STATE OF ALASKA

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DIVISION OF WATER
WASTEWATER DISCHARGE PROGRAM

December 18, 2003

ADEC File #121.62.002

Mr. Karl Hanneman
Teck-Pogo, Inc.
3520 International Street
Fairbanks, AK 99701

Certified Mail # 7000 1530 0001 6497 0173
Return Receipt Requested

Subject: Waste Disposal Permit 0131-BA002, Teck-Pogo, Inc.

Dear Mr. Hanneman:

The Alaska Department of Environmental Conservation has completed its evaluation of your Waste Disposal Permit application for the disposal of treated tailings from a gold recovery facility to an approximately 91-acre surface disposal site and within the underground workings of the mine, and the storage, treatment and/or disposal of other solid waste to be generated by the Pogo mine project, as detailed in your application materials and in the attached permit. The attached permit is issued under the provisions of Alaska Statute 46.03, and the Alaska Administrative Code, 18 AAC 15, 18 AAC 60, 18 AAC 70, and 18 AAC 72, as amended or revised, and other applicable state laws and regulations, and incorporates the Pogo project's November 2002 Solid Waste Permit Application Description of Facilities and the December 2003 Monitoring Plan. Please review the conditions and stipulations in this permit and ensure that they are all understood. This permit is effective December 18, 2003, and expires December 18, 2008.

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195- 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Director, Division of Water, 410 Willoughby Ave., Juneau, Alaska 99801, within 15 days of the permit decision. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days of the permit decision. If a hearing is not requested within 30 days, the right to appeal is waived.

Sincerely,

SIGNATURE ON FILE
William D. McGee
Technical Engineer

Clean Air, Clean Water

cc: Luke Boles, ADEC/Fairbanks
Cam Leonard, AG/Fairbanks
Jim Vohden, DNR/Fairbanks
Ed Fogels, ADNR/Anchorage
Jack Winters, ADFG/Fairbanks
Stan Foo, ADNR/Anchorage
Steve McGroarty/ADNR/Fairbanks
Cindi Godsey, EPA/Anchorage
Victor Ross, ACOE/Anchorage
Mara, Bacsujlaky, NAEC
Dave Chambers, CSP^2
Native Village of Tanacross

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
610 UNIVERSITY AVE.
FAIRBANKS, AK 99709-3643

WASTE DISPOSAL PERMIT

For
The Pogo Mine

Permit 0131BA002 **Date: December 18, 2003**

This Waste Disposal Permit is issued to Teck-Pogo, Inc., 3520 International Street, Fairbanks, Alaska 99701, for the disposal of mine tailings, development rock and other solid wastes as defined in Section 1.2 of this permit, from a gold recovery facility to an approximately 91-acre tailings dry stack surface disposal facility, exclusive of treatment works, the mine underground workings, and an approximately five-acre surface landfill located within Sections 13, 14, 22-27 and 34-36, T5S, R14E; Sections 18, 19 and 29-34, T5S, R15E; Sections 1-3, 10-15 and 36, T6S, R14E; Sections 3-11, 14-23 and 29-32, T6S, R14E, Fairbanks Meridian. This permit is issued under the provisions of Alaska Statutes 46.03, and the Alaska Administrative Code, 18 AAC 15, 18 AAC 60, 18 AAC 70 and 18 AAC 72, as amended or revised, and other applicable state laws and regulations. This permit is effective December 18, 2003 and expires December 18, 2008. It may be terminated or modified in accordance with AS 46.03.120.

This permit is subject to the conditions and stipulations contained in Sections 1 - 5. This permit incorporates by reference the Pogo project's November 2002 Solid Waste permit Application and Description of Facilities and the December 2003 Monitoring Plan. Changes to the documents incorporated herein must be approved by the Department if they affect this permit. If the Department approves the changes, they become part of this permit.

The Department requires the permittee to conduct post-closure maintenance and monitoring for a minimum of 30 years after closure. The permittee shall assess the conditions at the facility and respond accordingly throughout the post-closure care period. At the end of the post-closure period, the Department will determine whether post-closure care and monitoring should be extended beyond 30 years, based upon the information collected by that time.

This permit waives the following regulatory requirements:

1. 18 AAC 60.243. The requirement that intermediate cover be placed within seven days after the waste is last deposited in an area of a landfill, using soil material at least 12 inches thick, graded to prevent ponding, is waived for the tailings dry stack disposal facility. However, the waiver does not apply to the surface landfill. In light of the nature of the tailings and development rock to be disposed in the dry stack facility, the management plan for this waste and the conditions of this permit provide for equal or

better environmental protection, reduction in public health risk and control of nuisance factors than would the use of intermediate cover required for typical landfills.

2. 18 AAC 60.825(a). The requirement for a background groundwater monitoring well located hydraulically upgradient of the facility or, if not hydraulically upgradient providing representative background groundwater quality, is waived. This waiver applies insofar as the monitoring well located upgradient of the waste treatment facility does not appear to provide representative background groundwater quality for the Liese Creek drainage but use of that well will allow monitoring for evidence of upgradient contamination entering the groundwater system influenced by the facility.

3. 18 AAC 70.020. The requirement for groundwater samples to be analyzed for total recoverable for metals is waived, subject to the condition that if Dissolved analyses show water quality at or closely approaching the applicable water quality criteria, Total Recoverable analyses shall be added to the analytical requirements starting with the next scheduled sampling event. This condition applies only for so long as the Water Quality Standards (18 AAC 70) require that metals are to be expressed in terms of Total Recoverable. The Dissolved analyses proposed in the Monitoring Plan will provide equal or better environmental protection and reduction in public health risk.

SIGNATURE ON FILE

William D. McGee
Technical Engineer

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1 SPECIFIC PERMIT CONDITIONS

1.1 INTRODUCTION

1.1.1 This permit covers the tailings dry stack facility, underground mine workings, surface landfill solid waste facilities, the non-mineralized development rock stockpile, and, as relevant to the permitted disposal activity, the treatment works which include the mill operation, seepage and runoff collection system, Recycle Tailings Pond (RTP), water treatment plants, Off River Treatment Works (ORTW), and the groundwater and surface water monitoring systems. Finally, this permit covers hazardous chemical storage and containment, and reclamation activities related to the tailings dry stack facility.

