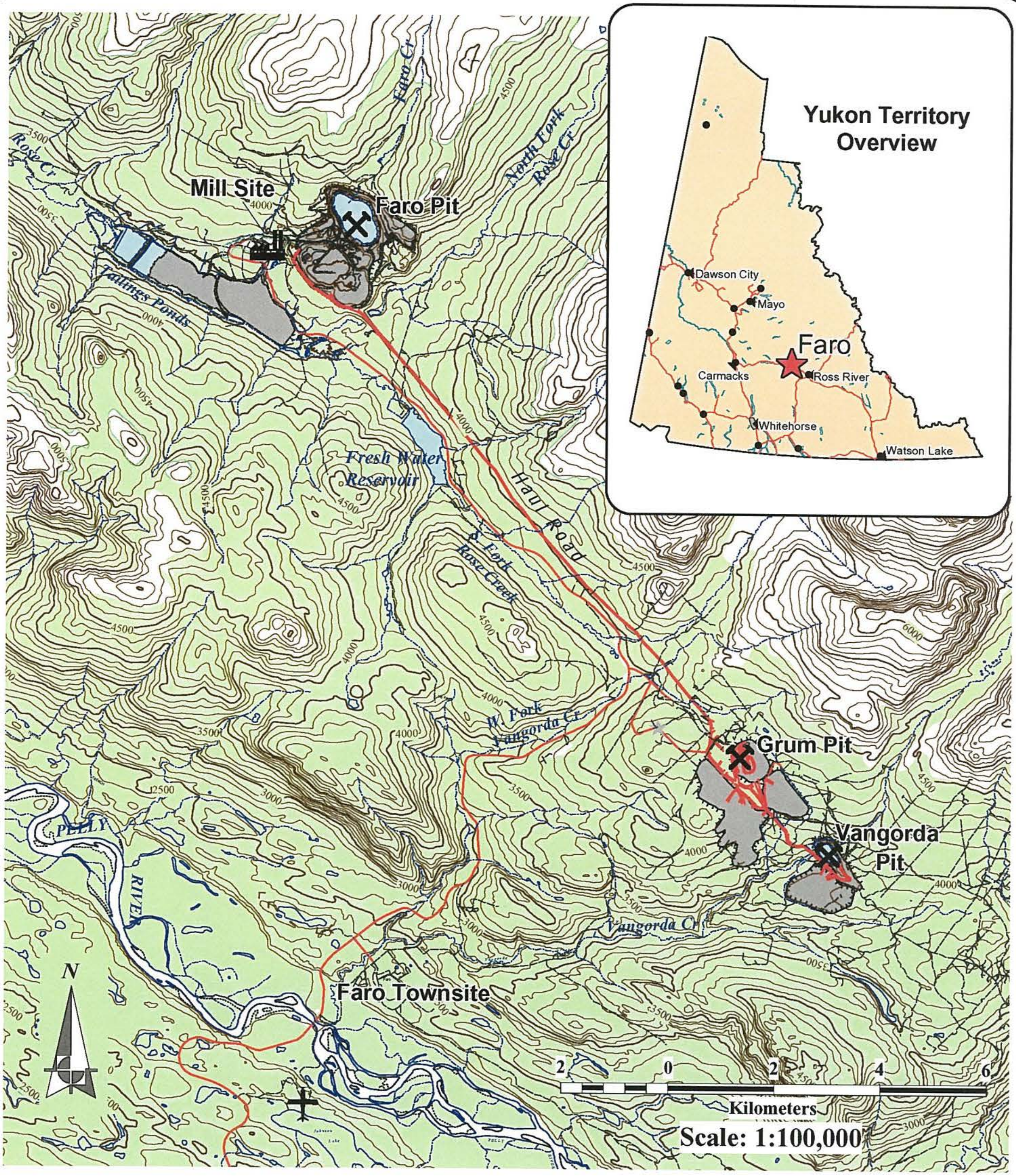
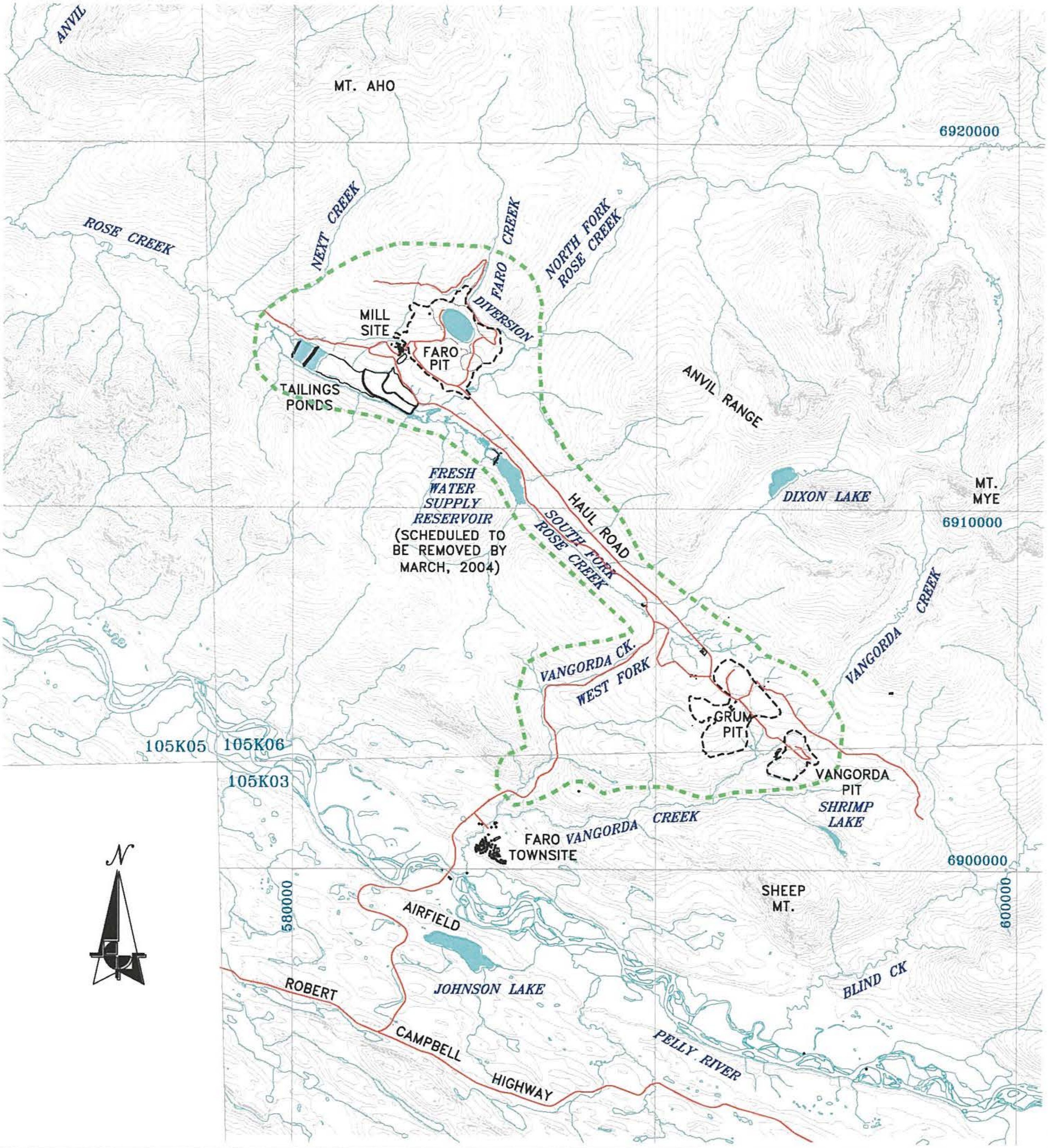
Figures



Site Name: FARO	DELOITTE & TOUCHE INC.	Project No: 22-307
File : 22307-D6-V2-FIG1.PDF	**Project Location Map**	Date Issued: April. 2003
Gartner Lee Limited		**Figure 1**
Scale: 1: 100,000		



LEGEND:

- MAIN ROAD
- SURFACE DRAINAGE
- FOOTPRINT OF OPEN PITS AND ROCK DUMPS
- LOCAL STUDY AREA

0 1.5 3.0 4.5 6.0 7.5 Km

SCALE 1:150,000

COORDINATES ARE UTM NAD83 ZONE 8
CONTOUR INTERVAL 100 FT.

DRAWING INFORMATION:	
REVIEWED BY:	LH
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-D6-V2-01.DWG
REVISION:	0

ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

LOCAL STUDY AREA

Gartner Lee

Deloitte & Touche

VOLUME 2
FIGURE NO. 2

SUMMARY TABLE OF SAMPLING SITES

SITE	WATER	SEDIMENT	BENTHIC INVERTEBRATES
R1	√		√
R2/X14	√	√	√
R3	√		√
R4	√	√	√
R5	√		√
R6	√	√	√
R7	√		√
V1	√	√	√
V2	√		
V4	√		
V5	√	√	√
V6A	√		
V8	√	√	√
V27	√	√	√
V25BSP	√		
VGMAIN	√		
W10	√		
FC	√		
X2	√		
X5	√		
X13	√		
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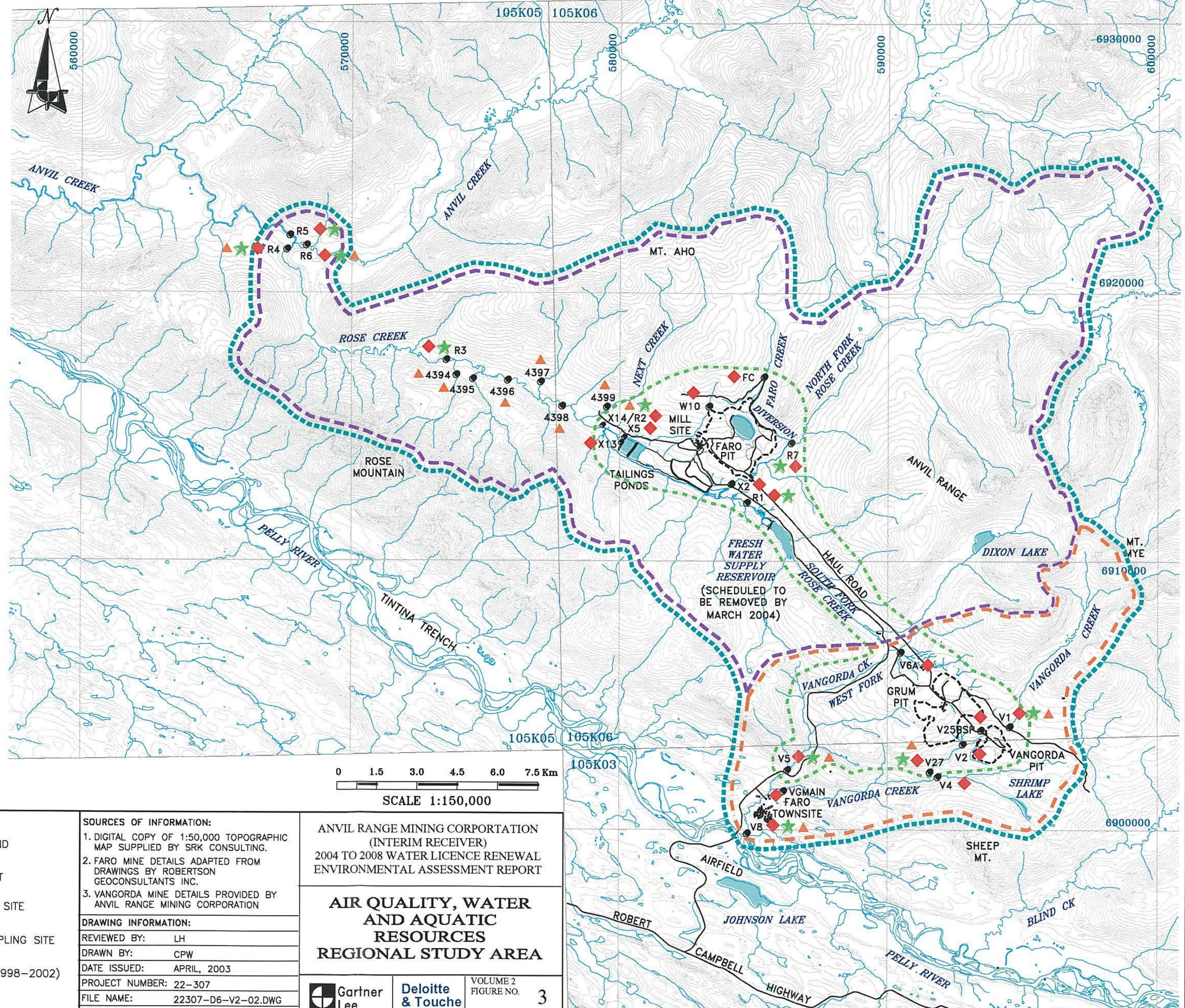
4397		√	
4398		√	
4399		√	



LEGEND:

- MAIN ROAD
- SURFACE DRAINAGE
- FOOTPRINT OF OPEN PITS AND ROCK DUMPS
- ROSE CREEK WATERSHED
- VANGORDA WATERSHED
- LOCAL STUDY AREA
- AIR QUALITY, WATER AND AQUATIC RESOURCES REGIONAL STUDY AREA

V1 ● SAMPLING SITE LOCATION AND IDENTIFICATION

TYPE OF SAMPLING CONDUCTED AT SAMPLING SITE:

- WATER QUALITY MONITORING SITE (1998–2002)
- BENTHIC INVERTEBRATE SAMPLING SITE (1998–2002)
- SEDIMENT SAMPLING SITE (1998–2002)

COORDINATES ARE UTM NAD83 ZONE 8
CONTOUR INTERVAL 100 FT.

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.
3. VANGORDA MINE DETAILS PROVIDED BY ANVIL RANGE MINING CORPORATION

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ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
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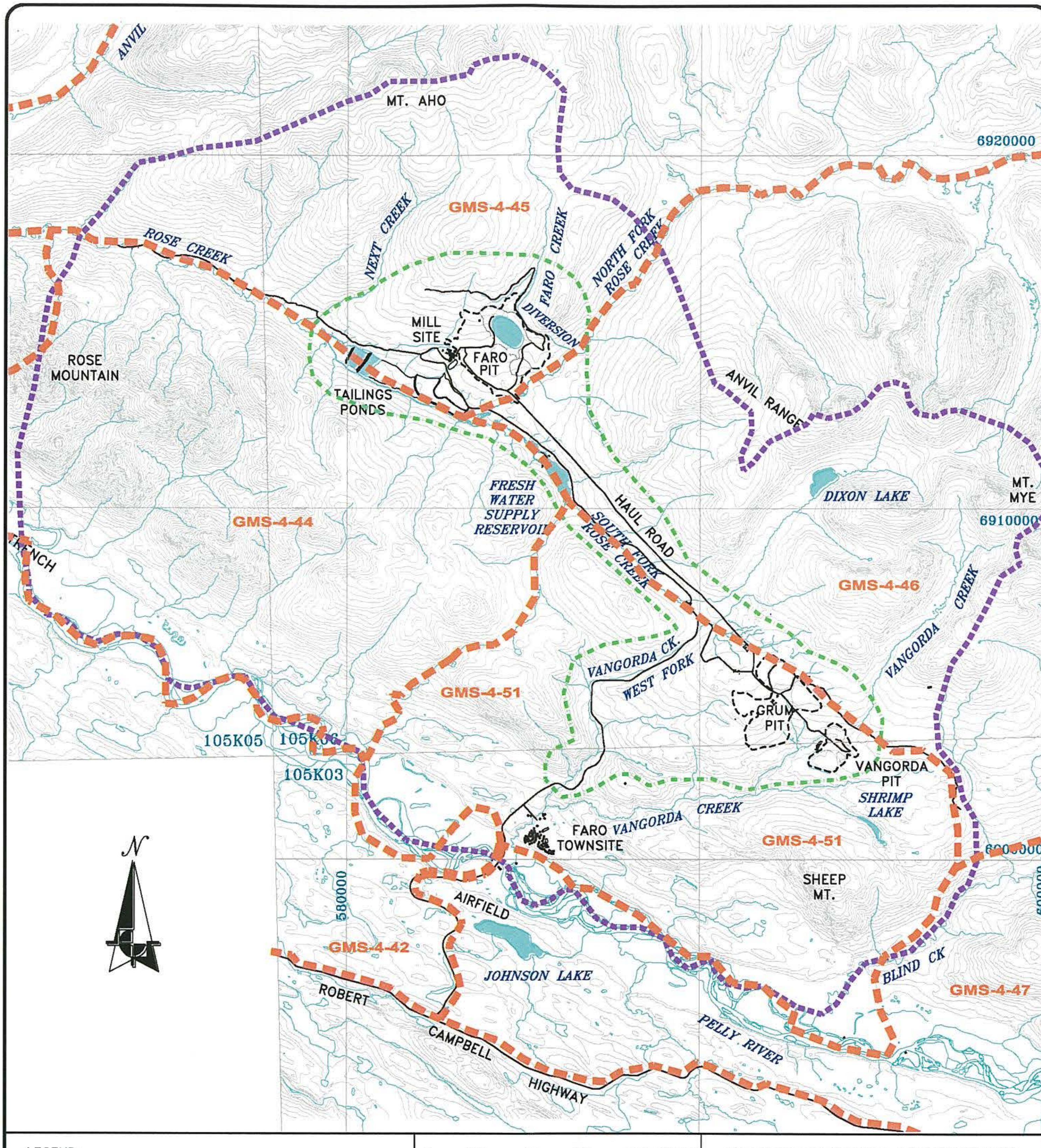
ENVIRONMENTAL ASSESSMENT REPORT

AIR QUALITY, WATER AND AQUATIC RESOURCES REGIONAL STUDY AREA

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 3



LEGEND:

- MAIN ROAD
- SURFACE DRAINAGE
- FOOTPRINT OF OPEN PITS AND ROCK DUMPS
- LOCAL STUDY AREA
- APPROXIMATE TERRESTRIAL REGIONAL STUDY AREA
- GAME MANAGEMENT SUB-ZONE

0 1.5 3.0 4.5 6.0 7.5 Km

SCALE 1:150,000

COORDINATES ARE UTM NAD83 ZONE 8
CONTOUR INTERVAL 100 FT.

DRAWING INFORMATION:	
REVIEWED BY:	LH
DRAWN BY:	CPW
DATE ISSUED:	APRIL, 2003
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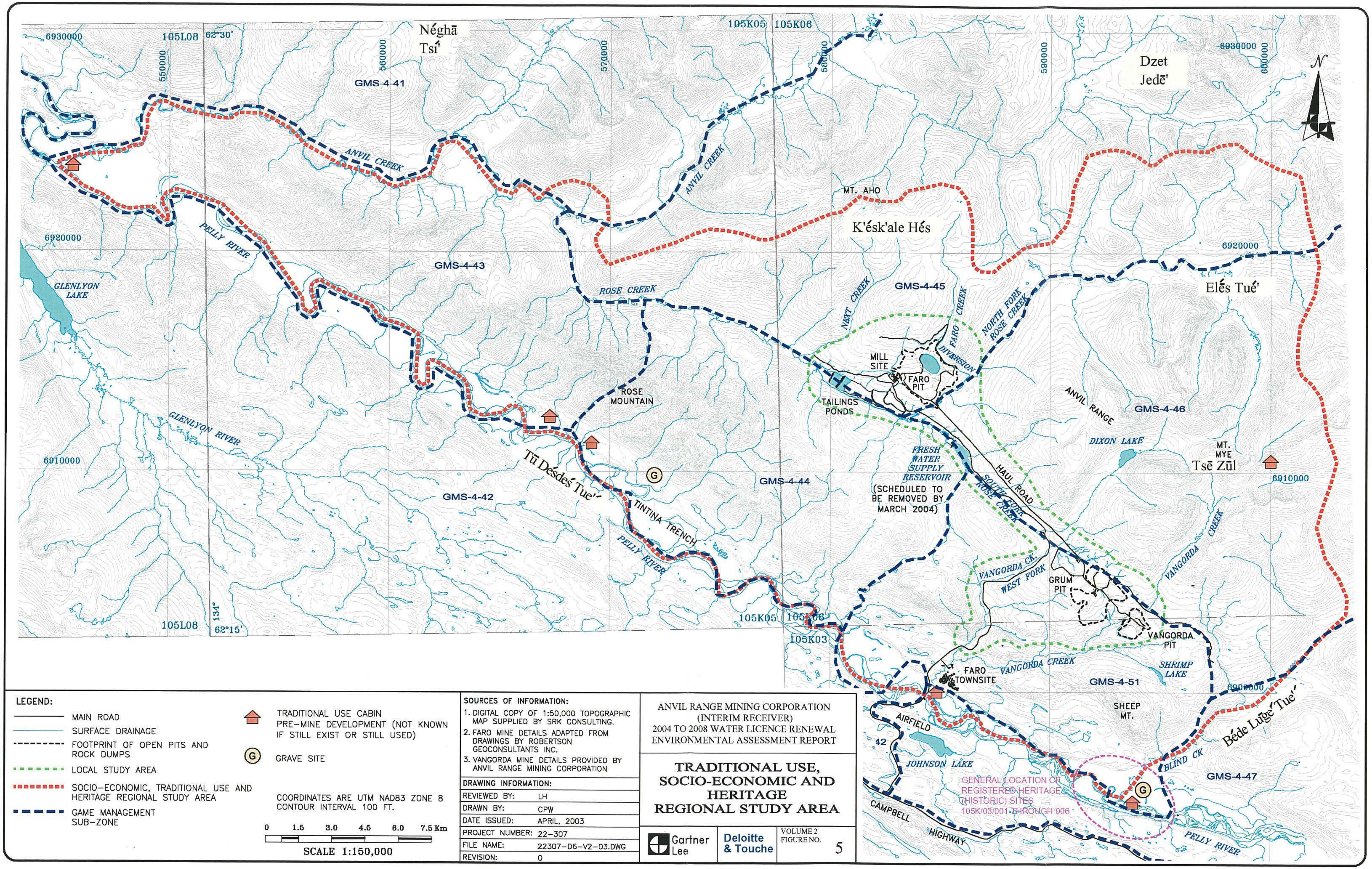
ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

TERRESTRIAL RESOURCES REGIONAL STUDY AREA

Gartner Lee

Deloitte & Touche

VOLUME 2
FIGURE NO. 4



LEGEND:

- MAIN ROAD
- SURFACE DRAINAGE
- FOOTPRINT OF OPEN PITS AND ROCK DUMPS
- LOCAL STUDY AREA
- SOCIO-ECONOMIC, TRADITIONAL USE AND HERITAGE REGIONAL STUDY AREA
- GAME MANAGEMENT SUB-ZONE
- TRADITIONAL USE CABIN PRE-MINE DEVELOPMENT (NOT KNOWN IF STILL EXIST OR STILL USED)
- GRAVE SITE

COORDINATES ARE UTM NAD83 ZONE 8
CONTOUR INTERVAL 100 FT.

0 1.5 3.0 4.5 6.0 7.5 Km

SCALE 1:150,000

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.
3. VANGORDA MINE DETAILS PROVIDED BY ANVIL RANGE MINING CORPORATION

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ANVIL RANGE MINING CORPORATION
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TRADITIONAL USE, SOCIO-ECONOMIC AND HERITAGE REGIONAL STUDY AREA

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VOLUME 2
FIGURE NO. 5

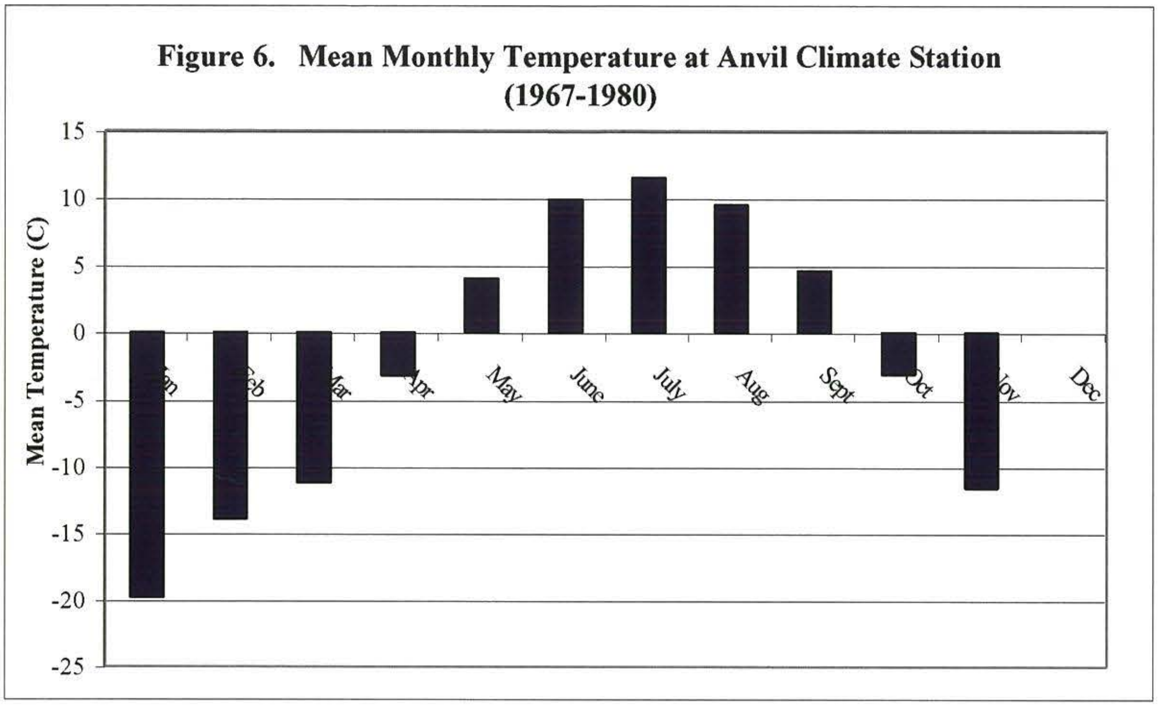


Figure 6. Mean Monthly Temperature at Anvil Climate Station (1967-1980)
Mean Temperature (C)
15
10
5
0
-5
-10
-15
-20
-25
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Oct
Nov
Dec

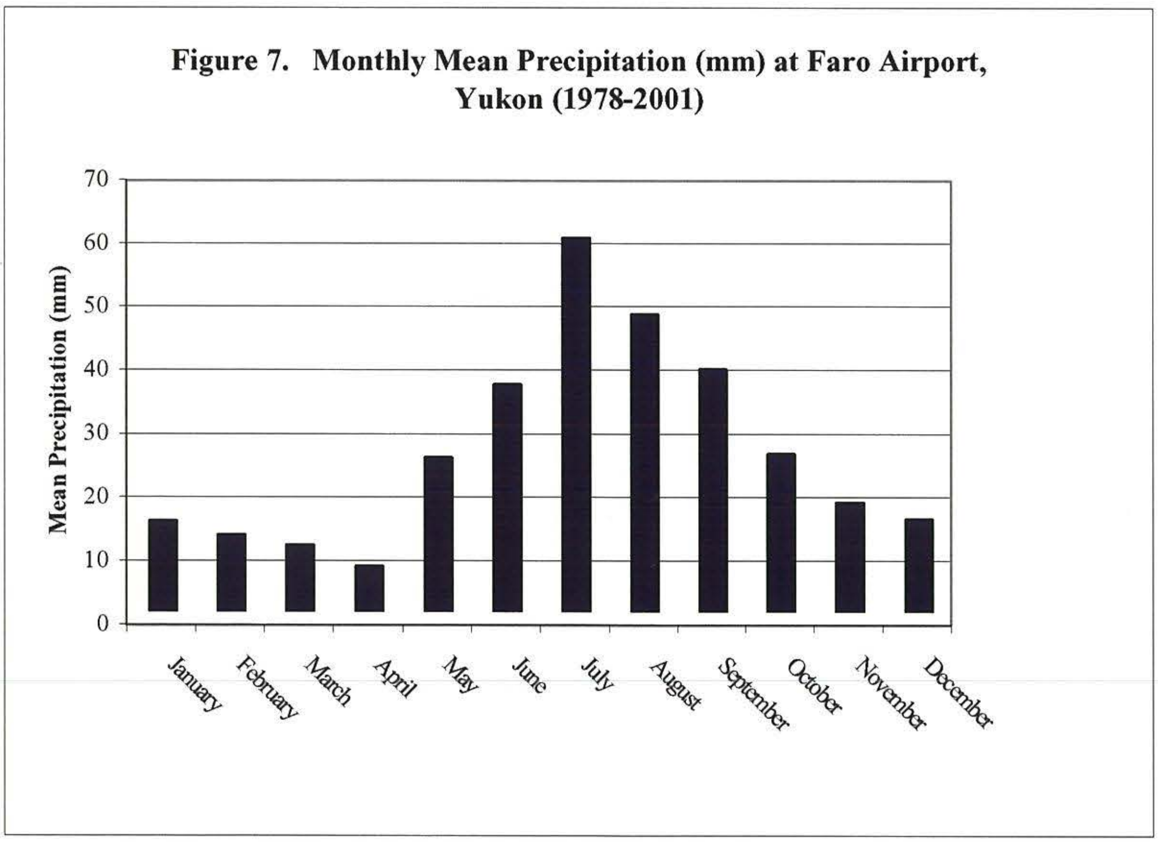
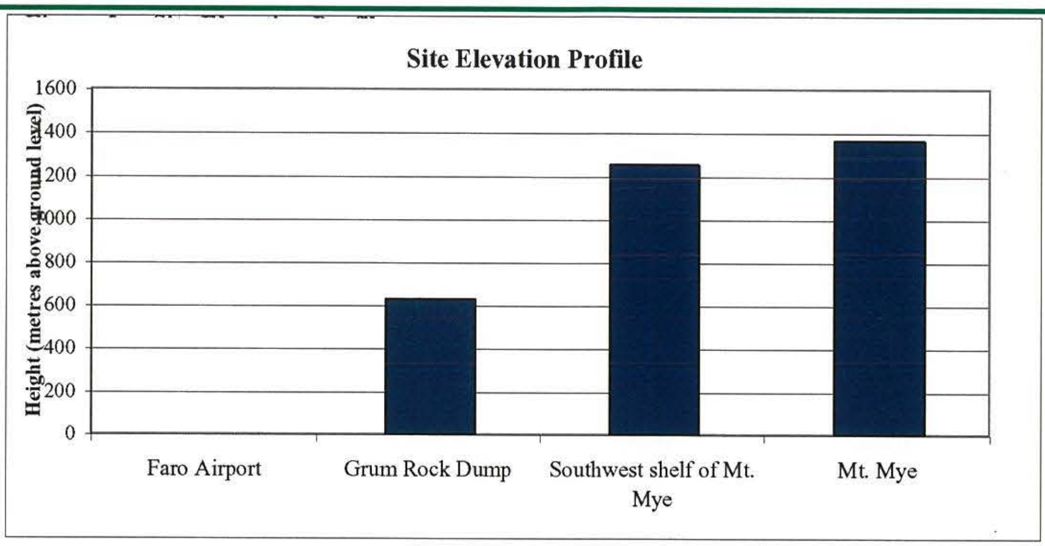
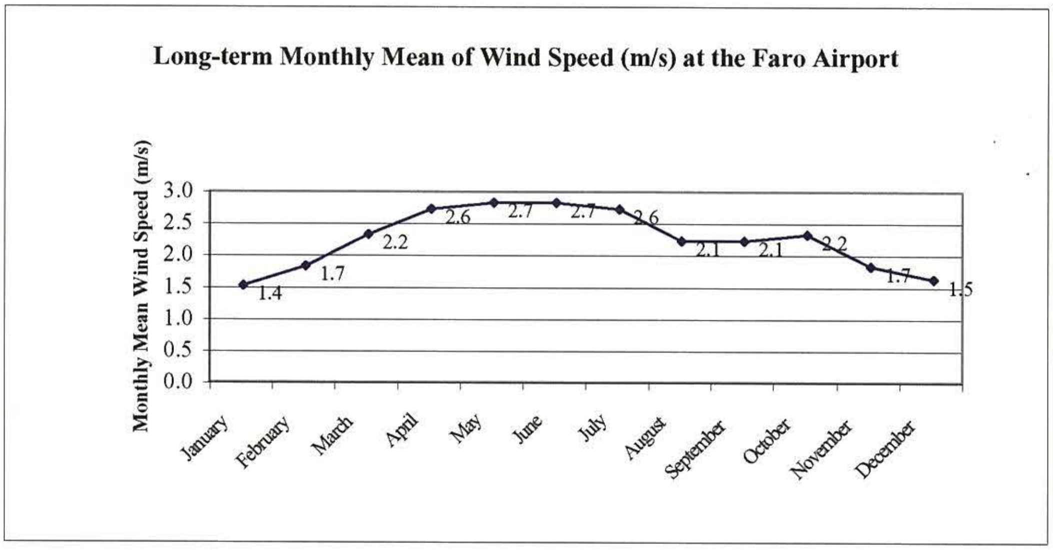
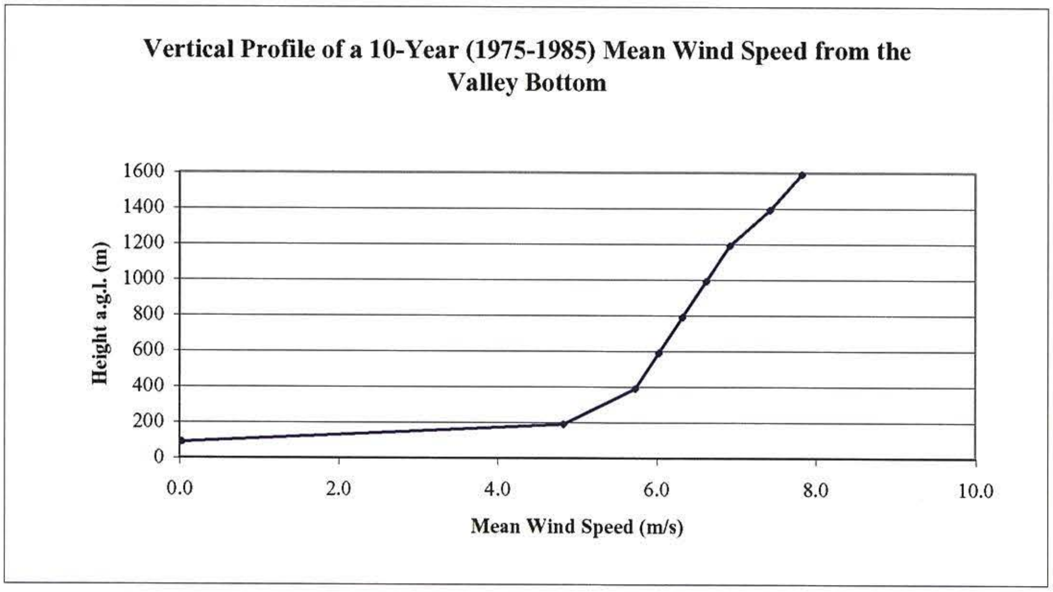


Figure 7. Monthly Mean Precipitation (mm) at Faro Airport, Yukon (1978-2001)
Mean Precipitation (mm)
70
60
50
40
30
20
10
0
January
February
March
April
May
June
July
August
September
October
November
December



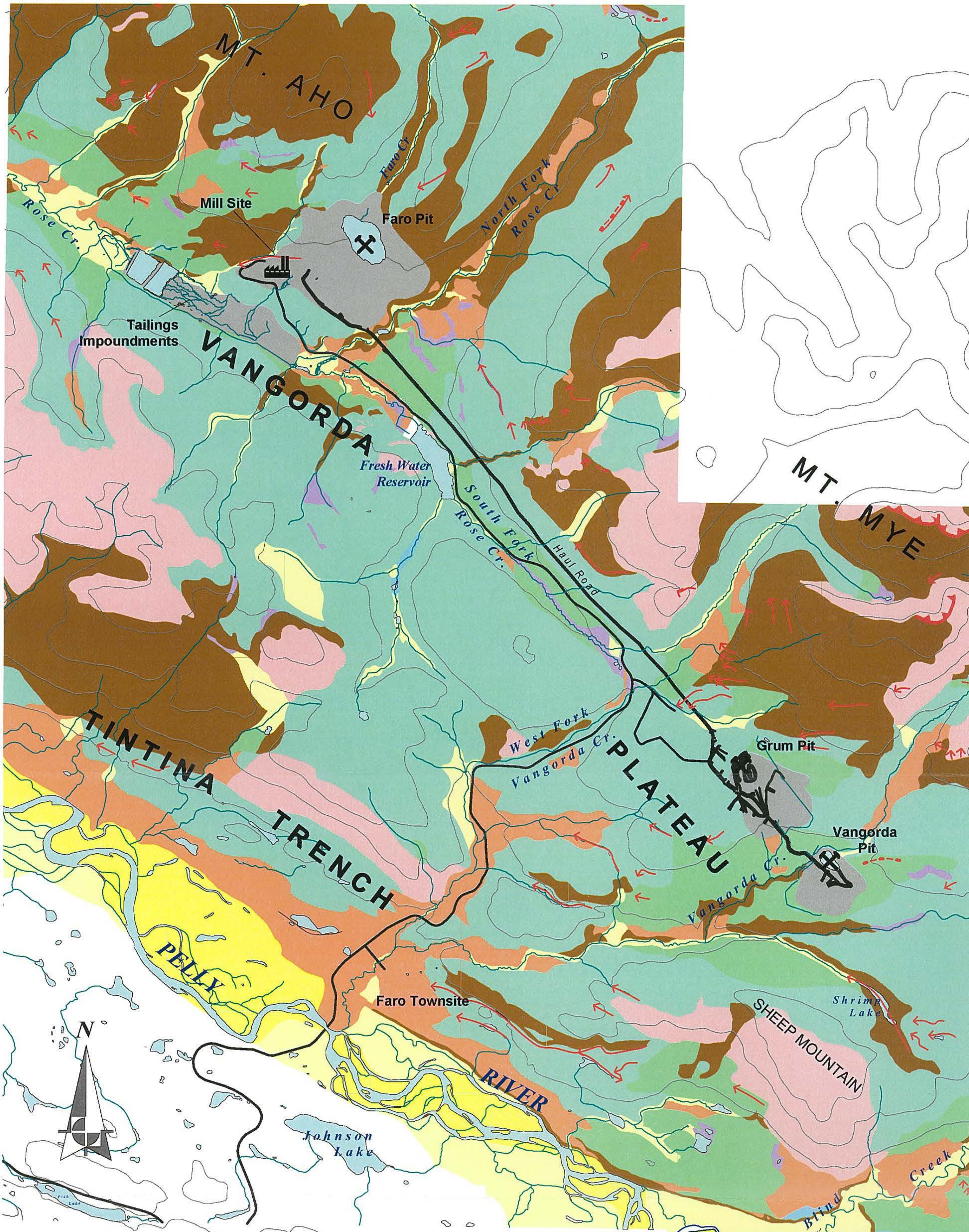




Volume 2
Project Number: 22307
Date: April, 2003

Figure 8. Wind Data for the Anvil Range Mining Complex

Gartner Lee



LEGEND

SURFICIAL MATERIALS

- Anthropogenic
- Colluvium
- Fluvial (Active)
- Glaciofluvial
- Fluvial
- Glaciolacustrine
- Morainal Veneer (Till)
- Morainal Blanket (Till)
- Organic
- Bedrock

SYMBOLS

- Cirque
- Glacial meltwater channel
- Moraine ridge

SOURCE: Surficial Geology from "Quaternary geology and till geochemistry of the Anvil District, central Yukon Territory (Bulletin 11)" Bond, J.D., 2001.

1 0 1 2 3

Kilometers

Scale: 1:75,000

Anvil Range Mine Complex

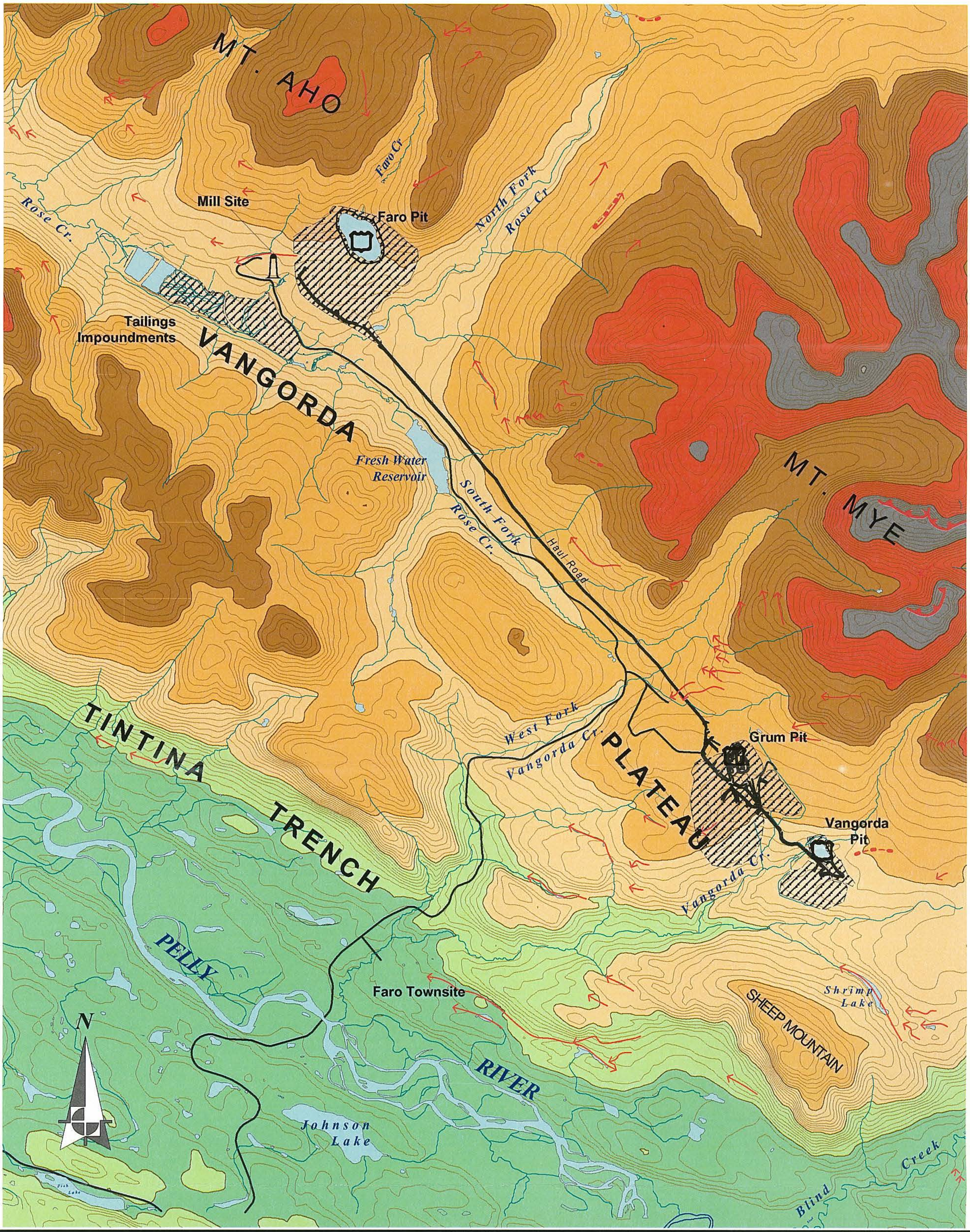
Surficial Geology and Landforms

Drawn By: F.K.P.	Reviewed By: E.J.D.
Revision No.: 0	Project No: 22-307
Date Issued: APR. 2003	Projection: UTM Z8, NAD83
Site Name: FARO	File Name: 22307-D6-V2-FIG9.PDF

Gartner Lee Limited

Deloitte & Touche

Volume 2
Figure No.
9



LEGEND

ELEVATION RANGES
(metres ASL)

- below 800 m
- 800-1,000 m
- 1,000-1,200 m
- 1,200-1,400 m
- 1,400-1,600 m
- 1,600-1,800 m
- above 1,800 m

SYMBOLS

- Cirque
- Glacial meltwater channel
- Moraine ridge

1 0 1 2 3
Kilometers
Scale: 1:75,000

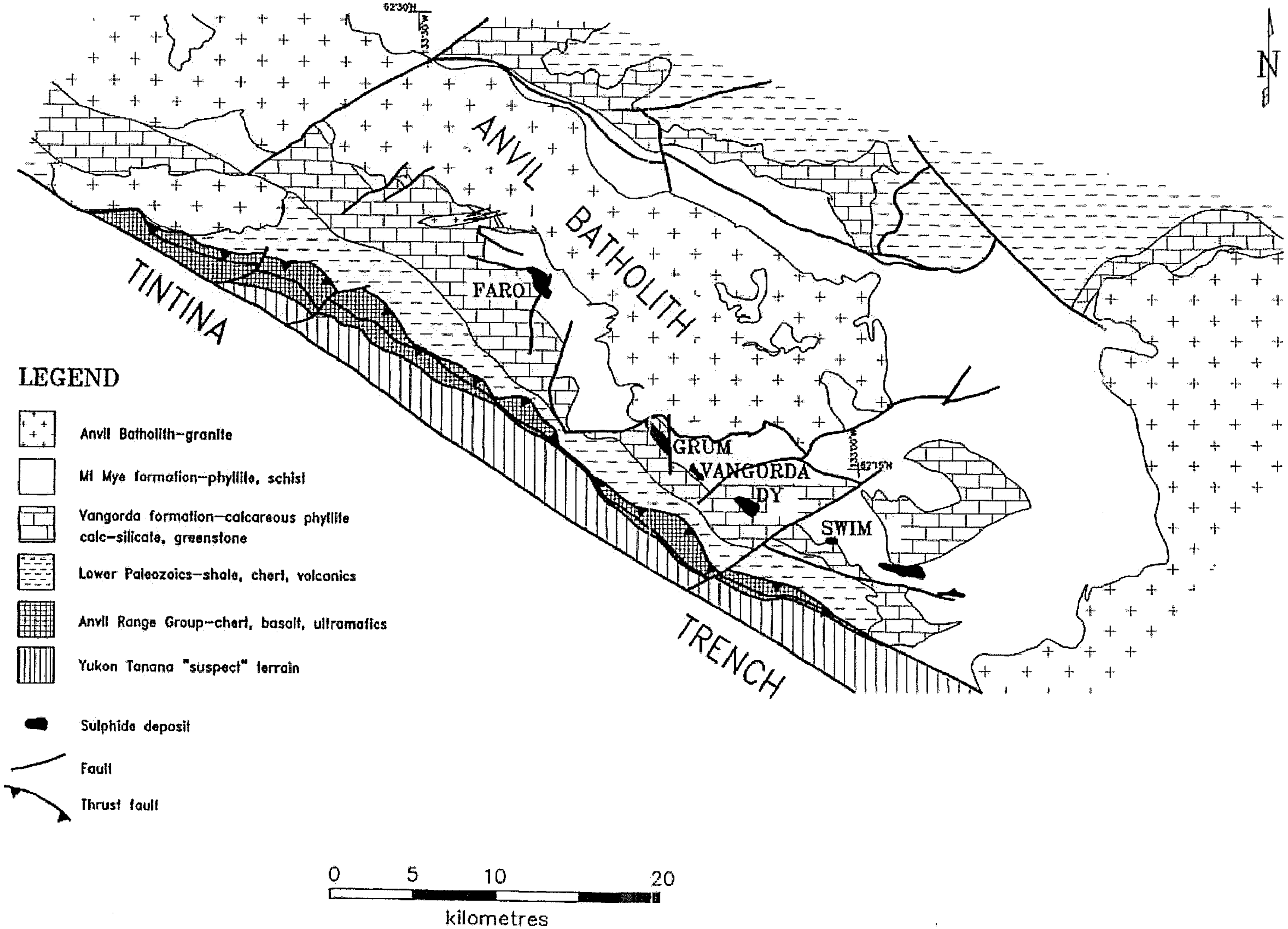
SOURCE: Surficial Geology from "Quaternary geology and till geochemistry of the Anvil District, central Yukon Territory (Bulletin 11)" Bond, J.D., 2001.

Anvil Range Mine Complex

Physiographic Setting

Drawn By:	F.K.P.	Reviewed By:	E.J.D.
Revision No.:	0	Project No:	22-307
Date Issued:	APR. 2003	Projection:	UTM Z8, NAD83
Site Name:	FARO	File Name:	22307-D6-V2-FIG10.PDF

Gartner Lee Limited | Deloitte & Touche | Volume 2 Figure No. 10



SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY ROBERTSON GEOCONSULTANTS INC.
REPORT NO. 033001/3 DATED NOVEMBER 1996
"ANVIL RANGE MINING COMPLEX – INTEGRATED COMPREHENSIVE ABANDONMENT PLAN"
DRAWING TAKEN FROM ACCESS MINING, 1996

ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers

Anvil Range Mining Corporation

Anvil Complex Closure Plan

Geological Map of the Anvil Range

033001 | Nov. 1996 | 3-2

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
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ANVIL RANGE MINING CORPORATION
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2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

REGIONAL GEOLOGY

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 11

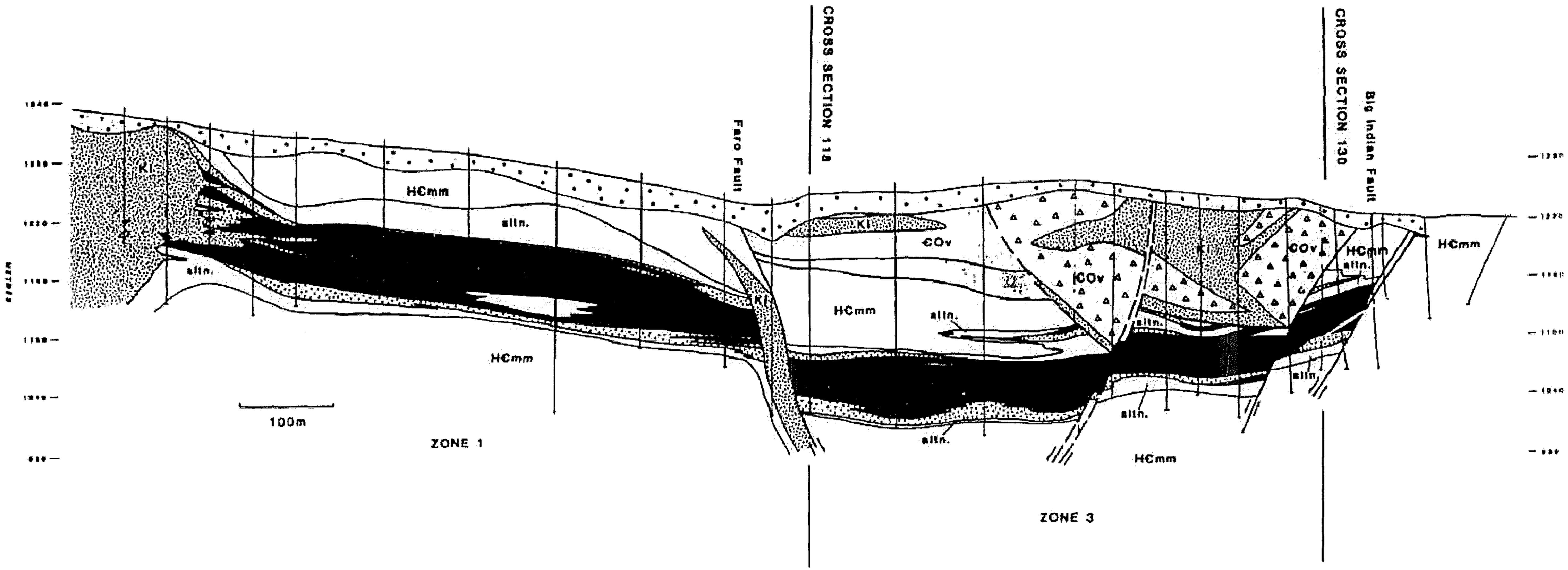

FIGURE Vertical longitudinal section 22 of the Faro deposit, looking northeast, no vertical exaggeration. *Units are same as Figure* 4-3 Zones 1 and 3 are indicated, the largely eroded northeast extension of zone 2 is just beneath *the overburden southeast of the Big Indian Fault*. Within about 150 m of the diorite dyke at the northwest end of the section, *the massive sulphides are altered to pyrrhotite rich* assemblages containing local large magnetite octahedra and partly reverted to pyrite. *Adjacent to the diorite dyke along the Faro Fault* massive magnetite is developed in the sulphides.

SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY ROBERTSON GEOCONSULTANTS INC.
REPORT NO. 033001/3 DATED NOVEMBER 1996
"ANVIL RANGE MINING COMPLEX – INTEGRATED COMPREHENSIVE ABANDONMENT PLAN"

ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers
Anvil Range Mining Corporation

Anvil Complex Closure Plan
FARO DEPOSIT
VERTICAL LONGITUDINAL
SECTION 22
033001 | Nov. 1996 | 4-4

DRAWING INFORMATION:	
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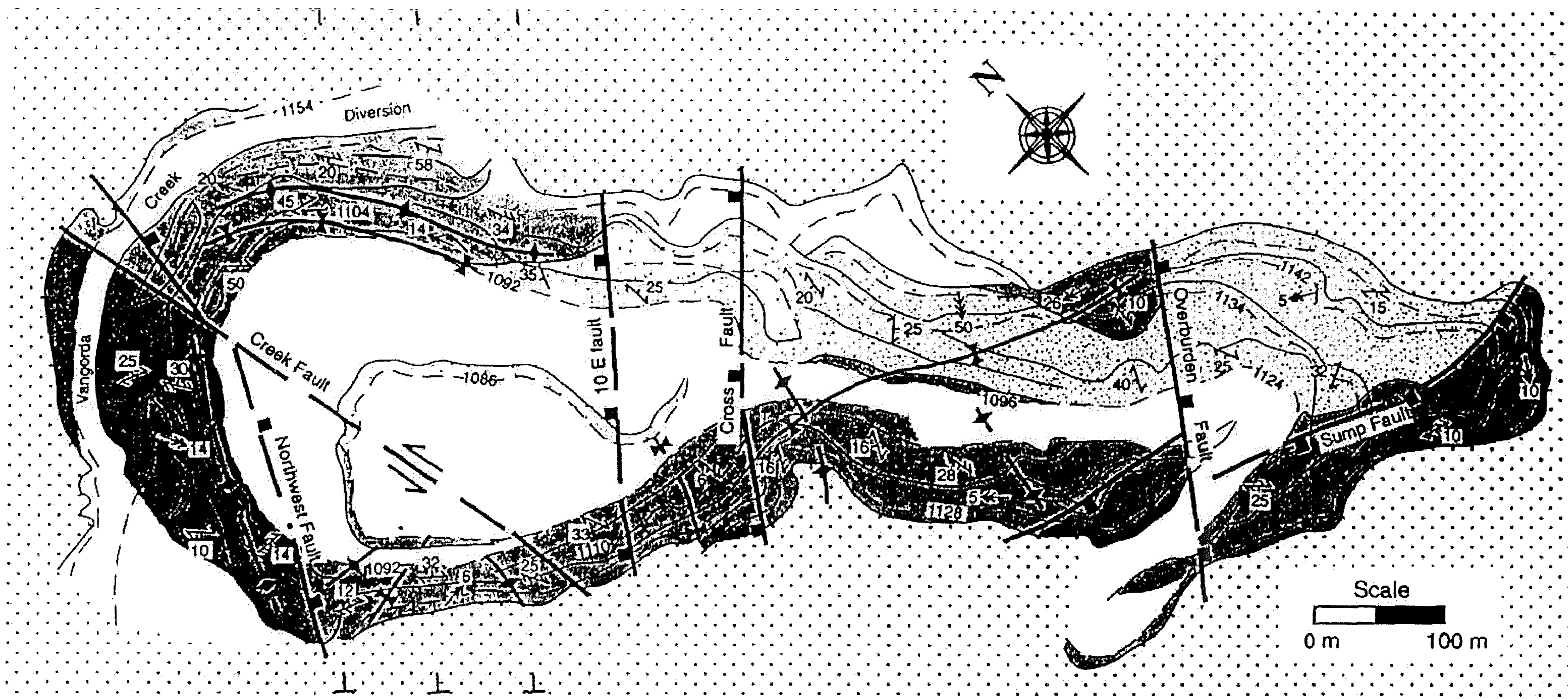
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

FARO OREBODY

Gartner Lee
Deloitte & Touche
VOLUME 2
FIGURE NO. 12



SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY STEFFEN, ROBERTSON KIRSTEN (CANADA) INC.
REPORT NO. 60647
DATED MAY 1992
"CONSTRUCTION REPORT VANGORDA CREEK DIVERSION REALIGNMENT VANGORDA PLATEAU DEVELOPMENT"

Massive sulphides

DRAWING INFORMATION:	
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REVISION:	0

ANVIL RANGE MINING CORPORATION
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2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

VANGORDA OREBODY

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 13

SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY STEFFEN, ROBERTSON KIRSTEN (CANADA) INC.
REPORT NO. 60647
DATED MAY 1992
"CONSTRUCTION REPORT VANGORDA CREEK DIVERSION REALIGNMENT VANGORDA PLATEAU DEVELOPMENT"

ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers
Anvil Range Mining Corporation

Anvil Complex Claims Plan
GRUM OPEN PIT GEOLOGY

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
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REVISION:	0

ANVIL RANGE MINING CORPORATION
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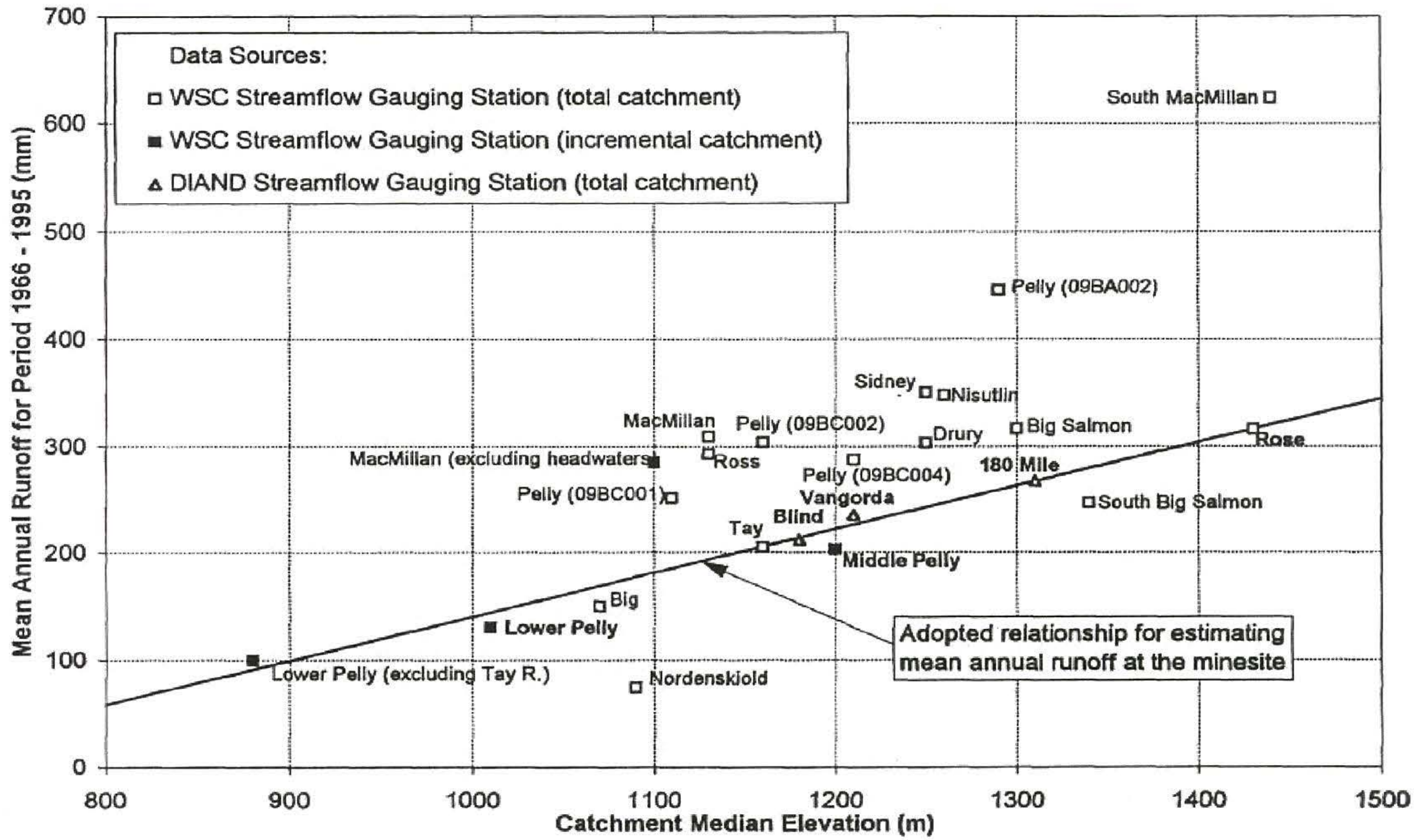
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

GRUM OREBODY

Gartner Lee
Deloitte & Touche
VOLUME 2
FIGURE NO. 14

Figure 15. **Regional Relationship Between Mean Annual Runoff and Catchment Median Elevation**



RGC Report No. 033001/3

Volume 2

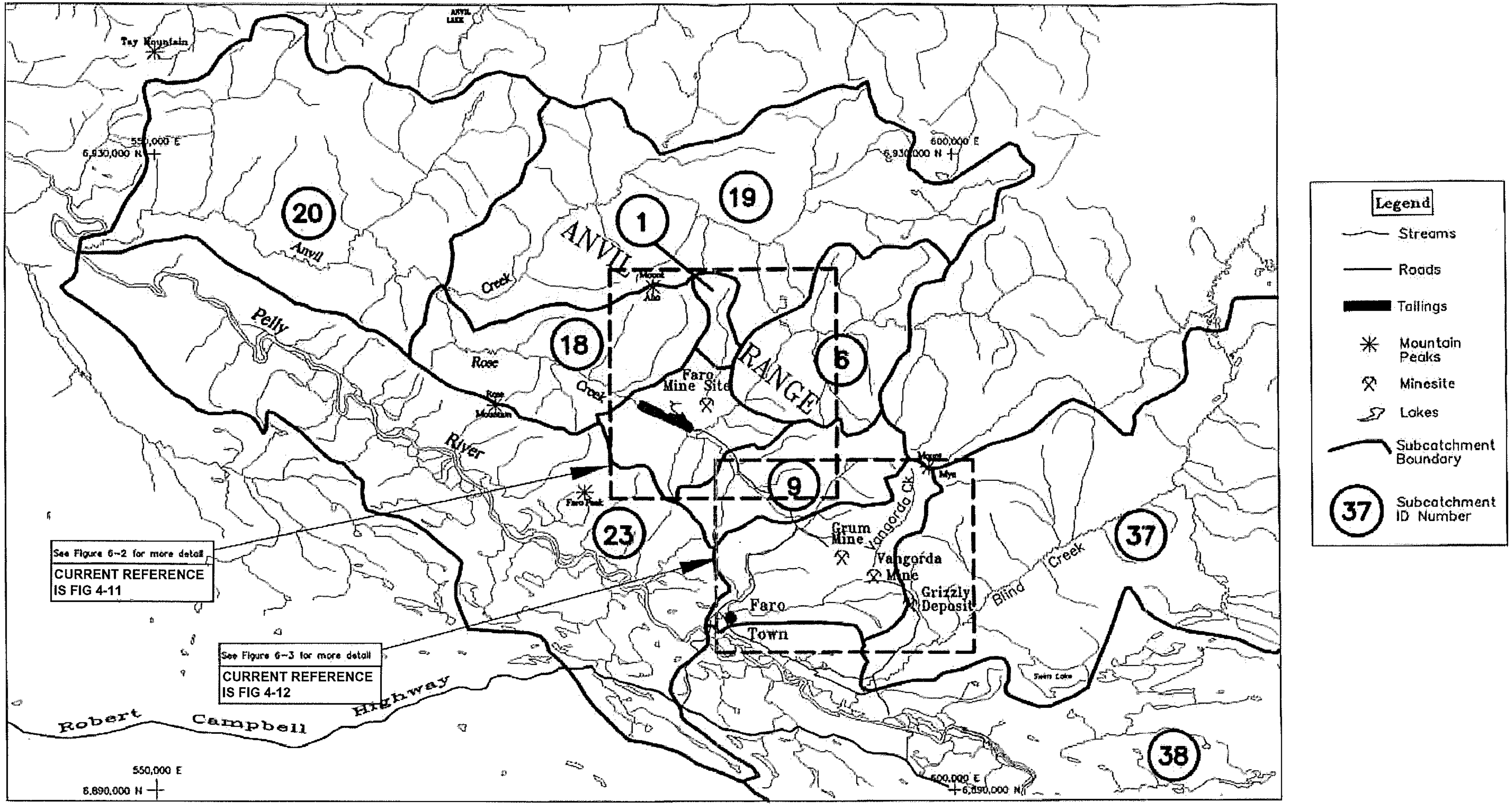
Project Number: 22307

Date: April, 2003

Anvil Range Mining Complex - ICAP

Gartner Lee

22307-vol2-fig15.xls



Notes: Map derived from 1:250,000 scale
NTS Mapsheet 105 K
North American Datum 1927
Transverse Mercator Projection

0 2500 5000 7500 10,000 12,500 METRES

SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY ROBERTSON GEOCONSULTANTS INC.
REPORT NO. 033001/3 DATED NOVEMBER 1996
"ANVIL RANGE MINING COMPLEX – INTEGRATED COMPREHENSIVE ABANDONMENT PLAN"

ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers

Anvil Range Mining Corporation

Anvil Complex Closure Plan

MINESITE CATCHMENTS

033001 | Nov. 1996 | | 6–1

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
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ANVIL RANGE MINING CORPORATION
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2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

OVERVIEW MINESITE CATCHMENTS

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 16

SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY ROBERTSON GEOCONSULTANTS INC.
REPORT NO. 033001/3 DATED NOVEMBER 1996
"ANVIL RANGE MINING COMPLEX – INTEGRATED COMPREHENSIVE ABANDONMENT PLAN"

ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers
Anvil Range Mining Corporation
Anvil Complex Closure Plan
Minesite Subcatchments in Vicinity of Faro Development
033001 Nov. 1996 E-2

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
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FILE NAME:	22307-06-V2-10.DWG
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ANVIL RANGE MINING CORPORATION
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ENVIRONMENTAL ASSESSMENT REPORT

MINESITE SUBCATCHMENTS IN VICINITY OF FARO DEVELOPMENT

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 17

ROBERTSON GEOCONSULTANTS INC. Consulting Geotechnical and Environmental Engineers	Anvil Complex Closure Plan Minesite Subcatchments in the Vicinity of Vangorda Plateau Development
Anvil Range Mining Corporation	1D33001 Nov 1996 6-3

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-07-V2-11.DWG
REVISION:	0

ANVIL RANGE MINING CORPORATION
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ENVIRONMENTAL ASSESSMENT REPORT

MINESITE SUBCATCHMENTS IN VICINITY OF VANGORDA PLATEAU DEVELOPMENT

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 18

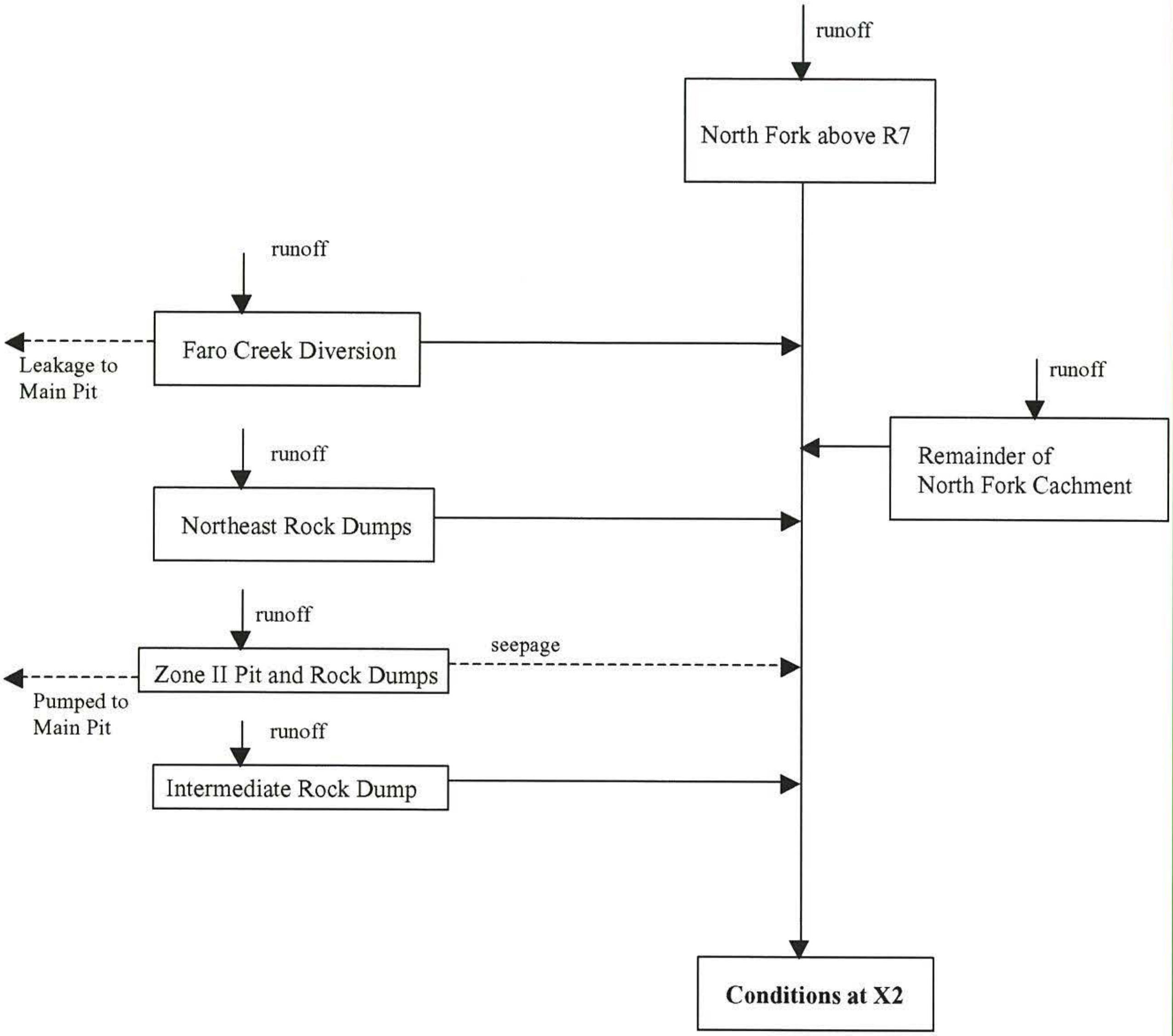


Figure 19. North Fork Rose Creek Water Balance Representation

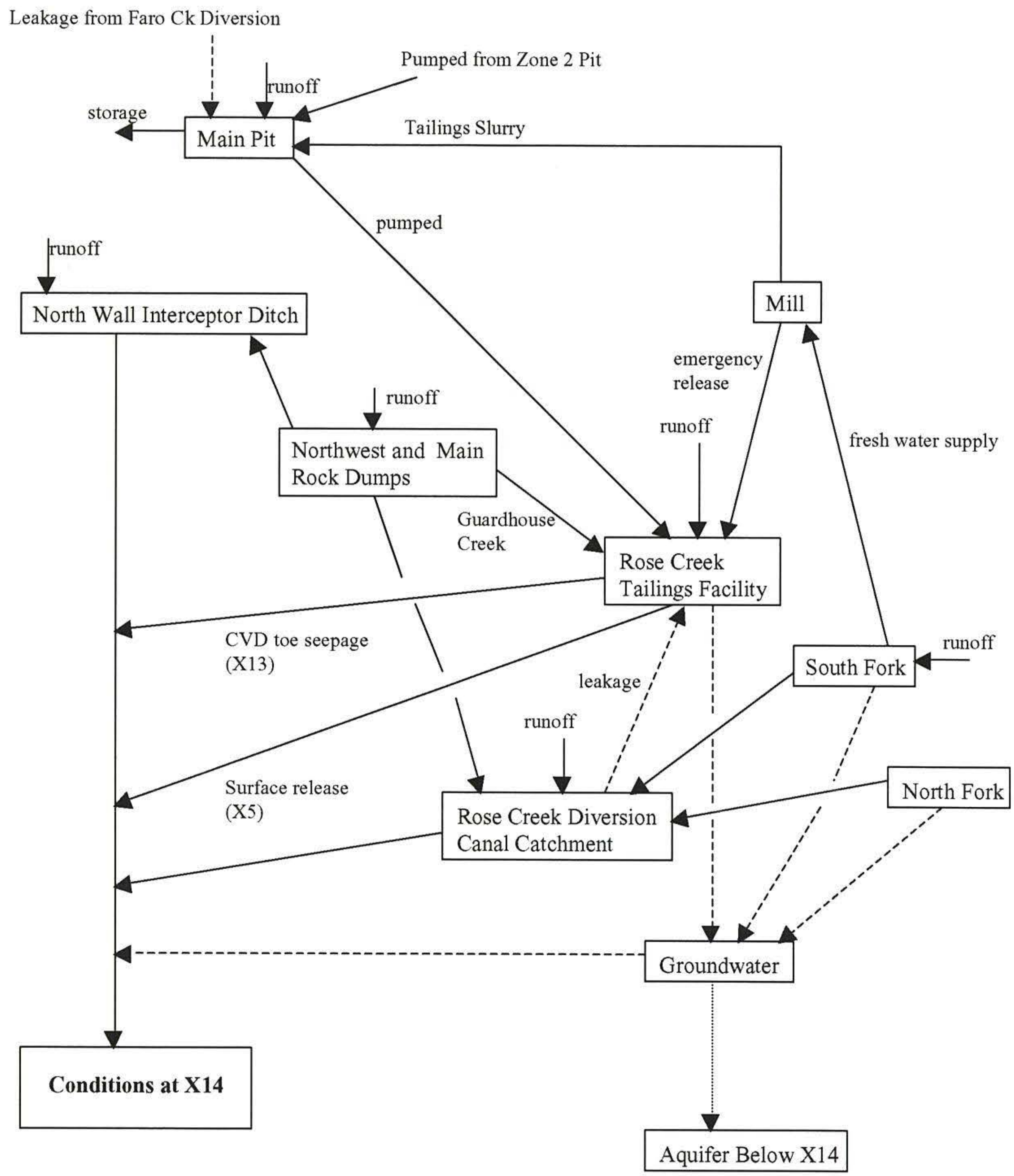
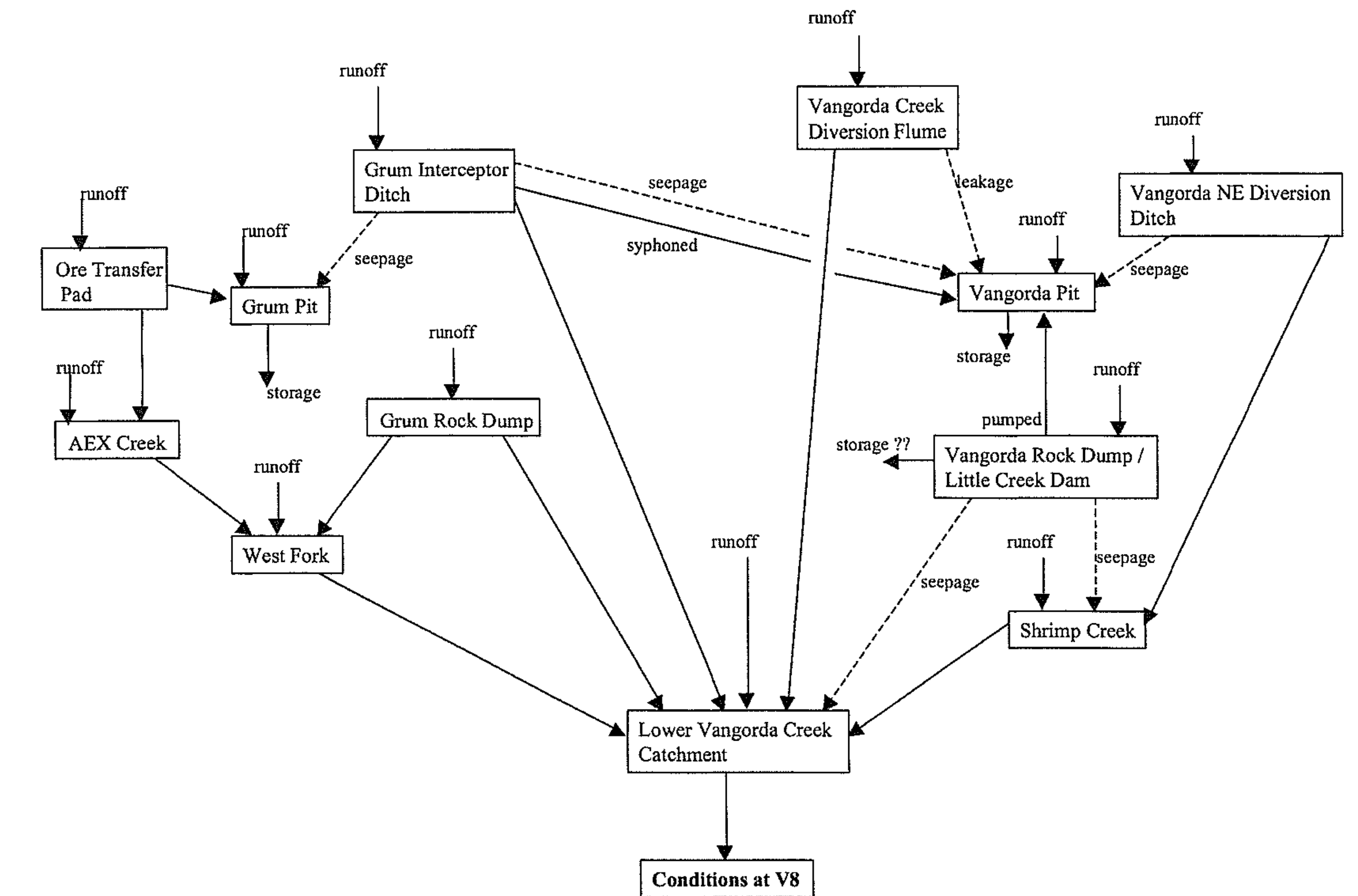


Figure 20. Rose Creek Water Balance Representation

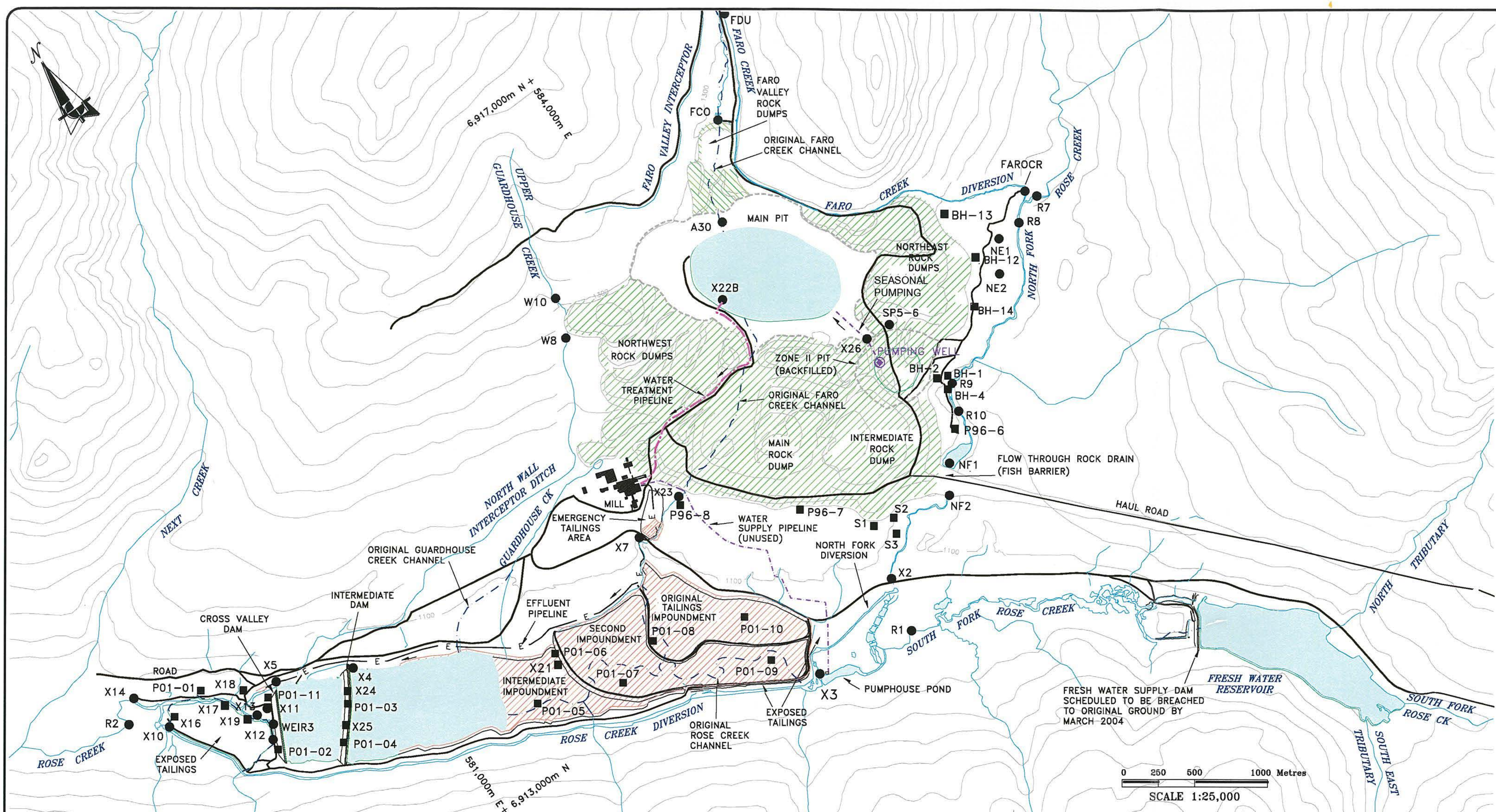


Volume 2
Project Number: 22307

22307-Vol2-Fig21.ppt

Figure 21. Vangorda Creek Water Balance Representation

Gartner Lee



LEGEND:

- ROADS
- EXISTING SURFACE DRAINAGE
- PRE-MINE DRAINAGE
- E — EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER
- WASTE DUMPS
- TAILINGS IMPOUNDMENT
- GROUNDWATER SAMPLING LOCATION
- SURFACE WATER SAMPLING LOCATION

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. MAP COORDINATES ARE UTM NAD83 ZONE 8; CONTOUR INTERVAL 100 FT.
3. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.

DRAWING INFORMATION:

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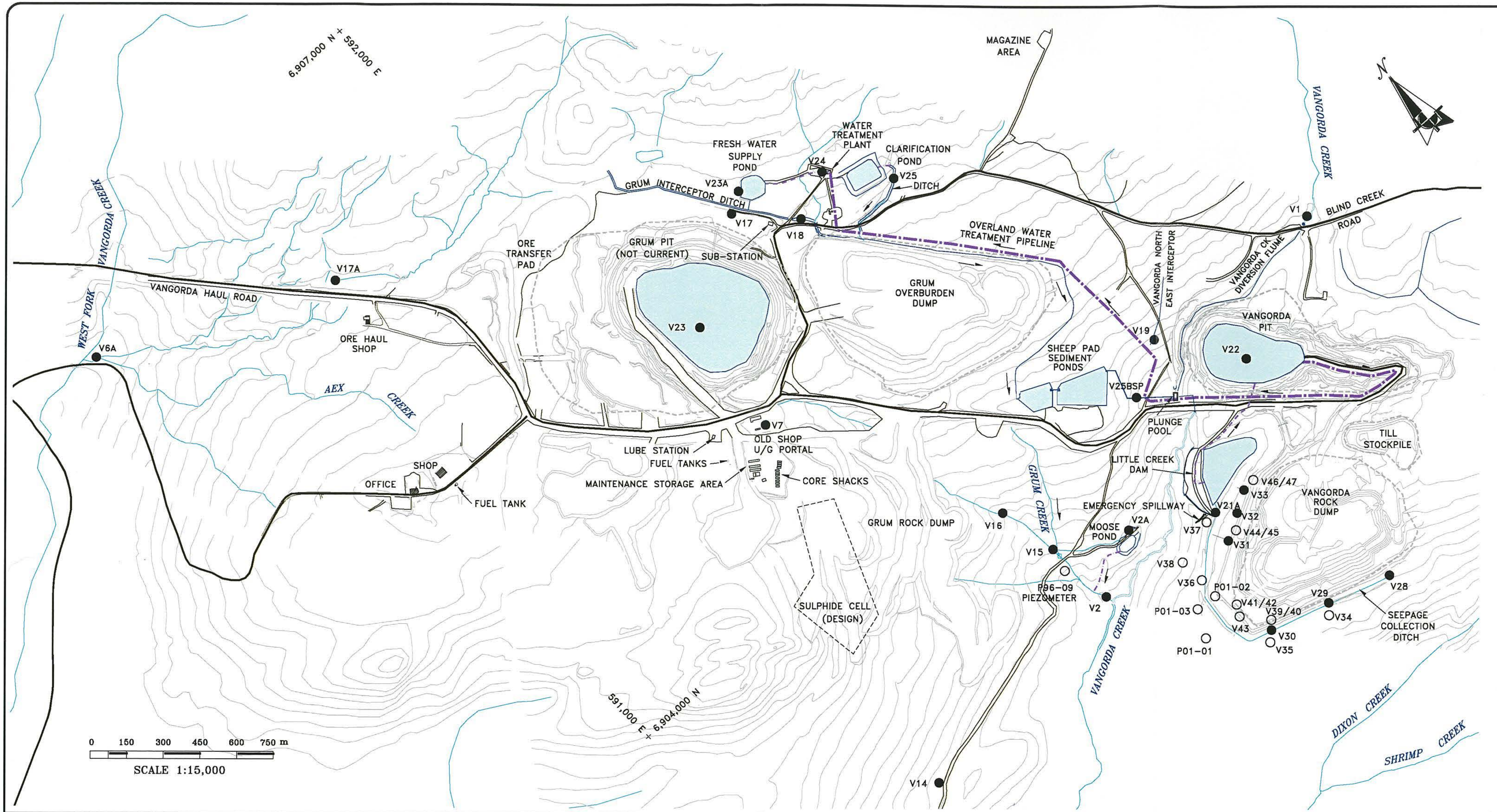
ANVIL RANGE MINING CORPORATION (INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL ENVIRONMENTAL ASSESSMENT REPORT

SURFACE AND GROUNDWATER SAMPLING LOCATIONS - FARO MINESITE

Gartner Lee
Deloitte & Touche

VOLUME 2 FIGURE NO. 22



LEGEND:

- ROADS
- EXISTING SURFACE DRAINAGE
- PRE-MINE DRAINAGE
- EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER
- ○ GROUND WATER SAMPLING LOCATION
- ● SURFACE WATER SAMPLING LOCATION

DRAIN #1 = V28
DRAIN #2 = V29
DRAIN #3 = V30
DRAIN #4 = V31
DRAIN #5 = V32
DRAIN #6 = V33

GROUNDWATER WELLS = V34 TO V38

PIEZOS. IN TOE BERM = V39 TO V47

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.