1.1.2 In addition to the stipulations in this permit, the permittee shall adhere to the requirements of 18 AAC 60 Solid Waste Management Regulations as applicable, 18 AAC 70 Alaska Water Quality Standards, and 18 AAC 72.500–600 Non-Domestic Wastewater. The permittee shall also adhere to requirements of the Pogo Project Reclamation and Closure Plan, the Pogo Project Monitoring Plan and the Pogo Project Quality Assurance Project Plan as approved by the Department. The tailings dry stack facility is considered to be part of the treatment works as well as a disposal site, and the associated drainage control systems, the ORTW, the RTP and the non-mineralized development rock stockpile are considered to be part of the treatment works. The water quality standards need not be met in the treatment works.

1.1.3 During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to dispose of solid waste as specified in this permit into the tailings dry stack facility, the underground workings and the surface landfill at the Pogo project.

1.1.4 For purposes of this permit the compliance points are identified as MW-500, MW-501, MW-502, MW-503 and MW-504.

1.2 LIMITATIONS

1.2.1 The waste materials covered under this section are limited to a lifetime of facility maximum of 20 million tons, consisting of approximately 12,500 tons weekly of flotation tailings and approximately 24,500 tons weekly of development rock, meeting the conditions in this permit, deposited in the tailings dry stack facility. Also covered under this section is the non-mineralized stockpile, which will store up to 355,000 tons of non-mineralized development rock. The cutoff limit for differentiating between mineralized and non-mineralized development rock shall be either greater than 0.5% Sulfur content or arsenic content greater than 600 mg/kg. No volume limitation is placed on disposal of paste backfill tailings (consisting of approximately 50% of total flotation tailings and 100% of Carbon-in-Pulp [CIP] tailings) or development rock in the underground workings because

the permittee is expected to place wastes underground to the maximum extent practicable over the life of the facility.

1.2.2 The following materials may not be disposed into the surface landfill, the surface tailings dry stack facility or the underground facility, unless otherwise provided or approved in writing by the Department:

1.2.2.1 Other than interstitial waters entrained in the tailings or paste backfill tailings, treated or untreated process water in quantities or concentrations that would exceed water quality standards in 18 AAC 70.

1.2.2.2 Chemical containers (unless triple rinsed), and discarded, unused chemicals.

1.2.2.3 Uncombusted household waste.

1.2.2.4 Laboratory wastes other than wash waters, neutralized acids and neutralized bases.

1.2.2.5 Sewage solids that are untreated and/or have less than 10% solids by weight.

1.2.2.6 Asbestos waste.

1.2.2.7 Hazardous wastes, as defined by 40 C.F.R. Part 261, including radioactive material, explosives, strong acids and untreated pathogenic waste. This prohibition does not preclude disposal of residual wastes included as byproducts of the beneficiation process due to recycling of refinery slag, fire assay crucibles and cupels.

1.2.2.8 Fuels, oil, transformers, paint, equipment and packing material.

1.2.2.9 Glycol and solvents.

1.2.2.10 Batteries.

1.2.2.11 CIP tailings except when subjected to cyanide destruction as required by section 1.2.3 and disposed underground as part of the paste backfill tailings.

1.2.3 Prior to disposal as part of the paste backfill tailings, the CIP tailings shall be subjected to cyanide destruction using the SO_2 /air process or other suitable cyanide destruction process approved by the Department. At least 90% of the samples shall contain less 10mg/kg of WAD cyanide and none of the samples shall contain more than 20 mg/kg of WAD cyanide.

1.2.4 Washwater from the vehicle maintenance shop may go into the RTP. Oily water

must go through an oil/water separator and the treated water may not have a sheen prior to entering the RTP. Dry methods of cleanup shall be used for initial cleanup of oil spills in the maintenance shop.

1.2.5 Activities at the site which will cause a greater amount of waste material to be treated and disposed of, above that contemplated in this section of the permit, are prohibited without the prior approval by the Department.

1.2.6 The water in the compliance groundwater monitoring wells, listed in section 1.1.4, must not exceed the State Water Quality Standards (18 AAC 70) or show a statistically significant increase in concentration above the applicable WQS, including natural condition, for the parameters monitored. If these standards are exceeded or if a statistically significant change above the WQS is detected, the corrective action outlined in section 1.7 must be implemented.

1.2.7 The limitations in section 1.2 do not preclude the surface storage prior to treatment/disposal of development rock or the stockpiling of non-mineralized development rock prior to use in construction or erosion control. Mineralized development rock shall be temporarily stored within the catchment area of the RTP and shall placed in the drystack or underground as soon as practicable. The limitations also do not preclude, and authorization is hereby given for, disposal of non-hazardous incidental wastes such as (i) settled solids from sumps, ditches, and degritting basins; (ii) settled solids from the water treatment plant; (iii) dewatered water treatment plant sludge, including the sludge generated during the advanced exploration phase; (iv) dewatered sewage sludge meeting the requirements of section 1.2.2.6; (v) incinerator ash and residue; (vi) ash from combustion of scrap wood material; (vii) iron (drill steel, balls, empty case, etc.); (viii) used ventilation tubing and used filter press cloth; (ix) empty plastic and glass containers; (x) inert domestic waste; (xi) construction debris; (xii) tires; (xiii) spill cleanup debirs approved by the Department; (xiv) non-terne plated used oil filters that have been gravity hot-drained; and (xv) such other material as would otherwise be disposed of in a surface landfill without special handling.

1.2.8 The Department may set or modify permit conditions based on monitoring results or changes in facility processes, after consultation with the permittee, in accordance with permit amendment or modification procedures.

1.3 SITE MAINTENANCE

1.3.1 Information on engineering changes to the mill, new waste treatment processes, changes to the groundwater monitoring well system, and addition of new point sources that discharge into the RTP must be submitted to the Department and approval must be obtained prior to any such changes or discharges.

1.3.2 The permittee must provide and maintain secondary containment for all process piping and chemical mix tanks containing hazardous or toxic materials. Secondary

containment is considered to be 110% of the largest tank within one containment, or the total volume of manifolded tanks. The permittee must design and install secondary containment structures in a manner that ensures that solid waste and leachate will not escape from the structures. Facilities to prevent such discharges shall be maintained in good working condition at all times by the permittee.

1.3.3 Secondary containment of all hazardous substances as defined at AS 46.03.826(5) must be impermeable to those stored hazardous substances.

1.3.4 The permittee must design all process piping and chemical mix tanks to allow for routine inspections for leaks. Process piping outside of the mill building must not be buried unless secondary containment is used that provides the ability to inspect for leaks. This stipulation does not apply to the RTP water return lines.

1.3.5 The permittee shall develop the site in accordance with the plans submitted by the applicant as required by this permit and approved by the Department, and approved amendments to those plans. Pollution prevention concepts shall be incorporated into operations plans for the project.

1.4 SITE CONSTRUCTION AND OPERATION

1.4.1 The permittee shall establish, update and maintain proof of financial responsibility in accordance with section 1.10 of this permit.

1.4.2 The freeboard of the RTP shall be maintained to minimize overtopping as indicated in the most recent edition Pogo Project Water Management Plan.

1.4.3 The permittee shall take reasonable measures to control particulates that may occur from wind-blown tailings by wetting or other effective measures.

1.4.4 The permittee shall prevent disposal of waste materials from exceeding the design capacity of the disposal facilities.

1.4.5 The permittee shall minimize run-on water from entering the tailings dry stack facility and the surface landfill from upgradient sources of surface and groundwater.

1.4.6 The permittee shall control and treat surface water, groundwater and leachate as necessary to prevent off-site water quality exceedences, shall not place solid waste in water, and shall not allow solid waste to wash away from the facility.

1.4.7 The permittee shall minimize infiltration of water into the dry stack tailings facility during the routine operations, closure and post-closure care periods.

1.4.8 The permittee shall ensure geotechnical stability of waste materials and cover systems, including minimizing the potential for liquefaction within the dry stack

tailings facility in the event of a maximum credible earthquake event.

1.4.9 The permittee shall minimize the potential for development of acid rock drainage conditions, for example, by entombing mineralized development rock within the compacted tailings.

1.4.10 The permittee must notify the Department in writing at least 15 days before the introduction of a new chemical into the process or waste treatment streams. Material Safety Data Sheets on new chemicals must be forwarded to the Department and maintained on site.

1.4.11 The permittee must submit plans to the Department and receive approval of any changes that will significantly modify the quality or quantity of a discharge, significantly modify the operation of a waste treatment component, or significantly modify the disposal facility, at least 60 days before construction of the modification.

1.4.12 The permittee must notify the Department in writing at least 15 days before the introduction of process solutions into an existing process or waste treatment component that has been significantly modified.

1.4.13 The permittee must submit to the Department within 90 days after completing construction of a significant modification to an existing process component:

1.4.13.1 As built drawings of the process component(s) which show any changes of those aspects that would affect performance of that process component as required in 18 AAC 72.600.

1.4.13.2 A summary of the quality control activities that were carried out during construction.

1.4.13.3 The final operating plans that reflect modifications made during construction.

1.4.14 The permittee shall maintain fuel handling and storage facilities in a manner, which will prevent the discharge of hazardous substances. A Spill Prevention, Control and Countermeasures (SPCC) plan shall be in effect according to provisions of 40 C.F.R. Part 112 for facilities storing 660 gallons of fuel in a single container above ground, 1320 gallons in the aggregate above ground, or 42,000 gallons below ground.

1.4.15 The permittee shall notify the Department of a discharge of any hazardous substance at the facility in conformance with 18 AAC 75, Article 3. Reportable spills include unplanned discharges of process chemicals to the RTP which would violate limitations in this permit.

1.4.16 Using best efforts, the permittee shall develop spill response plans for the

transportation of hazardous substances, including petroleum products, by the permittee to the facility and shall require other transporters of these substances under contract with the permittee to make such spill plans available to the permittee and/or the Department. Upon request from the Department, the permittee shall provide copies of such plans.

1.4.17 The permittee shall cover disposed solid waste in the surface landfill with six inches of earthen material, or an alternate material approved by the Department, as needed to control disease vectors, fire, odor, blowing litter, and scavenging.

1.4.18 The permittee shall apply an intermediate cover to any inactive portion of the surface landfill within seven days after the waste is last deposited in that area, using a soil material at least 12 inches thick and graded to prevent water from ponding.

1.5 MONITORING

1.5.1 Within 90 days of the effective date of the permit the permittee shall submit a QAPP to the Department for approval. The permittee shall maintain and update the QAPP to include the following:

1.5.1.1 Weekly visual monitoring of the facility for signs of damage or potential damage from settlement, ponding, leakage, erosion or operations at the site. Visual monitoring shall be documented.

1.5.1.2 Surface water and groundwater analyses for parameters at frequencies and locations, which will ensure that sample results are representative and statistically valid.

1.5.1.3 Monitoring of the CIP tailings prior to placement in the paste backfill to ensure that the limitations contained in section 1.2.3 are met.

1.5.1.4 A fluid management monitoring plan including a water accounting of process water discharged to the RTP, process water recycled to the mill, and water treated and discharged.

1.5.1.5 A biological visual survey program to monitor wildlife interaction with the surface waste disposal facilities.

1.5.1.6 A program to track the classification and segregation of the mineralized and non-mineralized development rock produced at the facility to ensure that the cutoff criteria contained in section 1.2.1 are being met.

1.5.2 The Monitoring Plan submitted in December 2003, by Teck-Pogo, Inc., and

approved by the Department, is incorporated into this permit. Approved changes to project monitoring will be included as modifications to the Monitoring Plan and do not require re-issuance or amendment of this permit.