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DRAWN BY:	CPW
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REVISION:	0

ANVIL RANGE MINING CORPORATION
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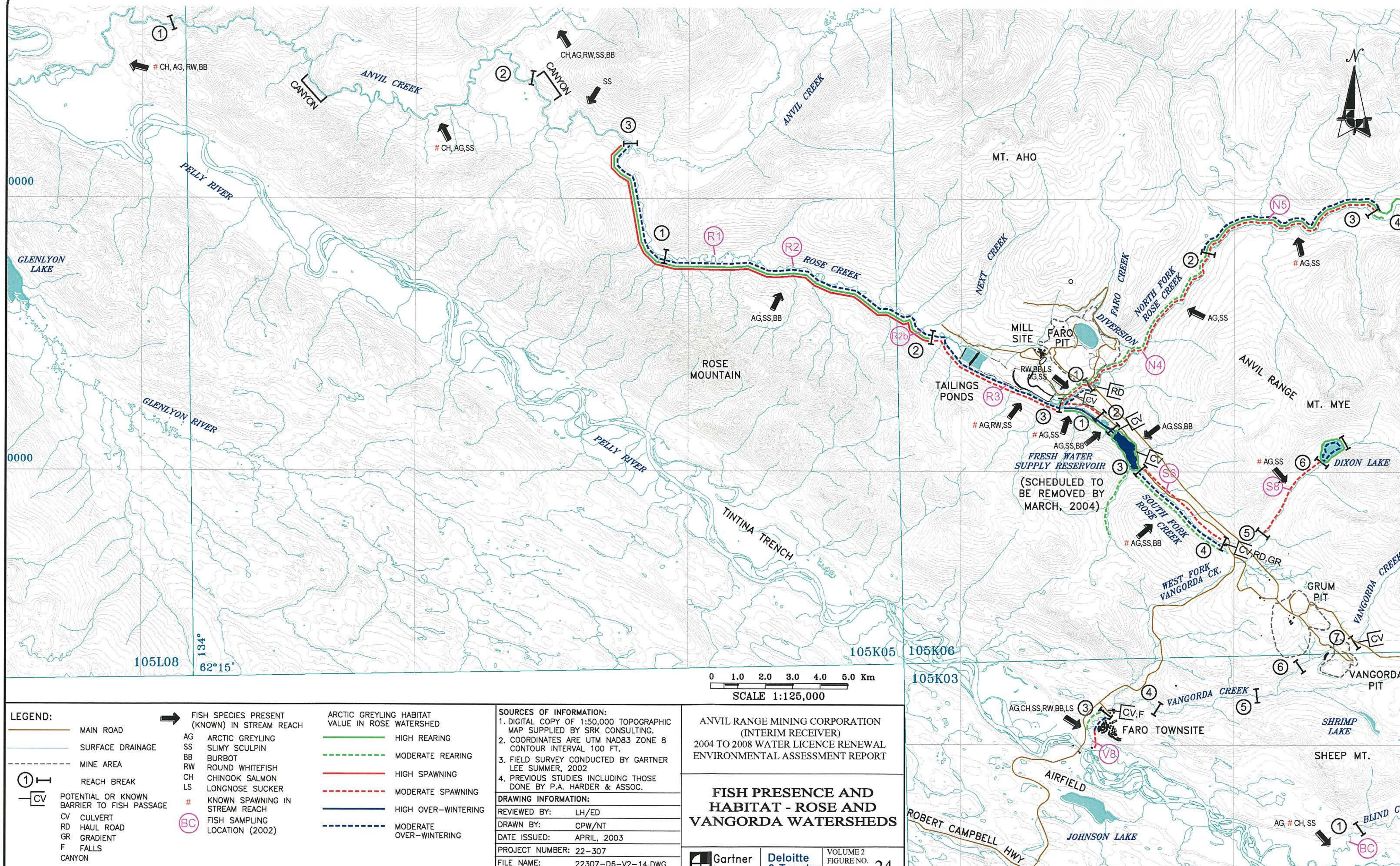
ENVIRONMENTAL ASSESSMENT REPORT

SURFACE AND GROUNDWATER SAMPLING LOCATIONS - VANGORDA PLATEAU MINE SITE

Gartner Lee

Deloitte & Touche

VOLUME 2
FIGURE NO. 23



LEGEND:

MAIN ROAD

SURFACE DRAINAGE

MINE AREA

① REACH BREAK

CV POTENTIAL OR KNOWN BARRIER TO FISH PASSAGE

CV CULVERT
RD HAUL ROAD
GR GRADIENT
F FALLS
CANYON

FISH SPECIES PRESENT (KNOWN) IN STREAM REACH

AG ARCTIC GREYLING
SS SLIMY SCULPIN
BB BURBOT
RW ROUND WHITEFISH
CH CHINOOK SALMON
LS LONGNOSE SUCKER
\# KNOWN SPAWNING IN STREAM REACH
BC FISH SAMPLING LOCATION (2002)

ARCTIC GREYLING HABITAT VALUE IN ROSE WATERSHED

HIGH REARING
MODERATE REARING
HIGH SPAWNING
MODERATE SPAWNING
HIGH OVER-WINTERING
MODERATE OVER-WINTERING

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. COORDINATES ARE UTM NAD83 ZONE 8 CONTOUR INTERVAL 100 FT.
3. FIELD SURVEY CONDUCTED BY GARTNER LEE SUMMER, 2002
4. PREVIOUS STUDIES INCLUDING THOSE DONE BY P.A. HARDER & ASSOC.

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NT
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ANVIL RANGE MINING CORPORATION
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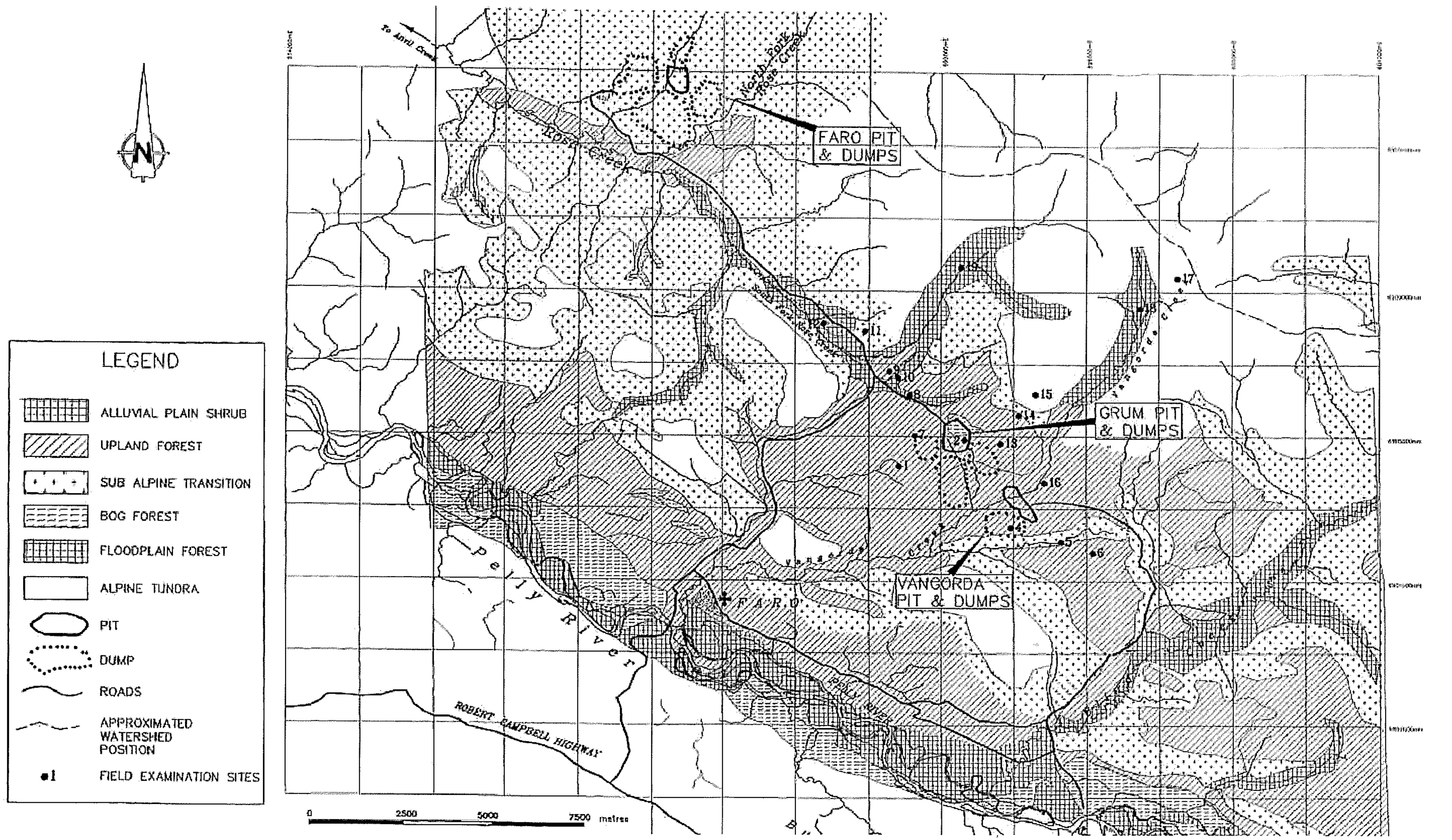
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

FISH PRESENCE AND HABITAT - ROSE AND VANGORDA WATERSHEDS

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 24



SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY ROBERTSON GEOCONSULTANTS INC.
REPORT NO. 033001/3 DATED NOVEMBER 1996
"ANVIL RANGE MINING COMPLEX – INTEGRATED COMPREHENSIVE ABANDONMENT PLAN"

ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers

Anvil Range Mining Corporation

Anvil Complex Closure Plan

Regional Vegetation

033001 | Nov. 1996 | 3-7

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
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ANVIL RANGE MINING CORPORATION
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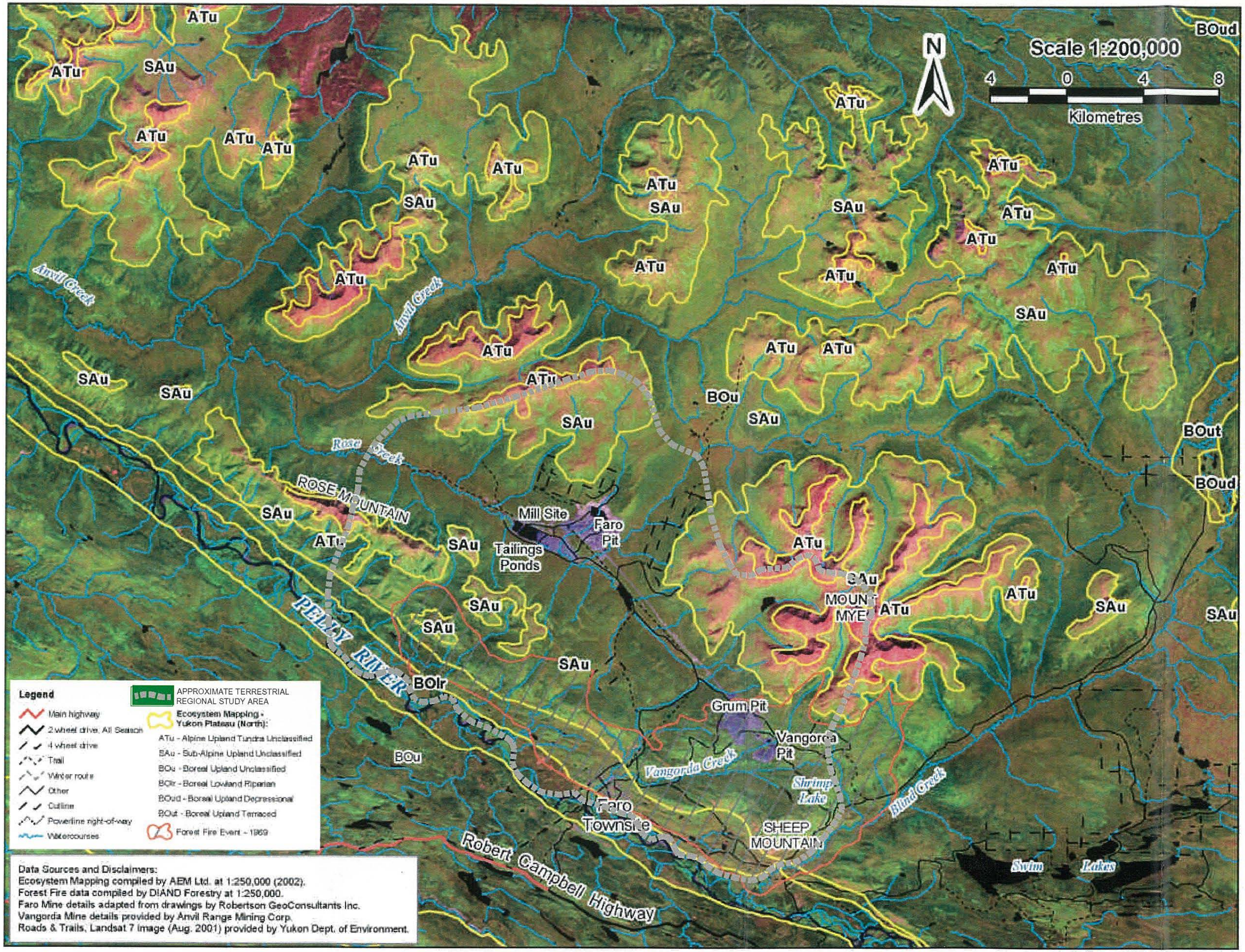
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

REGIONAL VEGETATION

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 25



DRAWING INFORMATION:	
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ANVIL RANGE MINING CORPORATION
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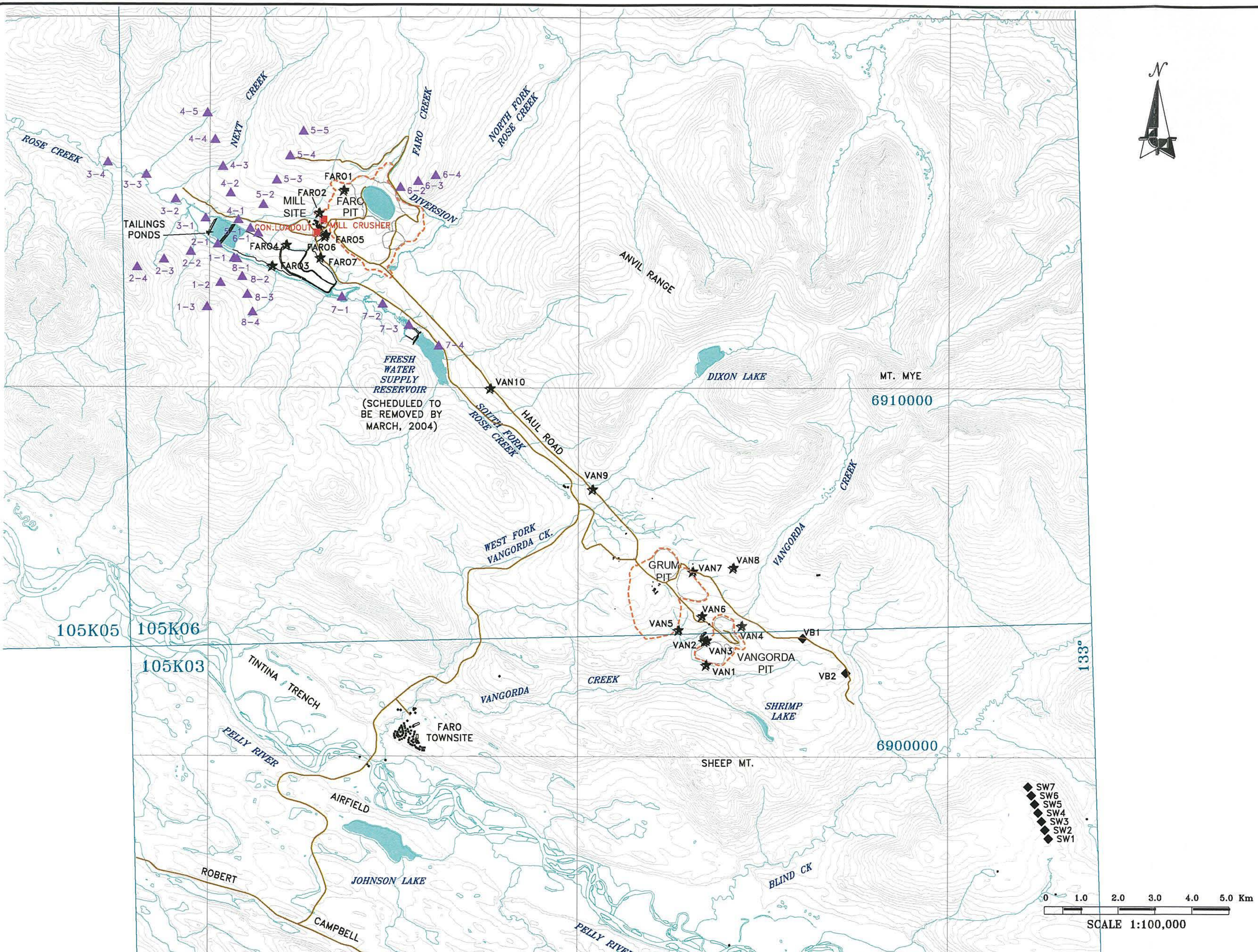
ENVIRONMENTAL ASSESSMENT REPORT

REGIONAL ECOSYSTEM MAPPING

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 26



LEGEND:

- MAIN ROAD
- SURFACE DRAINAGE
- MINE AREA
- BACKGROUND SAMPLING POINT
- POTENTIAL MINE-AFFECTED SAMPLING POINTS
- TAILINGS TRANSECTS SAMPLING POINTS
- REFERENCE POINTS

SOURCES OF INFORMATION:

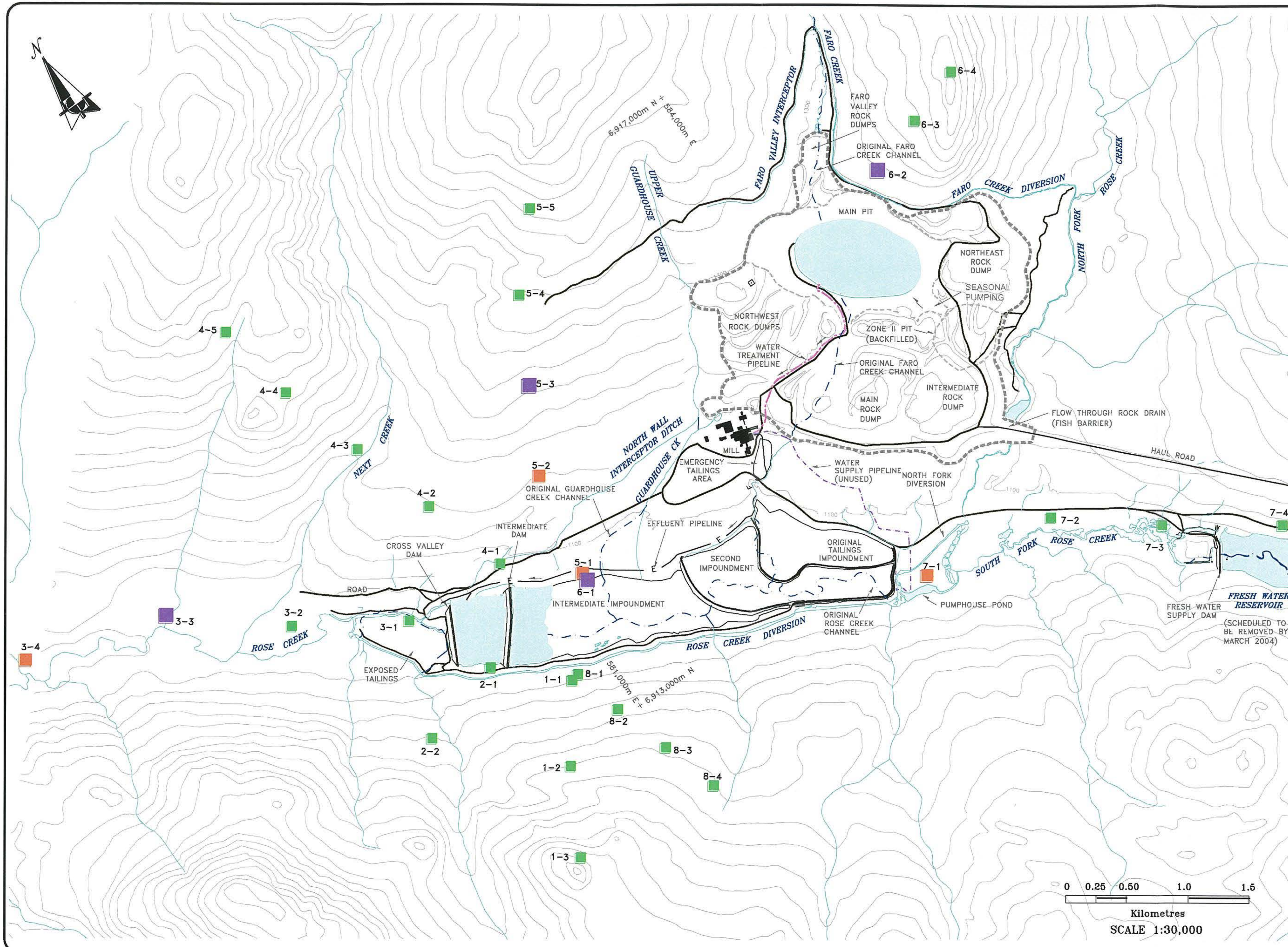
1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. VEGETATION AND SOILS METALS MAPPING CONDUCTED IN SUMMER 2002 BY JUSTIN STRAKER OF C.E. JONES & ASSOCIATES
3. MAP COORDINATESA ARE UTM NADB3 ZONE 8; CONTOUR INTERVAL 100 FT.

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED/JS (CE JONES)
DRAWN BY:	CPW
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-D6-V2-16.DWG
REVISION:	0

ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

SAMPLING SITES FOR ELEMENTAL ANALYSES OF SOIL AND VEGETATION

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 27



LEGEND:

- ROADS
- FOOTPRINT OF OPEN PITS AND ROCK DUMPS
- EXISTING SURFACE DRAINAGE
- PRE-MINE DRAINAGE
- EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER
- 1-2 TAILINGS TRANSECTS SAMPLING POINTS

ROSE CREEK TAILINGS TRANSECT FOLIAR ZINC CONCENTRATIONS IN WILLOW (ppm)

- < 243 (SWIM LAKE MAXIMUM)
- FROM 243 (SWIM LAKE MAXIMUM) TO 486 (TWICE SWIM LAKE MAXIMUM)
- >486 (TWICE SWIM LAKE MAXIMUM) MAX. 828 ppm

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. VEGETATION AND SOILS METALS MAPPING CONDUCTED IN SUMMER 2002 BY JUSTIN STRAKER OF C.E. JONES & ASSOCIATES
3. MAP COORDINATESA ARE UTM NAD83 ZONE 8; CONTOUR INTERVAL 100 FT.
4. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED/JS (CE JONES)
DRAWN BY:	CPW
DATE ISSUED:	APRIL, 2003
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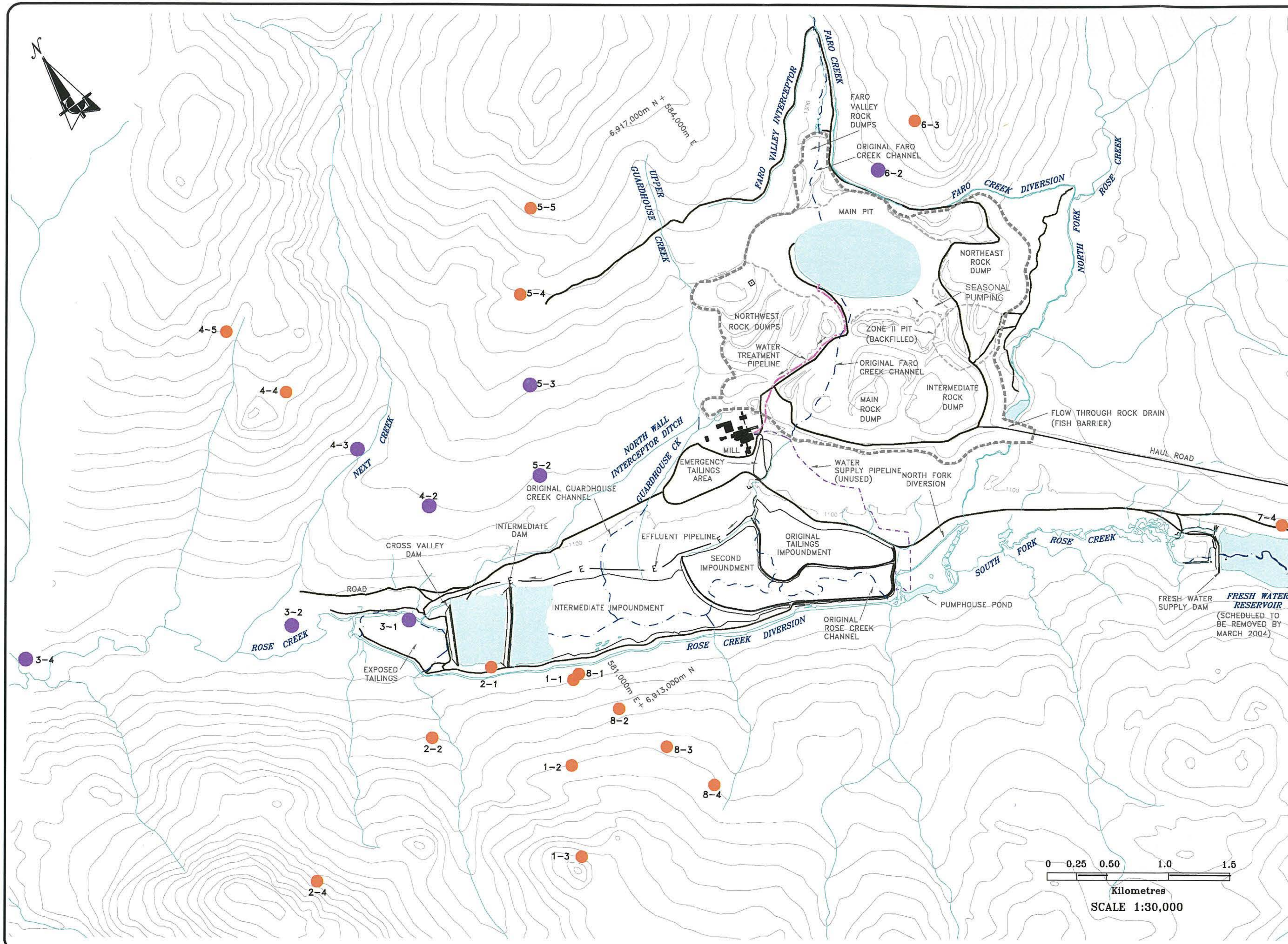
ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

ROSE CREEK TRANSECTS FOLIAR ZINC CONCENTRATIONS IN WILLOW

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 28



LEGEND:

- ROADS
- FOOTPRINT OF OPEN PITS AND ROCK DUMPS
- EXISTING SURFACE DRAINAGE
- PRE-MINE DRAINAGE
- E — EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER
- ● 1-2 TAILINGS TRANSECTS SAMPLING POINTS

ROSE CREEK TAILINGS TRANSECT LICHEN LEAD CONCENTRATIONS (ppm)

- FROM 16 (10 X SWIM LAKE MAXIMUM) TO 160 (100 X SWIM LAKE MAXIMUM)
- >160 (100 X SWIM LAKE MAXIMUM) MAX 747.7 ppm

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. VEGETATION AND SOILS METALS MAPPING CONDUCTED IN SUMMER 2002 BY JUSTIN STRAKER OF C.E. JONES & ASSOCIATES
3. MAP COORDINATESA ARE UTM NAD83 ZONE 8; CONTOUR INTERVAL 100 FT.
4. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.

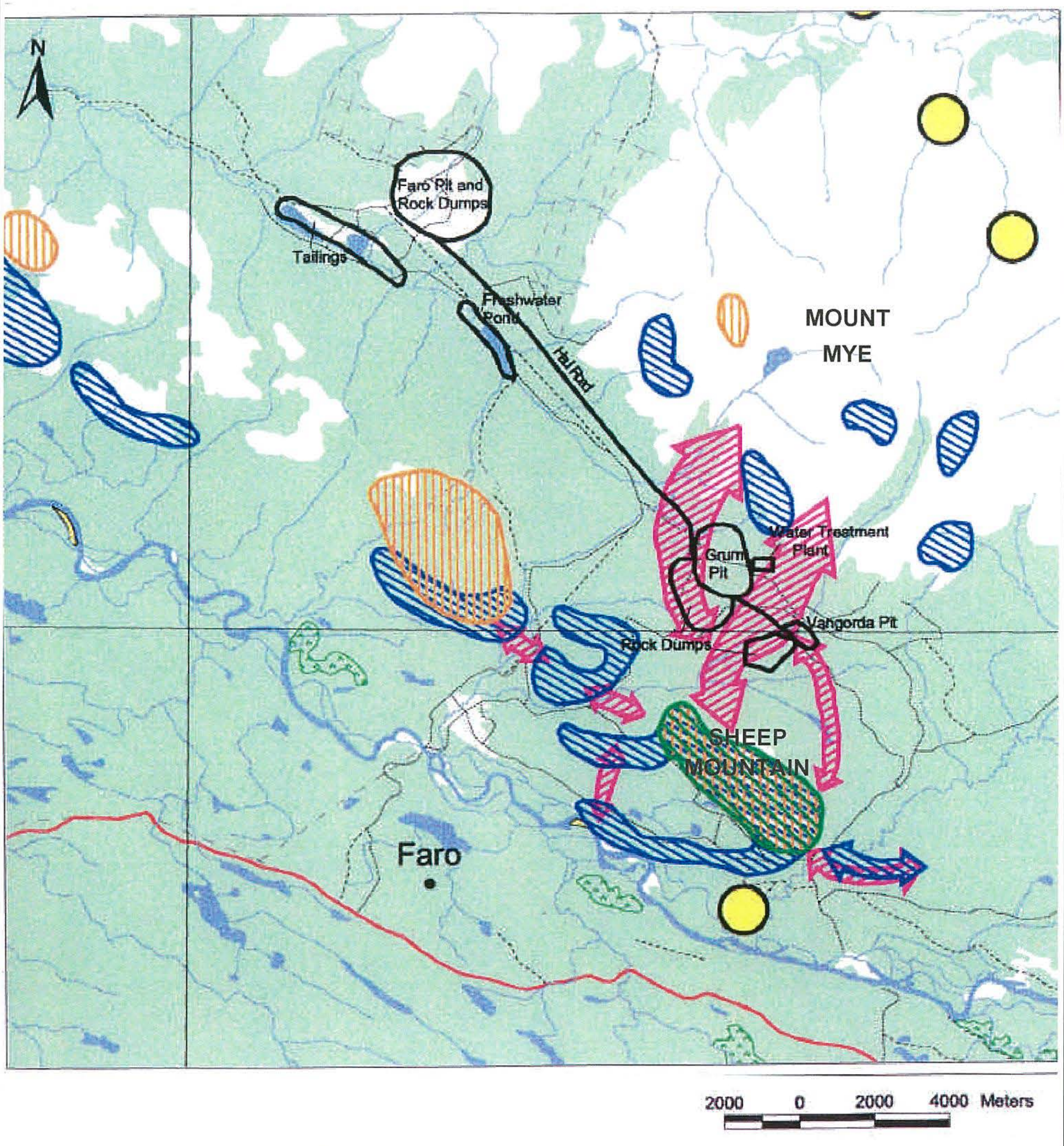
DRAWING INFORMATION:

REVIEWED BY:	LH/ED/JS (CE JONES)
DRAWN BY:	CPW
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-D6-V2-21.DWG
REVISION:	0

ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

ROSE CREEK TRANSECTS LICHEN LEAD CONCENTRATIONS

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 29



SOURCE OF FIGURE:
DRAWING SHOWN BELOW DRAWN FROM REPORT BY GARTNER LEE LIMITED DATED MARCH 2001. "FARO MINESITE – PHASE I ENVIRONMENTAL SITE ASSESSMENT FINAL REPORT"

Site Name: Faro / Vangorda Mine

Figure 3.1

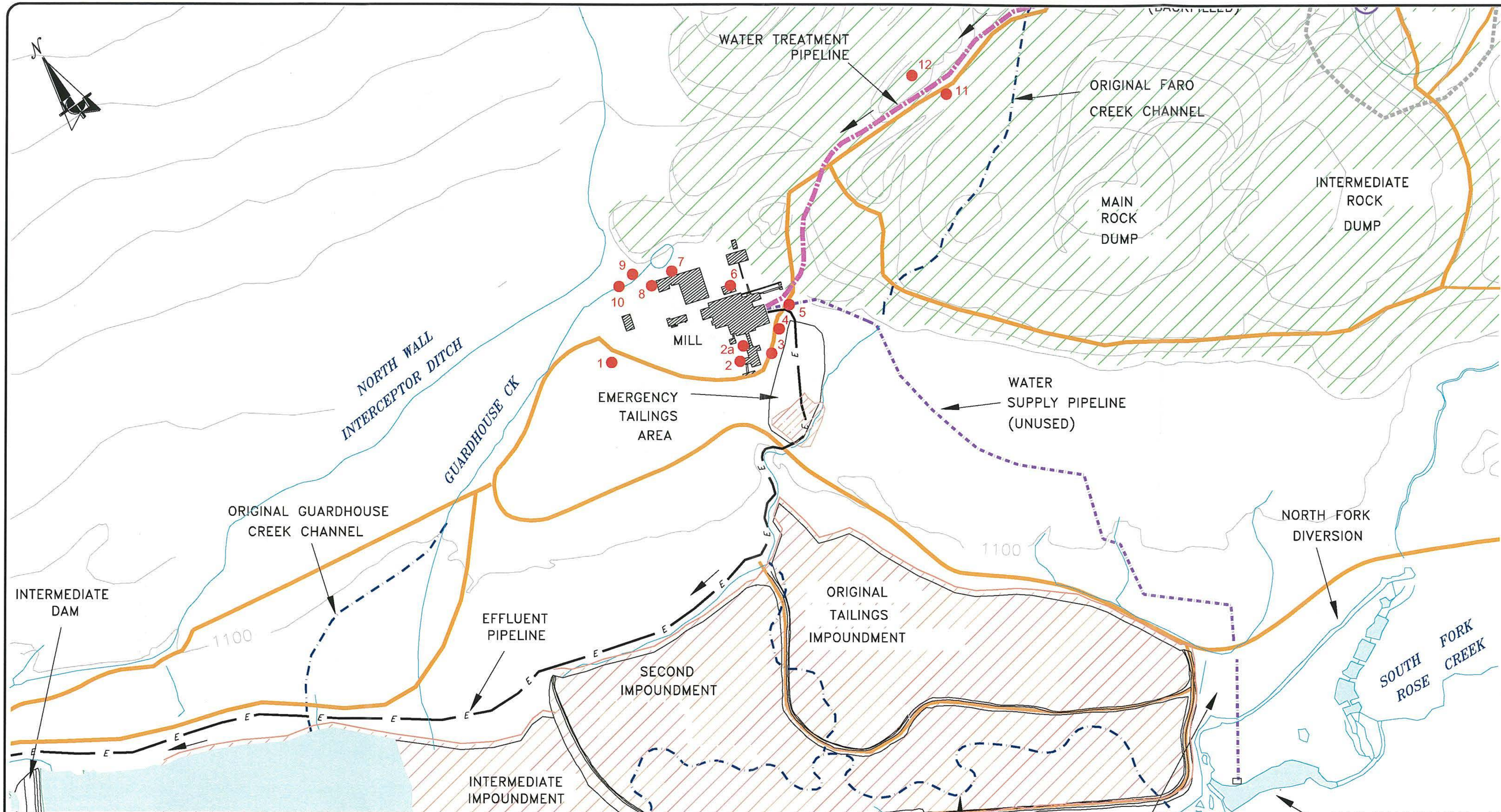
Legend
- Thinhorn Sheep (early winter rutting)
- Thinhorn Sheep (spring lambing)
- Thinhorn Sheep (winter range)
- Thinhorn Sheep (migration corridor)
- Mineral Lick

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW/NTO
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-D6-V2-18.DWG
REVISION:	0

ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

FARO AREA SHEEP HABITAT AND MIGRATION

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 30



LEGEND:

- ROADS
- EXISTING SURFACE DRAINAGE
- PRE-MINE DRAINAGE
- EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER
- WASTE DUMPS
- TAILINGS IMPOUNDMENT
- 3 SOIL SAMPLE SITES

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. MAP COORDINATES ARE UTM NAD83 ZONE 8; CONTOUR INTERVAL 100 FT.
3. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.

0 50 100 200 300 400 500 Metres

SCALE 1:10,000

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-D6-V2-19.DWG
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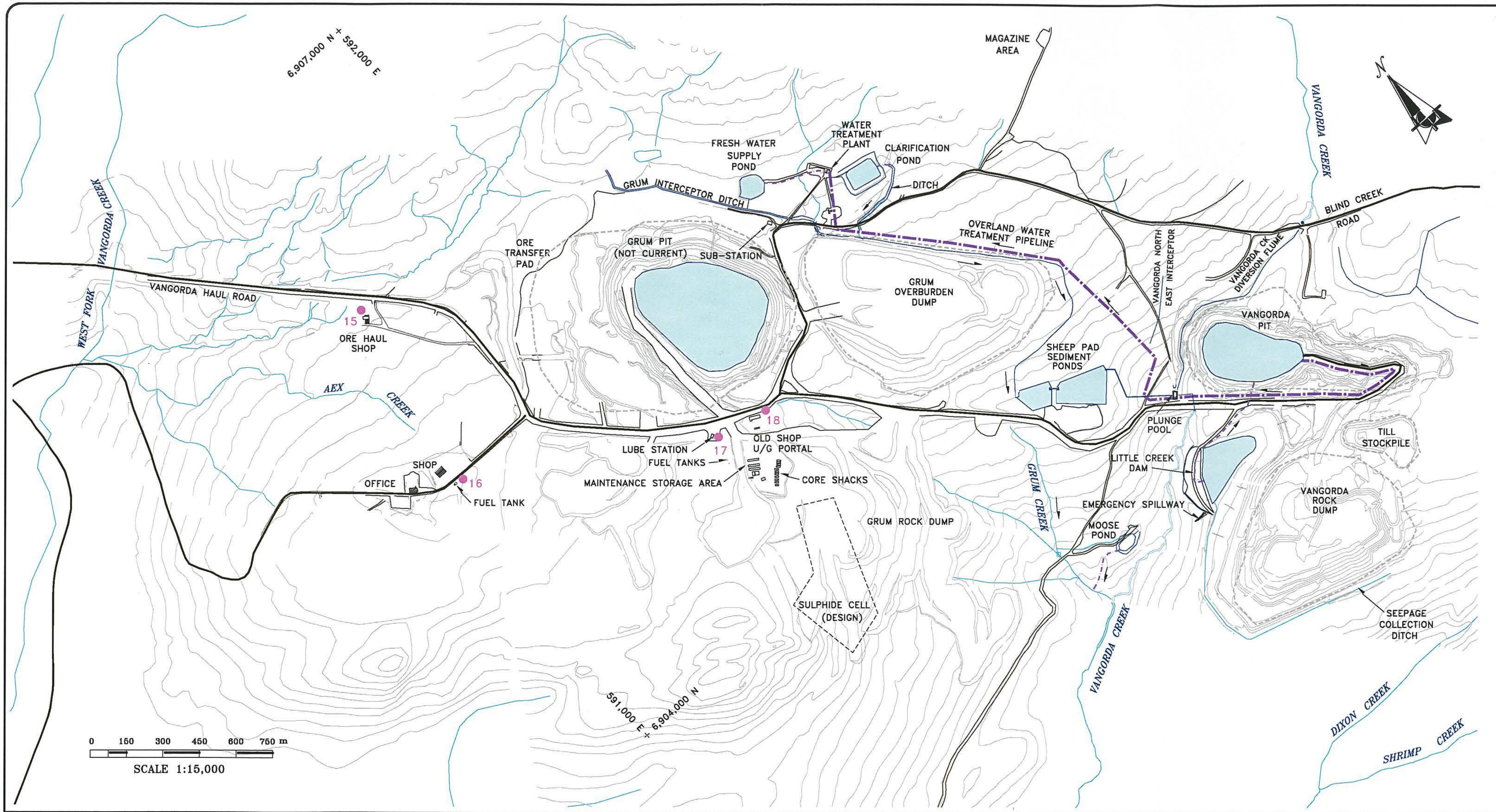
ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

SOIL SAMPLING SITES AROUND FARO MINE SITE

Gartner Lee

Deloitte & Touche

VOLUME 2
FIGURE NO. 31



LEGEND:

═══	ROADS	–··–··–	WATER TREATMENT PIPELINE
──	EXISTING SURFACE DRAINAGE	▬	SURFACE WATER
–·–·–	PRE-MINE DRAINAGE	●	SOIL SAMPLING SITES
—E—	EFFLUENT PIPELINE		
- - -	PIPELINE		

SOURCES OF INFORMATION:

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.

DRAWING INFORMATION:	
REVIEWED BY:	LH/ED
DRAWN BY:	CPW
DATE ISSUED:	APRIL, 2003
PROJECT NUMBER:	22-307
FILE NAME:	22307-D6-V2-20.DWG
REVISION:	0

ANVIL RANGE MINING CORPORATION
(INTERIM RECEIVER)
2004 TO 2008 WATER LICENCE RENEWAL
ENVIRONMENTAL ASSESSMENT REPORT

SOIL SAMPLING SITES AROUND VANGORDA PLATEAU MINE SITE

Gartner Lee | Deloitte & Touche | VOLUME 2 FIGURE NO. 32

Appendices

Appendix A

Guideline Conformity Table

Appendix A. Environmental Assessment Report Conformity with the DIAND March 10, 2003 Information Guidelines

DIAND Information Guidelines		Environmental Assessment Report		
Section	Topic to Address	Volume	Section	Heading
1.2	Scope of the Project	1 / 2 / 3	1.1	Introduction to the Environmental Assessment Report
1.3	Traditional Knowledge	2	2.11	Valued Ecosystem and Cultural Components
		3	6.3	Traditional Use
2.1.1	Project Overview	1	2.1.1	Project Overview
2.1.2	Project Purpose and Need	1	2.1.2	Project Purpose and Need
2.1.3	Timing Considerations	1	2.1.3	Timing Considerations
2.1.4	Project Proponent	1	2.1.4	Project Management
2.1.5	Regulatory History	1	2.1.6	Regulatory History
2.2.1.1	Project Background	1	2.1	Project Summary
2.2.1.2	Project Location	1	3 / 4	Description of Facilities - Faro and Vangorda Mine Sites
2.2.1.3	Overall Project Facilities	1	3 / 4	Description of Facilities - Faro and Vangorda Mine Sites
2.2.2.1	Care and Maintenance Plan	1	5	Description of Care and Maintenance Activities
2.2.2.2	Proposed new construction/activities	1	6	Proposed New Activities
2.2.2.3	Adaptive Management Program	1	7	Adaptive Management Plan
2.2.2.4	Proposed Water Licence Amendments	1	9	Proposed Amendments to the Water Licence
2.2.2.5	Proposed Studies	1	10	Proposed Studies
2.2.3	Accidents and Malfunctions	1	8	Accidents and Malfunctions
2.2.4	Project Schedule	1	11	Project Schedule
2.2.5	Environmental Monitoring and Protection Plans	1	12	Environmental Monitoring and Protection
2.3	Environmental Setting	2	2	Existing Environment
2.3.1.1	Climate	2	2.1	Meteorology
2.3.1.2	Terrain	2	2.2	Terrain
2.3.1.3	Regional Geology/Geochemistry	2	2.3	Geology
2.3.1.4	Geological Hazards and Seismicity	2	2.4	Geological Hazards and Seismicity
2.3.1.5	Water Resources	2	2.5	Water Resources
2.3.1.5.1	Hydrology	2	2.5.2	Hydrology
2.3.1.5.2	Water Quality	2	2.5.4 / 2.5.5	Surface Water Quality / Groundwater Quality
2.3.1.5.3	Hydrogeology	2	2.5.3	Hydrogeology
2.3.1.6	Aquatic Resources	2	2.6	Aquatic Resources
2.3.1.6.1	Fish Resources	2	2.6.4	Fish
2.3.1.6.2	Benthic Invertebrates	2	2.6.3	Benthic Invertebrates
2.3.1.6.3	Stream Sediments	2	2.6.2	Creek Sediment Quality
2.3.1.7	Terrestrial Resources	2	2.7	Terrestrial Resources
2.3.1.7.1	Soils	2	2.7.2	Soils / Terrain
2.3.1.7.2	Vegetation	2	2.7.3	Vegetation
2.3.1.7.3	Wildlife	2	2.7.4	Wildlife
2.3.1.8	Socio-economic and Cultural Conditions	2	2.8	Socio-economic Conditions
2.3.1.9	Heritage Resources/Traditional Land Use	2	2.9 / 2.10	Traditional Use / Heritage Resources
2.3.1.10	Valued Ecosystem and Cultural Components (VECC's)	2	2.11	Valued Ecosystem and Cultural Components
2.3.2	Mine Site Characterization	2	3	Site Characterization
2.3.2.1	Geochemistry and Acid Rock Drainage	2	3.4	Rock Dumps
2.3.2.2	Site Surface Water Quality and Water Balance	2	3.2	Contaminant Loading
2.3.2.3	Site Groundwater Quality	2	3.3	Rose Creek Tailings Facility
2.3.2.4	Site Soil Quality	2	3.1	Soil Quality
3.1.2	Scope of the Assessment	3	2	Scope of the Project and Assessment
3.2	First Nations and Public Consultation	3	3	First Nations and Public Consultation
3.3.1	Methods Used to Predict Effects	3	4	Methods Used to Predict Effects
3.3.2	Effects on Environmental Components	3	5	Effects on Environmental Components
3.3.3	Effects of Environmental Changes on Human Health	3	6.1	Human Health
3.3.4	Effects of Environmental Changes on Socio-economic Conditions	3	6.2	Sicio-economic Conditions
3.3.5	Effects of Environmental Changes on Physical and Cultural Heritage	3	6.3 / 6.4	Traditional Use / Heritage Resources
3.3.6	Effects of the Environment on the Project	3	7	Effects of the Environment on the Project
3.3.7	Effects of Possible Malfunctions or Accidents	3	8	Effects of Possible Malfunctions or Accidents
3.4	Mitigation Measure and Residual Effects	3	5 / 6	discussed by component
3.5	Determination of Significance	3	5 / 6	discussed by component
3.6	Cumulative Effects Analysis	3	9	Cumulative Effects Analysis
3.7	Monitoring and Follow-Up Program	3	5 / 6 / 10	discussed by component / Monitoring and Follow-up Plan

Appendix B

Surface Water Quality Data, 1998 to 2002

Faro Site - Select Surface Water Quality Listing, 1998-2002, Physical Parameters

Station	Date	TOTAL ACIDITY	ALK-T	CL-T	CN-T	CN-WAD	COND	COND-F	FLOW RATE	HARD	PH-F	PH-L	SO4-T	TEMP-C	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	µS/cm	L/s	mg/L	pH unit	pH unit	mg/L	deg C	mg/L
FDU															
	5/19/1998										6.98		51		7
	5/17/1999										7.21		2	1	13
	10/30/1999										6.93		2	0	
	6/11/2002												2		<1
R2															
	8/5/1998		108		<0.01			433	1541.2	226	7.69		39	13.5	4
	9/9/1998		115		<0.01					193			117		4
	9/10/1998							399	1541		7.98			7.4	
	7/31/2000		82		<0.01		340		4670	124	8.17		83	11.6	<1
	9/5/2000		85		<0.01		206		6125	78	8.07		21	5.4	<1
R3															
	8/5/1998		105		<0.01			405	1497	209	8.11		36	12.8	3
	9/9/1998		118		<0.01					179			103		2
	9/10/1998							362	1892		8.18			6.4	
	8/1/2000		84		<0.01		330		5130	122	8.12		76	10.7	1
	9/6/2000		87		<0.01		217			78	8.04		20	4	1
R4															
	8/5/1998		111		0.01			367	2428.8	196	8.21		24	8.8	3
	9/9/1998		111		<0.01					172			93		3
	9/10/1998							344	2539		8.32			4.7	
	3/17/1999						565			262			149		3
	8/1/2000		83		<0.01		315		6290	118			69	9.1	1
R5															
	8/5/1998		138		<0.01			283	4307	161	8.31		9	8.1	3
	9/9/1998		144							145			31		2
	9/10/1998							281	4234		8.37			3.7	
	8/1/2000		105				250		11090	101	8.35		20	7.5	2
	9/6/2000		115				257			107	8.4		18	3.2	3
R6															
	8/5/1998		141					265	1878.5	158	8.37		6	7.5	2
	9/9/1998		151							142			21		1
	9/10/1998							264	1695		8.44			3.5	
	8/1/2000		118				244		4800	99	8.4		15	7.2	1
	9/6/2000		114				261			111	7.4		18	3.2	2
R7															
	5/19/1998			1.5						29	7.26		3		8
	6/15/1998										8.11		14		2
	8/5/1998		92					155	761	83	8.19		9	9.2	16
	9/9/1998		102							82			8		3
	9/10/1998							157	675		8.01			4.1	
	10/19/1998										7.62		9		3
	2/25/1999									153		7.19	13		3
	5/17/1999									21	7.46		6	2	16
	7/4/1999									54	7.17		5	9	
	10/30/1999										7.82		10	0	
	3/26/2000											7.77	11		2
	6/3/2000										8.79		3	8	4
	8/1/2000		66				126.8		1610	47	7.97		5	7.4	1
	9/6/2000		66				144.8		2625	61	8.06		7	3.2	3
	9/12/2000										7.43		22	2.7	<1
	3/5/2001										8.2		11	1	<1
	6/13/2001										8.2		6	2.2	8
	9/8/2001										8.5		11	3.1	683
	3/21/2002												12		2
	6/25/2002												7		1
	9/27/2002										8.1		9	3.5	4
W10															
	6/16/1998								10		7.89		4		
	7/3/1999								5		7.98		3	7	3
	6/3/2000										7.95		3	4	
	6/11/2001										8		3	3.7	<1
	6/11/2002														1
X5															
	1/5/1998														
	1/5/1998				<0.01				265		9.09		438		<5
	1/12/1998														
	1/12/1998				<0.01				355		9.13		378		8
	1/19/1998								445		8.81				
	1/23/1998								492		8.67				
	1/28/1998														
	2/2/1998														
	2/5/1998														
	2/9/1998														
	2/12/1998								392		8.35				
	2/14/1998														
	2/18/1998								392		8.45				
	2/19/1998								0						
	4/13/1998				<0.01				0		7.22		389		3
	4/22/1998								182		7.65				
	4/24/1998								105		7.62				
	4/26/1998								124		7.81				
	4/30/1998								211						
	5/1/1998								211						
	5/4/1998														
	5/9/1998								235						
	5/14/1998														
	5/18/1998														
	5/18/1998										8.24		414		2
	5/23/1998														
	5/27/1998								275						
	6/2/1998				<.01				290		8		398		2
	6/5/1998														
	6/8/1998														

Faro Site - Select Surface Water Quality Listing, 1998-2002, Physical Parameters

Station	Date	TOTAL ACIDITY	ALK-T	CL-T	CN-T	CN-WAD	COND	COND-F	FLOW RATE	HARD	PH-F	PH-L	SO4-T	TEMP-C	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	µS/cm	L/s	mg/L	pH unit	pH unit	mg/L	deg C	mg/L
	6/10/1998														
	6/15/1998								295	446	7.67		165		2
	6/19/1998				<0.01	<0.01			0						
	6/20/1998				0.01	<0.01			0						
	6/21/1998														
	6/25/1998								0						
	6/26/1998														
	6/30/1998				<0.01	<0.01			295		7.58		400		1
	7/7/1998								295						
	7/9/1998								295						
	7/14/1998								295						
	7/16/1998								1235						
	7/21/1998				0.04	<0.01			0		7.65		468		3
	7/23/1998								0						
	7/28/1998								363						
	8/1/1998								363						
	8/5/1998														
	8/10/1998				<0.01	<0.01			290		7.63		162		6
	8/14/1998														
	8/17/1998														
	8/21/1998														
	8/24/1998														
	8/28/1998								137.5						
	8/31/1998														
	9/4/1998								300						
	9/7/1998								300						
	9/16/1998								300						
	9/21/1998								300						
	9/25/1998				0.02				300			7.91	586		2
	10/2/1998								300						
	10/11/1998								300						
	10/14/1998								300						
	10/19/1998				<.01	<.01			150		7.66		615		1
	10/20/1998								0						
	11/17/1998				<0.01				0		7.12		569		5
	1/18/1999										6.97		611		4
	2/21/1999								0		7.62		629	0	10
	3/21/1999				0.01	<0.01						7.17	538		
	4/20/1999				<.01	<.01					7.52		442	4	11
	5/6/1999								0				377		1
	5/17/1999				<.01	<.01			0.5		7.94		181	2	2
	5/27/1999								40				228		
	7/3/1999				<0.01	<0.01			126		8.55		430	14	8
	7/27/1999				<0.01	<0.01			163		8.29		541	11	19
	7/29/1999				<0.01	<0.01			163		8.53		480	12	7
	8/12/1999				<0.01	<0.01			197.5		8.59		493	15	6
	9/10/1999	<5	121		<0.01				325		7.67		536	9	7
	10/29/1999				<0.01				0		7.69		627	0	26
	1/26/2000				<0.01								566		2
	3/25/2000								0			7.6	580		1
	4/27/2000				<0.01				200		7.28		551	2	3
	5/15/2000				<0.01						8.69		152	2	1
	5/22/2000								249						
	6/4/2000										9.47		380	9	8
	6/4/2000								265						
	6/26/2000				<0.01						9.3		442	15	7
	7/25/2000								265		8.32		557	13.7	5
	7/28/2000								848.65		8.25			14.2	
	8/15/2000				<0.01	<0.01									
	8/29/2000				0.01						8.5		581	11	5
	8/30/2000								1000.25		8.2			9	
	9/25/2000				0.02						8.03		675	11.5	0.6
	10/21/2000				<0.01				312				507		7
	10/28/2000													2.8	
	11/13/2000				<0.01						8.2		632	2	1
	11/18/2000				0.01								561		0.2
	11/28/2000												525		1
	12/14/2000				<0.01						7.9		579		0.8
	1/13/2001				<0.01							8.26	227		14
	2/10/2001				<0.01							8.05	283		5
	3/10/2001				<0.01						8.4		577	-0.2	8
	4/16/2001				<0.01						8.4		486	0.6	1
	5/14/2001				<0.01						8.8		512	2.2	2
	6/17/2001				<0.01						8.8		545	11.9	3
	6/25/2001								358.2						
	7/14/2001				<0.01						8.2		588	13.5	5
	8/14/2001				<0.01						8.8		662	14	8
	8/21/2001								584						
	9/17/2001				<0.01						8.8		630	8.8	15
	10/15/2001				<0.01						8.8		633	2.5	8
	11/13/2001				<0.01						8.2		632	2	1
	12/14/2001				<0.01						8		542	2.2	1
	12/15/2001														
	1/15/2002				<0.01								600		<1
	2/12/2002				<0.01		1205						475		3
	3/12/2002				<0.01								528		5
	4/15/2002				<0.01						8.1		597	-0.2	4
	5/13/2002				<0.01								93		2
	6/16/2002												577		
	6/16/2002				<0.01										4
	7/16/2002												605		
	7/16/2002				<0.01										4
	8/12/2002												607		
	8/12/2002				<0.01										5

Faro Site - Select Surface Water Quality Listing, 1998-2002, Physical Parameters

Station	Date	TOTAL ACIDITY	ALK-T	CL-T	CN-T	CN-WAD	COND	COND-F	FLOW RATE	HARD	PH-F	PH-L	SO4-T	TEMP-C	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	µS/cm	L/s	mg/L	pH unit	pH unit	mg/L	deg C	mg/L
	9/16/2002												632		
	9/16/2002				<0.01										7
	9/29/2002										8.2			6.3	
	10/15/2002												645		
	10/15/2002				<0.01										5
	11/12/2002										8		656	0.4	
	11/12/2002				<0.01										6
	12/10/2002												635		
	12/10/2002				<0.01						7.9			0.2	4
	12/15/2002										7.8			0.6	
X13															
	1/5/1998				<0.01				71		6.84		567		8
	1/12/1998				<0.01				71		7.13		485		16
	1/23/1998								86		6.51				
	2/24/1998				<0.01				62		6.89		465		10
	3/13/1998								63						
	3/17/1998								61						
	3/17/1998				<0.01				60		6.98		132		8
	4/3/1998								61						
	4/13/1998				<0.01				60		6.88		493		9
	4/30/1998								62						
	5/7/1998								62						
	5/18/1998														
	5/18/1998				<0.01				81		7.35		405		6
	6/15/1998				<0.01										
	6/15/1998								97	706	7.09		489		8
	6/30/1998				<0.01	<0.01					7.01		1181		5
	7/21/1998				<0.01				81		7		419		8
	8/10/1998								119		7.07		486		12
	9/7/1998								73						
	9/25/1998								60			8.29	582		6
	10/19/1998								53		7.1		567		6
	11/13/1998								53						
	11/17/1998				<0.01				53		6.85		600		9
	12/15/1998								49						
	12/21/1998								49		6.89		441		11
	1/18/1999								45		6.99		717		8
	1/27/1999								45						
	2/22/1999								45				642	2	15
	3/17/1999				<0.01	<0.01			49		6.93		493	1	8
	3/24/1999								49						
	4/3/1999								49						
	4/20/1999								49		7.16		650	4	8
	5/17/1999								70		7.05		682	4	13
	6/4/1999								70						
	6/8/1999								62						
	7/3/1999								82		7.16		566	7	7
	7/27/1999								70		7.64		588	6	12
	8/12/1999				<0.01	<0.01			63		7.09		600	8	10
	9/10/1999				<0.01				52		6.91		580	4	10
	9/28/1999								44						
	10/29/1999				<0.01				49		6.46		603	1	10
	11/22/1999				<0.01				49		7.18		684	0	12
	12/14/1999				<0.01				50		6.33		547	0	7
	1/27/2000				<0.01				47				569		7
	2/28/2000				<0.01				47		6.72		594	0	19
	3/23/2000				<0.01				49		6.15		587	2	11
	4/27/2000				<0.01				47		7.08		694	3	11
	5/15/2000				<0.01						6.52		623	5	5
	6/20/2000														
	6/20/2000												496		5
	6/26/2000				<0.01				44.6		7.09		52	8	9
	7/19/2000								44.6						
	7/25/2000				<0.01				49		6.99		656	6.4	8
	7/28/2000								54.5		6.99			6.4	
	8/3/2000								46.65		7.12			5.6	
	8/10/2000								51.1		7.25			5.1	
	8/18/2000								49		7.14			4.9	
	8/24/2000								55		7.18			4.9	
	8/29/2000				<0.01				55		7.1		694	5.3	11
	9/8/2000								49		7.13			5	
	9/12/2000								55		7.15			5.5	
	9/25/2000				<0.01				49		7.15		459	5.3	6.4
	10/19/2000				<0.01				55		7.24		534	4.3	20
	10/28/2000								49					3.9	
	11/13/2000				<0.01				47		7.3		646	1.8	12
	11/18/2000				<0.01				35				620		5.2
	12/14/2000				<0.01				35		7.19		585		5.8
	1/13/2001				<0.01				35			7.3	295		8
	2/10/2001				<0.01				35		7.4	7.36	333		12
	3/1/2001								47		7.4			2	
	3/10/2001				<0.01				47		7.4		637	2.2	11
	3/15/2001								49		7.4			2.2	
	3/27/2001								49		7.3			2	
	4/5/2001								48		7.3			2.2	
	4/11/2001								48		7.4			2.2	
	4/16/2001				<0.01				49		7.4		568	2.2	15
	4/23/2001								49		7.4			2.8	
	4/30/2001								49		7.8			3.1	
	5/8/2001								49		7.6			2.4	
	5/14/2001				<0.01				48		7.6		544	3.7	9
	5/23/2001								48		7.5			2.8	
	5/30/2001								48		7.4			4.3	
	6/8/2001								49		7.4			4	

Faro Site - Select Surface Water Quality Listing, 1998-2002, Physical Parameters

Station	Date	TOTAL ACIDITY	ALK-T	CL-T	CN-T	CN-WAD	COND	COND-F	FLOW RATE	HARD	PH-F	PH-L	SO4-T	TEMP-C	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	µS/cm	L/s	mg/L	pH unit	pH unit	mg/L	deg C	mg/L
	6/14/2001								49		7.3			6.2	
	6/17/2001				<0.01				49		7.6		582	4.1	10
	6/21/2001								49		7.4			4.8	
	6/29/2001								49		7.6			4.1	
	7/14/2001				<0.01				49		7.6		495	4.4	11
	8/14/2001				<0.01				49		7.5		608	4.9	14
	9/12/2001								49		7.5			3.6	
	9/17/2001				<0.01						7.6		599	4.3	13
	9/24/2001								49		7.6			3.9	
	10/15/2001				<0.01				49		7.4		664	2.8	10
	11/13/2001				<0.01				47		7.3		646	1.8	12
	12/8/2001								47		7.3			2.2	
	12/14/2001				<0.01				47		7.3		559	2.2	16
	12/15/2001														
	12/20/2001								47		7.5			2.2	
	12/28/2001								47		7.5			2.2	
	1/15/2002				<0.01								570		12
	2/12/2002				<0.01								419		11
	3/12/2002				<0.01								513		14
	4/15/2002				<0.01				47		7.5		582	3.4	9
	5/13/2002				<0.01								684		11
	6/16/2002												541		
	6/16/2002				<0.01										8
	7/16/2002												683		
	7/16/2002				<0.01										6
	8/12/2002												693		
	8/12/2002				<0.01										8
	9/5/2002										7.3			5.4	
	9/5/2002								49		7.3			5.4	
	9/12/2002										7.4			5.1	
	9/12/2002								49		7.4			5.1	
	9/16/2002										7.4		646	4.6	
	9/16/2002				<0.01				49		7.4			4.6	7
	9/27/2002										7.2			5	
	9/27/2002								45		7.2			5	
	9/29/2002										7.2			5	
	10/3/2002										7.4			4.3	
	10/3/2002								38		7.4			4.3	
	10/12/2002										7.4			3.7	
	10/12/2002								38		7.4			3.7	
	10/15/2002												493		
	10/15/2002				<0.01										9
	10/21/2002										7.4			4.2	
	10/21/2002								38		7.4			4.2	
	10/29/2002										7.5			3.7	
	10/29/2002								38		7.5			3.7	
	11/5/2002								38		7.5			4.1	
	11/12/2002										7.8		678	2.6	
	11/12/2002				<0.01										12
	11/19/2002								45		7.5			2.7	
	11/26/2002								45		7.3			3.6	
	12/3/2002								45		7.5			2.9	
	12/10/2002												639		
	12/10/2002				<0.01				45		7.4			3.1	10
	12/15/2002										7.4			3	
	12/17/2002										7.3			3.1	
	12/24/2002										7.2			3	
	12/31/2002										7.4			2.3	
X14															
	1/12/1998										7.34		294		7
	2/24/1998								776		7.14		291		6
	3/17/1998									260	7.39		170		<1
	4/13/1998									226	7.05		303		3
	4/16/1998								758						
	4/22/1998														
	4/24/1998														
	4/26/1998								988		7.65				
	4/30/1998														
	5/18/1998									85	8.33		24		10
	6/15/1998									126	7.87		49		2
	6/19/1998				0.01	<0.01									
	6/20/1998				0.02	<0.01									
	6/21/1998														
	6/21/1998														
	7/21/1998				<0.01						7.77		24		6
	8/4/1998								1541.2						
	8/10/1998										7.65		45		12
	9/25/1998				<0.01					161		8.22	90		3
	10/19/1998				<.01	<.01				188	7.69		106		2
	11/17/1998				<0.01					332	7.24		149		4
	12/21/1998									349	6.94		207		5
	1/18/1999									387	6.72		265		3
	2/22/1999									413	5.94		326	0	3
	3/17/1999				<0.01	<0.01				398	7.09		268	1	7
	4/20/1999				0.02	<.01				304	7.24		201	2	6
	5/17/1999				<.01	<.01				51	7.29		23	1	15
	6/25/1999								7820						
	7/3/1999				0.02	<0.01				86	8.53		38	8	4
	7/27/1999				<0.01	<0.01				89	8.17		32	9	27
	7/29/1999								3421						
	8/12/1999				0.01	<0.01				199	8.18		135	11	
	8/31/1999								1912						
	9/10/1999									177	7.95		119	6	
	10/29/1999										8.06		76	0	

Faro Site - Select Surface Water Quality Listing, 1998-2002, Physical Parameters

Station	Date	TOTAL ACIDITY	ALK-T	CL-T	CN-T	CN-WAD	COND	COND-F	FLOW RATE	HARD	PH-F	PH-L	SO4-T	TEMP-C	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	µS/cm	L/s	mg/L	pH unit	pH unit	mg/L	deg C	mg/L
	11/22/1999									156	7.49		104	0	1
	12/14/1999									243	7.81		114	0	10
	1/27/2000									298			206		2
	2/28/2000									302	7.56		179	0	6
	3/23/2000									324	6.88		185	1	2
	4/27/2000									367	7.43		324	2	8
	5/15/2000									101	6.48		60	1	1
	6/26/2000									135	8.63		83	12	1
	7/25/2000									183	8.02		153	10.9	2
	8/29/2000									130	7.85		63	7	1
	9/25/2000									99	7.76		9	4.8	2.2
	10/28/2002													3.2	
	10/29/2000									141			70		6
	11/13/2000									200	8		83	-0.4	3
	11/18/2000									99			11		1.6
	12/14/2000									246	7.48		96		1.2
	1/13/2001									246		7.56	111		4
	2/10/2001									266		7.65	142		9
	3/10/2001									291.33	7.9		153	0.6	7
	4/16/2001									430	7.8		166	0.2	6
	5/14/2001									233	8.3		130	1	6
	6/17/2001									65	8.3		18	4.7	9
	7/14/2001									128	8.3		56	9.1	3
	8/14/2001									627	8.2		138	10.3	9
	9/17/2001									175	8.2		83	6.7	7
	10/15/2001				<0.01					367	8.3		288	0.6	9
	11/13/2001									200	8		83	-0.4	3
	12/14/2001									392	7.8		241	0.2	4
	12/15/2001														
	1/15/2002									207			81		5
	2/12/2002									224			78		<1
	3/12/2002									377			190		9
	4/15/2002									403	8		211	1.6	4
	5/13/2002									119			42		25
	6/16/2002									95			27		<1
	7/16/2002									250			166		1
	8/12/2002												41		1
	9/16/2002									214			118		2
	10/15/2002									139			38		4
	11/11/2002										8.1			0.4	
	11/12/2002									186			64		3
	12/10/2002									233	7.9		92	0.2	2

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FDU																				
	5/19/1998	<.003	0.4	0.02	0.22	0.036	0.02	<.04	3.5	<.002	<.005	0.039	0.026	0.35		1	0.036		1.5	<.01
	5/17/1999	<.003	0.08	<.005	<.05	0.096	0.002	<.04	3.8	0.001	<.005	<.005	0.013	0.23		1	<.005		0.7	0.03
	10/30/1999	<.003	0.16	<.005	0.09	0.094	0.001	<.04	3.8	<.001	<.005	0.008	0.011	0.05		1	0.027		1	<.01
	6/11/2002	<0.2	0.276	<0.003	0.08	0.169	0.2	<0.01	3.1	<0.2	0.003	0.02	0.064	0.256		0.3	<0.001		0.7	0.007
R2																				
	8/5/1998	<.0006	0.07	<.004	0.09	0.0522	0.0003	<.008	66.47	0.0005	0.003	<.001	0.0108	0.247	<.1	2.5	0.012		14	0.889
	9/9/1998	<.001	0.14	<.005	<.05	0.13	<.001	<.04	57	<.001	<.005	0.031	0.04	0.54	<.1	1.6	<.005		11.8	1.16
	9/10/1998																			
	7/31/2000	<.0001	0.075	0.001	<.002	0.0403	0.0003	<.001	41.5	<.0001	<.0002	<.0002	0.0059	0.392		1.49	0.0027		8.383	0.4625
	9/5/2000	<.0001	0.028	<.001	0.053	0.0485	0.0002	<.001	22.737	<.0001	0.0028	<.0002	0.0152	0.261		0.86	<.0002		5.175	0.1002
R3																				
	8/5/1998	<.0006	0.05	<.004	0.04	0.0539	0.0003	<.008	61.68	0.0012	0.001	<.001	0.0056	0.241	<.1	2.2	0.012		12.75	0.63
	9/9/1998	<.001	0.14	<.005	<.05	0.139	<.001	<.04	56.2	<.001	<.005	0.058	0.042	0.27	<.1	1.5	<.005		11.5	0.9
	9/10/1998																			
	8/1/2000	<.0001	0.065	<.001	<.002	0.0369	0.0003	<.001	38.5	<.0001	0.0005	<.0002	0.0053	0.169		1.39	0.0202		7.733	0.4123
	9/6/2000	<.0001	0.069	<.001	0.059	0.05	0.0002	<.001	23.092	<.0001	0.0036	<.0002	0.0169	0.232		0.9	<.0002		4.994	0.079
R4																				
	8/5/1998	<.0006	0.06	<.004	0.07	0.0676	0.0002	<.008	57.47	0.0006	<.001	<.001	0.0032	0.144	<.1	1.9	0.008		12.08	0.271
	9/9/1998	0.001	0.1	<.005	<.05	0.159	<.001	<.04	52	0.001	<.005	0.037	0.035	0.17	<.1	1.3	<.005		10.8	0.48
	9/10/1998																			
	3/17/1999	<.003	0.23	<.005	0.17	0.092	<.001	<.04	81.3	<.001	<.005	0.207	0.025	0.06		1	0.006		14.2	0.08
	8/1/2000	<.0001	0.085	<.001	0.036	0.0598	0.0003	<.001	39.1	<.0001	<.0002	<.0002	0.0073	0.169		1.38	0.0029		7.989	0.2632
R5																				
	8/5/1998	<.0006	0.05	<.004	0.05	0.0762	<.0002	<.008	44.84	<.0004	<.001	0.002	0.0033	0.102	<.1	1.1	0.009		11.29	0.057
	9/9/1998	<.001	0.08	<.005	<.05	0.155	<.001	<.04	41.9	<.001	<.005	0.022	0.036	0.11	<.1	<1	<.005		10	0.06
	9/10/1998																			
	8/1/2000	<.0001	0.08	<.001	0.034	0.0631	0.0002	<.001	32.5	<.0001	<.0002	<.0002	0.0041	0.118		1.05	0.0087		8.263	0.0359
	9/6/2000	<.0001	0.109	<.001	0.055	0.0827	0.0003	<.001	31.201	<.0001	0.0012	<.0002	0.0139	0.293		1.15	<.0002		8.425	0.0177
R6																				
	8/5/1998	<.0006	0.04	<.004	0.03	0.0839	<.0002	<.008	43.28	<.0004	<.001	0.008	0.0043	0.119	<.1	0.9	0.01		11.66	0.009
	9/9/1998	0.001	0.11	<.005	<.05	0.161	<.001	<.04	40.4	0.002	<.005	0.044	0.036	0.09	<.1	<1	<.005		10	<.01
	9/10/1998																			
	8/1/2000	<.0001	0.081	0.003	0.017	0.064	0.0003	<.001	32.5	<.0001	<.0002	<.0002	0.0059	0.137		0.88	0.0101		8.529	0.0127
	9/6/2000	<.0001	0.148	<.001	0.048	0.0731	0.0003	<.001	32.216	<.0001	0.0021	<.0002	0.0167	0.374		1.03	<.0002		8.902	0.0152
R7																				
	5/19/1998	<.003	0.36	<.02	0.21	0.036	<.001	<.04	8.3	<.002	<.005	0.02	0.022	0.99		<1	0.022		1.9	0.05
	6/15/1998	<.003	<.05	<.02	<.05	0.116	<.001	<.04	16.8	<.002	<.005	<.005	0.029	0.16		<1	<.005		3.3	<.01
	8/5/1998	<.0006	0.04	<.004	0.03	0.0506	<.0002	<.008	24.31	0.0016	0.002	<.001	0.0029	0.122	<.1	0.4	<.001		5.1	0.011
	9/9/1998	<.001	0.14	<.005	<.05	0.136	<.001	<.04	25.4	<.001	<.005	0.025	0.034	0.07	<.1	<1	<.005		4.9	<.01
	9/10/1998																			
	10/19/1998	<.003	0.07	<.02	0.12	0.056	<.001	<.04	28.2	<.002	0.011	<.005	0.009	0.14		<1	<.005		5.7	0.01
	2/25/1999	<.003	0.16	<.005	0.24	0.103	<.001	<.04	46	<.001	<.005	<.005	0.022	0.11		<1	<.005		9.4	0.02
	5/17/1999	<.003	0.25	<.005	<.05	0.134	0.002	<.04	8.4	<.001	<.005	<.005	0.013	1.63		2	<.005		1.2	0.03
	7/4/1999	<.003	0.35	<.005	0.27	0.053	<.001	<.04	18.1	0.025	<.005	<.005	0.009	1.28		<1	<.005		4.2	0.03
	10/30/1999	<.003	0.08	<.005	0.05	0.159	<.001	<.04	24.2	<.001	<.005	<.005	0.01	0.09		2	<.005		4.9	0.01
	3/26/2000	<.003	0.06	<.005	0.06	0.199	<.001	<.05	40.6	<.001	0.02	<.005	0.002	0.07		2	<.005		8.1	0.21
	6/3/2000	<.003	0.18	<.005	<.05	0.106	<.001	<.05	11	<.001	<.005	0.013	<.002	0.83		2	<.005		2	0.02
	8/1/2000	<.0001	0.07	<.001	<.002	0.0511	0.0001	<.001	16.5	<.0001	<.0002	<.0002	0.0033	0.156		0.36	0.0164		3.119	0.0129
	9/6/2000	<.0001	0.04	<.001	0.031	0.0565	0.0002	<.001	19.716	<.0001	0.0021	<.0002	0.0112	0.279		0.7	<.0002		3.979	0.0164
	9/12/2000	<.003	0.09	<.005	<.05	0.133	<.001	<.05	23	<.001	<.005	<.005	0.009	0.09		<1	<.005		4	0.02
	3/5/2001	<.003	0.35	<.005	0.15	0.25	<.001	<.05	42	<.001	<.005	<.005	0.01	0.08		1.95	<.005		8.39	0.01
	6/13/2001	<.003	0.32	<.005	<.05	0.148	<.001	<.05	8.2	<.001	<.005	<.005	0.002	0.51		<1	<.005		1.9	0.07
	9/8/2001	<0.003	0.06	0.068	2.26	0.149	<0.001	<0.05	26.6	<0.001	<0.005	<0.005	0.01	0.13		<1	0.009		5.1	0.02
	3/21/2002	<0.001	0.06	<0.005	<0.05	0.167	<0.001	<0.05	50.2	<0.001	<0.005	<0.005	<0.002	0.05		2	0.01		9.4	0.02
	6/25/2002	<0.2	0.148	<0.003	0.07	0.191	0.2	<0.01	20.8	1.1	<0.001	0.009	0.011	0.18		0.7	0.002		4.5	0.015
	9/27/2002	<0.2	0.058	<0.003	0.09	0.139	<0.2	0.02	28.6	<0.2	<0.001	<0.001	0.015	0.164		0.6	0.004		5.4	0.018
W10																				
	6/16/1998	<.003	<.05	<.02	<.05	0.091	<.001	<.04	13.7	<.002	<.005	<.005	0.024	<.01		<1	<.005		1.8	<.01
	7/3/1999	<.003	0.31	<.005	0.34	0.018	<.001	<.04	11.7	0.003	<.005	<.005	0.008	0.86		<1	<.005		1.6	0.01
	6/3/2000	<.003	<.05	<.005	<.05	0.063	<.001	<.05	7.4	<.001	<.005	0.048	<.002	0.11		2	<.005		1.5	<.01

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	6/11/2001	<.003	0.14	0.011	0.08	0.119	<.001	<.05	9.4	0.003	<.005	<.005	0.003	0.12		<1	<.005		1.4	0.02
	6/11/2002	<0.2	0.139	0.008	0.05	0.238	<0.2	<0.01	11.1	1.8	0.003	0.006	<0.001	0.068		0.5	0.002		1.4	0.031
X5																				
	1/5/1998																			
	1/5/1998	<.003	<.05	<.02	0.19	0.024	<.001	<.04	124.5	<.002	<.005	<.005	0.012	0.03		<1	<.005		20.7	0.35
	1/12/1998																			
	1/12/1998	<.003	<.05	0.02	<.05	0.093	<.001	<.04	120.1	<.002	<.005	<.005	0.005	0.02		2	<.005		18.9	0.35
	1/19/1998																			
	1/23/1998																			
	1/28/1998																			
	2/2/1998																			
	2/5/1998																			
	2/9/1998																			
	2/12/1998																			
	2/14/1998																			
	2/18/1998																			
	2/19/1998																			
	4/13/1998	<.003	0.08	<.02	<.05	0.093	<.001	<.04	128.9	<.002	0.006	0.028	0.137	0.03		6	0.005		23.3	1.3
	4/22/1998																			
	4/24/1998																			
	4/26/1998																			
	4/30/1998																			
	5/1/1998																			
	5/4/1998																			
	5/9/1998																			
	5/14/1998																			
	5/18/1998																			
	5/18/1998	<.003	0.22	<.02	0.22	0.03	<.001	<.04	113	<.002	<.005	0.008	0.043	0.02		6	<.005		18.4	0.88
	5/23/1998																			
	5/27/1998																			
	6/2/1998	<.003	0.1	<.02	<.05	0.101	0.002	<.04	120.9	<.002	0.017	0.028	0.024	0.23		6	0.017		19.5	0.9
	6/5/1998																			
	6/8/1998																			
	6/10/1998																			
	6/15/1998	<.003	0.09	<.02	0.06	0.104	0.001	<.04	140.2	<.002	<.005	<.005	0.053	0.24		8	0.009		22.7	1.16
	6/19/1998																			
	6/20/1998	<.003	0.08	<.02	<.05	0.112	<.001	<.04	128.8	<.002	<.005	0.016	0.046	0.09		8	<.005		21.3	0.97
	6/21/1998	<.003	0.07	<.02	<.05	0.107	<.001	<.04	122.2	<.002	<.005	0.073	0.035	0.25		7	0.013		20.3	0.99
	6/25/1998																			
	6/26/1998																			
	6/30/1998	<.003	0.11	<.02	<.05	0.114	0.001	<.04	135.9	<.002	0.009	<.005	0.02	0.03		7	<.005		23.2	1.08
	7/7/1998																			
	7/9/1998																			
	7/14/1998																			
	7/16/1998																			
	7/21/1998	<.003	0.09	0.03	<.05	0.088	<.001	<.04	165.7	<.002	0.009	0.043	0.049	0.12		9	<.005		30.5	1.85
	7/23/1998																			
	7/28/1998																			
	8/1/1998																			
	8/5/1998																			
	8/10/1998	<.003	0.21	<.02	0.25	0.003	0.001	<.04	183.2	<.002	<.005	0.006	0.063	0.18		10	0.045		34.7	2.87
	8/14/1998																			
	8/17/1998																			
	8/21/1998																			
	8/24/1998																			
	8/28/1998																			
	8/31/1998																			
	9/4/1998																			
	9/7/1998																			
	9/16/1998																			
	9/21/1998																			

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/25/1998	<.003	0.14	<.02	<.05	0.18	0.001	<.04	198.2	<.002	<.005	0.036	0.035	0.27		9	<.005		41.6	5.38
	10/2/1998																			
	10/11/1998																			
	10/14/1998																			
	10/19/1998	<.003	0.28	<.02	0.2	0.032	0.001	<.04	182.8	<.002	0.013	<.005	0.029	0.32		9	<.005		38.5	5.07
	10/20/1998																			
	11/17/1998	<.003	0.15	<.005	<.05	0.112	<.001	<.04	230.7	<.001	0.011	0.083	0.036	0.32		10	<.005		46.1	5.73
	1/18/1999	<.003	0.17	<.005	0.21	0.038	<.001	<.04	195	0.003	0.008	0.061	0.044	0.39		7	<.005		39.8	5.87
	2/21/1999	0.015	0.38	<.005	0.39	0.039	<.001	<.04	226.3	<.001	0.016	0.097	0.035	0.38		8	0.007		44.6	6.47
	3/21/1999	<.003	0.22	<.005	<.05	0.042	<.001	<.04	201.6	0.004	<.005	0.898	0.041	0.76		7	<.005		37.4	7.81
	4/20/1999	<.003	0.52	<.005	0.17	0.043	0.001	<.04	143.5	<.001	<.005	<.005	0.028	0.76		6	<.005		31.2	4.23
	5/6/1999	<.003	0.17	<.005	0.18	0.013	0.001	<.04	125.1	0.004	0.012	<.005	0.011	0.3		7	<.005		19.6	0.89
	5/17/1999	<0.003	0.33	<0.005	<0.05	0.152	<.001	<.04	63.8	<.001	0.02	0.301	0.042	3.61		3	<.005		11.1	0.52
	5/27/1999	<.003	0.2	<.005	0.06	0.127	0.001	<.04	87.6	0.012	<.005	<.005	0.043	3.12		4	<.005		14.1	0.86
	7/3/1999	<.003	0.47	<.005	0.53	0.035	<.001	<.04	137.7	0.002	0.006	<.005	0.03	0.89		6	<.005		25.6	1.7
	7/27/1999	<.003	0.66	<.005	0.07	0.154	<.001	<.04	150.6	<.001	0.017	<.005	0.032	0.72		7	<.005		32	2.87
	7/29/1999	<.0003	0.11	<.002	0.02	0.076	<.001	<.004	160.5	<.0002	<.001	<.001	0.029	0.43		7.9	<.001		30.8	2.56
	8/12/1999	<.003	<.05	<.005	0.08	<.002	0.002	<.04	177.7	0.002	0.03	<.005	0.008	0.1		<1	<.005		33	2.28
	9/10/1999	<.003	0.27	<.005	<.05	0.112	<.001	<.04	174.7	0.001	0.012	<.005	0.028	0.24		8	0.02		35.4	3.85
	10/29/1999	<.003	0.46	<.005	0.16	2.007	0.002	<.04	179.5	<.001	<.005	<.005	0.033	0.36		4	<.005		36.3	7.87
	1/26/2000																			
	3/25/2000	<.003	0.59	<.005	0.08	0.154	<.001	<.05	206.8	<.001	0.027	<.005	0.007	0.19		12	<.005		42.1	6.3
	4/27/2000	<.003	0.32	<.005	<.05	0.139	0.002	<.05	166.9	<.001	<.005	<.005	0.033	0.28		6	<.005		34.9	6.4
	5/15/2000	<.003	0.15	0.012	0.06	0.088	<.001	<.05	49.5	<.001	0.007	0.094	0.01	0.17		1	0.033		7.2	0.47
	5/22/2000																			
	6/4/2000																			
	6/4/2000	<.003	0.9	<.005	<.05	0.203	<.001	<.05	119.3	<.001	0.005	0.033	0.029	2.44		6	<.005		22.5	1.29
	6/26/2000	<.003	0.2	<.005	<.05	0.096	0.002	<.05	157.4	<.001	0.006	<.005	0.024	0.19		8	<.005		27.8	1.55
	7/25/2000	<.003	0.11	<.005	<.05	0.112	0.002	<.05	164.2	0.004	0.022	<.005	0.026	0.68		8	0.121		30.7	2.37
	7/28/2000																			
	8/15/2000																			
	8/29/2000	<.003	0.33	<.005	0.06	0.082	<.001	<.05	187.2	<.001	<.005	<.005	0.027	0.19		9	<.005		37.8	2.77
	8/30/2000																			
	9/25/2000	<0.01	0.05	<0.2	<0.1	0.02	<0.005	<0.1	191	<0.001	<0.01	<0.01	<0.01	0.11		7		0.02	39.8	4.4
	10/21/2000	<.003	0.44	<.005	<.05	0.197	0.003	<.05	190.8	0.004	0.009	<.005	0.039	0.89		9	<.005		38.3	4.72
	10/28/2000																			
	11/13/2000	<0.003	0.08	<0.005	0.26	0.076	<0.001	<0.05	195.2	<0.001	<0.005	<0.005	<0.002	0.11		9	0.028		45.5	3.74
	11/18/2000	<0.01	<0.05	<0.2	<0.1	0.03	<0.005	<0.1	220	<0.001	<0.01	<0.01	<0.01	0.08		7		0.02	38.8	5.18
	11/28/2000																			
	12/14/2000	<0.01	<0.05	<0.2	<0.1	0.03	<0.005	<0.1	223	<0.001	<0.01	<0.01	<0.01	0.14		8		0.03	45.6	5.51
	1/13/2001	<.003	0.15	<.005	0.06	0.127	0.002	<.05	162.2	<.001	<.005	<.005	0.035	0.48		8	<.005		31.3	3.57
	2/10/2001	<.003	0.29	<.005	<.05	0.161	0.003	<.05	171.7	<.001	<.005	<.005	0.028	0.33		10	<.005		34.1	3.68
	3/10/2001	<.003	0.72	<.005	0.12	0.2	<.001	<.05	179	<.001	<.005	<.005	0.02	0.07		4.38	<.005		36.84	4.86
	4/16/2001	<.003	0.1	<.005	<.05	0.046	<.001	<.05	174.8	<.001	<.005	<.005	0.007	0.05		<1	<.005		36.7	4.64
	5/14/2001	<.003	0.39	0.012	<.05	0.185	<.001	<.05	185.5	<.001	0.025	<.005	0.014	0.04		9	<.005		35.5	3.41
	6/17/2001	<.003	0.09	<.005	0.11	0.142	<.001	<.05	185.1	<.001	<.005	0.012	0.01	0.13		6	0.022		35.4	1.59
	6/25/2001																			
	7/14/2001	<.003	0.09	<.005	0.28	0.188	<.001	<.05	189.3	<.001	0.007	0.013	<.002	0.09		6	0.008		38.7	3.42
	8/14/2001	<0.003	0.08	<0.005	<0.05	0.169	<0.001	<0.05	214	<0.001	<0.005	<0.005	0.006	0.05		7	0.005		48.1	2.63
	8/21/2001																			
	9/17/2001	<0.003	0.05	<0.005	0.13	0.13	<0.001	<0.05	180.6	<0.001	<0.005	<0.005	0.003	0.03		7	0.018		42.9	2.16
	10/15/2001	<0.003	<0.05	<0.005	0.25	0.15	<0.001	<0.05	189	<0.001	0.007	<0.005	0.006	<0.01		9	0.036		44.2	3.17
	11/13/2001	<0.003	0.08	<0.005	0.26	0.076	<0.001	<0.05	195.2	<0.001	<0.005	<0.005	<0.002	0.11		9	0.028		45.5	3.74
	12/14/2001																			
	12/15/2001	<0.001	0.08	<0.005	0.09	0.021	0.001	<0.05	189.8	<0.001	0.007	0.011	<0.002	0.05		6	0.031		43.4	3.08
	1/15/2002	<0.001	<0.05	<0.005	<0.05	0.154	<0.001	<0.05	186.6	<0.001	0.006	<0.005	0.003	0.08		9	0.024		44.1	4.06
	2/12/2002	<0.001	<0.05	0.01	<0.05	0.124	<0.001	<0.05	183.6	<0.001	0.006	<0.005	0.004	0.11		7	0.008		39.6	4.76
	3/12/2002	<0.001	<0.05	0.007	<0.05	0.208	<0.001	<0.05	192.6	<0.001	0.006	<0.005	0.004	0.05		9	<0.005		41.4	4.39
	4/15/2002	<0.001	<0.05	<0.005	0.07	0.095	<0.001	<0.05	191.4	<0.001	0.006	<0.005	0.003	<0.01		9	0.008		45	3.47
	5/13/2002	<0.001	<0.05	<0.005	0.05	0.097	<0.001	<0.05	40.2	<0.001	<0.005	0.005	0.003	0.01		1	0.005		3.7	0.42
	6/16/2002																			