1.5.3 Groundwater, surface water, process water and tailings solids sampling locations and frequency shall be in conformance with the solid waste monitoring section of the most recent Pogo Monitoring Plan and QAPP as approved by the Department. The sampling locations shall provide for the following monitoring: the surface water at the Goodpaster River and the groundwater monitoring wells, including compliance wells located downgradient of the RTP and the surface landfill.

1.5.4 Samples taken as required by section 1.5.2 shall be analyzed in conformance with the most recent Monitoring Plan and QAPP submitted by Teck-Pogo, Inc., as approved by the Department.

1.5.5 The permittee shall maintain a log of waste disposed into the tailings dry stack facility, underground mine workings and the surface landfill for all wastes. The log shall include the date of disposal, estimated volume of waste and a description of the waste. A summary shall be included in the annual report required in section 1.6.

1.5.6 Maintenance of inspection and sampling logs, and procedures for processing, consolidating and reporting inspection and sampling data shall be in conformance with the most recent Monitoring Plan and QAPP submitted by Teck-Pogo, Inc., as approved by the Department.

1.5.7 Groundwater and surface water monitoring and corrective action shall be in accordance with section 1.7, 18 AAC 60 Solid Waste Management Regulations, and the most recent Monitoring Plan and QAPP submitted by Teck-Pogo, Inc., as approved or modified by amendment to this permit.

1.5.8 The Department may modify monitoring requirements, including the establishment of additional compliance points, after consultation with the permittee, in response to trends showing changes in the concentration of parameters being monitored.

1.5.9 The permittee shall establish and follow monitoring procedures as follows:

1.5.9.1 Adhere to conditions in the ADEC approved Pogo Project QAPP Quality Control and Quality Assurance Objectives sections. The QAPP will reflect the current sampling program for the solid waste components of the mine facility. Any significant changes in the QAPP procedures shall be submitted to the Department for approval.

1.5.9.2 Ensure samples are analyzed by a laboratory that follows EPA-approved procedures, quality control requirements, reporting and documentation

procedures. The QAPP, containing quality control procedures and criteria, analytical methods, detection limits and reporting requirements pertinent to the permit holder's samples shall be submitted to the Department for approval and must be updated annually and whenever changes to methods or in the laboratories used occur.

1.5.9.3 Analyze collected samples using methods set out in EPA-600/4-79-020 Methods for Chemical Analysis of Water and Wastes; EPA-600/4-82-057 Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater; Standard Methods for the Examination of Water and Wastewater (edition in effect at the time of sampling); or other methods approved by the Department. Each result must be accompanied by a reference, such as the method number, to the method that was used to perform the analysis.

1.5.9.4 Conduct inspections of the tailings dry stack disposal facility and the RTP in conformance with the Operation and Maintenance Manual approved by ADNR, Division of Mining, Land and Water, Dam Safety and Construction Unit.

1.5.10 If the permittee monitors any influent, effluent, receiving water, air or solid waste characteristic in addition to those identified in this permit, or more frequently than required, the results of such monitoring shall be available for inspection by the Commissioner or his/her representative at the project site, or other location proposed by the permittee and agreed upon by the Department. The permittee shall provide copies of the results to the Department upon request.

1.6 REPORTING

1.6.1 For each year of sample collection and analysis, the permitee shall submit to the Department quarterly monitoring reports, for a total of four quarterly reports each year, and one annual monitoring report, summarizing the inspection and monitoring results set out in section 1.5. All quarterly reports shall be submitted to the Department no later than 60 days after the last day of the quarter. The annual report will be due annually on March 1st and summarize the calendar year. Copies of the laboratory reports should be submitted with the quarterly reports for the first year of data collection and analysis, or for the first year after a change of laboratory is made. Electronic copies of reports shall be submitted to the Department using commercially available software along with the hard copies. An annual meeting with the Department will be held in conjunction with ADNR in which the annual report will be presented to the agencies and the public. The annual report shall be available to the Department at least two weeks prior to the annual meeting.

1.6.2 Quarterly and annual reports required in section 1.6.1, shall include information necessary to determine data validity and to determine data variations and trends,

and any exceedence of standards or criteria (see section 1.5.1.2). All records and information which validate the QAPP, resulting from the monitoring activities required by this permit, including but not limited to all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained in Alaska for observation by the Department for three years. Upon request from the Department, the permittee shall submit certified copies of such records. The Department may at its discretion perform field and laboratory audits of monitoring activities.

1.6.3 The annual report required in section 1.6.1 shall also address the adequacy of the financial responsibility, including, but not limited to, inflation, significant changes in reclamation activity costs, concurrent reclamation, expansion or other changes to the operation of the facility.

1.6.4 The permittee shall maintain an updated plan of operations as required by ADNR showing site use and development plans, and shall provide the Department with copies of any amendments to that plan of operations affecting the waste disposal operations authorized by the permit.

1.7 CORRECTIVE ACTIONS

1.7.1 The permittee shall comply with 18 AAC 60.815 if the visual monitoring program discovers damage or potential damage to the waste disposal-related facility that could lead to water quality violations.

1.7.2 The permittee shall comply with 18 AAC 60.820-860 if a statistically significant increase above background in water quality in any of the groundwater sampling locations is detected. Statistical significance shall be determined using one of the methods outlined in 18 AAC 60.830(h). The permittee shall comply with the notification requirements in 18 AAC 850(c) upon determination of a statistically significant increase above background water quality.

1.7.3 If a violation of water quality standards is detected at a surface water or groundwater monitoring station, or if an exceedence of the limits set out in section 1.2 is detected, the permittee shall:

1.7.3.1 Orally notify the Department within 24 hours.

1.7.3.2 Determine the extent of the exceedence.

1.7.3.3 In consultation with the Department and documented in writing, implement a plan to determine the cause and/or source of the exceedence.

1.7.3.4 Submit to the Department, within 7 working days after an exceedence is verified, a plan for corrective actions to prevent adverse environmental impacts and further exceedences of applicable water quality standards or

permit limits.