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	6/16/2002	<0.2	0.116	<0.003	0.08	0.151	0.8	<0.01	175.9	<0.2	0.002	0.02	0.02	0.049		7.5	<0.001		38.2	1.698
	7/16/2002																			
	7/16/2002	1.3	0.096	0.007	0.06	0.131	0.5	<0.01	181	0.8	0.005	0.012	0.016	0.08		8.2	<0.001		42.8	1.323
	8/12/2002																			
	8/12/2002	<0.2	0.077	0.006	0.11	0.078	0.5	0.01	170.5	<0.2	0.007	<0.001	0.011	0.109		9	0.002		48.6	2.694
	9/16/2002																			
	9/16/2002	0.5	0.075	0.005	0.12	0.113	<0.2	<0.01	192.3	<0.2	0.005	<0.001	0.018	0.126		10.2	<0.001		47.1	2.344
	9/29/2002																			
	10/15/2002																			
	10/15/2002	0.4	0.066	0.005	0.15	0.111	<0.2	0.02	187.6	0.3	0.007	0.004	0.012	0.174		9.4	0.003		46.5	3.592
	11/12/2002																			
	11/12/2002	0.3	0.039	0.003	0.2	0.079	<0.2	<0.01	205.1	0.2	0.007	<0.001	0.015	0.215		9.9	0.001		48.3	4.45
	12/10/2002																			
	12/10/2002	0.5	0.032	0.028	0.14	0.096	0.4	<0.01	186.2	0.4	0.008	<0.001	0.023	0.24		9.7	<0.001		49.7	4.461
	12/15/2002																			
X13																				
	1/5/1998	<.003	<.05	<.02	0.19	0.09	0.003	<.04	205.9	<.002	<.005	<.005	0.015	1.12		3	<.005		37.8	9.12
	1/12/1998	<.003	<.05	<.02	<.05	0.146	<.001	<.04	189.3	<.002	0.016	<.005	0.004	2.03		3	<.005		33.4	8.39
	1/23/1998																			
	2/24/1998	0.004	0.33	0.02	0.24	0.07	0.001	<.04	193.7	<.002	0.008	0.007	0.049	1.54		4	0.021		37.4	8.15
	3/13/1998																			
	3/17/1998																			
	3/17/1998	<.003	0.12	0.02	<.05	0.159	<.001	<.04	201.2	<.002	0.011	0.024	0.024	2.14		4	0.014		39.2	8.27
	4/3/1998																			
	4/13/1998	<.003	0.14	<.02	<.05	0.173	0.001	<.04	196.8	<.002	0.016	0.015	0.05	1.83		4	0.014		37.3	8.52
	4/30/1998																			
	5/7/1998																			
	5/18/1998																			
	5/18/1998	<.003	0.23	0.03	0.2	0.08	<.001	<.04	222.7	<.002	<.005	<.005	0.041	2.05		5	<.005		40.8	9.15
	6/15/1998																			
	6/15/1998	<.003	0.17	<.02	0.06	0.145	0.002	<.04	216.9	<.002	0.01	0.014	0.054	2.41		6	<.005		39.1	8.69
	6/30/1998	<.003	0.14	<.02	<.05	0.202	0.001	<.04	218.9	<.002	0.012	0.093	0.019	1.95		6	<.005		42.8	7.66
	7/21/1998	<.003	0.08	<.02	<.05	0.143	<.001	0.04	200.4	<.002	<.005	0.03	0.046	1.52		5	0.011		37.9	7.29
	8/10/1998	0.003	0.28	<.02	0.21	0.052	0.001	<.04	205.2	<.002	<.005	<.005	0.058	1.21		5	0.021		36.6	7.56
	9/7/1998																			
	9/25/1998	0.004	0.16	<.02	<.05	0.181	0.002	<.04	218.5	<.002	0.013	0.048	0.03	1.11		5	0.019		39.4	8.4
	10/19/1998	0.005	0.17	<.02	0.07	0.089	0.001	<.04	198.2	<.002	0.012	<.005	0.027	1.38		5	<.005		36.7	7.26
	11/13/1998																			
	11/17/1998	<.003	0.33	0.037	<.05	0.186	<.001	<.04	280.1	<.001	0.012	0.036	0.038	2.5		7	<.005		51.5	9.79
	12/15/1998																			
	12/21/1998	<.003	0.22	0.011	0.27	0.114	<.001	<.04	180.6	0.003	<.005	<.005	0.03	1.66		4	<.005		33.6	7.04
	1/18/1999	<.003	0.18	0.009	0.21	0.083	0.001	<.04	246.9	0.003	<.005	0.106	0.041	2.77		6	<.005		46.2	10.08
	1/27/1999																			
	2/22/1999	0.023	0.4	<.005	0.35	0.11	<.001	<.04	258.3	<.001	0.016	0.127	0.039	3.86		6	<.005		48.2	10.29
	3/17/1999	<.003	0.38	<.005	0.19	0.101	<.001	<.04	191.7	<.001	<.005	0.229	0.039	1.54		4	<.005		33.8	7.32
	3/24/1999																			
	4/3/1999																			
	4/20/1999	<.003	0.16	0.011	0.18	0.08	0.002	0.04	225.3	<.001	0.01	<.005	0.034	2.69		6	<.005		44.7	10.1
	5/17/1999	<.003	0.05	<.005	<.05	0.149	0.003	<.04	214.9	<.001	<.005	<.005	0.033	2.7		6	<.005		39.5	9.34
	6/4/1999																			
	6/8/1999																			
	7/3/1999	<.003	0.53	<.005	0.51	0.079	<.001	<.04	213.4	<.001	0.01	<.005	0.035	3.07		6	<.005		41.1	9.48
	7/27/1999	<.003	<.05	<.005	0.18	0.189	0.005	<.04	207.4	0.004	0.102	<.005	0.011	2.46		4	<.005		42.6	9.49
	8/12/1999	<.003	<.05	<.005	0.16	0.183	<.001	<.04	238.2	<.001	0.03	<.005	0.012	2.16		8	<.005		42.9	8.2
	9/10/1999	<.003	0.25	<.005	0.06	0.157	<.001	<.04	214.3	<.001	<.005	<.005	0.026	1.51		6	0.016		40.1	9.27
	9/28/1999																			
	10/29/1999	<.003	0.17	<.005	0.07	0.189	<.001	<.04	194.6	<.001	<.005	<.005	0.003	2.31		4	<.005		36.2	9.27
	11/22/1999	<.003	0.27	<.005	0.08	0.163	0.001	0.05	188.8	<.001	0.014	<.005	0.049	2.3		6	<.005		40.6	9.59
	12/14/1999	<.003	0.57	<.005	<.05	0.145	<.001	<.04	212.8	<.001	<.005	<.005	0.029	1.74		5	<.005		35.8	8.58
	1/27/2000	<.003	0.31	<.005	<.05	0.167	0.002	<.05	214.1	0.004	0.018	<.005	0.041	1.97		7	0.019		39.6	8.39
	2/28/2000	<.003	0.37	<.005	<.05	0.151	<.001	<.05	221.4	0.001	<.005	0.118	0.666	2.39		8	0.073		43.6	8.56

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	3/23/2000	<.003	0.55	<.005	0.13	0.231	<.001	<.05	224.7	<.001	0.047	<.005	0.007	1.71		11	<.005		42.3	10.67
	4/27/2000	<.003	0.37	<.005	<.05	0.206	0.002	<.05	212.9	<.001	0.014	<.005	0.034	2.01		6	<.005		42.2	10.88
	5/15/2000	<.003	0.32	0.025	<.05	0.175	<.001	<.05	245	<.001	0.029	0.185	0.022	1.88		6	0.052		48.4	10.32
	6/20/2000																			
	6/20/2000	<.003	0.35	<.005	<.05	0.202	0.003	<.05	193.4	<.001	0.009	<.005	0.029	1.51		7	<.005		41.1	8.32
	6/26/2000	<.003	0.24	<.005	0.06	0.108	0.003	<.05	227	0.002	<.005	0.063	0.031	1.36		8	<.005		41.9	10.14
	7/19/2000																			
	7/25/2000	<.003	0.18	<.005	<.05	0.152	0.003	<.05	239.3	0.009	0.034	<.005	0.033	2.37		8	0.091		45.4	11.18
	7/28/2000																			
	8/3/2000																			
	8/10/2000																			
	8/18/2000																			
	8/24/2000																			
	8/29/2000	<.003	0.38	<.005	<.05	0.128	0.001	<.05	263.1	<.001	<.005	<.005	0.029	1.52		8	<.005		47.2	10.58
	9/8/2000																			
	9/12/2000																			
	9/25/2000	<0.01	<0.05	<0.2	<0.1	0.06	<0.005	<0.1	237	<0.001	0.01	<0.01	<0.01	2.45		5		0.01	44.9	10.1
	10/19/2000	<.003	0.44	<.005	<.05	0.23	0.003	<.05	200.7	<.001	0.009	<.005	0.048	4.5		8	<.005		38.6	8.59
	10/28/2000																			
	11/13/2000	<0.003	<0.05	0.025	0.07	0.151	<0.001	<0.05	235.7	0.001	0.009	<0.005	<0.002	1.96		7	0.037		46.5	14.17
	11/18/2000	<0.01	0.06	<0.2	<0.1	0.07	<0.005	<0.1	269	<0.001	0.01	<0.01	<0.01	2.51		6		0.01	45.3	11.4
	12/14/2000	<0.01	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	257	<0.001	0.01	<0.01	<0.01	2.42		6		0.02	45.3	10.1
	1/13/2001	<.003	0.23	<.005	0.07	0.167	0.003	<.05	215.4	<.001	0.031	<.005	0.044	2.55		8	0.031		41.1	9.94
	2/10/2001	<.003	0.16	<.005	0.06	0.193	0.003	<.05	211.7	<.001	<.005	<.005	0.048	2.95		10	<.005		40	9.97
	3/1/2001																			
	3/10/2001	<.003	0.81	<.005	0.1	0.24	<.001	<.05	222	<.001	<.005	<.005	0.02	2.28		2.7	<.005		42.24	12.08
	3/15/2001																			
	3/27/2001																			
	4/5/2001																			
	4/11/2001																			
	4/16/2001	<.003	0.16	<.005	<.05	0.158	<.001	<.05	230.3	<.001	<.005	<.005	0.012	2.49		<1	<.005		43.6	12.78
	4/23/2001																			
	4/30/2001																			
	5/8/2001																			
	5/14/2001	<.003	0.47	<.005	<.05	0.214	<.001	<.05	228.3	<.001	<.005	<.005	0.009	1.8		5	<.005		42.4	10.56
	5/23/2001																			
	5/30/2001																			
	6/8/2001																			
	6/14/2001																			
	6/17/2001	<.003	0.14	<.005	0.1	0.196	<.001	<.05	224.6	<.001	0.011	0.005	0.038	2.43		6	0.04		43.3	6.34
	6/21/2001																			
	6/29/2001																			
	7/14/2001	<.003	0.09	<.005	0.17	0.226	<.001	<.05	203.8	<.001	0.01	0.012	0.002	1.23		5	0.015		39.9	9.7
	8/14/2001	<0.003	0.07	<0.005	<0.05	0.272	<0.001	<0.05	238.9	<0.001	0.011	<0.005	0.008	2.29		6	0.009		51.2	11.77
	9/12/2001																			
	9/17/2001	<0.003	<0.05	<0.005	<0.05	0.164	<0.001	<0.05	214.1	<0.001	0.012	<0.005	<0.002	2.52		6	0.022		45.7	13.63
	9/24/2001																			
	10/15/2001	<0.003	<0.05	<0.005	0.18	0.186	<0.001	<0.05	230	<0.001	0.014	<0.005	<0.002	1.53		7	0.035		47.8	14.32
	11/13/2001	<0.003	<0.05	0.025	0.07	0.151	<0.001	<0.05	235.7	0.001	0.009	<0.005	<0.002	1.96		7	0.037		46.5	14.17
	12/8/2001																			
	12/14/2001																			
	12/15/2001	<0.001	<0.05	0.022	0.07	0.074	0.001	<0.05	243	<0.001	0.018	0.013	<0.002	2.86		5	0.06		47.8	11.96
	12/20/2001																			
	12/28/2001																			
	1/15/2002	<0.001	<0.05	0.011	<0.05	0.225	<0.001	<0.05	199.9	<0.001	0.007	<0.005	0.003	2.31		7	0.022		42.8	9.36
	2/12/2002	<0.001	<0.05	<0.005	<0.05	0.188	<0.001	<0.05	183.8	<0.001	<0.005	<0.005	0.009	3.08		6	0.013		35	6.97
	3/12/2002	<0.001	<0.05	0.008	<0.05	0.243	<0.001	<0.05	211.4	<0.001	0.007	<0.005	<0.002	2.52		6	<0.005		39.6	9.64
	4/15/2002	0.001	<0.05	<0.005	<0.05	0.129	<0.001	<0.05	212.6	<0.001	0.007	<0.005	0.003	1.95		7	0.006		40.2	9.58
	5/13/2002	<0.001	<0.05	<0.005	<0.05	0.134	<0.001	<0.05	242.4	<0.001	0.011	0.019	<0.002	2.34		7	0.013		45.7	11.35
	6/16/2002																			
	6/16/2002	1.6	0.062	<0.003	<0.05	0.178	0.7	<0.01	185.5	<0.2	0.007	0.016	0.009	1.078		5.5	0.006		37.7	8.371

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	7/16/2002																			
	7/16/2002	1.3	0.112	0.012	0.06	0.161	0.6	<0.01	237	<0.2	0.012	0.013	0.016	0.819		6.5	<0.001		44.6	9.851
	8/12/2002																			
	8/12/2002	<0.2	0.115	0.04	0.08	0.113	<0.2	<0.01	236.6	<0.2	0.012	0.002	0.009	1.417		6.6	<0.001		45.7	9.939
	9/5/2002																			
	9/5/2002																			
	9/12/2002																			
	9/12/2002																			
	9/16/2002																			
	9/16/2002	0.2	0.059	0.006	0.1	0.149	0.3	<0.01	234.1	0.2	0.009	<0.001	0.014	2.301		8.1	<0.001		46.8	9.398
	9/27/2002																			
	9/27/2002																			
	9/29/2002																			
	10/3/2002																			
	10/3/2002																			
	10/12/2002																			
	10/12/2002																			
	10/15/2002																			
	10/15/2002	0.6	0.034	0.006	0.13	0.166	<0.2	0.02	194.1	<0.2	0.005	0.002	0.013	1.359		6.3	0.002		37.8	7.224
	10/21/2002																			
	10/21/2002																			
	10/29/2002																			
	10/29/2002																			
	11/5/2002																			
	11/12/2002																			
	11/12/2002	<0.2	0.033	0.005	0.15	0.13	0.3	<0.01	246.5	<0.2	0.012	0.001	0.014	2.237		8.1	<0.001		46.9	10.628
	11/19/2002																			
	11/26/2002																			
	12/3/2002																			
	12/10/2002																			
	12/10/2002	0.4	0.023	0.041	0.13	0.14	0.5	<0.01	220.6	<0.2	0.009	<0.001	0.023	2.074		7.9	<0.001		48.4	9.938
	12/15/2002																			
	12/17/2002																			
	12/24/2002																			
	12/31/2002																			
X14																				
	1/12/1998	<.003	<.05	<.02	<.05	0.118	<.001	<.04	108.4	<.002	<.005	<.005	0.005	0.35		2	<.005		18.5	1.37
	2/24/1998	<.003	0.24	<.02	0.26	0.061	<.001	<.04	72.5	<.002	<.005	0.008	0.011	0.4		1	<.005		14.8	1.47
	3/17/1998	<.003	<.05	<.02	<.05	0.138	<.001	<.04	77.2	<.002	<.005	0.013	0.018	0.33		<1	<.005		15.6	1.6
	4/13/1998	<.003	0.05	<.02	<.05	0.135	<.001	<.04	68	<.002	<.005	0.01	0.033	0.2		1	<.005		13.5	1.48
	4/16/1998																			
	4/22/1998																			
	4/24/1998																			
	4/26/1998																			
	4/30/1998																			
	5/18/1998	<.003	0.25	<.02	0.16	0.039	<.001	<.04	24.8	<.002	<.005	<.005	0.027	0.52		2	<.005		5.4	0.31
	6/15/1998	<.003	<.05	<.02	<.05	0.11	<.001	<.04	38.1	<.002	<.005	<.005	0.03	0.3		1	0.01		7.3	0.38
	6/19/1998																			
	6/20/1998	<.003	<.05	<.02	<.05	0.109	<.001	<.04	27.8	<.002	<.005	0.043	0.029	0.16		<1	0.006		5.9	0.29
	6/21/1998	<.003	<.05	<.02	<.05	0.12	<.001	<.04	29.3	<.002	<.005	0.043	0.031	0.19		1	0.007		6.4	0.32
	6/21/1998	<.003	<.05	<.02	<.05	0.12	<.001	<.04	29.3	<.002	<.005	0.043	0.031	0.19		1	0.007		6.4	0.32
	7/21/1998	<.003	<.05	<.02	<.05	0.124	<.001	<.04	52.1	<.002	<.005	0.033	0.035	0.41		2	0.008		11	0.72
	8/4/1998																			
	8/10/1998	<.003	0.37	<.02	0.29	0.03	<.001	<.04	76.3	<.002	<.005	<.005	0.09	0.57		4	<.005		15.2	1.02
	9/25/1998	<.003	0.08	<.02	<.05	0.148	<.001	<.04	47.7	<.002	<.005	0.02	0.018	0.11		2	<.005		9.8	0.7
	10/19/1998	<.003	0.11	<.02	0.21	0.059	<.001	<.04	55.6	<.002	<.005	<.005	0.016	0.38		2	<.005		11.8	0.9
	11/17/1998	<.003	0.11	<.005	<.05	0.178	<.001	<.04	99.9	<.001	<.005	0.045	0.024	0.5		4	<.005		20	1.65
	12/21/1998	<.003	0.15	0.01	0.31	0.09	<.001	<.04	105.7	0.007	<.005	0.013	0.028	0.39		3	<.005		20.6	2.57
	1/18/1999	<.003	0.12	<.005	0.18	0.09	<.001	<.04	116.5	0.002	<.005	0.046	0.035	0.46		3	<.005		23.2	2.61
	2/22/1999	0.016	0.27	<.005	0.32	0.084	<.001	<.04	125.3	<.001	<.005	<.005	0.022	0.53		3	<.005		24.4	3.04
	3/17/1999	<.003	0.28	<.005	0.18	0.085	<.001	<.04	122.5	<.001	<.005	0.301	0.033	0.51		3	<.005		22.3	3.11

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	HG-T	K-T	LA-T	LI-T	MG-T	MN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	4/20/1999	<.003	0.14	<.005	0.25	0.08	<.001	<.04	89.2	<.001	<.005	<.005	0.02	0.48		2	<.005		19.1	1.94
	5/17/1999	<.003	0.33	<.005	<.05	0.131	0.002	<.04	18.3	0.003	<.005	<.005	0.022	1.06		2	<.005		3.8	0.24
	6/25/1999																			
	7/3/1999	<.003	0.45	<.005	0.33	0.054	<.001	0.04	30.8	0.003	<.005	<.005	0.023	1.19		1	<.005		7.6	0.26
	7/27/1999	<.003	0.46	<.005	0.08	0.069	0.001	<.04	23.2	0.005	0.042	<.005	0.005	1.05		<1	<.005		6.1	0.23
	7/29/1999																			
	8/12/1999	<.003	<.05	<.005	0.09	0.087	<.001	<.04	61.6	<.001	0.021	<.005	0.005	0.23		1	<.005		12.2	0.68
	8/31/1999																			
	9/10/1999	<.003	0.15	<.005	<.05	0.13	<.001	<.04	52.9	0.003	<.005	<.005	0.015	0.24		2	0.006		11.1	0.83
	10/29/1999	<.003	0.06	<.005	<.05	0.146	<.001	<.04	43.2	<.001	<.005	<.005	<.002	0.32		2	<.005		9.1	0.66
	11/22/1999	<.003	0.13	<.005	0.1	0.165	<.001	0.05	51.9	<.001	<.005	<.005	0.027	0.46		1	<.005		12.3	0.97
	12/14/1999	<.003	0.33	<.005	<.05	0.167	<.001	<.04	71.4	<.001	0.015	<.005	0.03	0.76		6	<.005		13.3	1.2
	1/27/2000	<.003	0.2	<.005	<.05	0.166	0.001	<.05	97.7	0.007	<.005	<.005	0.027	0.48		4	0.036		19.7	2.02
	2/28/2000	<.003	0.24	<.005	<.05	0.143	<.001	<.05	91.5	<.001	0.007	0.016	0.032	0.55		4	0.011		21.4	1.81
	3/23/2000	<.003	0.27	<.005	0.14	0.201	<.001	<.05	99.5	0.003	0.043	0.006	0.009	0.26		7	0.009		20	2.38
	4/27/2000	<.003	0.25	<.005	<.05	0.193	0.001	<.05	113.3	<.001	0.005	<.005	0.026	0.42		4	<.005		23.8	3.52
	5/15/2000	<.003	0.25	0.022	<.05	0.109	<.001	<.05	37.3	<.001	0.014	0.148	0.008	0.73		2	<.005		7.8	0.51
	6/26/2000	<.003	0.11	<.005	<.05	0.102	0.001	<.05	41.7	<.001	0.007	<.005	0.008	0.21		4	<.005		8.3	0.46
	7/25/2000	<.003	<.05	<.005	<.05	0.125	0.001	<.05	59.2	0.004	0.009	<.005	0.016	0.58		4	0.09		12.2	0.69
	8/29/2000	<.003	0.27	<.005	<.05	0.116	<.001	<.05	39	<.001	<.005	<.005	0.004	0.35		2	<.005		8.5	0.37
	9/25/2000	<0.01	0.06	<0.2	<0.1	0.04	<0.005	<0.1	28.6	<0.001	<0.01	<0.01	<0.01	0.22		<2		<0.01	6.5	0.114
	10/28/2002																			
	10/29/2000	<.003	0.24	<.005	<.05	0.231	0.002	<.05	44.7	<.001	<.005	<.005	0.024	0.75		3	<.005		10.4	0.43
	11/13/2000	<0.003	0.11	0.012	<0.05	0.139	<0.001	<0.05	59.9	<0.001	<0.005	<0.005	<0.002	0.29		2	0.013		13.5	1.03
	11/18/2000	<0.01	0.1	<0.2	<0.1	0.06	<0.005	<0.1	66.8	0.002	<0.01	<0.01	<0.01	0.32		<2		<0.01	13.5	0.886
	12/14/2000	<0.01	<0.05	<0.2	<0.1	0.07	<0.005	<0.1	73.1	<0.001	<0.01	<0.01	<0.01	0.27		2		<0.01	15.5	1.14
	1/13/2001	<.003	0.11	<.005	<.05	0.165	0.001	<.05	63.7	<.001	<.005	<.005	0.021	0.68		4	<.005		13.4	1.28
	2/10/2001	<.003	0.3	<.005	0.05	0.197	0.002	<.05	96.7	<.001	<.005	<.005	0.03	0.43		7	<.005		20	1.96
	3/10/2001	<.003	0.35	<.005	0.12	0.26	<.001	<.05	78	<.001	<.005	<.005	0.02	0.28		2.33	<.005		16.41	1.81
	4/16/2001	<.003	<.05	<.005	<.05	0.104	<.001	<.05	91.4	<.001	<.005	<.005	0.004	0.31		<1	<.005		18.9	2.21
	5/14/2001	<.003	0.24	0.006	<.05	0.194	<.001	<.05	70.3	0.002	<.005	0.008	0.015	0.73		10	0.005		13.7	1.08
	6/17/2001	<.003	0.39	<.005	0.07	0.163	<.001	<.05	18.6	<.001	<.005	<.005	0.006	0.62		<1	<.005		4.3	0.12
	7/14/2001	<.003	0.16	0.024	0.16	0.221	<.001	<.05	41.8	<.001	<.005	<.005	0.014	0.75		1	<.005		8.6	0.43
	8/14/2001	<0.003	0.25	<0.005	<0.05	0.237	<0.001	<0.05	74.4	<0.001	<0.005	<0.005	0.006	0.55		2	<0.005		16.5	0.8
	9/17/2001	<0.003	0.07	<0.005	<0.05	0.156	<0.001	<0.05	45.9	<0.001	<0.005	<0.005	0.002	0.23		1	0.01		10.3	0.63
	10/15/2001	<0.003	0.14	<0.005	0.16	0.194	<0.001	<0.05	113.5	<0.001	<0.005	0.014	<0.002	0.25		4	0.028		26	1.76
	11/13/2001	<0.003	0.11	0.012	<0.05	0.139	<0.001	<0.05	59.9	<0.001	<0.005	<0.005	<0.002	0.29		2	0.013		13.5	1.03
	12/14/2001																			
	12/15/2001	<0.001	0.12	<0.005	0.07	0.065	0.002	<0.05	109.6	<0.001	0.006	0.007	<0.002	0.3		3	0.022		25.6	1.89
	1/15/2002	<0.001	0.07	<0.005	<0.05	0.198	<0.001	<0.05	58.1	<0.001	<0.005	0.008	0.014	0.8		2	0.007		12.1	0.82
	2/12/2002	<0.001	<0.05	<0.005	<0.05	0.163	<0.001	<0.05	61.6	<0.001	<0.005	0.008	0.013	0.17		2	0.01		11.6	0.83
	3/12/2002	<0.001	0.06	<0.005	<0.05	0.242	<0.001	<0.05	108.8	<0.001	<0.005	0.007	0.004	0.33		3	0.006		20.5	2.28
	4/15/2002	<0.001	<0.05	<0.005	<0.05	0.147	<0.001	<0.05	113	<0.001	<0.005	0.007	0.004	0.18		3	0.006		21.8	2.37
	5/13/2002	<0.001	0.54	<0.005	<0.05	0.17	<0.001	<0.05	35.1	<0.001	<0.005	0.006	0.007	1.4		2	0.006		7.1	0.42
	6/16/2002	<0.2	0.14	<0.003	<0.05	0.191	<0.2	0.01	28.1	<0.2	<0.001	0.006	0.009	0.342		1	0.001		6	0.221
	7/16/2002	1.9	0.11	<0.003	0.05	0.176	0.4	0.01	67.3	<0.2	0.004	<0.001	0.016	0.19		2.5	0.003		15.1	0.601
	8/12/2002	<0.2	0.076	<0.003	0.09	0.103	<0.2	<0.01	36.7	0.6	<0.001	0.002	0.005	0.256		1	0.003		7.3	0.344
	9/16/2002	<0.2	0.062	0.007	0.12	0.113	<0.2	<0.01	60.9	0.5	0.001	0.005	0.023	0.231		2.5	0.004		14.2	0.581
	10/15/2002	0.6	0.068	<0.003	0.14	0.137	<0.2	0.02	41.6	0.3	<0.001	0.003	0.02	0.272		1.1	0.003		8.6	0.296
	11/11/2002																			
	11/12/2002	0.5	0.057	<0.003	0.17	0.126	<0.2	<0.01	55.9	<0.2	0.004	0.001	0.017	0.312		1.5	0.004		11.1	0.581
	12/10/2002	0.3	0.042	0.006	0.13	0.136	0.2	<0.01	65.9	1	0.003	0.004	0.022	0.215		2	0.004		14.9	0.923

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FDU																	
	5/19/1998	<.002	2	0.01	0.33	<.02	17	<.03	<.03	1.9	<.01	0.018	<.005		0.021	<.03	0.08
	5/17/1999	0.011	<1	<.005	<.04	<.01		<.03	<.03	0.8	<.01	0.033	<.005		0.021	<.03	0.09
	10/30/1999	<.002	3	0.006	<.04	<.01	<1	<.03	<.005	5.1	0.02	0.026	<.005		<.005	<.03	<.01
	6/11/2002	<0.001	1.3	0.023	0.02	0.026	0.7	<0.002	<0.005	5.4	0.008	0.016	0.007		0.001	<0.03	0.013
R2																	
	8/5/1998	0.0067	9.9	0.013	1.29	<.004	13	0.019	<.001	4.224	<.002	0.2343	0.01		<.001	<.006	0.059
	9/9/1998	<.002	8	<.005	0.34	<.01		<.03	<.005	3.14	<.01	0.215	0.033		<.005	<.03	0.19
	9/10/1998																
	7/31/2000	0.0064	4.4	0.0041	0.7	0.003	26.18	<.001	<.001	3.86	<.0004	0.1447	0.0229		0.0089	<.001	0.0368
	9/5/2000	0.004	2.53	<.0002	<.2	<.001	7.25	<.001	<.001	5.323	<.0004	0.1097	0.0182		<.0002	<.001	0.0223
R3																	
	8/5/1998	0.004	8.5	0.006	1.531	<.004	12	0.007	<.001	3.968	<.002	0.2174	0.005		0.002	<.006	0.047
	9/9/1998	<.002	8	<.005	<.04	0.02		<.03	<.005	3.61	<.01	0.211	0.023		<.005	<.03	0.15
	9/10/1998																
	8/1/2000	0.0073	4	0.005	0.7	<.001	23.99	<.001	<.001	3.83	<.0004	0.141	0.0126		0.0054	<.001	0.0388
	9/6/2000	0.0033	2.58	<.0002	<.2	<.001	6.77	<.001	<.001	5.782	<.0004	0.1063	0.018		<.0002	<.001	0.0217
R4																	
	8/5/1998	0.0047	7.5	0.007	0.624	<.004	8	0.009	<.001	4.034	<.002	0.2086	0.004		<.001	<.006	0.023
	9/9/1998	<.002	7	0.007	0.06	<.01		<.03	<.005	3.14	<.01	0.199	0.017		<.005	<.03	0.12
	9/10/1998																
	3/17/1999	<.002	10	<.005	0.59	<.01	50	<.03	<.03	3.9	<.01	0.256	0.007		<.005	<.03	0.05
	8/1/2000	0.0034	4.04	0.0093	0.2	0.003	22.06	<.001	<.001	4.32	<.0004	0.1498	0.012		0.0014	<.001	0.0288
R5																	
	8/5/1998	0.0048	3.2	0.004	1.631	<.004	3	0.007	<.001	3.953	<.002	0.1515	0.003		<.001	0.098	0.01
	9/9/1998	<.002	3	0.011	0.25	<.01		<.03	<.005	2.83	<.01	0.138	0.011		<.005	<.03	0.07
	9/10/1998																
	8/1/2000	0.0051	1.66	0.0021	0.8	<.001	6.46	<.001	<.001	4.03	<.0004	0.1067	0.0093		0.0013	<.001	0.007
	9/6/2000	0.0032	2.43	0.0007	<.2	<.001	6.18	<.001	<.001	5.597	<.0004	0.1073	0.0216		<.0002	<.001	0.0202
R6																	
	8/5/1998	0.0069	2.3	0.003	0.464	<.004	2	<.006	<.001	4.102	<.002	0.1451	0.002		<.001	<.006	0.004
	9/9/1998	0.002	3	<.005	<.04	0.03		<.03	<.005	2.89	<.01	0.131	0.014		<.005	<.03	0.06
	9/10/1998																
	8/1/2000	0.0039	1.42	0.0026	0.6	<.001	4.76	0.003	<.001	3.73	<.0004	0.0929	0.013		0.0005	<.001	0.0035
	9/6/2000	0.0029	2.23	0.0022	<.2	<.001	6.07	<.001	<.001	5.841	<.0004	0.111	0.0283		<.0002	<.001	0.0258
R7																	
	5/19/1998	<.002	1	<.005	1.32	<.02	1	0.04	<.03	1.7	<.01	0.033	0.006		<.005	<.03	<.01
	6/15/1998	<.002	<1	<.005	1.2	<.02	5	<.03	<.03	2.6	<.01	0.067	<.005		<.005	<.03	0.03
	8/5/1998	0.0035	2.3	0.003	1.66	<.004	3	0.008	<.001	4.375	<.002	0.1138	0.002		<.001	<.006	<.002
	9/9/1998	<.002	3	<.005	0.25	0.04		<.03	<.005	3.96	<.01	0.12	0.008		<.005	<.03	0.06
	9/10/1998																
	10/19/1998	<.002	3	0.014	12.35	0.02	3	<.03	<.03	3.5	<.01	0.125	0.014		<.005	<.03	0.01
	2/25/1999	<.002	4	<.005	0.36	<.01	4	<.03	<.03	5.6	<.01	0.237	0.006		<.005	<.03	0.03
	5/17/1999	0.015	1	<.005	<.04	<.01		<.03	<.03	1.5	<.01	0.048	<.005		0.012	<.03	0.04
	7/4/1999	<.002	<1	<.005	0.08	0.01	2	<.03	<.03	4.4	<.01	0.076	<.005		<.005	<.03	0.03
	10/30/1999	<.002	4	<.005	<.04	<.01	3	<.03	<.005	4	<.01	0.115	<.005		<.005	<.03	<.01
	3/26/2000	<.002	8	<.005	<1	<.01	4	<.03	<.005	4.9	<.01	0.205	<.005		<.005	<.03	0.02
	6/3/2000	0.002	1	<.005	<1	<.01		<.03	<.005	2.7	<.01	0.054	0.061		0.048	<.03	0.02
	8/1/2000	0.0029	1.47	0.0033	1.4	<.001	1.72	<.001	<.001	3.84	<.0004	0.074	0.0082		0.0009	<.001	0.009
	9/6/2000	0.0015	2.24	<.0002	<.2	<.001	2.25	<.001	<.001	6.629	<.0004	0.0935	0.018		<.0002	<.001	0.0169
	9/12/2000	<.002	3	<.005	4	<.01		<.03	<.005	4	<.01	0.03	<.005		<.005	<.03	0.05
	3/5/2001	<.002	7.9	<.005	<1	<.01	4	<.03	<.005	5.39	<.01	0.2	0.006		<.005	<.03	<.01
	6/13/2001	0.008	2	<.005	<1	<.01	<1	<.03	<.005	2.4	<.01	0.038	0.013		0.005	<.03	0.02
	9/8/2001	<0.002	<1	<0.005	<1	<0.01	2	<0.03	<0.005	4.9	<0.01	0.116	<0.005		<0.005	<0.03	0.03
	3/21/2002	0.004	5	<0.005	<0.01	<0.01	3	<0.03	<0.005	6.9	0.02	0.222	<0.005		<0.005	<0.03	<0.01
	6/25/2002	<0.001	1.8	0.003	0.03	0.015	2.3	0.007	<0.005	4.4	0.004	0.085	0.002		<0.001	<0.03	<0.001
	9/27/2002	0.002	1.6	0.001	0.03	<0.002	2.8	0.023	<0.005	4.9	0.038	0.107	0.001		<0.001	<0.03	0.006
W10																	
	6/16/1998	<.002	<1	<.005	<.04	<.02	1	<.03	<.03	4.9	<.01	0.046	<.005		<.005	<.03	0.05
	7/3/1999	<.002	1	<.005	0.1	<.01	1	<.03	<.03	8.2	<.01	0.039	<.005		0.008	<.03	0.03
	6/3/2000	<.002	1	<.005	<1	<.01		<.03	<.005	3.6	<.01	0.047	0.006		<.005	<.03	<.01

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	6/11/2001	<.002	3	<.005	<1	<.01	<1	<.03	<.005	3.2	<.01	0.038	<.005		<.005	<.03	0.02
	6/11/2002	0.006	1.3	<0.001	0.03	0.003	1.2	<0.002	<0.005	6.4	0.002	0.046	0.001		<0.001	<0.03	0.024
X5																	
	1/5/1998																
	1/5/1998	0.009	16	<.005	<.04	<.02	146	<.03	<.03	1.6	<.01	0.41	<.005		<.005	<.03	0.07
	1/12/1998																
	1/12/1998	<.002	16	0.007	<.04	<.02	126	<.03	<.03	1.1	<.01	0.362	<.005		<.005	<.03	0.06
	1/19/1998																
	1/23/1998																
	1/28/1998																
	2/2/1998																
	2/5/1998																
	2/9/1998																
	2/12/1998																
	2/14/1998																
	2/18/1998																
	2/19/1998																
	4/13/1998	0.011	21	0.013	1.09	<.02	117	<.03	<.03	3.1	<.01	0.402	0.012		<.005	<.03	0.37
	4/22/1998																
	4/24/1998																
	4/26/1998																
	4/30/1998																
	5/1/1998																
	5/4/1998																
	5/9/1998																
	5/14/1998																
	5/18/1998																
	5/18/1998	<.002	17	0.016	<.04	<.02	138	0.03	<.03	2.1	<.01	0.31	0.005		<.005	<.03	0.44
	5/23/1998																
	5/27/1998																
	6/2/1998	0.003	18	<.005	0.37	<.02	133	<.03	<.03	2.4	<.01	0.307	0.014		0.011	<.03	0.48
	6/5/1998																
	6/8/1998																
	6/10/1998																
	6/15/1998	<.002	21	<.005	1.04	<.02	55	<.03	<.03	1	<.01	0.362	0.022		<.005	<.03	0.32
	6/19/1998																
	6/20/1998	0.009	21	0.008	1.54	<.02		<.03	<.03	0.7	<.01	0.309	0.012		0.013	<.03	0.33
	6/21/1998	0.015	21	0.012	0.42	<.02		<.03	<.03	0.8	<.01	0.294	0.007		<.005	<.03	0.29
	6/25/1998																
	6/26/1998																
	6/30/1998	0.006	20	0.012	<.04	<.02	133	<.03	<.03	1.9	<.01	0.369	0.025		<.005	<.03	0.23
	7/7/1998																
	7/9/1998																
	7/14/1998																
	7/16/1998																
	7/21/1998	0.014	26	0.01	<.04	<.02	156	0.06	<.03	1.2	<.01	0.426	0.012		<.005	<.03	0.31
	7/23/1998																
	7/28/1998																
	8/1/1998																
	8/5/1998																
	8/10/1998	<.002	30	<.005	<.04	0.04	54	<.03	<.03	1.8	<.01	0.484	0.011		0.01	<.03	0.39
	8/14/1998																
	8/17/1998																
	8/21/1998																
	8/24/1998																
	8/28/1998																
	8/31/1998																
	9/4/1998																
	9/7/1998																
	9/16/1998																
	9/21/1998																

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/25/1998	0.017	37	0.013	2.3	<.02	195.4	<.03	<.03	3.2	<.01	0.596	0.03		0.007	<.03	0.55
	10/2/1998																
	10/11/1998																
	10/14/1998																
	10/19/1998	<.002	34	0.024	<.04	<.02	205	<.03	<.03	3.4	<.01	0.511	0.041		<.005	<.03	0.56
	10/20/1998																
	11/17/1998	0.022	38	0.015	2.21	0.02	190	<.03	<.03	3.1	<.01	0.533	0.017		<.005	<.03	0.6
	1/18/1999	0.006	36	0.019	<.04	<.01	204	<.03	<.03	5.1	<.01	0.537	0.023		<.005	<.03	0.33
	2/21/1999	0.028	39	0.019	2.21	<.01	210	<.03	<.03	5.1	<.01	0.634	0.034		<.005	<.03	0.53
	3/21/1999	<.002	33	0.014	1.78	<.01	197.3	<.03	<.03	5.1	<.01	0.53	0.012		0.095	<.03	0.31
	4/20/1999	0.028	26	0.006	0.75	<.01	139	<.03	<.03	4	<.01	0.42	0.046		<.005	<.03	0.3
	5/6/1999	<.002	16	<.005	0.74	<.01		<.03	<.03	1.5	<.01	0.423	0.012		<.005	<.03	0.41
	5/17/1999	<.002	10	<.005	<.04	<.01		<.03	<.03	0.3	<.01	0.213	0.138		<.005	<.03	0.39
	5/27/1999	0.044	13	<.005	<.04	0.03		<.03	<.03	0.6	<.01	0.268	0.127		<.005	<.03	0.25
	7/3/1999	<.002	19	<.005	<.04	<.01	157	<.03	<.03	5	<.01	0.424	<.005		<.005	<.03	0.37
	7/27/1999	0.039	23	<.005	<.04	0.01	180	<.03	<.03	3.5	<.01	0.504	0.102		<.005	<.03	0.38
	7/29/1999	0.006	24	0.004	0.06	0.017	117.1	<.003	<.003	3.61	<.001	0.467	0.013		<.001	<.003	0.342
	8/12/1999	0.014	25	<.005	<.04	<.01	185	<.03	<.005	3.9	<.01	0.494	0.011		0.015	<.03	0.3
	9/10/1999	0.013	23	0.015	<.04	<.01	209	<.03	<.005	2.7	<.01	0.459	0.032		<.005	<.03	0.31
	10/29/1999	<.002	33	0.022	<.04	<.01	198	<.03	<.005	4.8	<.01	0.521	0.01		<.005	<.03	0.6
	1/26/2000																0.35
	3/25/2000	<.002	27	<.005	<1	<.01	199	<.03	<.005	5.7	<.01	0.635	0.024		<.005	<.03	0.32
	4/27/2000	0.015	25	0.013	<1	<.01		<.03	<.005	5.6	<.01	0.483	0.084		<.005	<.03	0.29
	5/15/2000	<.002	1	<.005	<1	<.01		<.03	<.005	1.6	<.01	0.23	0.021		0.007	<.03	0.08
	5/22/2000																
	6/4/2000		15	0.02	<1	0.11		0.05	<.005	2.4	<.01	0.377	0.141		0.545	<.03	0.35
	6/4/2000	0.02															
	6/26/2000	<.002	22	0.005	4	<.01		0.07	<.005	2.4	<.01	0.424	0.065		0.023	<.03	0.4
	7/25/2000	0.011	25	0.021	4	<.01		<.03	<.005	1.9	<.01	0.568	0.048		0.055	<.03	0.46
	7/28/2000																
	8/15/2000																
	8/29/2000	<.002	26	0.031	3	<.01		<.03	<.005	3.3	<.01	0.475	0.031		<.005	<.03	0.41
	8/30/2000																
	9/25/2000	<0.01	28	<0.05	<0.3	<0.05		<0.2	<0.2	3.2	<0.03	0.526	<0.01	<0.2	<0.03		0.741
	10/21/2000	0.008	33	0.005	7	<.01	173	<.03	<.005	4.2	<.01	0.545	0.128		0.023	<.03	0.71
	10/28/2000																
	11/13/2000	<0.002	30	0.007	0.04	<0.01	212	<0.03	<0.005	4.9	0.01	0.538	0.009		0.007	<0.03	0.14
	11/18/2000	<0.01	31	<0.05	<0.3	<0.05		<0.2	<0.2	4.09	<0.03	0.574	<0.01	<0.2	<0.03		0.528
	11/28/2000																0.42
	12/14/2000	0.01	30	<0.05	<0.3	<0.05		<0.2	<0.2	4.29	<0.03	0.595	<0.01	<0.2	<0.03		0.813
	1/13/2001	0.024	27	0.013	<1	<.01	74	<.03	<.005	4	<.01	0.682	0.063		<.005	<.03	0.46
	2/10/2001	<.002	28	0.033	<1	<.01	92	<.03	<.005	4.3	<.01	0.347	0.027		<.005	<.03	0.36
	3/10/2001	0.003	28.46	<.005	<1	<.01	172.2	<.03	<.005	3.84	<.01	0.55	0.01		<.005	<.03	0.61
	4/16/2001	<.002	28	<.005	<1	<.01	153	<.03	<.005	3.6	<.01	0.56	0.01		<.005	<.03	0.48
	5/14/2001	0.002	25	0.009	<1	0.05	163	<.03	0.006	2.8	<.01	0.544	0.006		0.013	<.03	0.37
	6/17/2001	<.002	22	<.005	<1	<.01	181	<.03	<.005	2.9	0.03	0.584	<.005		<.005	<.03	0.12
	6/25/2001																
	7/14/2001	<.002	20	0.016	<1	<.01	191	<.03	<.005	4.6	<.01	0.598	0.008		<.005	<.03	0.4
	8/14/2001	0.003	26	0.013	<1	<0.01	225	<0.03	<0.005	5	<0.01	0.676	0.01		<0.005	<0.03	0.42
	8/21/2001																
	9/17/2001	<0.002	75	0.009	<1	<0.01	206	<0.03	<0.005	4.3	<0.01	0.557	<0.005		0.005	<0.03	0.21
	10/15/2001	0.003	26	0.012	<1	<0.01	213	<0.03	<0.005	4.2	<0.01	0.554	<0.005		<0.005	<0.03	0.25
	11/13/2001	<0.002	30	0.007	0.04	<0.01	212	<0.03	<0.005	4.9	0.01	0.538	0.009		0.007	<0.03	0.14
	12/14/2001																
	12/15/2001	0.01	24	0.006	0.03	<0.01	175	<0.03	<0.005	4.1	0.12	0.473	<0.005		0.005	<0.03	0.15
	1/15/2002	0.004	31	0.011	<0.01	<0.01	191	<0.03	0.005	5.9	0.04	0.558	<0.005		<0.005	<0.03	0.16
	2/12/2002	0.004	32	0.011	<0.01	<0.01	147	<0.03	<0.005	6.7	0.05	0.521	<0.005		<0.005	<0.03	0.11
	3/12/2002	0.006	30	0.007	<0.01	<0.01	165	0.04	<0.005	6.1	0.01	0.549	<0.005		<0.005	<0.03	0.1
	4/15/2002	0.002	29	0.008	<0.01	<0.01	189	<0.03	<0.005	5	0.02	0.518	<0.005		<0.005	<0.03	0.1
	5/13/2002	0.004	4	0.006	0.02	<0.01	28	<0.03	<0.005	1.4	<0.01	0.104	<0.005		<0.005	<0.03	0.02
	6/16/2002																

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	6/16/2002	0.007	23.1	0.005	<0.01	<0.002	182.3	0.015	<0.005	4.1	0.008	0.471	<0.001		0.003	<0.03	0.262
	7/16/2002																
	7/16/2002	0.016	21.2	0.008	0.07	<0.002	188.8	0.005	<0.005	3.9	<0.002	0.505	<0.001		<0.001	<0.03	0.073
	8/12/2002																
	8/12/2002	0.005	27	0.014	<0.01	0.016	191.2	0.003	<0.005	4	<0.002	0.531	<0.001		<0.001	<0.03	0.202
	9/16/2002																
	9/16/2002	0.005	24.9	0.005	<0.01	<0.002	206.6	<0.002	<0.005	4.1	<0.002	0.563	<0.001		0.001	<0.03	0.177
	9/29/2002																
	10/15/2002																
	10/15/2002	0.005	27.5	0.01	<0.01	0.002	199.6	<0.002	<0.005	4.7	0.009	0.572	0.001		0.001	<0.03	0.256
	11/12/2002																
	11/12/2002	0.006	29.9	0.016	0.1	<0.002	212.8	0.008	<0.005	5.4	<0.002	0.604	0.001		0.003	<0.03	0.288
	12/10/2002																
	12/10/2002	0.004	27.7	0.01	<0.01	0.027	205.1	<0.002	<0.005	5.9	<0.002	0.571	<0.001		0.001	<0.03	0.299
	12/15/2002																
X13																	
	1/5/1998	0.003	34	<.005	<.04	<.02	189	<.03	<.03	5.5	<.01	0.609	<.005		<.005	<.03	0.02
	1/12/1998	<.002	31	0.013	<.04	<.02	162	<.03	<.03	4.7	<.01	0.532	<.005		<.005	<.03	0.02
	1/23/1998																
	2/24/1998	0.012	34	0.022	1.74	0.03	155	0.03	<.03	5.3	<.01	0.539	0.018		<.005	0.04	<.01
	3/13/1998																
	3/17/1998																
	3/17/1998	0.007	38	0.021	<.04	<.02	132	<.03	<.03	6	<.01	0.576	0.013		0.011	<.03	0.01
	4/3/1998																
	4/13/1998	<.002	37	0.02	<.04	<.02	148	<.03	<.03	6.3	<.01	0.608	0.016		<.005	<.03	0.3
	4/30/1998																
	5/7/1998																
	5/18/1998																
	5/18/1998	<.002	39	0.02	<.04	0.02	135	0.04	<.03	6.5	<.01	0.615	0.009		<.005	<.03	0.07
	6/15/1998																
	6/15/1998	<.002	38	0.011	5.4	<.02	163	<.03	<.03	5.7	<.01	0.582	0.022		<.005	<.03	0.05
	6/30/1998	0.01	41	0.018	<.04	<.02	394	<.03	<.03	7.9	<.01	0.675	0.025		0.01	<.03	0.03
	7/21/1998	<.002	36	0.017	0.44	<.02	140	<.03	<.03	5.4	<.01	0.566	0.011		<.005	<.03	0.03
	8/10/1998	<.002	34	0.008	<.04	0.05	162	<.03	<.03	5.7	<.01	0.586	0.014		0.006	<.03	0.04
	9/7/1998																
	9/25/1998	0.008	35	0.015	2.36	<.02	193.9	0.05	<.03	5.7	<.01	0.639	0.026		<.005	<.03	0.03
	10/19/1998	0.012	35	0.044	<.04	<.02	189	<.03	<.03	4.9	<.01	0.545	0.026		<.005	<.03	<.01
	11/13/1998																
	11/17/1998	0.007	47	<.005	2.36	0.02	200	0.05	<.03	7	<.01	0.694	0.026		<.005	<.03	0.02
	12/15/1998																
	12/21/1998	<.002	34	0.012	0.43	<.01	147	<.03	<.03	6.3	<.01	0.523	0.024		0.052	<.03	0.02
	1/18/1999	<.002	42	0.018	<.04	<.01	239	0.03	<.03	7.2	<.01	0.702	0.021		<.005	<.03	0.02
	1/27/1999																
	2/22/1999	0.013	45	0.021	2.33	<.01	214	<.03	<.03	8.1	<.01	0.764	0.035		<.005	<.03	0.05
	3/17/1999	<.002	33	0.005	1.52	<.01	164	<.03	<.03	6.2	<.01	0.512	0.028		<.005	<.03	0.04
	3/24/1999																
	4/3/1999																
	4/20/1999	<.002	38	0.008	1.19	<.01	201	<.03	<.03	6.3	<.01	0.653	0.035		<.005	<.03	<.01
	5/17/1999	<.002	38	<.005	1.09	<.01		<.03	<.03	6.4	<.01	0.641	<.005		<.005	<.03	0.04
	6/4/1999																
	6/8/1999																
	7/3/1999	<.002	34	<.005	<.04	<.01	200	<.03	<.03	9	<.01	0.665	<.005		0.008	<.03	0.04
	7/27/1999	0.019	36	0.051	<.04	<.01	216	<.03	<.005	6.2	<.01	0.745	0.017		0.037	<.03	0.02
	8/12/1999	<.002	38	0.016	<.04	<.01	212	<.03	<.005	9.2	<.01	0.694	0.009		<.005	<.03	0.02
	9/10/1999	<.002	32	0.017	<.04	<.01	193	<.03	<.005	6	<.01	0.605	0.023		0.011	<.03	<.01
	9/28/1999																
	10/29/1999	<.002	34	<.005	<.04	<.01	188	<.03	<.005	5.4	<.01	0.577	<.005		<.005	<.03	<.01
	11/22/1999	<.002	33	0.034	0.28	<.01	199	<.03	<.005	6.7	<.01	0.637	0.028		<.005	<.03	<.01
	12/14/1999	<.002	31	0.015	<.04	<.01	171	<.03	<.005	4.6	<.01	0.538	0.009		<.005	<.03	0.02
	1/27/2000	<.002	34	0.011	<1	0.02		<.03	<.005	5.9	<.01	0.569	0.032		0.022	<.03	<.01
	2/28/2000	<.002	40	0.021	<1	0.05	192	<.03	<.005	7.7	<.01	0.628	0.052		0.011	<.03	0.18

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	3/23/2000	<.002	27	<.005	<1	<.01	191	<.03	<.005	7.3	<.01	0.678	0.006		<.005	<.03	<.01
	4/27/2000	<.002	31	0.015	<1	0.05		<.03	<.005	6.7	<.01	0.637	0.063		<.005	<.03	<.01
	5/15/2000	<.002	38	0.014	<1	<.01		<.03	<.005	8.2	<.01	0.792	0.033		<.005	<.03	0.04
	6/20/2000																
	6/20/2000	<.002	33	0.019	6	<.01	<1	0.05	<.005	6.2	<.01	0.586	0.034		<.005	0.03	0.05
	6/26/2000	<.002	37	0.021	<1	0.01		0.07	<.005	6.2	<.01	0.59	0.06		0.025	<.03	0.05
	7/19/2000																
	7/25/2000	<.002	43	0.029	<1	<.01		<.03	<.005	6.7	<.01	0.77	0.041		0.037	<.03	0.03
	7/28/2000																
	8/3/2000																
	8/10/2000																
	8/18/2000																
	8/24/2000																
	8/29/2000	<.002	39	0.026	2	<.01		<.03	<.005	7.2	<.01	0.642	0.032		<.005	<.03	0.07
	9/8/2000																
	9/12/2000																
	9/25/2000	<0.01	39	<0.05	<0.3	<0.05		<0.2	<0.2	6.68	<0.03	0.653	<0.01	<0.2	<0.03		0.021
	10/19/2000	<.002	40	0.01	<1	<.01	174	<.03	<.005	6.9	<.01	0.617	0.096		<.005	<.03	0.04
	10/28/2000																
	11/13/2000	<0.002	43	0.013	0.02	<0.01	214	0.03	<0.005	8.5	0.07	0.669	0.012		0.007	<0.03	0.02
	11/18/2000	<0.01	43	<0.05	<0.3	<0.05		<0.2	<0.2	7.42	<0.03	0.709	<0.01	<0.2	<0.03		0.019
	12/14/2000	<0.01	37	<0.05	<0.3	<0.05		<0.2	<0.2	7	<0.03	0.653	<0.01	<0.2	<0.03		0.014
	1/13/2001	0.004	39	0.031	<1	0.2	99	0.09	<.005	6.7	<.01	0.723	0.056		<.005	<.03	0.01
	2/10/2001	<.002	36	0.032	18	<.01	108	<.03	<.005	6.5	<.01	0.387	0.018		<.005	<.03	<.01
	3/1/2001																
	3/10/2001	<.002	39.22	<.005	<1	<.01	200.6	<.03	<.005	5.97	<.01	0.64	0.005		<.005	<.03	0.02
	3/15/2001																
	3/27/2001																
	4/5/2001																
	4/11/2001																
	4/16/2001	<.002	38	0.005	<1	<.01	182	<.03	<.005	6	<.01	0.66	0.01		<.005	<.03	0.03
	4/23/2001																
	4/30/2001																
	5/8/2001																
	5/14/2001	<.002	34	0.007	<1	<.01	178	<.03	<.005	5.2	<.01	0.587	<.005		<.005	<.03	0.02
	5/23/2001																
	5/30/2001																
	6/8/2001																
	6/14/2001																
	6/17/2001	0.011	40	0.059	<1	<.01	191	<.03	<.005	7.4	0.02	0.638	0.016		<.005	<.03	0.09
	6/21/2001																
	6/29/2001																
	7/14/2001	<.002	32	0.021	<1	<.01	169	<.03	<.005	8.7	0.02	0.608	<.005		<.005	<.03	0.05
	8/14/2001	0.004	42	0.022	<1	<0.01	224	<0.03	<0.005	10.3	0.01	0.744	<0.005		<0.005	<0.03	<0.01
	9/12/2001																
	9/17/2001	<0.002	40	0.018	<1	<0.01	202	<0.03	<0.005	8.9	<0.01	0.673	<0.005		<0.005	<0.03	0.02
	9/24/2001																
	10/15/2001	<0.002	40	0.019	<1	<0.01	220	<0.03	<0.005	9.1	<0.01	0.712	<0.005		<0.005	<0.03	<0.01
	11/13/2001	<0.002	43	0.013	0.02	<0.01	214	0.03	<0.005	8.5	0.07	0.669	0.012		0.007	<0.03	0.02
	12/8/2001																
	12/14/2001																
	12/15/2001	0.007	33	0.011	<0.01	<0.01	188	<0.03	<0.005	8	0.04	0.626	<0.005		<0.005	<0.03	0.04
	12/20/2001																
	12/28/2001																
	1/15/2002	0.004	38	0.014	<0.01	<0.01	186	<0.03	0.011	8.5	0.03	0.63	<0.005		<0.005	<0.03	0.01
	2/12/2002	0.004	35	0.012	<0.01	<0.01	131	<0.03	<0.005	7.7	0.05	0.527	<0.005		<0.005	<0.03	<0.01
	3/12/2002	0.003	36	0.011	<0.01	<0.01	163	<0.03	<0.005	8.5	0.02	0.613	<0.005		<0.005	<0.03	<0.01
	4/15/2002	<0.002	37	0.014	<0.01	<0.01	186	<0.03	<0.005	8.2	0.02	0.595	<0.005		<0.005	<0.03	<0.01
	5/13/2002	0.006	37	0.016	<0.01	<0.01	211	<0.03	<0.005	8.5	0.03	0.645	<0.005		<0.005	<0.03	<0.01
	6/16/2002																
	6/16/2002	<0.001	31.4	0.01	<0.01	0.003	171.2	0.007	<0.005	8.1	0.01	0.536	<0.001		<0.001	<0.03	<0.001

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	7/16/2002																
	7/16/2002	0.01	32.1	0.018	0.03	<0.002	216.5	0.025	<0.005	8.4	<0.002	0.6	0.001		0.001	<0.03	0.009
	8/12/2002																
	8/12/2002	0.006	37.5	0.019	0.05	0.008	216.9	0.004	<0.005	8	<0.002	0.666	<0.001		0.006	<0.03	0.022
	9/5/2002																
	9/5/2002																
	9/12/2002																
	9/12/2002																
	9/16/2002																
	9/16/2002	0.003	36.4	0.01	<0.01	<0.002	204.9	<0.002	<0.005	8.3	<0.002	0.621	<0.001		0.005	<0.03	0.016
	9/27/2002																
	9/27/2002																
	9/29/2002																
	10/3/2002																
	10/3/2002																
	10/12/2002																
	10/12/2002																
	10/15/2002																
	10/15/2002	0.003	33.2	0.009	<0.01	<0.002	156.4	<0.002	<0.005	7.8	0.005	0.54	<0.001		0.003	<0.03	0.017
	10/21/2002																
	10/21/2002																
	10/29/2002																
	10/29/2002																
	11/5/2002																
	11/12/2002																
	11/12/2002	0.002	38.9	0.013	<0.01	<0.002	218.2	<0.002	<0.005	8.8	0.007	0.68	<0.001		0.002	<0.03	0.004
	11/19/2002																
	11/26/2002																
	12/3/2002																
	12/10/2002																
	12/10/2002	0.004	35.5	0.013	<0.01	0.006	210.5	0.004	<0.005	9.8	0.003	0.635	<0.001		<0.001	<0.03	0.025
	12/15/2002																
	12/17/2002																
	12/24/2002																
	12/31/2002																
X14																	
	1/12/1998	0.004	14	0.015	<.04	<.02	98	<.03	<.03	2.3	0.01	0.339	<.005		<.005	<.03	0.06
	2/24/1998	0.005	10	0.007	2.76	<.02	97	<.03	<.03	5.3	<.01	0.261	0.008		0.005	<.03	0.03
	3/17/1998	0.006	12	<.005	<.04	<.02	170	<.03	<.03	4.3	<.01	0.276	<.005		0.014	<.03	0.02
	4/13/1998	0.003	0	0.005	<.04	<.02	91	<.03	<.03	4.3	<.01	0.277	<.005		<.005	<.03	0.32
	4/16/1998																
	4/22/1998																
	4/24/1998																
	4/26/1998																
	4/30/1998																
	5/18/1998	<.002	3	0.007	1.35	<.02	8	0.05	<.03	1.9	<.01	0.087	<.005		<.005	<.03	0.3
	6/15/1998	<.002	4	<.005	1.06	<.02	16	<.03	<.03	2.4	<.01	0.131	0.008		<.005	<.03	0.06
	6/19/1998																
	6/20/1998	<.002	4	0.008	0.68	<.02		<.03	<.03	2.1	<.01	0.099	<.005		0.012	0.03	0.09
	6/21/1998	0.003	5	<.005	0.13	<.02		<.03	<.03	2.3	<.01	0.105	<.005		<.005	<.03	0.18
	6/21/1998	0.003	5	<.005	0.13	<.02		<.03	<.03	2.3	<.01	0.105	<.005		<.005	<.03	0.18
	7/21/1998	0.006	7	<.005	<.04	<.02	8	<.03	<.03	3	<.01	0.197	<.005		<.005	<.03	0.05
	8/4/1998																
	8/10/1998	0.014	10	<.005	<.04	0.02	15	0.04	<.03	3.4	<.01	0.25	0.01		<.005	<.03	0.13
	9/25/1998	0.019	7	0.009	0.87	<.02	29.9	<.03	<.03	2.7	<.01	0.183	0.016		<.005	<.03	0.07
	10/19/1998	0.003	8	0.015	1.2	<.02	35.2	<.03	<.03	3.1	<.01	0.207	0.023		<.005	<.03	0.08
	11/17/1998	0.009	13	0.019	1.29	<.01	50	<.03	<.03	5.1	<.01	0.309	0.022		<.005	<.03	0.09
	12/21/1998	<.002	15	0.01	<.04	<.01	69	<.03	<.03	5.2	<.01	0.366	0.015		0.044	<.03	0.06
	1/18/1999	0.003	17	<.005	<.04	<.01	88	<.03	<.03	5.2	<.01	0.384	0.013		<.005	<.03	0.06
	2/22/1999	0.003	18	0.009	1.58	<.01	109	0.04	<.03	4.6	<.01	0.415	0.021		<.005	<.03	0.03
	3/17/1999	<.002	17	<.005	1.07	<.01	89	<.03	<.03	5.2	<.01	0.378	0.017		<.005	<.03	0.04

Faro Site - Select Surface Water Quality Listing, 1998-2002, Total Metals

Station	Date	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	TL-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	4/20/1999	<.002	13	<.005	0.45	<.01	60	<.03	<.03	4.2	<.01	0.321	0.023		<.005	<.03	0.03
	5/17/1999	0.013	2	<.005	<.04	<.01		<.03	<.03	2	<.01	0.09	<.005		<.005	<.03	0.07
	6/25/1999																
	7/3/1999	<.002	2	<.005	<.04	<.01	14	0.05	<.03	6.2	<.01	0.122	<.005		0.007	<.03	0.05
	7/27/1999	0.011	1	0.008	<.04	<.01	12	<.03	<.005	3.4	<.01	0.104	0.021		0.017	<.03	0.04
	7/29/1999																
	8/12/1999	0.006	8	<.005	<.04	<.01	46	<.03	<.005	5.4	<.01	0.219	<.005		<.005	<.03	0.08
	8/31/1999																
	9/10/1999	<.002	7	<.005	<.04	<.01	42	<.03	<.005	3.5	<.01	0.188	0.013		0.006	<.03	0.05
	10/29/1999	<.002	6	<.005	<.04	<.01	23	<.03	<.005	3.8	<.01	0.176	<.005		<.005	<.03	0.02
	11/22/1999	<.002	8	0.103	<.04	<.01	31	0.05	<.005	6.6	<.01	0.277	0.016		<.005	<.03	0.05
	12/14/1999	0.009	7	0.025	<.04	<.01	36	<.03	<.005	3.4	<.01	0.231	0.013		0.015	<.03	0.08
	1/27/2000	<.002	14	0.011	1	0.02		<.03	<.005	4.4	<.01	0.307	0.022		<.005	<.03	0.02
	2/28/2000	<.002	13	0.007	<1	0.02	62	<.03	<.005	5.3	<.01	0.346	0.027		<.005	<.03	0.64
	3/23/2000	<.002	9	0.009	<1	<.01	63	<.03	<.005	5.9	<.01	0.376	<.005		<.005	<.03	0.03
	4/27/2000	<.002	16	<.005	<1	0.03		<.03	<.005	5.1	<.01	0.387	0.047		<.005	<.03	0.09
	5/15/2000	<.002	<1	<.005	<1	<.01		<.03	<.005	4	<.01	0.24	0.021		<.005	<.03	0.07
	6/26/2000	<.002	4	<.005	7	<.01		<.03	<.005	2.6	<.01	0.137	0.029		<.005	<.03	0.1
	7/25/2000	<.002	9	0.014	<1	<.01		<.03	<.005	3.1	<.01	0.305	0.024		0.022	<.03	0.14
	8/29/2000	<.002	5	0.019	<1	<.01		<.03	<.005	4.9	<.01	0.139	0.019		<.005	<.03	0.1
	9/25/2000	<0.01	2	<0.05	<0.3	<0.05		<0.2	<0.2	4.49	<0.03	0.12	<0.01	<0.2	<0.03		0.01
	10/28/2002																
	10/29/2000	<.002	7	<.005	3	<.01	28	<.03	<.005	5.2	<.01	0.195	0.062		0.014	<.03	0.07
	11/13/2000	0.01	7	<0.005	<0.01	0.02	28	0.08	0.071	5	0.03	0.233	<0.005		0.006	0.05	0.07
	11/18/2000	<0.01	7	<0.05	<0.3	<0.05		<0.2	<0.2	5.23	<0.03	0.244	<0.01	<0.2	<0.03		0.088
	12/14/2000	<0.01	7	<0.05	<0.3	<0.05		<0.2	<0.2	5.47	<0.03	0.263	<0.01	<0.2	<0.03		0.051
	1/13/2001	<.002	8	0.012	<1	<.01	30	0.03	<.005	4.8	<.01	0.365	0.022		<.005	<.03	0.07
	2/10/2001	<.002	15	<.005	<1	<.01	54	<.03	<.005	5.2	<.01	0.144	0.035		0.052	<.03	0.11
	3/10/2001	<.002	13.7	<.005	<1	<.01	46.2	<.03	<.005	4.7	<.01	0.3	<.005		0.008	<.03	0.04
	4/16/2001	<.002	11	<.005	<1	<.01	54	<.03	<.005	4.4	<.01	0.33	<.005		<.005	<.03	0.08
	5/14/2001	0.013	8	0.016	<1	0.12	42	0.07	<.005	3.1	<.01	0.233	0.007		0.021	<.03	0.12
	6/17/2001	<.002	4	<.005	<1	<.01	6	0.1	<.005	1.4	0.02	0.08	0.014		<.005	<.03	0.03
	7/14/2001	<.002	6	<.005	<1	<.01	19	<.03	0.009	4.8	<.01	0.171	<.005		<.005	<.03	0.04
	8/14/2001	<0.002	4	0.006	<1	<0.01	48	<0.03	<0.005	5.4	<0.01	0.286	0.014		<0.005	<0.03	0.04
	9/17/2001	<0.002	5	<0.005	<1	<0.01	25	<0.03	<0.005	3.7	<0.01	0.195	<0.005		<0.005	<0.03	0.03
	10/15/2001	<0.002	12	0.005	<1	<0.01	100	<0.03	0.011	5.1	<0.01	0.362	<0.005		<0.005	<0.03	0.11
	11/13/2001	0.01	7	<0.005	<0.01	0.02	28	0.08	0.071	5	0.03	0.233	<0.005		0.006	0.05	0.07
	12/14/2001																
	12/15/2001	0.006	11	0.017	<0.01	<0.01	81	<0.03	<0.005	4.8	<0.01	0.325	0.006		0.006	<0.03	0.08
	1/15/2002	0.002	7	<0.005	0.01	<0.01	25	<0.03	<0.005	5.6	<0.01	0.238	<0.005		<0.005	<0.03	0.05
	2/12/2002	0.002	8	<0.005	<0.01	0.01	23	<0.03	<0.005	5.3	0.03	0.234	<0.005		<0.005	<0.03	0.02
	3/12/2002	<0.002	14	0.006	0.04	<0.01	57	<0.03	<0.005	6.4	<0.01	0.36	<0.005		<0.005	<0.03	0.03
	4/15/2002	<0.002	15	<0.005	<0.01	<0.01	66	<0.03	<0.005	6	0.04	0.353	<0.005		<0.005	<0.03	0.03
	5/13/2002	0.005	5	0.009	0.03	<0.01	12	<0.03	<0.005	4	<0.01	0.134	0.02		<0.005	<0.03	0.07
	6/16/2002	0.007	2.8	0.002	0.01	0.007	8.9	0.004	<0.005	3.8	0.01	0.108	0.004		<0.001	<0.03	0.031
	7/16/2002	0.009	6.8	0.007	0.07	0.003	52.3	0.037	<0.005	4.2	<0.002	0.213	<0.001		<0.001	<0.03	0.034
	8/12/2002	<0.001	4.6	0.008	0.02	0.017	12.8	0.003	<0.005	3.6	0.003	0.151	<0.001		0.001	<0.03	0.018
	9/16/2002	0.002	5.7	0.002	0.13	0.012	38.2	<0.002	<0.005	4.4	<0.002	0.203	<0.001		0.002	<0.03	0.107
	10/15/2002	0.002	4.2	0.004	<0.01	0.002	12.3	<0.002	<0.005	4.7	0.003	0.163	<0.001		<0.001	<0.03	0.031
	11/11/2002																
	11/12/2002	0.002	5.5	0.001	0.02	0.004	20.7	<0.002	<0.005	5.5	0.002	0.212	<0.001		0.003	<0.03	0.04
	12/10/2002	<0.001	6	0.002	<0.01	0.01	29.9	<0.002	<0.005	6.2	0.003	0.245	<0.001		<0.001	<0.03	0.059

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FDU																				
	5/19/1998																			
	5/17/1999	<.003	<.05	<.005	<.05	0.027	0.002	<.04	4.4	<.001	<.005	<.005	<.002	<.01		1	0.019		0.9	0.03
	10/30/1999	<.003	<.05	<.005	<.05	0.051	0.001	<.04	4	<.001	<.005	<.005	<.002	<.01		3	<.005		0.8	<.01
	6/11/2002	<0.2	0.144	0.009	<0.05	0.124	0.5	<0.01	2.2	0.2	0.003	0.001	0.002	0.063		0.3	<0.001		0.6	0.002
R2																				
	8/5/1998	<.0006	0.05	<.004	0.24	0.0425	0.0004	<.008	60.82	<.0004	<.001	0.004	0.0112	0.174	<.1	2.6	0.004		12.89	0.776
	9/9/1998	<.001	<.05	<.005	<.05	0.037	<.001	<.04	56.6	<.001	<.005	<.005	0.002	0.02	<.1	1.5	<.005		12.3	0.82
	9/10/1998																			
	7/31/2000	<.0001	0.049	<.001	0.012	0.0417	0.0003	<.001	43.4	<.0001	0.0016	<.0002	0.0045	0.089		1.66	0.0012		8.98	0.4651
	9/5/2000	<.0001	0.015	<.001	0.021	0.0452	0.0002	<.001	22.65	<.0001	0.0003	<.0002	<.0001	0.046		0.688	<.0002		5.162	0.098
R3																				
	8/5/1998	<.0006	<.01	<.004	0.75	0.0296	0.0002	<.008	36.44	<.0004	<.001	0.003	<.0004	<.002	<.1	2.3	<.001		3.5	0.007
	9/9/1998	<.001	<.05	<.005	<.05	0.035	<.001	<.04	52.7	<.001	<.005	<.005	0.003	<.01	<.1	1	<.005		11.2	0.65
	9/10/1998																			
	8/1/2000	<.0001	0.051	<.001	0.011	0.0472	0.0003	<.001	41.2	<.0001	<.0002	<.0002	0.0042	0.071		1.44	0.0012		8.431	0.4098
	9/6/2000	<.0001	0.016	<.001	0.018	0.0458	0.0002	<.001	23.09	<.0001	0.0003	<.0002	<.0001	0.038		0.818	<.0002		5.043	0.076
R4																				
	8/5/1998	<.0006	<.01	<.004	0.05	0.0567	0.0003	<.008	54.37	<.0004	<.001	0.002	0.0037	0.028	<.1	2.2	0.003		11.43	0.228
	9/9/1998	<.001	<.05	<.005	<.05	0.041	<.001	<.04	50.6	<.001	<.005	<.005	<.002	<.01	<.1	1.1	<.005		10.8	0.39
	9/10/1998																			
	3/17/1999	<.003	0.07	<.005	0.07	0.022	<.001	<.04	81.3	<.001	<.005	0.531	0.014	<.01		1	<.005		15.6	<.01
	8/1/2000	<.0001	0.041	<.001	<.002	0.0322	0.0002	<.001	37	<.0001	<.0002	<.0002	0.0053	0.059		1.22	0.0013		7.603	0.2313
R5																				
	8/5/1998	<.0006	<.01	<.004	0.03	0.0582	0.0003	<.008	39.52	<.0004	<.001	0.001	0.0028	0.012	<.1	1.5	0.004		10	0.04
	9/9/1998	<.001	<.05	<.005	<.05	0.04	<.001	<.04	40.5	<.001	<.005	<.005	<.002	<.01	<.1	<1	<.005		10.5	0.12
	9/10/1998																			
	8/1/2000	<.0001	0.035	<.001	<.002	0.0866	0.0002	<.001	31.9	<.0001	<.0002	<.0002	0.0039	0.053		0.87	0.0023		8.3	0.0285
	9/6/2000	<.0001	0.031	<.001	0.009	0.0616	0.0003	<.001	29.72	<.0001	0.0002	<.0002	0.0015	0.028		0.967	<.0002		8.094	0.013
R6																				
	8/5/1998	0.0011	<.01	<.004	0.03	0.0648	0.0003	<.008	39.69	<.0004	<.001	0.002	0.0024	0.035	<.1	1.2	0.002		10.63	0.004
	9/9/1998	<.001	<.05	<.005	<.05	0.038	<.001	<.04	39.6	0.001	<.005	0.023	0.004	<.01	<.1	<1	<.005		10.2	0.04
	9/10/1998																			
	8/1/2000	<.0001	0.027	<.001	<.002	0.084	0.0002	<.001	30.7	<.0001	<.0002	<.0002	0.0038	0.047		0.77	0.0024		8.275	0.0061
	9/6/2000	<.0001	0.038	<.001	0.029	0.0653	0.0003	<.001	30.54	<.0001	<.0002	<.0002	<.0001	0.043		0.9	<.0002		8.51	0.008
R7																				
	5/19/1998																			
	6/15/1998																			
	8/5/1998	<.0006	<.01	<.004	0.12	0.0397	<.0002	<.008	22.1	<.0004	<.001	<.001	0.0019	0.035	<.1	0.5	<.001		4.58	0.007
	9/9/1998	<.001	<.05	<.005	<.05	0.037	<.001	<.04	24.4	<.001	<.005	<.005	<.002	<.01	<.1	<1	<.005		4.9	0.02
	9/10/1998																			
	10/19/1998																			
	2/25/1999	<.003	<.05	<.005	0.22	0.017	<.001	<.04	41.2	<.001	<.005	<.005	0.008	<.01		1	<.005		8.9	<.01
	5/17/1999	<.003	<.05	0.011	<.05	0.02	0.002	<.04	6.1	0.002	<.005	<.005	0.081	0.1		1	0.012		1.4	0.12
	7/4/1999	<.003	<.05	<.005	0.21	0.007	<.001	<.04	15.7	<.001	<.005	<.005	<.002	0.3		<1	<.005		3.5	0.4
	10/30/1999	<.003	<.05	<.005	<.05	0.084	<.001	<.04	27.6	<.001	<.005	<.005	0.006	<.01		3	<.005		5.6	0.02
	3/26/2000	<.003	<.05	<.005	<.05	0.156	<.001	<.05	40.4	<.001	<.005	<.005	<.002	<.01		2	<.005		8.2	<.01
	6/3/2000	<.003	<.05	<.005	<.05	<.002	<.001	<.05	10	<.001	<.005	<.005	<.002	0.08		1	<.005		1.8	0.03
	8/1/2000	<.0001	0.029	<.001	<.002	0.0795	<.0001	<.001	16.8	<.0001	<.0002	<.0002	0.0031	0.065		0.45	<.0002		3.207	0.0058
	9/6/2000	<.0001	0.015	<.001	0.011	0.054	0.0002	<.001	18.48	<.0001	<.0002	<.0002	0.0034	0.059		0.572	<.0002		3.686	0.009
	9/12/2000	<.003	<.05	<.005	<.05	0.01	<.001	<.05	16.2	<.001	<.005	<.005	0.003	<.01		<1	<.005		<.1	<.01
	3/5/2001	<.003	0.09	<.005	0.07	0.25	<.001	<.05	40	<.001	<.005	<.005	0.005	<.01		<1	<.005		8	0.01
	6/13/2001	<.003	<.05	<.005	0.06	0.112	<.001	<.05	9.5	<.001	<.005	<.005	<.002	0.17		<1	<.005		2.6	0.39
	9/8/2001	<0.003	<0.05	0.033	<0.05	0.082	<0.001	<0.05	24.4	<0.001	<0.005	<0.005	<0.002	0.14		<1	0.011		5.5	0.32
	3/21/2002	<0.001	<0.05	<0.005	<0.05	0.204	<0.001	<0.05	52.1	<0.001	<0.005	<0.005	0.007	<0.01		2	0.008		9.6	0.02
	6/25/2002	<0.2	0.052	<0.003	0.06	0.139	0.3	<0.01	21.2	<0.2	<0.001	0.002	0.009	0.05		0.7	0.002		4.4	0.011
	9/27/2002	<0.2	0.049	<0.003	0.1	0.138	0.2	<0.01	27	<0.2	<0.001	<0.001	0.019	0.066		0.7	0.004		5.3	0.015
W10																				
	6/16/1998																			
	7/3/1999	<.003	<.05	<.005	0.2	<.002	<.001	<.04	9	<.001	<.005	<.005	<.002	0.26		<1	<.005		1.7	0.27
	6/3/2000	<.003	<.05	<.005	<.05	<.002	<.001	<.05	6.8	<.001	<.005	0.036	<.002	<.01		1	<.005		1.4	<.01
	6/11/2001	<.003	<.05	<.005	0.08	0.049	<.001	<.05	8.3	0.001	<.005	<.005	<.002	0.03		<1	<.005		1.2	0.01
	6/11/2002	<0.2	0.093	<0.003	<0.05	0.127	0.3	<0.01	10.6	1.7	0.002	0.002	0.003	0.024		0.5	0.003		1.4	0.005

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
X5																				
	1/5/1998																			
	1/5/1998	<.003	<.05	<.02	0.08	0.07	<.001	<.04	127.4	<.002	<.005	<.005	0.008	<.01		4	<.005		22	0.21
	1/12/1998																			
	1/12/1998			<.02																
	1/19/1998																			
	1/23/1998																			
	1/28/1998																			
	2/2/1998																			
	2/5/1998																			
	2/9/1998																			
	2/12/1998																			
	2/14/1998																			
	2/18/1998																			
	2/19/1998																			
	4/13/1998	<.003	<.05	<.02	<.05	0.065	0.002	<.04	132.9	<.002	<.005	<.005	0.029	<.01		6	<.005		23.6	1.14
	4/22/1998																			
	4/24/1998																			
	4/26/1998																			
	4/30/1998																			
	5/1/1998																			
	5/4/1998																			
	5/9/1998																			
	5/14/1998																			
	5/18/1998	<.003	0.06	<.02	0.13	0.021	0.021	<.04	117.2	<.002	<.005	<.005	0.019	<.01		7	<.005		19.8	0.82
	5/18/1998																			
	5/23/1998																			
	5/27/1998																			
	6/2/1998			<.02																
	6/5/1998																			
	6/8/1998																			
	6/10/1998																			
	6/15/1998																			
	6/19/1998																			
	6/20/1998																			
	6/21/1998																			
	6/25/1998																			
	6/26/1998																			
	6/30/1998																			
	7/7/1998																			
	7/9/1998																			
	7/14/1998																			
	7/16/1998																			
	7/21/1998																			
	7/23/1998																			
	7/28/1998																			
	8/1/1998																			
	8/5/1998																			
	8/10/1998																			
	8/14/1998																			
	8/17/1998																			
	8/21/1998																			
	8/24/1998																			
	8/28/1998																			
	8/31/1998																			
	9/4/1998																			
	9/7/1998																			
	9/16/1998																			
	9/21/1998																			
	9/25/1998																			
	10/2/1998																			
	10/11/1998																			
	10/14/1998																			

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	10/19/1998	<.003	<.05	<.02	<.05	0.022	0.001	<.04	179.5	<.002	0.006	<.005	0.018	0.11		8	<.005		37.8	4.5
	10/20/1998																			
	11/17/1998																			
	1/18/1999	<.003	<.05	<.005	0.05	0.017	0.001	<.04	184.9	<.001	<.005	0.165	0.021	0.12		7	<.005		38.3	4.91
	2/21/1999	<.003	0.14	<.005	0.19	0.023	<.001	<.04	211.9	<.001	<.005	0.062	0.019	0.09		8	<.005		42.6	5.21
	3/21/1999	<.003	0.12	<.005	<.05	0.011	<.001	<.04	178.1	0.002	<.005	<.005	0.02	<.01		6	<.005		34	5.87
	4/20/1999	<.003	0.1	<.005	0.06	0.026	0.002	<.04	141.8	<.001	0.009	<.005	0.018	0.19		6	0.041		31.2	3.3
	5/6/1999	<.003	<.05	<.005	<.05	<.002	0.001	<.04	125.2	0.004	0.007	<.005	<.002	<.01		6	<.005		20	0.78
	5/17/1999	<.003	<.05	<.005	<.05	0.007	<.001	<.04	56.2	<.001	<.005	0.061	0.008	0.01		3	<.005		10.2	0.34
	5/27/1999	<.003	<.05	<.005	<.05	0.008	<.001	<.04	80.7	<.001	<.005	<.005	0.008	0.02		4	0.034		13.5	0.63
	7/3/1999	<.003	0.12	<.005	0.19	0.032	<.001	<.04	131.6	<.001	<.005	<.005	0.014	0.19		5	<.005		23.7	1.53
	7/27/1999	<.003	0.17	<.005	<.05	0.013	<.001	<.04	138.6	<.001	<.005	<.005	0.011	0.06		6	<.005		29.7	2.29
	7/29/1999	<.0003	0.05	<.002	0.02	0.031	<.001	<.004	155.8	<.0002	<.001	<.001	0.015	0.03		7.9	<.001		30	2.44
	8/12/1999	<.003	<.05	<.005	<.05	0.087	<.001	<.04	159.9	<.001	0.019	<.005	0.01	<.01		10	<.005		30.1	1.88
	9/10/1999	<.003	0.1	<.005	<.05	0.025	<.001	<.04	163.9	<.001	<.005	<.005	0.018	0.03		7	0.006		33.8	3.02
	10/29/1999	<.003	<.05	<.005	<.05	0.084	<.001	<.04	194.2	<.001	<.005	<.005	0.003	0.04		4	<.005		38.6	7.92
	1/26/2000																			
	3/25/2000	<.003	0.41	<.005	<.05	0.089	<.001	<.05	196.6	<.001	<.005	<.005	0.002	0.06		12	0.005		40.9	5.53
	4/27/2000	<.003	0.19	<.005	<.05	0.058	0.001	<.05	148.9	<.001	<.005	<.005	0.021	0.06		4	<.005		31.8	4.3
	5/15/2000	<.003	<.05	<.005	<.05	0.058	<.001	<.05	47.1	<.001	<.005	<.005	<.002	0.03		1	0.033		7.1	0.36
	5/22/2000																			
	6/4/2000																			
	6/4/2000	<.003	<.05	<.005	<.05	0.019	<.001	<.05	112.1	0.005	<.005	<.005	<.002	0.01		6	<.005		21.9	0.63
	6/26/2000	<.003	<.05	<.005	<.05	0.036	0.002	<.05	152.5	<.001	<.005	<.005	0.018	<.01		7	<.005		27.6	1.36
	7/25/2000	<.003	<.05	<.005	<.05	0.051	0.002	<.05	157.9	0.01	0.01	0.006	0.017	0.15		8	0.059		31.8	2.03
	7/28/2000																			
	8/15/2000																			
	8/29/2000	<.003	0.34	<.005	<.05	0.031	<.001	<.05	161.3	<.001	<.005	<.005	0.019	0.19		8	<.005		33.3	2.27
	8/30/2000																			
	9/25/2000	<0.01	<0.05	<0.2	<0.1	0.02	<0.005	<0.1	188	<0.001	<0.01	<0.01	<0.01	0.06		7		0.03	39.8	4.36
	10/21/2000	<.003	0.27	<.005	<.05	0.048	0.002	<.05	182.7	<.001	<.005	<.005	0.03	0.17		8	<.005		37.5	3.92
	10/28/2000																			
	11/13/2000	<0.003	<0.05	<0.005	<0.05	0.047	<0.001	<0.05	188.5	<0.001	0.01	<0.005	<0.002	0.03		9	0.012		44.8	3.56
	11/18/2000	<0.01	<0.05	<0.2	<0.1	0.02	<0.005	<0.1	220	<0.001	<0.01	<0.01	<0.01	<0.01		7		0.02	39.1	5.18
	11/28/2000																			
	12/14/2000	<0.01	<0.05	<0.2	<0.1	0.03	<0.005	<0.1	223	<0.001	<0.01	<0.01	<0.01	<0.01		8		0.03	46.1	5.52
	1/13/2001	<.003	0.12	<.005	<.05	0.029	0.002	<.05	159.1	<.001	0.011	<.005	0.024	0.15		6	<.005		31.8	3.24
	2/10/2001	<.003	0.14	<.005	<.05	0.032	0.002	<.05	170.3	<.001	<.005	<.005	0.017	0.01		9	<.005		34.9	3.42
	3/10/2001	<.003	0.64	<.005	<.05	0.09	<.001	<.05	197	<.001	<.005	<.005	0.009	<.01		3	<.005		40.98	5.19
	4/16/2001	<.003	0.1	<.005	<.05	0.04	<.001	<.05	180.3	<.001	<.005	<.005	0.006	0.02		2	<.005		38.3	4.42
	5/14/2001	<.003	0.39	<.005	<.05	0.074	<.001	<.05	189.9	<.001	<.005	<.005	0.002	<.01		4	<.005		36.9	3.17
	6/17/2001	<.003	<.05	<.005	0.12	0.069	<.001	<.05	176.5	<.001	<.005	<.005	<.002	<.01		6	0.02		35	1.42
	6/25/2001																			
	7/14/2001	<.003	<.05	<.005	0.77	0.027	<.001	<.05	186.5	<.001	<.005	<.005	<.002	<.01		6	0.009		39.2	1.99
	8/14/2001	<0.003	<0.05	<0.005	<0.05	0.038	<0.001	<0.05	198.9	<0.001	<0.005	<0.005	<0.002	<0.01		7	0.008		45.5	1.28
	8/21/2001																			
	9/17/2001	<0.003	<0.05	<0.005	<0.05	0.045	<0.001	<0.05	177.6	<0.001	<0.005	<0.005	<0.002	<0.01		8	0.023		43.9	1.57
	10/15/2001	<0.003	<0.05	<0.005	0.05	0.029	<0.001	<0.05	182	<0.001	0.005	<0.005	<0.002	<0.01		9	0.027		46.4	2.8
	11/13/2001	<0.003	<0.05	<0.005	<0.05	0.047	<0.001	<0.05	188.5	<0.001	0.01	<0.005	<0.002	0.03		9	0.012		44.8	3.56
	12/14/2001																			
	12/15/2001	<0.001	<0.05	<0.005	<0.05	0.027	0.001	<0.05	197.1	<0.001	0.011	0.006	<0.002	<0.01		7	0.02		45.9	3.1
	1/15/2002	<0.001	<0.05	<0.005	0.05	0.087	<0.001	<0.05	193.4	<0.001	0.007	<0.005	<0.002	<0.01		10	0.02		47	4.14
	2/12/2002	<0.001	<0.05	0.008	<0.05	0.025	<0.001	<0.05	185.1	<0.001	0.006	<0.005	<0.002	<0.01		8	0.013		39.8	4.77
	3/12/2002	<0.001	<0.05	<0.005	0.06	0.1	<0.001	<0.05	203.8	<0.001	0.006	<0.005	0.018	<0.01		10	<0.005		44.2	4.66
	4/15/2002	0.001	<0.05	<0.005	<0.05	0.052	<0.001	<0.05	195.1	<0.001	0.006	<0.005	0.003	<0.01		10	0.012		47.3	3.72
	5/13/2002	<0.001	<0.05	<0.005	<0.05	0.081	<0.001	<0.05	40.1	0.002	<0.005	<0.005	0.013	<0.01		1	<0.005		3.8	0.42
	6/16/2002																			
	6/16/2002	<0.2	0.037	<0.003	<0.05	0.042	0.4	<0.01	179.7	<0.2	0.003	0.012	0.015	0.053		8.7	0.005		40.2	1.763
	7/16/2002																			
	7/16/2002	0.7	0.051	0.012	<0.05	0.031	0.5	<0.01	183.7	0.5	0.008	0.007	0.016	0.014		9.5	<0.001		46	1.385
	8/12/2002																			
	8/12/2002	<0.2	0.063	0.018	0.1	0.017	0.3	<0.01	188.1	<0.2	0.009	<0.001	0.014	0.049		9.5	<0.001		46.6	2.6
	9/16/2002																			

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/16/2002	<0.2	0.083	<0.003	0.1	0.087	0.3	<0.01	192.9	0.6	0.005	<0.001	0.019	0.036		11	<0.001		48.4	2.282
	9/29/2002																			
	10/15/2002																			
	10/15/2002	0.3	0.038	0.006	0.09	0.06	0.2	<0.01	201.8	0.9	0.007	0.001	0.037	0.042		10.9	0.002		50.4	3.831
	11/12/2002																			
	11/12/2002	<0.2	0.029	<0.003	0.09	0.044	0.3	0.01	205.2	<0.2	0.008	<0.001	0.02	0.067		10.3	<0.001		47	4.298
	12/10/2002																			
	12/10/2002	0.7	0.022	0.036	0.1	0.04	0.4	<0.01	178.6	0.6	0.008	<0.001	0.023	0.088		9.5	0.003		48.4	4.272
	12/15/2002																			
X13																				
	1/5/1998	<.003	<.05	<.02	0.05	0.109	0.003	<.04	200	<.002	<.005	<.005	0.009	0.03		9	<.005		39.2	7.17
	1/12/1998			0.03																
	1/23/1998																			
	2/24/1998			<.02																
	3/13/1998																			
	3/17/1998																			
	3/17/1998			<.02																
	4/3/1998																			
	4/13/1998			<.02																
	4/30/1998																			
	5/7/1998																			
	5/18/1998	<.003	0.08	0.04	0.3	0.044	0.021	<.04	203.9	<.002	0.006	<.005	0.025	<.01		5	<.005		41.7	4.76
	5/18/1998																			
	6/15/1998																			
	6/15/1998																			
	6/30/1998																			
	7/21/1998																			
	8/10/1998																			
	9/7/1998																			
	9/25/1998																			
	10/19/1998																			
	11/13/1998																			
	11/17/1998																			
	12/15/1998																			
	12/21/1998																			
	1/18/1999	<.003	<.05	<.005	0.09	0.032	0.001	<.04	238.7	<.001	<.005	0.124	0.022	<.01		5	<.005		45.6	8.68
	1/27/1999																			
	2/22/1999	<.003	0.14	<.005	0.21	0.037	<.001	<.04	225.8	<.001	0.008	0.244	0.019	0.06		5	<.005		42.6	7.61
	3/17/1999	<.003	0.14	<.005	0.07	0.034	<.001	<.04	175.6	<.001	<.005	0.264	0.021	<.01		4	<.005		32.4	4.53
	3/24/1999																			
	4/3/1999																			
	4/20/1999	<.003	<.05	<.005	<.05	0.04	0.002	<.04	219.8	<.001	<.005	<.005	0.023	0.08		6	<.005		44.5	8.98
	5/17/1999	<.003	<.05	<.005	<.05	0.064	0.003	<.04	202.3	<.001	<.005	<.005	0.01	<.01		5	<.005		41.2	5.29
	6/4/1999																			
	6/8/1999																			
	7/3/1999	<.003	0.14	<.005	0.25	0.045	<.001	<.04	173.7	<.001	<.005	<.005	0.017	0.21		5	<.005		37.5	3.47
	7/27/1999	<.003	<.05	<.005	<.05	0.132	0.002	<.04	194.2	0.002	0.081	<.005	0.012	0.68		6	0.014		41.5	8.79
	8/12/1999	<.003	<.05	<.005	<.05	0.104	<.001	<.04	214.6	<.001	<.005	<.005	0.005	0.02		6	<.005		41.1	5.74
	9/10/1999																			
	9/28/1999																			
	10/29/1999	<.003	<.05	<.005	<.05	0.117	<.001	<.04	197.4	<.001	<.005	<.005	<.002	<.01		<1	<.005		38.7	7.49
	11/22/1999	<.003	0.09	<.005	<.05	0.05	<.001	<.04	191.3	<.001	<.005	<.005	0.027	0.02		6	<.005		43.8	6.44
	12/14/1999	<.003	0.52	<.005	<.05	0.112	<.001	<.04	220.8	<.001	<.005	<.005	0.014	0.11		4	<.005		37.7	8.87
	1/27/2000	<.003	0.18	<.005	<.05	0.078	0.002	<.05	218.1	<.001	<.005	<.005	0.025	<.01		6	0.017		41.1	6.95
	2/28/2000	<.003	0.24	<.005	<.05	0.056	<.001	<.05	214.7	<.001	<.005	<.005	0.029	0.08		7	0.013		42.8	6.12
	3/23/2000	<.003	0.43	<.005	0.06	0.125	<.001	<.05	216	<.001	0.023	<.005	<.002	0.01		7	<.005		43.4	8.7
	4/27/2000	<.003	0.26	<.005	<.05	0.067	0.001	<.05	206.4	<.001	<.005	<.005	0.027	0.6		5	<.005		41.5	8.92
	5/15/2000	<.003	0.28	<.005	<.05	0.027	<.001	<.05	232.7	<.001	0.007	<.005	0.018	0.28		6	0.07		46	9.8
	6/20/2000																			
	6/20/2000	<.003	0.24	<.005	<.05	0.13	0.002	<.05	192	0.002	<.005	<.005	0.02	0.26		7	<.005		43	4.54
	6/26/2000	<.003	0.09	<.005	<.05	0.038	0.002	<.05	213.2	<.001	<.005	<.005	0.022	0.07		7	<.005		40.7	7.02
	7/19/2000																			
	7/25/2000	<.003	<.05	<.005	<.05	0.052	0.002	<.05	207.8	<.001	0.03	<.005	0.021	0.21		7	0.06		44.8	5.84

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	7/28/2000																			
	8/3/2000																			
	8/10/2000																			
	8/18/2000																			
	8/24/2000																			
	8/29/2000	<.003	0.23	<.005	<.05	0.037	<.001	<.05	213.1	<.001	<.005	<.005	0.018	<.01		7	<.005		45.1	3.58
	9/8/2000																			
	9/12/2000																			
	9/25/2000	<0.01	0.06	<0.2	<0.1	0.08	<0.005	<0.1	176	<0.001	<0.01	<0.01	<0.01	0.93		4		<0.01	33.7	6.22
	10/19/2000	<.003	0.25	<.005	<.05	0.06	0.002	<.05	190.4	0.003	<.005	0.018	0.03	0.18		7	<.005		39.3	5.17
	10/28/2000																			
	11/13/2000	<0.003	<0.05	0.021	<0.05	0.067	<0.001	<0.05	231.3	<0.001	0.011	0.007	<0.002	0.04		7	0.022		45.9	13.55
	11/18/2000	<0.01	<0.05	<0.2	<0.1	0.06	<0.005	<0.1	258	<0.001	0.01	<0.01	<0.01	<0.01		6		0.01	43.9	11
	12/14/2000	<0.01	<0.05	<0.2	<0.1	0.07	<0.005	<0.1	252	<0.001	<0.01	<0.01	<0.01	0.02		6		0.02	45.8	10.1
	1/13/2001	<.003	0.23	<.005	0.06	0.13	0.002	<.05	216.9	<.001	<.005	0.037	0.062	0.32		7	0.011		40.9	9.86
	2/10/2001	<.003	0.22	<.005	<.05	0.137	0.003	0.09	220.9	<.001	<.005	<.005	0.046	0.38		8	<.005		41.1	9.9
	3/1/2001																			
	3/10/2001	<.003	0.8	<.005	0.05	0.13	<.001	<.05	236	<.001	<.005	<.005	0.005	<.01		2	<.005		45.18	12.68
	3/15/2001																			
	3/27/2001																			
	4/5/2001																			
	4/11/2001																			
	4/16/2001	<.003	0.33	<.005	0.07	0.06	<.001	<.05	233	<.001	<.005	<.005	0.025	0.09		2	<.005		44.8	12.96
	4/23/2001																			
	4/30/2001																			
	5/8/2001																			
	5/14/2001	<.003	0.52	<.005	<.05	0.163	<.001	<.05	232.4	<.001	<.005	<.005	0.008	0.17		9	<.005		44	10.61
	5/23/2001																			
	5/30/2001																			
	6/8/2001																			
	6/14/2001																			
	6/17/2001	<.003	<.05	<.005	0.12	0.126	<.001	<.05	220.5	<.001	0.006	<.005	<.002	0.01		6	0.025		43.7	5.14
	6/21/2001																			
	6/29/2001																			
	7/14/2001	<.003	<.05	0.019	0.28	0.107	<.001	<.05	200.5	<.001	0.005	<.005	<.002	<.01		5	0.023		38.8	9.3
	8/14/2001	<0.003	<0.05	<0.005	<0.05	0.041	<0.001	<0.05	217.5	<0.001	0.008	<0.005	0.01	0.08		6	0.012		44.3	10.18
	9/12/2001																			
	9/17/2001	<0.003	<0.05	<0.005	<0.05	0.076	<0.001	<0.05	206	<0.001	0.011	<0.005	<0.002	<0.01		6	0.022		44.7	13.14
	9/24/2001																			
	10/15/2001	<0.003	<0.05	0.009	0.09	0.112	<0.001	<0.05	227.2	<0.001	0.013	<0.005	<0.002	0.05		8	0.035		49	14.39
	11/13/2001	<0.003	<0.05	0.021	<0.05	0.067	<0.001	<0.05	231.3	<0.001	0.011	0.007	<0.002	0.04		7	0.022		45.9	13.55
	12/8/2001																			
	12/14/2001																			
	12/15/2001	<0.001	<0.05	0.059	<0.05	0.074	<0.001	<0.05	243.3	0.001	0.015	<0.005	<0.002	0.1		5	0.012		48.4	12
	12/20/2001																			
	12/28/2001																			
	1/15/2002	<0.001	<0.05	<0.005	<0.05	0.147	<0.001	<0.05	207.6	<0.001	0.008	<0.005	<0.002	0.35		7	0.025		44.4	9.4
	2/12/2002	<0.001	<0.05	0.018	<0.05	0.034	<0.001	<0.05	191.5	<0.001	<0.005	<0.005	0.003	0.07		6	0.013		37	7.29
	3/12/2002	0.022	<0.05	<0.005	0.1	0.11	<0.001	<0.05	230	<0.001	0.009	<0.005	0.016	0.1		7	<0.005		41.6	10.39
	4/15/2002	0.001	<0.05	<0.005	<0.05	0.149	<0.001	<0.05	223.3	0.003	0.01	<0.005	0.011	<0.01		8	<0.005		44	9.91
	5/13/2002	<0.001	<0.05	<0.005	0.05	0.086	<0.001	<0.05	267	<0.001	0.011	0.011	0.009	<0.01		7	<0.005		47.7	11.78
	6/16/2002																			
	6/16/2002	0.3	0.014	<0.003	<0.05	0.04	0.5	<0.01	207.5	<0.2	0.006	0.008	0.012	0.298		6.4	0.005		40.1	8.747
	7/16/2002																			
	7/16/2002	0.9	0.025	0.01	<0.05	0.04	0.6	<0.01	253	<0.2	0.012	0.005	0.013	0.058		7.2	<0.001		46.4	10.254
	8/12/2002																			
	8/12/2002	<0.2	0.071	<0.003	0.06	0.054	<0.2	<0.01	242.8	<0.2	0.012	<0.001	0.015	0.043		7.4	<0.001		46.9	10.061
	9/5/2002																			
	9/5/2002																			
	9/12/2002																			
	9/12/2002																			
	9/16/2002																			
	9/16/2002	<0.2	0.063	0.004	0.1	0.099	0.3	<0.01	239.9	0.6	0.009	<0.001	0.022	0.095		8.5	<0.001		47.8	9.599

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/27/2002																			
	9/27/2002																			
	9/29/2002																			
	10/3/2002																			
	10/3/2002																			
	10/12/2002																			
	10/12/2002																			
	10/15/2002																			
	10/15/2002	<0.2	0.029	0.005	0.15	0.082	<0.2	<0.01	205.1	0.3	0.004	<0.001	0.019	0.065		7.4	0.001		40.6	7.614
	10/21/2002																			
	10/21/2002																			
	10/29/2002																			
	10/29/2002																			
	11/5/2002																			
	11/12/2002																			
	11/12/2002	0.3	0.014	0.004	0.1	0.059	0.3	<0.01	251.8	<0.2	0.012	<0.001	0.016	0.237		8.6	<0.001		47.4	10.921
	11/19/2002																			
	11/26/2002																			
	12/3/2002																			
	12/10/2002																			
	12/10/2002	0.9	0.024	0.043	0.09	0.06	0.5	<0.01	223.7	0.7	0.009	<0.001	0.025	0.213		8.3	<0.001		49.6	10.173
	12/15/2002																			
	12/17/2002																			
	12/24/2002																			
	12/31/2002																			
X14																				
	1/12/1998																			
	2/24/1998																			
	3/17/1998																			
	4/13/1998																			
	4/16/1998																			
	4/22/1998																			
	4/24/1998																			
	4/26/1998																			
	4/30/1998																			
	5/18/1998																			
	6/15/1998																			
	6/19/1998																			
	6/20/1998																			
	6/21/1998																			
	6/21/1998																			
	7/21/1998																			
	8/4/1998																			
	8/10/1998																			
	9/25/1998																			
	10/19/1998	<.003	<.05	<.02	<.05	0.017	<.001	<.04	59.7	<.002	0.01	<.005	0.006	0.12		2	<.005		12.9	0.86
	11/17/1998																			
	12/21/1998	<.003	<.05	<.005	0.1	0.02	<.001	<.04	92.7	<.001	<.005	<.005	0.014	<.01		3	<.005		18.3	1.37
	1/18/1999	<.003	<.05	<.005	<.05	0.025	<.001	<.04	115.2	0.001	<.005	0.112	0.011	0.04		3	<.005		23.5	2.57
	2/22/1999	<.003	0.08	<.005	0.21	0.026	<.001	<.04	135.5	<.001	<.005	0.161	0.012	0.07		4	<.005		26.6	3.04
	3/17/1999	<.003	0.08	<.005	0.08	0.026	<.001	<.04	106.9	<.001	<.005	0.776	0.014	<.01		2	<.005		20.8	2.22
	4/20/1999	<.003	<.05	<.005	<.05	0.027	0.001	<.04	88.3	<.001	<.005	<.005	0.011	0.19		3	<.005		19.3	2.02
	5/17/1999	<.003	<.05	<.005	<.05	0.016	0.002	<.04	15.2	<.001	<.005	<.005	0.057	0.08		2	<.005		3.1	0.35
	6/25/1999																			
	7/3/1999	<.003	<.05	<.005	0.24	0.01	<.001	<.04	25.2	<.001	<.005	<.005	<.002	0.3		<1	<.005		5.5	0.35
	7/27/1999	<.003	<.05	<.005	<.05	0.036	0.001	<.04	25	0.006	0.081	<.005	0.007	0.18		<1	<.005		6.5	0.27
	7/29/1999																			
	8/12/1999	<.003	<.05	<.005	0.06	0.107	<.001	<.04	59.9	0.005	<.005	<.005	0.008	0.1		7	<.005		12	0.63
	8/31/1999																			
	9/10/1999	<.003	<.05	<.005	<.05	0.021	<.001	<.04	52.7	<.001	<.005	<.005	0.006	0.05		2	<.005		11.1	0.78
	10/29/1999	<.003	<.05	<.005	<.05	0.083	<.001	<.04	48.7	<.001	<.005	<.005	<.002	0.09		<1	<.005		10.1	0.74
	11/22/1999	<.003	<.05	<.005	<.05	0.026	<.001	<.04	44.7	<.001	<.005	<.005	0.008	0.07		<1	<.005		10.5	1.06
	12/14/1999	<.003	0.06	<.005	<.05	0.086	<.001	<.04	73.8	<.001	<.005	<.005	0.009	0.13		4	<.005		13.7	1.16

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	HG-D	K-D	LA-D	LI-D	MG-D	MN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	1/27/2000	<.003	<.05	<.005	<.05	0.048	<.001	<.05	89.6	0.001	<.005	<.005	0.009	0.05		3	<.005		18	2.13
	2/28/2000	<.003	0.14	<.005	<.05	0.033	<.001	<.05	89.3	<.001	<.005	<.005	0.015	0.16		4	0.018		19.1	1.72
	3/23/2000	<.003	0.13	<.005	<.05	0.146	<.001	<.05	96.9	<.001	0.031	<.005	<.002	0.07		2	<.005		20	2.18
	4/27/2000	<.003	0.15	<.005	<.05	0.042	0.001	<.05	107.4	<.001	<.005	<.005	0.016	0.19		2	<.005		22.9	2.49
	5/15/2000	<.003	<.05	0.009	<.05	0.012	<.001	<.05	29	<.001	<.005	<.005	0.002	0.26		<1	0.044		6.9	0.26
	6/26/2000	<.003	<.05	<.005	<.05	0.008	<.001	<.05	40.6	<.001	<.005	<.005	0.005	<.01		3	<.005		8.1	0.86
	7/25/2000	<.003	<.05	<.005	<.05	0.023	<.001	<.05	54.2	<.001	0.025	<.005	0.007	0.17		3	0.055		11.5	1
	8/29/2000	<.003	0.11	<.005	<.05	0.016	<.001	<.05	31.9	<.001	<.005	<.005	<.002	<.01		<1	<.005		7	0.34
	9/25/2000	<0.01	0.07	<0.2	<0.1	0.04	<0.005	<0.1	28.9	<0.001	<0.01	<0.01	<0.01	0.13		<2		<0.01	6.5	0.108
	10/28/2002																			
	10/29/2000	<.003	0.13	<.005	<.05	0.029	<.001	<.05	40.5	<.001	<.005	<.005	0.011	0.32		2	<.005		9.4	0.41
	11/13/2000	<0.003	<0.05	0.01	<0.05	0.109	<0.001	<0.05	58.2	<0.001	<0.005	<0.005	<0.002	0.12		2	0.023		13.3	0.98
	11/18/2000	<0.01	<0.05	<0.2	<0.1	0.06	<0.005	<0.1	67.1	<0.001	<0.01	<0.01	<0.01	0.05		<2		<0.01	13.7	0.885
	12/14/2000	<0.01	<0.05	<0.2	<0.1	0.07	<0.005	<0.1	73.5	<0.001	<0.01	<0.01	<0.01	<0.01		2		<0.01	15.6	1.14
	1/13/2001	<.003	<.05	0.03	<.05	0.027	0.001	<.05	71.6	0.001	<.005	<.005	0.022	0.3		2	<.005		16.4	0.96
	2/10/2001	<.003	<.05	<.005	<.05	0.027	<.001	<.05	80.2	<.001	<.005	<.005	0.007	0.14		3	<.005		17.6	1.3
	3/10/2001	<.003	0.3	<.005	<.05	0.13	<.001	<.05	85	<.001	<.005	<.005	0.005	0.04		1	<.005		18.14	1.99
	4/16/2001	<.003	<.05	<.005	<.05	0.13	<.001	<.05	90.6	<.001	<.005	<.005	<.002	0.02		<1	<.005		19.2	1.94
	5/14/2001	<.003	0.19	<.005	<.05	0.126	<.001	<.05	72.3	<.001	0.016	<.005	0.01	0.32		14	0.016		14.3	1.13
	6/17/2001	<.003	<.05	<.005	0.1	0.085	<.001	<.05	19.2	<.001	<.005	<.005	<.002	0.1		<1	<.005		4.3	0.13
	7/14/2001	<.003	<.05	<.005	0.21	0.068	<.001	<.05	38.8	<.001	<.005	<.005	<.002	0.05		1	<.005		8.2	0.34
	8/14/2001	<0.003	<0.05	0.006	<0.05	0.108	<0.001	<0.05	68.4	<0.001	<0.005	<0.005	0.002	0.06		2	<0.005		15.2	0.6
	9/17/2001	<0.003	<0.05	0.026	<0.05	0.09	<0.001	<0.05	51.3	<0.001	<0.005	0.005	<0.002	0.1		2	0.008		11.4	0.64
	10/15/2001	<0.003	<0.05	<0.005	0.1	0.061	<0.001	<0.05	106.4	<0.001	<0.005	0.009	<0.002	<0.01		5	0.026		24.6	1.6
	11/13/2001	<0.003	<0.05	0.01	<0.05	0.109	<0.001	<0.05	58.2	<0.001	<0.005	<0.005	<0.002	0.12		2	0.023		13.3	0.98
	12/14/2001																			
	12/15/2001	<0.001	<0.05	<0.005	<0.05	0.059	<0.001	<0.05	113.1	<0.001	<0.005	<0.005	<0.002	0.05		3	0.037		26.5	1.94
	1/15/2002	<0.001	<0.05	<0.005	<0.05	0.156	<0.001	<0.05	61.2	<0.001	<0.005	<0.005	<0.002	0.15		2	0.015		13.1	0.82
	2/12/2002	<0.001	<0.05	<0.005	<0.05	0.115	<0.001	<0.05	66.1	<0.001	<0.005	0.006	<0.002	0.06		2	0.007		12.5	0.87
	3/12/2002	<0.001	<0.05	<0.005	0.11	0.205	<0.001	<0.05	115.3	<0.001	<0.005	<0.005	0.019	0.03		4	0.007		21.9	2.52
	4/15/2002	<0.001	<0.05	<0.005	<0.05	0.106	<0.001	<0.05	123.6	0.002	<0.005	0.009	0.003	0.09		4	0.007		22.9	2.5
	5/13/2002	<0.001	0.1	<0.005	<0.05	0.126	<0.001	<0.05	37	<0.001	<0.005	<0.005	0.019	0.31		2	<0.005		7.4	0.36
	6/16/2002	<0.2	0.078	0.004	0.09	0.151	<0.2	<0.01	27.6	0.4	<0.001	0.003	0.009	0.165		1.1	0.004		6	0.217
	7/16/2002	1.9	0.068	0.004	<0.05	0.095	0.2	<0.01	71.9	<0.2	0.002	0.001	0.011	0.119		2.8	0.004		15.9	0.612
	8/12/2002	0.2	0.086	<0.003	0.05	0.042	<0.2	<0.01	38.4	<0.2	0.002	<0.001	0.015	0.191	125	1.2	0.005		7.4	0.34
	9/16/2002	0.3	0.087	<0.003	0.07	0.148	<0.2	<0.01	60.6	0.5	<0.001	0.005	0.018	0.134		2.5	0.005		13.9	0.534
	10/15/2002	0.3	0.05	<0.003	0.12	0.145	<0.2	<0.01	42	<0.2	<0.001	0.001	0.028	0.186		1.4	0.004		9.1	0.304
	11/11/2002																			
	11/12/2002	<0.2	0.04	<0.003	0.09	0.112	<0.2	<0.01	54.6	0.7	<0.001	0.002	0.024	0.236		1.6	0.004		11.1	0.57
	12/10/2002	<0.2	0.03	0.009	0.08	0.118	0.3	<0.01	62.3	0.7	0.002	<0.001	0.032	0.115		2	0.004		14.6	0.907

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Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FDU																	
	5/19/1998																
	5/17/1999	0.009	<1	<.005	1.12	<.01		<.03	<.03	1	<.01	0.033	<.005		0.03	<.03	0.06
	10/30/1999	<.002	4	<.005	<.04	<.01	<1	<.03	<.005	5.1	<.01	0.025	<.005		<.005	<.03	<.01
	6/11/2002	<0.001	1.4	<0.001	<0.01	0.009	0.4	<0.002	<0.005	5.4	<0.002	0.013	0.001		<0.001	<0.03	<0.001
R2																	
	8/5/1998	0.0034	9.7	0.001	0.036	<.004	7	0.009	<.001	3.559	<.002	0.2071	0.001		<.001	<.006	0.021
	9/9/1998	<.002	8	<.005	<.04	<.01	38.8	<.03	<.005	3.28	<.01	0.212	<.005		<.005	<.03	0.03
	9/10/1998																
	7/31/2000	0.0021	4.97	0.0018	0.7	0.004	24.73	<.001	<.001	3.88	<.0004	0.1551	0.0044		0.0123	<.001	0.0351
	9/5/2000	<.0001	2.233	<.0002	<.2	<.001	7.107	<.001	<.001	4.786	<.0004	0.1	0.006		<.0002	<.001	0.008
R3																	
	8/5/1998	0.0019	9.5	<.001	0.158	<.004	3.1	<.006	<.001	8.583	<.002	0.173	<.001		<.001	<.006	<.002
	9/9/1998	<.002	7	<.005	0.19	<.01	34.5	<.03	<.005	3.64	<.01	0.196	<.005		0.005	<.03	0.02
	9/10/1998																
	8/1/2000	0.0041	4.76	<.0002	1.2	<.001	22.65	<.001	<.001	4.01	<.0004	0.1471	0.0037		0.001	<.001	0.0341
	9/6/2000	<.0001	2.327	<.0002	<.2	<.001	6.632	<.001	<.001	4.994	<.0004	0.099	0.007		<.0002	<.001	0.006
R4																	
	8/5/1998	0.0016	7.2	<.001	0.46	<.004	2	<.006	<.001	2.496	<.002	0.1877	<.001		0.003	<.006	0.014
	9/9/1998	<.002	7	<.005	0.04	<.01	31.1	<.03	<.005	3.48	<.01	0.19	<.005		<.005	<.03	<.01
	9/10/1998																
	3/17/1999	<.002	10	<.005	0.29	<.01	55	<.03	<.03	3.9	<.01	0.285	<.005		<.005	<.03	<.01
	8/1/2000	0.001	4.13	0.0046	0.5	<.001	20.81	<.001	<.001	3.58	<.0004	0.1344	0.0029		0.0011	<.001	0.0233
R5																	
	8/5/1998	0.0024	2.9	<.001	<.008	<.004	2	<.006	<.001	2.159	<.002	0.1254	<.001		<.001	<.006	0.002
	9/9/1998	<.002	3	<.005	0.27	<.01	10.4	<.03	<.005	3.55	<.01	0.14	<.005		<.005	<.03	0.03
	9/10/1998																
	8/1/2000	0.0033	2.02	0.0009	0.4	<.001	5.95	<.001	<.001	3.69	<.0004	0.0974	0.0021		0.0011	<.001	0.005
	9/6/2000	0.0005	2.006	<.0002	<.2	<.001	6.057	<.001	<.001	4.821	<.0004	0.096	0.006		<.0002	<.001	<.0004
R6																	
	8/5/1998	0.0011	2.2	<.001	0.123	<.004	2	0.012	<.001	2.467	<.002	0.1245	<.001		<.001	<.006	<.002
	9/9/1998	<.002	2	<.005	0.22	<.01	7	<.03	<.005	3.57	<.01	0.126	<.005		<.005	<.03	0.04
	9/10/1998																
	8/1/2000	0.0023	1.73	0.0007	0.8	<.001	4.33	<.001	<.001	3.9	<.0004	0.0966	0.0014		0.0003	<.001	0.0013
	9/6/2000	0.0004	2.105	<.0002	<.2	<.001	5.955	<.001	<.001	4.109	<.0004	0.096	0.007		<.0002	<.001	<.0004
R7																	
	5/19/1998																
	6/15/1998																
	8/5/1998	0.0012	2.6	<.001	<.008	<.004	<.2	<.006	<.001	2.86	<.002	0.0965	<.001		0.003	<.006	<.002
	9/9/1998	<.002	3	<.005	0.19	<.01	2.8	<.03	<.005	4.18	<.01	0.107	<.005		<.005	<.03	0.02
	9/10/1998																
	10/19/1998																
	2/25/1999	<.002	4	<.005	<.04	<.01	4	<.03	<.03	5.5	<.01	0.191	0.005		<.005	<.03	<.01
	5/17/1999	<.002	<1	0.022	0.54	<.01		<.03	<.03	0.6	<.01	0.039	<.005		0.018	<.03	0.02
	7/4/1999	<.002	<1	<.005	<.04	<.01	2	<.03	<.03	3.5	<.01	0.023	<.005		<.005	<.03	<.01
	10/30/1999	<.002	3	<.005	0.04	<.01	3	<.03	<.005	4	<.01	0.13	<.005		<.005	<.03	0.26
	3/26/2000	<.002	4	<.005	<1	<.01	4	<.03	<.005	5.8	<.01	0.207	<.005		<.005	<.03	<.01
	6/3/2000	<.002	1	<.005	<1	<.01	1	<.03	<.005	2.3	<.01	0.055	<.005		<.005	<.03	<.01
	8/1/2000	0.0028	1.66	0.0026	0.3	<.001	1.44	<.001	<.001	4.05	<.0004	0.0743	0.0006		0.002	<.001	0.006
	9/6/2000	<.0001	1.859	<.0002	<.2	<.001	2.202	<.001	<.001	5.775	<.0004	0.078	0.008		<.0002	<.001	0.003
	9/12/2000	<.002	3	<.005	7	<.01	7	<.03	<.005	3.6	<.01	0.003	<.005		0.02	<.03	0.04
	3/5/2001	<.002	7.48	<.005	<1	<.01	3.7	<.03	<.005	6.24	<.01	0.19	<.005		<.005	<.03	<.01
	6/13/2001	<.002	3	0.013	<1	<.01	2	<.03	0.036	3	<.01	0.044	<.005		<.005	<.03	<.01
	9/8/2001	<0.002	5	<0.005	<1	<0.01	4	<0.03	<0.005	5.3	<0.01	0.124	<0.005		<0.005	<0.03	0.69
	3/21/2002	<0.002	6	<0.005	0.02	<0.01	4	<0.03	<0.005	6.9	0.01	0.224	<0.005		<0.005	<0.03	<0.01
	6/25/2002	<0.001	1.7	0.002	<0.01	<0.002	2.3	<0.002	<0.005	4.2	0.004	0.084	<0.001		<0.001	<0.03	0.007
	9/27/2002	<0.001	2.6	0.002	<0.01	<0.002	2.9	0.013	<0.005	4.6	0.024	0.104	<0.001		<0.001	<0.03	0.008
W10																	
	6/16/1998																
	7/3/1999	<.002	<1	<.005	<.04	<.01	<1	<.03	<.03	6.1	<.01	<.002	<.005		<.005	<.03	<.01
	6/3/2000	<.002	2	<.005	<1	<.01	<1	<.03	<.005	3.5	<.01	0.041	<.005		<.005	<.03	<.01
	6/11/2001	<.002	2	<.005	<1	<.01	<1	<.03	<.005	2.6	<.01	0.036	<.005		<.005	<.03	0.02
	6/11/2002	<0.001	1.7	<0.001	<0.01	<0.002	1.3	0.005	<0.005	6.6	<0.002	0.032	<0.001		0.001	<0.03	0.003

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
X5																	
	1/5/1998																
	1/5/1998	<.002	19	<.005	<.04	<.02	152	<.03	<.03	1.8	<.01	0.423	<.005		<.005	<.03	0.02
	1/12/1998																
	1/12/1998																
	1/19/1998																
	1/23/1998																
	1/28/1998																
	2/2/1998																
	2/5/1998																
	2/9/1998																
	2/12/1998																
	2/14/1998																
	2/18/1998																
	2/19/1998																
	4/13/1998	0.011	21	0.011	<.04	<.02	118	<.03	<.03	3.6	<.01	0.398	0.007		<.005	<.03	0.01
	4/22/1998																
	4/24/1998																
	4/26/1998																
	4/30/1998																
	5/1/1998																
	5/4/1998																
	5/9/1998																
	5/14/1998																
	5/18/1998	<.002	18	0.009	1.18	<.02	140	0.03	<.03	2.3	<.01	0.325	0.005		0.031	<.03	0.23
	5/18/1998																
	5/23/1998																
	5/27/1998																
	6/2/1998																0.11
	6/5/1998																
	6/8/1998																
	6/10/1998																
	6/15/1998																
	6/19/1998																
	6/20/1998																
	6/21/1998																
	6/25/1998																
	6/26/1998																
	6/30/1998																
	7/7/1998																
	7/9/1998																
	7/14/1998																
	7/16/1998																
	7/21/1998																
	7/23/1998																
	7/28/1998																
	8/1/1998																
	8/5/1998																
	8/10/1998																0.15
	8/14/1998																
	8/17/1998																
	8/21/1998																
	8/24/1998																
	8/28/1998																
	8/31/1998																
	9/4/1998																
	9/7/1998																
	9/16/1998																
	9/21/1998																
	9/25/1998																
	10/2/1998																
	10/11/1998																
	10/14/1998																

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	10/19/1998	0.012	33	0.021	0.71	<.02	146.9	0.04	<.03	2.3	<.01	0.499	0.007		0.012	<.03	0.46
	10/20/1998																
	11/17/1998																
	1/18/1999	0.017	34	0.011	<.04	<.01	208	<.03	<.03	4.7	<.01	0.501	0.007		<.005	<.03	0.16
	2/21/1999	0.007	38	<.005	1.91	<.01		<.03	<.03	4.6	<.01	0.599	0.015		<.005	<.03	0.18
	3/21/1999	<.002	31	<.005	0.65	<.01	175.6	<.03	<.03	4.6	<.01	0.464	<.005		<.005	<.03	0.09
	4/20/1999	<.002	26	<.005	0.38	<.01	147	<.03	<.03	3.2	<.01	0.422	0.023		0.014	<.03	0.08
	5/6/1999	<.002	17	<.005	0.78	<.01	124	<.03	<.03	0.9	<.01	0.414	<.005		<.005	<.03	0.07
	5/17/1999	<.002	9	<.005	<.04	<.01		<.03	<.03	0.3	<.01	0.176	0.016		<.005	<.03	<.01
	5/27/1999	<.002	12	<.005	<.04	<.01	77	<.03	<.03	0.4	<.01	0.232	0.021		<.005	0.1	0.13
	7/3/1999	<.002	18	<.005	<.04	<.01	143	0.03	<.03	2.6	<.01	0.37	<.005		<.005	<.03	0.09
	7/27/1999	0.005	21	<.005	0.59	<.01	173	<.03	<.03	2.6	<.01	0.451	0.015		<.005	<.03	0.1
	7/29/1999	<.0004	23	<.001	0.03	0.005	159.9	<.003	<.003	2.59	<.001	0.447	0.024		<.001	<.003	0.1
	8/12/1999	<.002	26	0.019	<.04	<.01	164	<.03	<.005	3.5	<.01	0.457	0.006		0.024	<.03	0.07
	9/10/1999	0.003	23	0.01	<.04	<.01	199	<.03	<.005	2.3	<.01	0.435	0.009		<.005	<.03	0.06
	10/29/1999	<.002	34	<.005	<.04	<.01	209	<.03	<.005	3.4	<.01	0.542	<.005		<.005	<.03	0.04
	1/26/2000																0.05
	3/25/2000	<.002	26	<.005	<1	<.01	193	<.03	<.005	5.4	<.01	0.616	<.005		<.005	<.03	<.01
	4/27/2000	<.002	23	<.005	<1	<.01	184	<.03	<.005	4.6	<.01	0.404	0.019		<.005	<.03	0.04
	5/15/2000	<.002	2	<.005	<1	<.01		<.03	<.005	1.6	<.01	0.19	<.005		<.005	<.03	0.03
	5/22/2000																
	6/4/2000		15	<.005	<1	<.01	127	<.03	<.005	1.8	<.01	0.354	<.005		<.005	<.03	0.01
	6/4/2000	<.002															
	6/26/2000	<.002	23	0.006	6	<.01	147	<.03	<.005	2.7	<.01	0.418	0.014		<.005	<.03	0.27
	7/25/2000	<.002	28	0.022	3	<.01	186	<.03	<.005	2.1	<.01	0.564	0.013		0.02	<.03	0.2
	7/28/2000																
	8/15/2000																
	8/29/2000	<.002	24	0.008	<1	<.01	199	<.03	<.005	2.9	<.01	0.437	0.027		<.005	<.03	0.22
	8/30/2000																
	9/25/2000	<0.01	28	<0.05	<0.3	<0.05		<0.2	<0.2	3.23	<0.03	0.525	<0.01	<0.2	<0.03		0.687
	10/21/2000	<.002	33	<.005	<1	<.01	169	<.03	<.005	3.7	<.01	0.55	0.015		<.005	<.03	0.44
	10/28/2000																
	11/13/2000	<0.002	32	<0.005	0.05	<0.01	211	0.04	<0.005	4.9	0.01	0.524	0.014		0.008	<0.03	0.04
	11/18/2000	<0.01	32	<0.05	<0.3	<0.05		<0.2	<0.2	4.07	<0.03	0.58	<0.01	<0.2	<0.03		0.424
	11/28/2000																
	12/14/2000	<0.01	30	<0.05	<0.3	<0.05		<0.2	<0.2	4.3	<0.03	0.598	<0.01	<0.2	<0.03		0.767
	1/13/2001	0.005	28	<.005	<1	<.01	76	<.03	<.005	3.7	<.01	0.625	0.007		<.005	<.03	0.36
	2/10/2001	<.002	28	0.023	<1	0.07	94	<.03	<.005	4.1	<.01	0.383	<.005		0.062	<.03	0.32
	3/10/2001	<.002	32.68	<.005	<1	<.01	192	<.03	<.005	4.14	<.01	0.6	<.005		<.005	<.03	0.23
	4/16/2001	<.002	32	<.005	<1	<.01	162	<.03	<.005	4.4	<.01	0.573	0.005		<.005	<.03	<.01
	5/14/2001	<.002	25	<.005	<1	<.01	171	<.03	<.005	2.9	<.01	0.565	<.005		<.005	<.03	0.04
	6/17/2001	<.002	22	0.057	<1	<.01	182	0.03	<.005	2.6	<.01	0.574	<.005		<.005	<.03	<.01
	6/25/2001																
	7/14/2001	<.002	24	0.014	<1	<.01	196	<.03	<.005	4.7	<.01	0.607	<.005		<.005	<.03	0.05
	8/14/2001	<0.002	29	0.007	<1	<0.01	221	<0.03	<0.005	5.2	<0.01	0.652	<0.005		<0.005	<0.03	0.02
	8/21/2001																
	9/17/2001	<0.002	28	0.009	<1	<0.01	210	<0.03	<0.005	4.8	<0.01	0.551	<0.005		<0.005	<0.03	<0.01
	10/15/2001	<0.002	77	0.009	<1	<0.01	211	<0.03	<0.005	4.3	0.01	0.547	<0.005		<0.005	<0.03	0.04
	11/13/2001	<0.002	32	<0.005	0.05	<0.01	211	0.04	<0.005	4.9	0.01	0.524	0.014		0.008	<0.03	0.04
	12/14/2001																
	12/15/2001	0.007	24	0.007	0.05	<0.01	181	<0.03	<0.005	4.5	0.08	0.479	<0.005		0.009	<0.03	0.04
	1/15/2002	0.005	33	0.014	<0.01	<0.01	200	<0.03	0.006	6.4	0.05	0.574	<0.005		<0.005	0.04	0.1
	2/12/2002	0.005	33	0.011	<0.01	<0.01	148	<0.03	<0.005	6.5	0.04	0.52	<0.005		<0.005	<0.03	0.1
	3/12/2002	0.005	33	0.008	<0.01	<0.01	179	<0.03	<0.005	6.6	<0.01	0.572	<0.005		<0.005	<0.03	0.1
	4/15/2002	0.005	31	0.008	0.02	<0.01	199	<0.03	<0.005	5.5	0.04	0.576	<0.005		<0.005	<0.03	0.12
	5/13/2002	<0.002	5	0.005	0.05	<0.01	29	<0.03	<0.005	1.2	<0.01	0.102	<0.005		<0.005	<0.03	0.04
	6/16/2002																
	6/16/2002	0.007	25.5	0.007	<0.01	0.004	197.7	<0.002	<0.005	4.3	0.004	0.489	<0.001		0.001	<0.03	0.199
	7/16/2002																
	7/16/2002	0.008	23	0.008	0.08	<0.002	203.7	<0.002	<0.005	3.8	0.003	0.535	<0.001		0.002	<0.03	0.067
	8/12/2002																
	8/12/2002	0.006	28.1	0.014	<0.01	0.021	197.2	0.004	<0.005	4.1	0.002	0.546	<0.001		<0.001	<0.03	0.194
	9/16/2002																

Faro Site - Select Surface Water Quality Listing, 1998-2002, Dissolved Metals

Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/16/2002	0.005	26.4	0.006	0.03	<0.002	212.5	0.003	<0.005	4.1	<0.002	0.566	<0.001		0.001	<0.03	0.095
	9/29/2002																
	10/15/2002																
	10/15/2002	0.003	31.6	0.013	0.03	0.014	225.3	<0.002	<0.005	5	<0.002	0.621	<0.001		<0.001	<0.03	0.255
	11/12/2002																
	11/12/2002	0.005	30.8	0.013	<0.01	0.017	214.3	0.003	<0.005	5.3	0.005	0.598	<0.001		0.002	<0.03	0.264
	12/10/2002																
	12/10/2002	0.005	26.5	0.011	<0.01	0.011	204.1	0.002	<0.005	5.9	0.004	0.554	<0.001		<0.001	<0.03	0.283
	12/15/2002																
X13																	
	1/5/1998	<.002	37	0.006	<.04	<.02	192	<.03	0.039	5.8	0.05	0.602	<.005		<.005	<.03	<.01
	1/12/1998																
	1/23/1998																
	2/24/1998																
	3/13/1998																
	3/17/1998																
	3/17/1998																
	4/3/1998																
	4/13/1998																
	4/30/1998																
	5/7/1998																
	5/18/1998	<.002	41	0.013	<.04	<.02	138	0.04	<.03	6.5	<.01	0.61	0.009		0.029	<.03	0.05
	5/18/1998																
	6/15/1998																
	6/15/1998																
	6/30/1998																
	7/21/1998																
	8/10/1998																
	9/7/1998																
	9/25/1998																
	10/19/1998																
	11/13/1998																
	11/17/1998																
	12/15/1998																
	12/21/1998																
	1/18/1999	0.005	41	0.014	<.04	<.01	250	<.03	<.03	6.7	<.01	0.676	0.009		<.005	<.03	0.03
	1/27/1999																
	2/22/1999	0.004	40	<.005	2.03	<.01		<.03	<.03	6.5	<.01	0.659	0.017		<.005	<.03	0.03
	3/17/1999	<.002	32	<.005	0.85	<.01	170	<.03	<.03	5.5	<.01	0.483	0.017		<.005	<.03	<.01
	3/24/1999																
	4/3/1999																
	4/20/1999	<.002	39	<.005	1.1	<.01	217	<.03	<.03	5.8	<.01	0.643	0.024		<.005	<.03	<.01
	5/17/1999	<.002	40	<.005	1.38	<.01		<.03	<.03	6.1	<.01	0.639	<.005		<.005	<.03	0.03
	6/4/1999																
	6/8/1999																
	7/3/1999	<.002	31	<.005	<.04	<.01	189	<.03	<.03	6.8	<.01	0.539	<.005		<.005	<.03	<.01
	7/27/1999	0.003	36	0.034	0.13	<.01	207	<.03	<.005	5.7	<.01	0.716	0.014		0.009	<.03	<.01
	8/12/1999	<.002	37	<.005	<.04	<.01	200	<.03	<.005	7.9	<.01	0.638	<.005		0.023	<.03	0.05
	9/10/1999																
	9/28/1999																
	10/29/1999	<.002	38	<.005	<.04	<.01	201	<.03	<.005	5.1	<.01	0.606	<.005		<.005	<.03	<.01
	11/22/1999	0.017	35	<.005	<.04	<.01	228	<.03	<.005	5.7	<.01	0.575	0.006		<.005	<.03	<.01
	12/14/1999	<.002	34	<.005	<.04	<.01	182	<.03	<.005	4.9	<.01	0.569	<.005		<.005	<.03	<.01
	1/27/2000	<.002	36	<.005	3	<.01	190	<.03	<.005	6	<.01	0.599	0.028		<.005	<.03	<.01
	2/28/2000	<.002	40	<.005	<1	<.01	198	<.03	<.005	6.8	<.01	0.601	0.014		<.005	<.03	<.01
	3/23/2000	<.002	25	<.005	<1	<.01	196	<.03	<.005	7.4	<.01	0.676	<.005		<.005	<.03	<.01
	4/27/2000	<.002	31	<.005	<1	<.01	231	<.03	<.005	6.2	<.01	0.578	0.026		<.005	<.03	<.01
	5/15/2000	<.002	37	<.005	<1	<.01		<.03	<.005	7.9	<.01	0.732	0.038		<.005	<.03	<.01
	6/20/2000																
	6/20/2000	<.002	35	0.015	3	<.01	165	<.03	<.005	6.7	<.01	0.607	0.022		<.005	<.03	0.03
	6/26/2000	<.002	37	0.006	<1	<.01	17	<.03	<.005	5.7	<.01	0.569	0.019		<.005	<.03	0.01
	7/19/2000																
	7/25/2000	<.002	45	0.02	<1	<.01	219	<.03	<.005	6.3	<.01	0.734	0.018		0.017	<.03	<.01

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Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	7/28/2000																
	8/3/2000																
	8/10/2000																
	8/18/2000																
	8/24/2000																
	8/29/2000	<.002	39	0.027	1	<.01	238	<.03	<.005	6.6	<.01	0.576	0.011		<.005	<.03	<.01
	9/8/2000																
	9/12/2000																
	9/25/2000	<0.01	32	<0.05	<0.3	<0.05		<0.2	<0.2	6.32	<0.03	0.483	<0.01	<0.2	<0.03		0.007
	10/19/2000	<.002	41	<.005	<1	<.01	178	<.03	<.005	6.7	<.01	0.594	0.014		<.005	<.03	<.01
	10/28/2000																
	11/13/2000	<0.002	43	<0.005	0.01	<0.01	215	<0.03	<0.005	8.6	<0.01	0.657	<0.005		0.009	<0.03	0.01
	11/18/2000	<0.01	41	<0.05	<0.3	<0.05		<0.2	<0.2	6.94	<0.03	0.683	<0.01	<0.2	<0.03		0.007
	12/14/2000	<0.01	37	<0.05	<0.3	<0.05		<0.2	<0.2	6.68	<0.03	0.665	<0.01	<.03	<0.03		0.006
	1/13/2001	0.009	39	<.005	10	0.03	98	<.03	<.005	6.2	<.01	0.844	0.03		<.005	<.03	<.01
	2/10/2001	<.002	35	0.052	<1	<.01	111	<.03	<.005	6	<.01	0.537	0.011		<.005	<.03	<.01
	3/1/2001																
	3/10/2001	<.002	41.13	<.005	<1	<.01	212	<.03	<.005	6.29	<.01	0.67	<.005		<.005	<.03	0.04
	3/15/2001																
	3/27/2001																
	4/5/2001																
	4/11/2001																
	4/16/2001	<.002	44	<.005	<1	<.01	189	<.03	<.005	6.2	<.01	0.677	0.011		<.005	<.03	0.06
	4/23/2001																
	4/30/2001																
	5/8/2001																
	5/14/2001	<.002	40	<.005	<1	<.01	181	<.03	<.005	5.5	<.01	0.605	<.005		<.005	<.03	<.01
	5/23/2001																
	5/30/2001																
	6/8/2001																
	6/14/2001																
	6/17/2001	<.002	39	0.058	<1	<.01	194	<.03	<.005	7	<.01	0.625	0.008		<.005	<.03	<.01
	6/21/2001																
	6/29/2001																
	7/14/2001	<.002	34	0.017	<1	<.01	165	<.03	<.005	8.5	<.01	0.574	<.005		<.005	<.03	0.02
	8/14/2001	<0.002	43	0.018	<1	<0.01	203	<0.03	0.006	8.7	0.04	0.675	0.015		<0.005	<0.03	<0.01
	9/12/2001																
	9/17/2001	<0.002	40	0.017	<1	<0.01	200	<0.03	<0.005	8.8	<0.01	0.655	<0.005		<0.005	<0.03	<0.01
	9/24/2001																
	10/15/2001	<0.002	42	0.016	<1	<0.01	221	0.04	<0.005	8.6	<0.01	0.708	<0.005		<0.005	<0.03	0.03
	11/13/2001	<0.002	43	<0.005	0.01	<0.01	215	<0.03	<0.005	8.6	<0.01	0.657	<0.005		0.009	<0.03	0.01
	12/8/2001																
	12/14/2001																
	12/15/2001	0.003	35	0.013	<0.01	<0.01	186	<0.03	<0.005	8.2	<0.01	0.609	0.006		<0.005	<0.03	<0.01
	12/20/2001																
	12/28/2001																
	1/15/2002	0.005	39	0.013	<0.01	<0.01	190	<0.03	<0.005	8.9	0.04	0.635	<0.005		<0.005	<0.03	0.01
	2/12/2002	0.003	36	0.014	<0.01	<0.01	137	<0.03	<0.005	7.7	0.03	0.534	<0.005		<0.005	<0.03	0.02
	3/12/2002	0.004	39	0.012	<0.01	<0.01	177	<0.03	<0.005	8.9	<0.01	0.649	<0.005		<0.005	<0.03	<0.01
	4/15/2002	0.005	39	0.017	<0.01	<0.01	194	<0.03	<0.005	8.5	0.03	0.621	<0.005		<0.005	0.04	<0.01
	5/13/2002	0.01	39	0.014	<0.01	<0.01	222	0.05	<0.005	8.6	0.05	0.669	<0.005		<0.005	<0.03	<0.01
	6/16/2002																
	6/16/2002	0.002	34.7	0.01	<0.01	0.009	186	0.003	<0.005	8.8	0.007	0.563	<0.001		<0.001	<0.03	<0.001
	7/16/2002																
	7/16/2002	0.009	33.8	0.015	0.02	<0.002	226.3	0.034	<0.005	9	<0.002	0.642	<0.001		0.001	<0.03	0.002
	8/12/2002																
	8/12/2002	<0.001	38.9	0.01	<0.01	<0.002	223.8	0.007	<0.005	8.1	<0.002	0.672	<0.001		0.002	<0.03	0.023
	9/5/2002																
	9/5/2002																
	9/12/2002																
	9/12/2002																
	9/16/2002																
	9/16/2002	0.005	37.5	0.016	<0.01	<0.002	214.4	0.006	<0.005	8.8	<0.002	0.641	<0.001		0.002	<0.03	0.014

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Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/27/2002																
	9/27/2002																
	9/29/2002																
	10/3/2002																
	10/3/2002																
	10/12/2002																
	10/12/2002																
	10/15/2002																
	10/15/2002	0.002	37.1	0.011	<0.01	0.004	172.7	0.006	<0.005	8.2	<0.002	0.575	<0.001		0.002	<0.03	0.024
	10/21/2002																
	10/21/2002																
	10/29/2002																
	10/29/2002																
	11/5/2002																
	11/12/2002																
	11/12/2002	0.004	40.1	0.013	<0.01	<0.002	224.7	<0.002	<0.005	8.6	0.011	0.686	<0.001		0.002	<0.03	0.003
	11/19/2002																
	11/26/2002																
	12/3/2002																
	12/10/2002																
	12/10/2002	0.004	36.4	0.017	<0.01	0.009	221.1	<0.002	<0.005	9.7	0.004	0.645	<0.001		<0.001	<0.03	0.022
	12/15/2002																
	12/17/2002																
	12/24/2002																
	12/31/2002																
X14																	
	1/12/1998																
	2/24/1998																
	3/17/1998																
	4/13/1998																
	4/16/1998																
	4/22/1998																
	4/24/1998																
	4/26/1998																
	4/30/1998																
	5/18/1998																
	6/15/1998																
	6/19/1998																
	6/20/1998																
	6/21/1998																
	6/21/1998																
	7/21/1998																
	8/4/1998																
	8/10/1998																0.02
	9/25/1998																
	10/19/1998	<.002	8	0.011	<.04	<.02	25.2	<.03	<.03	2.9	<.01	0.224	<.005		0.006	<.03	0.07
	11/17/1998																
	12/21/1998	<.002	13	0.012	0.44	<.01	72	0.03	<.03	4	<.01	0.31	0.005		0.04	<.03	<.01
	1/18/1999	<.002	17	<.005	<.04	<.01	94	<.03	<.03	4.9	<.01	0.37	<.005		<.005	<.03	0.02
	2/22/1999	0.003	20	<.005	1.38	<.01		<.03	<.03	4.9	<.01	0.442	0.011		<.005	<.03	<.01
	3/17/1999	<.002	17	<.005	0.73	<.01	95	<.03	<.03	4.4	<.01	0.332	<.005		<.005	<.03	<.01
	4/20/1999	<.002	13	<.005	1.44	<.01	67	<.03	<.03	3.9	<.01	0.309	0.012		0.009	<.03	<.01
	5/17/1999	0.011	2	0.007	<.04	<.01		<.03	<.03	0.7	<.01	0.067	<.005		0.014	<.03	0.03
	6/25/1999																
	7/3/1999	<.002	2	<.005	<.04	<.01	13	<.03	<.03	3.3	<.01	0.042	<.005		<.005	<.03	<.01
	7/27/1999	<.002	2	0.008	<.04	<.01	13	<.03	<.005	3.2	<.01	0.118	0.013		0.011	<.03	0.02
	7/29/1999																
	8/12/1999	<.002	9	0.013	<.04	0.04	45	<.03	<.005	4.8	<.01	0.208	0.008		0.021	<.03	0.02
	8/31/1999																
	9/10/1999	<.002	7	<.005	0.55	<.01	45	<.03	<.005	3.1	<.01	0.175	<.005		<.005	<.03	<.01
	10/29/1999	<.002	6	<.005	<.04	<.01	25	<.03	<.005	3.5	<.01	0.199	<.005		<.005	<.03	<.01
	11/22/1999	0.011	6	<.005	0.36	0.02	35	<.03	<.005	3.4	<.01	0.106	<.005		<.005	<.03	<.01
	12/14/1999	<.002	7	0.008	<.04	<.01	38	<.03	<.005	3.5	<.01	0.242	<.005		0.011	<.03	0.01

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Station	Date	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	TL-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	1/27/2000	<.002	13	<.005	<1	<.01	69	<.03	<.005	4.1	<.01	0.278	0.009		0.006	<.03	<.01
	2/28/2000	<.002	14	<.005	<1	<.01	60	<.03	<.005	5.4	<.01	0.292	<.005		<.005	<.03	<.01
	3/23/2000	<.002	6	<.005	<1	<.01	62	<.03	<.005	6	<.01	0.368	<.005		<.005	<.03	<.01
	4/27/2000	<.002	15	<.005	<1	<.01	108	<.03	<.005	4.5	<.01	0.289	0.016	.	0.006	<.03	<.01
	5/15/2000	<.002	<1	<.005	<1	<.01		<.03	<.005	3.4	<.01	0.145	<.005		<.005	<.03	<.01
	6/26/2000	<.002	5	<.005	3	<.01	28	<.03	<.005	2.5	<.01	0.112	<.005		<.005	<.03	0.03
	7/25/2000	<.002	9	0.011	<1	<.01	51	<.03	<.005	2.8	<.01	0.251	0.005		0.027	<.03	<.01
	8/29/2000	<.002	4	0.011	1	<.01	22	<.03	<.005	4	<.01	0.114	<.005		<.005	<.03	<.01
	9/25/2000	<0.01	2	<0.05	<0.3	<0.05		<0.2	<0.2	4.52	<0.03	0.125	<0.01	<0.2	<0.03		0.007
	10/28/2002																
	10/29/2000	<.002	7	<.005	<1	<.01	23	<.03	<.005	5	<.01	0.142	<.005		<.005	<.03	<.01
	11/13/2000	<0.002	7	<0.005	0.08	<0.01	28	0.06	0.013	5.4	0.16	0.228	<0.005		0.006	<0.03	<0.01
	11/18/2000	<0.01	6	<0.05	<0.3	<0.05		<0.2	<0.2	5.12	<0.03	0.246	<0.01	<0.2	<0.03		0.081
	12/14/2000	<0.01	8	<0.05	<0.3	<0.05		<0.2	<0.2	5.46	<0.03	0.265	<0.01	<0.2	<0.03		0.039
	1/13/2001	<.002	11	<.005	<1	0.08	37	<.03	<.005	5.7	<.01	0.38	<.005		0.022	<.03	0.03
	2/10/2001	<.002	13	<.005	<1	<.01	47	<.03	<.005	4.2	<.01	0.222	<.005		<.005	<.03	0.09
	3/10/2001	<.002	13.61	<.005	<1	<.01	50.9	<.03	<.005	5.15	<.01	0.32	<.005		<.005	<.03	<.01
	4/16/2001	<.002	17	<.005	<1	<.01	55	<.03	<.005	5.6	<.01	0.342	<.005		<.005	<.03	<.01
	5/14/2001	<.002	10	<.005	<1	<.01	43	<.03	<.005	3.3	<.01	0.244	<.005		<.005	<.03	0.02
	6/17/2001	<.002	3	<.005	<1	<.01	6	<.03	<.005	1.1	<.01	0.08	<.005		<.005	<.03	<.01
	7/14/2001	<.002	10	<.005	<1	<.01	19	<.03	<.005	4.7	<.01	0.157	<.005		<.005	<.03	<.01
	8/14/2001	<0.002	10	<0.005	<1	<0.01	46	<0.03	<0.005	5.1	<0.01	0.263	<0.005		<0.005	<0.03	<0.01
	9/17/2001	<0.002	4	<0.005	<1	<0.01	28	<0.03	<0.005	4.7	<0.01	0.209	<0.005		<0.005	<0.03	<0.01
	10/15/2001	<0.002	13	<0.005	<1	<0.01	96	<0.03	<0.005	4.5	<0.01	0.341	<0.005		<0.005	<0.03	<0.01
	11/13/2001	<0.002	7	<0.005	0.08	<0.01	28	0.06	0.013	5.4	0.16	0.228	<0.005		0.006	<0.03	<0.01
	12/14/2001																
	12/15/2001	<0.002	12	<0.005	<0.01	<0.01	80	<0.03	<0.005	4.7	<0.01	0.33	<0.005		0.009	<0.03	0.03
	1/15/2002	<0.002	7	<0.005	<0.01	<0.01	27	<0.03	<0.005	5.8	0.01	0.253	<0.005		<0.005	<0.03	0.02
	2/12/2002	<0.002	9	<0.005	0.02	<0.01	25	<0.03	<0.005	5.4	<0.01	0.253	<0.005		<0.005	<0.03	0.04
	3/12/2002	0.005	16	<0.005	0.04	<0.01	63	<0.03	<0.005	6.8	<0.01	0.388	<0.005		<0.005	<0.03	0.04
	4/15/2002	<0.002	15	0.005	<0.01	<0.01	70	<0.03	<0.005	6.3	0.04	0.376	<0.005		<0.005	<0.03	0.03
	5/13/2002	0.003	6	0.007	0.04	<0.01	14	<0.03	<0.005	3.9	<0.01	0.139	<0.005		<0.005	<0.03	0.06
	6/16/2002	0.004	4	<0.001	0.08	0.008	9.5	0.004	<0.005	3.8	<0.002	0.108	<0.001		<0.001	<0.03	0.025
	7/16/2002	0.001	7.5	0.008	<0.01	<0.002	56.2	0.003	<0.005	4.1	<0.002	0.23	<0.001		<0.001	<0.03	0.025
	8/12/2002	<0.001	5.2	0.005	0.02	0.009	14.2	0.003	<0.005	3.7	0.006	0.149	<0.001		<0.001	<0.03	0.018
	9/16/2002	0.002	6	0.003	<0.01	<0.002	39	<0.002	<0.005	4.4	0.003	0.195	0.002		<0.001	<0.03	0.101
	10/15/2002	<0.001	5.2	0.003	<0.01	0.007	13.7	0.003	<0.005	4.9	<0.002	0.165	<0.001		<0.001	<0.03	0.032
	11/11/2002																
	11/12/2002	0.001	5.8	<0.001	<0.01	0.012	20.5	<0.002	<0.005	5.3	0.008	0.213	<0.001		0.003	<0.03	0.04
	12/10/2002	0.002	5.7	0.006	<0.01	0.007	30	<0.002	<0.005	5.9	<0.002	0.234	<0.001		<0.001	<0.03	0.057

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Station	Date	ALK-T	FLOW	COND	CN-T	HARD-T (CACO3)	NH3-N	SO4-T	TSS	TEMP-C	PH-F	PH-Lab
		mg/L	L/s	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L		pH unit	pH unit
V1												
	18/05/98					23	<0.05	24	1		7.6	
	30/05/98		1426									
	9/6/1998		580									
	30/06/98					325	<0.05	17	<1		7.6	
	14/09/98					29	<0.05	10	2	3	7.88	
	31/12/98					58	<0.05	13	1		7.16	
	17/03/99			124		56	<0.05	13	3		7.12	
	18/06/99					10	<0.05	3	2	7	8.08	
	29/07/99	2	534	35.2		9	<0.05	6	1	3	7.44	
	31/08/99	26	293	55.5		22	<0.05	7	1	3.9	7.7	
	12/10/1999					17	<0.05	10	1	1	6.75	
	20/06/00					12	<0.05	4	1			
	9/8/2000		663.5							5.9	7.13	
	12/9/2000			73		21		10	2	7.6	8.05	
	5/3/2001			116		65		16	<1	1	8.4	
	13/06/01					12		3	5	3	8.6	
	21/03/02			116		66		13	2			
	25/06/02							5				
	25/06/02			52		22			<1			
	27/09/02							9				
	27/09/02			72		33			2	3.3	8.3	
	14/12/02									0.6	8.2	
	15/12/02							12				
	15/12/02			111		51			3			
V2												
	12/1/1998		1.5				0.12	82	9		7.8	
	17/03/98		1.5				<0.05	28	9		7.45	
	18/05/98		4				<0.05	234	1		7.7	
	29/06/98		2				<0.05	115	1		7.1	
	14/09/98		2				<0.05	125	2			8.09
	31/12/98						0.05	154	12		7.22	
	17/03/99			945			<0.05	202	11		7.67	
	18/06/99		1				<0.05	180	8	6	7.64	
	10/9/1999		1	810			<0.05	169	5	5	7.76	
	12/10/1999		1.5	775			<0.05	191	4	2	6.95	
	13/12/99		0.5	800			<0.05	146	6	0	7.06	
	22/03/00		0.5	820			<0.05	183	10			7.76
	20/06/00			460			<0.05	571	1			
	12/9/2000			1435			<0.05	638	7	7.8	8.23	
	12/11/2000						<0.05	543	7	-0.6	8	
	5/3/2001			1110			<0.05	380	3	1	7.9	
	13/06/01						<0.05	849	5			
	8/9/2001			1550		951	<0.05	643	58	3.1	8.2	
	12/11/2001						<0.05	543	7	-0.6	8	
	15/01/02			1475		887	<0.05	564	11			
	12/2/2002			1550			<0.05	527	10			
	21/03/02			1250			<0.05	488	5			
	15/04/02			1050			<0.05	349	6	-0.2	7.8	
	13/05/02			1185			<0.05	482	11			
	25/06/02							615				
	25/06/02			1510			<0.05		6			
	27/09/02							622				
	27/09/02			1512			<0.05		7	3.2	8	
	14/12/02									0.4	7.8	
	15/12/02							620				
	15/12/02			1555			<0.05		24			
V4												
	29/05/98						<0.05	17	2		7.02	
	29/06/98					355	<0.05	14	1		7.91	
	14/09/98					370	<0.05	68	3			8.35
	16/03/99			800		458	<0.05	134	5			8.17
	18/06/99					259	<0.05	40	46	<9	8.06	
	29/07/99		64	442		255	<0.05	43	10	4.9	8.42	
	12/10/1999					322		66	3	1	8.09	
	25/03/00	341		720		375	<.05	105	1			7.76
	20/06/00					239		39	2			
	12/9/2000			448		200		37	17	3.9	8.04	
	7/6/2001									4.8	8.4	7.87
	25/06/02							49				
	25/06/02			520		306			6			
	27/09/02							47				
	27/09/02			545		331			5	3.2	8.2	
V5												
	13/01/98					408.1139	0.07	149	9		7.91	

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Physical Parameters

Station	Date	ALK-T	FLOW	COND	CN-T	HARD-T (CACO3)	NH3-N	SO4-T	TSS	TEMP-C	PH-F	PH-Lab
		mg/L	L/s	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L		pH unit	pH unit
	17/03/98					591	<0.05	53	<1		7.8	
	14/04/98					416	<0.05	153	4			
	19/05/98					176	<0.05	24	16		7.7	
	10/6/1998		152									
	30/06/98					391	<0.05	98	5		7.62	
	21/07/98						<0.05	27	<1		8.12	
	11/8/1998						<0.05	105	5		8.01	
	15/09/98					256	<0.05	81	8	4	7.76	
	19/10/98					293	<0.05	88	1		7.92	
	17/11/98					574	<0.05	206	2		7.42	
	31/12/98					971	<0.05	461	<1		7.12	
	19/01/99					810	<0.05	435	2			8.37
	23/02/99					1161	<0.05	532	29	0	7.75	
	23/03/99					602	<0.05	235	5			7.47
	20/04/99					498		208	13	2	8.14	
	18/05/99					126	<0.05	39	100	2	8.04	
	20/06/99					134	<0.05	34	731	6	7.97	
	29/07/99	22	364	328		174	<0.05	49	300	5.8	8.53	
	31/08/99	187	144	431		226	<0.05	60	7	5.9	8.6	
	12/10/1999					245	<0.05	79	5	2	7.09	
	14/12/99					340		105	3	0	7.68	
	28/02/00					319	<0.05	144	7	0	7.53	
	27/04/00					316	<0.05	168	12	3	8.18	
	15/05/00					164		71	58	5	8	
	20/06/00					130	<0.05	34	17			
	25/07/00					172		48	33	8.9	8.17	
	9/8/2000		449.45							6.9	8.26	
	29/08/00					153		42	80	5	8.3	
	12/9/2000			400		173		55	27	4.7	8.4	
	26/09/00					207		73	251	6.2	8.04	
	28/10/00									4	.	
	29/10/00					271		340	11			
	13/11/00					346		107	10	-0.4	8	
	18/11/00					207		110	4.6			
	14/12/00					367		122	4.6		7.98	
	13/01/01					340		257	6			8.05
	10/2/2001					371		323	10			7.95
	5/3/2001			360			<0.05	72	24	-0.1	8	
	10/3/2001					489		180	2	-0.2	8	
	16/04/01					411		158	16	0.2	8.2	
	14/05/01					218		61	51	2.4	8.4	
	13/06/01					119		25	19	5.9	8.5	
	17/06/01					121		28	35	5.7	8.6	
	14/07/01					248		65	34	6.8	8.5	
	14/08/01					478		72	48	6.3	8.5	
	8/9/2001			470		276		76	3	2.9	8.5	
	17/09/01					276		75	13	5.1	8.4	
	15/10/01					339		101	14	-0.4	8.3	
	13/11/01					346		107	10	-0.4	8	
	14/12/01					386		104	4	-0.4	8.2	
	15/01/02					460		155	3			
	12/3/2002					622		211	4			
	21/03/02			1050		685		266	5			
	13/05/02					170		43	195			
	16/06/02							45				
	16/06/02					178			68			
	25/06/02							62				
	25/06/02			398		222			31			
	16/07/02							72				
	16/07/02					260			23			
	12/8/2002							90				
	12/8/2002								28			
	16/09/02							62				
	16/09/02					241			13			
	27/09/02							68				
	27/09/02			450		256			14	4	8.2	
	15/10/02							77				
	15/10/02					289			9			
	11/11/2002									0.5	8.1	
	12/11/2002							95				
	12/11/2002					333			13			
	10/12/2002							125				
	10/12/2002					392			15	-0.2	7.9	
	14/12/02									0.4	7.7	
	15/12/02							118				

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Station	Date	ALK-T mg/L	FLOW L/s	COND µS/cm	CN-T mg/L	HARD-T (CACO3) mg/L	NH3-N mg/L	SO4-T mg/L	TSS mg/L	TEMP-C	PH-F pH unit	PH-Lab pH unit
	15/12/02			660		358			9			
V6A												
	13/01/98						<0.05	20	66		7.53	
	17/03/98						<0.05	7	<1			
	19/05/98						<0.05	9	10		7.4	
	30/06/98						<0.05	86	3		7.52	
	15/09/98						<0.05	12	4	4	7.98	
	31/12/98						<0.05	26	5		6.39	
	22/03/99						<0.05	46	13			7.93
	3/7/1999						<0.05	10	7	8	8.45	
	10/9/1999			159			<0.05	14	1	7	7.69	
	12/10/1999			178			<0.05	16	1	1	7.23	
	14/12/99			250			<0.05	21	1	0	7.45	
	23/03/00			285			<0.05	24	2	1	7.21	7.81
	20/06/00			79			<0.05	7	1			
	12/9/2000			179			<0.05	34	2	5.3	7.68	
	5/3/2001	514.9		2150			<0.05	990	13	3	8	
	13/06/01						<0.05	10	9	5.5	8.4	
	8/9/2001			205			<0.05	35	<1	3	8.5	
	25/06/02							19				
	25/06/02			138			<0.05		8			
	27/09/02							25				
	27/09/02			172			<0.05		4	4.4	8	
	14/12/02									0.3	7.9	
	15/12/02							50				
	15/12/02			300			<0.05		3			
V8												
	13/01/98					328.1499	<0.05	132	8		7.58	
	17/03/98					389	<0.05	46	<1		7.59	
	14/04/98					345	<0.05	136	4			
	19/05/98					102	<0.05	24	13		7.4	
	10/6/1998		594									
	30/06/98					97	<0.05	86	1		7.78	
	21/07/98						<0.05	27	<1		8.18	
	11/8/1998						<0.05	123	4		7.98	
	15/09/98					169	<0.05	48	29	6	7.84	
	19/10/98					183	<0.05	62	<1		7.95	
	17/11/98					577	<0.05	179	2		7.75	
	31/12/98					335	<0.05	111	2		7.08	
	19/01/99					451	<0.05	190	3			8.3
	23/02/99					462	<0.05	136	5	0	8.02	
	23/03/99					458	<0.05	238	12			7.84
	20/04/99					404		174	7	3	7.48	
	18/05/99					116	<0.05	39	47	1	8.16	
	20/06/99					37	<0.05	12	184	7	7.53	
	25/06/99		1403									
	29/07/99	13	1101	203		107	<0.05	31	85	7.7	8.21	
	30/08/99	112	484	264		135	<0.05	36	3	7.3	8.5	
	12/10/1999	144		380		164	<0.05	61	5	2	7.38	
	14/12/99	190		505		271	<0.05	85	1	0	7.78	
	28/02/00					289	<0.05	111	<1	0	7.15	
	23/03/00	216		600		323	<0.05	109	1	1	7.48	7.76
	27/04/00					278	<0.05	128	3	2	7.77	
	15/05/00					179		67	1	8	7	
	20/06/00	59		173		80	<0.05	22	1			
	25/07/00					109		33	9	10.3	8.03	
	29/08/00					141		34	44	6.7	8.19	
	12/9/2000	138		345		148	<0.05	47	16	6.4	8.36	
	26/09/00					137		55	129	6.1	8.09	
	28/10/00									2.1		
	29/10/00					269		328	2			
	13/11/00					244		87	2	-0.4	8	
	18/11/00					137		100	1.4			
	14/12/00					355		119	1.2		8	
	13/01/01					304		219	2			8.07
	10/2/2001					324		274	2			8.02
	5/3/2001	144.3		1360				703	8	1	8	
	10/3/2001					411		153	2	-0.2	8	
	16/04/01					283		138	4	0.2	8.2	
	14/05/01					241		76	9	2.7	8.4	
	13/06/01	47				75	<0.05	20	31	5.9	8.5	
	17/06/01					83		23	30	6.3	8.6	
	14/07/01					181		54	8	8.4	8.5	
	14/08/01					439		75	9	8.1	8.5	
	8/9/2001	138		350		201	<0.05	64	2	3.8	8.5	

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Physical Parameters

Station	Date	ALK-T	FLOW	COND	CN-T	HARD-T (CACO3)	NH3-N	SO4-T	TSS	TEMP-C	PH-F	PH-Lab
		mg/L	L/s	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L		pH unit	pH unit
	17/09/01					196		61	3	6.2	8.3	
	15/10/01					284		94	8	-0.4	8.2	
	13/11/01					288		98	6	-0.4	8	
	14/12/01					318		100	<1	-0.4	7.9	
	15/01/02					378		135	<1			
	12/2/2002					419		136	7			
	12/3/2002					458		150	7			
	21/03/02	270		745		463	<0.05	175	4			
	15/04/02					467		168	8	-0.2	8.1	
	13/05/02					178		56	45			
	16/06/02							37				
	16/06/02					121			12			
	25/06/02							105				
	25/06/02	92		385		205	<0.05		5			
	16/07/02							200				
	16/07/02					335			6			
	12/8/2002							239				
	12/8/2002								8			
	16/09/02							60				
	16/09/02					192			6			
	27/09/02							66				
	27/09/02	127		380		206	<0.05		3	4.6	8.2	
	15/10/02							74				
	15/10/02					237			5			
	11/11/2002									0.5	8.2	
	12/11/2002							100				
	12/11/2002					303			7			
	10/12/2002							119				
	10/12/2002					334			5	-0.2	8	
	14/12/02									0.5	7.8	
	15/12/02							113				
	15/12/02			575	190	306	<0.05		6			
VGMAIN												
	17/03/98					318	<0.05	107	4		7.6	
	14/04/98					285	<0.05	105	5			
	19/05/98					87	<0.05	21	17		7.5	
	30/06/98					152	<0.05	40	<1		7.82	
	21/07/98						<0.05	24	1		8.13	
	15/09/98					109	<0.05	34	5	6	7.81	
	19/10/98					155	<0.05	48	1		7.91	
	17/11/98					275	<0.05	86	2		7.75	
	31/12/98					371	<0.05	149	<1		7.21	
	20/04/99					298		126	3			
	18/05/99					100	0.06	33	42	1	8.01	
	20/06/99					34	0.07	7	125	7	7.58	
	29/07/99					74	<0.05	20	4	10	7.99	
	12/10/1999					134	<0.05	46	<1	2	7.48	
	27/04/00					207	<0.05	99	1	3	7.74	
	15/05/00					178		61	3	6	7.35	
	20/06/00					62	<0.05	17	2			
	25/07/00					87		27	3	11.2	8.16	
	29/08/00					124		31	11	7.5	8.12	
	26/09/00					137		46	67	6.1	8.11	
	28/10/00									2.5		
	29/10/00					230		254	3			
	13/11/00					288		98	6	-0.4	8	
	18/11/00					137		98	<0.2			
	14/12/00					306		109	1		8.01	
	13/01/01					280		191	<1			8.09
	10/2/2001					288		227	2			7.86
	10/3/2001					341		132	3	-0.2	8.1	
	16/04/01					358		123	5	0.2	8.2	
	14/05/01					241		82	5	2.2	8.5	
	17/06/01					63		20	23	6.5	8.6	
	14/07/01					144		47	4	8.6	8.4	
	14/08/01					395		72	<1	8.5	8.5	
	17/09/01					156		52	<1	6.3	8.3	
	15/10/01					220		76	2	-0.4	8.3	
	13/11/01					244		87	2	-0.4	8	
	14/12/01					268		85	<1	-0.4	8	
	15/01/02					320		119	1			
	12/2/2002					353		116	4			
	15/04/02					380		144	<1	-0.4	8.2	
	13/05/02					190		67	31			
	16/06/02					101		34	2			

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Physical Parameters

Station	Date	ALK-T mg/L	FLOW L/s	COND µS/cm	CN-T mg/L	HARD-T (CACO3) mg/L	NH3-N mg/L	SO4-T mg/L	TSS mg/L	TEMP-C	PH-F pH unit	PH-Lab pH unit
	16/07/02					337		234	3			
	12/8/2002							278	5			
	16/09/02					162		57	4			
	15/10/02					207		73	2			
	11/11/2002									0.4	8.1	
	12/11/2002					270		99	1			
	10/12/2002		10			288		109	2	0	8	
V25BSP												
	6/1/1998		0.1				2.65	486	34		7.13	
	12/1/1998		0.01				0.14	310	5		7.2	
	17/03/98		0									
	14/04/98		0.1				<0.05	333	11			
	19/04/98		0.5									
	7/5/1998		3									
	18/05/98		10				<0.05	63	137		7.4	
	31/05/98		5				<0.05	68	8		7.4	
	9/6/1998		13.2									
	30/06/98		5				<0.05	233	3		7.34	
	25/07/98		0.13									
	11/8/1998		0.125				<0.05	249	2		7.66	
	18/05/99		3				0.07	68	129	2	7.95	
	27/05/99							63	148			
	18/06/99		0.5									
	3/7/1999		5			73	<0.05	38	15	14	8.21	
	12/8/1999						<0.05	145	3	18		
	10/9/1999		1					136		10	7.83	
	20/06/00							132	1			
	25/07/00							52	4	12.8	7.78	
	29/08/00							40	27	7.7	7.67	
	25/09/00					187		77	2.2	5.1	7.34	
	28/10/00									1.8		
	29/10/00							59	4			
	18/11/00					187	0.02	84	0.4			
	14/12/00							107	0.4		7.4	
	14/05/01							127	3	0.2	8.4	
	17/06/01					68		23	159	12.3	8.5	
	14/07/01					100		38	7	11.7	8.4	
	14/08/01							84	4	11.4	7.7	
	17/09/01							106	4	6.2	8	
	15/10/01							101	2	0.2	8.4	
	13/05/02							110	6			
	16/06/02							54	4			
	25/06/02	39		1075	<0.01		0.11	563	17			
	9/7/2002	31		1215	<0.01	739	0.07	693	5			
	16/07/02	30			<0.01	815	0.07	729	8			
	23/07/02	33		1360	<0.01	773	<0.05	799	6			
	6/8/2002	31		1370	<0.01	847	0.11	810	6			
	12/8/2002	29		1430	<0.01	<0.1	0.1	803	9			
	20/08/02	31		1385	<0.01	778	0.15	790	7			
	27/08/02	33		1320	<0.01	755	0.05	747	2			
	16/09/02							490	2			
	15/10/02							476	4			
	11/11/2002									0.4	8	
	12/11/2002							309	16			
V27												
	29/05/98						<0.05	45	7		6.66	
	29/06/98					88	<0.05	43	1		7.72	
	14/09/98					56	<.05	18	2			8.4
	16/03/99	118		298		149	<0.05	46	5			7.92
	18/06/99					18	<0.05	5	4	<8	8.33	
	29/07/99	5	785	46.3		36	<0.05	14	5	4.4	7.74	
	31/08/99	46	348	114		49	<0.05	16	3	5.2	7.97	
	12/10/1999	59		162		69		27	<1	3	8.41	
	25/03/00	111		295		148	<.05	50	1			7.93
	20/06/00	66		67		26		9	2			
	12/9/2000	66		183		74		37	1	3.2	7.63	
	7/6/2001									3.1	8.6	7.64
	25/06/02							125				
	25/06/02	39		352		174			2			
	27/09/02							46				
	27/09/02	47		187		96			1	4.2	8.3	