1.7.3.5 Implement the corrective action plan as approved by the Department.

1.8 TEMPORARY CLOSURE

1.8.1 A temporary closure shall be defined as a suspension of mining and milling activities for more than 90 days but less than three years. The length of time for a temporary closure may be extended beyond three years by written authorization from the Department. The permittee shall submit a conceptual temporary closure plan to the Department prior to commencement of tailings disposal operations at the site.

1.8.2 The permittee shall submit a specific temporary closure plan to the Department no later than ten days after a temporary closure has been initiated. The permittee is encouraged to submit the specific plan immediately upon availability, and prior to commencement of the temporary closure if possible. The specific plan shall include the following:

1.8.2.1 The procedures, methods, and schedule to be implemented for the treatment, disposal, or storage of process water.

1.8.2.2 The control of surface and groundwater drainage to and from the facility and the surrounding area.

1.8.2.3 The control of erosion from the drystack and surface landfill.

1.8.2.4 The secure storage of chemicals during the period of closure.

1.8.3 The Department shall have 15 days to review and approve or request modifications to the temporary closure plan.

1.8.4 Once a temporary closure plan has been approved, full implementation of the approved specific plan is required. The plan can be amended by submitting a revised plan to the Department for approval.

1.8.5 During temporary closure of the site, the permittee shall:

1.8.5.1 Continue pollution control activities associated with the tailings dry stack facility, including but not limited to dust control, maintenance of the drainage diversion structures, maintenance of all discharge and leakage control structures and processes, and maintenance of the RTP including appropriate freeboard as specified by this permit or the temporary closure plan.

1.8.5.2 Continue monitoring and reporting activities of all active portions of the site

including the tailings dry stack facility, surface landfill and the RTP as specified by this permit or the temporary closure plan.

1.8.5.3 Complete reclamation and corrective action requirements as appropriate under the Reclamation Plan in light of the nature of the closure.

1.9 PERMANENT CLOSURE

1.9.1 Updated reclamation and monitoring plans must be submitted for approval within 90 days of the decision that permanent cessation of the mill process will occur. These updates must address current conditions at the facility.

1.9.2 Permanent closure of the site must be implemented and completed in accordance with the conditions of this permit and with the Reclamation and Closure Plan approved by the Department and ADNR.

1.9.3 Permanent closure of the waste disposal facility will be complete when the following two criteria are met:

1.9.3.1 A Department-approved engineered soil cover system is installed on the dry stack tailings pile and drainage channels are constructed and stable,

1.9.3.2 A vegetative cover as prescribed in section 3.5 of the October 2003 Reclamation and Closure Plan or most recent ADEC and ADNR approved Reclamation and Closure Plan.

1.9.4 Permanent closure must be achieved prior to the cessation of any care and maintenance activities required by section 1.8.5 and the approved temporary closure plan if a period of temporary closures immediately preceded commencement of permanent closure.

1.9.5 The permittee shall maintain the facility, correcting any erosion or settlement of the tailings dry stack that may impair water quality or otherwise threaten the environment, up until the time that this permit, or any successor permit, is transferred to another entity or terminated by the Department.

1.9.6 Post-closure monitoring of surface water and groundwater shall occur according to the sampling schedule set out in the most recent Pogo Project Monitoring Plan approved by the Department. This schedule and the parameters monitored may be modified by the Department, after consultation with the permittee, based on the monitoring results received.

1.10 PROOF OF FINANCIAL RESPONSIBILITY

1.10.1 The permittee shall provide the Department with proof of financial responsibility

for closure of the facility and post-closure monitoring. The proof of financial responsibility shall cover costs incurred for closure and post-closure monitoring of the facility, shall cover the activities set out in Section 3, and shall be in the amount shown in Section 3. The area covered by the financial responsibility required in this section is shown on the map attached as section 5.

1.10.2 The Department, in consultation with ADNR, will review, and modify, if appropriate, the financial responsibility requirements including adjustments for inflation, concurrent reclamation and expansion or other changes to the operation of the facility annually, or during the renewal, modification or amendment of this permit. The permittee shall address the adequacy of the financial responsibility in the annual report required in section 1.6.1.

1.10.3 The proof of financial responsibility may be in the form of a trust fund, surety bond, letter of credit, insurance, or any other mechanism approved by the Department.

1.10.4 Approved proof of financial responsibility must remain available through the post-closure period, up to 30 years, and may not be released until the Department certifies in writing that closure of the facility and the required post-closure monitoring have been successfully concluded, or that another entity will assume responsibility for permit compliance and/or post-closure monitoring.

1.10.5 It shall be the responsibility of the permittee to provide acceptable proof of financial responsibility. The Department will accept or reject said Offer of Proof as expeditiously as possible, but in no event later than 30 days after its receipt.

1.10.6 If the permittee is unable to provide proof of financial responsibility, which is acceptable to the Department and is approved by the Department in writing within the time periods stated above, this permit will expire automatically at that time, notwithstanding any other approvals to the contrary, unless the Department's failure to act is responsible for the delay in accepting or rejecting this proof.

1.10.7 If the permittee fails to comply with the terms and conditions of this permit, as written, renewed, modified or amended; and if the Department concludes that such failure may prevent, inhibit or delay satisfactory closure or post-closure monitoring of the disposal facility; then the Department may exercise its rights under the approved mechanism for financial responsibility to access the funds and use them for appropriate closure and post-closure activities.

1.11 FACILITY AUDIT

1.11.1 Prior to the renewal of this permit every five years, in coordination with a review of the General Plan of Operations, and prior to and in preparation for the termination of this permit, a facility audit shall be conducted at the expense of the permittee. The Department, in consultation with other agencies having land use

management or regulatory authority over the facility and the permittee, shall mutually select a qualified auditor.

The intent of the audits will be to determine if both the facility management and regulatory controls of the facility provide reasonable assurances that the facility and controls are functioning as intended.

The scope of subsequent audits may be revised as mutually agreed upon prior to initiation of each audit, to address specific issues or objectives not previously identified in this permit. Identification of such issues or objectives may be accomplished through a joint permittee/agency meeting prior to the audit.

1.11.2 The audit will be an objective, systematic, documented review of the conditions, operations, and practices related to permit requirements and facility management conducted under this permit.