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CT-T	CO-T	CR-T	CU-T	FE-T	K-T	LA-T	MG-T	MN-T	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
V1																																	
	18/05/98	<.003	0.15	0.02	0.23	0.028	<.001	<.04	7.1	<.002	<.005	0.02	0.027	0.09	1	<.005	1.3	<.01	<.002	2	0.01	0.27	<.02	8	<.03	<.03	1.6	<.01	0.033	<.005	<.005	<.03	0.02
	30/06/98	<.003	<.05	<.02	<.05	0.152	<.001	<.04	7.5	<.002	<.005	0.008	<.002	<.01	<1	<.005	1.4	<.01	0.005	2	<.005	2.37	<.02	6	<.03	<.03	4	<.01	0.048	0.008	0.008	<.03	<.01
	14/09/98	<.003	<.05	<.02	<.05	0.078	<.001	<.04	9.1	<.002	0.01	<.005	0.016	0.61	<1	<.005	1.5	<.01	0.007	2	0.011	<.04	<.02	3.2	<.03	<.03	3.4	<.01	0.058	0.038	<.005	<.03	0.02
	31/12/98	<.003	0.06	<.005	0.21	0.058	<.001	<.04	18.5	<.001	0.009	<.005	0.057	0.29	<1	<.005	2.8	<.01	0.033	3	<.005	1.95	<.01	4	<.03	<.03	4.4	<.01	0.102	0.013	<.005	<.03	0.05
	17/03/99	<.003	0.24	<.005	0.22	0.043	<.001	<.04	17.7	<.001	<.005	<.005	0.025	0.09	<1	<.005	2.9	<.01	<.002	4	<.005	<.04	<.01	4	<.03	<.03	4.2	<.01	0.083	<.005	<.005	<.03	0.04
	18/06/99	<.003	0.15	<.005	0.08	0.095	<.001	<.04	4.1	0.002	0.007	<.005	0.007	4.18	1	<.005	0.8	<.01	0.021	2	<.005	0.77	0.11	2	<.03	<.03	1.9	<.01	0.049	0.104	<.005	<.03	0.24
	29/07/99	<.0001	0.03	<.001	0.01	0.0167	<.0001	<.001	2.9	<.0001	<.0002	<.0002	0.002	0.07	0.4	<.0002	0.61	0.001	<.0001	0.8	<.0002	<.002	<.001	1.4	<.001	<.001	2.46	<.0004	0.0237	0.0035	<.0002	<.001	0.002
	31/08/99	<.0001	0.038	<.001	0.017	0.0245	<.0001	<.001	8.073	0.0051	<.0002	<.0002	0.0113	0.421	0.42	<.0002	0.698	0.0017	0.0009	2.43	0.0008	<.002	<.001	2.59	<.001	<.001	2.702	<.0004	0.0385	0.0221	0.0011	<.001	0.0015
	12/10/1999	<.003	0.05	<.005	<.05	0.131	<.001	<.04	9.8	0.001	<.005	<.005	0.013	0.2	<1	<.005	1.6	<.01	<.002	3	<.005	<.04	<.01	3	<.03	<.005	4.3	<.01	0.051	0.028	<.005	<.03	0.01
	20/06/00	<.003	0.19	<.005	<.05	0.211	0.001	<.05	4.5	<.001	<.005	<.005	0.017	0.81	1	<.005	0.6	0.08	<.002	1	<.005	<1	0.04	<1	<.03	<.005	2.2	<.01	0.044	0.065	0.009	<.03	0.06
	12/9/2000	<.003	0.33	<.005	0.1	0.15	<.001	<.05	12.8	0.01	<.005	<.005	0.103	4.44	<1	<.005	2.4	0.01	0.029	3	0.023	4	0.02	<.03	<.005	5.3	<.01	0.004	0.085	<.005	<.03	0.02	
	5/3/2001	<.003	0.36	<.005	0.08	0.226	<.001	<.05	18	<.001	<.005	0.011	0.025	0.045	5.51	0.033	3	<.01	<.002	7	<.005	<1	<.01	5	<.03	<.005	4.6	<.01	0.1	0.01	0.023	<.03	0.02
	13/06/01	<.003	0.21	0.022	0.87	0.136	<.001	<.05	3.9	<.001	<.005	0.121	0.015	0.41	<1	<.005	0.8	0.07	<.002	2	0.007	<1	<.01	1	<.03	0.023	2.2	0.04	0.025	0.009	<.005	<.03	0.03
	21/03/02	<0.001	0.05	<0.005	<0.05	0.151	<0.001	<0.05	20.6	<0.001	<0.005	<0.005	<0.002	0.04	1	3.2	<0.01	0.005	4	<0.005	0.01	<0.01	4	<0.03	<0.005	5.5	0.01	0.099	<0.005	<0.005	<0.03	<0.01	
	25/06/02	2.1	0.128	<0.003	0.12	0.155	0.4	0.01	8.1	1.3	0.002	0.007	0.021	0.064	0.5	<0.001	1.2	0.003	0.007	1.1	0.005	<0.01	<0.002	1.9	0.006	<0.005	3.8	0.005	0.041	<0.001	<0.001	<0.03	0.002
	27/09/02	3.7	0.074	<0.003	0.09	0.137	<0.2	0.03	12.1	<0.2	0.002	0.003	0.042	0.309	0.4	0.002	1.8	0.004	0.001	1.4	0.002	<0.01	0.008	3	0.019	<0.005	4.5	0.035	0.06	0.003	<0.001	<0.03	0.043
	15/12/02	<0.2	0.057	<0.003	0.23	0.15	<0.2	0.01	19.1	0.4	<0.001	0.006	0.012	0.075	0.6	<0.001	2.8	0.005	<0.001	1.1	<0.001	<0.01	0.006	4	<0.002	<0.005	5	<0.002	0.084	<0.001	<0.001	<0.03	<0.001
V2																																	
	12/1/1998	<.003	<.05	<.02	<.05	0.295	<.001	<.04	78.7	<.002	0.007	<.005	0.008	0.21	<1	<.005	19.8	<.01	<.002	4	<.005	<.04	<.02	27	<.03	<.03	3.4	<.01	0.392	<.005	<.005	<.03	0.02
	17/03/98	<.003	0.14	<.02	<.05	0.351	<.001	<.04	103.1	<.002	<.005	0.026	0.018	0.18	1	0.006	29.2	<.01	0.01	8	<.005	<.04	<.02	28	<.03	<.03	4.6	<.01	0.523	0.008	0.018	<.03	<.01
	18/05/98	<.003	0.31	0.04	0.22	0.201	<.001	<.04	86.9	<.002	<.005	0.008	0.032	0.19	1	<.005	22.5	0.02	<.002	6	0.007	0.1	<.02	78	0.08	<.03	4.5	<.01	0.415	<.005	<.005	<.03	0.1
	29/06/98	<.003	0.11	0.03	<.05	0.333	0.001	<.04	94.6	<.002	0.009	0.066	0.022	0.1	2	<.005	23.8	<.01	0.012	6	0.008	<.04	<.02	38	<.03	<.03	5.2	<.01	0.466	0.041	<.005	<.03	0.01
	14/09/98	<.003	0.1	<.02	0.06	0.32	<.001	<.04	106	<.002	0.009	<.005	0.026	0.23	2	<.005	28.7	0.04	0.008	8	0.02	1.18	<.02	41.6	<.03	<.03	5.1	<.01	0.556	0.028	<.005	<.03	0.03
	31/12/98	<.003	0.22	<.005	0.28	0.294	<.001	<.04	133.8	<.001	0.012	<.005	0.057	0.38	3	<.005	41.4	<.01	0.008	11	<.005	13.49	<.01	51	<.03	<.03	6.4	<.01	0.705	0.021	<.005	<.03	0.04
	17/03/99	<.003	0.57	<.005	0.21	0.352	<.001	<.04	141.3	<.001	<.005	0.335	0.036	0.5	3	<.005	49.4	0.02	<.002	10	<.005	1.27	<.01	67	<.03	<.03	5.7	<.01	0.721	0.017	<.005	<.03	0.07
	18/06/99	<.003	0.3	<.005	0.11	0.342	0.001	<.04	137.5	<.001	<.005	<.005	0.032	1.61	4	0.076	44.3	<.01	0.031	11	<.005	0.12	0.02	52	0.04	<.03	6.2	<.01	0.667	0.056	0.015	<.03	0.11
	10/9/1999	<.003	0.11	<.005	<.05	0.234	<.001	<.04	88.4	<.001	<.005	<.005	0.017	0.03	2	0.015	22.4	0.1	0.004	5	<.005	0.18	<.01	56	<.03	<.005	3.2	<.01	0.425	0.013	0.013	<.03	0.24
	12/10/1999	<.003	0.16	<.005	0.06	0.308	<.001	<.04	110.8	0.005	<.005	<.005	0.027	0.18	3	<.005	29.1	<.01	<.002	8	0.007	<.04	0.03	59	<.03	<.005	5.1	<.01	0.528	0.035	<.005	<.03	<.01
	13/12/99	<.003	0.49	<.005	0.09	0.328	<.001	<.04	132.3	0.003	<.005	<.005	0.036	0.06	4	0.006	32.9	0.01	<.002	6	0.018	<.04	0.02	64	<.03	<.005	3.7	<.01	0.592	0.01	0.013	<.03	0.05
	22/03/00	<.003	0.41	<.005	0.05	0.391	<.001	<.05	123.6	0.003	0.009	<.005	0.012	0.25	3	<.005	32.4	<.01	<.002	<1	<.005	<1	<.01	61	<.03	<.005	5.4	<.01	0.651	0.012	<.005	<.03	<.01
	20/06/00	<.003	0.44	<.005	<.05	0.249	0.003	<.05	213.4	<.001	<.005	<.005	0.035	0.29	6	<.005	99.9	0.03	0.012	9	0.028	5	<.01	<1	0.04	<.005	4.5	<.01	0.867	0.064	<.005	<.03	0.25
	12/9/2000	0.005	0.47	<.005	<.05	0.194	0.001	<.05	224.8	<.001	<.005	<.005	0.061	0.86	4	<.005	87.8	0.02	0.005	10	0.073	2	<.01	<.03	<.005	4	<.01	0.806	0.057	0.015	<.03	1.02	
	12/11/2000	<0.003	0.14	0.045	<0.05	0.214	<0.001	<0.05	206.8	<0.001	<0.005	<0.005	0.013	0.16	4	0.015	82.9	0.06	<0.002	10	0.024	0.03	0.02	174	<0.03	0.042	6.3	0.05	0.778	<0.005	<0.005	<0.03	0.54
	5/3/2001	<.003	0.762	<.005	0.089	0.394	<.001	<.05	186	<.001	<.005	<.005	0.029	<.01	6.94	<.005	50	0.02	<.002	13	<.005	<1	<.01	127	<.03	<.005	4.6	<.01	0.78	0.02	0.005	<.03	0.09
	13/06/01	<.003	0.07	0.046	0.46	0.188	<.001	<.05	241.9	<.001	<.005	0.105	0.006	0.09	5	0.031	119.2	0.61	0.004	8	0.113	<1	<.01	257	<.03	<.005	6.1	<.01	0.892	0.006	0.005	<.03	3.35
	8/9/2001	<0.003	1.46	0.01	<0.05	0.189	<0.001	<0.05	220.9	<0.001	<0.005	0.006	0.009	2.15	6	0.019	104.2	0.03	<0.002	8	0.087	<1	0.03	214	<0.03	0.005	7.4	<0.01	0.809	0.033	<0.005	0.04	1.41
	12/11/2001	<0.003	0.14	0.045	<0.05	0.214	<0.001	<0.05	206.8	<0.001	<0.005	<0.005	0.013	0.16	4	0.015	82.9	0.06	<0.002	10	0.024	0.03	0.02	174	<0.03	0.042	6.3	0.05	0.778	<0.005	<0.005	<0.03	0.54
	15/01/02	<0.001	0.15	<0.005	<0.05	0.293	<0.001	<0.05	202	<0.001	<0.005	<0.005	0.003	0.19	3	86.2	0.02	<0.002	12	<0.005	<0.01	<0.01	184	<0.03	<0.005	7.3	0.06	0.838	<0.005	<0.005	<0.03	0.02	
	12/2/2002	<0.001	0.14	0.005	<0.05	0.219	<0.001	<0.05	206.9	<0.001	<0.005	<0.005	0.004	0.15	3	80.5	0.02	0.005	12	<0.005	0.04	<0.01	159	<0.03	<0.005	6.9	0.04	0.783	<0.005	<0.005	<0.03	<0.01	
	21/03/02	0.001	0.06	<0.005	<0.05	0.198	<0.001	<0.05	188.8	<0.001	<0.005	<0.005	<0.002	<0.01	4	71.2	0.02	0.006	10	0.008	<0.01	0.03	157	<0.03	<0.005	6.7	0.04	0.7	<0.005	<0.005	<0.03	0.12	
	15/04/02	0.001	0.05	<0.005	<0.05	0.158	<0.001	<0.05	150.7	<0.001	<0.005	<0.005	0.004	<0.01	3	51.4	0.02	<0.002	9	<0.005	<0.01	<0.01	109	<0.03	<0.005	5.3	0.01	0.536	<0.005	<0.005	<0.03	0.1	
	13/05/02	<0.001	0.22	<0.005	0.06	0.172	<0.001	<0.05	162.8	<0.001	<0.005	<0.005	0.01	0.28	5	74.5	0.06	0.003	8	0.017	0.08	0.01	155	<0.03	<0.005	5.1	0.01	0.579	<0.005	<0.005	<0.03	0.22	
	25/06/02	0.8	0.113	0.052	0.11	0.202	0.8	<0.01	216.9	<0.2	<0.001	0.004	0.013	0.143	2.7	<0.001	91	0.031	0.008	9.8	0.008	<0.01	0.006	197.8	0.007	<0.005	7.9	0.008	0.737	0.001	0.001	<0.03	0.038
	27/09/02	0.5	0.063	0.034	0.09	0.2	<0.2	0.03	211.4	<0.2	<0.001	<0.001	0.017	0.083	3.5	0.003	92.9	0.019	0.005	10.3	0.002	<0.01	0.006	192.8	0.009	<0.005	6.8	0.014	0.75	<0.001	0.003	<0.03	0.011
	15/12/02	0.7	0.398	0.028	0.22	0.177	<0.2	<0.01	219.5	1.3	<0.001	0.004	0.016	0.524	3.3	<0.001	96.7	0.023	0.004	10.3	0.002	<0.01	<0.002	201.1	0.01	<0.005	7.3	<0.002	0.743	0.008	0.002	<0.03	0.011
V4																																	
	29/05/98	<.003	0.12	<.02	<.05	0.132	0.002	<.04	61.6	<.002	<.005	0.036	0.019	0.39	<1	0.032	23.5	0.02	<.002	2	<.005	<.04	<.02	6	<.03	<.03	3.9	<.01	0.245	0.013	0.006	<.03	0.08
	29/06/98	<.003	<.05	<.02	<.05	0.183	<.001	<.04	73.8	<.002	<.005	0.021	0.012	0.04	<1	0.012	30.1	<.01	0.011	4	<.005	1.39	<.02	5	<.03	<.03	4.8	<.01	0.353	0.02	<.005	<.03	<.01
	14/09/98	<.003	0.06	<.02	<.05	0.134	<.001	<.04	87.5	<.002	0.006	<.005	0.024	0.16	1	<.005	36.1	0.02	0.003	5	0.009	0.95	<.02	22.6	<.03	<.03	4.2	<.01	0.403	0.021	<.005	<.03	0.03
	16/03/99	<.003	0.3	<.005	0.17	0.129	<.001	<.04	112.1	0.001	<.005	0.694	0.03	0.12	1	<.005	43.4	0.03	<.002	7	<.005	0.97	<.01	45	<.03	<.03	5.4	<.01	0.479	0.006	<.005	<.03	0.05
	18/06/99	<.003	1.23	<.005	0.1	0.144	<.001	<.04	62.4	<.001	<.005	<.005	0.009	2.56	2	0.006	26.7	0.03	0.015	3	<.005	0.15	<.01	12	<.03	<.03	4.8	<.01	0.286	0.041	<.005	<.03	0.07
	29/07/99	<.0001	0.24	0.003	0.02	0.0606	0.0003	<.001	64.04	<.0001	<.0002	0.004	0.0273	0.342	0.9	0.003	25.93	0.033	<.0001	2.1	0.002	<.002	0.005	10.7	<.001	<.001	4.35	<.0004	0.207	0.0097	<.0002	<.001	0.008
	12/10/1999	<.003	0.16	<.005	<.05	0.168	<.001	<.04	79	0.002	0.006	<.005	0.025	0.46	2	0.007	31.7	0.06	<.002	5	0.008	<.04	<.01	21	<.03	<.005	4.9	<.01	0.342	0.026	<.005	<.03	<.01
	25/03/00	<.003	0.27	<.005	<.05	0.244	<.001	<.05	99.8	<.001	0.057	<.005	0.004	0.18	4	<.005	37.8	0.03	<.002	10	<.005	<1	<.01	34	<.03	<.005	4.6	<.01	0.48	<.005	<.005	<.03	0.01
	20/06/00	<.003	0.22	<.005	<.05	0.196	0.002	<.05	54.7	<.001	<.005	<.005	0.01	0.31	2	<.005	22.4	0.01	<.002	3	0.008	2	<.01	<1	<.03	<.005	3.5	<.01	0.267	0.026	<.005	<.03	0.01
	12/9/2000	<.003	0.57	<.005	0.09	0.15	<.001	<.05	68.2	0.001	<.005	<.005	0.063	0.91	<1	<.005	23.4	0.03	0.015	4	0.014	2	<.01	<.03	<.005	5.7	<.01	0.246	0.024	<.005	<.03	0.03	
	7/6/2001	<.003	0.38	<.005	0.07	0.199	<.001	<.05	46.3	<.001	<.005	0.141	0.005	0.57	<1	0.009	16.2	0.28	<.002	2	<.005	<1	<.01	7	<.03	<.005	3.7	<.01	0.198	0.01	<.005	<.03	0.02
	25/06/02	<0.2	0.149	0.019	0.1	0.208	0.4	<0.01	75.9	<0.2	0.002	0.028	0.016	0.359	1.2	0.009	26.2	0.039	0.007	3.2	0.021	0.01	<0.002	15.9	0.011	<0.005	5.7	0.006	0.313	0.002	<0.001	<0.03	0.022
	27/09/02	<0.2	0.049	0.01	0.09	0.165	<0.2	0.03	79.9	<0.2	<0.001	0.001	0.018	0.151	1.3	0.006	29	0.031	0.003	3.6	0.002	<0.01	0.005	14.9	0.023	<0.005	4.9	<0.002	0.332	0.001	<0.001	<0.03	0.009
V5																																	
	13/01/98	<.003	<.05	<.02	<.05	0.171	<.001	<.04	93.7	<.002	0.018	<.005	0.006	0.18	2	<.005	42.2	0.01	0.002	4	<.005	<.04	<.02	50	<.03	<.03	3.4	<.01	0.383	<.005	<.005	<.03	0.02
	17/03/98	<.003	0.1	<.02	<.05	0.158	<.001	<.04	125.3	<.002	<.005	0.034	0.022	<.01	2	0.016	64.6	<.01	0.007	8	0.01	0.32	0.02	53	<.03	<.03	4.9	<.01	0.507	0.007	0.014	<.03	<.01
	14/04/98	<.003	0.13	<.02	<.05	0.157	<.001	<.04	92.2	<.002	<.005	0.031	0.036	0.02	<1	0.012	44.1	0.01	0.01	8	0.012	0.04	<.02	46	<.03	<.03	4.4	<.01	0.402	0.009	<.005	<.03	0.28
	19/05/98	<.003	0.5	<.02	0.23	0.064	<.001	<.04	41	<.002	<.005	0.014	0.031	0.76	2	<.005	17	0.03	<.002	3	0.012	2.6	<.02	8	0.07	<.03	3.7	<.01	0.172	0.008	<.005	<.03	0.06
	30/06/98	<.003	0.26	<.02	<.05	0.189	<.001	<.04	53.6	<.002	<.005	0.032	0.011	0.13	<1	0.037	22.6	<.01	0.01	5	<.005	<.04	<.02	33	<.03	<.03	5.2	<.01	0.247	0.014	0.015	<.03	0.01
	21/07/98	<.003	<.05	<.02	<.05	0.139	<.001	<.04	65.8	<.002	<.005	0.022	0.041	0.02	<1	0.032	26.9	<.01	<.002	6	0.01	<.04	<.02	9	0.03	<.03	3.7	<.01	0.276	<.005	<.005	<.03	0.01
	11/8/1998	<.003	0.17	<.02	0.21	0.042	<.001	<.04	65.5	<.002	<.005	<.005	0.035	0.11	<1	<.005	25	<.01	<.002	4	<.005	<.04	0.03	35	0.06	<.03	4	<.01	0.281	<.005	0.007	<.03	0.01
	15/09/98	<.003	0.05	<.02	<.05	0.113	<.001	<.04	60	<.002	<.005	<.005	0.024	0.09	1	<.005	25.1	0.01	0.007	5	0.007	<.04	<.02	27.1	<.03	<.03	3.9	<.01	0.264	0.016	<.005	<.03	0.04
	19/10/98	<.003	0.21	<.02	0.1	0.083	<.001	<.04	62.8	<.002	<.005	<.005	0.018	0.35	1	<.005	25.7	0.06	0.012	5	0.026	8.88	<.02	29.2	<.03	<.03	3.4	<.01	0.274	0.102	0.008	<.03	1.31
	17/11/98	<.003	0.15	<.005	<.05	0.201	<.001	<.04	131.2	<.001	<.005	0.112	0.025	0.12	2	<.005	60	0.01	0.014	8	0.01	1.85	<.01	69	<.03	<.03	4.4	<.01	0.481	0.012	<.005	<.03	0.05
	31/12/98	<.003	0.25	<.005	0.21	0.228	<.001	<.04	220	<.001	<.005	<.005	0.058	0.23	3	<.005	102.6	0.01	0.005	13	0.008	13.93	<.01	154	0.05	<.03	7.9	<.01	0.95	0.029	<.005	<.03	0.03
	19/01/99	<.003	0.27	0.028	0.25	0.16	0.001	<.04	182.5	0.006	<.005	0.086	0.039	0.18	3	<.005	86.2	<.01	0.005	11	<.005	<.04	<.01	145	<.03	<.03	6.3	<.01	0.844	0.022	<.005	<.03	0.02
	23/02/99	0.007	0.47	<.005	0.25	0.098	<.001	<.04	244.2	<.001	<.005	0.299	0.036	0.1	4	0.031	134.2	<.01	0.009	16	<.005	3.1	<.01	177	<.03	<.03	9.3	<.01	1.081	0.027	<.005	<.03	0.05
	23/03/99	<.003	0.37	<.005	0.25	0.128	<.001	<.04	140.3	0.001	<.005	0.6	0.031	0.08	3	0.019	79.6	0.27	<.002	9	<.005	1.55	<.01	86.3	<.03	<.03	4.9	<.01	0.716	0.009	0.007	<.03	0.08
	20/04/99	<.003	0.31	<.005	0.14	0.095	0.001	<.04	95.5	<.001	<.005	<.005	0.024	0.44	2	<.005	53.6	0.03	0.009	8	<.005	0.1	<.01	65	<.03	<.03	4.5	<.01	0.404	0.029	<.005	<.03	0.01
	18/05/99	<.003	1.24	<.005	<.05	0.166	0.002	<.04	31.8	<.001	<.005	<.005	0.016	2.15	2	<.005	12	0.08	0.003	3	0.009	3.16	<.01	<.03	<.03	4.2	<.01	0.149	0.019	0.009	<.03	0.05	
	20/06/99	0.003	13.82	<.005	0.08	0.389	<.001	<.04	39.1	<.001	<.005	0.124	0.044	25.27	4	0.027	20.9	0.23	<.002	4	0.021	<.04	0.05	11	<.03	<.03	27	<.01	0.197	0.399	0.034	<.03	<.01
	29/07/99	<.0001	4.67	<.001	0.01	0.157	0.0003	<.001	42.7	<.0001	<.0002	0.018	0.0204	7.337	1.4	0.005	18.2	0.111	<.0001	2.4	0.016	0.196	0.018	11.2	<.001	<.001	8.65	<.0004	0.1592	0.133	0.011	<.001	0.032

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	K-T	LA-T	MG-T	MN-T	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	31/08/99	<.0001	0.082	<.001	0.045	0.0495	0.0002	<.001	58.09	0.0023	0.0004	<.0002	0.0092	0.242	0.81	<.0002	22.277	0.0088	0.0009	5.29	<.0002	<.002	<.001	20.83	<.001	<.001	2.795	<.0004	0.1679	0.0127	<.0002	<.001	<.0004
	12/10/1999	<.003	0.2	<.005	<.05	0.152	<.001	<.04	61.5	<.001	0.007	<.005	0.024	0.8	2	0.008	24.9	0.02	<.002	5	<.005	<.04	0.02	25	<.03	<.005	4.7	<.01	0.253	0.023	<.005	<.03	<.01
	14/12/99	<.003	0.26	<.005	<.05	0.14	<.001	<.04	78.1	0.002	<.005	<.005	0.025	0.06	5	<.005	28.9	0.01	<.002	4	0.02	<.04	<.01	32	<.03	<.005	3	<.01	0.282	0.008	0.008	<.03	0.03
	28/02/00	<.003	0.33	<.005	<.05	0.146	<.001	0.06	88.6	<.001	<.005	<.005	0.028	0.35	3	0.025	40	<.01	<.002	6	0.005	<1	0.02	44	<.03	<.005	5	<.01	0.372	0.028	0.009	<.03	0.02
	27/04/00	<.003	0.35	<.005	<.05	0.186	0.001	<.05	74.8	<.001	<.005	<.005	0.021	0.35	2	<.005	33.1	0.13	<.002	5	0.007	<1	<.01	<.03	<.005	4.2	<.01	0.301	0.042	<.005	<.03	0.04	
	15/05/00	<.003	1.1	0.022	<.05	0.143	<.001	<.05	48	<.001	0.024	0.157	0.015	1.91	2	0.027	20.1	0.03	0.004	<1	0.008	<1	0.01	<.03	<.005	5.4	<.01	0.278	0.041	0.014	<.03	0.04	
	20/06/00	<.003	0.41	<.005	<.05	0.173	0.001	<.05	33.9	<.001	<.005	<.005	0.012	0.72	2	<.005	13.7	0.03	<.002	3	<.005	2	<.01	<1	<.03	<.005	4.3	<.01	0.181	0.027	<.005	<.03	<.01
	25/07/00	<.003	0.96	<.005	<.05	0.17	0.002	<.05	44.8	<.001	0.014	<.005	0.018	2.26	3	0.122	17.3	0.04	<.002	5	0.022	2	<.01	<.03	<.005	5.5	<.01	0.317	0.043	0.052	<.03	<.01	
	29/08/00	<.003	2.02	<.005	<.05	0.169	<.001	<.05	38.1	<.001	<.005	<.005	0.019	3.91	1	<.005	14.3	0.12	<.002	3	0.006	3	<.01	<.03	<.005	8.3	<.01	0.152	0.054	0.021	<.03	<.01	
	12/9/2000	<.003	0.89	<.005	0.15	0.169	<.001	<.05	58.3	<.001	<.005	<.005	0.046	1.24	<1	<.005	21.6	0.02	0.006	5	0.013	3	<.01	<.03	<.005	6.7	<.01	0.183	0.026	<.005	<.03	0.02	
	26/09/00	<0.01	1.1	<0.2	<0.1	0.09	<0.005	<0.1	51.8	<0.001	<0.01	<0.01	<0.01	1.57	<2	19.1	0.055	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	6.12	<0.03	0.203	0.03	<0.03	0.012			
	29/10/00	<.003	0.4	<.005	0.08	0.276	0.002	<.05	69.7	<.001	<.005	<.005	0.04	2.3	3	<.005	27.9	<.01	<.002	7	<.005	9	<.01	119	<.03	<.005	5.1	<.01	0.311	0.049	<.005	<.03	0.01
	13/11/00	<0.003	0.21	<0.005	<0.05	0.16	<0.001	<0.05	80	0.001	<0.005	0.01	0.008	0.29	1	0.024	35.7	0.05	<0.002	5	<0.005	0.03	<0.01	35	<0.03	<0.005	5.3	0.09	0.337	<0.005	0.009	<0.03	0.01
	18/11/00	<0.01	0.15	<0.2	<0.1	0.1	<0.005	<0.1	83.1	<0.001	<0.01	<0.01	<0.01	0.25	<2	33.3	0.019	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	4.8	<0.03	0.35	<0.01	<0.03	0.005			
	14/12/00	<0.01	0.09	<0.2	<0.1	0.09	<0.005	<0.1	81	<0.001	<0.01	<0.01	<0.01	0.16	<2	39.9	0.007	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	4.52	<0.03	0.341	<0.01	<0.03	<0.005			
	13/01/01	<.003	0.08	<.005	<.05	0.195	0.002	<.05	86.5	0.013	<.005	<.005	0.034	1.07	3	<.005	37.9	<.01	0.009	6	<.005	<1	<.01	91	<.03	<.005	4.8	<.01	0.369	0.028	<.005	<.03	<.01
	10/2/2001	<.003	0.12	<.005	0.06	0.225	0.003	<.05	93.7	<.001	<.005	<.005	0.014	0.1	3	<.005	41.6	<.01	<.002	7	<.005	<1	<.01	112	<.03	<.005	5	<.01	0.224	0.012	<.005	<.03	<.01
	5/3/2001	<.003	0.484	0.01	0.089	0.267	0.001	<.05	61	<.001	<.005	0.017	0.022	0.177	4.31	<.005	14	0.02	<.002	8	<.005	<1	<.01	24	<.03	<.005	5	<.01	0.3	0.01	0.026	<.03	0.03
	10/3/2001	<.003	0.505	<.005	0.105	0.271	<.001	<.05	101	<.001	<.005	<.005	0.02	0.211	1.94	<.005	47	0.03	<.002	9	<.005	<1	<.01	56	<.03	<.005	4.5	<.01	0.43	0.01	<.005	<.03	0.04
	16/04/01	<.003	0.2	<.005	<.05	0.177	<.001	0.06	105.1	0.002	<.005	<.005	0.014	0.2	<1	<.005	49	0.02	0.011	7	<.005	<1	<.01	52	<.03	<.005	4.3	<.01	0.448	0.009	0.006	<.03	0.04
	14/05/01	<.003	1.19	<.005	<.05	0.22	<.001	<.05	50.2	<.001	<.005	0.006	0.012	2.1	3	0.005	20.9	0.07	<.002	<1	<.005	<1	<.01	19	<.03	<.005	3.9	<.01	0.18	0.032	0.02	<.03	0.01
	13/06/01	<.003	0.61	<.005	0.19	0.177	<.001	<.05	25.4	<.001	<.005	0.031	0.009	1.01	<1	0.006	9.9	0.25	<.002	3	0.021	<1	<.01	8	0.04	0.059	4.2	0.01	0.123	0.018	<.005	<.03	0.03
	17/06/01	<.003	1.24	<.005	0.07	0.193	<.001	<.05	31.8	<.001	<.005	0.01	0.006	2.14	1	0.007	11.3	0.16	0.003	4	<.005	<1	<.01	9	<.03	<.005	3.1	0.02	0.143	0.025	<.005	<.03	0.03
	14/07/01	<.003	0.72	0.019	0.08	0.32	<.001	<.05	61.3	<.001	<.005	0.016	0.005	1.2	1	0.006	24.9	0.04	<.002	6	0.008	<1	<.01	21	<.03	<.005	5.7	<.01	0.284	0.017	<.005	<.03	0.04
	14/08/01	<0.003	1.38	<0.005	<0.05	0.309	<0.001	<0.05	79.4	<0.001	<0.005	0.013	0.01	2.03	1	<0.005	33.8	<0.01	0.003	5	0.006	<1	<0.01	26	<0.03	<0.005	7.4	0.06	0.368	0.032	<0.005	<0.03	0.03
	8/9/2001	<0.003	0.19	<0.005	3.6	0.148	<0.001	<0.05	68.8	<0.001	<0.005	0.007	0.004	0.28	1	0.019	27.4	0.02	<0.002	<1	0.006	<1	<0.01	26	<0.03	0.026	5.1	<0.01	0.301	0.009	<0.005	<0.03	0.06
	17/09/01	<0.003	0.2	<0.005	<0.05	0.195	<0.001	<0.05	67.8	<0.001	<0.005	<0.005	0.003	0.23	1	0.015	28	<0.01	<0.002	<1	<0.005	<1	<0.01	25	<0.03	<0.005	5.3	<0.01	0.311	0.006	<0.005	<0.03	<0.01
	15/10/01	<0.003	0.28	<0.005	0.14	0.276	<0.001	<0.05	80.1	<0.001	<0.005	<0.005	0.003	0.21	2	0.02	35.2	<0.01	<0.002	2	<0.005	<1	<0.01	33	<0.03	<0.005	5.8	<0.01	0.357	0.011	<0.005	<0.03	<0.01
	13/11/01	<0.003	0.21	<0.005	<0.05	0.16	<0.001	<0.05	80	0.001	<0.005	0.01	0.008	0.29	1	0.024	35.7	0.05	<0.002	5	<0.005	0.03	<0.01	35	<0.03	<0.005	5.3	0.09	0.337	<0.005	0.009	<0.03	0.01
	14/12/01	<0.001	0.13	<0.005	<0.05	0.096	<0.001	<0.05	91.5	<0.001	<0.005	0.008	0.002	0.15	1	0.017	40.4	0.03	0.017	2	0.006	0.01	<0.01	35	<0.03	<0.005	5	0.02	0.349	<0.005	<0.005	<0.03	<0.01
	15/01/02	<0.001	0.09	<0.005	<0.05	0.234	<0.001	<0.05	101.2	<0.001	<0.005	<0.005	0.005	0.11	2	47.1	0.02	0.004	7	<0.005	0.01	<0.01	51	<0.03	0.02	5.6	0.02	0.427	<0.005	<0.005	<0.03	<0.01	
	12/3/2002	<0.001	0.1	<0.005	0.08	0.331	<0.001	<0.05	128.4	<0.001	<0.005	<0.005	0.005	0.05	2	58.7	0.03	0.006	8	<0.005	<0.01	<0.01	64	0.04	<0.005	6	0.01	0.506	<0.005	<0.005	<0.03	<0.01	
	21/03/02	<0.001	0.05	<0.005	<0.05	0.176	<0.001	<0.05	142.9	<0.001	<0.005	<0.005	<0.002	0.04	3	71.3	0.02	0.007	8	<0.005	<0.01	<0.01	84	<0.03	<0.005	6.9	0.03	0.558	<0.005	<0.005	<0.03	<0.01	
	13/05/02	<0.001	4.41	<0.005	0.05	0.215	<0.001	<0.05	48.3	<0.001	<0.005	0.015	0.018	7.74	3	18.3	0.17	0.01	4	0.019	0.19	0.02	14	0.06	<0.005	9.1	0.07	0.173	0.115	0.013	0.04	<0.01	
	16/06/02	0.8	0.694	<0.003	<0.05	0.218	0.3	<0.01	43.2	<0.2	<0.001	0.006	0.014	1.381	1.1	0.005	16.2	0.05	<0.001	3.7	0.011	0.13	0.016	14.9	0.019	<0.005	5.2	0.004	0.184	0.018	0.002	<0.03	0.022
	25/06/02	1.3	0.655	0.044	0.1	0.194	0.2	<0.01	55.2	1.1	0.003	0.006	0.021	0.864	1.2	0.004	19.4	0.043	0.011	3.7	0.011	0.08	0.011	20.6	<0.002	<0.005	5.7	0.005	0.216	0.011	<0.001	<0.03	0.017
	16/07/02	1.1	0.488	<0.003	<0.05	0.185	0.4	<0.01	57	<0.2	0.002	0.002	0.023	0.739	1	0.013	22	0.038	0.003	3.2	0.002	0.03	0.009	22.2	0.013	<0.005	5.6	0.004	0.224	0.01	0.001	<0.03	0.011
	12/8/2002	0.4	0.381	0.007	0.07	0.134	0.4	<0.01	68.2	<0.2	0.002	0.007	0.016	0.627	1.3	0.006	28.1	0.04	0.002	5.2	0.004	0.08	0.015	27.7	0.003	<0.005	5.1	0.009	0.284	0.023	<0.001	<0.03	0.001
	16/09/02	<0.2	0.117	<0.003	0.09	0.166	<0.2	<0.01	60.6	0.2	<0.001	0.004	0.025	0.199	1.2	0.004	23.1	0.034	0.002	3.4	<0.001	<0.01	0.003	21.3	<0.002	<0.005	4.9	<0.002	0.232	0.002	<0.001	<0.03	0.041
	27/09/02	0.3	0.097	<0.003	0.08	0.159	<0.2	0.04	60.4	<0.2	<0.001	0.004	0.015	0.153	1.1	0.005	23.8	0.018	0.003	3.7	0.002	<0.01	0.008	20.9	0.011	<0.005	4.7	0.027	0.247	0.003	0.001	<0.03	0.01
	15/10/02	1.9	0.149	<0.003	0.12	0.154	<0.2	0.02	67.2	0.2	0.001	0.01	0.019	0.241	1.3	0.004	26.1	0.02	0.003	4.7	0.002	0.04	0.004	23.4	<0.002	<0.005	5.1	0.004	0.267	0.003	<0.001	<0.03	0.009
	12/11/2002	<0.2	0.291	<0.003	0.13	0.149	<0.2	<0.01	82.1	<0.2	0.001	0.002	0.017	0.418	1.6	0.004	32.6	0.036	0.002	5.8	<0.001	0.01	<0.002	31.9	<0.002	<0.005	6.1	<0.002	0.331	0.009	0.001	<0.03	0.01
	10/12/2002	<0.2	0.165	0.011	0.12	0.151	0.3	<0.01	86.2	<0.2	0.002	<0.001	0.023	0.324	1.8	0.003	39.3	0.033	0.003	5.1	0.004	0.02	0.004	40.1	0.011	<0.005	6.7	<0.002	0.357	0.004	<0.001	<0.03	0.011
	15/12/02	<0.2	0.158	0.023	0.21	0.168	<0.2	<0.01	90.2	<0.2	<0.001	0.003	0.017	0.249	1.5	0.002	36.7	0.028	0.003	4.4	0.002	0.01	<0.002	39.2	<0.002	<0.005	5.5	<0.002	0.347	0.003	<0.001	<0.03	<0.001
V6A																																	
	13/01/98	<.003	0.31	<.02	<.05	0.252	<.001	<.04	39.3	<.002	0.023	<.005	0.008	1.5	<1	<.005	7.8	0.04	0.002	2	<.005	<.04	0.13	7	<.03	<.03	3.5	<.01	0.194	0.006	<.005	<.03	0.34
	17/03/98	<.003	<.05	<.02	<.05	0.12	<.001	<.04	46.8	<.002	<.005	0.011	0.012	<.01	<1	<.005	9.8	<.01	<.002	3	<.005	<.04	<.02	7	<.03	<.03	3.9	<.01	0.232	<.005	0.014	<.03	<.01
	19/05/98	<.003	0.57	<.02	0.21	0.045	<.001	<.04	15.3	<.002	<.005	0.028	0.026	0.99	<1	0.021	3.3	0.08	<.002	2	<.005	1.5	<.02	3	0.07	<.03	2.8	<.01	0.07	<.005	<.005	<.03	0.08
	30/06/98	<.003	0.06	<.02	<.05	0.147	<.001	<.04	22.7	<.002	<.005	0.066	0.007	0.13	<1	<.005	4.3	<.01	<.002	2	<.005	<.04	<.02	29	<.03	<.03	5.4	<.01	0.117	0.011	<.005	<.03	0.01
	15/09/98	<.003	<.05	<.02	<.05	0.109	<.001	<.04	24.8	<.002	<.005	<.005	0.016	0.17	<1	<.005	4.5	0.01	<.002	2	<.005	0.33	<.02	4.1	<.03	<.03	4.3	<.01	0.126	0.017	<.005	<.03	0.02
	31/12/98	<.003	0.11	<.005	0.2	0.097	<.001	<.04	49.8	<.001	<.005	<.005	0.046	0.26	2	0.027	10.4	0.01	<.002	3	<.005	<.04	<.01	9	<.03	<.03	5.1	<.01	0.259	0.011	<.005	<.03	0.05
	22/03/99	<.003	0.38	<.005	0.21	0.107	<.001	<.04	69.4	<.001	<.005	0.395	0.027	0.11	3	<.005	16.7	0.03	<.002	4	<.005	0.72	0.02	16.8	<.03	<.03	7	<.01	0.317	0.006	0.008	<.03	0.08
	3/7/1999	<.003	0.46	<.005	0.49	0.041	<.001	<.04	15.4	<.001	<.005	<.005	0.009	1	<1	<.005	2.6	0.01	<.002	1	<.005	<.04	<.01	4	<.03	<.03	6.1	<.01	0.088	<.005	0.01	<.03	0.03
	10/9/1999	<.003	0.12	<.005	<.05	0.12	<.001	<.04	24.4	<.001	0.007	<.005	0.014	0.3	<1	<.005	3.9	0.02	0.037	2	0.008	<.04	<.01	8	0.05	<.005	3.6	<.01	0.118	0.011	<.005	<.03	0.04
	12/10/1999	<.003	0.08	<.005	<.05	0.139	<.001	<.04	25.1	0.001	<.005	<.005	0.014	0.3	<1	<.005	4.5	<.01	<.002	3	<.005	<.04	<.01	5	<.03	<.005	5.7	<.01	0.125	0.015	<.005	<.03	0.01
	14/12/99	<.003	0.22	<.005	0.07	0.125	<.001	<.04	35.8	0.005	<.005	<.005	0.032	0.29	8	0.014	5.9	0.04	0.005	2	0.032	0.07	0.06	7	0.03	<.005	3.2	<.01	0.15	0.009	0.022	<.03	0.06
	23/03/00	<.003	0.13	<.005	<.05	0.156	<.001	<.05	45.5	0.003	<.005	<.005	0.004	0.15	1	<.005	8.2	<.01	<.002	<1	<.005	<1	<.01	8	<.03	<.005	5.1	<.01	0.24	<.005	<.005	<.03	0.02
	20/06/00	<.003	0.17	<.005	<.05	0.165	0.001	<.05	11.3	<.001	<.005	<.005	0.004	0.25	1	<.005	2.2	<.01	<.002	2	<.005	1	<.01	<1	<.03	<.005	3.8	<.01	0.088	0.014	<.005	<.03	0.02
	12/9/2000	<.003	0.05	<.005	<.05	0.102	<.001	<.05	26.4	<.001	<.005	<.005	0.014	0.16	<1	<.005	4	<.01	0.006	3	<.005	4	<.01	<.03	<.005	3.1	<.01	0.061	<.005	<.005	<.03	0.04	
	5/3/2001	<.003	1.295	<.005	0.104	0.252	<.001	<.05	348	<.001	<.005	<.005	<.002	0.168	1.02	<.005	144	0.01	<.002	14	<.005	<1	<.01	344	<.03	<.005	6.7	<.01	1.33	0.01	<.005	<.03	0.01
	13/06/01	<.003	0.33	<.005	0.16	0.151	<.001	<.05	10.3	<.001	<.005	0.017	0.005	0.46	<1	<.005	2.3	0.08	<.002	3	<.005	<1	<.01	3	0.07	<.005	3.5	0.01	0.053	0.006	<.005	<.03	0.04
	8/9/2001	<0.003	0.06	<0.005	3.38	0.114	<0.001	<0.05	35.8	<0.001	<0.005	<0.005	0.003	0.15	<1	0.01	7.2	0.01	<0.002	2	0.006	<1	<0.01	12	<0.03	<0.005	4.3	<0.01	0.167	<0.005	<0.005	<0.03	0.03
	25/06/02	<0.2	0.177	0.014	0.1	0.149	0.4	<0.01	20.7	1.3	<0.001	0.007	0.012	0.252	0.6	0.005	4.2	0.011	<0.001	1.2	0.006	0.1	0.014	5.7	<0.002	<0.005	4.6	<0.002	0.102	0.003	<0.001	<0.03	0.01
	27/09/02	<0.2	0.081	<0.003	0.1	0.135	<0.2	0.03	30.3	<0.2	<0.001	0.002	0.016	0.158	0.5	0.004	5.3	0.01	0.002	2.2	0.003	<0.01	0.005	8	0.013	<0.005	4.5	0.021	0.127	0.001	<0.001	<0.03	0.012
	15/12/02	<0.2	0.077	0.015	0.21	0.137	<0.2	<0.01	49.7	1.3	0.001	0.002	0.011	0.18	0.7	0.002	9.9	0.022	<0.001	1.9	<0.001	<0.01	0.002	16.2	0.016	<0.005	5.3	<0.002	0.207	<0.001	<0.001	<0.03	0.013
V8																																	
	13/01/98	<.003	<.05	<.02	<.05	0.173	<.001	<.04	77.7	<.002	0.013	<.005	0.006	<.01	1	<.005	32.5	0.1	0.006	4	<.005	<.04	<.02	44	<.03	<.03	2.9	<.01	0.37	<.005	<.005	<.03	0.02
	17/03/98	<.003	0.08	<.02	<.05	0.166	<.001	<.04	85.8	<.002	<.005	0.019	0.015	<.01	<1	0.005	40.6	0.14	0.003	7	<.005	<.04	<.02	46	<.03	<.03	4.2	<.01	0.402	<.005	0.016	<.03	0.03
	14/04/98	<.003	0.09	<.02	<.05	0.141	<.001	<.04	77.7	0.002	<.005	0.029	0.037	<.01	<1	<.005	36	0.1	0.003	6	0.007	<.04	<.02	41	<.03	<.03	4	<.01	0.387	0.006	<.005	<.03	0.26
	19/05/98	<.003	0.45	<.02	0.18	0.053	<.001	<.04	24.8	<.002	<.005	0.038	0.031	0.75	1	<.005	9.3	0.04	<.002	2	0.015	0.87	0.04	8	0.04	<.03	2.4	<.01	0.109	0.006	0.019	<.03	0.07
	30/06/98	<.003	<.05	<.02	<.05	0.163	<.001	<.04	35.3	<.002	<.005	0.025	0.008	<.01	<1	0.017	13.7	<.01	<.002	3	<.005	0.54	<.02	29	<.03	<.03	4.4	<.01	0.177	0.009	0.006	<.03	0.02
	21/07/98	<.003	<.05	<.02	<.05	0.131	<.001	<.04	50.2	<.002	<.005	0.038	0.036	0.02	<1	0.022	19.8	0.02	<.002	5	0.01	<.04	<.02	9	<.03	<.03	3.3	<.01	0.234	<.005	<.005	<.03	0.04
	11/8/1998	<.003	0.14	<.02	0.25	0.022	<.001	<.04	33	<.002	<.005	0.046	0.03	0.08	<1	<.005	11.6	0.01	<.002	2	<.005	2.33	<.02	41	<.03	<.03	3.6	<.01	0.157	<.005	<.005	<.03	0.01
	15/09/98	<.003	0.12	<.02	<.05	0.124	<.001	<.04	40.6	<.002	<.005	<.005	0.017	0.23	1	<.005	16	0.04	0.006	4	<.005	1.1	<.02	15.9	<.03	<.03	3.4	<.01	0.197	0.012	<.005	<.03	0.03
	19/10/98	<.003	0.11	<.02	0.13	0.053	<.001	<.04	44.4	<.002	<.005	0.02	0.014	0.18	<1	<.005	17.5	0.03	<.002	4	0.012	2.49	<.02	20.7	<.03	<.03	2.7	<.01	0.203	0.031	0.012	<.03	0.04
	17/11/98	<.003	0.14	<.005	<.05	0.206	<.001	<.04	131.8	<.001	<.005	0.086	0.025	0.16	3	<.005	60.3	0.15	0.01	10	0.01	1.82	<.01	60	<.03	<.03	6.6	<.01	0.537	0.012	<.005	<.03	0.04
	31/12/98	<.003	0.07	<.005	0.16	0.077	<.001	<.04	75.7	<.001	<.005	<.005	0.04	0.09	2	0.024	35.5	0.34	<.002	6	0.006	5.1	<.01	37	0.04	<.03	3.4	<.01	0.367	0.01	<.005	<.03	0.02
	19/01/99	<.003	0.13	<.005	0.2	0.095	<.001	<.04	100.9	0.001	<.005	0.089	0.034	0.04	3	<.005	48.5	0.54	<.002	8	<.005	<.04	0.03	63	<.03	<.03	5	<.01	0.474	0.012	<.005	<.03	0.02
	23/02/99	0.011	0.3	<.005	0.4	0.082	<.001	<.04	107.3	<.001	0.005	<.005	0.026	<.01	2	0.009	47.3	0.98	0.005	7	0.01	1.21	<.01	45	<.03	<.03	5.3	<.01	0.511	0.018	<.005	<.03	0.06

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CT-T	CO-T	CR-T	CU-T	FE-T	K-T	LA-T	MG-T	MN-T	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	23/03/99	<.003	0.33	<.005	0.23	0.11	<.001	<.04	109.7	<.001	<.005	0.099	0.034	0.28	3	0.006	71.4	0.39	<.002	9	<.005	1.26	<.01	88	<.03	<.03	4.7	<.01	0.543	<.005	<.005	<.03	0.08
	20/04/99	<.003	0.13	0.016	0.14	0.077	0.001	0.04	75.9	<.001	0.009	<.005	0.02	0.09	2	<.005	40.6	0.1	0.008	6	<.005	0.34	0.01	52	<.03	<.03	3.4	<.01	0.354	0.02	<.005	<.03	<.01
	18/05/99	<.003	0.46	<.005	<.05	0.132	0.002	<.04	28.5	<.001	<.005	<.005	0.017	0.97	2	<.005	10.1	0.05	<.002	2	0.01	0.96	<.01	<.03	<.03	3.1	<.01	0.138	<.005	0.006	<.03	0.05	
	20/06/99	<.003	2.57	<.005	<.05	0.134	<.001	<.04	14.5	<.001	<.005	0.098	0.005	4.55	2	<.005	6.4	0.07	<.002	2	<.005	3.46	<.01	4	<.03	<.03	5.6	<.01	0.104	0.066	<.005	<.03	0.09
	29/07/99	<.0001	1.09	<.001	0.01	0.0577	0.0002	<.001	27.35	<.0001	<.0002	0.012	0.0204	1.745	0.6	0	10.5	0.036	<.0001	1.6	0.004	<.002	0.007	7.3	<.001	<.001	4.23	<.0004	0.0988	0.0329	0.002	<.001	0.021
	30/08/99	<.0001	0.065	<.001	0.008	0.0421	0.0001	<.001	35.718	0.0007	0.0002	<.0002	0.0081	0.157	0.76	<.0002	12.658	0.0178	0.0005	3.8	<.0002	<.002	<.001	12.42	<.001	<.001	2.91	<.0004	0.1238	0.0091	<.0002	<.001	0.0054
	12/10/1999	<.003	0.12	<.005	<.05	0.151	<.001	<.04	49.1	0.002	0.009	<.005	0.02	0.18	2	<.005	19	0.05	<.002	5	0.008	<.04	0.02	20	<.03	<.005	4.5	<.01	0.23	0.016	<.005	<.03	<.01
	14/12/99	<.003	0.26	0.016	0.05	0.138	<.001	<.04	59.4	0.005	<.005	<.005	0.034	0.05	7	0.034	21.5	0.06	<.002	3	0.034	0.14	0.04	25	0.06	<.005	2.6	<.01	0.234	0.011	0.01	<.03	0.04
	28/02/00	<.003	0.23	<.005	<.05	0.143	<.001	<.05	71.9	0.002	<.005	0.084	0.027	0.23	3	0.024	32.1	0.07	0.018	6	0.007	<1	0.04	34	<.03	<.005	4.7	<.01	0.357	0.025	0.016	<.03	0.02
	23/03/00	<.003	0.16	<.005	<.05	0.208	<.001	<.05	78.3	0.002	0.027	<.005	0.006	0.09	4	<.005	33.6	0.09	<.002	1	<.005	<1	<.01	38	<.03	<.005	5	<.01	0.383	<.005	<.005	<.03	0.01
	27/04/00	<.003	0.25	<.005	<.05	0.19	0.001	<.05	63.6	<.001	<.005	<.005	0.018	0.2	2	<.005	29	0.07	<.002	5	<.005	<1	<.01	<.03	<.005	4.1	<.01	0.286	0.039	0.027	<.03	0.02	
	15/05/00	<.003	0.32	<.005	<.05	0.123	<.001	<.05	44.5	<.001	0.009	0.157	0.013	0.55	1	0.025	18.1	0.03	<.002	<1	0.012	<1	<.01	<.03	<.005	4.1	<.01	0.287	0.017	0.013	<.03	0.1	
	20/06/00	<.003	0.27	<.005	<.05	0.145	0.001	<.05	20.5	<.001	0.008	<.005	0.012	0.25	2	<.005	7.3	0.02	<.002	2	0.015	<1	<.01	<1	<.03	<.005	2.8	<.01	0.128	0.018	<.005	<.03	0.01
	25/07/00	<.003	0.16	<.005	<.05	0.13	0.001	<.05	28	0.002	0.014	0.087	0.013	0.78	3	0.093	9.7	0.03	<.002	3	0.023	2	<.01	<.03	<.005	3.2	<.01	0.249	0.019	0.044	<.03	0.09	
	29/08/00	<.003	1.15	<.005	<.05	0.12	<.001	<.05	36.3	<.001	<.005	<.005	0.003	1.94	1	<.005	12.5	0.06	<.002	3	0.016	<1	<.01	<.03	<.005	5.9	<.01	0.152	0.031	0.008	<.03	0.16	
	12/9/2000	<.003	0.38	<.005	<.05	0.137	<.001	<.05	48.4	<.001	<.005	<.005	0.021	0.63	<1	<.005	15.3	0.02	<.002	4	0.01	<1	0.02	<.03	<.005	4	<.01	0.14	0.005	<.005	<.03	0.04	
	26/09/00	<0.01	3.6	<0.2	<0.1	0.13	<0.005	<0.1	52.3	<0.001	<0.01	<0.01	<0.01	4.75	<2	16.2	0.108	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	9.61	<0.03	0.18	0.1	<0.03	0.089			
	29/10/00	<.003	0.39	<.005	0.11	0.248	0.002	<.05	66.7	<.001	0.007	0.017	0.046	1	3	<.005	26.7	0.05	<.002	7	<.005	5	<.01	113	<.03	<.005	5.4	<.01	0.277	0.047	<.005	<.03	0.05
	13/11/00	<0.003	0.1	<0.005	<0.05	0.144	<0.001	<0.05	60.4	0.001	<0.005	0.018	0.015	0.09	1	0.024	23.9	0.07	<0.002	3	<0.005	0.02	0.04	29	0.04	<0.005	5	0.07	0.267	<0.005	<0.005	<0.03	0.04
	18/11/00	<0.01	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	76.2	<0.001	<0.01	<0.01	<0.01	0.12	<2	29.9	0.02	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.03	<0.2	4.67	0.315	<0.01	<0.03	0.022			
	14/12/00	<0.01	<0.05	<0.2	<0.1	0.09	<0.005	<0.1	83.7	<0.001	<0.01	<0.01	<0.01	0.11	<2	35.5	0.024	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	4.56	<0.03	0.356	<0.01	<0.03	0.045			
	13/01/01	<.003	0.11	<.005	<.05	0.211	0.002	<.05	83.5	<.001	<.005	<.005	0.023	0.31	2	<.005	35.7	0.11	<.002	5	0.012	<1	<.01	85	<.03	<.005	5.1	<.01	0.541	0.03	0.043	<.03	<.01
	10/2/2001	<.003	<.05	0.025	0.06	0.216	0.002	<.05	76.2	<.001	<.005	<.005	0.017	0.17	5	<.005	32.6	0.04	<.002	7	<.005	<1	<.01	88	<.03	<.005	4.2	<.01	0.197	<.005	0.021	<.03	<.01
	5/3/2001	<.003	0.696	<.005	0.098	0.243	<.001	<.05	173	0.094	0.282	<.005	0.028	0.146	1.31	<.005	67	19.04	<.002	12	0.425	<1	<.01	244	<.03	<.005	5.2	<.01	1.23	0.01	<.005	<.03	
	10/3/2001	<.003	0.322	0.037	0.081	0.235	<.001	<.05	81	<.001	<.005	<.005	0.016	0.082	<1	<.005	36	0.06	<.002	7	<.005	<1	<.01	44	<.03	<.005	3.9	<.01	0.37	<.005	0.006	<.03	0.03
	16/04/01	<.003	0.05	<.005	<.05	0.107	<.001	<.05	87.3	<.001	<.005	<.005	<.002	0.09	<1	<.005	39.2	0.06	<.002	5	<.005	<1	<.01	44	<.03	<.005	3.8	<.01	0.403	<.005	<.005	<.03	0.03
	14/05/01	<.003	0.48	<.005	<.05	0.217	<.001	<.05	56.4	0.001	0.005	0.006	0.008	0.79	<1	<.005	22.3	0.04	0.003	<1	0.008	<1	0.06	24	<.03	<.005	3.3	<.01	0.217	0.012	0.02	<.03	0.02
	13/06/01	<.003	0.86	<.005	0.12	0.174	<.001	<.05	25.9	<.001	<.005	0.014	0.011	1.57	<1	0.007	6.7	0.77	0.004	3	<.005	<1	<.01	6	<.03	<.005	3.7	0.02	0.101	0.023	<.005	<.03	0.06
	17/06/01	<.003	1.13	<.005	0.07	0.202	<.001	<.05	23.3	<.001	<.005	0.007	0.011	1.55	<1	0.009	8.1	0.12	0.004	4	<.005	<1	<.01	8	<.03	0.014	2.3	<.01	0.106	0.025	<.005	<.03	0.04
	14/07/01	<.003	0.25	0.018	0.07	0.229	<.001	<.05	47.7	<.001	<.005	<.005	0.002	0.33	<1	0.009	17.4	0.02	<.002	12	0.006	<1	0.01	18	<.03	<.005	5.1	<.01	0.218	0.005	<.005	<.03	0.02
	14/08/01	<0.003	0.17	<0.005	<0.05	0.28	<0.001	<0.05	65	<0.001	<0.005	<0.005	0.005	0.2	1	<0.005	26.7	0.02	<0.002	4	0.008	<1	<0.01	26	<0.03	<0.005	5.4	<0.01	0.315	0.006	<0.005	<0.03	0.05
	8/9/2001	<0.003	0.13	0.028	3.16	0.164	<0.001	<0.05	52.7	<0.001	<0.005	0.008	0.028	0.11	1	0.016	19.8	0.02	<0.002	4	<0.005	<1	<0.01	21	<0.03	<0.005	4.8	<0.01	0.233	0.009	<0.005	<0.03	0.03
	17/09/01	<0.003	0.06	<0.005	<0.05	0.175	<0.001	<0.05	48.8	<0.001	<0.005	0.009	0.006	0.05	<1	0.009	19.6	0.02	<0.002	<1	<0.005	<1	<0.01	21	<0.03	<0.005	4.5	<0.01	0.236	<0.005	<0.005	<0.03	0.02
	15/10/01	<0.003	0.15	<0.005	0.15	0.272	<0.001	<0.05	67.7	<0.001	<0.005	<0.005	0.003	0.09	1	0.02	29.5	0.04	<0.002	<1	<0.005	<1	<0.01	32	<0.03	<0.005	5.4	<0.01	0.321	<0.005	<0.005	<0.03	0.05
	13/11/01	<0.003	0.08	<0.005	<0.05	0.152	<0.001	<0.05	70.2	<0.001	<0.005	0.01	0.012	0.12	1	0.028	29.3	0.07	<0.002	4	<0.005	0.08	0.02	32	0.06	<0.005	5	0.14	0.308	<0.005	<0.005	<0.03	0.05
	14/12/01	<0.001	0.07	<0.005	<0.05	0.095	<0.001	<0.05	76.3	<0.001	0.006	<0.005	<0.002	0.11	1	0.014	33.2	0.06	0.003	<1	0.01	<0.01	<0.01	32	<0.03	<0.005	5.1	<0.01	0.312	<0.005	<0.005	<0.03	0.02
	15/01/02	<0.001	0.07	<0.005	<0.05	0.255	<0.001	<0.05	87.5	<0.001	<0.005	<0.005	0.003	0.1	2	39.4	0.06	0.003	6	<0.005	<0.01	<0.01	44	<0.03	0.011	5.5	0.03	0.388	<0.005	<0.005	<0.03	0.03	
	12/2/2002	<0.001	<0.05	<0.005	<0.05	0.195	<0.001	<0.05	91.6	<0.001	<0.005	<0.005	0.016	0.06	2	39.3	0.06	0.003	7	<0.005	0.05	<0.01	41	<0.03	<0.005	5.5	0.02	0.387	<0.005	<0.005	<0.03	0.02	
	12/3/2002	<0.001	0.07	<0.005	0.07	0.303	<0.001	<0.05	100.5	<0.001	<0.005	<0.005	0.005	0.1	2	41.5	0.09	0.004	7	<0.005	0.03	<0.01	46	<0.03	<0.005	5.6	0.01	0.426	<0.005	<0.005	<0.03	0.02	
	21/03/02	<0.001	0.06	<0.005	0.05	0.183	<0.001	<0.05	104.1	<0.001	<0.005	<0.005	<0.002	0.13	2	47.4	0.09	0.003	7	0.007	<0.01	<0.01	55	<0.03	<0.005	6.2	0.03	0.442	<0.005	<0.005	<0.03	0.03	
	15/04/02	<0.001	0.06	<0.005	<0.05	0.162	<0.001	<0.05	100.5	<0.001	<0.005	<0.005	0.003	0.08	2	43.1	0.09	0.003	7	<0.005	<0.01	<0.01	53	<0.03	<0.005	5.2	0.03	0.409	<0.005	<0.005	<0.03	0.03	
	13/05/02	<0.001	1	<0.005	<0.05	0.157	<0.001	<0.05	47.2	<0.001	<0.005	0.007	0.008	1.62	2	17.9	0.08	<0.002	3	<0.005	<0.01	<0.01	19	<0.03	<0.005	5	0.02	0.183	0.027	<0.005	<0.03	0.05	
	16/06/02	<0.2	0.213	<0.003	<0.05	0.178	0.2	<0.01	31.1	<0.2	<0.001	0.004	0.007	0.326	0.8	0.006	10.7	0.026	<0.001	2.9	0.002	0.07	<0.002	11.9	<0.002	<0.005	4.1	<0.002	0.134	0.005	<0.001	<0.03	0.016
	25/06/02	0.9	0.175	<0.003	0.09	0.177	0.3	<0.01	54.1	<0.2	0.001	0.004	0.012	0.201	1.1	0.004	15.9	0.032	<0.001	2.7	0.005	<0.01	0.01	32.6	<0.002	<0.005	4.6	<0.002	0.219	0.002	<0.001	<0.03	0.042
	16/07/02	0.7	0.158	0.004	<0.05	0.213	0.4	<0.01	82.3	1.9	0.003	0.005	0.016	0.149	1.3	0.003	23.3	0.039	<0.001	3.5	0.004	0.04	0.006	62.8	0.015	<0.005	4.7	0.002	0.317	0.002	<0.001	<0.03	0.041
	12/8/2002	0.3	0.096	0.013	0.07	0.151	0.3	<0.01	94	<0.2	0.002	0.01	0.016	0.09	1.5	0.005	27.3	0.037	<0.001	5.5	<0.001	0.09	0.009	73.5	<0.002	<0.005	4.2	<0.002	0.411	<0.001	<0.001	<0.03	0.025
	16/09/02	0.6	0.062	<0.003	0.09	0.151	<0.2	<0.01	48	<0.2	<0.001	0.004	0.021	0.105	0.9	0.004	16.7	0.026	0.002	2.8	0.002	<0.01	0.006	19.5	<0.002	<0.005	4.5	0.002	0.189	<0.001	<0.001	<0.03	0.021
	27/09/02	<0.2	0.125	0.014	0.07	0.169	<0.2	0.02	51	<0.2	0.001	0.005	0.021	0.155	1	0.005	18.7	0.024	0.002	2.9	0.003	0.02	0.006	20.4	0.01	<0.005	4.5	0.028	0.214	0.002	<0.001	<0.03	0.021
	15/10/02	0.5	0.1	<0.003	0.14	0.161	<0.2	0.02	59.2	0.2	<0.001	0.007	0.025	0.161	1.4	0.005	21.6	0.028	0.002	4.9	0.004	0.22	0.004	24.3	<0.002	<0.005	4.8	0.004	0.24	0.001	0.001	<0.03	0.058
	12/11/2002	<0.2	0.069	<0.003	0.12	0.138	<0.2	0.01	75.3	<0.2	<0.001	0.002	0.024	0.094	1.3	0.003	28.5	0.038	0.003	5.4	0.002	0.01	0.005	33.4	0.005	<0.005	5.4	0.011	0.316	<0.001	0.001	<0.03	0.02
	10/12/2002	0.4	0.06	0.009	0.12	0.141	0.2	<0.01	77.8	<0.2	<0.001	<0.001	0.023	0.171	1.6	0.006	33.2	0.045	0.002	4.6	0.003	<0.01	0.007	39.4	0.018	<0.005	6.1	<0.002	0.321	0.001	<0.001	<0.03	0.036
	15/12/02	<0.2	0.089	<0.003	0.21	0.157	<0.2	<0.01	76.2	1.1	<0.001	0.001	0.014	0.216	1.4	0.002	30.9	0.04	0.002	4.1	0.001	<0.01	<0.002	35.8	<0.002	<0.005	5.1	0.006	0.311	0.002	<0.001	<0.03	0.054
VGMAIN	17/03/98	<.003	0.08	<.02	<.05	0.162	<.001	<.04	73.2	<.002	<.005	0.018	0.013	0.11	<1	<.005	31.4	0.01	<.002	6	0.01	<.04	<.02	107	<.03	<.03	3.9	<.01	0.342	<.005	0.015	<.03	0.05
	14/04/98	<.003	0.11	<.02	<.05	0.18	<.001	<.04	67.1	<.002	<.005	0.027	0.038	0.1	<1	<.005	28	0.02	0.004	6	0.009	<.04	<.02	32	<.03	<.03	3.9	<.01	0.342	0.007	<.005	<.03	0.32
	19/05/98	<.003	0.67	<.02	0.2	0.059	<.001	<.04	21.6	<.002	<.005	0.028	0.035	1.11	1	<.005	7.6	0.04	<.002	2	0.011	0.79	<.02	7	0.04	<.03	3	<.01	0.097	0.009	<.005	<.03	0.08
	30/06/98	<.003	<.05	<.02	<.05	0.144	<.001	<.04	27.9	<.002	<.005	0.027	0.008	<.01	<1	<.005	9.6	<.01	0.003	3	<.005	2.49	<.02	13	<.03	<.03	4	<.01	0.14	0.011	<.005	<.03	0.03
	21/07/98	<.003	<.05	<.02	<.05	0.121	<.001	<.04	37.6	<.002	<.005	0.037	0.03	<.01	<1	0.015	13.3	<.01	<.002	4	0.006	<.04	<.02	8	<.03	<.03	2.8	<.01	0.181	<.005	<.005	<.03	0.04
	15/09/98	<.003	<.05	<.02	<.05	0.096	<.001	<.04	27.4	<.002	<.005	<.005	0.015	0.04	1	<.005	9.6	<.01	0.007	3	<.005	<.04	<.02	11.4	<.03	<.03	2.9	<.01	0.14	0.016	<.005	<.03	0.01
	19/10/98	<.003	0.09	<.02	0.11	0.055	<.001	<.04	39.1	<.002	<.005	<.005	0.013	0.08	<1	<.005	14	<.01	<.002	4	0.01	2.22	<.02	16	<.03	<.03	3	<.01	0.183	0.022	0.006	<.03	0.03
	17/11/98	<.003	<.05	<.005	<.05	0.168	<.001	<.04	65.5	<.001	<.005	0.023	0.019	0.05	2	<.005	27.2	<.01	0.007	6	<.005	1.08	<.01	29	<.03	<.03	3.4	<.01	0.278	0.009	<.005	<.03	0.04
	31/12/98	<.003	0.13	<.005	0.24	0.095	<.001	<.04	78.4	<.001	<.005	<.005	0.047	0.17	2	<.005	42.6	<.01	0.007	7	0.012	<.04	<.01	50	<.03	<.03	3.9	<.01	0.446	0.012	<.005	<.03	0.02
	20/04/99	<.003	0.06	<.005	0.14	0.074	<.001	<.04	55.5	0.002	<.005	<.005	0.014	0.03	1	<.005	26.2	0.02	0.011	5	<.005	0.6	<.01	36	<.03	<.03	3	<.01	0.274	0.014	<.005	<.03	0.02
	18/05/99	<.003	0.74	<.005	<.05	0.137	0.002	<.04	25.8	<.001	<.005	<.005	0.021	1.48	1	0.007	8.6	0.05	0.04	2	0.007	0.74	<.01	<.03	<.03	3.3	<.01	0.129	<.005	<.005	<.03	0.08	
	20/06/99	<.003	0.65	<.005	0.06	0.105	<.001	<.04	10.5	0.002	<.005	0.049	0.009	1.78	1	0.007	3.8	0.02	<.002	2	<.005	1.92	<.01	3	<.03	<.03	2.8	<.01	0.084	0.02	<.005	<.03	0.12
	29/07/99	<.0001	0.11	<.001	0.02	0.0327	<.0001	<.001	20.08	<.0001	<.0002	0.009	0.0166	0.206	0.4	<.0002	6.65	0.005	<.0001	1.3	0.002	0.061	0.005	5.1	<.001	<.001	3.09	<.0004	0.0708	0.0047	<.0002	<.001	0.024
	12/10/1999	<.003	0.1	0.005	<.05	0.149	<.001	<.04	36.8	0.002	0.005	<.005	0.022	0.15	2	0.006	12.5	<.01	<.002	4	0.018	<.04	<.01	14	<.03	<.005	3.9	<.01	0.17	0.018	<.005	<.03	0.03
	27/04/00	<.003	0.21	<.005	<.05	0.203	<.001	0.05	52.8	<.001	<.005	<.005	0.018	0.17	1	<.005	22	0.11	<.002	4	0.011	<1	<.01	<.03	<.005	3.7	<.01	0.257	0.035	0.008	<.03	0.03	
	15/05/00	<.003	0.27	<.005	<.05	0.125	<.001	<.05	44.4	<.001	0.005	0.171	0.01	0.28	1	0.027	16.4	<.01	<.002	<1	<.005	<1	<.01	<.03	<.005	4.3	<.01	0.303	0.016	<.005	<.03	0.1	
	20/06/00	<.003	0.19	<.005	<.05	0.168	0.001	<.05	16.8	<.001	<.005	<.005	0.009	0.2	<1	<.005	5.6	<.01	<.002	2	<.005	<1	<.01	<1	<.03	<.005	2.7	<.01	0.121	0.015	<.005	<.03	<.01
	25/07/00	<.003	<.05	<.005	<.05	0.123	0.001	<.05	24.4	0.003	0.024	<.005	0.012	0.62	3	0.127	7.6	0.02	<.002	3	0.028	2	<.01	<.03	<.005	3.4	<.01	0.229	0.021	0.038	<.03	0.06	
	29/08/00	<.003	0.32	<.005	<.05	0.108	<.001	<.05	33.4	<.001	<.005	<.005	<.002	0.64	1	<.005	10.2	0.02	<.002	3	0.01	<1	<.01	<.03	<.005	4.7	<.01	0.14	0.011	0.007	<.03	0.11	
	26/09/00	<0.01	0.37	<0.2	<0.1	0.06	<0.005	<0.1	37	<0.001	<0.01	<0.01	<0.01	0.58	<2	10.9	0.021	<0.01	<2	<0.05	<0.3	<0.05	<0.2	<0.2	4.54	<0.03	0.14	0.01	<0.03	0.05			
	29/10/00	<.003	0.38	<.005	<.05	0.225	0.002	<.05	57.2	0.001	<.005	0.029	0.042	1.01	4	<.005	20.6	0.03	<.002	6	<.005	5	<.01	81	<.03	<.005	5.1	<.01	0.246	0.048	<.005	<.03	0.05
	13/11/00	<0.003	0.08	<0.005	<0.05	0.152	<0.001	<0.05	70.2	<0.001	<0.005	0.01	0.012	0.12	1	0.028	29.3	0.07	<0.002	4	<0.005	0.08	0.02	32	0.06	<0.005	5	0.14	0.308	<0.005	<0.005	<0.03	0.05
	18/11/00	<0.01	0.08	<0.2	<0.1	0.09	<0.005	<0.1	74.2	<0.001	<0.01	<0.01	<0.01	0.1	<2	25.9	0.005	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.03	<0.2	4.82	0.294	<0.01	<0.03	0.048			
	14/12/00	<0.01	<0.05	<0.2	<0.1	0.09	<0.005	<0.1	76.5	<0.001	<0.01	<0.01	<0.01	0.06	<2	28	0.005	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	4.54	<0.03	0.321	<0.01	<0.03	0.023			
	13/01/01	<.003	0.1	<.005	<.05	0.187	0.002	<.05	67.6	<.001	<.005	0.139	0.025	0.4	3	<.005	25.4	0.09	<.002	4	0.021	<1	<.01	59	<.03	<.005	4.4	<.01	0.356	0.022	0.024	<.03	0.04
	10/2/2001	<.003	<.05	<.005	<.05	0.202	0.002	<.05	69	<.001	0.024	<.005	0.009	0.08	3	0.073	26.2	0.04	<.002	6	<.005	<1	<.01	71	<.03	<.005	4.2	<.01	0.183	<.005	<.005	<.03	0.01

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Total Metals

Station	Date	AG-T	AL-T	AS-T	B-T	BA-T	BE-T	BI-T	CA-T	CD-T	CO-T	CR-T	CU-T	FE-T	K-T	LA-T	MG-T	MN-T	MO-T	NA-T	NI-T	P-T	PB-T	S-T	SB-T	SE-T	SI-T	SN-T	SR-T	TI-T	V-T	W-T	ZN-T
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	10/3/2001	<.003	0.307	<.005	0.09	0.272	<.001	<.05	76	<.001	<.005	<.005	0.015	0.017	<1	<.005	29	<.01	<.002	7	<.005	<1	<.01	41	<.03	<.005	4.1	<.01	0.34	<.005	0.013	<.03	0.05
	16/04/01	<.003	0.09	<.005	<.05	0.142	<.001	<.05	82	<.001	<.005	<.005	0.01	0.06	<1	0.005	31.8	<.01	<.002	6	<.005	<1	<.01	40	<.03	<.005	4.1	<.01	0.368	0.005	<.005	<.03	0.06
	14/05/01	<.003	0.2	<.005	<.05	0.22	<.001	<.05	59.4	<.001	0.007	0.006	0.01	0.24	2	<.005	21.2	<.01	0.005	<1	<.005	<1	<.01	26	<.03	<.005	3.1	<.01	0.231	<.005	0.013	<.03	0.05
	17/06/01	<.003	1.03	<.005	0.07	0.178	<.001	<.05	18.3	<.001	<.005	<.005	0.023	0.98	<1	0.065	5.9	0.08	0.003	3	<.005	<1	<.01	7	<.03	<.005	1.8	<.01	0.081	0.016	<.005	<.03	0.08
	14/07/01	<.003	0.17	<.005	0.07	0.226	<.001	<.05	39.2	<.001	<.005	<.005	<.002	0.1	<1	<.005	12.8	<.01	<.002	3	<.005	<1	<.01	16	<.03	<.005	4.9	0.03	0.182	<.005	<.005	<.03	<.01
	14/08/01	<0.003	0.09	<0.005	<0.05	0.223	<0.001	<0.05	56.3	<0.001	<0.005	<0.005	0.011	0.08	1	<0.005	21.4	<0.01	0.003	5	<0.005	<1	<0.01	25	<0.03	<0.005	5.3	0.02	0.26	<0.005	<0.005	<0.03	<0.01
	17/09/01	<0.003	0.06	0.009	<0.05	0.179	<0.001	<0.05	40.2	<0.001	<0.005	<0.005	0.005	0.03	<1	0.005	14.8	<0.01	<0.002	2	<0.005	<1	<0.01	18	<0.03	<0.005	4.3	<0.01	0.194	<0.005	<0.005	<0.03	0.02
	15/10/01	<0.003	0.06	<0.005	0.13	0.235	<0.001	<0.05	54.6	<0.001	<0.005	<0.005	0.003	<0.01	1	0.016	21.9	<0.01	<0.002	2	<0.005	<1	<0.01	26	<0.03	<0.005	5.2	<0.01	0.258	<0.005	<0.005	<0.03	0.04
	13/11/01	<0.003	0.1	<0.005	<0.05	0.144	<0.001	<0.05	60.4	0.001	<0.005	0.018	0.015	0.09	1	0.024	23.9	0.07	<0.002	3	<0.005	0.02	0.04	29	0.04	<0.005	5	0.07	0.267	<0.005	<0.005	<0.03	0.04
	14/12/01	<0.001	0.11	<0.005	<0.05	0.083	<0.001	<0.05	65.7	<0.001	<0.005	<0.005	<0.002	0.07	<1	0.017	25.7	0.03	<0.002	2	<0.005	0.03	<0.01	28	<0.03	<0.005	4.6	<0.01	0.261	<0.005	<0.005	<0.03	0.04
	15/01/02	<0.001	0.29	<0.005	<0.05	0.234	<0.001	<0.05	73.6	<0.001	<0.005	<0.005	0.046	0.05	1	29.8	0.02	0.003	5	<0.005	<0.01	<0.01	38	<0.03	<0.005	5	<0.01	0.328	<0.005	<0.005	<0.03	0.05	
	12/2/2002	<0.001	<0.05	<0.005	<0.05	0.201	<0.001	<0.05	80.4	<0.001	<0.005	<0.005	<0.002	<0.01	1	30	0.02	0.002	6	<0.005	0.04	<0.01	35	<0.03	<0.005	5.3	0.03	0.329	<0.005	<0.005	<0.03	0.03	
	15/04/02	<0.001	0.09	<0.005	<0.05	0.171	<0.001	<0.05	91	<0.001	<0.005	<0.005	0.004	<0.01	2	34	0.02	0.003	6	<0.005	0.02	<0.01	47	<0.03	<0.005	5.1	0.04	0.354	<0.005	<0.005	<0.03	0.04	
	13/05/02	<0.001	0.91	<0.005	<0.05	0.145	<0.001	<0.05	45.9	0.002	<0.005	0.007	0.007	1.46	2	16.5	0.05	<0.002	4	0.01	<0.01	0.02	20	<0.03	<0.005	4.5	<0.01	0.175	0.022	<0.005	<0.03	0.05	
	16/06/02	0.6	0.129	<0.003	<0.05	0.178	<0.2	<0.01	27	<0.2	<0.001	0.005	0.018	0.108	0.8	0.003	8.3	0.019	<0.001	2.4	0.002	0.06	0.004	11	0.002	<0.005	3.7	0.006	0.111	0.002	<0.001	<0.03	0.051
	16/07/02	0.4	0.119	0.005	<0.05	0.219	0.5	<0.01	91.4	1.3	0.002	0.003	0.015	0.029	1.3	0.004	22.9	0.024	0.002	2.8	0.009	0.04	<0.002	75.2	0.005	<0.005	4.7	<0.002	0.373	<0.001	0.002	<0.03	0.054
	12/8/2002	<0.2	0.076	<0.003	0.07	0.156	<0.2	<0.01	108.9	<0.2	0.001	0.007	0.104	0.032	1.5	0.004	25.3	0.022	0.005	6.4	0.004	<0.01	0.009	89.8	0.003	<0.005	4	<0.002	0.434	<0.001	<0.001	<0.03	0.046
	16/09/02	<0.2	0.054	<0.003	0.08	0.154	<0.2	<0.01	41.2	0.7	0.001	0.002	0.014	0.052	0.9	0.005	12.8	0.012	0.002	2.8	<0.001	<0.01	<0.002	18.2	<0.002	<0.005	4.4	<0.002	0.162	<0.001	<0.001	<0.03	0.03
	15/10/02	1.2	0.064	<0.003	0.13	0.141	<0.2	<0.01	52.5	0.6	0.001	0.009	0.027	0.091	1	0.005	17.6	0.012	<0.001	3.9	0.003	<0.01	<0.002	23.1	<0.002	<0.005	4.7	0.007	0.211	0.001	<0.001	<0.03	0.073
	12/11/2002	0.2	0.049	<0.003	0.14	0.13	<0.2	<0.01	66.7	0.4	<0.001	0.003	0.013	0.021	1.1	0.004	23	0.014	<0.001	4.5	<0.001	<0.01	0.004	31.3	0.005	<0.005	5	0.003	0.268	<0.001	<0.001	<0.03	0.03
	10/12/2002	0.6	0.037	0.011	0.11	0.139	0.2	<0.01	65.8	0.3	<0.001	0.002	0.022	0.04	1.3	0.004	26.5	0.017	0.002	3.8	0.003	<0.01	0.008	34	<0.002	<0.005	5.6	<0.002	0.278	<0.001	<0.001	<0.03	0.076
V25BSP																																	
	6/1/1998	<.003	1.31	<.02	0.23	0.116	<.001	<.04	131.8	<.002	<.005	<.005	0.062	2.71	<1	<.005	38.9	0.27	0.006	9	<.005	<.04	0.08	162	0.03	<.03	3.8	<.01	0.91	0.025	<.005	<.03	0.32
	12/1/1998	<.003	<.05	0.03	<.05	0.107	<.001	<.04	95.2	<.002	0.032	<.005	0.017	0.04	<1	<.005	23.9	0.14	<.002	6	<.005	<.04	<.02	103	<.03	<.03	3.4	<.01	0.524	<.005	<.005	<.03	0.39
	18/05/98	<.003	4.59	0.04	0.14	0.131	<.001	<.04	26.5	<.002	<.005	0.024	0.055	8.3	2	<.005	8	0.13	<.002	3	0.042	<.04	0.02	21	0.08	<.03	7.9	<.01	0.149	0.128	0.014	<.03	0.13
	31/05/98	<.003	0.44	<.02	<.05	0.132	0.002	<.04	47.3	<.002	0.007	0.028	0.027	0.79	1	0.018	11	0.04	<.002	3	<.005	<.04	0.02	23	<.03	<.03	3.4	<.01	0.238	0.022	0.009	<.03	0.13
	30/06/98	<.003	<.05	<.02	<.05	0.199	<.001	<.04	67.8	<.002	<.005	0.04	0.018	<.01	2	<.005	16.5	<.01	0.005	7	<.005	1.84	<.02	78	<.03	<.03	4.2	<.01	0.387	0.014	<.005	<.03	0.08
	11/8/1998	<.003	0.16	<.02	0.27	0.041	<.001	<.04	74.7	<.002	<.005	<.005	0.049	0.03	<1	0.007	17.3	<.01	<.002	6	<.005	3.05	<.02	83	0.03	<.03	3.5	<.01	0.374	<.005	0.009	<.03	0.14
	18/05/99	<.003	5.26	<.005	<.05	0.225	0.002	<.04	29.1	<.001	<.005	<.005	0.074	9.34	3	<.005	7.4	0.27	0.013	3	0.024	1.68	0.13	<.03	<.03	8.4	<.01	0.15	0.124	0.019	<.03	0.19	
	27/05/99	<.003	6.93	0.011	<.05	0.215	<.001	<.04	32.3	0.009	<.005	<.005	0.052	11.65	3	<.005	9	0.15	0.005	4	0.015	<.04	0.07	<.03	<.03	10.6	<.01	0.161	0.23	0.006	<.03	0.1	
	3/7/1999	<.003	1.01	<.005	0.42	0.058	<.001	<.04	23.5	0.008	<.005	<.005	0.023	1.79	2	0.026	4.6	0.02	0.006	1	<.005	<.04	<.01	13	<.03	<.03	6.1	<.01	0.142	<.005	<.005	<.03	0.06
	12/8/1999	<.003	<.05	<.005	0.06	0.146	<.001	<.04	55.6	<.001	0.049	<.005	0.026	0.04	<1	<.005	11.7	0.26	<.002	3	<.005	<.04	<.01	50	<.03	<.005	7.9	<.01	0.275	<.005	<.005	<.03	0.38
	10/9/1999	<.003	0.2	<.005	<.05	0.119	<.001	<.04	41.7	0.002	0.043	0.017	0.044	0.03	2	0.032	8.7	0.33	0.007	4	0.011	0.52	<.01	45	<.03	<.005	4.3	<.01	0.195	0.009	<.005	<.03	0.27
	20/06/00	<.003	0.25	<.005	0.05	0.184	0.002	<.05	47.8	<.001	<.005	<.005	0.025	0.12	3	<.005	11.2	0.07	<.002	5	0.012	<1	0.03	<1	<.03	<.005	6.1	<.01	0.251	0.016	<.005	<.03	0.31
	25/07/00	<.003	0.25	<.005	<.05	0.155	0.001	<.05	33.1	<.001	0.03	0.542	0.023	0.72	3	0.12	6.5	0.04	<.002	4	0.024	2	<.01	<.03	<.005	4.8	<.01	0.288	0.023	0.053	<.03	0.11	
	29/08/00	<.003	2	<.005	<.05	0.17	<.001	<.05	36.6	<.001	<.005	<.005	0.011	3.32	2	<.005	7	0.08	<.002	4	0.012	<1	0.02	<.03	<.005	8.4	<.01	0.156	0.065	0.031	<.03	0.19	
	25/09/00	<0.01	0.29	<0.2	<0.1	0.06	<0.005	<0.1	36.3	<0.001	<0.01	<0.01	<0.01	0.34	<2	6.2	0.064	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	5.58	<0.03	0.146	0.01	<0.03	0.108			
	29/10/00	<.003	0.62	<.005	<.05	0.248	0.001	<.05	42.9	<.001	<.005	0.012	0.054	0.8	4	<.005	9	0.09	<.002	7	<.005	1	<.01	21	<.03	<.005	6.1	<.01	0.199	0.053	<.005	<.03	0.11
	18/11/00	<0.01	0.17	<0.2	<0.1	0.07	<0.005	<0.1	50.6	<0.001	<0.01	<0.01	0.01	0.1	<2	10	0.015	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.03	<0.2	5.72	0.201	<0.01	<0.03	0.098			
	14/12/00	<0.01	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	56.5	<0.001	<0.01	<0.01	<0.01	0.1	<2	10.1	<0.005	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	5.65	<0.03	0.234	<0.01	<0.03	0.092			
	14/05/01	<.003	0.1	<.005	<.05	0.208	<.001	<.05	67.4	<.001	<.005	<.005	0.01	0.03	3	<.005	12.9	0.02	<.002	2	<.005	<1	<.01	39	<.03	<.005	3.8	<.01	0.244	<.005	<.005	<.03	0.06
	17/06/01	<.003	9.63	<.005	0.09	0.384	<.001	<.05	23.7	<.001	<.005	0.019	0.041	15.05	3	0.011	7.1	0.17	<.002	4	<.005	<1	0.23	7	0.04	<.005	13.7	0.06	0.113	0.283	0.016	0.06	0.11
	14/07/01	<.003	0.61	0.022	0.09	0.238	<.001	<.05	33	<.001	<.005	<.005	0.012	0.69	1	<.005	5.8	<.01	<.002	3	0.006	<1	0.01	13	<.03	<.005	5.8	0.12	0.169	0.015	<.005	<.03	0.06
	14/08/01	<0.003	0.16	<0.005	<0.05	0.304	<0.001	<0.05	52.1	<0.001	<0.005	<0.005	0.017	0.07	1	<0.005	9.9	0.01	0.002	7	<0.005	<1	<0.01	30	<0.03	<0.005	6.2	<0.01	0.252	<0.005	<0.005	<0.03	0.06
	17/09/01	<0.003	0.14	<0.005	<0.05	0.215	<0.001	<0.05	52.8	<0.001	<0.005	<0.005	0.008	0.1	1	0.009	10.4	<0.01	<0.002	3	<0.005	<1	<0.01	35	<0.03	<0.005	5.6	<0.01	0.249	<0.005	<0.005	<0.03	0.09
	15/10/01	<0.003	0.1	<0.005	0.11	0.261	<0.001	<0.05	50.8	<0.001	<0.005	<0.005	0.004	<0.01	1	0.018	10	<0.01	<0.002	3	<0.005	<1	<0.01	31	0.04	<0.005	4.8	<0.01	0.232	0.005	<0.005	<0.03	0.05
	13/05/02	<0.001	0.35	<0.005	<0.05	0.166	<0.001	<0.05	53.4	0.001	<0.005	<0.005	0.016	0.31	2	10.5	0.03	<0.002	5	<0.005	0.08	0.01	34	<0.03	<0.005	3.6	<0.01	0.205	0.01	<0.005	<0.03	0.34	
	16/06/02	<0.2	0.374	<0.003	<0.05	0.198	<0.2	<0.01	37	<0.2	<0.001	0.006	0.015	0.373	1.2	0.006	6.4	0.033	0.002	3	<0.001	0.06	0.017	18	<0.002	<0.005	5	<0.002	0.155	0.01	0.001	<0.03	0.081
	25/06/02	42.7	0.4	0.016	0.13	0.217	0.5	<0.01	174	12.7	0.005	0.019	0.02	0.601	2.5	0.002	32.5	0.311	0.003	5.2	0.007	<0.01	0.014	180.8	<0.002	<0.005	3.8	0.007	0.741	0.009	0.001	<0.03	0.149
	9/7/2002	0.6	0.148	0.008	0.81	0.174	0.4	<0.01	237.2	0.2	<0.001	0.013	0.008	0.181	2.8	<0.001	37.7	0.077	0.011	6.4	0.004	<0.01	0.019	225.9	0.006	<0.005	3.2	<0.002	0.897	0.002	0.002	<0.03	0.085
	16/07/02	1.6	0.121	0.008	0.05	0.173	0.7	<0.01	227.3	0.6	0.004	0.011	0.017	0.032	3	<0.001	43.9	0.129	0.005	6.2	0.002	0.05	0.012	237.3	0.059	<0.005	3.1	<0.002	0.896	0.001	0.001	<0.03	0.098
	23/07/02	<0.2	0.071	0.004	0.38	0.159	0.3	<0.01	232.9	<0.2	0.006	0.011	0.008	0.127	3.4	<0.001	47.1	0.127	0.006	7.9	0.008	<0.01	0.017	254.5	0.007	<0.005	3	<0.002	0.987	<0.001	<0.001	<0.03	0.098
	6/8/2002	<0.2	0.061	0.006	0.2	0.113	0.5	<0.01	252.2	0.5	<0.001	<0.001	0.004	0.039	3.4	<0.001	51.6	0.107	0.002	4.8	<0.001	<0.01	<0.002	262.4	0.006	<0.005	3.2	<0.002	1.023	<0.001	0.003	<0.03	0.082
	12/8/2002	0.5	0.151	0.022	0.08	0.104	<0.2	<0.01	252	0.7	0.002	0.003	0.011	0.08	3.4	<0.001	44.3	0.075	0.005	9.1	0.005	0.03	0.006	258	0.004	<0.005	3.1	0.003	1.038	0.003	0.002	<0.03	0.067
	20/08/02	<0.2	0.084	<0.003	0.23	0.117	0.3	<0.01	232.3	0.5	0.003	0.007	0.004	0.104	3.5	0.002	45.4	0.11	<0.001	5.5	<0.001	<0.01	<0.002	258.2	<0.002	<0.005	2.9	<0.002	1.068	0.004	<0.001	<0.03	0.062
	27/08/02	0.3	0.098	<0.003	0.08	0.123	<0.2	<0.01	213.2	0.4	0.002	0.004	0.022	0.1	3.7	<0.001	40.8	0.074	<0.001	6.6	0.003	0.06	<0.002	230.4	0.012	<0.005	3.5	<0.002	0.949	0.002	0.001	<0.03	0.184
	16/09/02	0.2	0.084	0.005	0.08	0.131	<0.2	<0.01	170.8	0.6	0.006	<0.001	0.023	0.019	2.8	<0.001	31.6	0.063	0.002	5.8	0.003	<0.01	0.006	161.7	0.011	<0.005	4.7	<0.002	0.671	<0.001	0.002	<0.03	0.14
	15/10/02	1	0.117	0.003	0.14	0.138	<0.2	0.02	164.7	1	0.011	0.003	0.025	0.021	2.7	0.004	31.2	0.098	0.002	7.8	0.005	<0.01	0.01	154	0.019	<0.005	4.8	<0.002	0.661	<0.001	0.002	<0.03	0.174
	12/11/2002	<0.2	0.404	0.007	0.12	0.121	<0.2	<0.01	126.4	0.4	0.015	0.007	0.03	0.367	2.4	0.004	24.1	0.146	0.002	8.5	0.003	0.02	0.027	99.8	<0.002	<0.005	6.8	0.008	0.462	0.008	<0.001	<0.03	0.213
V27																																	
	29/05/98	<.003	0.2	<.02	<.05	0.104	0.002	<.04	6.3	<.002	0.008	0.033	0.01	0.53	<1	0.006	2	0.02	<.002	<1	<.005	0.3	<.02	15	<.03	<.03	2.6	<.01	0.032	0.012	0.008	<.03	0.09
	29/06/98	<.003	<.05	<.02	<.05	0.139	<.001	<.04	12.8	<.002	<.005	<.005	0.006	0.01	<1	<.005	2.9	<.01	<.002	2	<.005	1.66	<.02	14	<.03	<.03	4	<.01	0.076	0.007	<.005	<.03	0.05
	14/09/98	<.003	0.13	<.02	<.05	0.089	<.001	<.04	16.4	<.002	0.006	0.027	0.021	0.08	<1	<.005	3.6	<.01	0.005	3	<.005	<.04	<.02	6.1	<.03	<.03	4.5	<.01	0.094	0.011	<.005	<.03	0.04
	16/03/99	<.003	0.25	<.005	0.22	0.081	<.001	<.04	42.9	<.001	<.005	0.069	0.024	0.07	<1	<.005	10.3	<.01	<.002	4	<.005	0.39	<.01	15	<.03	<.03	4.2	<.01	0.197	<.005	<.005	<.03	0.07
	18/06/99	<.003	0.19	<.005	0.11	0.1	<.001	<.04	5.9	<.001	<.005	0.227	0.015	0.5	<1	<.005	1.5	<.01	<.002	2	<.005	0.08	<.01	1	0.06	<.03	1.8	<.01	0.053	0.007	0.012	<.03	0.06
	29/07/99	<.0001	0.08	<.001	0.02	0.0289	<.0001	<.001	10.73	0.0002	<.0002	<.0002	0.0261	0.17	0.3	<.0002	2.6	0.005	<.0001	1.1	0.004	<.002	<.001	3.1	<.001	<.001	3.73	<.0004	0.0464	0.0039	<.0002	<.001	0.04
	31/08/99	<.0001	0.048	<.001	0.057	0.0366	<.0001	<.001	14.778	0.0009	<.0002	<.0002	0.0076	0.134	0.42	<.0002	3.355	0.0032	<.0001	2.42	0.0009	<.002	<.001	5.68	<.001	<.001	3.442	<.0004	0.0703	0.0058	<.0002	<.001	0.0283
	12/10/1999	<.003	0.08	<.005	<.05	0.13	<.001	<.04	21.5	<.001	<.005	<.005	0.018	0.2	<1	<.005	4.9	<.01	<.002	3	<.005	<.04	<.01	8	<.03	<.005	4	<.01	0.111	0.012	<.005	<.03	0.07
	25/03/00	<.003	0.06	<.005	0.08	0.213	<.001	<.05	41.2	<.001	0.034	<.005	<.002	0.02	3	<.005	10.4	<.01	<.002	8	<.005	<1	<.01	17	<.03	<.005	4.1	<.01	0.218	<.005	<.005	<.03	0.04
	20/06/00	<.003	0.19	<.005	<.05	0.138	0.001	<.05	8.2	<.001	<.005	<.005	0.007	0.2	1	<.005	1.9	<.01	<.002	2	<.005	2	<.01	<1	<.03	<.005	2.2	<.01	0.092	0.009	<.005	<.03	0.04
	12/9/2000	<.003	0.12	<.005	<.05	0.126	<.001	<.05	26.7	0.003	<.005	<.005	0.008	0.23	<1	<.005	5.3	<.01	<.002	3	0.013	<1	0.01	<.03	<.005	3.3	<.01	0.068	<.005	<.005	<.03	0.04	
	7/6/2001	<.003	0.8	<.005	0.09	0.156	<.001	<.05	9.8	<.001	<.005	0.182	0.017	1.37	<1	<.005	3.1	0.08	<.002	<1	<.005	<1	0.02	5	<.03	<.005	2.4	<.01	0.044	0.018	<.005	<.03	0.05
	25/06/02	<0.2	0.224	0.007	0.07	0.185	0.3	<0.01	53.1	2.9	0.003	0.01	0.029	0.261	1.1	<0.001	10.9	0.038	0.003	2.1	0.006	0.05	0.011	41.9	0.002	<0.005	4.1	0.003	0.217	0.001	<0.001	<0.03	0.175
	27/09/02	<0.2	0.063	0.009	0.09	0.142	<0.2	0.03	28	<0.2	0.001	0.002	0.017	0.183	0.6	0.005	7.1	0.013	0.001	1.9	0.004	<0.01	0.006	14.5	0.017	<0.005	4.4	0.028	0.116	<0.001	<0.001	<0.03	0.107

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
V1																																	
	31/12/98	<.003	<.05	<.005	<.05	0.011	<.001	<.04	16.6	<.001	0.013	<.005	<.002	<.01	<1	<.005	3.3	<.01	0.014	2	<.005	<.04	<.01	4	<.03	<.03	3.7	<.01	0.114	<.005	<.005	<.03	<.01
	17/03/99	<.003	<.05	<.005	0.08	0.005	<.001	<.04	17.1	<.001	<.005	0.48	0.007	<.01	<1	<.005	2.9	<.01	<.002	3	<.005	<.04	<.01	5	<.03	<.03	3.7	<.01	0.075	<.005	<.005	<.03	<.01
	18/06/99	<.003	<.05	<.005	<.05	<.002	<.001	<.04	2.7	<.001	<.005	<.005	<.002	0.07	<1	<.005	0.7	<.01	<.002	<1	<.005	<.04	<.01	1	<.03	<.03	0.1	<.01	0.04	<.005	<.005	<.03	<.01
	29/07/99	<.0001	0.05	<.001	0.05	0.008	<.0001	<.001	2.78	<.0001	<.0002	0.007	0.0014	0.014	0.2	0.0003	0.58	0.001	<.0001	1	0.002	<.002	<.001	1.9	<.001	<.001	3.23	<.0004	0.027	0.001	<.0002	<.001	0.002
	31/08/99	<.0001	0.006	<.001	0.075	0.0035	<.0001	<.001	7.725	<.0001	<.0002	<.0002	0.001	<.001	0.2	<.0002	0.668	<.0004	0.0002	2.32	<.0002	<.002	<.001	2.48	<.001	<.001	3.538	<.0004	0.0282	0.0014	<.0002	<.001	<.0004
	12/10/1999	<.003	<.05	<.005	<.05	0.002	<.001	<.04	5.2	<.001	<.005	<.005	<.002	<.01	<1	<.005	1.1	<.01	<.002	2	<.005	<.04	<.01	3	<.03	<.005	3	<.01	0.034	<.005	<.005	<.03	<.01
	20/06/00	<.003	<.05	<.005	<.05	0.006	<.001	<.05	2	<.001	<.005	<.005	<.002	0.13	1	<.005	1.4	<.01	<.002	2	<.005	<1	<.01	1	<.03	<.005	2.1	<.01	<.002	<.005	0.006	<.03	<.01
	12/9/2000	<.003	<.05	<.005	<.05	0.011	<.001	<.05	8.5	<.001	<.005	<.005	<.002	<.01	<1	<.005	1	<.01	<.002	4	0.005	4	<.01	3	<.03	<.005	3	<.01	0.004	<.005	<.005	<.03	<.01
	5/3/2001	<.003	<.05	<.005	0.07	0.13	<.001	<.05	20	<.001	<.005	<.005	<.002	<.01	<1	<.005	4	0.01	<.002	5	<.005	<1	<.01	5	<.03	<.005	4.88	<.01	0.1	<.005	<.005	<.03	0.02
	13/06/01	<.003	<.05	<.005	0.09	0.084	<.001	<.05	4	0.001	<.005	<.005	<.002	0.09	<1	<.005	0.6	<.01	0.006	3	<.005	<1	<.01	<1	<.03	<.005	2.3	0.04	0.023	0.014	0.013	<.03	0.01
	21/03/02	<0.001	<0.05	<0.005	<0.05	0.162	<0.001	<0.05	21.5	<0.001	<0.005	<0.005	0.011	0.01	1	3.3	0.01	0.003	4	<0.005	0.03	<0.01	4	<0.03	<0.005	5.6	<0.01	<0.005	<0.005	<0.03	<0.01		
	25/06/02	0.5	0.058	0.004	0.06	0.108	0.3	<0.01	7.6	0.9	<0.001	<0.001	0.012	0.024	0.5	<0.001	1.1	0.003	<0.001	0.9	0.003	0.03	<0.002	2	<0.002	<0.005	4	<0.002	0.037	<0.001	<0.001	<0.03	0.008
	27/09/02	<0.2	0.059	0.005	0.08	0.109	<0.2	<0.01	11.5	0.2	<0.001	<0.001	0.022	0.023	0.6	0.002	1.7	0.004	0.001	2.2	0.002	0.01	0.004	3.2	0.007	<0.005	4.3	0.017	0.058	0.001	<0.001	<0.03	0.07
	15/12/02	<0.2	0.075	<0.003	0.16	0.17	<0.2	<0.01	18.5	0.7	<0.001	0.007	0.026	0.072	0.8	<0.001	2.7	0.004	<0.001	1.3	<0.001	0.01	<0.002	4.2	0.009	<0.005	5.3	<0.002	0.084	<0.001	<0.001	<0.03	<0.001
V2																																	
	17/03/99	<.003	0.11	<.005	0.1	0.095	<.001	<.04	110.9	<.001	<.005	0.319	0.017	<.01	3	<.005	45.7	<.01	<.002	10	<.005	0.5	<.01	70	<.03	<.03	4.6	<.01	0.631	<.005	<.005	<.03	<.01
	18/06/99	<.003	<.05	<.005	<.05	0.124	<.001	<.04	105.6	0.002	<.005	<.005	0.013	0.04	3	0.009	35.7	0.11	0.006	9	<.005	<.04	<.01	60	0.05	<.03	5	<.01	0.692	<.005	<.005	<.03	<.01
	10/9/1999	<.003	<.05	<.005	<.05	0.038	<.001	<.04	61.8	<.001	<.005	<.005	0.007	<.01	1	<.005	18.6	0.03	<.002	4	0.008	<.04	<.01	64	<.03	<.005	2.6	<.01	0.313	<.005	<.005	<.03	0.07
	12/10/1999	<.003	<.05	<.005	<.05	0.071	<.001	<.04	103.8	<.001	<.005	<.005	0.012	0.02	3	<.005	29.3	<.01	0.004	8	0.008	<.04	<.01	64	<.03	<.005	4.4	<.01	0.5	0.013	<.005	<.03	<.01
	13/12/99	<.003	0.11	<.005	<.05	0.214	<.001	<.04	98.6	<.001	<.005	<.005	0.009	<.01	3	<.005	25.3	<.01	<.002	4	<.005	<.04	<.01	49	<.03	<.005	2.7	<.01	0.448	<.005	<.005	<.03	<.01
	22/03/00	<.003	0.23	<.005	<.05	0.34	<.001	<.05	117.2	<.001	0.014	<.005	<.002	<.01	3	<.005	32.7	<.01	<.002	<1	<.005	<1	<.01	61	<.03	<.005	5.9	<.01	0.648	<.005	<.005	<.03	<.01
	20/06/00	<.003	0.32	<.005	<.05	0.034	0.003	<.05	193.4	0.001	<.005	<.005	0.026	0.21	7	<.005	99.4	0.01	0.007	8	0.02	4	0.01	190	<.03	<.005	4.2	<.01	0.722	0.026	<.005	<.03	<.01
	12/9/2000	<.003	0.17	<.005	<.05	0.048	<.001	<.05	189.7	<.001	<.005	<.005	0.026	0.02	5	0.059	75.9	0.02	<.002	9	0.037	7	<.01	213	<.03	<.005	2.6	<.01	0.635	<.005	<.005	<.03	0.08
	12/11/2000	<0.003	<0.05	<0.005	<0.05	0.166	<0.001	<0.05	197.8	<0.001	<0.005	<0.005	0.002	0.01	4	0.041	80.4	0.06	<0.002	12	0.02	0.03	0.02	181	0.06	0.023	6.4	0.03	0.784	<0.005	0.006	<0.03	0.26
	5/3/2001	<.003	0.53	<.005	<.05	0.32	<.001	<.05	184	<.001	<.005	<.005	0.002	<.01	<1	<.005	50	0.017	<.002	12	<.005	<1	<.01	127	<.03	<.005	5.16	<.01	0.77	<.005	<.005	<.03	0.01
	13/06/01	<.003	<.05	0.028	0.11	0.137	<.001	<.05	277.2	<.001	<.005	0.012	<.002	<.01	6	0.037	135	0.39	0.008	10	0.166	<1	<.01	283	<.03	<.005	6.4	0.05	1.051	<.005	0.005	<.03	0.47
	8/9/2001	<0.003	<0.05	0.006	<0.05	0.098	<0.001	<0.05	204	<0.001	<0.005	<0.005	<0.002	<0.01	5	0.032	107	<0.01	<0.002	11	0.075	<1	<0.01	214	<0.03	0.012	6.6	<0.01	0.868	0.012	<0.005	<0.03	0.41
	12/11/2001	<0.003	<0.05	<0.005	<0.05	0.166	<0.001	<0.05	197.8	<0.001	<0.005	<0.005	0.002	0.01	4	0.041	80.4	0.06	<0.002	12	0.02	0.03	0.02	181	0.06	0.023	6.4	0.03	0.784	<0.005	0.006	<0.03	0.26
	15/01/02	0.001	<0.05	<0.005	<0.05	0.246	<0.001	<0.05	207.2	<0.001	<0.005	<0.005	<0.002	<0.01	3	89.5	0.02	0.005	12	<0.005	<0.01	<0.01	188	<0.03	<0.005	7.5	0.05	<0.005	<0.005	<0.03	0.02		
	12/2/2002	<0.001	<0.05	0.029	<0.05	0.043	<0.001	<0.05	218.8	<0.001	<0.005	<0.005	<0.002	<0.01	3	85.1	0.02	0.004	13	<0.005	0.03	<0.01	168	<0.03	<0.005	7	0.05	<0.005	<0.005	<0.03	<0.01		
	21/03/02	<0.001	<0.05	<0.005	<0.05	0.109	<0.001	<0.05	198.3	<0.001	<0.005	<0.005	0.014	<0.01	5	74.9	0.02	0.005	11	0.009	<0.01	<0.01	155	<0.03	<0.005	6.8	0.01	<0.005	<0.005	<0.03	0.13		
	15/04/02	0.001	<0.05	<0.005	<0.05	0.114	<0.001	<0.05	161.9	0.002	<0.005	<0.005	0.002	<0.01	4	54.9	0.02	0.004	9	<0.005	<0.01	<0.01	116	<0.03	<0.005	5.7	0.05	<0.005	<0.005	<0.03	0.12		
	13/05/02	<0.001	<0.05	<0.005	<0.05	0.069	<0.001	<0.05	171.2	<0.001	<0.005	<0.005	0.004	<0.01	5	73.1	0.06	0.004	8	0.014	<0.01	<0.01	155	<0.03	<0.005	5	0.03	<0.005	<0.005	<0.03	0.17		
	25/06/02	0.5	<0.001	0.027	0.08	0.108	0.9	<0.01	215.7	0.8	<0.001	<0.001	0.006	<0.002	3	<0.001	93.1	0.028	0.004	10	0.027	0.03	0.004	210.2	<0.002	<0.005	8.3	0.005	0.764	0.002	0.002	<0.03	0.018
	27/09/02	0.8	<0.001	0.048	0.09	0.119	0.4	<0.01	220.7	<0.2	<0.001	<0.001	0.011	<0.002	3.9	<0.001	98.7	0.018	0.006	10.3	0.004	<0.01	<0.002	203.4	0.01	<0.005	7.1	0.008	0.788	<0.001	0.003	<0.03	0.007
	15/12/02	<0.2	0.045	0.033	0.17	0.081	<0.2	0.01	228.5	0.9	<0.001	0.004	0.009	0.031	3.4	<0.001	99.6	0.017	0.005	10.8	0.002	0.02	<0.002	207	<0.002	<0.005	7.3	<0.002	0.773	<0.001	0.001	<0.03	0.011
V4																																	
	16/03/99	<.003	0.08	<.005	0.09	0.033	<.001	<.04	85.7	<.001	<.005	0.537	0.015	<.01	1	<.005	40.7	<.01	<.002	6	<.005	0.57	<.01	47	<.03	<.03	4.7	<.01	0.408	<.005	<.005	<.03	<.01
	18/06/99	<.003	0.27	<.005	<.05	0.058	<.001	<.04	60.6	<.001	<.005	<.005	0.01	0.27	2	0.016	26.3	0.03	0.004	4	<.005	<.04	<.01	13	<.03	<.03	4.5	<.01	0.297	0.007	<.005	<.03	<.01
	29/07/99	<.0001	0.02	<.001	0.02	0.0278	0.0001	<.001	61.29	<.0001	<.0002	<.0002	0.0104	<.001	0.6	<.0002	24.81	0.002	<.0001	2	0.001	<.002	0.003	14.5	<.001	<.001	1.56	<.0004	0.0874	0.0012	<.0002	<.001	0.001
	12/10/1999	<.003	<.05	<.005	<.05	0.024	<.001	<.04	76.7	<.001	0.006	<.005	0.007	0.09	2	<.005	31.8	0.01	<.002	5	<.005	<.04	<.01	22	<.03	<.005	4	<.01	0.341	0.007	<.005	<.03	<.01
	25/03/00	<.003	0.09	<.005	<.05	0.182	<.001	<.05	88.5	<.001	<.005	<.005	<.002	<.01	6	<.005	37.5	0.03	<.002	10	<.005	<1	<.01	35	<.03	<.005	5	<.01	0.453	<.005	<.005	<.03	<.01
	20/06/00	<.003	0.11	<.005	<.05	0.017	0.001	<.05	53.9	<.001	<.005	<.005	0.004	0.2	2	<.005	23.5	<.01	<.002	4	<.005	1	<.01	13	<.03	<.005	4.2	<.01	0.215	0.006	<.005	<.03	<.01
	12/9/2000	<.003	0.09	<.005	<.05	0.021	<.001	<.05	57.1	<.001	<.005	<.005	0.005	0.04	<1	<.005	20.3	<.01	<.002	4	0.009	4	<.01	12	<.03	<.005	3.6	<.01	0.184	<.005	<.005	<.03	0.01
	7/6/2001	<.003	0.14	<.005	<.05	0.194	<.001	<.05	48.4	<.001	<.005	0.007	0.002	0.09	1	0.013	16.6	0.26	<.002	3	<.005	<1	<.01	8	<.03	<.005	2.9	<.01	0.207	<.005	<.005	<.03	0.01
	25/06/02	<0.2	0.036	0.046	0.06	0.15	0.4	<0.01	79.5	<0.2	<0.001	0.013	0.016	0.069	1.3	0.004	26.6	0.031	0.004	3.3	0.001	<0.01	0.01	16.8	0.032	0.006	6	0.003	0.323	<0.001	<0.001	<0.03	<0.001
	27/09/02	<0.2	0.003	0.005	0.12	0.133	0.3	0.01	85.7	<0.2	<0.001	<0.001	0.02	0.031	1.5	0.006	32	0.03	0.003	4.1	<0.001	<0.01	0.005	16.3	0.03	<0.005	5.3	<0.002	0.344	0.001	0.001	<0.03	0.007
V5																																	
	31/12/98	<.003	<.05	<.005	0.08	0.088	<.001	<.04	211.9	<.001	<.005	<.005	0.019	<.01	2	<.005	101.5	0.02	<.002	12	<.005	<.04	<.01	111	0.03	<.03	6.9	<.01	0.916	<.005	<.005	<.03	<.01
	23/02/99	<.003	0.18	<.005	0.2	0.031	<.001	<.04	180.1	<.001	0.008	0.04	0.015	<.01	3	<.005	106.5	0.7	0.019	12	<.005	2.81	<.01	<.03	<.03	6.9	<.01	0.825	0.014	<.005	<.03	<.01	
	23/03/99	<.003	0.1	<.005	<.05	0.035	<.001	<.04	109.3	<.001	<.005	<.005	0.015	<.01	2	<.005	65.4	<.01	<.002	8	<.005	0.84	<.01	82.5	<.03	<.03	4	<.01	0.58	<.005	<.005	<.03	<.01
	20/04/99	0.01	<.05	0.01	<.05	0.031	0.002	<.04	102.6	<.001	0.012	<.005	0.021	0.05	3	0.014	56.1	0.11	<.002	7	0.011	0.24	<.01	69	<.03	<.03	4.2	<.01	0.384	0.023	<.005	<.03	<.01
	18/05/99	<.003	0.08	<.005	<.05	0.036	0.002	<.04	31.1	0.003	<.005	<.005	0.002	<.01	2	<.005	11.7	0.09	0.049	2	<.005	0.32	0.04	<.03	<.03	2.3	<.01	0.135	<.005	<.005	<.03	0.01	
	20/06/99	<.003	0.94	<.005	<.05	0.03	<.001	<.04	32.9	<.001	<.005	<.005	0.006	0.94	2	0.009	12.6	0.24	0.003	3	<.005	<.04	<.01	11	0.03	<.03	5.3	<.01	0.139	0.028	<.005	<.03	0.03
	29/07/99	<.0001	0.32	<.001	0.07	0.0357	0.0001	<.001	40.86	<.0001	<.0002	0.003	0.0101	0.01	0.7	<.0002	17.41	0.002	<.0001	2.4	0.001	<.002	0.002	16.3	<.001	<.001	2.72	<.0004	0.0892	0.0024	0	<.001	<.0004
	31/08/99	<.0001	0.022	<.001	0.61	0.0207	0.0001	<.001	55.588	0.0003	<.0002	<.0002	0.0029	0.004	0.79	<.0002	21.317	0.0025	0.0004	5.06	<.0002	<.002	<.001	19.93	<.001	<.001	3.295	<.0004	0.1459	0.0023	<.0002	<.001	<.0004
	12/10/1999	<.003	<.05	<.005	<.05	0.025	<.001	<.04	58.5	<.001	<.005	<.005	0.007	0.01	2	<.005	24.1	<.01	<.002	5	0.008	<.04	<.01	26	<.03	<.005	4	<.01	0.254	0.007	<.005	<.03	<.01
	14/12/99	<.003	<.05	<.005	<.05	0.108	<.001	<.04	82.3	<.001	<.005	<.005	0.006	<.01	1	<.005	31.3	<.01	<.002	3	<.005	<.04	<.01	35	<.03	<.005	3.4	<.01	0.303	<.005	<.005	<.03	<.01
	28/02/00	<.003	0.14	<.005	<.05	0.038	<.001	<.05	72.1	<.001	<.005	0.082	0.016	<.01	2	0.022	33.9	<.01	<.002	6	<.005	<1	0.02	48	<.03	<.005	4.6	<.01	0.305	<.005	<.005	<.03	<.01
	27/04/00	<.003	0.17	<.005	<.05	0.039	<.001	<.05	69	<.001	<.005	<.005	0.01	0.04	<1	<.005	33.3	0.08	<.002	5	<.005	<1	<.01	56	<.03	<.005	3.7	<.01	0.241	0.011	<.005	<.03	<.01
	15/05/00	<.003	0.09	0.014	<.05	0.021	<.001	<.05	37.4	<.001	<.005	<.005	0.005	0.14	<1	0.024	17.1	<.01	<.002	<1	<.005	<1	<.01	<.03	<.005	4	<.01	0.18	<.005	<.005	<.03	<.01	
	20/06/00	<.003	0.11	<.005	<.05	0.021	<.001	<.05	30.2	<.001	<.005	<.005	0.005	0.18	<1	<.005	12.3	0.01	<.002	3	<.005	<1	<.01	11	<.03	<.005	4	<.01	0.125	<.005	<.005	<.03	<.01
	25/07/00	<.003	<.05	<.005	<.05	0.021	0.001	<.05	41.7	<.001	0.033	<.005	0.008	0.18	2	0.062	16.5	0.4	<.002	5	0.032	<1	<.01	16	<.03	<.005	4.2	<.01	0.23	0.007	0.032	<.03	0.49
	29/08/00	<.003	0.22	<.005	<.05	0.017	<.001	<.05	30.6	<.001	<.005	<.005	<.002	<.01	<1	<.005	12.1	<.01	<.002	4	<.005	<1	<.01	14	<.03	<.005	4.8	<.01	0.107	<.005	<.005	<.03	<.01
	12/9/2000	<.003	<.05	<.005	<.05	0.025	<.001	<.05	49.2	<.001	<.005	<.005	0.011	0.04	<1	<.005	17.5	<.01	<.002	5	0.008	4	<.01	18	<.03	<.005	3.3	<.01	0.167	<.005	<.005	<.03	<.01
	26/09/00	<0.01	0.07	<0.2	<0.1	0.06	<0.005	<0.1	51.3	<0.001	<0.01	<0.01	<0.01	0.06	<2	18.8	0.012	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	4.27	<0.03	0.215	<0.01	<0.03	<0.005			
	29/10/00	<.003	0.16	<.005	<.05	0.028	0.001	<.05	61.8	<.001	<.005	0.007	0.019	0.2	2	<.005	26.8	<.01	<.002	7	<.005	<1	<.01	113	<.03	<.005	5	<.01	0.246	<.005	<.005	<.03	<.01
	13/11/00	<0.003	<0.05	0.028	<0.05	0.134	<0.001	<0.05	80.1	<0.001	<0.005	0.023	<0.002	<0.01	1	0.023	35.3	0.04	<0.002	4	<0.005	0.02	<0.01	36	<0.03	<0.005	5.6	0.1	0.343	<0.005	0.008	<0.03	<0.01
	18/11/00	<0.01	<0.05	<0.2	<0.1	0.1	<0.005	<0.1	88.8	<0.001	<0.01	<0.01	<0.01	<0.01	<2	35.7	0.013	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	5.2	<0.03	0.368	<0.01	<0.03	<0.005			
	14/12/00	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	82.9	<0.001	<0.01	<0.01	<0.01	<0.01	<2	39.5	0.01	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	4.36	<0.03	0.336	<0.01	<0.03	<0.005				
	13/01/01	<.003	0.05	<.005	<.05	0.038	0.001	<.05	77.3	<.001	0.013	<.005	0.02	<.01	<1	<.005	35.8	0.02	<.002	6	<.005	6	<.01	86	0.08	<.005	4.6	<.01	0.418	<.005	<.005	<.03	<.01
	10/2/2001	<.003	0.06	0.007	<.05	0.031	0.001	<.05	84.8	<.001	<.005	<.005	0.014	0.01	2	<.005	39.8	<.01	<.002	8	<.005	2	<.01	108	<.03	<.005	4.7	<.01	0.27	<.005	<.005	<.03	<.01
	5/3/2001	<.003	0.1	<.005	0.06	0.16	<.001	<.05	62	<.001	<.005	<.005	<.002	<.01	<1	<.005	14	0.024	<.002	7	<.005	<1	<.01	24	<.03	<.005	5.12	<.01	0.3	<.005	<.005	<.03	<.01
	10/3/2001	<.003	0.46	<.005	0.07	0.18	<.001	<.05	108	0.001	<.005	<.005	0.026	<.01	2.55	0.008	51	0.027	0.01	10	0.012	<1	0.07	60	<.03	<.005	5.05	<.01	0.46	0.01	0.01	<.03	0.03
	16/04/01	<.003	0.07	<.005	<.05	0.197	<.001	<.05	104.8	<.001	0.023	<.005	0.009	0.01	<1	<.005	49.8	0.02	<.002	10	<.005	<1	<.01	53	<.03	<.005	5.7	<.01	0.452	<.005	<.005	<.03	<.01
	14/05/01	<.003	0.28	<.005	<.05	0.123	<.001	<.05	52.6	<.001	<.005	<.005	0.007	0.24	3	<.005	21.8	0.03	<.002	1	<.005	<1	<.01	20	<.03	<.005	3.2	<.01	0.189	0.009	0.006	<.03	<.01
	13/06/01	<.003	<.05	<.005	0.1	0.144	<.001	<.05	29.8	<.001	<.005	<.005	<.002	0.05	<1	0.006	11.1	0.27	<.002	4	<.005	<1	<.01	8	<.03	0.045	4.7	<.01	0.142	<.005	<.005	<.03	<.01
	17/06/01	<.003	<.05	<.005	0.06	0.122	<.001	<.05	30.6	<.001	<.005	<.005	<.002	0.09	<1	<.005	11	0.11	<.002	4	<.005	<1	<.01	9	<.03	<.005	2.1	<.01	0.138	<.005	<.005	<.03	0.01

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	14/07/01	<.003	<.05	<.005	0.13	0.094	<.001	<.05	59.5	<.001	<.005	<.005	<.002	0.01	1	<.005	24.5	0.01	<.002	8	0.007	<1	<.01	22	<.03	<.005	5.5	<.01	0.29	<.005	<.005	<.03	0.02
	14/08/01	<0.003	<0.05	<0.005	<0.05	0.157	<0.001	<0.05	72.1	<0.001	<0.005	<0.005	<0.002	<0.01	1	<0.005	30.4	<0.01	0.007	6	<0.005	<1	<0.01	24	<0.03	<0.005	6	<0.01	0.338	<0.005	<0.005	<0.03	0.02
	8/9/2001	<0.003	<0.05	<0.005	<0.05	0.11	<0.001	<0.05	65	<0.001	<0.005	0.011	<0.002	<0.01	1	0.02	27.5	<0.01	<0.002	6	<0.005	<1	<0.01	25	<0.03	0.023	5.5	<0.01	0.314	0.005	<0.005	<0.03	0.05
	17/09/01	<0.003	<0.05	0.026	<0.05	0.111	<0.001	<0.05	64.9	<0.001	<0.005	<0.005	<0.002	<0.01	1	0.013	27.6	<0.01	<0.002	2	<0.005	<1	<0.01	25	<0.03	<0.005	5.4	<0.01	0.294	<0.005	<0.005	<0.03	<0.01
	15/10/01	<0.003	<0.05	<0.005	<0.05	0.141	<0.001	<0.05	77	<0.001	<0.005	<0.005	<0.002	<0.01	2	0.026	35.7	<0.01	<0.002	4	<0.005	<1	<0.01	34	0.03	<0.005	5.6	0.01	0.343	<0.005	<0.005	<0.03	<0.01
	13/11/01	<0.003	<0.05	0.028	<0.05	0.134	<0.001	<0.05	80.1	<0.001	<0.005	0.023	<0.002	<0.01	1	0.023	35.3	0.04	<0.002	4	<0.005	0.02	<0.01	36	<0.03	<0.005	5.6	0.1	0.343	<0.005	0.008	<0.03	<0.01
	14/12/01	<0.001	<0.05	<0.005	<0.05	0.091	<0.001	<0.05	88.2	<0.001	<0.005	0.006	<0.002	<0.01	1	0.043	40.1	0.03	<0.002	1	<0.005	0.03	<0.01	35	<0.03	<0.005	5.2	<0.01	0.33	<0.005	<0.005	<0.03	<0.01
	15/01/02	<0.001	<0.05	<0.005	<0.05	0.171	<0.001	<0.05	103	<0.001	<0.005	<0.005	<0.002	<0.01	2	49.2	0.03	0.005	6	<0.005	<0.01	<0.01	52	<0.03	0.012	5.9	0.02	<0.005	<0.005	<0.03	0.04		
	12/3/2002	<0.001	<0.05	<0.005	0.06	0.214	<0.001	<0.05	136.2	<0.001	<0.005	<0.005	0.012	<0.01	3	65.2	0.02	0.005	9	<0.005	<0.01	<0.01	69	<0.03	<0.005	6.7	<0.01	<0.005	<0.005	<0.03	<0.01		
	21/03/02	<0.001	<0.05	<0.005	<0.05	0.171	<0.001	<0.05	146.3	<0.001	<0.005	<0.005	0.01	<0.01	3	75.2	0.02	0.007	9	0.02	<0.01	<0.01	89	<0.03	<0.005	7	0.01	<0.005	<0.005	<0.03	<0.01		
	13/05/02	<0.001	0.2	<0.005	0.06	0.13	<0.001	<0.05	42.4	<0.001	<0.005	0.005	0.011	0.36	2	15.5	0.04	0.003	4	0.008	0.14	<0.01	14	<0.03	<0.005	3.5	0.01	0.01	<0.005	<0.03	<0.01		
	16/06/02	0.4	0.112	<0.003	0.09	0.156	<0.2	<0.01	43.5	0.6	<0.001	0.001	0.017	0.084	1.1	0.006	16.2	0.019	<0.001	4.1	<0.001	0.08	<0.002	15.5	0.013	<0.005	4.9	<0.002	0.182	0.003	<0.001	<0.03	0.023
	25/06/02	0.2	0.076	0.01	0.05	0.129	0.4	<0.01	51.9	<0.2	0.002	0.002	0.012	0.064	1.2	<0.001	19.5	0.014	<0.001	3.2	0.005	0.04	0.005	20.1	<0.002	<0.005	5.3	<0.002	0.211	<0.001	<0.001	<0.03	0.018
	16/07/02	0.8	0.097	0.003	<0.05	0.155	<0.2	<0.01	63.1	0.4	<0.001	0.003	0.01	0.036	1.1	0.001	23.4	0.023	0.006	3.5	0.002	0.05	<0.002	24.1	0.019	<0.005	5.3	<0.002	0.248	<0.001	<0.001	<0.03	0.009
	12/8/2002	0.6	0.116	<0.003	<0.05	0.065	0.3	<0.01	68.5	1	<0.001	0.003	0.015	0.029	1.4	0.003	27.7	0.017	0.001	6.1	0.005	0.05	0.011	27.8	<0.002	<0.005	4.7	0.007	0.286	<0.001	<0.001	<0.03	<0.001
	16/09/02	<0.2	0.094	<0.003	0.14	0.178	<0.2	<0.01	58	<0.2	<0.001	0.004	0.018	0.045	1.4	0.004	22.8	0.02	0.003	3.8	0.001	0.01	<0.002	21.3	<0.002	<0.005	5	<0.002	0.227	<0.001	<0.001	<0.03	0.028
	27/09/02	<0.2	0.033	<0.003	0.11	0.111	0.3	0.01	64	<0.2	0.001	0.005	0.015	0.025	1.3	0.006	25.2	0.016	0.003	4.4	0.001	<0.01	0.006	23	0.004	<0.005	4.9	0.013	0.26	0.003	<0.001	<0.03	0.004
	15/10/02	<0.2	0.034	<0.003	0.13	0.125	<0.2	<0.01	68.3	0.3	<0.001	0.003	0.021	<0.002	1.5	0.004	27.1	0.009	<0.001	5.4	0.001	<0.01	0.005	27.9	<0.002	<0.005	5.5	0.002	0.273	<0.001	<0.001	<0.03	0.003
	12/11/2002	<0.2	0.058	<0.003	0.15	0.108	<0.2	0.03	80.1	<0.2	0.001	<0.001	0.025	0.007	1.6	0.005	32.1	0.019	0.003	6.9	0.003	<0.01	<0.002	31.2	0.013	<0.005	5.5	<0.002	0.323	0.001	<0.001	<0.03	0.016
	10/12/2002	<0.2	0.046	0.018	0.12	0.116	0.2	<0.01	84.5	0.3	<0.001	<0.001	0.023	0.042	1.8	0.002	39.5	0.022	<0.001	5.2	<0.001	<0.01	0.006	41.1	0.016	<0.005	6.3	<0.002	0.349	<0.001	<0.001	<0.03	0.014
	15/12/02	<0.2	0.059	0.028	0.16	0.139	<0.2	<0.01	95.2	0.9	<0.001	0.003	0.017	0.031	1.7	0.003	38.5	0.02	0.003	4.9	<0.001	<0.01	<0.002	40.4	<0.002	<0.005	5.8	<0.002	0.36	<0.001	<0.001	<0.03	0.002
V6A																																	
	22/03/99	<.003	0.07	<.005	<.05	0.023	<.001	<.04	57.8	<.001	<.005	0.114	0.012	<.01	3	<.005	14.7	<.01	<.002	3	<.005	0.46	<.01	16.3	<.03	<.03	5.6	<.01	0.254	<.005	<.005	<.03	<.01
	3/7/1999	<.003	<.05	<.005	0.28	0.007	<.001	<.04	11.7	<.001	<.005	<.005	<.002	0.54	<1	<.005	2.7	0.03	<.002	<1	<.005	<.04	<.01	3	<.03	<.03	4.5	<.01	0.025	<.005	<.005	<.03	<.01
	10/9/1999	<.003	<.05	<.005	<.05	0.019	<.001	<.04	21.2	<.001	<.005	<.005	0.003	0.04	<1	<.005	4	<.01	<.002	2	<.005	<.04	<.01	5	<.03	<.005	4.1	<.01	0.106	<.005	0.008	<.03	<.01
	12/10/1999	<.003	<.05	<.005	<.05	0.008	<.001	<.04	24.2	<.001	<.005	<.005	<.002	0.03	<1	<.005	5.1	<.01	<.002	3	<.005	<.04	<.01	5	<.03	<.005	4.3	<.01	0.123	<.005	<.005	<.03	<.01
	14/12/99	<.003	<.05	<.005	<.05	0.09	<.001	<.04	38.7	<.001	<.005	<.005	0.008	0.09	1	<.005	6.3	<.01	<.002	1	0.009	<.04	<.01	7	<.03	<.005	3.6	<.01	0.163	<.005	0.014	<.03	<.01
	23/03/00	<.003	0.06	<.005	<.05	0.145	<.001	<.05	45	<.001	0.007	<.005	<.002	<.01	3	<.005	8.3	<.01	<.002	<1	<.005	<1	<.01	8	<.03	<.005	5.6	<.01	0.241	<.005	<.005	<.03	<.01
	20/06/00	<.003	<.05	<.005	<.05	0.013	<.001	<.05	10.2	<.001	<.005	<.005	<.002	0.16	1	<.005	2.4	<.01	<.002	3	<.005	<1	<.01	2	<.03	<.005	3.6	<.01	0.049	<.005	<.005	<.03	<.01
	12/9/2000	<.003	<.05	<.005	<.05	0.017	<.001	<.05	26.3	<.001	<.005	0.036	<.002	<.01	<1	<.005	5.3	<.01	<.002	3	<.005	2	<.01	11	<.03	<.005	3.2	<.01	0.062	<.005	<.005	<.03	<.01
	5/3/2001	<.003	1.12	<.005	0.06	0.18	<.001	<.05	320	<.001	<.005	<.005	0.012	<.01	3.63	<.005	144	0.021	<.002	14	<.005	<1	<.01	330	<.03	<.005	7.28	<.01	1.25	0.01	<.005	<.03	0.01
	13/06/01	<.003	<.05	<.005	0.09	0.102	<.001	<.05	11.8	<.001	<.005	<.005	<.002	0.06	<1	<.005	2.5	0.05	<.002	3	<.005	<1	<.01	3	<.03	<.005	3.7	<.01	0.062	<.005	<.005	<.03	<.01
	8/9/2001	<0.003	<0.05	0.014	<0.05	0.091	<0.001	<0.05	33.5	<0.001	<0.005	<0.005	<0.002	0.04	<1	0.009	7.5	<0.01	<0.002	6	<0.005	<1	<0.01	12	<0.03	<0.005	4.5	<0.01	0.174	<0.005	<0.005	<0.03	0.07
	25/06/02	0.3	0.057	<0.003	<0.05	0.132	0.5	<0.01	22.9	<0.2	0.003	0.001	0.017	0.066	0.7	0.008	4.3	0.008	<0.001	2	0.008	<0.01	0.004	6.2	<0.002	<0.005	4.7	0.002	0.103	<0.001	<0.001	<0.03	0.015
	27/09/02	<0.2	0.042	<0.003	0.13	0.129	0.2	<0.01	30.2	<0.2	<0.001	0.001	0.019	0.059	0.6	0.004	5.5	0.009	<0.001	2.5	<0.001	<0.01	0.007	8.5	<0.002	<0.005	4.6	<0.002	0.133	0.001	<0.001	<0.03	0.023
	15/12/02	<0.2	0.066	0.012	0.14	0.16	<0.2	0.03	48.7	<0.2	0.002	0.002	0.021	0.106	0.8	0.001	9.9	0.018	<0.001	2.2	<0.001	<0.01	0.008	16.6	0.012	<0.005	5.5	<0.002	0.204	<0.001	0.001	<0.03	0.007
V8																																	
	31/12/98	<.003	<.05	<.005	0.06	0.046	<.001	<.04	82.8	<.001	0.007	0.016	0.003	<.01	1	<.005	40.3	0.21	0.006	6	<.005	<.04	<.01	43	<.03	<.03	3.8	<.01	0.422	<.005	<.005	<.03	<.01
	23/02/99	<.003	0.07	<.005	0.25	0.025	<.001	<.04	94.1	<.001	<.005	0.04	0.007	<.01	1	<.005	43.1	0.63	<.002	6	<.005	1.11	<.01	<.03	<.03	4.7	<.01	0.45	0.008	<.005	<.03	<.01	
	23/03/99	<.003	0.1	<.005	<.05	0.031	<.001	<.04	104.7	0.003	<.005	0.035	0.022	<.01	2	<.005	56.2	0.09	<.002	8	<.005	0.53	<.01	79.7	<.03	<.03	4.4	<.01	0.488	<.005	<.005	<.03	<.01
	20/04/99	<.003	<.05	0.055	<.05	0.023	0.001	<.04	82.1	0.001	<.005	<.005	0.011	<.01	2	<.005	46.3	0.1	<.002	7	<.005	0.55	<.01	58	<.03	<.03	3.6	<.01	0.386	0.014	0.011	<.03	<.01
	18/05/99	<.003	<.05	<.005	<.05	0.033	0.002	<.04	29.3	0.002	<.005	<.005	<.002	<.01	2	0.031	10.4	0.06	0.004	2	0.008	<.04	<.01	<.03	<.03	2.2	<.01	0.134	<.005	<.005	<.03	0.02	
	20/06/99	<.003	0.07	<.005	<.05	<.002	<.001	<.04	9.5	<.001	<.005	<.005	<.002	0.21	<1	<.005	3.3	0.07	<.002	<1	<.005	<.04	<.01	4	<.03	<.03	0.7	<.01	0.064	<.005	<.005	<.03	0.03
	29/07/99	<.0001	0.15	<.001	0.07	0.0223	<.0001	<.001	26.17	<.0001	<.0002	0.005	0.005	0.003	0.5	<.0002	10.05	0.001	<.0001	1.7	0.001	<.002	<.001	10.2	<.001	<.001	3.11	<.0004	0.065	0.0014	0.001	<.001	<.0004
	30/08/99	<.0001	0.009	<.001	0.28	0.0089	<.0001	<.001	34.18	0.0002	<.0002	<.0002	0.0011	0.001	0.56	<.0002	12.113	0.0016	0.0001	3.64	0.0002	<.002	<.001	11.88	<.001	<.001	3.448	<.0004	0.0791	0.0011	0.0002	<.001	<.0004
	12/10/1999	<.003	<.05	<.005	<.05	0.021	<.001	<.04	40.5	<.001	<.005	<.005	0.006	0.05	2	<.005	15.3	0.01	<.002	3	0.009	<.04	0.01	20	<.03	<.005	2.9	<.01	0.184	0.006	<.005	<.03	<.01
	14/12/99	<.003	<.05	<.005	<.05	0.114	<.001	<.04	66.6	<.001	<.005	<.005	0.011	<.01	2	<.005	24.3	0.05	<.002	3	0.007	<.04	<.01	28	<.03	<.005	3.2	<.01	0.265	<.005	<.005	<.03	<.01
	28/02/00	<.003	0.13	<.005	<.05	0.041	<.001	<.05	65.5	<.001	<.005	0.016	0.012	0.04	3	0.018	30.4	<.01	<.002	6	<.005	<1	0.04	37	<.03	<.005	4.5	<.01	0.301	<.005	<.005	<.03	<.01
	23/03/00	<.003	0.1	<.005	<.05	0.161	<.001	<.05	74.7	0.001	0.034	<.005	<.002	<.01	<1	<.005	33.2	0.06	<.002	<1	<.005	<1	<.01	36	<.03	<.005	5.4	<.01	0.375	<.005	<.005	<.03	<.01
	27/04/00	<.003	0.16	<.005	<.05	0.038	<.001	<.05	61.7	<.001	<.005	<.005	0.008	0.06	<1	<.005	28.7	0.02	<.002	5	<.005	<1	<.01	43	<.03	<.005	3.6	<.01	0.246	0.009	0.007	<.03	<.01
	15/05/00	<.003	0.08	<.005	<.05	0.028	<.001	<.05	42.3	<.001	<.005	0.011	0.005	0.09	<1	<.005	17.8	0.03	<.002	<1	<.005	<1	<.01	<.03	<.005	4.1	<.01	0.224	<.005	<.005	<.03	0.04	
	20/06/00	<.003	<.05	<.005	<.05	0.023	0.001	<.05	21	<.001	<.005	<.005	0.004	0.15	1	<.005	7.4	<.01	<.002	3	<.005	<1	<.01	7	<.03	<.005	3.2	<.01	0.099	<.005	<.005	<.03	<.01
	25/07/00	<.003	<.05	<.005	<.05	0.024	<.001	<.05	27.5	<.001	0.039	<.005	0.003	0.18	2	0.049	9.7	0.17	<.002	4	0.014	2	<.01	11	<.03	<.005	3.3	<.01	0.174	<.005	0.023	<.03	0.31
	29/08/00	<.003	0.12	<.005	<.05	0.023	<.001	<.05	32.9	<.001	<.005	<.005	<.002	0.03	<1	<.005	11.6	0.03	<.002	4	<.005	5	<.01	12	<.03	<.005	4.4	<.01	0.132	<.005	<.005	<.03	0.1
	12/9/2000	<.003	<.05	<.005	<.05	0.028	<.001	<.05	44.8	<.001	<.005	<.005	0.006	0.04	<1	0.021	13.7	<.01	<.002	4	<.005	<1	<.01	16	<.03	<.005	3.4	<.01	0.148	<.005	<.005	<.03	<.01
	26/09/00	<0.01	0.74	<0.2	<0.1	0.09	<0.005	<0.1	45.1	<0.001	<0.01	<0.01	<0.01	1.41	<2	15.1	0.082	<0.01	2	<0.05	<0.3	<0.05	<0.2	<0.2	5.36	<0.03	0.174	0.02	<0.03	0.047			
	29/10/00	<.003	0.14	<.005	<.05	0.04	0.001	<.05	62.7	<.001	<.005	<.005	0.012	0.2	2	<.005	26	0.04	<.002	7	<.005	<1	<.01	109	<.03	<.005	5.2	<.01	0.247	<.005	<.005	<.03	0.02
	13/11/00	0.004	<0.05	<0.005	<0.05	0.101	<0.001	<0.05	58.7	<0.001	<0.005	<0.005	<0.002	<0.01	1	0.012	23.7	0.03	<0.002	4	<0.005	0.02	<0.01	29	<0.03	<0.005	5.1	0.11	0.26	<0.005	0.007	<0.03	0.02
	18/11/00	<0.01	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	79.3	<0.001	<0.01	<0.01	<0.01	<0.01	<2	31.3	0.018	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.03	<0.2	4.81	0.32	<0.01	<0.03	<0.005			
	14/12/00	<0.05	<0.2	<0.1	0.09	<0.005	<0.1	87.6	<0.001	<0.01	<0.01	<0.01	0.01	<2	36	0.024	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	4.64	<0.03	0.359	<0.01	<0.03	0.016				
	13/01/01	<.003	<.05	<.005	<.05	0.03	0.001	<.05	71.1	<.001	<.005	0.135	0.006	0.08	2	<.005	30.8	0.07	<.002	5	<.005	<1	0.03	73	<.03	<.005	4.1	<.01	0.434	<.005	<.005	<.03	<.01
	10/2/2001	<.003	<.05	<.005	<.05	0.028	0.002	<.05	75.9	<.001	<.005	<.005	0.011	<.01	3	<.005	33.8	0.05	<.002	6	<.005	25	<.01	91	<.03	<.005	4.4	<.01	0.278	<.005	0.012	<.03	<.01
	5/3/2001	<.003	0.61	<.005	0.06	0.06	<.001	<.05	172	0.083	0.309	<.005	0.018	<.01	3.97	<.005	67	18.653	<.002	11	0.408	<1	<.01	234	<.03	<.005	4.82	<.01	1.2	<.005	<.005	<.03	
	10/3/2001	<.003	0.41	<.005	0.07	0.16	<.001	<.05	92	0.003	<.005	<.005	0.025	<.01	4.12	<.005	42	0.042	0.015	10	0.014	<1	0.03	51	<.03	<.005	4.69	<.01	0.43	0.01	0.01	<.03	<.01
	16/04/01	<.003	<.05	<.005	<.05	0.208	<.001	<.05	91.1	<.001	<.005	<.005	<.002	0.02	<1	<.005	41.6	<.01	<.002	8	<.005	<1	<.01	46	<.03	<.005	5.3	<.01	0.427	<.005	<.005	<.03	<.01
	14/05/01	<.003	0.12	<.005	<.05	0.127	<.001	<.05	59.2	<.001	<.005	<.005	<.002	0.1	11	<.005	23.6	0.02	<.002	2	<.005	<1	<.01	25	<.03	<.005	3.3	<.01	0.233	<.005	<.005	<.03	<.01
	13/06/01	<.003	<.05	0.012	0.08	0.127	<.001	<.05	19.2	<.001	<.005	0.008	0.003	0.07	<1	<.005	6.8	0.21	<.002	3	<.005	<1	<.01	7	<.03	<.005	3.4	<.01	0.095	0.005	<.005	<.03	<.01
	17/06/01	<.003	0.1	<.005	<.05	0.111	<.001	<.05	21.2	<.001	<.005	<.005	0.003	0.13	<1	<.005	7.5	0.09	<.002	4	<.005	<1	<.01	8	<.03	<.005	1.4	<.01	0.094	<.005	<.005	<.03	<.01
	14/07/01	<.003	<.05	<.005	0.09	0.08	<.001	<.05	45.1	<.001	<.005	<.005	<.002	<.01	<1	0.008	17	<.01	<.002	6	<.005	<1	<.01	18	<.03	0.007	5.4	<.01	0.222	<.005	<.005	<.03	0.01
	14/08/01	<0.003	<0.05	<0.005	<0.05	0.147	<0.001	<0.05	60.8	<0.001	<0.005	<0.005	0.004	<0.01	1	<0.005	24.9	0.01	0.007	5	<0.005	<1	<0.01	25	<0.03	<0.005	5.4	0.02	0.288	<0.005	<0.005	<0.03	0.01
	8/9/2001	<0.003	<0.05	<0.005	<0.05	0.107	<0.001	<0.05	47.4	<0.001	<0.005	<0.005	<0.002	<0.01	1	0.02	20	0.01	<0.002	6	<0.005	<1	<0.01	21	<0.03	0.006	5.1	<0.01	0.238	<0.005	<0.005	<0.03	<0.01
	17/09/01	<0.003	<0.05	<0.005	<0.05	0.103	<0.001	<0.05	46.5	<0.001	<0.005	<0.005	<0.002	<0.01	<1	0.008	19.3	0.01	<0.002	<1	<0.005	<1	<0.01	20	<0.03	<0.005	4.8	<0.01	0.225	<0.005	<0.005	<0.03	<0.01
	15/10/01	<0.003	<0.05	<0.005	0.06	0.125	<0.001	<0.05	64.2	<0.001	<0.005	<0.005	<0.002	<0.01	1	0.019	30	0.03	<0.002	6	<0.005	<1	<0.01	31	<0.03	<0.005	5.1	<0.01	0.314	<0.005	<0.005	<0.03	0.01
	13/11/01	<0.003	<0.05	<0.005	<0.05	0.114	<0.001	<0.05	66.7	<0.001	<0.005	<0.005	<0.002	0.02	1	0.021	29.5	0.06	<0.002	4	<0.005	0.03	<0.01	33	0.15	<0.005	5.3	0.17	0.301	<0.005	0.008	<0.03	0.02
	14/12/01	<0.001	<0.05	<0.005	<0.05	0.086	<0.001	<0.05	73.3	<0.001	0.005	0.006	0.005	0.03	2	0.015	32.8	0.07	0.008	2	<0.005	0.03	<0.01	33	<0.03	<0.005	4.4	<0.01	0.294	<0.005	<0.005	<0.03	<0.01
	15/01/02	<0.001	<0.05	<0.005	<0.05	0.193	<0.001	<0.05	85.6	<0.001	<0.005	<0.005	<0.002	0.03	2	39.8	0.06	0.003	6	<0.005	<0.01	<0.01	45	<0.03	0.007	5.6	0.02	<0.005	<0.005	<0.03	0.04		
	12/2/2002	<0.001	<0.05	<0.005	<0.05	0.131	<0.001	<0.05	99	0.003	<0.005	<0.005	0.003	<0.01	2	41.7	0.07	<0.002	7	<0.005	0.03	0.04	44	<0.03	<0.005	5.5	0.02	<0.005	<0.005	<0.03	0.05		
	12/3/2002	<0.001	<0.05	0.006	0.05	0.255	<0.001	<0.05	106.6	<0.001	<0.005	<0.005	0.011	<0.01	2	43.6	0.09	0.003	8	<0.005	<0.01	<0.01	49	<0.03	<0.005	5.9	<0.01	<0.005	<0.005	<0.03	0.02		
	21/03/02	<0.001	<0.05	<0.005	<0.05	0.144	<0.001	<0.05	108.5	<0.001	<0.005	<0.005	0.009	<0.01	3	48	0.09	<0.002	8	0.005	0.03	<0.01	58	<0.03	<0.005	6.2	<0.01	<0.005	<0.005	<0.03	0.03		

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	15/04/02	<0.001	<0.05	<0.005	<0.05	0.128	<0.001	<0.05	106.1	0.005	<0.005	<0.005	<0.002	<0.01	2	49	0.1	0.003	8	<0.005	<0.01	<0.01	56	<0.03	<0.005	5.6	0.04	<0.005	<0.005	<0.03	0.03		
	13/05/02	<0.001	0.08	<0.005	0.06	0.13	<0.001	<0.05	47.2	<0.001	<0.005	0.007	0.004	0.19	2	17.7	0.05	<0.002	4	0.019	<0.01	<0.01	20	<0.03	<0.005	3.8	<0.01	<0.005	<0.005	<0.03	0.03		
	16/06/02	0.2	0.09	<0.003	0.08	0.143	0.2	0.02	31	<0.2	<0.001	<0.001	0.015	0.063	0.9	0.008	10.7	0.021	<0.001	3.5	<0.001	0.09	0.006	12.9	<0.002	<0.005	4.1	<0.002	0.135	<0.001	<0.001	<0.03	0.016
	25/06/02	<0.2	0.046	0.009	<0.05	0.113	0.4	<0.01	59.4	1.7	<0.001	0.003	0.016	0.033	1.2	0.01	16	0.031	0.004	3.2	0.004	0.1	<0.002	37.1	<0.002	<0.005	4.8	0.004	0.225	<0.001	<0.001	<0.03	0.074
	16/07/02	0.4	0.094	<0.003	<0.05	0.081	0.2	<0.01	89.5	1.4	<0.001	<0.001	0.014	0.016	1.4	0.018	24.5	0.037	0.006	4	0.009	0.08	<0.002	66.9	0.008	<0.005	4.7	<0.002	0.355	<0.001	<0.001	<0.03	0.056
	12/8/2002	<0.2	0.082	<0.003	<0.05	0.09	<0.2	<0.01	103	1	0.001	0.005	0.017	0.031	1.7	0.003	27.4	0.035	<0.001	6	0.004	0.03	0.01	80.8	0.002	<0.005	4.3	<0.002	0.415	<0.001	0.002	<0.03	0.029
	16/09/02	<0.2	0.088	<0.003	0.13	0.156	<0.2	<0.01	49.4	<0.2	<0.001	0.003	0.018	0.058	1.1	0.005	17.2	0.025	0.002	2.9	<0.001	<0.01	<0.002	21	<0.002	<0.005	4.7	<0.002	0.191	<0.001	<0.001	<0.03	0.023
	27/09/02	<0.2	0.044	0.012	0.13	0.11	0.3	0.01	54.3	37.6	<0.001	0.004	0.018	0.041	1.2	0.005	19.7	0.023	0.002	3.5	0.001	<0.01	0.007	22.1	0.017	<0.005	4.8	<0.002	0.221	<0.001	0.001	<0.03	0.124
	15/10/02	0.7	0.065	<0.003	0.14	0.126	<0.2	<0.01	60.2	0.4	<0.001	0.006	0.024	0.038	1.4	0.005	22.2	0.029	<0.001	5.3	0.001	0.04	0.004	28.6	<0.002	<0.005	5.3	<0.002	0.241	<0.001	<0.001	<0.03	0.05
	12/11/2002	<0.2	0.059	0.011	0.14	0.105	<0.2	0.02	75.8	<0.2	0.001	0.001	0.029	0.028	1.5	0.004	28.2	0.038	0.002	5.8	<0.001	0.04	0.009	33.6	<0.002	<0.005	5.3	0.002	0.31	<0.001	<0.001	<0.03	0.019
	10/12/2002	0.4	0.038	0.01	0.09	0.117	0.3	<0.01	75.4	0.3	0.002	<0.001	0.024	0.076	1.6	0.006	32.4	0.041	0.003	5	0.003	<0.01	0.011	39.1	0.009	<0.005	5.9	0.005	0.322	<0.001	<0.001	<0.03	0.037
	15/12/02	<0.2	0.05	<0.003	0.11	0.129	<0.2	<0.01	81.5	0.6	<0.001	<0.001	0.012	0.064	1.5	0.003	31.4	0.034	0.002	4.2	0.002	0.05	0.006	38	<0.002	<0.005	5.4	0.004	0.307	<0.001	<0.001	<0.03	0.007
VGMAIN																																	
	31/12/98	<.003	<.05	<.005	<.05	0.04	<.001	<.04	77.1	<.001	<.005	<.005	0.005	<.01	2	<.005	42.1	<.01	0.005	6	<.005	1.71	<.01	56	<.03	<.03	3.5	<.01	0.439	<.005	<.005	<.03	<.01
	20/04/99	<.003	<.05	<.005	<.05	0.025	0.001	<.04	65.2	<.001	<.005	<.005	0.009	<.01	2	<.005	31.5	0.07	<.002	5	<.005	0.86	<.01	42	<.03	<.03	3.2	<.01	0.307	0.011	<.005	<.03	<.01
	18/05/99	<.003	0.06	<.005	<.05	0.03	0.002	<.04	25.9	<.001	<.005	<.005	0.003	<.01	1	<.005	8.6	0.06	0.01	2	<.005	1.25	<.01	<.03	<.03	2.3	<.01	0.12	<.005	0.01	<.03	0.02	
	20/06/99	<.003	<.05	<.005	<.05	<.002	<.001	<.04	8.8	<.001	<.005	<.005	<.002	0.13	<1	<.005	2.9	0.06	<.002	2	<.005	<.04	<.01	2	<.03	<.03	1.1	<.01	0.067	<.005	<.005	<.03	0.03
	29/07/99	<.0001	0.02	<.001	0.03	0.0145	0.0001	<.001	19.21	<.0001	<.0002	<.0002	0.0054	0.008	0.4	<.0002	6.37	0.001	<.0001	1.3	0.001	<.002	0.001	6.8	<.001	<.001	3.66	<.0004	0.0638	0.0016	0.001	<.001	<.0004
	12/10/1999	<.003	<.05	<.005	<.05	0.024	<.001	<.04	34.6	<.001	<.005	<.005	<.002	0.02	1	<.005	11.6	<.01	<.002	4	<.005	<.04	<.01	15	<.03	<.005	3.3	<.01	0.189	<.005	<.005	<.03	<.01
	27/04/00	<.003	<.05	<.005	<.05	0.03	<.001	<.05	47.5	<.001	<.005	<.005	0.006	<.01	<1	<.005	20.5	0.03	<.002	4	<.005	<1	<.01	33	<.03	<.005	3.3	<.01	0.167	0.007	<.005	<.03	<.01
	15/05/00	<.003	0.05	<.005	<.05	0.026	<.001	<.05	43.1	<.001	<.005	<.005	0.007	0.08	<1	<.005	17.1	<.01	<.002	<1	<.005	<1	<.01	<.03	<.005	4.5	<.01	0.228	<.005	<.005	<.03	0.1	
	20/06/00	<.003	<.05	<.005	<.05	0.024	<.001	<.05	15.5	<.001	<.005	<.005	0.002	0.11	<1	<.005	4.6	<.01	<.002	1	<.005	<1	<.01	6	<.03	<.005	2.5	<.01	0.08	<.005	<.005	<.03	<.01
	25/07/00	<.003	<.05	<.005	<.05	0.017	<.001	<.05	22.5	<.001	0.026	<.005	0.002	0.18	2	0.081	7.5	0.18	<.002	3	0.019	2	<.01	9	<.03	<.005	3.2	<.01	0.135	<.005	0.035	<.03	0.27
	29/08/00	<.003	0.09	<.005	<.05	0.011	<.001	<.05	30.4	<.001	<.005	<.005	<.002	<.01	1	<.005	10	0.02	<.002	3	0.012	<1	<.01	11	<.03	<.005	4.3	<.01	0.11	<.005	<.005	<.03	0.02
	26/09/00	<0.01	0.08	<0.2	<0.1	0.05	<0.005	<0.1	36.8	<0.001	<0.01	<0.01	<0.01	0.05	<2	10.8	0.006	<0.01	<2	<0.05	<0.3	<0.05	<0.2	<0.2	4.07	<0.03	0.14	<0.01	<0.03	0.025			
	29/10/00	<.003	0.16	<.005	<.05	0.033	0.001	<.05	55.6	<.001	<.005	<.005	0.013	0.2	2	<.005	21.3	0.07	<.002	6	<.005	<1	<.01	85	<.03	<.005	5.2	<.01	0.227	<.005	<.005	<.03	0.02
	13/11/00	<0.003	<0.05	<0.005	<0.05	0.114	<0.001	<0.05	66.7	<0.001	<0.005	<0.005	<0.002	0.02	1	0.021	29.5	0.06	<0.002	4	<0.005	0.03	<0.01	33	0.15	<0.005	5.3	0.17	0.301	<0.005	0.008	<0.03	0.02
	18/11/00	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	72.2	<0.001	<0.01	<0.01	<0.01	<0.01	<2	26	<0.005	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.03	<0.2	4.8	0.293	<0.01	<0.03	0.015				
	14/12/00	<0.05	<0.2	<0.1	0.09	<0.005	<0.1	76.5	<0.001	<0.01	<0.01	0.01	<2	29	<0.005	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	4.49	<0.03	0.322	<0.01	<0.03	0.022					
	13/01/01	<.003	<.05	<.005	<.05	0.034	0.001	<.05	67.8	<.001	<.005	<.005	0.018	0.06	<1	<.005	27.1	0.12	0.022	5	<.005	<1	<.01	64	<.03	<.005	4.5	<.01	0.44	<.005	<.005	<.03	0.01
	10/2/2001	<.003	0.08	<.005	<.05	0.026	0.001	<.05	70.8	<.001	<.005	<.005	0.017	<.01	4	0.062	28.1	0.02	<.002	7	<.005	<1	<.01	76	<.03	<.005	4.5	<.01	0.285	<.005	0.033	<.03	0.01
	10/3/2001	<.003	0.4	0.021	0.06	0.16	<.001	<.05	81	0.005	<.005	0.009	0.026	<.01	4.38	<.005	32	<.01	0.012	9	0.015	<1	0.01	44	<.03	<.005	4.66	<.01	0.37	0.01	0.02	<.03	<.01
	16/04/01	<.003	0.09	<.005	<.05	0.202	<.001	<.05	82.1	<.001	<.005	<.005	0.006	<.01	<1	<.005	32.4	<.01	<.002	6	<.005	<1	<.01	41	<.03	<.005	5.2	<.01	0.376	<.005	<.005	<.03	<.01
	14/05/01	<.003	0.11	<.005	<.05	0.134	<.001	<.05	61.4	<.001	0.023	0.005	0.009	0.01	3	<.005	22.3	0.01	<.002	<1	0.013	<1	<.01	27	<.03	<.005	3.3	<.01	0.241	<.005	0.008	<.03	<.01
	17/06/01	<.003	0.08	<.005	0.05	0.088	<.001	<.05	16.5	<.001	<.005	<.005	<.002	0.1	<1	<.005	5.3	0.06	0.005	3	<.005	<1	<.01	7	0.06	<.005	0.9	<.01	0.076	<.005	<.005	<.03	<.01
	14/07/01	<.003	<.05	<.005	0.09	0.08	<.001	<.05	37.4	<.001	<.005	<.005	<.002	<.01	<1	<.005	12.6	<.01	<.002	4	<.005	<1	<.01	16	<.03	<.005	5.1	0.02	0.17	<.005	<.005	<.03	0.03
	14/08/01	<0.003	<0.05	<0.005	<0.05	0.128	<0.001	<0.05	52.3	<0.001	<0.005	0.006	0.006	<0.01	1	<0.005	19.8	<0.01	<0.002	2	<0.005	<1	<0.01	24	<0.03	<0.005	5.3	<0.01	0.245	<0.005	<0.005	<0.03	0.02
	17/09/01	<0.003	<0.05	<0.005	<0.05	0.111	<0.001	<0.05	38.9	<0.001	<0.005	<0.005	<0.002	<0.01	<1	0.007	14.3	<0.01	<0.002	3	<0.005	<1	<0.01	17	<0.03	<0.005	4.7	<0.01	0.187	<0.005	<0.005	<0.03	0.01
	15/10/01	<0.003	<0.05	<0.005	0.1	0.117	<0.001	<0.05	53.6	<0.001	<0.005	0.007	<0.002	<0.01	1	0.019	20.8	<0.01	<0.002	<1	<0.005	<1	<0.01	25	<0.03	<0.005	5	<0.01	0.248	<0.005	<0.005	<0.03	<0.01
	13/11/01	0.004	<0.05	<0.005	<0.05	0.101	<0.001	<0.05	58.7	<0.001	<0.005	<0.005	<0.002	<0.01	1	0.012	23.7	0.03	<0.002	4	<0.005	0.02	<0.01	29	<0.03	<0.005	5.1	0.11	0.26	<0.005	0.007	<0.03	0.02
	14/12/01	<0.001	<0.05	<0.005	<0.05	0.083	<0.001	<0.05	64.6	<0.001	0.007	0.006	<0.002	<0.01	<1	0.014	25.9	0.03	0.004	<1	<0.005	<0.01	<0.01	28	<0.03	<0.005	4.7	<0.01	0.258	<0.005	<0.005	<0.03	<0.01
	15/01/02	<0.001	<0.05	<0.005	<0.05	0.185	<0.001	<0.05	76.2	<0.001	<0.005	<0.005	<0.002	<0.01	2	31.4	0.02	<0.002	5	<0.005	<0.01	<0.01	40	<0.03	<0.005	5.4	<0.01	<0.005	<0.005	<0.03	0.03		
	12/2/2002	<0.001	<0.05	<0.005	<0.05	0.127	<0.001	<0.05	82.3	<0.001	<0.005	<0.005	<0.002	<0.01	2	30.9	0.02	0.003	7	<0.005	<0.01	0.12	36	<0.03	<0.005	5.1	0.02	<0.005	<0.005	<0.03	0.08		
	15/04/02	<0.001	<0.05	<0.005	<0.05	0.125	<0.001	<0.05	93.8	0.004	<0.005	<0.005	<0.002	<0.01	2	35.3	0.02	0.002	6	<0.005	<0.01	<0.01	48	<0.03	<0.005	5.3	0.04	<0.005	<0.005	<0.03	0.03		
	13/05/02	<0.001	0.06	<0.005	<0.05	0.115	<0.001	<0.05	46.8	0.001	<0.005	<0.005	<0.002	0.08	2	16.7	0.03	<0.002	4	0.005	<0.01	<0.01	21	<0.03	<0.005	3.8	<0.01	<0.005	<0.005	<0.03	0.03		
	16/06/02	<0.2	0.09	<0.003	0.07	0.141	<0.2	<0.01	26.1	0.5	<0.001	<0.001	0.014	0.046	0.8	0.005	8.3	0.008	<0.001	3.1	<0.001	0.03	0.009	11.4	<0.002	<0.005	3.9	<0.002	0.108	<0.001	<0.001	<0.03	0.054
	16/07/02	0.3	0.063	0.007	<0.05	0.073	0.4	<0.01	96.9	<0.2	0.002	0.002	0.008	<0.002	1.4	0.012	23.8	0.023	0.007	3.5	0.004	0.06	<0.002	79.4	0.005	<0.005	4.4	<0.002	0.385	<0.001	<0.001	<0.03	0.056
	12/8/2002	<0.2	0.084	0.005	<0.05	0.098	0.2	<0.01	110.1	<0.2	0.003	0.007	0.018	0.012	1.7	0.003	26.7	0.021	<0.001	6.2	0.004	0.01	0.008	93.7	<0.002	<0.005	3.9	<0.002	0.457	<0.001	<0.001	<0.03	0.047
	16/09/02	<0.2	0.074	<0.003	0.12	0.157	<0.2	<0.01	41.3	<0.2	<0.001	<0.001	0.018	0.022	1	0.004	13.1	0.012	0.001	2.4	<0.001	<0.01	<0.002	19.3	<0.002	<0.005	4.5	<0.002	0.162	<0.001	<0.001	<0.03	0.028
	15/10/02	0.4	0.043	<0.003	0.12	0.123	<0.2	<0.01	53.3	<0.2	<0.001	0.003	0.031	0.013	1.2	0.005	18.3	0.012	<0.001	4.7	0.001	0.03	<0.002	26.2	<0.002	<0.005	5.1	<0.002	0.215	<0.001	<0.001	<0.03	0.089
	12/11/2002	<0.2	0.03	0.007	0.12	0.099	<0.2	<0.01	68.2	<0.2	0.001	0.004	0.014	<0.002	1.2	0.004	23.5	0.013	0.002	4.8	<0.001	<0.01	<0.002	32.5	<0.002	<0.005	5.1	0.004	0.275	<0.001	<0.001	<0.03	0.036
	10/12/2002	0.2	0.036	0.017	0.08	0.12	0.3	0.01	65.7	<0.2	0.002	0.005	0.02	0.03	1.4	0.005	26.3	0.021	0.002	4.1	0.003	0.04	0.004	35.6	<0.002	<0.005	5.7	0.005	0.273	<0.001	<0.001	<0.03	0.067
V25BSP																																	
	31/05/98	0.04																															
	18/05/99	<.003	0.27	<.005	<.05	0.039	0.002	<.04	23.5	<.001	<.005	<.005	0.065	0.04	2	0.031	5.2	0.06	<.002	3	0.011	0.33	<.01	<.03	<.03	1.1	<.01	0.112	<.005	0.014	<.03	0.05	
	27/05/99	<.003	3.49	<.005	<.05	0.058	<.001	<.04	30	0.008	<.005	<.005	0.034	2.71	3	<.005	6.6	0.12	<.002	10	0.007	<.04	<.01	21	<.03	<.03	6.9	<.01	0.13	0.128	<.005	<.03	0.07
	3/7/1999	<.003	0.42	<.005	0.59	0.036	<.001	<.04	22.1	0.004	<.005	<.005	0.011	0.82	<1	<.005	4.4	0.03	<.002	2	<.005	<.04	<.01	13	<.03	<.03	5.7	<.01	0.1	<.005	<.005	<.03	<.01
	12/8/1999	<.003	<.05	<.005	0.06	0.085	<.001	<.04	52.3	0.007	0.028	<.005	0.013	<.01	8	0.011	11	0.23	<.002	5	0.007	<.04	<.01	48	<.03	<.005	7.1	<.01	0.266	0.009	0.016	<.03	0.72
	10/9/1999	<.003	<.05	<.005	<.05	0.028	<.001	<.04	36.7	<.001	0.012	<.005	0.012	<.01	1	0.014	8.2	0.32	<.002	3	0.011	<.04	<.01	52	<.03	<.005	3.4	<.01	0.212	<.005	<.005	<.03	0.16
	20/06/00	<.003	0.09	<.005	<.05	0.058	0.001	<.05	46.7	<.001	<.005	<.005	0.009	0.1	2	<.005	11.6	0.08	<.002	5	<.005	<1	<.01	44	<.03	<.005	5.9	<.01	0.257	<.005	<.005	<.03	0.1
	25/07/00	<.003	0.07	<.005	<.05	0.031	<.001	<.05	30.2	0.002	0.009	<.005	0.009	0.28	2	0.07	6.5	0.14	<.002	5	0.021	2	<.01	17	<.03	<.005	4.5	<.01	0.199	0.01	0.02	<.03	0.28
	29/08/00	<.003	0.8	<.005	<.05	0.042	<.001	<.05	28.6	<.001	<.005	<.005	<.002	0.54	<1	<.005	5.9	0.05	<.002	4	0.011	3	<.01	14	<.03	<.005	5.9	<.01	0.114	0.014	<.005	<.03	0.15
	25/09/00	<0.01	0.12	<0.2	<0.1	0.06	<0.005	<0.1	36	<0.001	<0.01	<0.01	<0.01	0.12	<2	6.2	0.062	<0.01	3	<0.05	<0.3	<0.05	<0.2	<0.2	5.33	<0.03	0.147	<0.01	<0.03	0.055			
	29/10/00	<.003	0.15	<.005	<.05	0.035	<.001	<.05	36.4	<.001	<.005	0.012	0.015	0.22	2	<.005	8.7	0.04	<.002	6	<.005	<1	<.01	20	<.03	<.005	5.2	<.01	0.167	<.005	<.005	<.03	0.03
	18/11/00	<0.01	0.11	<0.2	<0.1	0.07	<0.005	<0.1	50.8	<0.001	<0.01	<0.01	<0.01	0.01	<2	9.8	0.015	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.03	<0.2	5.6	0.199	<0.01	<0.03	0.088			
	14/12/00	<0.05	<0.2	<0.1	0.08	<0.005	<0.1	57	<0.001	<0.01	<0.01	<0.01	<0.01	<2	10.3	<0.005	<0.01	4	<0.05	<0.3	<0.05	<0.2	<0.2	5.65	<0.03	0.247	<0.01	<0.03	0.087				
	14/05/01	<.003	0.08	<.005	<.05	0.13	<.001	<.05	72.4	<.001	<.005	<.005	0.003	<.01	9	<.005	14.1	0.02	<.002	6	<.005	<1	<.01	42	<.03	<.005	4.1	<.01	0.265	<.005	<.005	<.03	0.02
	17/06/01	<.003	0.44	<.005	0.06	0.189	<.001	<.05	21.5	<.001	<.005	<.005	0.023	0.59	1	0.005	3.8	0.04	<.002	4	<.005	<1	0.02	8	<.03	<.005	2.2	<.01	0.097	<.005	<.005	<.03	0.06
	14/07/01	<.003	0.28	0.008	0.09	0.092	<.001	<.05	31.7	<.001	<.005	<.005	0.005	0.23	1	<.005	5.6	<.01	<.002	12	<.005	<1	<.01	13	<.03	<.005	6.3	0.02	0.164	0.008	<.005	<.03	0.02
	14/08/01	<0.003	<0.05	<0.005	<0.05	0.142	<0.001	<0.05	46.7	<0.001	<0.005	<0.005	0.007	<0.01	1	<0.005	9.1	<0.01	0.002	3	<0.005	<1	<0.01	28	<0.03	<0.005	5.9	0.07	0.231	<0.005	<0.005	<0.03	<0.01
	17/09/01	<0.003	<0.05	0.017	<0.05	0.109	<0.001	<0.05	52.3	<0.001	<0.005	<0.005	0.003	<0.01	1	0.006	10.4	<0.01	<0.002	2	<0.005	<1	0.02	35	<0.03	<0.005	5.8	<0.01	0.246	<0.005	<0.005	<0.03	<0.01
	15/10/01	<0.003	<0.05	<0.005	0.11	0.121	<0.001	<0.05	53.9	<0.001	<0.005	<0.005	<0.002	<0.01	1	0.023	10.4	<0.01	<0.002	1	<0.005	<1	<0.01	34	<0.03	<0.005	5.3	0.05	0.234	<0.005	<0.005	<0.03	0.04
	13/05/02	<0.001	<0.05	<0.005	0.05	0.095	<0.001	<0.05	57	<0.001	<0.005	<0.005	0.004	<0.01	2	10.3	0.03	0.006	5	<0.005	0.05	0.01	36	<0.03	<0.005	2.9	0.03	<0.005	<0.005	<0.03	0.34		
	16/06/02	0.6	0.21	<0.003	0.07	0.163	<0.2	0.02	36.6	0.2	<0.001	<0.001	0.018	0.151	1.3	0.007	6.4	0.029	<0.001	3.9	<0.001	<0.01	0.011	18.3	<0.002	<0.005	5.2	0.003	0.154	0.005	<0.001	<0.03	0.094
	25/06/02	<0.2	0.052	0.038	0.05	0.048	0.6	<0.01	199.7	0.5	0.003	0.012	0.014	0.076	2.8	<0.001	34.1	0.291	0.007	6	0.004	<0.01	0.008	194.2	<0.002	<0.005	3.5	0.004	0.767	<0.001	<0.001	<0.03	0.144
	9/7/2002	0.8	0.056	0.005	0.68	0.054	0.4	<0.01	227.5	<0.2	<0.001	0.012	0.007	0.014	3	<0.001	39.5	0.069	0.004	6.8	0.004	<0.01	0.021	237.7	0.002	<0.005	3.2	0.002	0.922	<0.001	0.002	<0.03	0.09
	16/07/02	1.2	0.077	0.01	<0.05	0.034	0.6	<0.01	232.7	0.4	0.003	0.01	0.017	0.002	3.3	<0.001	45.7	0.13	0.006	6.9	0.004	0.06	<0.002	249.5	0.018	<0.005	2.9	<0.002	0.918	<0.001	0.002	<0.03	0.106
	23/07/02	<0.2	0.004	<0.003	0.44	0.037	0.2	<0.01	233.7	<0.2	0.011	0.005	0.008	0.014	3.6	<0.001	47.3	0.118	<0.001	7.8	<0.001	<0.01	0.004	261.8	0.005	<0.005	2.9	<0.002	0.97	<0.001	0.001	<0.03	0.089
	6/8/2002	<0.2	<0.001	0.006	0.16	0.069	<0.2	<0.01	257.3	0.8	0.002	<0.001	<0.001	<0.002	3.6	<0.001	49.5	0.102	0.002	5.8	<0.001	0.01	<0.002	270.1	0.004	<0.005	3.3	<0.002	1.02	<0.001	0.002	<0.03	0.043

Vangorda Plateau Site - Select Surface Water Quality Listing, 1998 to 2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	12/8/2002	0.6	0.161	0.02	0.06	0.046	0.4	<0.01	250.1	<0.2	0.003	0.005	0.034	0.096	4	<0.001
	20/08/02	<0.2	<0.001	<0.003	0.15	0.072	<0.2	<0.01	235.2	0.3	0.003	0.003	0.002	0.004	3.7	0.002
	27/08/02	<0.2	0.074	<0.003	0.08	0.089	<0.2	<0.01	238.5	0.4	<0.001	<0.001	0.011	0.033	4.2	<0.001
	16/09/02	0.9	0.092	<0.003	0.11	0.106	<0.2	<0.01	173.4	0.8	0.006	<0.001	0.023	<0.002	3.1	<0.001
	15/10/02	1.1	0.078	0.005	0.11	0.046	<0.2	<0.01	174.6	0.8	0.012	<0.001	0.031	0.027	3.2	0.002
	12/11/2002	<0.2	0.092	0.007	0.16	0.065	0.2	<0.01	125	<0.2	0.012	0.008	0.029	0.02	2.5	0.005
V27																
	16/03/99	<.003	<.05	<.005	0.05	0.032	<.001	<.04	38.7	<.001	<.005	<.005	0.01	<.01	<1	<.005
	18/06/99	<.003	<.05	<.005	<.05	<.002	<.001	<.04	5	<.001	<.005	<.005	<.002	0.08	<1	<.005
	29/07/99	<.0001	0.03	<.001	0.03	0.0133	0.0001	<.001	10.27	<.0001	<.0002	<.0002	0.0008	0.015	0.3	<.0002
	31/08/99	<.0001	0.012	<.001	1.056	0.0056	<.0001	<.001	14.142	0.0005	<.0002	<.0002	0.0018	<.001	0.34	<.0002
	12/10/1999	<.003	<.05	<.005	<.05	0.024	<.001	<.04	20	<.001	<.005	<.005	<.002	0.06	<1	<.005
	25/03/00	<.003	<.05	<.005	<.05	0.142	<.001	<.05	41.6	<.001	0.027	<.005	<.002	<.01	3	<.005
	20/06/00	<.003	<.05	<.005	<.05	0.017	0.001	<.05	7.8	<.001	<.005	<.005	<.002	0.15	<1	<.005
	12/9/2000	<.003	<.05	<.005	<.05	0.022	<.001	<.05	23.5	<.001	<.005	0.049	<.002	0.04	<1	0.112
	7/6/2001	<.003	0.16	<.005	<.05	0.206	<.001	<.05	9.7	<.001	<.005	<.005	0.002	0.09	<1	<.005
	25/06/02	<0.2	0.067	0.015	0.05	0.094	0.3	<0.01	53.4	1.5	<0.001	0.002	0.015	0.033	1.1	0.004
	27/09/02	<0.2	0.046	0.008	0.11	0.116	<0.2	<0.01	28.9	<0.2	<0.001	<0.001	0.015	0.068	0.7	0.004

Station	Date	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	12/8/2002	45.4	0.066	<0.001	9.4	0.005	0.03	0.003	260.3	0.005	<0.005	3	<0.002	1.04	<0.001	0.002	<0.03	0.097
	20/08/02	46.1	0.098	0.001	6.2	0.001	<0.01	<0.002	263.3	<0.002	<0.005	3	<0.002	1.051	0.005	0.004	<0.03	0.03
	27/08/02	45.3	0.078	<0.001	7	0.004	<0.01	<0.002	249	0.007	<0.005	3.9	<0.002	1.188	<0.001	0.003	<0.03	0.123
	16/09/02	32.9	0.062	0.003	6.7	0.003	0.01	0.004	166.7	0.025	<0.005	4.8	<0.002	0.675	<0.001	0.002	<0.03	0.135
	15/10/02	32.5	0.102	<0.001	8.7	0.003	<0.01	<0.002	172.1	0.01	<0.005	5	<0.002	0.697	<0.001	<0.001	<0.03	0.192
	12/11/2002	24.3	0.104	<0.001	9.1	0.007	0.02	0.007	98.5	0.004	<0.005	6.6	<0.002	0.459	<0.001	0.002	<0.03	0.189
V27																		
	16/03/99	10	<.01	<.002	3	<.005	0.14	<.01	18	<.03	<.03	3.5	<.01	0.197	<.005	<.005	<.03	<.01
	18/06/99	1.3	0.07	<.002	2	<.005	<.04	<.01	2	<.03	<.03	1.3	<.01	0.052	<.005	<.005	<.03	<.01
	29/07/99	2.49	0.003	<.0001	1.2	0.001	<.002	<.001	4.6	<.001	<.001	4.84	<.0004	0.0637	0.0024	<.0002	<.001	0.02
	31/08/99	3.21	0.001	0.0001	2.31	0.0003	<.002	<.001	5.43	<.001	<.001	8.119	<.0004	0.0592	0.0014	0.0011	<.001	<.0004
	12/10/1999	4.7	<.01	<.002	3	<.005	<.04	<.01	9	<.03	<.005	3	<.01	0.123	<.005	<.005	<.03	0.02
	25/03/00	10.8	<.01	<.002	7	<.005	<1	<.01	17	<.03	<.005	4.5	<.01	0.22	<.005	<.005	<.03	<.01
	20/06/00	1.6	<.01	<.002	2	<.005	<1	<.01	3	<.03	<.005	2.2	<.01	0.048	<.005	<.005	<.03	0.01
	12/9/2000	6.3	0.13	<.002	3	<.005	<1	<.01	12	<.03	<.005	2.8	<.01	0.087	<.005	<.005	<.03	0.08
	7/6/2001	2.8	0.05	0.003	2	<.005	<1	<.01	5	<.03	<.005	1.1	<.01	0.043	<.005	<.005	<.03	0.03
	25/06/02	10.9	0.035	0.002	2.5	0.003	<0.01	<0.002	44.2	0.005	<0.005	4.4	0.003	0.219	<0.001	<0.001	<0.03	0.154
	27/09/02	7.4	0.014	0.002	2.5	0.002	<0.01	<0.002	15.5	0.003	<0.005	4.7	<0.002	0.116	<0.001	<0.001	<0.03	0.105

Appendix C

General Groundwater Quality Data, 1998 to 2002

Faro Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F pH unit	PH-L pH unit	TEMP-C	SO4-T mg/L	COND µS/cm	ALK-T mg/L	HARD-T (CACO3) mg/L
X16A								
	6/1/1998	6.99			23			
	10/31/1998	7.31			22.8		141	
	10/29/1999	7.13		4	15			
	5/31/2000	7.73		4	33			
	10/9/2000	7.12		5.3	60			
	6/5/2001	8	7.36	3.5	26	275	119	147
	9/5/2001		8.25		26			
	6/10/2002		8.12		26	314	150	168
	9/23/2002	8.13	8.13		36	346	146	227
	Mean	**7.49**	**7.97**	**4.2**	**29.8**	**314**	**139**	**181**
	Median	**7.31**	**8.12**	**4**	**26**	**314**	**144**	**168**
	Values	**7**	**4**	**4**	**9**	**1**	**4**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
X16B								
	6/1/1998	7.09			25			
	10/31/1998	7.49			42		167	
	6/19/1999	7.79		5	23			
	10/29/1999	7.38		3	24			
	5/31/2000	7.66		5	26			
	10/9/2000	7.38		1.1	87			
	6/5/2001	7.9	7.61	3.9	26		213	219
	9/5/2001		8		33			
	6/10/2002	6.7	8.19		28	396	205	229
	9/23/2002	8.14	8.14		25		195	223
	Mean	**7.5**	**7.99**	**3.6**	**34**	**396**	**195**	**224**
	Median	**7.49**	**8.07**	**3.9**	**26**	**396**	**200**	**223**
	Values	**9**	**4**	**5**	**10**	**1**	**4**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
X17A								
	6/1/1998	7.05			34			
	10/31/1998	7.21			29		174	
	6/19/1999	7.56		5	34			
	10/29/1999	7.45		3	44			
	5/31/2000	8.13		5	43			
	10/10/2000	7.83		4.4	107			
	6/6/2001	7.8		3.7	32			229
	9/5/2001	8	8.26	4.3	31	388		
	6/10/2002	6.9	7.97		46	466	233	275
	9/23/2002	8.13	8.13		36		194	242
	Mean	**7.61**	**8.12**	**4.23**	**44**	**427**	**200**	**249**
	Median	**7.68**	**8.13**	**4.35**	**35**	**427**	**194**	**242**
	Values	**10**	**3**	**6**	**10**	**2**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Faro Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F pH unit	PH-L pH unit	TEMP-C	SO4-T mg/L	COND µS/cm	ALK-T mg/L	HARD-T (CACO3) mg/L
X17B								
	6/1/1998	7.07			28			
	10/31/1998	7.12			22		138	
	6/19/1999	7.55		5	19			
	10/29/1999	7.52		3	23			
	5/31/2000	8.14		7	25			
	10/10/2000	7.68		4.2	79			
	6/6/2001	7.4		4.7	50			303
	6/10/2002	5.1	7.67		54	599	320	331
	9/23/2002	8.11	8.11		39		251	285
	Mean	**7.3**	**7.89**	**4.78**	**38**	**599**	**236**	**306**
	Median	**7.52**	**7.89**	**4.7**	**28**	**599**	**251**	**303**
	Values	**9**	**2**	**5**	**9**	**1**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
X18A								
	6/2/1998	6.92			313			
	10/31/1998	6.64			413		157	
	6/19/1999	6.93		5	455			
	10/29/1999	6.28		2	382			
	6/27/2000	6.35		8	435			
	10/9/2000	7		4.5	131			
	6/6/2001	7.4		4.3	423			562
	9/5/2001		7.67		392			
	6/10/2002	7.3	7.65		553	1205	217	706
	9/27/2002	7.79	7.79		449		203	590
	Mean	**6.96**	**7.7**	**4.76**	**395**	**1205**	**192**	**619**
	Median	**6.93**	**7.67**	**4.5**	**418**	**1205**	**203**	**590**
	Values	**9**	**3**	**5**	**10**	**1**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
X18B								
	6/2/1998	7.26			327			
	10/31/1998	6.85			456		190	
	7/29/1999	8.03		5	397			
	10/29/1999	5.75		2	422			
	5/31/2000	7.16		6	399			
	10/9/2000	7.09		3.3	245			
	6/6/2001	7.4		4.3	475			606
	9/5/2001		7.83		438			
	6/10/2002	7.5	7.67		470	1074	222	634
	9/23/2002	7.96	7.96		550		177	647
	Mean	**7.22**	**7.82**	**4.1**	**418**	**1074**	**196**	**629**
	Median	**7.26**	**7.83**	**4.3**	**430**	**1074**	**190**	**634**
	Values	**9**	**3**	**5**	**10**	**1**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Faro Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F pH unit	PH-L pH unit	TEMP-C	SO4-T mg/L	COND µS/cm	ALK-T mg/L	HARD-T (CACO3) mg/L
P96-6								
	6/15/1998	5.88			250			
	10/20/1998	5.75			254			
	12/21/1998	5.85			342			
	7/4/1999	5.84		3	428			
	10/30/1999	6.05		1	341			
	7/25/2000	6.15		5.6	207			
	10/22/2000	5.97		1.3	397			
	6/5/2001	5.6	5.47	1.8	246		302	538
	10/25/2001	6.54	6.14	1.4	193	437		
	6/11/2002	6.8	7.08		303	1123	359	638
	9/25/2002	6.69	6.69		183		269	515
	Mean	6.1	6.34	2.35	286	780	310	564
	Median	5.97	6.41	1.6	254	780	302	538
	Values	11	4	6	11	2	3	3
	Values <DL	0	0	0	0	0	0	0
P96-7								
	6/15/1998	6.96			437			
	10/31/1998	7.01			1219		141	
	12/22/1998	7.06			1155			
	10/31/1999	6.81		1	1606			
	10/22/2000	7.02		1.5	720			
	6/6/2001	7.3		3.4	1226			1258
	10/26/2001	7.67	7.23	1.4	1800	1498		
	6/12/2002	7.5	7.61		1260	2082	267	1530
	9/25/2002	7.58	7.58		1960	2910	162	2220
	Mean	**7.21**	**7.47**	**1.8**	**1265**	**2163**	**190**	**1669**
	Median	**7.06**	**7.58**	**1.4**	**1226**	**2082**	**162**	**1530**
	Values	**9**	**3**	**4**	**9**	**3**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
P96-8A								
	6/15/1998	6.47			1702			
	10/19/1998	6.3			2535			
	7/3/1999	6.46		3	2290			
	10/29/1999	6.28		2	2993			
	5/31/2000	5.9		2	1340			
	10/10/2000	6.07		4.9	1752			
	6/7/2001	6.9	5.98	2.3	3391		144	
	10/25/2001	6.31	7.04	4.8	3900	3225		
	6/11/2002		7.87		1420		299	1640
	9/5/2002		7.06		3510		230	3650
	9/25/2002	7.15	7.15		4300		251	4580
	Mean	**6.43**	**7.02**	**3.17**	**2648**	**3225**	**231**	**3290**
	Median	**6.31**	**7.06**	**2.65**	**2535**	**3225**	**240**	**3650**