The audit shall evaluate:

1.11.2.1 The permittee's compliance with all federal, State and local permits and authorizations related to the permitted facility, and specific compliance with the conditions of this permit.

1.11.2.2 The reliability and integrity of information relating to facility reporting and compliance.

1.11.2.3 The adequacy of the Department's permit and other agencies' oversight of the facility.

1.11.2.4 The condition of chemical containment structures.

1.11.2.5 Laboratories and sample analysis procedures.

1.11.2.6 The pollution prevention strategy in section 2.10 of this permit.

1.11.2.7 The adequacy of the closure and post-closure financial responsibility, including the collection and treatment of contact water.

1.11.3 The Department and permittee will use the audit results to assist in:

1.11.3.1 Updating, renewing, or amending this permit.

1.11.3.2 Updating policies, plans, and procedures.

1.11.3.3 Determining compliance with this permit.

1.11.3.4 Determining the adequacy of the closure and post-closure financial responsibility, including the collection and treatment of contact water.

1.11.4 The facility audit shall be a component of or combined with the audit required by the ADNR Millsite Permit, ADL # 416949.

2 GENERAL PERMIT CONDITIONS

2.1 ACCESS AND INSPECTION

The permittee shall allow the Commissioner or his/her representative access to the permitted facility at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, state laws, and regulations.

2.2 INFORMATION ACCESS

Except where protected from disclosure by applicable State or Federal law, all records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the State of Alaska Department of Environmental Conservation, Fairnanks Office, 610 University Ave., Fairbanks, Alaska.

2.3 CIVIL AND CRIMINAL LIABILITY

Nothing in this permit shall relieve the permittee from any potential civil or criminal liability for noncompliance with the permit or with applicable laws.

2.4 AVAILABILITY

The permittee shall post or maintain a copy of this permit available to the public at the facility.

2.5 ADVERSE IMPACT

The permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation specified in this permit, including any additional monitoring needed to determine the nature and impact of the noncomplying activity. The permittee shall cleanup and restore all areas adversely impacted by the noncompliance.

2.6 CULTURAL OR PALEONTOLOGICAL RESOURCES

Should cultural or paleontological resources be discovered as a result of this activity, work, which would disturb such resources, is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, Department of Natural Resources (907-465-4563), is to be notified promptly.

2.7 APPLICATIONS FOR RENEWAL

In accordance with 18 AAC 15.100(d), applications for renewal or amendment of this permit must be made no later than 30 days before the expiration date of the permit or the planned effective date of the amendment.

2.8 OTHER LEGAL OBLIGATIONS

This permit does not relieve the permittee from the duty to obtain any other necessary permits from the Department or from other local, state, or federal agencies, and to comply with the requirements contained in any such permits. All activities conducted and all plans implemented by the permittee pursuant to the terms of this permit shall comply with all applicable local, state, and federal laws and regulations.

2.9 TRANSFER OF OWNERSHIP.

In the event of any change in control or ownership of the permitted facility, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Director of Air and Water Quality. The original permittee remains responsible for permit compliance unless and until the succeeding owner or controller agrees in writing to assume such responsibility, and the Department approves assignment of the permit. The Department will not unreasonably withhold such approval.

As between the State and the permittee, no transfer of this permit shall relieve the permittee of any liability arising out of operations conducted prior to such transfer, regardless of whether such liability accrues before or after such transfer.

2.10 POLLUTION PREVENTION

In order to prevent and minimize present and future pollution, when making management decisions that effect waste generation, the permittee shall consider the following order of priority options as outlined in AS 46.06.021:

- waste source reduction,
- recycling of waste,
- waste treatment, and
- waste disposal

3 FINANCIAL RESPONSIBILITY FOR THE POGO PROJECT FACILITY CLOSURE, MAINTENANCE AND POST-CLOSURE MONITORING COSTS

Solid waste regulations (18 AAC 60) allow the Department to require proof of financial responsibility for closure of the facility and post-closure monitoring. The proof of financial responsibility for the life of this permit, unless modified sooner, shall be **$22,135,567**. The financial responsibility in the amount of $22,135,567 includes financial responsibility required by ADEC under 18 AAC 60 and by the Alaska Department of Natural Resources under Title 11 of the Alaska Administrative Code for the mine site facility. The $22,135,567 financial responsibility amount does not apply to the financial responsibility for reclamation of the facility access road and power line in the amount of $4,518,865, which is administered by ADNR separate from the mine facility financial responsibility. A detailed breakdown of the financial responsibility cost estimate can be found in Appendix F of the 2003 Pogo Project Reclamation and Closure Plan. The permittee can apply to have the amount of the financial responsibility adjusted during the life of the permit, for example if concurrent reclamation has been completed. The Pogo mine site financial responsibility is based on the following:

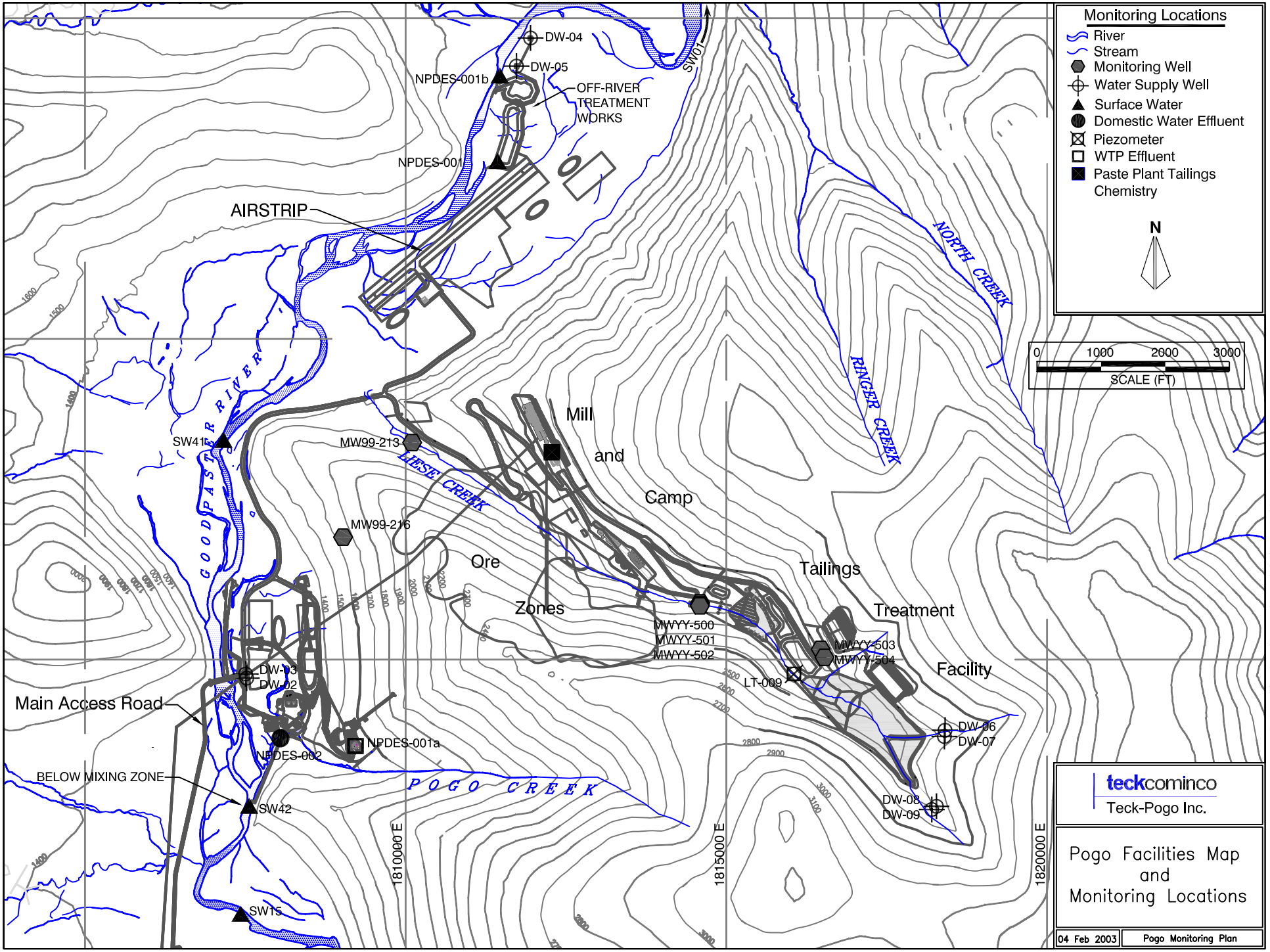
CLOSURE MAINTENANCE ITEM	FINANCIAL RESPONSIBILITY
Phase I: Post Construction	$ 483,935
Phase II: Reclamation Concurrent with Mining	$ 779,241
Phase III: Final Reclamation and Closure	$ 8,875,347
Phase IV: Post Closure Reclamation	$ 5,563,857
Phase V: Post Closure Monitoring	$ 1,195,000
Direct Cost Subtotal	**$ 16,897,380**
Contractor Profit and Overhead (10%)	$ 1,689,738
Contingency (10%)	$ 1,689,738
Contractor Mobilization/Demobilization (5%)	$ 844,869
Engineering Redesign (3%)	$ 506,921
Agency Administration Costs (3%)	$ 506,921
Indirect Cost Subtotal	**$ 5,238,187**
TOTAL	**$ 22,135,567** [1]

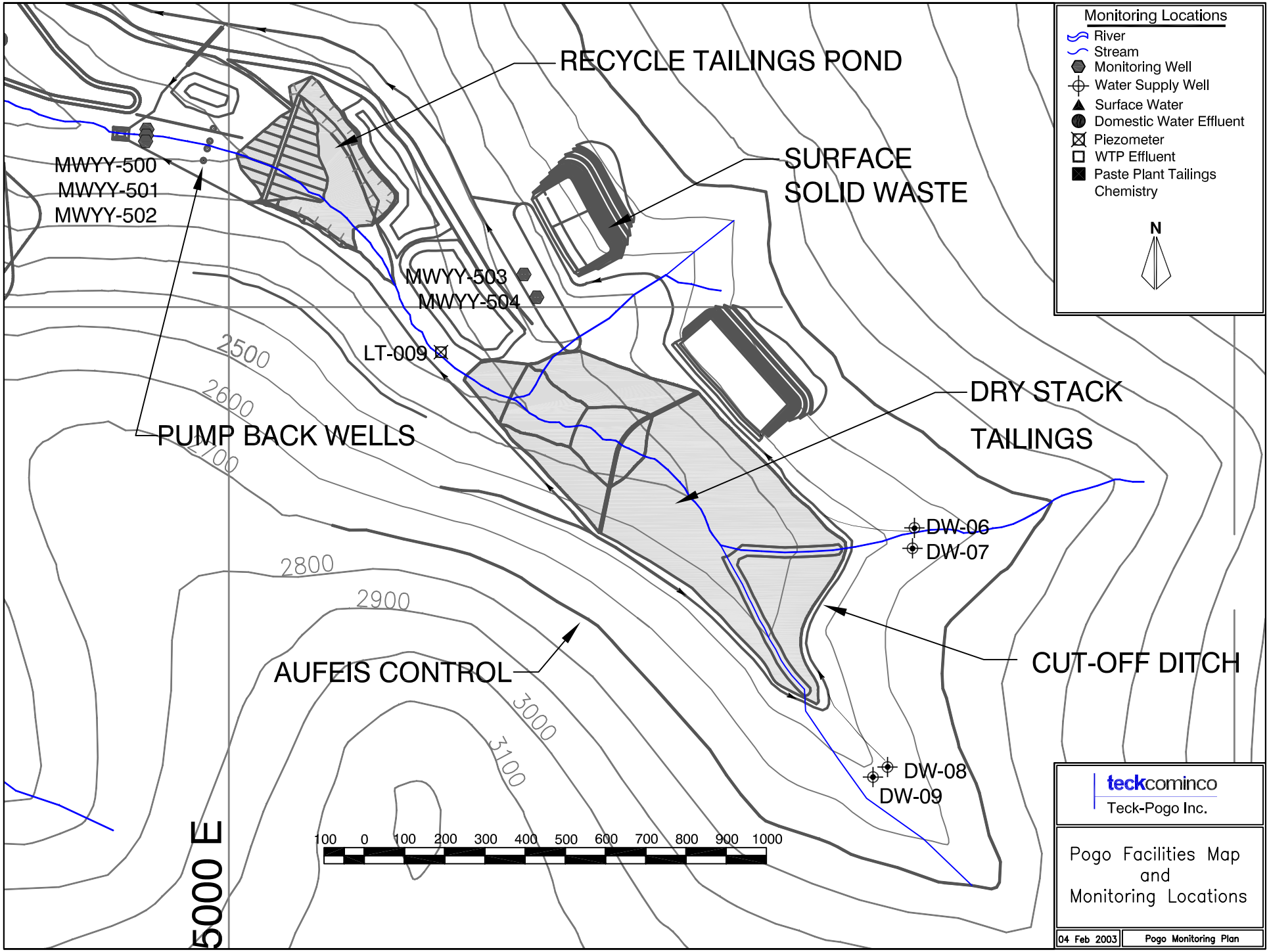
[1] The financial responsibility will be reevaluated and adjusted as allowed in section 1.10.2 or as requested by the permittee.