Station	Date	PH-F	PH-L	TEMP-C	SO4-T	COND	ALK-T	HARD-T (CACO3)
		pH unit	pH unit		mg/L	µS/cm	mg/L	mg/L
	Values	**9**	**5**	**6**	**11**	**1**	**4**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
P96-8B								
	6/15/1998	6.58			2092			
	7/3/1999	6.67		3	2983			
	10/29/1999	6.18		2	3218			
	5/31/2000	6.48		4	3714			
	10/10/2000	6.68		2	3270			
	6/7/2001	6.6	6.1	3.7	4468		341	
	10/25/2001	6.35	6.12	4.7	4690	3422		
	9/5/2002		6.82		4140		356	4750
	9/25/2002	6.94	6.94		4240		360	5200
	Mean	**6.56**	**6.5**	**3.23**	**3646**	**3422**	**352**	**4975**
	Median	**6.59**	**6.47**	**3.35**	**3714**	**3422**	**356**	**4975**
	Values	**8**	**4**	**6**	**9**	**1**	**3**	**2**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S1A								
	6/15/1998	6.78			1325			
	10/31/1998	6.24			2351		292	
	7/3/1999	7.24		3	2356			
	10/31/1999	6.75		1	2533			
	7/25/2000	6.64		7.2	2530			
	10/22/2000	6.11		1.3	2357			
	6/6/2001	6.6		2.1	2964			2851
	10/26/2001	6.84	6.36	0.9	3380	2350		
	6/12/2002	5.9	6.84		4080	4746	229	3830
	9/25/2002	7.11	7.11		3590		220	4170
	Mean	**6.62**	**6.77**	**2.58**	**2747**	**3548**	**247**	**3617**
	Median	**6.69**	**6.84**	**1.7**	**2532**	**3548**	**229**	**3830**
	Values	**10**	**3**	**6**	**10**	**2**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S1B								
	6/15/1998	7.02			348			
	10/31/1998	6.42			820		187	
	7/3/1999	7.66		2	626			
	10/31/1999	6.28		0	863			
	7/25/2000	6.42		3.9				
	10/22/2000	6.12		1.6	351			
	6/6/2001	6.6		2	1528			1356
	10/26/2001		6.37	1	1150	955		
	6/12/2002	6.3	7.39		1170	1844	144	1160
	9/25/2002	7.03	7.03		1150		87	1240
	Mean	**6.65**	**6.93**	**1.75**	**890**	**1400**	**139**	**1252**
	Median	**6.42**	**7.03**	**1.8**	**863**	**1400**	**144**	**1240**

Faro Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F pH unit	PH-L pH unit	TEMP-C	SO4-T mg/L	COND µS/cm	ALK-T mg/L	HARD-T (CACO3) mg/L
	Values	**9**	**3**	**6**	**9**	**2**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S2A								
	6/15/1998	6.1			529			
	10/31/1998	6.33			1069		223	
	7/3/1999	6.76		2	1491			
	10/31/1999	6.18		0	1385			
	7/25/2000	6.39		4.2	1408			
	10/22/2000	6.21		1.4				
	6/6/2001	7		4.8	1263			1325
	6/12/2002	5.7	6.83		2190	3850	152	3030
	9/25/2002	7.08	7.08		4120		198	3390
	Mean	**6.42**	**6.95**	**2.48**	**1682**	**3850**	**191**	**2582**
	Median	**6.33**	**6.95**	**2**	**1396**	**3850**	**198**	**3030**
	Values	**9**	**2**	**5**	**8**	**1**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S2B								
	6/15/1998	6.07			725			
	10/31/1998	6.3			550		361	
	7/3/1999	6.82		2	1300			
	10/31/1999	6.15		0	345			
	7/25/2000	5.56		4.7	388			
	10/22/2000	6.22		1.3	696			
	6/6/2001	7.4		3	1200			1332
	10/26/2001		6.25	1	2210	1256		
	6/12/2002	6.6	6.98		2250	1267	57	974
	9/25/2002	6.92	6.92		2550		110	1980
	Mean	6.45	6.72	2	1221	1262	176	1429
	Median	6.3	6.92	1.65	962	1262	110	1332
	Values	9	3	6	10	2	3	3
	Values <DL	0	0	0	0	0	0	0
S3								
	6/15/1998	6.33			1323			
	10/31/1998	6.32			1862		239	
	10/31/1999	5.55		0	2119			
	7/25/2000	6.37		5.5	2025			
	10/22/2000	6.03		1.4	1994			
	6/6/2001	7.1		1.6	2792			2715
	10/26/2001	6.78	6.17	2.4	3210	2371		
	6/12/2002	6.1	6.83		4420	5070	148	4520
	9/25/2002	6.74	6.74		4350		178	3530
	Mean	**6.37**	**6.58**	**2.2**	**2677**	**3720**	**188**	**3588**
	Median	**6.33**	**6.74**	**1.6**	**2119**	**3720**	**178**	**3530**
	Values	**9**	**3**	**5**	**9**	**2**	**3**	**3**

Faro Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F	PH-L	TEMP-C	SO4-T	COND	ALK-T	HARD-T (CACO3)
		pH unit	pH unit		mg/L	µS/cm	mg/L	mg/L
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH1								
	6/15/1998	6.56			92			
	10/20/1998	6.16			21			
	7/4/1999			3	399			
	10/30/1999	5.75		1	150			
	6/5/2001	6.5	6.07	4.5	92		157	222
	9/23/2002	6.89	6.89		286		122	480
	Mean	**6.37**	**6.48**	**2.83**	**173**		**140**	**351**
	Median	**6.5**	**6.48**	**3**	**121**		**140**	**351**
	Values	**5**	**2**	**3**	**6**		**2**	**2**
	Values <DL	**0**	**0**	**0**	**0**		**0**	**0**
BH2								
	6/16/1998	6.37			139			
	10/20/1998	6.14			182			
	7/4/1999	5.48		4	259			
	10/30/1999	5.77		2	206			
	6/4/2000	5.44		4	236			
	10/22/2000	5.88		2.6	220			
	6/5/2001	6.4	5.97	2	615		66	648
	10/25/2001	6.35	6.33	2.7	334	457		
	6/11/2002	7.4	6.74		310	645	77	361
	9/23/2002	6.78	6.78		123		97	187
	Mean	**6.2**	**6.45**	**2.88**	**262**	**551**	**80**	**399**
	Median	**6.24**	**6.53**	**2.65**	**228**	**551**	**77**	**361**
	Values	**10**	**4**	**6**	**10**	**2**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH4								
	6/15/1998	3.45			625			
	10/20/1998	5.88			98			
	10/30/1999	5.95		1	158			
	6/4/2000	3.7		2	187			
	10/22/2000	4.7		2.3	422			
	6/5/2001	5.6	5.28	1.9	182		33	212
	10/25/2001	6.25	7.02	2.1	152	265		
	9/23/2002	6.69	6.69		132		90	194
	Mean	**5.28**	**6.33**	**1.9**	**244**	**265**	**62**	**203**
	Median	**5.74**	**6.69**	**2**	**170**	**265**	**62**	**203**
	Values	**8**	**3**	**5**	**8**	**1**	**2**	**2**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH12A								
	6/29/1998	6.34			498			
	10/19/1998	6.7			159			

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Station	Date	PH-F pH unit	PH-L pH unit	TEMP-C	SO4-T mg/L	COND µS/cm	ALK-T mg/L	HARD-T (CACO3) mg/L
	10/30/1999				259			
	6/26/2000	6.94		6	578			
	10/22/2000	6.76		1.2	288			
	6/4/2001	6.2	6.72	1.9	583		246	988
	10/25/2001	7.16	6.77	0.9	382	634		
	6/11/2002	7.4	7.25		1170	2070	222	1370
	Mean	**6.79**	**6.91**	**2.5**	**490**	**1352**	**234**	**1179**
	Median	**6.76**	**6.77**	**1.6**	**440**	**1352**	**234**	**1179**
	Values	**7**	**3**	**4**	**8**	**2**	**2**	**2**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH12B								
	6/29/1998	6.43			562			
	10/19/1998	6.83			488			
	10/30/1999	6.75		0	805			
	6/26/2000	6.62		5	633			
	10/22/2000	6.81		1.5	257			
	6/4/2001	7.7	6.65	1.6	628		226	954
	6/11/2002	7.4	7.31		1060	2004	222	1280
	9/25/2002	7.64	7.64		340		182	560
	Mean	**7.02**	**7.2**	**2**	**597**	**2004**	**210**	**931**
	Median	**6.82**	**7.31**	**1.6**	**595**	**2004**	**222**	**954**
	Values	**8**	**3**	**4**	**8**	**1**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH13B								
	10/19/1998	6.9			416			
	10/30/1999	6.85		0	603			
	10/22/2000	6.68		2	379			
	10/25/2001	7.15	6.93	0.6	513	611		
	9/25/2002	8.09	8.09		439		76	441
	Mean	**7.13**	**7.51**	**0.9**	**470**	**611**	**76**	**441**
	Median	**6.9**	**7.51**	**0.6**	**439**	**611**	**76**	**441**
	Values	**5**	**2**	**3**	**5**	**1**	**1**	**1**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH14A								
	6/29/1998	6.56			723			
	10/19/1998	6.7			974			
	10/30/1999	5.35		2	544			
	6/26/2000	7.85		4	805			
	10/22/2000	6.9		2.9	804			
	6/4/2001	6.9	6.78	2	1674		420	2307
	6/11/2002	7.2	7.89		1780	3434	401	2340
	9/25/2002	7.84	7.84		1980		389	2880
	Mean	**6.91**	**7.5**	**2.7**	**1160**	**3434**	**403**	**2509**

Faro Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F	PH-L	TEMP-C	SO4-T	COND	ALK-T	HARD-T (CACO3)
		pH unit	pH unit		mg/L	µS/cm	mg/L	mg/L
	Median	**6.9**	**7.84**	**2.5**	**890**	**3434**	**401**	**2340**
	Values	**8**	**3**	**4**	**8**	**1**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BH14B								
	6/29/1998	6.53			755			
	10/19/1998	6.78			948			
	10/30/1999	5.79		1	1063			
	6/3/2000	6.46		3	958			
	10/22/2000	6.94		2.6	872			
	6/4/2001	7.1	6.91	1.4	1523		420	2103
	10/25/2001	7.14	7.42	2.4	2000	2056		
	6/11/2002	7.2	7.88		1800	3289	393	2390
	9/25/2002	7.53	7.53		1700		389	2340
	Mean	**6.83**	**7.44**	**2.1**	**1291**	**2672**	**401**	**2278**
	Median	**6.94**	**7.48**	**2.4**	**1063**	**2672**	**393**	**2340**
	Values	**9**	**4**	**5**	**9**	**2**	**3**	**3**
	Values <DL	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Faro Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
X16A																																	
	6/1/1998	<.003	<.05	<.02	<.05	0.05	0.002	<.04	40.2	<.002	<.005	0.013	0.006	0.26	<1	0.026	10.4	0.1	0.01	2	0.009	0.19	<.02	8	<.03	<.03	4.1	<.01	0.111	0.006	<.005	<.03	0.01
	10/31/1998	<.003	0.1	<.005	<.05	0.032	<.001	<.04	47.9	<.001	<.005	<.005	<.002	0.27	<1	<.005	12.4	0.03	0.007	3	<.005	1.37	<.01	8	<.03	<.03	3.4	<.01	0.155	0.022	<.005	<.03	<.01
	10/29/1999	<.003	<.05	<.005	<.05	0.143	<.001	<.04	31.4	<.001	<.005	<.005	<.002	<.01	<1	<.005	7.1	<.01	<.002	2	<.005	<.04	<.01	5	<.03	<.005	1.9	<.01	0.101	<.005	<.005	<.03	<.01
	5/31/2000	<.003	<.05	0.007	<.05	0.031	<.001	<.05	39.8	0.001	<.005	<.005	<.002	<.01	<1	<.005	9.6	0.3	<.002	3	<.005	<1	<.01	11	<.03	<.005	4	<.01	0.142	<.005	<.005	<.03	0.09
	10/9/2000	<.003	0.06	<.005	<.05	0.042	<.001	<.05	38.1	<.001	<.005	<.005	0.004	0.06	2	<.005	10	0.33	<.002	4	<.005	3	<.01	20	<.03	<.005	3.7	<.01	0.15	0.006	0.013	<.03	0.04
	6/5/2001	<.003	0.09	<.005	<.05	0.212	<.001	<.05	42.7	<.001	<.005	<.005	<.002	0.04	1	0.009	10.3	0.15	<.002	2	<.005	<1	<.01	9	<.03	<.005	1.5	<.01	0.132	<.005	<.005	<.03	0.02
	9/5/2001	<0.00004	0.02	<0.001	<0.1	0.16	<0.002		70.5	<0.0001	<0.0006	<0.002	<0.002	<0.03	<2		21.3	0.0007	0.002	2	<0.002		<0.001		0.007	<0.002		<0.001		<0.01	<0.03		0.006
	6/10/2002	<0.00002	<0.005	<0.0005	<0.1	0.09	<0.001		48.4	<0.00005	<0.0003	<0.001	<0.001	<0.03	<2		11.5	0.0093	0.002	<2	<0.001		<0.0005		0.0014	0.002		<0.0005		<0.0002	<0.03		0.005
	9/23/2002	<0.00002	<0.005	<0.0005	<0.1	0.13	<0.001		63.6	<0.00005	<0.0003	<0.001	<0.001	<0.03	<2		16.4	0.0004	0.002	<2	<0.001		<0.0005		<0.0005	0.002		<0.0005		<0.0002	<0.03		<0.005
	Mean	0.00201	0.05	0.0054	0.07	0.099	0.001	0.04	47	0.0008	0.0035	0.005	0.002	0.08	1	0.009	12.1	0.1034	0.003	2	0.004	1.1	0.008	10	0.021	0.01	3.1	0.0069	0.132	0.0066	0.014	0.03	0.022
	Median	0.003	0.05	0.005	0.05	0.09	0.001	0.04	42.7	0.001	0.005	0.005	0.002	0.03	1	0.005	10.4	0.03	0.002	2	0.005	1	0.01	8	0.03	0.005	3.6	0.01	0.137	0.005	0.005	0.03	0.01
	Values	9	9	9	9	9	9	6	9	9	9	9	9	9	9	6	9	9	9	9	9	6	9	6	9	9	6	9	6	9	9	6	9
	Values <DL	9	5	8	9	0	8	6	0	8	9	8	7	5	7	4	0	1	4	2	8	3	9	0	7	7	0	9	0	6	8	6	3
X16B																																	
	6/1/1998	<.003	0.05	<.02	<.05	0.057	0.003	<.04	46.6	<.002	0.007	<.005	0.009	0.23	1	0.021	13.5	0.04	0.006	1	<.005	<.04	<.02	8	<.03	<.03	3.8	<.01	0.141	0.006	0.008	<.03	<.01
	10/31/1998	<.003	<.05	<.005	<.05	0.043	<.001	<.04	61.9	<.001	<.005	<.005	<.002	<.01	<1	<.005	17.6	<.01	0.006	3	<.005	<.04	<.01	14	<.03	<.03	3.2	<.01	0.219	<.005	<.005	<.03	<.01
	6/19/1999	<.003	0.2	<.005	<.05	0.075	<.001	<.04	60	<.001	<.005	<.005	0.006	0.03	2	0.015	16.2	<.01	0.002	4	<.005	<.04	<.01	8	<.03	<.03	4.3	<.01	0.208	<.005	<.005	<.03	<.01
	10/29/1999	<.003	<.05	<.005	<.05	0.171	<.001	<.04	52.8	<.001	<.005	<.005	<.002	<.01	<1	<.005	14.2	<.01	<.002	3	<.005	<.04	<.01	8	<.03	<.005	3.2	<.01	0.179	<.005	<.005	<.03	<.01
	5/31/2000	<.003	<.05	0.025	<.05	0.044	<.001	<.05	48.5	0.003	<.005	0.016	<.002	<.01	<1	<.005	13.1	0.24	<.002	2	0.007	<1	<.01	9	<.03	<.005	4.4	<.01	0.172	<.005	<.005	<.03	0.03
	10/9/2000	<.003	0.1	<.005	<.05	0.05	<.001	<.05	49.2	<.001	<.005	<.005	0.005	0.07	2	<.005	13.6	0.24	<.002	5	<.005	2	<.01	29	<.03	<.005	4.5	<.01	0.193	0.007	0.03	<.03	0.05
	6/5/2001	<.003	0.07	<.005	<.05	0.272	<.001	<.05	61.3	<.001	<.005	<.005	<.002	0.01	2	0.013	16.7	0.12	<.002	2	<.005	<1	<.01	9	<.03	<.005	2.4	<.01	0.206	<.005	<.005	<.03	<.01
	9/5/2001	<0.00002	0.011	<0.0005	<0.1	0.11	<0.001		57.6	0.0001	<0.0003	<0.001	<0.001	<0.03	<2		13.2	0.0046	0.002	2	<0.001		<0.0005		0.0067	0.001		<0.0005		<0.01	<0.03		0.018
	6/10/2002	<0.00002	0.011	<0.0005	<0.1	0.14	<0.001		63.8	<0.00005	<0.0003	<0.001	<0.001	<0.03	<2		16.9	<0.0003	0.002	<2	<0.001		<0.0005		0.0024	0.002		<0.0005		<0.0002	<0.03		<0.005
	9/23/2002	<0.00002	0.006	<0.0005	<0.1	0.13	<0.001		62.6	<0.00005	<0.0003	<0.001	<0.001	<0.03	<2		16.2	<0.0003	0.002	<2	<0.001		<0.0005		<0.0005	0.002		<0.0005		<0.0002	<0.03		<0.005
	Mean	0.00211	0.06	0.0071	0.07	0.109	0.001	0.04	56.6	0.00102	0.0038	0.005	0.003	0.05	2	0.01	15.1	0.0675	0.003	3	0.004	0.59	0.0081	12	0.022	0.011	3.7	0.0071	0.188	0.005	0.015	0.03	0.016
	Median	0.003	0.05	0.005	0.05	0.093	0.001	0.04	58.8	0.001	0.005	0.005	0.002	0.03	2	0.005	15.2	0.01	0.002	2	0.005	0.04	0.01	9	0.03	0.005	3.8	0.01	0.193	0.005	0.007	0.03	0.01
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	10	3	9	10	0	9	7	0	8	9	9	7	6	6	4	0	5	4	2	9	6	10	0	8	7	0	10	0	8	8	7	7
X17A																																	
	6/1/1998	<.003	0.08	<.02	<.05	0.097	0.003	<.04	56.7	<.002	0.01	<.005	0.008	0.25	<1	0.015	17.2	0.07	0.007	2	0.005	<.04	<.02	11	<.03	<.03	4.1	<.01	0.155	0.009	<.005	<.03	<.01
	10/31/1998	<.003	0.25	<.005	<.05	0.045	<.001	<.04	56.4	<.001	<.005	<.005	<.002	0.06	<1	<.005	17.6	0.11	<.002	3	<.005	<.04	<.01	10	<.03	<.03	3.7	<.01	0.179	0.019	<.005	<.03	<.01
	6/19/1999	<.003	0.23	<.005	<.05	0.076	<.001	<.04	57.1	<.001	<.005	<.005	0.004	0.3	2	<.005	19	0.11	0.004	4	<.005	<.04	<.01	11	<.03	<.03	4.3	<.01	0.187	<.005	<.005	<.03	0.45
	10/29/1999	<.003	<.05	<.005	0.05	0.229	<.001	<.04	57.6	<.001	<.005	<.005	<.002	<.01	<1	<.005	16.7	0.35	<.002	5	<.005	<.04	<.01	15	<.03	<.005	3.5	<.01	0.184	<.005	<.005	<.03	<.01
	5/31/2000	<.003	<.05	0.052	<.05	0.057	<.001	<.05	59.7	0.005	0.005	0.018	<.002	<.01	1	<.005	18.1	0.16	<.002	3	<.005	<1	<.01	14	<.03	<.005	4.6	<.01	0.195	<.005	<.005	<.03	0.02
	10/10/2000	<.003	0.09	<.005	<.05	0.058	<.001	<.05	53.8	<.001	<.005	<.005	0.002	0.1	1	<.005	16.2	0.16	0.013	6	<.005	<1	<.01	36	<.03	<.005	4.7	<.01	0.191	0.008	0.035	<.03	0.04
	6/6/2001	<.003	0.07	<.005	0.07	0.271	<.001	<.05	62	<.001	<.005	<.005	0.003	0.05	2	0.013	18.7	0.32	<.002	5	<.005	<1	0.03	11	0.07	<.005	4.1	<.01	0.193	<.005	<.005	<.03	0.01
	9/5/2001	<0.00002	0.714	0.0013	<0.1	0.2	<0.001		62.2	0.00017	0.0015	<0.001	0.008	0.84	<2		17.3	0.19	<0.001	3	0.002		0.0066		<0.0005	<0.001		<0.0005		<0.01	<0.03		0.022
	6/10/2002	<0.00002	<0.005	0.0006	<0.1	0.15	<0.001		74.7	<0.00005	<0.0003	<0.001	<0.001	<0.03	<2		21.5	0.01	<0.001	3	<0.001		<0.0005		0.0013	<0.001		<0.0005		<0.0002	<0.03		<0.005
	9/23/2002	<0.00002	<0.005	0.0006	<0.1	0.13	<0.001		66.3	<0.00005	<0.0003	<0.001	<0.001	<0.03	<2		18.7	0.006	0.001	3	<0.001		<0.0005		<0.0005	<0.001		<0.0005		<0.0002	<0.03		<0.005
	Mean	0.00211	0.154	0.01	0.07	0.131	0.001	0.04	60.6	0.00123	0.0042	0.005	0.003	0.17	2	0.008	18.1	0.149	0.004	4	0.004	0.45	0.0108	15	0.0252	0.011	4.1	0.0071	0.183	0.0066	0.016	0.03	0.058
	Median	0.003	0.075	0.005	0.05	0.113	0.001	0.04	58.6	0.001	0.005	0.005	0.002	0.05	2	0.005	17.9	0.135	0.002	3	0.005	0.04	0.01	11	0.03	0.005	4.1	0.01	0.187	0.005	0.005	0.03	0.01
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	10	4	6	8	0	9	7	0	8	7	9	5	4	6	5	0	0	6	0	8	7	8	0	8	10	0	10	0	7	9	7	5
X17B																																	
	6/1/1998	<.003	<.05	<.02	<.05	0.102	0.002	<.04	36.8	<.002	0.011	<.005	0.005	0.31	1	0.045	11.1	0.06	0.002	2	<.005	0.19	<.02	9	<.03	<.03	3.3	<.01	0.115	0.005	<.005	<.03	<.01
	10/31/1998	<.003	<.05	<.005	<.05	0.044	<.001	<.04	40.5	<.001	<.005	0.007	<.002	0.38	<1	<.005	12.5	0.07	<.002	3	0.009	1.67	<.01	7	<.03	<.03	2.2	<.01	0.153	<.005	<.005	<.03	<.01
	6/19/1999	<.003	<.05	<.005	<.05	0.059	<.001	<.04	42.3	<.001	<.005	<.005	0.004	0.4	2	0.017	13.8	0.08	0.003	5	<.005	<.04	<.01	6	<.03	<.03	3.2	<.01	0.164	<.005	<.005	<.03	0.21
	10/29/1999	<.003	<.05	<.005	<.05	0.168	<.001	<.04	43.7	<.001	<.005	<.005	<.002	0.07	<1	<.005	12.4	0.11	<.002	4	<.005	<.04	<.01	8	<.03	<.005	2.9	<.01	0.173	<.005	<.005	<.03	<.01
	5/31/2000	<.003	<.05	<.005	<.05	0.056	<.001	<.05	39.6	0.001	<.005	<.005	<.002	0.04	1	<.005	11.3	0.13	<.002	4	<.005	<1	<.01	8	<.03	<.005	4	<.01	0.163	<.005	<.005	<.03	<.01
	10/10/2000	0.003	0.12	<.005	<.05	0.046	<.001	<.05	42.7	<.001	<.005	<.005	0.003	0.07	2	<.005	12.5	0.11	<.002	6	<.005	2	<.01	26	<.03	<.005	4.5	<.01	0.158	0.006	<.005	<.03	0.05
	6/6/2001	<.003	0.08	<.005	0.06	0.359	<.001	<.05	84.1	<.001	<.005	<.005	<.002	0.7	3	0.015	23.7	0.44	<.002	14	<.005	<1	0.01	17	<.03	<.005	5.7	<.01	0.416	0.006	<.005	<.03	<.01
	6/10/2002	<0.00002	<0.005	<0.0005	<0.1	0.26	<0.001		90.4	<0.00005	<0.0003	<0.001	<0.001	1.11	2		25.5	0.276	<0.001	17	<0.001		<0.0005		0.0009	<0.001		<0.0005		<0.0002	<0.03		<0.005
	9/23/2002	<0.00002	<0.005	<0.0005	<0.1	0.25	<0.001		78.3	<0.00005	<0.0003	<0.001	<0.001	0.68	<2		21.6	0.2	0.001	10	<0.001		<0.0005		<0.0005	<0.001		<0.0005		<0.0002	<0.03		<0.005
	Mean	0.00234	0.051	0.0057	0.06	0.149	0.001	0.04	55.4	0.0009	0.0046	0.004	0.002	0.42	2	0.014	16.1	0.164	0.002	7	0.005	0.85	0.009	12	0.0235	0.012	3.7	0.0079	0.192	0.0042	0.011	0.03	0.036
	Median	0.003	0.05	0.005	0.05	0.102	0.001	0.04	42.7	0.001	0.005	0.005	0.002	0.38	2	0.005	12.5	0.11	0.002	5	0.005	1	0.01	8	0.03	0.005	3.3	0.01	0.163	0.005	0.005	0.03	0.01
	Values	9	9	9	9	9	9	7	9	9	9	9	9	9	9	7	9	9	9	9	9	7	9	7	9	9	7	9	7	9	9	7	9
	Values <DL	8	7	9	8	0	8	7	0	8	8	8	6	0	3	4	0	0	6	0	8	4	8	0	8	9	0	9	0	6	9	7	7
X18A																																	
	6/2/1998	<.003	0.13	<.02	<.05	0.2	0.003	<.04	130.2	<.002	<.005	<.005	0.017	0.45	5	0.052	30.9	0.53	<.002	21	0.008	<.04	<.02	104	<.03	<.03	5.1	<.01	0.485	0.013	0.007	<.03	0.02
	10/31/1998	<.003	<.05	<.005	<.05	0.117	0.001	<.04	139.9	<.001	<.005	0.02	0.005	0.57	5	<.005	35	0.22	<.002	19	0.008	0.5	<.01	138	<.03	<.03	3.6	<.01	0.586	0.008	<.005	<.03	0.02
	6/19/1999	<.003	0.06	<.005	<.05	0.229	0.001	<.04	182	0.005	<.005	0.18	0.02	0.28	9	<.005	49.2	0.28	0.01	32	<.005	<.04	<.01	152	<.03	<.03	5.6	<.01	0.768	<.005	<.005	<.03	0.32
	10/29/1999	<.003	<.05	<.005	<.05	0.227	<.001	<.04	139.7	<.001	<.005	<.005	<.002	0.28	3	<.005	33.2	0.3	<.002	22	<.005	<.04	<.01	127	<.03	<.005	3.8	<.01	0.594	<.005	<.005	<.03	0.02
	6/27/2000	<.003	<.05	<.005	<.05	0.078	0.002	<.05	175.8	<.001	0.014	<.005	0.025	0.04	8	<.005	41	1.7	<.002	25	0.039	6	<.01	145	0.07	<.005	5	<.01	0.639	0.016	<.005	<.03	3.57
	10/9/2000	<.003	<.05	<.005	<.05	0.02	<.001	<.05	78.4	<.001	<.005	<.005	0.008	<.01	5	<.005	19.4	0.74	<.002	20	<.005	<1	<.01	44	<.03	<.005	6	<.01	0.311	<.005	0.023	<.03	<.01
	6/6/2001	<.003	0.08	<.005	0.1	0.237	<.001	<.05	163	<.001	<.005	0.015	0.004	0.03	6	0.029	39.7	2.12	<.002	23	<.005	<1	0.02	141	<.03	<.005	6.6	<.01	0.636	0.008	<.005	<.03	0.01
	9/5/2001	<0.00004	0.01	<0.001	<0.1	0.15	<0.002		202	0.0002	<0.0006	<0.002	<0.002	0.06	6		49.5	2.3	<0.002	19	0.009		<0.001		0.007	<0.002		<0.001		<0.01	<0.03		0.016
	6/10/2002	<0.00004	<0.01	0.009	<0.1	0.21	<0.002		206	<0.0001	<0.0006	<0.002	<0.002	2.29	6		46.5	2.55	<0.002	28	<0.002		<0.001		0.002	<0.002		<0.001		<0.0004	<0.03		<0.01
	9/27/2002	<0.00004	0.01	0.007	<0.1	0.2	<0.002		170	<0.0001	<0.0006	<0.002	<0.002	2.29	5		40	0.569	<0.002	22	<0.002		<0.001		<0.001	<0.002		<0.001		<0.0004	<0.03		<0.01
	Mean	0.00211	0.05	0.007	0.07	0.167	0.002	0.04	158.7	0.0012	0.0046	0.024	0.009	0.63	6	0.015	38.4	1.131	0.003	23	0.009	1.23	0.009	122	0.026	0.012	5.1	0.007	0.574	0.0071	0.014	0.03	0.401
	Median	0.003	0.05	0.005	0.05	0.2	0.002	0.04	166.5	0.001	0.005	0.005	0.005	0.28	6	0.005	39.9	0.655	0.002	22	0.005	0.5	0.01	138	0.03	0.005	5.1	0.01	0.594	0.0065	0.006	0.03	0.018

Faro Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	10	5	8	9	0	6	7	0	8	9	7	4	1	0	5	0	0	9	0	6	5	9	0	7	10	0	10	0	6	8	7	3
X18B																																	
	6/2/1998	<.003	0.11	<.02	<.05	0.215	0.003	<.04	148.4	<.002	0.013	<.005	0.017	0.3	5	0.036	36	0.39	0.011	24	<.005	0.11	<.02	109	<.03	<.03	5	<.01	0.591	0.013	<.005	<.03	0.01
	10/31/1998	<.003	0.32	<.005	<.05	0.122	0.001	<.04	143.9	<.001	<.005	0.05	0.012	0.26	5	<.005	35.9	0.95	<.002	22	0.01	1.46	<.01	152	<.03	<.03	4.4	<.01	0.602	0.016	<.005	<.03	0.01
	7/29/1999	<.0001	0.17	<.001	0.04	0.1026	0.0004	<.001	161.2	<.0001	<.0002	<.0002	0.0183	0.014	4.1	0.007	39.53	0.006	<.0001	15.5	0.001	0.007	0.005	132.2	<.001	<.001	5.05	<.0004	0.3172	0.0053	<.0002	<.001	<.0004
	10/29/1999	<.003	<.05	<.005	<.05	0.231	<.001	<.04	151.4	<.001	<.005	<.005	<.002	0.08	5	<.005	33.9	1.6	<.002	23	<.005	<.04	<.01	141	<.03	<.005	4.3	<.01	0.611	<.005	<.005	<.03	<.01
	5/31/2000	<.003	<.05	<.005	<.05	0.149	0.001	<.05	141	<.001	<.005	<.005	0.008	0.02	5	<.005	36.7	0.33	<.002	21	<.005	<1	<.01	133	<.03	<.005	5.6	<.01	0.599	<.005	<.005	<.03	0.03
	10/9/2000	<.003	0.21	<.005	<.05	0.116	0.001	<.05	144.9	<.001	<.005	<.005	0.017	0.11	6	<.005	34.7	0.38	0.005	26	<.005	2	<.01	82	<.03	<.005	5.3	<.01	0.61	0.017	0.015	<.03	0.01
	6/6/2001	<.003	0.07	<.005	0.06	0.314	<.001	<.05	174.7	<.001	<.005	0.013	<.002	2.76	6	0.027	43.5	0.79	<.002	27	<.005	<1	0.02	158	<.03	<.005	6.8	<.01	0.847	0.007	<.005	<.03	<.01
	9/5/2001	<0.00004	0.02	0.01	<0.1	0.2	<0.002		188	<0.0001	<0.0006	<0.002	<0.002	2.51	6		48.6	0.453	<0.002	27	<0.002		<0.001		0.005	<0.002		<0.001		<0.01	<0.03		0.008
	6/10/2002	<0.00004	<0.01	<0.001	<0.1	0.13	<0.002		183	0.0003	<0.0006	<0.002	<0.002	0.04	6		43.3	1.79	<0.002	24	0.011		<0.001		0.004	<0.002		<0.001		<0.0004	<0.03		<0.01
	9/23/2002	<0.00004	<0.01	<0.001	<0.1	0.13	<0.002		188	0.0001	<0.0006	<0.002	<0.002	<0.03	6		43.1	1.76	<0.002	22	0.01		<0.001		<0.001	<0.002		<0.001		<0.0004	<0.03		<0.01
	Mean	0.00182	0.1	0.006	0.07	0.171	0.0014	0.039	162.45	0.0008	0.004	0.0089	0.0082	0.612	5.4	0.013	39.52	0.845	0.003	23.1	0.006	0.802	0.009	129.6	0.019	0.009	5.21	0.0063	0.5967	0.0079	0.013	0.026	0.0108
	Median	0.003	0.06	0.005	0.05	0.1395	0.001	0.04	156.3	0.001	0.005	0.005	0.005	0.095	5.5	0.005	38.11	0.622	0.002	23.5	0.005	1	0.01	133	0.03	0.005	5.05	0.01	0.602	0.0062	0.005	0.03	0.01
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	10	4	9	8	0	5	7	0	8	9	8	5	1	0	4	0	0	8	0	6	3	8	0	8	10	0	10	0	5	9	7	5
P96-6																																	
	6/15/1998	<.003	<.05	<.02	<.05	0.062	0.001	<.04	126.6	<.002	<.005	<.005	0.004	<.01	3	<.005	42.3	0.08	0.003	10	0.014	<.04	<.02	83	<.03	<.03	9.1	<.01	0.439	<.005	<.005	0.33	0.33
	10/20/1998	<.003	<.05	0.05	<.05	0.024	0.001	<.04	147.2	<.002	<.005	<.005	0.012	<.01	4	<.005	51.7	0.07	0.009	11	0.025	2.86	<.02	84.6	<.03	<.03	9.4	<.01	0.57	<.005	<.005	<.03	0.98
	12/21/1998	<.003	<.05	0.01	0.11	0.03	<.001	<.04	142.9	0.007	<.005	<.005	0.018	<.01	4	<.005	45.4	0.63	<.002	9	0.025	6.63	<.01	114	<.03	<.03	10.7	<.01	0.527	0.009	0.045	<.03	0.11
	7/4/1999	<.003	0.2	<.005	0.2	0.019	<.001	<.04	165.6	0.002	<.005	<.005	0.019	0.14	5	0.02	65.8	0.48	<.002	12	<.005	0.16	<.01	143	<.03	<.03	14.4	<.01	0.624	<.005	<.005	<.03	0.76
	10/30/1999	<.003	<.05	<.005	0.07	0.058	<.001	<.04	144.3	<.001	0.005	<.005	<.002	<.01	<1	<.005	48	0.04	<.002	10	<.005	0.05	<.01	114	<.03	<.005	9.4	<.01	0.528	<.005	<.005	<.03	0.41
	7/25/2000	<.003	<.05	<.005	<.05	0.1	0.002	<.05	103	0.006	0.008	<.005	0.012	0.23	5	0.126	33	0.73	<.002	12	0.05	<1	<.01	69	<.03	<.005	11.8	<.01	0.568	0.012	0.013	<.03	2.77
	10/22/2000	<.003	0.11	<.005	<.05	0.03	0.003	<.05	169.5	<.001	<.005	<.005	0.013	0.12	4	<.005	56.9	0.03	<.002	9	0.017	<1	<.01	132	0.05	<.005	8.7	<.01	0.578	0.017	<.005	<.03	0.1
	6/5/2001	<.003	0.17	0.055	<.05	0.145	<.001	<.05	137.9	<.001	<.005	<.005	0.016	11.04	5	0.02	48.1	1.11	<.002	11	<.005	<1	<.01	82	<.03	<.005	14.3	0.09	0.605	<.005	<.005	<.03	1.46
	10/25/2001	<0.00004	<0.01	<0.001	<0.1	<0.02	<0.002		121	<0.0001	<0.0006	<0.002	<0.002	0.79	4		39.8	0.0687	<0.002	6	0.009		<0.001		0.001	0.003		<0.001		<0.01	<0.03		0.31
	6/11/2002	<0.00004	0.01	<0.001	<0.1	0.03	<0.002		168	0.0002	0.0008	<0.002	<0.002	0.55	4		53.3	0.134	<0.002	9	0.023		<0.001		0.003	<0.003		<0.001		<0.0004	<0.03		0.56
	9/25/2002	<0.0001	<0.03	<0.003	<0.1	0.02	<0.005		131	<0.0003	<0.002	<0.005	<0.005	0.67	3		45.6	0.07	<0.005	6	0.008		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		0.3
	Mean	0.0022	0.07	0.015	0.08	0.049	0.002	0.04	141.5	0.0021	0.0042	0.004	0.01	1.25	4	0.024	48.2	0.313	0.003	10	0.017	1.59	0.01	102.7	0.024	0.014	11	0.015	0.555	0.0068	0.016	0.07	0.75
	Median	0.003	0.05	0.005	0.07	0.03	0.001	0.04	142.9	0.001	0.005	0.005	0.012	0.14	4	0.005	48	0.08	0.002	10	0.014	1	0.01	99.3	0.03	0.005	10	0.01	0.569	0.005	0.005	0.03	0.41
	Values	11	11	11	11	11	11	8	11	11	11	11	11	11	11	8	11	11	11	11	11	8	11	8	11	11	8	11	8	11	11	8	11
	Values <DL	11	7	8	8	1	7	8	0	7	8	11	4	4	1	5	0	0	9	0	3	4	11	0	8	10	0	10	0	8	9	7	0
P96-7																																	
	6/15/1998	<.003	0.17	<.02	<.05	0.048	0.002	<.04	300.8	<.002	<.005	<.005	0.014	<.01	5	0.008	73	0.16	<.002	9	<.005	0.28	<.02	146	<.03	<.03	3.8	<.01	0.563	0.014	<.005	<.03	0.04
	10/31/1998	<.003	0.69	<.005	<.05	0.05	0.002	<.04	430.8	0.005	<.005	<.005	0.02	5.7	6	<.005	90.7	0.39	<.002	13	0.014	1.97	<.01	406	<.03	<.03	5.3	<.01	0.793	0.037	<.005	<.03	0.06
	12/22/1998	<.003	0.11	0.014	0.12	0.025	0.001	<.04	356.9	0.004	<.005	<.005	0.031	<.01	6	<.005	77.3	0.18	<.002	11	0.013	1.66	<.01	385	<.03	<.03	4.2	<.01	0.661	0.018	0.022	<.03	0.02
	10/31/1999	<.003	0.78	<.005	<.05	0.143	<.001	<.04	469.4	<.001	0.012	<.005	0.005	<.01	5	<.005	78.1	<.01	<.002	16	<.005	0.35	<.01	535	<.03	<.005	4.3	<.01	0.698	<.005	<.005	<.03	<.01
	10/22/2000	<.003	0.56	<.005	0.05	0.04	0.004	<.05	525.9	0.004	<.005	<.005	0.037	0.59	8	<.005	99.9	0.2	<.002	19	<.005	<1	<.01	240	<.03	<.005	5.9	<.01	0.796	0.054	<.005	<.03	<.01
	6/6/2001	<.003	0.1	0.063	<.05	0.11	<.001	<.05	360.6	<.001	<.005	<.005	<.002	0.04	6	0.043	91.3	0.33	<.002	14	<.005	<1	0.03	409	<.03	<.005	8.3	<.01	0.664	<.005	<.005	<.03	0.02
	10/26/2001	<0.0002	<0.05	<0.005	<0.1	<0.02	<0.01		575	<0.0005	<0.003	<0.01	<0.01	<0.03	6		105	<0.003	<0.01	18	<0.01		<0.005		<0.005	<0.01		<0.005		<0.01	<0.03		<0.05
	6/12/2002	<0.0001	0.11	<0.003	<0.1	<0.02	<0.005		437	<0.0003	<0.002	<0.005	<0.005	0.17	6		107	0.008	<0.005	15	<0.005		<0.003		0.006	<0.005		<0.003		<0.001	<0.03		<0.03
	9/25/2002	<0.0001	<0.03	<0.003	<0.1	<0.02	<0.005		692	<0.0003	<0.002	<0.005	<0.005	<0.03	6		120	<0.002	<0.005	24	<0.005		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		<0.03
	Mean	0.002	0.29	0.014	0.07	0.053	0.003	0.04	460.9	0.002	0.005	0.006	0.014	0.73	6	0.012	93.6	0.143	0.004	15	0.007	1.04	0.011	354	0.022	0.014	5.3	0.008	0.696	0.016	0.015	0.03	0.03
	Median	0.003	0.11	0.005	0.05	0.04	0.002	0.04	437	0.001	0.005	0.005	0.01	0.03	6	0.005	91.3	0.16	0.002	15	0.005	1	0.01	396	0.03	0.005	4.8	0.01	0.681	0.01	0.006	0.03	0.03
	Values	9	9	9	9	9	9	6	9	9	9	9	9	9	9	6	9	9	9	9	9	6	9	6	9	9	6	9	6	9	9	6	9
	Values <DL	9	2	7	7	3	5	6	0	6	8	9	4	5	0	4	0	3	9	0	7	2	8	0	8	9	0	9	0	5	8	6	5
P96-8A																																	
	6/15/1998	<.003	0.38	<.02	<.05	0.077	0.003	<.04	506.7	0.002	<.005	0.072	0.031	0.06	8	<.005	276.4	1.64	<.002	35	0.074	4.76	0.04	567	<.03	<.03	5.9	<.01	2.226	0.025	0.011	<.03	7.4
	10/19/1998	0.003	0.32	<.02	<.05	0.037	0.003	0.07	572.2	0.013	<.005	<.005	0.038	0.06	10	<.005	354.5	3.19	<.002	41	0.171	<.04	<.02	845	<.03	<.03	7	<.01	2.986	0.03	<.005	<.03	16.1
	7/3/1999	<.003	0.46	<.005	0.16	0.027	0.002	<.04	416.6	<.001	<.005	<.005	0.042	0.19	9	0.03	299.8	0.76	0.019	30	0.063	<.04	<.01	763	<.03	<.03	6.4	<.01	2.495	<.005	<.005	<.03	11.15
	10/29/1999	<.003	1.26	0.071	<.05	0.118	0.002	<.04	523.4	0.014	<.005	<.005	0.006	<.01	8	<.005	362.1	3.96	<.002	39	0.135	0.17	0.02	998	<.03	<.005	4	<.01	3.01	<.005	<.005	<.03	5.82
	5/31/2000	<.003	0.3	<.005	0.07	0.065	0.002	<.05	259.9	0.004	<.005	<.005	0.022	0.02	6	<.005	188.9	0.9	<.002	20	0.074	<1	<.01	447	<.03	<.005	7	<.01	1.388	0.017	<.005	<.03	6.32
	10/10/2000	<.003	0.51	<.005	0.07	0.041	0.003	<.05	425	0.037	0.01	<.005	0.041	0.18	10	<.005	235.6	2.08	0.072	26	0.259	7	0.2	584	0.11	<.005	7.3	<.01	2.243	0.041	0.007	<.03	35.86
	6/7/2001	0.004	0.06	<.005	0.09	0.129	<.001	<.05	418.3	0.078	0.009	0.013	0.004	0.07	12	0.045	471.8	21.7	<.002	34	0.992	<1	<.01	1130	<.03	<.005	10.2	<.01	3.077	0.055	<.005	<.03	314
	10/25/2001	<0.001	<0.3	<0.03	<0.2	<0.04	<0.05		474	0.176	0.02	<0.05	<0.05	<0.06	15		692	97.5	<0.05	53	1.39		<0.03		<0.03	<0.05		<0.03		<0.02	<0.06		539
	6/11/2002	<0.0001	<0.03	<0.003	<0.1	0.06	<0.005		346	0.0014	0.005	<0.005	<0.005	0.06	5		169	1.6	<0.005	14	0.019		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		<0.03
	9/5/2002	<0.001	<0.3	<0.03	<0.1	<0.02	<0.05		437	0.097	<0.02	<0.05	<0.05	<0.03	14		620	44	<0.05	49	0.74		<0.03		<0.03	<0.05		<0.03		<0.01	<0.03		218
	9/25/2002	<0.001	<0.3	<0.03	<0.1	0.02	<0.05		571	0.101	<0.02	<0.05	<0.05	<0.03	17		767	43.8	<0.05	62	0.74		<0.03		<0.03	<0.05		<0.03		<0.01	<0.03		208
	Mean	0.0023	0.38	0.02	0.09	0.058	0.016	0.05	450	0.0477	0.01	0.024	0.031	0.07	10	0.014	405.2	20.1	0.023	37	0.423	2	0.037	762	0.035	0.024	6.8	0.015	2.49	0.02	0.018	0.03	123.79
	Median	0.003	0.3	0.02	0.09	0.041	0.003	0.05	437	0.014	0.005	0.005	0.038	0.06	10	0.005	354.5	3.19	0.005	35	0.171	1	0.02	763	0.03	0.03	7	0.01	2.495	0.017	0.007	0.03	16.1
	Values	11	11	11	11	11	11	7	11	11	11	11	11	11	11	7	11	11	11	11	11	7	11	7	11	11	7	11	7	11	11	7	11
	Values <DL	9	4	10	7	2	5	6	0	1	7	9	4	4	0	5	0	0	9	0	0	4	8	0	10	11	0	11	0	6	9	7	1
P96-8B																																	
	6/15/1998	<.003	0.5	<.02	<.05	0.092	0.004	<.04	652.1	<.002	<.005	0.073	0.045	0.2	9	<.005	305.6	8.8	<.002	36	<.005	1.67	<.02	697	<.03	<.03	8.3	<.01	2.534	0.032	<.005	<.03	1.88
	7/3/1999	<.003	0.5	<.005	0.24	0.033	0.002	<.04	480.4	<.001	<.005	<.005	0.044	0.22	9	0.03	345.9	2.69	0.026	33	0.007	<.04	<.01	994	<.03	<.03	9	<.01	2.591	<.005	<.005	<.03	3.31
	10/29/1999	<.003	1.51	0.052	<.05	0.202	0.005	<.04	587.1	0.005	0.022	<.005	0.013	0.03	10	<.005	392.2	15.96	<.002	40	0.032	0.36	<.01	1073	<.03	<.005	7.3	<.01	3.042	0.005	<.005	<.03	2.23
	5/31/2000	<.003	0.44	<.005	0.11	0.09	0.004	<.05	626.4	0.003	<.005	<.005	0.042	0.09	10	<.005	475.5	14.63	<.002	39	0.102	1	<.01	1238	<.03	<.005	9.7	<.01	3.157	0.034	<.005	<.03	10.09
	10/10/2000	<.003	0.73	<.005	0.07	0.043	0.004	<.05	455.7	0.022	0.028	<.005	0.053	0.25	11	<.005	437.9	13.89	0.042	46	0.162	5	0.08	1090	0.04	<.005	8.7	<.01	2.992	0.046	<.005	<.03	16.65
	6/7/2001	0.007	0.07	<.005	0.08	0.125	<.001	<.05	607.4	0.01	0.051	<.005	0.005	4.15	15	0.051	667.7	26.88	<.002	47	0.806	<1	<.01	1469	<.03	<.005	15.2	<.01	3.824	0.059	<.005	<.03	164
	10/25/2001	<0.001	<0.3	<0.03	<0.1	0.03	<0.05		567	0.031	0.21	<0.05	<0.05	4.32	13		739	77.3	<0.05	41	0.88		<0.03		<0.03	<0.05		<0.03		<0.01	<0.03		285
	9/5/2002	<0.001	<0.3	<0.03	<0.1	0.04	<0.05		575	0.023	0.09	<0.05	<0.05	0.43	14		804	43.2	<0.05	52	0.5		<0.03		<0.03	<0.05		<0.03		<0.01	<0.03		136

Faro Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/25/2002	<0.001	<0.3	<0.03	<0.1	0.04	<0.05		659	0.024	0.08	<0.05	<0.05	0.38	15		862	39.8	<0.05	56	0.5		<0.03		<0.03	<0.05		<0.03		<0.01	<0.03		129
	Mean	0.003	0.52	0.02	0.1	0.077	0.019	0.04	578.9	0.013	0.055	0.028	0.039	1.12	12	0.017	558.9	27.02	0.025	43	0.333	1.51	0.03	1097	0.03	0.026	9.7	0.02	3.023	0.023	0.013	0.03	83.13
	Median	0.003	0.44	0.02	0.1	0.043	0.004	0.04	587.1	0.01	0.028	0.005	0.045	0.25	11	0.005	475.5	15.96	0.026	41	0.162	1	0.02	1082	0.03	0.03	8.8	0.01	3.017	0.01	0.005	0.03	16.65
	Values	9	9	9	9	9	9	6	9	9	9	9	9	9	9	6	9	9	9	9	9	6	9	6	9	9	6	9	6	9	9	6	9
	Values <DL	8	3	8	5	0	4	6	0	2	3	8	3	0	0	4	0	0	7	0	1	2	8	0	8	9	0	9	0	4	9	6	0
S1A																																	
	6/15/1998	<.003	0.28	<.02	<.05	0.034	0.003	<.04	436.7	<.002	<.005	0.148	0.028	0.06	6	<.005	218.9	0.58	<.002	20	0.008	3.19	<.02	442	<.03	<.03	7.5	<.01	1.39	0.02	<.005	<.03	0.1
	10/31/1998	0.005	0.82	<.005	<.05	0.066	0.003	<.04	523.5	0.005	<.005	<.005	0.03	1.25	7	<.005	333.5	2.42	<.002	24	0.04	2.3	<.01	784	<.03	<.03	10.1	<.01	1.821	0.051	<.005	<.03	0.23
	7/3/1999	<.003	0.48	<.005	0.31	0.023	0.002	<.04	423.8	<.001	<.005	<.005	0.04	0.21	7	0.045	315.2	1.89	0.017	21	0.011	<.04	<.01	785	<.03	<.03	10.9	<.01	1.663	<.005	<.005	<.03	0.61
	10/31/1999	<.003	0.92	0.03	<.05	0.168	0.003	<.04	452.8	<.001	0.011	<.005	0.009	0.04	7	<.005	300.6	6.33	<.002	23	0.045	0.2	<.01	844	<.03	<.005	7.5	<.01	1.64	0.006	<.005	<.03	0.21
	7/25/2000	<.003	0.34	<.005	<.05	0.126	0.004	<.05	471.3	0.01	<.005	<.005	0.044	0.29	9	0.116	334.9	8.1	<.002	25	0.107	7	<.01	843	<.03	<.005	9.5	<.01	1.737	0.041	<.005	<.03	1.25
	10/22/2000	<.003	1.01	<.005	0.06	0.07	0.005	<.05	453.6	0.001	<.005	<.005	0.041	1.35	9	0.022	318.2	9.39	<.002	22	0.153	<1	0.01	786	<.03	<.005	10.9	<.01	1.607	0.083	<.005	<.03	0.31
	6/6/2001	<.003	0.08	<.005	0.1	0.094	<.001	<.05	482	<.001	0.005	0.019	0.004	0.09	10	0.044	393.9	7.21	<.002	27	0.252	<1	<.01	988	<.03	<.005	13.3	<.01	1.834	0.026	<.005	<.03	3.56
	10/26/2001	<0.0002	<0.05	<0.005	<0.1	0.02	<0.01		657	0.0025	0.004	<0.01	<0.01	<0.03	9		524	22.8	<0.01	29	0.45		<0.005		<0.005	<0.01		<0.005		<0.01	<0.03		8.37
	6/12/2002	<0.0002	<0.05	<0.005	<0.2	<0.04	<0.01		639	0.0041	0.006	<0.01	<0.01	<0.06	8		542	26.8	<0.01	27	0.69		<0.005		<0.005	<0.01		<0.005		<0.002	<0.06		23.2
	9/25/2002	<0.0002	<0.05	<0.005	<0.1	0.02	<0.01		641	0.0053	0.006	<0.01	<0.01	<0.03	10		624	28.3	<0.01	29	0.72		<0.005		<0.005	<0.01		<0.005		<0.002	<0.03		34.5
	Mean	0.0024	0.41	0.009	0.11	0.066	0.005	0.04	518.1	0.0033	0.006	0.022	0.023	0.34	8	0.035	390.5	11.38	0.006	25	0.248	2.1	0.009	782	0.022	0.014	10	0.008	1.67	0.025	0.015	0.03	7.23
	Median	0.003	0.31	0.005	0.08	0.053	0.004	0.04	476.6	0.0023	0.005	0.007	0.019	0.08	8	0.022	334.2	7.66	0.002	24	0.13	1	0.01	786	0.03	0.01	10.1	0.01	1.663	0.015	0.005	0.03	0.93
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	9	3	9	7	1	4	7	0	4	5	8	3	3	0	3	0	0	9	0	0	3	9	0	10	10	0	10	0	4	10	7	0
S1B																																	
	6/15/1998	<.003	0.16	<.02	<.05	0.039	0.002	<.04	239.5	<.002	<.005	0.021	0.017	0.03	4	<.005	58.8	0.05	0.003	36	0.007	1.38	<.02	116	<.03	<.03	5.6	<.01	0.666	0.011	<.005	<.03	0.05
	10/31/1998	<.003	0.11	<.005	<.05	0.035	0.001	<.04	280.3	0.002	<.005	<.005	0.018	0.12	6	<.005	73.7	0.31	<.002	45	0.018	1.47	<.01	273	<.03	<.03	7	<.01	0.872	0.013	<.005	<.03	0.03
	7/3/1999	<.003	0.21	<.005	0.19	0.014	<.001	<.04	145.5	<.001	<.005	<.005	0.016	0.26	2	0.007	40	0.27	<.002	29	<.005	<.04	<.01	209	<.03	<.03	5.8	<.01	0.491	<.005	<.005	<.03	0.11
	10/31/1999	<.003	0.23	<.005	<.05	0.142	<.001	<.04	234.2	<.001	0.006	<.005	0.005	0.06	5	<.005	59.5	0.12	<.002	38	<.005	<.04	<.01	288	<.03	<.005	5.8	<.01	0.689	<.005	<.005	<.03	0.03
	10/22/2000	<.003	0.57	<.005	<.05	0.046	0.003	<.05	231.7	<.001	<.005	<.005	0.024	0.61	4	<.005	50.8	0.62	<.002	46	<.005	<1	<.01	117	<.03	<.005	7.5	<.01	0.674	0.046	<.005	<.03	0.04
	6/6/2001	<.003	0.08	0.013	0.1	0.14	<.001	<.05	328.7	<.001	<.005	0.007	0.004	0.04	6	0.032	131.6	0.62	0.008	76	<.005	<1	<.01	509	<.03	<.005	8.2	0.01	1.174	<.005	<.005	<.03	0.1
	10/26/2001	<0.0001	<0.03	<0.003	<0.1	0.03	<0.005		344	0.0006	<0.002	<0.005	<0.005	0.04	4		69.3	0.094	<0.005	57	0.012		<0.003		<0.003	<0.005		<0.003		<0.01	<0.03		0.05
	6/12/2002	<0.0001	0.03	<0.003	<0.2	<0.04	<0.005		325	0.0007	0.003	<0.005	<0.005	0.23	4		63.4	0.854	<0.005	47	0.01		<0.003		0.005	<0.005		<0.003		<0.001	<0.06		0.07
	9/25/2002	<0.0001	<0.03	<0.003	<0.1	0.04	<0.005		350	0.0004	<0.002	<0.005	<0.005	<0.03	4		89.5	0.016	<0.005	63	<0.005		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		0.03
	Mean	0.002	0.16	0.007	0.1	0.058	0.003	0.04	275.4	0.0011	0.004	0.007	0.011	0.16	4	0.01	75.2	0.328	0.004	49	0.008	0.82	0.009	252	0.021	0.013	6.7	0.008	0.761	0.011	0.017	0.03	0.06
	Median	0.003	0.11	0.005	0.1	0.04	0.002	0.04	280.3	0.001	0.005	0.005	0.005	0.06	4	0.005	73.7	0.27	0.003	46	0.005	1	0.01	241	0.03	0.005	6.4	0.01	0.682	0.005	0.005	0.03	0.05
	Values	9	9	9	9	9	9	6	9	9	9	9	9	9	9	6	9	9	9	9	9	6	9	6	9	9	6	9	6	9	9	6	9
	Values <DL	9	2	8	7	1	6	6	0	5	7	7	3	1	0	4	0	0	7	0	5	4	9	0	8	9	0	8	0	6	9	6	0
S2A																																	
	6/15/1998	<.003	0.32	<.02	<.05	0.068	0.002	<.04	311.8	<.002	<.005	<.005	0.021	0.99	5	0.008	77.1	2.43	0.005	8	<.005	2.53	<.02	176	<.03	<.03	5.4	<.01	1.037	0.019	<.005	<.03	0.05
	10/31/1998	<.003	0.14	<.005	<.05	0.055	0.002	<.04	379.8	0.002	0.013	<.005	0.029	0.42	5	<.005	89.4	5.39	<.002	15	0.024	3.19	<.01	356	<.03	<.03	7.2	<.01	1.417	0.016	<.005	<.03	0.05
	7/3/1999	<.003	0.38	<.005	0.44	0.04	<.001	<.04	336.8	<.001	<.005	<.005	0.034	0.43	5	0.035	137.7	0.94	0.012	11	<.005	0.08	<.01	497	<.03	<.03	7.5	<.01	1.432	<.005	<.005	<.03	0.04
	10/31/1999	<.003	0.61	<.005	<.05	0.143	<.001	<.04	376.3	<.001	<.005	<.005	<.002	<.01	6	<.005	95.7	4.19	<.002	12	<.005	0.11	<.01	462	<.03	<.005	4.8	<.01	1.411	<.005	<.005	<.03	<.01
	7/25/2000	<.003	0.16	<.005	<.05	0.07	0.003	<.05	404.4	0.007	0.016	<.005	0.038	0.56	7	0.116	102.7	3.41	<.002	14	0.035	6	<.01	469	<.03	<.005	5.8	<.01	1.466	0.034	0.007	<.03	0.31
	6/6/2001	<.003	0.11	<.005	0.11	0.17	<.001	<.05	256.9	0.003	<.005	0.016	<.002	1.47	6	0.035	164.7	3.03	<.002	14	<.005	<1	0.02	421	<.03	<.005	8.4	<.01	1.027	<.005	<.005	<.03	0.76
	6/12/2002	<0.0001	0.04	<0.003	<0.1	0.06	<0.005		498	0.0036	0.005	<0.005	<0.005	4.43	10		433	20.1	<0.005	21	0.391		<0.003		0.006	<0.005		<0.003		<0.001	<0.03		22.2
	9/25/2002	<0.0002	0.59	<0.005	<0.1	0.03	<0.01		526	0.007	0.005	<0.01	<0.01	2.55	8		505	27.5	<0.01	22	0.57		<0.005		<0.005	<0.01		<0.005		<0.002	<0.03		39.7
	Mean	0.0023	0.29	0.007	0.12	0.08	0.003	0.04	386.2	0.0033	0.007	0.007	0.018	1.36	6	0.034	200.7	8.37	0.005	15	0.13	2.15	0.011	397	0.024	0.015	6.5	0.008	1.298	0.011	0.011	0.03	7.89
	Median	0.003	0.24	0.005	0.08	0.064	0.002	0.04	378	0.0025	0.005	0.005	0.015	0.78	6	0.022	120.2	3.8	0.003	14	0.015	1.76	0.01	442	0.03	0.007	6.5	0.01	1.414	0.005	0.005	0.03	0.18
	Values	8	8	8	8	8	8	6	8	8	8	8	8	8	8	6	8	8	8	8	8	6	8	6	8	8	6	8	6	8	8	6	8
	Values <DL	8	0	8	6	0	5	6	0	3	4	7	4	1	0	2	0	0	6	0	4	1	7	0	7	8	0	8	0	5	7	6	1
S2B																																	
	6/15/1998	<.003	0.19	<.02	<.05	0.071	0.002	<.04	308.5	<.002	<.005	0.012	0.019	1.88	6	<.005	114.1	1.54	<.002	12	<.005	1.61	<.02	242	<.03	<.03	8.1	<.01	0.981	0.013	<.005	<.03	0.08
	10/31/1998	<.003	0.36	<.005	<.05	0.037	0.001	<.04	182.9	0.003	0.006	<.005	0.011	2.56	4	<.005	69	1.34	<.002	9	0.007	<.04	<.01	183	0.05	<.03	8.4	<.01	0.68	0.027	<.005	<.03	0.14
	7/3/1999	<.003	0.37	<.005	0.15	0.045	<.001	<.04	302.1	<.001	<.005	<.005	0.033	0.31	5	<.005	138.3	0.42	0.01	10	<.005	<.04	<.01	433	<.03	<.03	7.8	<.01	1.271	<.005	<.005	<.03	0.07
	10/31/1999	<.003	<.05	<.005	<.05	0.11	<.001	<.04	129.3	<.001	<.005	<.005	<.002	<.01	5	<.005	49.3	0.77	<.002	8	<.005	<.04	<.01	115	<.03	<.005	5.6	<.01	0.515	<.005	<.005	<.03	0.2
	7/25/2000	<.003	<.05	<.005	<.05	0.042	0.002	<.05	93.3	0.002	0.027	<.005	0.018	1.37	8	0.09	38.4	0.58	<.002	6	0.023	5	<.01	129	<.03	<.005	2.2	<.01	0.419	0.017	<.005	<.03	0.22
	10/22/2000	<.003	0.38	<.005	<.05	0.249	0.003	<.05	235.5	<.001	<.005	<.005	0.09	0.37	6	0.01	96.8	0.56	<.002	11	0.021	<1	<.01	232	0.04	<.005	6.8	<.01	0.905	0.034	<.005	<.03	0.05
	6/6/2001	<.003	0.11	0.042	0.1	0.159	<.001	<.05	252.2	<.001	0.008	<.005	<.002	3.34	9	0.036	169.1	3.06	<.002	13	<.005	<1	0.03	400	<.03	<.005	9.6	0.02	0.94	0.007	<.005	<.03	1.37
	10/26/2001	<0.0002	<0.05	<0.005	<0.1	0.04	<0.01		491	0.0006	0.009	<0.01	<0.01	45.9	4		105	7.53	<0.01	12	0.02		<0.005		<0.005	<0.01		<0.005		<0.01	<0.03		0.19
	6/12/2002	0.0001	<0.03	<0.003	<0.1	0.03	<0.005		237	0.0008	0.003	<0.005	<0.005	7.08	4		92.6	2.59	<0.005	7	0.024		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		1.1
	9/25/2002	<0.0001	<0.03	<0.003	<0.1	0.04	<0.005		477	0.0016	0.01	<0.005	<0.005	50.1	4		192	10.9	<0.005	14	0.08		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		9.3
	Mean	0.0021	0.16	0.01	0.08	0.082	0.003	0.04	270.9	0.0014	0.008	0.006	0.02	11.29	6	0.022	106.5	2.93	0.004	10	0.019	1.25	0.011	248	0.025	0.013	6.9	0.009	0.816	0.012	0.012	0.03	1.27
	Median	0.003	0.08	0.005	0.08	0.044	0.002	0.04	244.6	0.001	0.005	0.005	0.01	2.22	5	0.005	100.9	1.44	0.002	10	0.013	1	0.01	232	0.03	0.005	7.8	0.01	0.905	0.008	0.005	0.03	0.2
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	9	5	9	8	0	6	7	0	5	4	9	5	1	0	4	0	0	9	0	4	5	9	0	8	10	0	9	0	5	10	7	0
S3																																	
	6/15/1998	<.003	0.28	<.02	<.05	0.085	0.003	<.04	393.3	<.002	<.005	0.008	0.02	0.68	6	<.005	216.6	0.98	<.002	18	<.005	1.33	<.02	441	<.03	<.03	7.3	<.01	1.37	0.017	<.005	<.03	0.11
	10/31/1998	0.003	0.3	<.005	<.05	0.073	0.002	<.04	371.8	0.002	0.007	<.005	0.021	3.11	6	<.005	225.9	1.44	<.002	15	0.01	<.04	<.01	621	<.03	<.03	7.2	<.01	1.406	0.023	<.005	<.03	0.1
	10/31/1999	<.003	0.58	<.005	<.05	0.151	<.001	<.04	360	<.001	<.005	<.005	0.002	0.07	5	<.005	248.5	1.9	<.002	18	<.005	0.17	<.01	706	<.03	<.005	5.6	<.01	1.483	<.005	<.005	<.03	0.03
	7/25/2000	<.003	0.24	<.005	<.05	0.082	0.004	<.05	360.4	0.004	0.019	<.005	0.037	0.33	9	0.065	252.4	2.07	<.002	19	0.007	8	<.01	675	<.03	<.005	7.6	0.01	1.421	0.033	<.005	<.03	0.24
	10/22/2000	<.003	0.54	<.005	0.06	0.054	0.004	<.05	399.8	0.001	<.005	<.005	0.036	8.79	8	<.005	269.9	2.07	<.002	17	0.025	<1	<.01	665	<.03	<.005	8.8	<.01	1.451	0.045	<.005	<.03	0.05
	6/6/2001	<.003	0.11	<.005	0.1	0.121	<.001	<.05	449.2	<.001	0.013	0.009	0.002	16.19	10	0.046	380.8	1.77	<.002	22	0.064	<1	0.02	931	<.03	<.005	13.2	<.01	1.853	<.005	<.005	<.03	0.03
	10/26/2001	<0.0002	<0.05	0.018	<0.1	0.08	<0.01		600	<0.0005	0.019	<0.01	<0.01	16.6	9		499	9.16	<0.01	23	0.05		<0.005		<0.005	<0.01		<0.005		<0.01	<0.03		4.16
	6/12/2002	0.0005	<0.05	0.018	<0.2	0.07	<0.01		708	<0.0005	0.026	<0.01	<0.01	17.6	11		669	17.7	<0.01	24	0.14		<0.005		<0.005	<0.01		<0.005		<0.002	<0.06		17.5

Faro Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	9/25/2002	<0.0002	0.06	0.026	<0.1	0.04	<0.01		507	<0.0005	0.027	<0.01	<0.01	12	9		550	19.9	<0.01	23	0.19		<0.005		<0.005	<0.01		<0.005		<0.002	<0.03		23
	Mean	0.0021	0.25	0.012	0.08	0.084	0.005	0.04	463.3	0.0014	0.014	0.007	0.016	8.37	8	0.022	368	6.33	0.005	20	0.055	1.92	0.011	673	0.022	0.012	8.3	0.008	1.497	0.016	0.017	0.03	5.03
	Median	0.003	0.24	0.005	0.06	0.08	0.004	0.04	399.8	0.001	0.013	0.008	0.01	8.79	9	0.006	269.9	2.07	0.002	19	0.025	1	0.01	670	0.03	0.01	7.5	0.01	1.436	0.01	0.005	0.03	0.11
	Values	9	9	9	9	9	9	6	9	9	9	9	9	9	9	6	9	9	9	9	9	6	9	6	9	9	6	9	6	9	9	6	9
	Values <DL	7	2	6	7	0	5	6	0	6	3	7	3	0	0	4	0	0	9	0	2	3	8	0	9	9	0	8	0	5	9	6	0
BH1																																	
	6/15/1998	<.003	2.09	<.02	<.05	0.098	<.001	<.04	42.8	<.002	<.005	0.118	0.006	1.66	2	<.005	10.1	1.26	0.006	5	<.005	0.33	0.03	31	<.03	<.03	7.6	<.01	0.228	0.029	<.005	<.03	0.28
	10/20/1998	<.003	3.87	<.02	<.05	0.172	<.001	<.04	33.8	<.002	<.005	<.005	0.02	3.37	2	<.005	8.4	1.16	<.002	7	0.01	<.04	0.13	6.8	<.03	<.03	8.8	<.01	0.193	0.085	0.017	0.08	0.28
	7/4/1999	<.003	0.16	<.005	0.49	0.185	<.001	<.04	129.3	0.015	0.061	<.005	0.019	0.46	4	<.005	32.3	4.95	0.012	8	0.084	<.04	<.01	133	<.03	<.03	8.2	<.01	0.609	<.005	<.005	<.03	25.87
	10/30/1999	<.003	<.05	<.005	<.05	0.139	<.001	<.04	61.3	0.004	<.005	<.005	<.002	<.01	<1	<.005	14	3.4	<.002	7	<.005	<.04	0.02	50	<.03	<.005	4.1	<.01	0.303	<.005	<.005	<.03	3.52
	6/5/2001	<.003	0.1	<.005	<.05	0.143	<.001	<.05	65.5	0.006	0.012	<.005	0.018	0.07	2	0.013	15.1	3.67	<.002	8	<.005	<1	<.01	31	<.03	<.005	4.8	<.01	0.327	0.007	<.005	<.03	1.75
	9/23/2002	<0.00002	0.04	<0.0005	<0.1	0.04	<0.001		140	0.00899	0.0075	<0.001	0.017	<0.03	3		32	1.84	<0.001	10	0.019		0.0024		<0.0005	<0.001		<0.0005		<0.0002	<0.03		2.26
	Mean	0.0025	1.05	0.0092	0.13	0.13	0.001	0.04	78.8	0.00633	0.0159	0.023	0.014	0.93	2	0.007	18.6	2.71	0.004	8	0.021	0.29	0.0337	50.4	0.0251	0.017	6.7	0.0084	0.332	0.0219	0.011	0.04	5.66
	Median	0.003	0.13	0.005	0.05	0.141	0.001	0.04	63.4	0.005	0.0062	0.005	0.018	0.27	2	0.005	14.6	2.62	0.002	8	0.007	0.04	0.015	31	0.03	0.017	7.6	0.01	0.303	0.006	0.005	0.03	2
	Values	6	6	6	6	6	6	5	6	6	6	6	6	6	6	5	6	6	6	6	6	5	6	5	6	6	5	6	5	6	6	5	6
	Values <DL	6	1	6	5	0	6	5	0	2	3	5	1	2	1	4	0	0	4	0	3	4	2	0	6	6	0	6	0	3	5	4	0
BH2																																	
	6/16/1998	<.003	0.58	<.02	<.05	0.06	<.001	<.04	73.5	<.002	0.008	<.005	0.005	0.58	2	<.005	23.6	0.1	<.002	6	0.027	0.42	0.02	46	<.03	<.03	4.7	<.01	0.37	0.013	<.005	<.03	3.1
	10/20/1998	<.003	0.86	<.02	<.05	0.045	0.001	<.04	84.7	0.009	0.016	<.005	0.011	0.93	2	<.005	27.4	0.54	0.012	6	0.04	0.51	0.02	60.8	<.03	<.03	5.3	<.01	0.464	0.025	0.01	0.39	5.04
	7/4/1999	<.003	0.1	<.005	0.4	0.092	<.001	<.04	72.4	0.005	<.005	<.005	0.007	0.48	2	<.005	26.5	0.74	0.003	8	0.04	<.04	<.01	86	<.03	<.03	4.7	<.01	0.415	<.005	<.005	<.03	9.85
	10/30/1999	<.003	<.05	<.005	<.05	0.135	<.001	<.04	65.4	0.006	<.005	<.005	<.002	<.01	3	<.005	23.7	0.07	<.002	7	0.015	<.04	<.01	69	<.03	<.005	3.7	<.01	0.389	<.005	<.005	<.03	4.15
	6/4/2000	<.003	<.05	<.005	<.05	0.081	<.001	<.05	71.8	0.015	<.005	<.005	<.002	0.04	3	<.005	25.9	0.14	<.002	6	0.045	5	0.01	79	<.03	<.005	3.6	<.01	0.427	<.005	<.005	<.03	7.53
	10/22/2000	<.003	0.91	<.005	<.05	0.252	0.002	<.05	106.3	0.03	<.005	<.005	0.052	1.25	4	0.011	33.3	0.8	0.028	7	0.1	<1	0.05	73	0.09	<.005	7	<.01	0.513	0.039	<.005	<.03	15.02
	6/5/2001	<.003	0.59	<.005	<.05	0.195	<.001	<.05	163.8	0.038	<.005	<.005	<.002	0.02	4	0.031	59.2	0.85	<.002	8	0.052	<1	<.01	205	<.03	<.005	5.6	0.03	0.88	<.005	<.005	<.03	26.2
	10/25/2001	<0.0001	0.05	<0.003	<0.1	0.24	<0.005		97.8	0.0231	<0.002	<0.005	<0.005	0.07	2		30.7	0.035	<0.005	8	0.101		0.007		<0.003	<0.005		<0.003		<0.01	<0.03		24.8
	6/11/2002	<0.00004	0.08	<0.001	<0.1	0.06	<0.002		93.8	0.0209	0.0016	<0.002	0.003	0.14	2		30.8	0.0521	<0.002	7	0.091		0.005		0.004	<0.002		<0.001		<0.0004	<0.03		17.7
	9/23/2002	<0.0001	0.06	<0.003	<0.1	0.05	<0.005		50.2	0.0135	<0.002	<0.005	<0.005	0.14	<2		15.1	0.046	<0.005	4	0.05		0.005		<0.003	<0.005		<0.003		<0.001	<0.03		11.3
	Mean	0.00212	0.33	0.007	0.1	0.121	0.002	0.04	88	0.0162	0.0055	0.005	0.009	0.37	3	0.01	29.6	0.3373	0.006	7	0.056	1.14	0.015	88.4	0.028	0.012	4.9	0.01	0.494	0.0108	0.013	0.08	12.47
	Median	0.003	0.09	0.005	0.05	0.087	0.001	0.04	79.1	0.0143	0.005	0.005	0.005	0.14	2	0.005	26.9	0.12	0.003	7	0.048	0.51	0.01	73	0.03	0.005	4.7	0.01	0.427	0.005	0.005	0.03	10.58
	Values	10	10	10	10	10	10	7	10	10	10	10	10	10	10	7	10	10	10	10	10	7	10	7	10	10	7	10	7	10	10	7	10
	Values <DL	10	2	10	9	0	8	7	0	1	7	10	5	1	1	5	0	0	7	0	0	4	3	0	8	10	0	9	0	7	9	6	0
BH4																																	
	6/15/1998	<.003	157.58	0.04	<.05	0.053	0.034	<.04	373.2	0.122	0.573	0.02	1.597	5.65	1	0.118	72.9	6.47	0.041	10	0.516	4.28	0.33	208	<.03	<.03	39.1	<.01	1.162	0.019	<.005	0.42	49.11
	10/20/1998	<.003	<.05	<.02	<.05	0.015	<.001	<.04	51.5	<.002	0.009	0.014	0.007	0.09	1	<.005	14.6	0.13	0.003	5	0.011	1.01	<.02	32.5	<.03	<.03	3.8	<.01	0.256	<.005	0.01	<.03	1.16
	10/30/1999	<.003	<.05	<.005	<.05	0.042	<.001	<.04	56.5	0.003	<.005	<.005	<.002	<.01	<1	<.005	14.3	0.17	<.002	5	<.005	<.04	<.01	53	<.03	<.005	3.9	<.01	0.294	<.005	<.005	<.03	1.34
	6/4/2000	<.003	<.05	<.005	<.05	0.068	<.001	<.05	50.4	0.007	0.007	<.005	<.002	<.01	3	<.005	14.1	0.34	0.007	5	0.029	<1	<.01	62	<.03	<.005	4.7	<.01	0.321	<.005	<.005	<.03	4.01
	10/22/2000	<.003	18.25	0.112	<.05	0.07	0.01	<.05	233.7	0.027	0.173	<.005	0.107	0.39	3	<.005	60.2	2.3	0.031	10	0.217	<1	0.11	141	0.07	<.005	13.5	<.01	0.925	0.03	<.005	<.03	14.99
	6/5/2001	<.003	3.39	<.005	<.05	0.138	0.001	<.05	59.9	0.006	0.04	<.005	0.081	0.09	2	0.013	15.9	0.67	<.002	5	<.005	<1	<.01	61	<.03	<.005	5.6	<.01	0.322	<.005	<.005	<.03	4.75
	10/25/2001	0.00004	0.11	<0.0005	<0.1	0.07	<0.001		66.4	0.00403	0.0178	<0.001	0.006	0.06	2		15.9	0.391	<0.001	5	0.028		0.0046		<0.0005	<0.001		<0.0005		<0.01	<0.03		3.67
	9/23/2002	<0.00002	1.34	<0.0005	<0.1	0.03	<0.001		56.1	0.00512	0.0268	<0.001	0.014	0.18	<2		13.2	0.334	<0.001	4	0.037		0.0006		<0.0005	<0.001		<0.0005		<0.0002	<0.03		3.47
	Mean	0.00226	22.6	0.0235	0.06	0.061	0.006	0.04	118.5	0.02202	0.1065	0.007	0.227	0.81	2	0.025	27.6	1.351	0.011	6	0.106	1.39	0.0619	92.9	0.0276	0.01	11.8	0.0076	0.547	0.0099	0.012	0.09	10.31
	Median	0.003	0.73	0.005	0.05	0.061	0.001	0.04	58.2	0.00556	0.0223	0.005	0.011	0.09	2	0.005	15.2	0.366	0.003	5	0.029	1	0.01	61.5	0.03	0.005	5.1	0.01	0.322	0.005	0.005	0.03	3.84
	Values	8	8	8	8	8	8	6	8	8	8	8	8	8	8	6	8	8	8	8	8	6	8	6	8	8	6	8	6	8	8	6	8
	Values <DL	7	3	6	8	0	5	6	0	1	1	6	2	2	2	4	0	0	4	0	2	4	4	0	7	8	0	8	0	6	7	5	0
BH12A																																	
	6/29/1998	<.003	0.07	<.02	<.05	0.098	0.001	<.04	184.7	<.002	<.005	0.045	0.01	<.01	3	<.005	75.4	<.01	0.014	12	0.006	2.27	<.02	166	0.03	<.03	7.1	<.01	0.988	0.018	<.005	<.03	<.01
	10/19/1998	<.003	0.07	<.02	<.05	0.011	<.001	<.04	81.5	<.002	<.005	<.005	0.009	<.01	3	<.005	39.2	<.01	<.002	5	<.005	1.17	<.02	53.1	<.03	<.03	3.8	<.01	0.392	0.012	<.005	<.03	0.01
	10/30/1999	<.003	<.05	<.005	<.05	0.08	<.001	<.04	107.3	<.001	<.005	<.005	<.002	<.01	2	<.005	37.8	0.02	<.002	6	<.005	<.04	<.01	86	<.03	<.005	3.9	<.01	0.519	<.005	<.005	<.03	0.07
	6/26/2000	<.003	0.12	<.005	<.05	0.06	0.003	<.05	221	<.001	<.005	0.026	0.029	0.02	6	<.005	82	0.95	<.002	9	0.009	5	<.01	193	<.03	<.005	4.8	<.01	0.96	0.022	0.014	<.03	0.64
	10/22/2000	<.003	0.3	<.005	<.05	0.025	0.002	<.05	96	<.001	<.005	<.005	0.006	0.06	2	<.005	42.4	0.02	<.002	6	0.008	<1	<.01	96	0.05	<.005	5.6	<.01	0.39	0.025	<.005	<.03	0.01
	6/4/2001	<.003	<.05	0.012	0.88	0.126	<.001	<.05	236	<.001	<.005	0.006	0.005	<.01	4	<.005	97.9	0.66	<.002	10	<.005	<1	<.01	194	<.03	<.005	5.2	<.01	1.138	<.005	<.005	<.03	0.25
	10/25/2001	<0.00004	<0.01	<0.001	<0.1	0.09	<0.002		142	0.0004	<0.0006	<0.002	0.003	<0.03	3		59.9	0.0053	<0.002	6	0.013		0.003		<0.001	0.004		<0.001		<0.01	<0.03		0.23
	6/11/2002	<0.0001	<0.03	<0.003	<0.1	0.09	<0.005		347	0.0004	<0.002	<0.005	<0.005	<0.03	4		123	0.004	<0.005	12	0.017		<0.003		<0.003	0.009		<0.003		<0.001	<0.03		0.19
	Mean	0.00227	0.09	0.009	0.17	0.073	0.002	0.04	176.9	0.0011	0.0041	0.012	0.009	0.02	3	0.005	69.7	0.2099	0.004	8	0.009	1.75	0.011	131.3	0.025	0.012	5.1	0.008	0.731	0.012	0.012	0.03	0.18
	Median	0.003	0.06	0.005	0.05	0.085	0.002	0.04	163.3	0.001	0.005	0.005	0.005	0.01	3	0.005	67.7	0.015	0.002	8	0.007	1.08	0.01	131	0.03	0.005	5	0.01	0.739	0.011	0.005	0.03	0.13
	Values	8	8	8	8	8	8	6	8	8	8	8	8	8	8	6	8	8	8	8	8	6	8	6	8	8	6	8	6	8	8	6	8
	Values <DL	8	4	7	7	0	5	6	0	6	8	5	2	6	0	6	0	2	7	0	3	3	7	0	6	6	0	8	0	4	7	6	1
BH12B																																	
	6/29/1998	<.003	0.11	0.03	<.05	0.128	0.002	<.04	262.7	0.005	0.011	0.061	0.017	<.01	3	0.005	83.5	<.01	0.006	12	0.01	4.47	<.02	187	<.03	<.03	7.1	<.01	1.18	0.024	<.005	<.03	<.01
	10/19/1998	<.003	<.05	0.02	<.05	0.015	0.001	<.04	219.7	<.002	<.005	<.005	0.018	<.01	3	<.005	51.3	0.23	0.006	9	0.01	5	<.02	162.5	0.05	<.03	3.5	<.01	0.874	0.013	<.005	<.03	<.01
	10/30/1999	<.003	0.35	<.005	<.05	0.104	<.001	<.04	306.3	<.001	<.005	<.005	<.002	<.01	4	<.005	63	0.43	<.002	12	<.005	<.04	<.01	268	<.03	<.005	5.7	<.01	1.249	<.005	<.005	<.03	0.23
	6/26/2000	<.003	0.17	<.005	<.05	0.066	0.003	<.05	233.3	<.001	<.005	<.005	0.028	0.03	6	<.005	79.7	0.4	<.002	10	0.015	4	<.01	211	0.04	<.005	4.8	<.01	0.988	0.026	0.007	<.03	0.44
	10/22/2000	<.003	0.99	<.005	<.05	0.187	0.002	<.05	117.5	<.001	<.005	<.005	0.064	0.41	3	<.005	38.2	0.08	0.007	6	0.009	<1	<.01	86	<.03	<.005	5.7	<.01	0.51	0.057	<.005	<.03	0.03
	6/4/2001	<.003	<.05	<.005	0.68	0.098	<.001	<.05	232.9	<.001	0.009	<.005	0.007	0.01	7	<.005	91.9	0.65	0.003	14	<.005	<1	<.01	209	<.03	<.005	4.9	<.01	1.096	0.012	0.008	<.03	0.26
	6/11/2002	<0.0001	<0.03	<0.003	<0.1	0.07	<0.005		327	0.0004	<0.002	<0.005	<0.005	<0.03	4		112	0.016	<0.005	11	0.016		<0.003		<0.003	0.009		<0.003		<0.001	<0.03		0.19
	9/25/2002	<0.00004	0.03	<0.001	<0.1	0.03	<0.002		136	0.0002	<0.0006	<0.002	0.003	<0.03	3		53.3	0.0018	<0.002	6	0.009		0.005		<0.001	0.003		<0.001		<0.0004	<0.03		0.09
	Mean	0.00227	0.22	0.009	0.14	0.087	0.002	0.04	229.4	0.0015	0.0053	0.012	0.018	0.07	4	0.005	71.6	0.2272	0.004	10	0.01	2.58	0.011	167.2	0.027	0.011	5.3	0.008	0.983	0.0173	0.012	0.03	0.16
	Median	0.003	0.08	0.005	0.05	0.084	0.002	0.04	233.1	0.001	0.005	0.005	0.012	0.02	4	0.005	71.3	0.155	0.004	10	0.009	2.5	0.01	198	0.03	0.005	5.3	0.01	1.042	0.0125	0.006	0.03	0.14
	Values	8	8	8	8	8	8	6	8	8	8	8	8	8	8	6	8	8	8	8	8	6	8	6	8	8	6	8	6	8	8	6	8
	Values <DL	8	3	6	7	0	4	6	0	5	6	7	2	5	0	5	0	1	4	0	2	3	7	0	6	6	0	8	0	3	6	6	2

Faro Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BH13B																																	
	10/19/1998	<.003	0.35	<.02	<.05	0.018	0.001	<.04	149.3	<.002	0.006	<.005	0.02	0.24	4	<.005	43.1	0.33	<.002	11	0.02	0.46	<.02	138.8	<.03	<.03	3.5	<.01	0.768	0.022	<.005	<.03	<.01
	10/30/1999	<.003	0.05	<.005	<.05	0.137	<.001	<.04	170.1	<.001	<.005	<.005	<.002	<.01	2	<.005	47.8	0.02	<.002	12	<.005	<.04	<.01	201	<.03	<.005	3.7	<.01	0.913	<.005	<.005	<.03	0.04
	10/22/2000	<.003	1.75	<.005	<.05	0.129	0.003	<.05	172.3	<.001	0.013	<.005	0.123	0.84	4	0.014	54.6	0.05	<.002	8	0.008	<1	<.01	126	<.03	<.005	5.6	<.01	0.831	0.058	<.005	<.03	0.02
	10/25/2001	<0.00004	<0.01	<0.001	<0.1	0.08	<0.002		176	0.0002	<0.0006	<0.002	0.007	<0.03	3		49.8	0.0121	0.005	9	0.007		0.002		<0.001	0.005		<0.001		<0.01	<0.03		0.05
	9/25/2002	<0.00004	<0.01	<0.001	<0.1	<0.02	<0.002		116	0.0001	0.0024	<0.002	0.007	0.03	5		36.8	0.14	0.004	8	0.013		<0.001		<0.001	0.005		<0.001		<0.0004	<0.03		0.01
	Mean	0.00182	0.43	0.006	0.07	0.077	0.002	0.04	156.7	0.0009	0.0054	0.004	0.032	0.23	4	0.008	46.4	0.1104	0.003	10	0.011	0.5	0.009	155.3	0.018	0.01	4.3	0.006	0.837	0.0191	0.015	0.03	0.03
	Median	0.003	0.05	0.005	0.05	0.08	0.002	0.04	170.1	0.001	0.005	0.005	0.007	0.03	4	0.005	47.8	0.05	0.002	9	0.008	0.46	0.01	138.8	0.03	0.005	3.7	0.01	0.831	0.01	0.005	0.03	0.02
	Values	5	5	5	5	5	5	3	5	5	5	5	5	5	5	3	5	5	5	5	5	3	5	3	5	5	3	5	3	5	5	3	5
	Values <DL	5	2	5	5	1	3	3	0	3	2	5	1	2	0	2	0	0	3	0	1	2	4	0	5	3	0	5	0	3	5	3	1
BH14A																																	
	6/29/1998	<.003	0.19	0.05	<.05	0.142	0.002	<.04	416.7	<.002	0.017	0.174	0.022	<.01	3	<.005	139.8	0.01	0.011	29	0.006	4.82	<.02	241	0.08	<.03	9.8	<.01	2.152	0.03	<.005	<.03	0.01
	10/19/1998	<.003	0.21	<.02	<.05	0.018	0.002	<.04	402.3	<.002	<.005	<.005	0.027	<.01	4	<.005	122.9	0.06	<.002	30	0.008	<.04	<.02	324.8	0.06	<.03	6.5	<.01	1.918	0.021	<.005	<.03	<.01
	10/30/1999	<.003	0.19	<.005	<.05	0.155	<.001	<.04	211.7	<.001	<.005	<.005	<.002	<.01	4	<.005	62.2	0.03	<.002	11	<.005	<.04	<.01	181	<.03	<.005	3.5	<.01	1.036	<.005	<.005	<.03	<.01
	6/26/2000	<.003	0.23	<.005	<.05	0.08	0.003	<.05	351.9	<.001	<.005	<.005	0.034	0.02	6	<.005	105.6	0.26	<.002	21	0.009	<1	0.01	268	0.06	<.005	6.4	<.01	1.574	0.034	0.014	<.03	0.71
	10/22/2000	<.003	0.44	<.005	<.05	0.028	0.004	<.05	375	0.001	<.005	<.005	0.035	0.07	4	0.014	111.2	0.02	<.002	18	0.014	<1	<.01	268	<.03	<.005	7.5	<.01	1.667	0.043	<.005	<.03	<.01
	6/4/2001	<.003	0.06	<.005	1.59	0.088	<.001	<.05	606.8	<.001	<.005	<.005	0.003	0.03	4	0.01	197.8	0.48	0.004	17	<.005	<1	<.01	558	<.03	<.005	12.6	<.01	2.934	<.005	0.007	<.03	0.05
	6/11/2002	<0.0002	<0.05	<0.005	<0.1	<0.02	<0.01		612	<0.0005	<0.003	<0.01	<0.01	<0.03	3		198	0.005	<0.01	25	<0.01		0.007		<0.005	<0.01		<0.005		<0.002	<0.03		<0.05
	9/25/2002	<0.0001	<0.03	<0.003	<0.1	0.03	<0.005		730	<0.0003	<0.002	<0.005	<0.005	<0.03	4		257	<0.002	<0.005	19	<0.005		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		<0.03
	Mean	0.0023	0.17	0.012	0.26	0.07	0.004	0.04	463.3	0.0011	0.006	0.027	0.017	0.03	4	0.007	149.3	0.108	0.005	21	0.008	1.32	0.011	306.8	0.037	0.012	7.7	0.008	1.88	0.018	0.013	0.03	0.11
	Median	0.003	0.19	0.005	0.05	0.055	0.003	0.04	409.5	0.001	0.005	0.005	0.016	0.02	4	0.005	131.4	0.025	0.003	20	0.007	1	0.01	268	0.03	0.005	7	0.01	1.793	0.013	0.006	0.03	0.02
	Values	8	8	8	8	8	8	6	8	8	8	8	8	8	8	6	8	8	8	8	8	6	8	6	8	8	6	8	6	8	8	6	8
	Values <DL	8	2	7	7	1	4	6	0	7	7	7	3	5	0	4	0	1	6	0	4	5	6	0	5	8	0	8	0	4	6	6	5
BH14B																																	
	6/29/1998	<.003	0.21	<.02	<.05	0.118	0.002	<.04	402.7	<.002	0.021	0.081	0.026	<.01	3	0.02	127.6	0.01	0.009	19	0.01	1.11	<.02	252	0.06	<.03	8.9	<.01	1.897	0.031	<.005	<.03	<.01
	10/19/1998	<.003	0.22	<.02	<.05	0.019	0.002	<.04	407.3	<.002	<.005	<.005	0.025	<.01	3	<.005	130.2	0.02	0.01	18	0.009	3.26	<.02	316	<.03	<.03	6.6	<.01	2.03	0.02	<.005	<.03	<.01
	10/30/1999	<.003	0.75	<.005	<.05	0.178	<.001	<.04	372.2	<.001	<.005	<.005	0.005	<.01	8	<.005	118.4	<.01	<.002	17	<.005	0.13	<.01	354	<.03	<.005	6.7	<.01	1.921	<.005	<.005	<.03	0.05
	6/3/2000	<.003	0.15	<.005	<.05	0.094	0.001	<.05	381.6	0.008	<.005	<.005	0.017	0.03	5	<.005	125.2	0.11	<.002	15	0.008	<1	0.05	319	<.03	<.005	6	<.01	1.84	0.014	<.005	<.03	0.05
	10/22/2000	<.003	0.44	<.005	<.05	0.034	0.004	<.05	390	0.005	0.006	<.005	0.031	0.09	5	<.005	120.3	0.03	<.002	16	0.022	<1	<.01	291	<.03	<.005	7.7	<.01	1.827	0.041	<.005	<.03	<.01
	6/4/2001	<.003	<.05	<.005	1.06	0.061	<.001	<.05	552	<.001	<.005	<.005	<.002	<.01	4	0.006	180.9	0.19	0.003	16	<.005	<1	<.01	508	<.03	<.005	11	<.01	2.689	<.005	0.008	<.03	0.04
	10/25/2001	<0.0002	<0.05	<0.005	<0.1	<0.02	<0.01		575	<0.0005	<0.003	<0.01	<0.01	<0.03	3		199	<0.003	<0.01	14	<0.01		<0.005		<0.005	<0.01		<0.005		<0.01	<0.03		<0.05
	6/11/2002	<0.0002	<0.05	<0.005	<0.1	<0.02	<0.01		616	<0.0005	<0.003	<0.01	<0.01	<0.03	4		207	<0.003	<0.01	19	<0.01		<0.005		<0.005	<0.01		<0.005		<0.002	<0.03		<0.05
	9/25/2002	<0.0001	<0.03	<0.003	<0.1	<0.02	<0.005		596	<0.0003	<0.002	<0.005	<0.005	<0.03	3		205	0.006	<0.005	22	<0.005		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		<0.03
	Mean	0.0021	0.22	0.008	0.18	0.063	0.004	0.04	477	0.0023	0.006	0.015	0.015	0.03	4	0.008	157.1	0.042	0.006	18	0.009	1.25	0.015	340	0.025	0.012	7.8	0.008	2.034	0.014	0.014	0.03	0.03
	Median	0.003	0.15	0.005	0.05	0.034	0.002	0.04	407.3	0.001	0.005	0.005	0.01	0.03	4	0.005	130.2	0.01	0.005	18	0.009	1	0.01	317.5	0.03	0.005	7.2	0.01	1.909	0.01	0.005	0.03	0.04
	Values	9	9	9	9	9	9	6	9	9	9	9	9	9	9	6	9	9	9	9	9	6	9	6	9	9	6	9	6	9	9	6	9
	Values <DL	9	4	9	8	3	5	6	0	7	7	8	4	7	0	4	0	3	6	0	5	3	8	0	8	9	0	9	0	5	8	6	6

Vangorda Plateau Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F	TEMP-C	SO4-T	COND	ALK-T	HARD-T (CACO3)
		pH unit		mg/L	µS/cm	mg/L	mg/L
V34 (GW94-01)							
	31/05/98	7		31			
	14/09/98			34			
	31/12/98	7.35		27			
	18/06/99	7.85	5	23			
	12/10/99	6.79	2	26	815	489	
	31/05/00	7.71	4	26			
	09/10/00	7.51	3.8	470			
	05/06/01	7.5	4.5	29	757	400	467
	04/09/01			32		448	525
	11/06/02	6.9	2.8	40	772	448	470
	24/09/02	8.13		42		441	474
Mean		**7.42**	**3.7**	**71**	**794**	**445**	**484**
Median		**7.5**	**3.9**	**31**	**794**	**448**	**472**
Values		**9**	**6**	**11**	**2**	**5**	**4**
Values <DL		**0**	**0**	**0**	**0**	**0**	**0**
V35 (GW94-02)							
	31/05/98	6.82		147			
	14/09/98			648			
	31/12/98	6.99		805			
	18/06/99	7.21	3	768			
	12/10/99	6.77	1	142	910	374	
	31/05/00	6.78	6	86			
	09/10/00	7.38	4.6	360			
	05/06/01	7.6	6.1	307	1076	426	685
	04/09/01			236		365	669
	11/06/02	6.6	2.6	1090	2074	487	1280
	24/09/02	8		579	1340	402	868
Mean		**7.13**	**3.9**	**470**	**1492**	**411**	**876**
Median		**6.99**	**3.8**	**360**	**1492**	**402**	**776**
Values		**9**	**6**	**11**	**2**	**5**	**4**
Values <DL		**0**	**0**	**0**	**0**	**0**	**0**
V36 (GW94-03)							
	31/05/98	6.92		350			
	14/09/98			245			
	31/12/98	6.88		279			
	18/06/99	7.29	3.000	271			
	12/10/99	6.27	1	313	1200	394	
	31/05/00	7.78	3	320			
	09/10/00	7.08	2.4	420			
	05/06/01	7.70	2.9	448	1321	400	819
	04/09/01			408		423	899
	11/06/02	7.60	2.5	369	1223	414	805
	24/09/02	7.95		545	1400	390	938

Vangorda Plateau Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F pH unit	TEMP-C	SO4-T mg/L	COND µS/cm	ALK-T mg/L	HARD-T (CACO3) mg/L
Mean		**7.27**	**2.5**	**361**	**1212**	**404**	**865**
Median		**7.29**	**2.7**	**350**	**1212**	**400**	**859**
Values		**9**	**6**	**11**	**2**	**5**	**4**
Values <DL		**0**	**0**	**0**	**0**	**0**	**0**
V37 (GW94-04)							
	31/05/98	7.36		54			
	14/09/98			65			
	31/12/98	7.25		74			
	18/06/99	7.48	3	66			
	12/10/99	6.07	1	62	775	426	
	31/05/00			62			
	09/10/00	8.02	5.3	279			
	05/06/01	8	2.6	99	836	426	390
	04/09/01			88		458	575
	11/06/02	8.2	3.1	93	849	426	449
	24/09/02	8.13		84	815	429	437
Mean		**7.56**	**3**	**93**	**812**	**433**	**463**
Median		**7.74**	**3**	**74**	**812**	**426**	**443**
Values		**8**	**5**	**11**	**2**	**5**	**4**
Values <DL		**0**	**0**	**0**	**0**	**0**	**0**
P2001-02A							
	11/06/02	7.7	3	149	990	453	585
	24/09/02	8.03		154		470	589
P2001-02B							
	13/09/01			199		476	511
	11/06/02	7.5	2	175	1058	471	575
	24/09/02	8.06		231		456	643
P2001-03							
	13/09/01			89		473	389
	11/06/02	7	3.6	190	992	408	495
	24/09/02	8.13		143		431	500
96-9A							
	31/05/98	7.26		102			
	15/09/98			203			
	31/12/98						
	18/06/99	6.96	4	181			
	12/10/99			168	650	157	
	31/05/00	7.43	5	668			
	09/10/00	6.51	5.6	545			
	05/06/01	6.7	3.5	948		203	1143
	11/06/02	7.4	3.4		2369		
	24/09/02	7.69		1280		469	1920
96-9B							
	31/05/98	7.31		96			
	15/09/98			155			
	31/12/98						
	18/06/99	7.67	3	190			

Vangorda Plateau Site - Select Groundwater Quality Listing, 1998-2002, Physical Parameters

Station	Date	PH-F	TEMP-C	SO4-T	COND	ALK-T	HARD-T (CACO3)
		pH unit		mg/L	µS/cm	mg/L	mg/L
	12/10/99			167	620	151	
	31/05/00	8.31	5	178			
	05/06/01	7.6	5.2	159		154	204

Vangorda Plateau Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
V34 (GW94-01)																																	
	31/05/98	<.003	<.05	0.04	<.05	0.023	0.002	<.04	40.4	<.002	<.005	<.005	0.005	0.17	5	<.005	70.6	0.04	0.007	5	<.005	<.04	<.02	10	<.03	<.03	5.1	<.01	0.438	0.006	0.015	<.03	0.01
	14/09/98	<.003	<.05	0.03	<.05	0.022	<.001	<.04	56.9	<.002	0.009	0.019	0.007	<.01	5	<.005	71.6	0.26	0.009	5	<.005	<.04	0.04	11.3	<.03	<.03	3.8	<.01	0.606	<.005	0.005	<.03	0.16
	31/12/98	<.003	<.05	<.005	0.08	0.028	<.001	<.04	59.3	<.001	<.005	<.005	0.003	0.03	5	0.012	78.8	0.06	0.01	6	<.005	<.04	<.01	9	<.03	<.03	4.4	<.01	0.646	<.005	<.005	<.03	<.01
	18/06/99	<.003	0.06	<.005	<.05	0.031	<.001	<.04	56.2	0.006	<.005	<.005	0.01	0.03	6	<.005	82.6	0.06	0.016	8	<.005	<.04	<.01	8	0.05	<.03	5.4	<.01	0.596	0.016	<.005	<.03	<.01
	12/10/1999	<.003	<.05	<.005	<.05	0.018	<.001	<.04	44.8	<.001	<.005	<.005	0.005	<.01	4	<.005	55.9	<.01	<.002	5	<.005	<.04	<.01	9	<.03	<.005	3	<.01	0.456	0.006	<.005	<.03	<.01
	31/05/00	<.003	<.05	<.005	<.05	0.047	<.001	<.05	55.5	<.001	0.008	<.005	0.01	<.01	4	<.005	75	0.2	<.002	6	<.005	<1	<.01	9	<.03	<.005	5.7	<.01	0.607	<.005	<.005	<.03	<.01
	9/10/2000	<.003	0.24	<.005	<.05	0.059	0.001	<.05	58.4	0.001	0.015	<.005	0.01	0.16	6	<.005	64.7	0.45	0.004	9	<.005	2	<.01	157	<.03	<.005	5.8	<.01	0.513	0.013	0.021	<.03	<.01
	5/6/2001	<.003	0.07	<.005	0.29	0.221	<.001	<.05	62.9	<.001	<.005	<.005	<.002	0.43	4	0.011	73.5	0.54	0.003	5	<.005	<1	<.01	10	<.03	<.005	2.6	<.01	0.708	<.005	<.005	<.03	<.01
	4/9/2001	<0.00004	0.02	0.001	<0.1	0.12	<0.002		72.7	<0.0001	<0.0006	<0.002	<0.002	0.34	5		83.4	0.075	0.004	6	<0.002		<0.001		0.008	<0.002		<0.001		<0.01	<0.03		0.012
	11/6/2002	<0.0001	<0.03	<0.003	<0.1	0.11	<0.005		62.8	<0.0003	<0.002	<0.005	<0.005	0.68	6		76	0.097	0.005	5	<0.005		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		<0.03
	24/09/02	<0.00002	0.542	0.0025	<0.1	0.15	<0.001		65	<0.00005	0.0008	<0.003	0.001	1.43	7		75.7	0.091	0.004	5	0.002		0.0012		<0.0005	<0.001		<0.0005		<0.0002	<0.03		0.006
	Mean	0.0022	0.11	0.0097	0.09	0.075	0.002	0.04	57.7	0.0014	0.0055	0.006	0.005	0.3	5	0.007	73.4	0.171	0.006	6	0.004	0.52	0.0114	27.9	0.0247	0.013	4.5	0.0077	0.571	0.0066	0.014	0.03	0.025
	Median	0.003	0.05	0.005	0.05	0.047	0.001	0.04	58.4	0.001	0.005	0.005	0.005	0.16	5	0.005	75	0.091	0.004	5	0.005	0.04	0.01	9.5	0.03	0.005	4.8	0.01	0.601	0.005	0.005	0.03	0.01
	Values	11	11	11	11	11	11	8	11	11	11	11	11	11	11	8	11	11	11	11	11	8	11	8	11	11	8	11	8	11	11	8	11
	Values <DL	11	6	7	9	0	9	8	0	9	7	10	3	3	0	6	0	1	2	0	10	7	9	0	9	11	0	11	0	7	8	8	7
V35 (GW94-02)																																	
	31/05/98	<.003	0.13	<.02	<.05	0.065	0.003	<.04	158.2	<.002	0.007	<.005	0.014	0.19	4	0.023	125.1	0.15	0.005	8	<.005	0.26	<.02	49	<.03	<.03	5.3	<.01	0.838	0.014	<.005	<.03	0.01
	14/09/98	0.003	0.11	0.09	<.05	0.034	0.002	<.04	215.5	<.002	0.008	<.005	0.019	<.01	4	<.005	148.9	0.34	0.019	9	0.016	0.76	<.02	216.1	<.03	<.03	4.7	<.01	1.097	0.01	<.005	<.03	0.11
	31/12/98	<.003	0.07	<.005	<.05	0.021	<.001	<.04	243.2	<.001	<.005	<.005	0.014	0.21	4	<.005	175.6	0.28	<.002	10	<.005	7.52	<.01	268	<.03	<.03	5	<.01	1.215	0.013	<.005	<.03	<.01
	18/06/99	<.003	0.24	<.005	<.05	0.031	0.002	<.04	228.3	<.001	<.005	<.005	0.032	0.09	6	0.026	187.1	0.22	<.002	13	<.005	<.04	<.01	256	<.03	<.03	6.4	<.01	1.085	0.012	<.005	<.03	<.01
	12/10/1999	<.003	<.05	<.005	<.05	0.029	<.001	<.04	86.8	0.001	0.014	<.005	0.01	0.04	3	<.005	51.2	0.24	<.002	6	0.01	<.04	<.01	47	<.03	<.005	3.1	<.01	0.515	0.006	<.005	<.03	<.01
	31/05/00	<.003	<.05	<.005	<.05	0.054	<.001	<.05	83.3	<.001	<.005	<.005	0.004	<.01	3	<.005	49	0.08	<.002	6	<.005	<1	<.01	29	<.03	<.005	4.8	<.01	0.537	<.005	<.005	<.03	<.01
	9/10/2000	<.003	0.24	<.005	<.05	0.063	0.001	<.05	91.4	<.001	<.005	<.005	0.014	0.15	4	<.005	50	0.38	<.002	9	0.005	5	<.01	120	<.03	<.005	5	<.01	0.553	0.015	0.006	<.03	<.01
	5/6/2001	<.003	0.08	<.005	<.05	0.133	<.001	<.05	139	<.001	<.005	<.005	<.002	0.09	4	0.022	81.7	0.52	0.006	6	<.005	2	<.01	102	<.03	<.005	3.7	<.01	0.955	<.005	<.005	<.03	0.02
	4/9/2001	<0.00004	0.01	0.002	<0.1	0.04	<0.002		149	<0.0001	<0.0006	<0.002	<0.002	<0.03	3		72.4	0.0211	<0.002	5	<0.002		0.001		0.009	0.003		<0.001		<0.01	<0.03		0.014
	11/6/2002	<0.0001	<0.03	<0.003	<0.1	0.03	<0.005		262	<0.0003	<0.002	<0.005	0.006	<0.03	4		152	0.055	<0.005	8	<0.005		<0.003		<0.003	<0.005		<0.003		<0.001	<0.03		<0.03
	24/09/02	<0.00004	<0.01	<0.001	<0.1	0.02	<0.002		187	<0.0001	<0.0006	<0.002	<0.002	<0.03	4		97.1	0.0175	<0.002	6	<0.002		<0.001		<0.001	0.003		<0.001		<0.0004	<0.03		<0.01
	Mean	0.0022	0.09	0.013	0.06	0.047	0.002	0.04	167.6	0.001	0.0052	0.004	0.011	0.08	4	0.012	108.2	0.2094	0.004	8	0.006	2.08	0.01	135.9	0.023	0.014	4.8	0.008	0.849	0.0083	0.012	0.03	0.022
	Median	0.003	0.07	0.005	0.05	0.034	0.002	0.04	158.2	0.001	0.005	0.005	0.01	0.04	4	0.005	97.1	0.22	0.002	8	0.005	0.88	0.01	111	0.03	0.005	4.9	0.01	0.896	0.01	0.005	0.03	0.01
	Values	11	11	11	11	11	11	8	11	11	11	11	11	11	11	8	11	11	11	11	11	8	11	8	11	11	8	11	8	11	11	8	11
	Values <DL	10	4	9	11	0	7	8	0	10	8	11	3	5	0	5	0	0	8	0	8	3	10	0	10	9	0	11	0	5	10	8	7
V36 (GW94-03)																																	
	31/05/98	<.003	0.07	0.09	<.05	0.043	0.002	<.04	92	<.002	0.011	<.005	0.011	0.21	6	0.06	87.9	0.08	0.007	10	<.005	0.13	<.02	117	<.03	<.03	6.6	<.01	0.523	0.01	<.005	<.03	0.03
	14/09/98	<.003	<.05	0.05	<.05	0.021	<.001	<.04	105.1	<.002	<.005	0.022	0.012	0.02	5	0.006	84.5	0.09	0.012	10	<.005	<.04	<.02	81.7	<.03	<.03	5.6	<.01	0.595	<.005	<.005	<.03	0.06
	31/12/98	<.003	<.05	0.02	0.14	0.009	<.001	<.04	116	<.001	<.005	<.005	0.01	0.07	5	<.005	96.4	0.08	0.006	11	<.005	<.04	<.01	93	0.04	<.03	6.2	<.01	0.656	<.005	<.005	<.03	<.01
	18/06/99	<.003	0.12	<.005	<.05	0.014	0.001	<.04	115.9	<.001	<.005	<.005	0.019	0.08	8	0.014	104.1	0.09	0.012	13	<.005	1.04	<.01	90	0.07	<.03	7.9	<.01	0.629	<.005	<.005	<.03	0.01
	12/10/1999	<.003	0.11	0.047	<.05	0.026	<.001	<.04	119.4	0.005	0.006	<.005	0.016	0.06	6	<.005	94.3	0.17	0.007	10	0.017	<.04	<.01	104	<.03	<.005	5.9	<.01	0.654	0.012	0.008	<.03	<.01
	31/05/00	<.003	<.05	<.005	<.05	0.046	0.001	<.05	122.2	0.001	<.005	<.005	0.01	<.01	5	<.005	101.7	0.15	<.002	10	<.005	<1	<.01	107	<.03	<.005	7.3	<.01	0.731	<.005	<.005	<.03	<.01
	9/10/2000	<.003	0.22	<.005	<.05	0.064	0.001	<.05	94.8	<.001	<.005	<.005	0.015	0.16	4	<.005	57.9	0.38	<.002	9	<.005	4	<.01	140	<.03	<.005	4.4	<.01	0.557	0.016	0.009	<.03	<.01
	5/6/2001	<.003	0.12	<.005	<.05	0.14	<.001	<.05	157.5	<.001	<.005	<.005	<.002	0.22	5	0.026	102.5	0.54	<.002	8	<.005	<1	<.01	149	<.03	<.005	4.6	0.02	0.896	<.005	<.005	<.03	0.03
	4/9/2001	<0.00004	0.04	0.041	<0.1	<0.02	<0.002		178	0.0001	0.0009	<0.002	<0.002	0.33	5		110	0.113	0.002	7	0.005		0.001		0.008	<0.002		<0.001		<0.01	<0.03		0.016
	11/6/2002	<0.00004	0.02	0.08	<0.1	<0.02	<0.002		156	<0.0001	0.0006	<0.002	<0.002	0.58	5		99.7	0.11	0.004	8	0.004		0.001		0.005	<0.002		<0.001		<0.0004	<0.03		0.01
	24/09/02	<0.00004	<0.01	0.069	<0.1	0.02	<0.002		190	0.0001	0.0009	<0.002	<0.002	0.51	5		112	0.156	0.003	8	0.004		0.002		<0.001	<0.002		<0.001		<0.0004	<0.03		<0.01
	Mean	0.00219	0.08	0.038	0.07	0.038	0.001	0.04	131.8	0.0013	0.0045	0.006	0.009	0.2	5	0.016	95.5	0.178	0.005	9	0.006	0.91	0.009	110.2	0.028	0.013	6.1	0.008	0.655	0.0067	0.012	0.03	0.019
	Median	0.003	0.05	0.041	0.05	0.021	0.001	0.04	119.4	0.001	0.005	0.005	0.01	0.16	5	0.005	99.7	0.113	0.004	10	0.005	0.56	0.01	105.5	0.03	0.005	6	0.01	0.641	0.005	0.005	0.03	0.01
	Values	11	11	11	11	11	11	8	11	11	11	11	11	11	11	8	11	11	11	11	11	8	11	8	11	11	8	11	8	11	11	8	11
	Values <DL	11	4	4	10	2	7	8	0	7	6	10	4	1	0	4	0	0	3	0	7	5	8	0	7	11	0	10	0	8	9	8	5
V37 (GW94-04)																																	
	31/05/98	<.003	<.05	<.02	<.05	0.087	0.002	<.04	45.7	<.002	<.005	<.005	0.005	0.18	9	0.037	67.8	0.04	0.028	24	<.005	<.04	<.02	18	<.03	<.03	3.6	<.01	0.458	0.007	<.005	<.03	<.01
	14/09/98	<.003	<.05	0.04	<.05	0.068	<.001	<.04	51.8	<.002	0.012	<.005	0.008	<.01	8	<.005	64.6	0.09	0.034	23	0.007	<.04	<.02	21.6	<.03	<.03	1.8	<.01	0.551	<.005	<.005	<.03	0.03
	31/12/98	<.003	<.05	<.005	0.11	0.057	<.001	<.04	53.3	<.001	<.005	<.005	0.003	0.03	9	<.005	70.8	0.06	0.027	24	<.005	1.69	<.01	25	0.05	<.03	2	<.01	0.532	<.005	<.005	<.03	<.01
	18/06/99	<.003	0.08	<.005	<.05	0.092	<.001	<.04	57.4	<.001	<.005	<.005	0.015	0.09	12	0.028	82.9	0.06	0.014	31	<.005	<.04	<.01	22	<.03	<.03	3.1	<.01	0.54	<.005	0.008	<.03	0.01
	12/10/1999	<.003	<.05	<.005	<.05	0.059	<.001	<.04	48.9	0.008	0.011	0.039	0.008	0.05	8	<.005	63.3	0.09	0.011	23	0.008	<.04	<.01	21	0.04	<.005	1.9	<.01	0.478	0.006	<.005	<.03	<.01
	31/05/00	<.003	<.05	0.015	<.05	0.082	<.001	<.05	46.3	<.001	<.005	<.005	0.006	<.01	7	<.005	64.7	0.13	0.01	23	<.005	<1	<.01	21	<.03	<.005	3.3	<.01	0.499	<.005	<.005	<.03	<.01
	9/10/2000	<.003	0.15	<.005	<.05	0.06	0.001	<.05	43.3	<.001	0.01	<.005	0.005	0.11	10	<.005	39.2	0.2	0.015	164	<.005	5	<.01	93	<.03	<.005	5.2	<.01	0.369	0.009	0.019	<.03	<.01
	5/6/2001	<.003	0.12	<.005	<.05	0.34	<.001	<.05	51	<.001	<.005	0.018	<.002	0.03	8	0.013	62.2	0.49	0.026	45	<.005	<1	<.01	33	<.03	<.005	1.2	<.01	0.53	<.005	<.005	<.03	0.01
	4/9/2001	<0.00004	2.28	0.008	<0.1	0.33	<0.002		67.1	0.0008	0.008	0.011	0.012	12.2	8		86.8	0.471	0.023	34	0.02		0.029		<0.001	<0.002		<0.001		0.02	0.03		0.159
	11/6/2002	<0.00004	<0.01	0.004	<0.1	0.11	<0.002		61.6	<0.0001	<0.0006	<0.002	<0.002	0.16	7		71.7	0.139	0.027	28	0.003		<0.001		0.006	<0.002		<0.001		<0.0004	<0.03		<0.01
	24/09/02	<0.00004	0.12	0.002	<0.1	0.17	<0.002		60	0.0001	<0.0006	<0.002	<0.002	0.32	7		69.8	0.113	0.025	26	0.003		<0.001		<0.001	<0.002		<0.001		<0.0004	<0.03		<0.01
	Mean	0.00219	0.27	0.01	0.07	0.132	0.001	0.04	55.1	0.0016	0.0061	0.009	0.006	1.2	8	0.013	67.6	0.171	0.022	40	0.006	1.11	0.012	31.8	0.025	0.013	2.8	0.008	0.495	0.0062	0.013	0.03	0.025
	Median	0.003	0.05	0.005	0.05	0.087	0.001	0.04	51.8	0.001	0.005	0.005	0.005	0.09	8	0.005	67.8	0.113	0.025	26	0.005	0.52	0.01	21.8	0.03	0.005	2.5	0.01	0.514	0.005	0.005	0.03	0.01
	Values	11	11	11	11	11	11	8	11	11	11	11	11	11	11	8	11	11	11	11	11	8	11	8	11	11	8	11	8	11	11	8	11
	Values <DL	11	6	6	10	0	9	8	0	8	7	8	3	2	0	5	0	0	0	0	6	6	10	0	8	11	0	11	0	7	8	8	7
P2001-02A																																	
	11/6/2002	<0.00004	<0.01	0.067	<0.1	0.05	<0.002	107	<0.0001	0.0041	<0.002	<0.002	0.16	7	77.3	0.451	0.013	15	0.028	<0.001	0.002	<0.002	<0.001	<0.0004	<0.03	<0.01							
	24/09/02	<0.00004	<0.01	0.043	<0.1	0.03	<0.002	111	<0.0001	0.0008	<0.002	<0.002	1.31	6	76.1	0.249	0.01	12	0.002	<0.001	<0.001	<0.002	<0.001	<0.0004	<0.03	<0.01							
P2001-02B																																	

Vangorda Plateau Site - Select Groundwater Quality Listing, 1998-2002, Dissolved Metals

Station	Date	AG-D	AL-D	AS-D	B-D	BA-D	BE-D	BI-D	CA-D	CD-D	CO-D	CR-D	CU-D	FE-D	K-D	LA-D	MG-D	MN-D	MO-D	NA-D	NI-D	P-D	PB-D	S-D	SB-D	SE-D	SI-D	SN-D	SR-D	TI-D	V-D	W-D	ZN-D
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	13/09/01	<0.001	0.01	0.01	<0.1	0.05	<0.002	89.6	0.0002	0.0015	<0.002	<0.002	<0.03	11	69.6	0.213	0.028	52	0.009	0.002	0.017	<0.002	<0.001	<0.01	<0.03	0.007							
	11/6/2002	<0.00004	<0.01	0.013	<0.1	0.04	<0.002	114	<0.0001	<0.0006	<0.002	<0.002	1.13	7	70.3	0.524	<0.002	37	<0.002	<0.001	<0.001	0.004	<0.001	<0.0004	<0.03	<0.01							
	24/09/02	<0.00004	1	0.033	<0.1	0.07	<0.002	133	0.0001	0.0015	<0.003	0.003	2.72	5	75.6	0.599	0.007	14	0.003	0.017	<0.001	<0.002	<0.001	<0.0004	<0.03	0.01							
P2001-03																																	
	13/09/01	<0.0005	0.013	0.0026	<0.1	0.04	<0.001	68.3	0.00062	0.0013	<0.001	0.001	0.34	3	53	1.26	0.007	24	0.003	<0.0005	0.0262	<0.001	<0.0005	<0.01	<0.03	0.014							
	11/6/2002	<0.00004	<0.01	0.01	<0.1	0.05	<0.002	99.2	<0.0001	<0.0006	<0.002	<0.002	0.51	4	60	0.716	0.029	62	0.003	<0.001	0.006	<0.002	<0.001	<0.0004	<0.03	<0.01							
	24/09/02	<0.00004	<0.01	0.006	<0.1	0.04	<0.002	97.5	<0.0001	<0.0006	<0.002	<0.002	0.61	3	62.2	0.721	0.017	43	<0.002	<0.001	<0.001	<0.002	<0.001	<0.0004	<0.03	<0.01							
96-9A																																	
	31/05/98	<.003	0.1	<.02	<.05	0.095	0.002	<.04	46.2	<.002	<.005	<.005	0.006	0.24	2	0.028	23.2	0.08	0.016	50	<.005	0.33	<.02	34	<.03	<.03	4.9	<.01	0.973	0.008	0.006	<.03	<.01
	15/09/98	<.003	0.97	0.04	<.05	0.37	0.001	<.04	164.9	<.002	<.005	0.056	0.026	0.45	3	0.018	68.5	0.08	0.009	15	0.009	1.03	<.02	67.7	<.03	<.03	8.3	<.01	1.079	0.028	<.005	<.03	0.07
	18/06/99	<.003	0.29	<.005	<.05	0.078	<.001	<.04	67.8	<.001	<.005	<.005	0.012	0.21	4	<.005	34.9	0.62	0.011	53	<.005	<.04	0.01	60	<.03	<.03	5.6	<.01	1.029	<.005	<.005	<.03	<.01
	12/10/1999	<.003	<.05	<.005	<.05	0.027	<.001	<.04	43.3	0.001	<.005	0.011	<.002	0.11	2	<.005	22.3	0.04	<.002	45	0.005	0.06	<.01	56	<.03	<.005	3	<.01	1.058	<.005	<.005	<.03	<.01
	31/05/00	<.003	<.05	<.005	<.05	0.215	0.001	<.05	182	<.001	<.005	<.005	0.013	0.03	4	<.005	70.2	6.36	<.002	15	0.017	<1	<.01	223	<.03	<.005	7.2	<.01	1.065	<.005	<.005	<.03	<.01
	9/10/2000	<.003	0.34	0.01	<.05	0.106	0.002	<.05	201	0.002	0.015	<.005	0.029	0.17	6	<.005	74.7	1.49	<.002	16	<.005	2	0.01	182	<.03	<.005	7.5	<.01	0.87	0.024	0.013	<.03	0.01
	5/6/2001	<.003	0.11	<.005	<.05	0.297	<.001	<.05	267.3	<.001	0.006	<.005	<.002	11.76	5	0.032	116.5	3.64	<.002	11	<.005	<1	<.01	316	<.03	<.005	5.8	<.01	1.194	<.005	<.005	<.03	0.03
	24/09/02	<0.0001	<0.03	<0.003	<0.1	0.07	<0.005	409	0.0014	<0.002	<0.005	<0.005	<0.03	5	219	0.366	<0.005	14	0.014	<0.003	<0.003	<0.005	<0.003	<0.001	<0.03	<0.03							
96-9B																																	
	31/05/98	<.003	<.05	<.02	<.05	0.09	0.002	<.04	51	<.002	<.005	<.005	0.008	0.21	1	0.036	24.9	0.06	0.005	54	0.009	<.04	<.02	32	<.03	<.03	5	<.01	1.139	0.007	0.005	<.03	<.01
	15/09/98	<.003	<.05	<.02	<.05	0.057	<.001	<.04	44.4	<.002	0.007	<.005	0.005	<.01	2	<.005	22.4	0.05	0.021	46	<.005	0.3	<.02	51.8	<.03	<.03	3.3	<.01	1.067	<.005	<.005	<.03	0.03
	18/06/99	<.003	0.17	<.005	<.05	0.042	<.001	<.04	66	<.001	<.005	<.005	0.017	0.12	4	0.026	35.9	0.21	0.019	76	<.005	0.1	<.01	63	0.05	<.03	6.6	<.01	1.444	<.005	<.005	<.03	<.01
	12/10/1999	<.003	0.14	<.005	<.05	0.026	<.001	<.04	44.9	<.001	0.006	0.005	0.004	0.09	2	<.005	22.3	0.06	<.002	47	<.005	0.05	<.01	56	<.03	<.005	3.7	<.01	1.12	0.006	<.005	<.03	<.01
	31/05/00	<.003	0.06	<.005	<.05	0.063	<.001	<.05	39.8	<.001	<.005	<.005	<.002	<.01	2	<.005	19.3	0.73	<.002	40	<.005	<1	<.01	59	<.03	<.005	4.7	<.01	0.811	<.005	<.005	<.03	<.01
	5/6/2001	<.003	0.11	<.005	<.05	0.163	<.001	<.05	45.5	<.001	<.005	<.005	<.002	0.31	3	0.01	22.2	0.27	0.012	44	<.005	<1	<.01	53	<.03	<.005	2.6	<.01	1.154	<.005	<.005	<.03	0.01

Appendix D

Rose Creek Tailings Facility Groundwater Quality Data, 2001 to 2002

Rose Creek Tailings Facility Groundwater Quality, Comparison of Select Groundwater Quality Parameters from 2001 to 2002

	Upgradient	Original Impoundment					Second Impoundment								
MonitorName	TH86-26 /	P01-10A	P01-10B	P01-08A	P01-08B	P01-08C	P01-09A	P01-09B	P01-09C	P01-09D	P01-07A	P01-07B	P01-07C	P01-07D	P01-07E
Depth of Monitor (m)	TH86-17	15.2	21	15.5	25.6	29.7	11.7	16.5	22.1	28.4	18	23.5	27.8	34.2	40.4
FALL 2001: pH	7.67	8.52	8.06	7.66	7.17	6.34	3.635	3.74	6.15	4.47	9.13	9.78	7.59	7.21	7.09
Sulphat	16	298	94	206	344	482	20300	711	623	1180	349	360	376	433	580
Zinc	<0.005	0.284	0.009	0.024	0.686	0.73	640	12.4	13.4	43.7	<0.005	<0.005	0.006	0.011	0.017
SPRING 2002: pH	7.87	9.03	7.83	-	-	-	3.39	4.94	6.00	5.46	8.32	7.75	7.71	7.85	6.7
Sulphat	20	402	116	-	-	-	9580	757	440	821	756	835	346	686	672
Zinc	<0.005	<0.03	<0.01	-	-	-	3880	33.7	27	59.5	<0.03	<0.03	<0.01	<0.01	0.01
FALL 2002: pH	8.06	8.20	7.85	8.05	6.07	6.91	3.34	5.27	4.05	4.50	9.02	7.91	7.47	7.15	7.25
Sulphat	12	1030	97	258	666	409	56200	1110	621	950	590	519	402	766	818
Zinc	0.01	0.05	<0.005	0.02	0.6	0.04	4070	45.1	34.4	26.1	0.11	0.05	<0.01	<0.01	0.26

	Intermediate Impoundment						Intermediate Dam								
MonitorName	X21A	X21B	X21C	P01-06	P01-05A	P01-05B	P01-03	P01-04A	P01-04B	X25A	X25B	X24A	X24B	X24C	X24D
Depth of Monitor (m)	8.5	14.7	29.4	10.7	10.5	16.4	9.3	34	53.4	9	19.2	6.5		16.5	28.3
FALL 2001: pH	5.41	4.81	8.2	6.02	7.32	7.22	6.98	7.77	8.11	8.16	8.22	8.15	-	8.1	8.12
Sulphat	8900	149	9	2610	1210	780	769	331	30	298	334	579	-	764	1020
Zinc	370	0.828	0.006	1.02	0.145	0.074	0.009	<0.005	<0.005	0.005	<0.005	0.005	-	0.009	0.028
SPRING 2002: pH	5.75	7.41	8.13	6.10	7.51	7.78	7.21	7.66	7.92	8.10	7.88	7.54	7.51	7.25	7.29
Sulphat	2070	434	10	1110	1130	600	1090	377	46	312	333	750	780	1140	1060
Zinc	2.23	0.09	0.015	1.88	<0.03	<0.03	<0.03	<0.01	<0.05	<0.01	<0.01	<0.03	<0.03	<0.03	0.03
FALL 2002: pH	5.5	7.08	8.19	5.83	7.45	7.82	6.92	7.73	7.49	7.90	8.05	7.59	7.18	7.57	7.76
Sulphat	3850	576	7	1880	1040	716	1260	338	44	292	341	39	542	1030	1150
Zinc	6.72	0.09	<0.005	2.58	<0.03	0.01	<0.03	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	0.03

	Downgradient of Polishing Pond										
MonitorName	P01-01A	P01-01B	P01-02A	P01-02B	X18A	X18B	X16A	X16B	X17A	X17B	P01-11
Depth of Monitor (m)	21.4	35.3	14.1	28.4	10.6	28.7	6	34	6.2	25	25
FALL 2001: pH	7.83	7.81	7.84	7.99	7.67	7.83	8.25	8.00	8.26	8.25	-
Sulphat	480	289	156	119	392	438	26	33	31	35	-
Zinc	<0.005	0.006	<0.005	<0.005	0.016	0.008	0.006	0.018	0.022	<0.005	-
SPRING 2002: pH	7.75	7.77	8.09	8.17	7.65	7.67	8.12	8.19	7.97	7.67	7.91
Sulphat	570	402	158	128	553	470	26	28	46	54	573
Zinc	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	0.005	<0.005	<0.005	<0.005	<0.01
FALL 2002: pH	7.99	8.08	8.10	8.17	7.79	7.96	8.13	8.14	8.13	8.11	7.98
Sulphat	549	399	1430	116	449	550	36	25	36	39	716
Zinc	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	0.05

Notes: Notes: Results are expressed as milligrams per litre except where noted.
< indicates less than the detection limit indicated.

Rose Creek Tailings Facility Groundwater Quality, September 2001

	Upgradient	Original Impoundment					Second Impoundment								
Sample ID	TH86-26	A1-2	A1-1	A2-1	AR6-B*	AR6-A	A3-2*	A3-1	AR11-B	AR11-A	A4-3	A4-2	A4-1*	AR5-B	AR5-A
MonitorName	TH86-26	P01-10A	P01-10B	P01-08A	P01-08B	P01-08C	P01-09A	P01-09B	P01-09C	P01-09D	P01-07A	P01-07B	P01-07C	P01-07D	P01-07E
MonitorID	86261	21101	21102	21081	21082	21083	21091	21092	21093	21094	21071	21072	21073	21074	21075
Depth of Monitor (m)		15.2	21	15.5	25.6	29.7	11.7	16.5	22.1	28.4	18	23.5	27.8	34.2	40.4
Date Sampled	9/10/2001	9/10/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/11/2001	9/10/2001	9/10/2001
Field Chemistry															
Field pH	7.6	8	7.6	7.3	6.9	6.7	7.1	6.4	6.9	6	9.5	9.7	7.6	6.9	6.9
Field Conductivity	214	1097	643	660	935	972	4710	1220	1097	1640	1154	1508	992	1013	1013
Temperature degrees C	3.7	4	3.8	5.4	2.2	2.6	3.7	3.5	3.5	3.5	3.6	4	3.2	4.1	4.1
Physical Tests															
Total Dissolved Solids	118	661	432	427	637	770	33850	1080	922	1760	760	968	768.5	778	960
Hardness CaCO3	79	52.3	249	150	382	427	3300	554	537	691	15.7	13.6	403.5	552	560
pH	7.67	8.52	8.06	7.66	7.17	6.34	3.635	3.74	6.15	4.47	9.13	9.78	7.585	7.21	7.09
Dissolved Anions															
Alkalinity-Total CaCO3	95	225	286	129	135.5	37	12.5	7	19	5	237	415	223	159	110
Sulphate SO4	16	298	94	206	344	482	20300	711	623	1180	349	360	376	433	580
Total Cyanide CN	<0.005	0.026	0.015	2.39	0.577	-0.005	0.82	0.007	<0.005	0.084	0.99	3.16	0.1005	<0.005	<0.005
Dissolved Metals															
Aluminum D-Al	<0.005	0.1	0.015	0.014	0.012	0.07	<0.3	0.05	0.11	0.31	0.05	0.11	<0.01	<0.01	<0.01
Antimony D-Sb	0.0016	0.053	0.0093	0.07	0.0069	0.0012	<0.05	0.004	0.001	0.002	0.054	0.097	0.005	0.004	0.001
Arsenic D-As	<0.0005	<0.003	0.01	0.0029	0.002	0.0013	<0.03	<0.001	<0.001	<0.001	0.009	0.008	0.014	0.002	<0.001
Barium D-Ba	0.05	0.11	0.25	<0.02	<0.02	0.04	<0.4	0.02	0.06	0.04	<0.02	0.02	0.06	0.07	0.02
Beryllium D-Be	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.05	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	<0.00005	0.0012	0.00006	<0.00005	<0.00005	0.045	<0.003	0.0095	0.0081	0.0135	<0.0001	<0.0003	<0.0001	0.0033	0.0043
Calcium D-Ca	24.1	12.6	80.4	49.2	116	124	387.5	165	162	196	4.5	3.5	117	156	164
Chromium D-Cr	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	<0.05	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002
Cobalt D-Co	<0.0003	<0.002	0.0016	0.0005	0.0164	0.136	<0.02	0.309	0.117	0.383	0.0034	0.01	0.0056	0.0174	0.0659
Copper D-Cu	<0.001	0.018	0.001	0.002	0.001	0.005	<0.05	<0.002	0.008	0.021	0.002	<0.005	<0.002	<0.002	<0.002
Iron D-Fe	0.5	0.23	4.19	0.22	24.65	35	10850	55.6	49.4	252	0.04	0.18	12.3	2.26	0.36
Lead D-Pb	<0.0005	0.047	0.0016	0.01	0.00645	<0.0005	0.35	0.016	0.002	0.005	0.011	0.286	0.007	<0.001	<0.001
Lithium D-Li	<0.005	<0.03	<0.005	0.018	0.016	0.024	0.4	0.06	0.04	0.1	<0.01	<0.03	-0.01	<0.01	0.02
Magnesium D-Mg	4.5	5.1	11.8	6.6	22.35	28.4	565.5	34.7	31.9	48.9	1.1	1.2	26.9	39.3	36.5
Manganese D-Mn	0.0147	0.094	9.67	0.397	7.025	28.8	60.45	53.5	33.3	50.3	0.0277	0.006	22.55	24.8	34.2
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.001	0.069	0.013	0.051	0.003	<0.001	<0.05	<0.002	<0.002	<0.002	0.147	0.142	0.002	<0.002	<0.002
Nickel D-Ni	<0.001	<0.005	0.001	0.002	0.018	0.106	<0.05	0.369	0.18	0.328	<0.002	<0.005	0.0055	0.029	0.082
Potassium D-K	<2	9	3	8	4.5	3	75	4	4	6	8	7	3.5	4	4
Selenium D-Se	<0.001	<0.005	<0.001	0.003	<0.001	<0.001	<0.05	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002
Silver D-Ag	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.002	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001
Sodium D-Na	<2	305	54	90	31	15	152.5	19	17	16	267	363	40.5	30	30
Thallium D-Tl	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.0004	<0.0004	<0.0004
Tin D-Sn	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.03	<0.001	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	0.0012	0.002	0.0153	0.0005	0.003	0.0012	<0.01	<0.0004	<0.0004	<0.0004	0.0014	0.003	0.00515	0.0032	0.0013
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.6	0.03	0.03	<0.05	<0.03	<0.03	<0.03	0.03	<0.04
Zinc D-Zn	<0.005	0.284	0.009	0.024	0.686	0.73	640	12.4	13.4	43.7	<0.005	<0.005	0.006	0.011	0.017

Notes: Results are expressed as milligrams per litre except where noted.
< indicates less than the detection limit indicated.
* indicates average value of two samples (field replicates)

Rose Creek Tailings Facility Groundwater Quality, September 2001

	Intermediate Impoundment						Intermediate Dam							
Sample ID	**P96-5A***	**P96-5B**	**P96-5C**	**A6-1A**	**A5-2**	**A5-1**	**A9-1**	**AR3-B**	**AR3-A**	**P96-3A**	**P96-3B**	**P96-4A**	**P96-4C**	**P96-4D**
MonitorName	**P96-5A**	**P96-5B**	**P96-5C**	**P01-06A**	**P01-05A**	**P01-05B**	**P01-03**	**P01-04A**	**P01-04B**	**P96-3A**	**P96-3B**	**P96-4A**	**P96-4C**	**P96-4D**
MonitorID	96051	96052	96053	21061	21051	21052	21031	21041	21042	96031	96032	96041	96043	96044
Depth of Monitor (m)	8.5	14.7	29.4	10.7	10.5	16.4	9.3	34	53.4	9	19.2	6.5	16.5	28.3
Date Sampled	9/6/2001	9/6/2001	9/6/2001	9/10/2001	9/10/2001	9/10/2001	9/10/2001	9/10/2001	9/10/2001	9/5/2010	9/5/2001	9/6/2001	9/6/2001	9/6/2001
Field Chemistry														
Field pH	6.1	7.3	8.3	7.1	8	7.8	7.5	7.8	7.5	7.7	7.9	7.6	7.3	7.6
Field Conductivity	3204	2106	3316	3189	1948	1475	1573	1055	1045	985	1050	1324	1595	1929
Temperature degrees C	3.9	2.8	2.3	3.3	3.5	3.1	3.5	3.8	4	3.7	3.2	3.4	3	3
Physical Tests														
Total Dissolved Solids	12650	2330	202	4220	1630	1240	1380	763	602	684	746	1070	1370	1800
Hardness CaCO3	5855	933	171	1990	611	582	993	575	478	466	501	683	936	1100
pH	5.41	4.81	8.2	6.02	7.32	7.22	6.98	7.77	8.11	8.16	8.22	8.15	8.1	8.12
Dissolved Anions														
Alkalinity-Total CaCO3	22	42	191	106	37	239	322	311	623	271	299	284	333	358
Sulphate SO4	8900	149	9	2610	1210	780	769	331	30	298	334	579	764	1020
Total Cyanide CN	0.7	0.007	<0.005	0.072	1.51	0.234	0.009	<0.005	<0.005	0.005	0.019	<0.005	0.032	<0.005
Dissolved Metals														
Aluminum D-Al	0.06	<0.01	0.014	0.04	<0.03	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03
Antimony D-Sb	0.005	0.001	0.0029	0.005	0.038	0.005	<0.003	0.001	0.004	0.009	0.001	0.003	0.004	<0.003
Arsenic D-As	0.014	0.003	0.0217	0.013	<0.003	0.005	<0.003	0.001	0.009	<0.001	<0.001	<0.001	<0.003	<0.003
Barium D-Ba	<0.1	0.02	0.18	<0.02	<0.02	-0.02	0.02	0.03	0.49	0.04	0.03	0.03	<0.02	0.02
Beryllium D-Be	<0.005	<0.002	<0.001	<0.005	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Boron D-B	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	0.0258	<0.0001	<0.00005	<0.0003	<0.0003	<0.0001	<0.0003	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	0.0005	0.0023
Calcium D-Ca	426.5	172	54	335	170	175	297	181	117	134	157	209	285	339
Chromium D-Cr	<0.005	<0.002	<0.001	<0.005	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt D-Co	0.106	0.0419	<0.0003	0.2	0.003	0.0067	0.029	<0.0006	0.001	0.0056	<0.0006	0.0147	0.029	0.014
Copper D-Cu	<0.005	<0.002	<0.001	<0.005	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Iron D-Fe	879	243	0.5	676	0.57	4.09	0.33	3.35	0.86	0.05	0.5	<0.03	0.04	<0.03
Lead D-Pb	0.164	<0.001	0.0023	0.005	0.045	0.032	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003
Lithium D-Li	0.17	<0.01	<0.005	<0.03	0.05	<0.01	<0.03	0.01	0.16	<0.01	<0.01	<0.01	<0.03	<0.03
Magnesium D-Mg	1160	123	8.8	281	45.2	35.3	61.3	29.6	45.5	31.9	26.6	39.3	54.5	61.4
Manganese D-Mn	338	23.6	0.261	104	0.494	19.7	22.1	0.464	0.232	6.86	0.195	15.5	24.9	24.9
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.005	<0.002	0.004	<0.005	<0.005	<0.002	<0.005	<0.002	0.009	<0.002	<0.002	<0.002	<0.005	<0.005
Nickel D-Ni	0.388	0.014	<0.001	0.06	0.008	0.005	0.049	<0.002	0.006	0.004	<0.002	0.024	0.052	0.098
Potassium D-K	24	5	<2	17	14	4	7	4	3	4	3	5	5	6
Selenium D-Se	<0.005	<0.002	<0.001	<0.005	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Silver D-Ag	<0.0001	<0.00004	<0.00002	<0.01	<0.003	<0.001	<0.006	<0.001	<0.001	<0.00004	<0.00004	<0.00004	<0.0001	<0.0001
Sodium D-Na	32.5	56	3	39	173	47	39	44	69	26	53	29	33	43
Thallium D-Tl	<0.001	<0.0004	<0.0002	<0.001	<0.001	<0.0004	<0.001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001
Tin D-Sn	<0.003	<0.001	<0.0005	<0.003	<0.003	<0.001	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003
Titanium D-Ti	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	<0.001	0.0029	<0.0002	0.004	<0.001	0.0044	0.004	0.0024	0.0073	0.0096	0.0052	0.0057	0.004	0.004
Vanadium D-V	<0.2	<0.03	<0.03	0.06	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	370	0.828	0.006	1.02	0.145	0.074	0.009	<0.005	<0.005	0.005	<0.005	0.005	0.009	0.028

Notes:

Notes: Results are expressed as milligrams per litre except where noted.
< indicates less than the detection limit indicated.
* indicates average value of two samples (field replicates)

Rose Creek Tailings Facility Groundwater Quality, September 2001

	Downgradient of Polishing Pond									
Sample ID	AR7-B	AR7-A	AR1-B	AR1-A	X18A	X18B	X16A	X16B	X17A	X17B
MonitorName	P01-01A	P01-01B	P01-02A	P01-02B	X18A	X18B	X16A	X16B	X17A	X17B
MonitorID	21011	21012	21021	21022	81031	81032	81011	81012	81021	81022
Depth of Monitor (m)	21.4	35.3	14.1	28.4	10.6	28.7	6	34	6.2	25
Date Sampled	9/10/2001	9/10/2001	9/10/2001	9/10/2001	9/5/2001	9/5/2001	9/5/2001	9/5/2001	9/5/2010	9/5/2010
Field Chemistry										
Field pH	8	7.8	7.9	8	7.7	7.8	7.8	8	8	7.9
Field Conductivity	1140	981	591	54	1104	1131	395	320	388	436
Temperature degrees C	2.5	2.7	4	4.2	3.8	4.1	4.3	6.6	4.3	4.1
Physical Tests										
Total Dissolved Solids	872	708	402	346	797	870	250	222	233	263
Hardness CaCO3	741	530	312	275	708	669	264	198	227	240
pH	7.83	7.81	7.84	7.99	7.67	7.83	8.25	8	8.26	8.25
Dissolved Anions										
Alkalinity-Total CaCO3	217	249	201	206	222	225	211	160	203	229
Sulphate SO4	480	289	156	119	392	438	26	33	31	35
Total Cyanide CN	<0.005	<0.005	<0.005	<0.005	0.006	0.006	<0.005	<0.005	<0.005	<0.005
Dissolved Metals										
Aluminum D-Al	<0.01	<0.01	<0.005	0.012	0.01	0.02	0.02	0.011	0.714	<0.005
Antimony D-Sb	0.001	0.035	0.0043	0.0081	0.007	0.005	0.007	0.0067	<0.0005	<0.0005
Arsenic D-As	<0.001	0.026	0.0008	0.0027	<0.001	0.01	<0.001	<0.0005	0.0013	<0.0005
Barium D-Ba	0.12	0.16	0.06	0.05	0.15	0.2	0.16	0.11	0.2	0.2
Beryllium D-Be	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	0.0001	0.0001	0.00007	<0.00005	0.0002	<0.0001	<0.0001	0.0001	0.00017	<0.00005
Calcium D-Ca	211	158	86.3	64.8	202	188	70.5	57.6	62.2	66.2
Chromium D-Cr	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Cobalt D-Co	<0.0006	0.0053	0.0014	0.0017	<0.0006	<0.0006	<0.0006	<0.0003	0.0015	<0.0003
Copper D-Cu	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	<0.001
Iron D-Fe	<0.03	0.12	<0.03	<0.03	0.06	2.51	<0.03	<0.03	0.84	0.64
Lead D-Pb	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.0005	0.0066	0.0006
Lithium D-Li	0.01	0.01	0.006	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	0.016
Magnesium D-Mg	51.7	32.8	23.4	27.5	49.5	48.6	21.3	13.2	17.3	18.1
Manganese D-Mn	0.0731	0.0744	0.692	0.215	2.3	0.453	0.0007	0.0046	0.19	0.209
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	0.003	0.125	0.002	0.002	<0.002	<0.002	0.002	0.002	<0.001	0.001
Nickel D-Ni	<0.002	0.037	0.013	0.023	0.009	<0.002	<0.002	<0.001	0.002	<0.001
Potassium D-K	7	5	4	4	6	6	<2	<2	<2	2
Selenium D-Se	<0.002	0.011	0.001	<0.001	<0.002	<0.002	<0.002	0.001	<0.001	<0.001
Silver D-Ag	<0.003	<0.001	<0.0005	<0.0005	<0.00004	<0.00004	<0.00004	<0.00002	<0.00002	<0.00002
Sodium D-Na	32	28	23	22	19	27	2	2	3	6
Thallium D-Tl	<0.0004	<0.0004	<0.0002	<0.0002	<0.0004	<0.0004	<0.0004	<0.0002	<0.0002	<0.0002
Tin D-Sn	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	0.0105	0.077	0.022	0.0465	0.0067	0.0043	0.0022	0.0015	0.0025	0.0017
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	<0.005	0.006	<0.005	<0.005	0.016	0.008	0.006	0.018	0.022	<0.005

Notes: Notes: Results are expressed as milligrams per litre except where noted.
< indicates less than the detection limit indicated.
* indicates average value of two samples (field replicates)

Rose Creek Tailings Facility Groundwater Quality, June 2002

	Upgradient	Original Impoundment		Second Impoundment								
Sample ID	TH86-26	P01-10A	P01-10B	P01-09A	P01-09B	P01-09C	P01-09D	P01-07A	P01-07B	P01-07C	P01-07D	P01-07E
Lab Sample ID	48	67	66	63	64	61	62	57	56	69	60	58
Depth of Monitor (m bgs)		15.2	21	11.7	16.5	22.1	28.4	18	23.5	27.8	34.2	40.4
Date Sampled	6/12/2002	6/13/2002	6/13/2002	6/13/2002	6/13/2002	6/13/2002	6/13/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002
Physical Tests												
Conductivity (uS/cm)	233	1200	632	29900	1130	793	1270	1810	1890	896	1220	1240
Total Dissolved Solids	147	854	471	72000	1150	699	1220	1290	1320	721	1050	1160
Hardness CaCO3	119	60.7	271	3260	319	260	337	26.2	173	445	602	661
pH	7.87	9.03	7.83	3.39	4.94	6	5.46	8.32	7.75	7.71	7.85	6.7
Dissolved Anions												
Acidity (to pH 8.3) CaCO3	4	<5	15	41200	403	160	401	<1	10	23	10	38
Alkalinity-Total CaCO3	100	244	273	<1	7	18	10	269	321	196	150	136
Chloride Cl	1.3	13.6	4.2	<0.5	1.1	1	1.1	18	9.2	1.6	1.6	1.2
Sulphate SO4	20	402	116	9580	757	440	821	756	835	346	686	672
Dissolved Metals												
Aluminum D-Al	<0.005	0.03	<0.01	<10	<0.05	<0.05	<0.1	0.07	<0.03	<0.01	0.02	0.02
Antimony D-Sb	0.003	0.07	0.004	<10	<0.005	<0.005	<0.01	0.025	0.01	0.005	0.003	0.002
Arsenic D-As	<0.0005	0.005	0.008	<10	<0.005	<0.005	<0.01	0.005	0.006	0.016	0.003	<0.001
Barium D-Ba	0.08	<0.02	0.22	<0.5	0.02	0.03	0.02	<0.02	<0.02	0.08	0.06	0.02
Beryllium D-Be	<0.001	<0.005	<0.002	<0.3	<0.01	<0.01	<0.02	<0.005	<0.005	<0.002	<0.002	<0.002
Bismuth D-Bi	-	-	-	<10	-	-	-	-	-	-	-	-
Boron D-B	<0.1	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	<0.00005	<0.0003	<0.0001	<0.5	0.0049	0.0018	0.003	<0.0003	<0.0003	<0.0001	0.0002	0.0007
Calcium D-Ca	36.7	5.4	87.9	474	92.5	73.4	88.1	6.9	30.3	134	176	197
Chromium D-Cr	<0.001	<0.005	<0.002	<0.5	<0.01	<0.01	<0.02	<0.005	<0.005	<0.002	<0.002	<0.002
Cobalt D-Co	<0.0003	0.002	0.001	<0.5	0.171	0.062	0.121	0.002	0.007	0.0062	0.0182	0.044
Copper D-Cu	<0.001	<0.005	<0.002	<0.5	<0.01	<0.01	<0.02	<0.005	<0.005	0.002	<0.002	<0.002
Iron D-Fe	0.66	0.14	4.5	22700	175	52.8	179	<0.03	0.14	12.7	7.89	2.34
Lead D-Pb	<0.0005	0.099	<0.001	<3	0.007	<0.005	<0.01	0.007	0.027	0.006	<0.001	<0.001
Lithium D-Li	<0.005	<0.03	<0.01	<0.5	<0.05	<0.05	<0.1	<0.03	<0.03	<0.01	<0.01	0.01
Magnesium D-Mg	6.7	11.4	12.5	505	21.4	18.7	28.4	2.2	23.6	27	39.2	41
Manganese D-Mn	0.017	0.023	6.21	179	28.5	13.2	16.4	0.01	0.079	19.6	30.6	32.3
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.001	0.067	0.009	<2	<0.01	<0.01	<0.02	0.122	0.129	<0.002	<0.002	<0.002
Nickel D-Ni	<0.001	<0.005	<0.002	<3	0.24	0.09	0.12	<0.005	<0.005	0.006	0.009	0.045
Phosphorus D-P	-	-	-	<20	-	-	-	-	-	-	-	-
Potassium D-K	<2	9	3	<100	3	3	4	13	18	3	5	4
Selenium D-Se	<0.001	<0.005	<0.002	<10	<0.01	<0.01	<0.02	<0.005	<0.005	<0.002	<0.002	<0.002
Silicon D-Si	-	-	-	<3	-	-	-	-	-	-	-	-
Silver D-Ag	<0.00002	<0.0001	<0.00004	<0.5	<0.0002	<0.0002	<0.0004	<0.0001	<0.0001	<0.00004	<0.00004	<0.00004
Sodium D-Na	2	281	51	<100	15	9	13	421	367	37	29	35
Strontium D-Sr	-	-	-	0.9	-	-	-	-	-	-	-	-
Thallium D-Tl	<0.0002	<0.001	<0.0004	<10	<0.002	<0.002	<0.004	<0.001	<0.001	<0.0004	<0.0004	<0.0004
Tin D-Sn	<0.0005	<0.003	<0.001	<2	<0.005	<0.005	<0.01	<0.003	<0.003	<0.001	<0.001	<0.001
Titanium D-Ti	<0.01	<0.01	<0.01	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	0.0016	0.001	0.018	<0.001	<0.002	<0.002	<0.004	0.001	0.001	0.0047	0.0038	0.0018
Vanadium D-V	<0.03	<0.03	<0.03	<2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	<0.005	<0.03	<0.01	3880	33.7	27	59.5	<0.03	<0.03	<0.01	<0.01	0.01

Rose Creek Tailings Facility Groundwater Quality, June 2002

	Intermediate Impoundment						Intermediate Dam								
Sample ID	X21A	X21B	X21C	P01-06	P01-05A	P01-05B	P01-03	P01-04A	P01-04B	X25A	X25B	X24A	X24B	X24C	X24D
Lab Sample ID	54	52	51	55	50	49	42	47	45	44	43	37	38	39	41
Depth of Monitor (m bgs)	8.5	14.7	29.4	10.7	10.5	16.4	9.3	34	53.4	9	19.2	6.5		16.5	28.3
Date Sampled	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/10/2002	6/10/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002	6/12/2002
Physical Tests															
Conductivity (uS/cm)	2770	1050	342	2270	1940	1550	1950	1120	1100	956	1050	1550	1600	2050	2110
Total Dissolved Solids	2820	793	200	2370	1260	1240	1750	845	665	727	777	1300	1190	1820	1980
Hardness CaCO3	1280	457	198	1180	651	790	1150	597	482	504	513	833	841	1230	1310
pH	5.75	7.41	8.13	6.1	7.51	7.78	7.21	7.66	7.92	8.1	7.88	7.54	7.51	7.25	7.29
Dissolved Anions															
Acidity (to pH 8.3) CaCO3	493	17	2	388	5	13	43	15	13	4	9	24	26	40	36
Alkalinity-Total CaCO3	22	182	179	78	21	227	303	284	571	253	282	272	301	322	344
Chloride Cl	3.7	2.3	0.9	2.6	6.4	1.6	3.7	2	7.7	2	1.6	3.3	3.2	4.5	3.8
Sulphate SO4	2070	434	10	1110	1130	600	1090	377	46	312	333	750	780	1140	1060
Dissolved Metals															
Aluminum D-Al	<0.03	<0.01	0.699	<0.03	<0.03	<0.03	<0.03	<0.01	<0.05	<0.01	<0.01	<0.03	<0.03	0.09	<0.03
Antimony D-Sb	<0.003	0.003	0.0028	<0.003	0.016	<0.003	<0.003	0.002	<0.005	0.002	0.005	0.003	0.006	<0.003	<0.003
Arsenic D-As	0.005	0.004	0.0187	0.015	<0.003	<0.003	<0.003	0.001	<0.005	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003
Barium D-Ba	<0.02	<0.02	0.23	0.03	<0.02	0.03	<0.02	0.02	0.44	0.03	0.02	0.02	0.03	0.02	0.02
Beryllium D-Be	<0.005	<0.002	<0.001	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005
Bismuth D-Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	0.0006	<0.0001	0.00005	<0.0003	<0.0003	<0.0003	0.0004	<0.0001	<0.0005	<0.0001	<0.0001	0.0006	0.0004	0.0004	0.0019
Calcium D-Ca	179	136	62.4	274	189	246	346	191	120	144	160	252	258	369	400
Chromium D-Cr	<0.005	<0.002	<0.001	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005
Cobalt D-Co	0.019	0.0048	<0.0003	0.168	<0.002	0.006	0.026	<0.0006	<0.003	0.0049	<0.0006	0.015	0.024	0.032	0.014
Copper D-Cu	<0.005	<0.002	0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005
Iron D-Fe	350	37.2	1.02	402	0.31	4.27	0.27	4	1.14	0.17	0.48	<0.03	0.03	0.1	<0.03
Lead D-Pb	0.023	<0.001	0.0161	<0.003	0.005	0.006	<0.003	<0.001	<0.005	<0.001	<0.001	<0.003	<0.003	<0.003	0.004
Lithium D-Li	<0.03	<0.01	<0.005	<0.03	0.05	<0.03	<0.03	0.01	0.17	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03
Magnesium D-Mg	203	28.5	10.2	119	43.3	42.4	68.7	29.1	44.2	34.9	27.6	49.3	47.9	74.5	74.6
Manganese D-Mn	30.4	9.12	0.249	40.5	0.264	16.4	25.9	0.667	0.244	6.23	0.236	16.4	18.9	26.3	21.9
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.005	<0.002	0.003	<0.005	0.009	<0.005	<0.005	<0.002	<0.01	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005
Nickel D-Ni	0.007	0.005	0.001	0.075	<0.005	0.006	0.048	<0.002	<0.01	0.004	<0.002	0.018	0.032	0.059	0.089
Phosphorus D-P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium D-K	14	3	<2	12	16	5	6	4	3	4	3	6	5	6	6
Selenium D-Se	<0.005	<0.002	<0.001	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005
Silicon D-Si	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver D-Ag	<0.0001	<0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.00004	0.0003	<0.00004	<0.00004	<0.0001	<0.0001	<0.0001	<0.0001
Sodium D-Na	93	69	3	39	211	66	44	44	67	27	54	30	30	39	48
Strontium D-Sr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium D-Tl	<0.001	<0.0004	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.0004	<0.002	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.001
Tin D-Sn	<0.003	<0.001	<0.0005	<0.003	<0.003	<0.003	<0.003	<0.001	<0.005	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003
Titanium D-Ti	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	0.001	0.0027	0.0004	0.004	<0.001	0.005	0.005	0.0026	<0.002	0.0098	0.0054	0.005	0.009	0.005	0.004
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	2.23	0.09	0.015	1.88	<0.03	<0.03	<0.03	<0.01	<0.05	<0.01	<0.01	<0.03	<0.03	<0.03	0.03

Rose Creek Tailings Facility Groundwater Quality, June 2002

	Downgradient of Polishing Pond										
Sample ID	P01-01A	P01-01B	P01-02A	P01-02B	X18A	X18B	X16A	X16B	X17A	X17B	P01-11
Lab Sample ID	3	4	10	11	8	9	1	2	5	6	13
Depth of Monitor (m bgs)	21.4	35.3	14.1	28.4	10.6	28.7	6	34	6.2	25	
Date Sampled	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/10/2002	6/11/2002
Physical Tests											
Conductivity (uS/cm)	1230	1040	625	554	1210	1110	319	407	500	649	1160
Total Dissolved Solids	1010	807	443	392	992	887	185	238	297	403	931
Hardness CaCO3	697	573	348	276	706	634	168	229	275	331	563
pH	7.75	7.77	8.09	8.17	7.65	7.67	8.12	8.19	7.97	7.67	7.91
Dissolved Anions											
Acidity (to pH 8.3) CaCO3	12	12	3	2	17	14	2	2	7	18	7
Alkalinity-Total CaCO3	211	238	192	182	217	222	150	205	233	320	175
Chloride Cl	2.2	2.1	2.3	1.1	2.1	1.9	1.2	1.1	1.1	4.3	3.6
Sulphate SO4	570	402	158	128	553	470	26	28	46	54	573
Dissolved Metals											
Aluminum D-Al	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	<0.005	0.011	<0.005	<0.005	<0.01
Antimony D-Sb	0.002	0.001	<0.0005	0.001	0.002	0.004	0.0014	0.0024	0.0013	0.0009	0.003
Arsenic D-As	<0.001	0.012	0.0005	0.0025	0.009	<0.001	<0.0005	<0.0005	0.0006	<0.0005	0.006
Barium D-Ba	0.11	0.1	0.06	0.03	0.21	0.13	0.09	0.14	0.15	0.26	0.05
Beryllium D-Be	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002
Bismuth D-Bi	-	-	-	-	-	-	-	-	-	-	-
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	<0.0001	<0.0001	<0.00005	<0.00005	<0.0001	0.0003	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001
Calcium D-Ca	206	173	101	68.3	206	183	48.4	63.8	74.7	90.4	170
Chromium D-Cr	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002
Cobalt D-Co	<0.0006	<0.0006	0.0004	0.0007	<0.0006	<0.0006	<0.0003	<0.0003	<0.0003	<0.0003	0.0018
Copper D-Cu	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002
Iron D-Fe	<0.03	0.67	<0.03	0.12	2.29	0.04	<0.03	<0.03	<0.03	1.11	1.59
Lead D-Pb	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Lithium D-Li	0.01	0.01	0.006	0.006	0.01	<0.01	<0.005	<0.005	<0.005	0.029	0.03
Magnesium D-Mg	44.6	34.6	23.6	25.7	46.5	43.3	11.5	16.9	21.5	25.5	33.7
Manganese D-Mn	0.0158	0.113	0.35	0.237	2.55	1.79	0.0093	<0.0003	0.01	0.276	3.63
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.002	0.002	0.001	<0.001	<0.002	<0.002	0.002	0.002	<0.001	<0.001	0.013
Nickel D-Ni	<0.002	<0.002	0.003	0.004	<0.002	0.011	<0.001	<0.001	<0.001	<0.001	0.004
Phosphorus D-P	-	-	-	-	-	-	-	-	-	-	-
Potassium D-K	6	4	3	2	6	6	<2	<2	<2	2	10
Selenium D-Se	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	0.002	0.002	<0.001	<0.001	<0.002
Silicon D-Si	-	-	-	-	-	-	-	-	-	-	-
Silver D-Ag	<0.00004	<0.00004	<0.00002	<0.00002	<0.00004	<0.00004	<0.00002	<0.00002	<0.00002	<0.00002	<0.00004
Sodium D-Na	27	26	18	19	28	24	<2	<2	3	17	36
Strontium D-Sr	-	-	-	-	-	-	-	-	-	-	-
Thallium D-Tl	<0.0004	<0.0004	<0.0002	<0.0002	<0.0004	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004
Tin D-Sn	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	0.0054	0.0069	0.0026	0.0039	0.0052	0.008	0.0016	0.0022	0.0032	0.0016	0.0036
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	0.005	<0.005	<0.005	<0.005	<0.01

Notes: Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.
ALS File No. P5893

Rose Creek Tailings Facility Groundwater Quality, September 2002

	Upgradient	Original Impoundment					Second Impoundment								
Sample ID	TH86-17	P01-10A	P01-10B	P01-08A	P01-08B	P01-08C	P01-09A	P01-09B	P01-09C	P01-09D	P01-07A	P01-07B	P01-07C	P01-07D	P01-07E
Lab Sample ID	81	78	80	76	73	74	64	65	63	62	55	54	53	52	51
Depth of Monitor (m bgs)		15.2	21	15.5	25.6	29.7	11.7	16.5	22.1	28.4	18	23.5	27.8	34.2	40.4
Date Sampled	9/27/2002	9/27/2002	9/27/2002	9/27/2002	9/27/2002	9/27/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002
Physical Tests															
Conductivity (uS/cm)	157	2200	674	857	1210	900	30300	1640	1010	1470	1770	1730	1040	1420	1490
Hardness CaCO3	76.3	404	253	26.7	563	458	3130	417	314	510	40.6	136	493	552	693
pH	8.06	8.2	7.85	8.05	6.07	6.91	3.34	5.27	4.05	4.5	9.02	7.91	7.47	7.15	7.25
Dissolved Anions															
Acidity (to pH 8.3) CaCO3	4	2	14	4	133	31	43500	518	186	308	<1	8	16	33	26
Alkalinity-Total CaCO3	67	171	286	139	38	81	<1	7	<1	<1	272	407	200	154	125
Chloride Cl	0.6	8.7	3.9	5.5	1.4	1.7	<0.5	1.3	1	1.1	19.7	8.6	1	1	1
Sulphate SO4	12	1030	97	258	666	409	56200	1110	621	950	590	519	402	766	818
Dissolved Metals															
Aluminum D-Al	<0.005	<0.03	<0.005	0.02	0.01	<0.01	<3	0.1	<0.05	0.09	0.07	<0.03	<0.01	<0.01	<0.01
Antimony D-Sb	<0.0005	0.047	<0.0005	0.027	<0.001	0.003	<0.3	<0.005	<0.005	<0.005	0.029	0.01	0.007	<0.001	<0.001
Arsenic D-As	<0.0005	<0.003	0.0081	0.001	<0.001	0.003	<0.3	<0.005	<0.005	<0.005	0.006	0.003	0.032	0.003	<0.001
Barium D-Ba	0.04	0.04	0.23	<0.02	0.04	<0.02	<0.5	<0.02	0.03	<0.02	0.05	0.02	0.06	0.06	0.03
Beryllium D-Be	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.5	<0.01	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	<0.00005	<0.0003	<0.00005	<0.0001	0.0024	<0.0001	<0.03	0.0073	0.0023	0.0055	<0.0003	<0.0003	<0.0001	0.0002	0.0007
Calcium D-Ca	22.8	26.2	81.8	8.5	166	142	432	121	89.8	149	10.7	23.6	147	160	205
Chromium D-Cr	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.5	<0.01	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002
Cobalt D-Co	<0.0003	0.003	0.0008	0.0009	0.0881	0.0006	<0.2	0.259	0.082	0.257	0.003	0.008	0.0054	0.0213	0.0479
Copper D-Cu	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.5	<0.01	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002
Iron D-Fe	0.11	0.19	4.06	<0.03	59	55	24900	238	78.6	127	0.68	0.2	14.7	8.05	4.64
Lead D-Pb	0.0007	0.095	<0.0005	0.005	<0.001	0.007	0.6	<0.005	<0.005	<0.005	0.116	0.014	0.004	<0.001	<0.001
Lithium D-Li	<0.005	<0.03	<0.005	<0.01	0.01	<0.01	<3	0.06	<0.05	0.07	<0.03	<0.03	<0.01	<0.01	0.01
Magnesium D-Mg	4.7	82.2	11.8	1.3	35.9	25.5	497	27.9	21.8	33.7	3.4	18.8	30.9	37.3	44
Manganese D-Mn	0.0045	0.082	5.64	0.0708	20	6.54	185	36.2	16.1	25.1	0.042	0.112	20.6	35.1	37.7
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.001	0.052	0.009	0.076	<0.002	<0.002	<0.5	<0.01	<0.01	<0.01	0.124	0.147	0.002	<0.002	<0.002
Nickel D-Ni	<0.001	<0.005	<0.001	<0.002	0.061	<0.002	1.1	0.33	0.11	0.23	<0.005	<0.005	0.005	0.01	0.043
Potassium D-K	<2	11	3	7	3	3	53	4	2	4	14	14	4	4	3
Selenium D-Se	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.5	<0.01	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002
Silver D-Ag	<0.00002	<0.0001	<0.00002	<0.00004	<0.00004	<0.00004	<0.01	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.00004	<0.00004	<0.00004
Sodium D-Na	<2	329	44	179	15	17	<50	18	10	18	436	332	38	28	35
Thallium D-Tl	<0.0002	<0.001	<0.0002	<0.0004	<0.0004	<0.0004	<0.1	<0.002	<0.002	<0.002	<0.001	<0.001	<0.0004	<0.0004	<0.0004
Tin D-Sn	<0.0005	<0.003	<0.0005	<0.001	<0.001	<0.001	<0.3	<0.005	<0.005	<0.005	<0.003	<0.003	<0.001	<0.001	<0.001
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	0.0004	0.002	0.0181	0.0004	0.001	0.0012	<0.1	<0.002	<0.002	<0.002	0.002	0.001	0.0051	0.0046	0.002
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.8	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	0.01	0.05	<0.005	0.02	0.6	0.04	4070	45.1	34.4	26.1	0.11	0.05	<0.01	<0.01	0.26

Rose Creek Tailings Facility Groundwater Quality, September 2002

	Intermediate Impoundment						Intermediate Dam								
Sample ID	X21A	X21B	X21C	P01-05A	P01-05B	P01-06	P01-03	P01-04A	P01-04B	X25A	X25B	X24A	X24B	X24C	X24D
Lab Sample ID	60	59	58	57	56	61	17	83	30	28	27	16	14	13	12
Depth of Monitor (m bgs)	8.5	14.7	29.4	10.7	10.5	16.4	9.3	34	53.4	9	19.2	6.5		16.5	28.3
Date Sampled	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/26/2002	9/23/2002	9/24/2002	9/24/2002	9/24/2002	9/24/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002
Physical Tests															
Conductivity (uS/cm)	4680	1180	340	1900	1520	2770	1870	1020	1030	895	1010	1580	1270	1990	2230
Hardness CaCO3	2380	512	161	623	774	1150	1010	548	462	452	497	860	646	1100	1310
pH	5.5	7.08	8.19	7.45	7.82	5.83	6.92	7.73	7.49	7.9	8.05	7.59	7.18	7.57	7.76
Dissolved Anions															
Acidity (to pH 8.3) CaCO3	1010	32	1	4	10	686	57	15	28	7	4	17	32	20	20
Alkalinity-Total CaCO3	18	157	179	272	228	67	306	188	605	245	275	273	275	310	338
Chloride Cl	4.5	2.1	0.9	6.1	1.5	2.9	4.5	1.9	7.3	1.5	1.8	4.3	3.4	5	4.2
Sulphate SO4	3850	576	7	1040	716	1880	1260	338	44	292	341	39	542	1030	1150
Dissolved Metals															
Aluminum D-Al	0.12	<0.01	<0.005	<0.03	<0.01	0.05	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.03	<0.03
Antimony D-Sb	<0.005	<0.001	<0.0005	0.014	<0.001	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003
Arsenic D-As	0.007	0.004	0.0243	<0.003	0.002	0.015	<0.003	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003
Barium D-Ba	<0.02	<0.02	0.16	<0.02	0.03	<0.02	0.02	0.03	0.38	0.03	0.03	0.03	0.03	0.02	0.02
Beryllium D-Be	<0.01	<0.002	<0.001	<0.005	<0.002	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	0.0058	<0.0001	<0.00005	<0.0003	<0.0001	<0.0003	0.0005	0.0002	<0.0001	<0.0001	<0.0001	0.0007	0.0003	0.0005	0.002
Calcium D-Ca	302	152	57	179	240	277	304	134	114	129	155	260	202	329	399
Chromium D-Cr	<0.01	<0.002	<0.001	<0.005	<0.002	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt D-Co	0.056	0.0062	<0.0003	<0.002	0.0069	0.169	0.027	<0.0006	<0.0006	0.0052	<0.0006	0.0186	0.0046	0.035	0.016
Copper D-Cu	<0.01	<0.002	<0.001	<0.005	<0.002	<0.005	<0.005	<0.002	<0.002	0.003	<0.002	<0.002	0.002	<0.005	<0.005
Iron D-Fe	763	37	0.3	0.97	4.57	518	0.28	<0.03	<0.03	0.24	0.51	<0.03	0.05	0.05	<0.03
Lead D-Pb	0.198	<0.001	<0.0005	0.016	0.002	0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003
Lithium D-Li	<0.05	<0.01	<0.005	0.04	<0.01	<0.03	<0.03	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03
Magnesium D-Mg	394	32	9.5	42.8	42	111	61.3	51.8	42.9	31.7	26.7	51.2	34.7	67	76.2
Manganese D-Mn	59.8	9.86	0.22	0.171	17.3	46.6	25.7	0.0015	0.238	6.49	0.19	19.2	6.02	27.4	23.7
Mercury D-Hg	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.01	<0.002	0.004	0.006	<0.002	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Nickel D-Ni	0.02	0.004	<0.001	<0.005	0.004	0.071	0.046	0.007	<0.002	0.004	<0.002	0.016	0.01	0.061	0.093
Potassium D-K	18	4	<2	15	4	11	5	3	3	4	3	5	5	5	6
Selenium D-Se	<0.01	<0.002	<0.001	<0.005	<0.002	<0.005	<0.005	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Silver D-Ag	<0.0002	<0.00004	<0.00002	<0.0001	<0.00004	<0.0001	<0.0001	<0.00004	<0.0004	<0.00004	<0.00004	<0.00004	<0.00004	<0.0001	<0.0001
Sodium D-Na	82	66	3	200	61	38	37	6	60	25	51	28	28	33	44
Thallium D-Tl	<0.002	<0.0004	<0.0002	<0.001	<0.0004	<0.001	<0.001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001
Tin D-Sn	<0.005	<0.001	<0.0005	<0.003	<0.001	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium D-U	<0.002	0.0027	<0.0002	<0.001	0.0049	0.004	0.005	0.0039	0.0005	0.0089	0.0052	0.0057	0.0076	0.005	0.004
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	6.72	0.09	<0.005	<0.03	0.01	2.58	<0.03	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	0.03

Rose Creek Tailings Facility Groundwater Quality, September 2002

	Downgradient of Polishing Pond										
Sample ID	P01-01A	P01-01B	P01-02A	P01-02B	X18A	X18B	X16A	X16B	X17A	X17B	P01-11
Lab Sample ID	4	3	9	11	82	7	2	1	6	5	8
Depth of Monitor (m bgs)	21.4	35.3	14.1	28.4	10.6	28.7	8	34	6.2	25	
Date Sampled	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002	9/23/2002
Physical Tests											
Conductivity (uS/cm)	1080	1240	625	561	1150	1180	346	404	430	529	1600
Hardness CaCO3	589	675	325	263	590	647	227	223	242	285	879
pH	8.08	7.99	8.1	8.17	7.79	7.96	8.13	8.14	8.13	8.11	7.98
Dissolved Anions											
Acidity (to pH 8.3) CaCO3	4	6	3	2	14	6	2	2	2	3	8
Alkalinity-Total CaCO3	232	217	196	179	203	177	146	195	194	251	264
Chloride Cl	2.3	2.3	1.6	1.4	1.9	2.3	1.2	0.8	1.1	2.9	3.6
Sulphate SO4	399	549	1430	116	449	550	36	25	36	39	716
Dissolved Metals											
Aluminum D-Al	<0.01	<0.01	<0.005	<0.005	0.01	<0.01	<0.005	0.006	<0.005	<0.005	0.96
Antimony D-Sb	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Arsenic D-As	0.01	<0.001	0.0006	0.0023	0.007	<0.001	<0.0005	<0.0005	0.0006	<0.0005	0.012
Barium D-Ba	0.1	0.11	0.06	0.04	0.2	0.13	0.13	0.13	0.13	0.25	0.07
Beryllium D-Be	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002
Boron D-B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	<0.0001	<0.0001	0.00005	<0.00005	<0.0001	0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001
Calcium D-Ca	178	200	93.7	64.8	170	188	63.6	62.6	66.3	78.3	270
Chromium D-Cr	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.003
Cobalt D-Co	<0.0006	<0.0006	<0.0003	0.0006	<0.0006	<0.0006	<0.0003	<0.0003	<0.0003	<0.0003	0.0025
Copper D-Cu	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.005
Iron D-Fe	0.71	<0.03	<0.03	0.16	2.29	<0.03	<0.03	<0.03	<0.03	0.68	7.43
Lead D-Pb	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	0.008
Lithium D-Li	0.01	<0.01	0.006	0.006	<0.01	<0.01	<0.005	<0.005	<0.005	0.022	0.02
Magnesium D-Mg	35	42.4	22.1	24.4	40	43.1	16.4	16.2	18.7	21.8	49.8
Manganese D-Mn	0.105	0.0141	0.273	0.234	0.569	1.76	0.0004	<0.0003	0.006	0.2	6.74
Mercury D-Hg	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum D-Mo	<0.002	<0.002	0.002	<0.001	<0.002	<0.002	0.002	0.002	0.001	0.001	0.005
Nickel D-Ni	<0.002	0.002	0.002	0.004	<0.002	0.01	<0.001	<0.001	<0.001	<0.001	0.006
Potassium D-K	4	6	3	3	5	6	<2	<2	<2	<2	11
Selenium D-Se	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	0.002	0.002	<0.001	<0.001	<0.002
Silver D-Ag	<0.00004	<0.00004	<0.00002	<0.00002	<0.00004	<0.00004	<0.00002	<0.00002	<0.00002	<0.00002	0.00005
Sodium D-Na	26	25	14	18	22	22	<2	<2	3	10	53
Thallium D-Tl	<0.0004	<0.0004	<0.0002	<0.0002	<0.0004	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004
Tin D-Sn	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
Uranium D-U	0.0059	0.0048	0.0019	0.0036	0.004	0.0064	0.0022	0.0021	0.0026	0.0018	0.0029
Vanadium D-V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	0.05

Notes: Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.
ALS File No. P9827