4 GLOSSARY OF TERMS

AAC	Alaska Administrative Code
ADNR	Alaska Department of Natural Resources
C.F.R.	Code of Federal Regulations
CIP	Carbon-in-Pulp
ORTW	Off River Treatment Works
QAPP	Quality Assurance Project Plan
RTP	Recycle Tailings Pond
SPCC	Spill Prevention Control and Countermeasure
WAD CN	Weak Acid Dissociable Cyanide
WQS	Alaska Water Quality Standards (18 AAC 70)

5 FACILITY MAPS


Monitoring Locations
River
Stream
Monitoring Well
Water Supply Well
Surface Water
Domestic Water Effluent
Piezometer
WTP Effluent
Paste Plant Tailings Chemistry
N
0
1000
2000
3000
SCALE (FT)
DW-04
DW-05
NPDES-001b
OFF-RIVER TREATMENT WORKS
NPDES-001
SW01
AIRSTRIP
NORTH CREEK
RINGER CREEK
GOODPASTER RIVER
SW41
MW99-213
LIESE CREEK
Mill
and
Camp
MW99-216
Ore
Zones
Tailings
Treatment
Facility
MWYY-500
MWYY-501
MWYY-502
MWYY-503
MWYY-504
LT-009
DW-06
DW-07
DW-08
DW-09
DW-03
DW-02
Main Access Road
NPDES-002
NPDES-001a
BELOW MIXING ZONE
SW42
POGO CREEK
SW15
1810000 E
1815000 E
1820000 E
teckcominco
Teck-Pogo Inc.
Pogo Facilities Map
and
Monitoring Locations
04 Feb 2003
Pogo Monitoring Plan
File Name: \\Quartz\shared\Documents\Drawings\ACAD\Working Drafts\Proposed\MonitoringLocations.dwg
Last update: 2/4/03 10:30 am


RECYCLE TAILINGS POND
SURFACE SOLID WASTE
MWYY-500
MWYY-501
MWYY-502
MWYY-503
MWYY-504
LT-009
PUMP BACK WELLS
DRY STACK TAILINGS
DW-06
DW-07
AUFEIS CONTROL
CUT-OFF DITCH
DW-08
DW-09
2500
2600
2700
2800
2900
3000
3100
5000 E
100 0 100 200 300 400 500 600 700 800 900 1000
Monitoring Locations
River
Stream
Monitoring Well
Water Supply Well
Surface Water
Domestic Water Effluent
Piezometer
WTP Effluent
Paste Plant Tailings Chemistry
N
teckcominco
Teck-Pogo Inc.
Pogo Facilities Map and Monitoring Locations
04 Feb 2003
Pogo Monitoring Plan
File Name: \\Quartz\shared\Documents\Drawings\ACAD\Working Drafts\Proposed\MonitoringLocations.dwg
Last update: 2/4/03 10:30 am

ADEC Response to Comments on the Waste Management Permit issued to the Pogo Mine (ADEC Permit #0131-BA002)

December 18, 2003

The ADEC received substantive comments on the draft Waste Management Permit (0131-BA002) from the following parties:

- Teck-Pogo Inc. (the applicant) in a letter dated 5/13/03,
- The Northern Alaska Environmental Center (NAEC) in a letter dated 5/13/03,
- The Center for Science in Public Participation (CSP^2) in a letter dated 5/13/03, and
- The Native Village of Tanacross, Tanacross Village Council (Tanacross) in a letter dated 4/30/03.

Additionally, the ADEC received 11 comments from parties stating that they support the issuance of the draft Waste Management Permit 0131-BA002.

Comment: Teck-Pogo
Sections 1.1.1, 1.1.2, 1.2.1
Drawing 3 of the Monitoring Plan shows the Non-Mineralized Stockpile just upstream of the Recycle Tailings Pond. Section 7.4 of the November 2002 Plan of Operations Supplement indicates that this stockpile will store up to 335,000 tons of non-mineralized development rock. The language of Section 1.1.1, 1.1.2 and 1.2.1 should be modified so as to clarify that this non-mineralized stockpile is covered by the permit.

Response:
Language has been added to the sections of the final permit listed above to clarify that the non-mineralized stockpile is covered under ADEC Permit #0131-BA002.

Comment: Teck-Pogo
Section 1.7.2
This provision should be deleted, as 18 AAC 60.815 applies only to points of compliance, not to the surface water monitoring locations included in the monitoring plan.

Response:
Section 1.7.2 of the draft permit has been deleted from the final permit.

Comment: NAEC
Monitoring Plan
The monitoring plan should clearly differentiate between waste rock that is left underground (and thus does not need to be segregated) and waste rock brought to the surface – which shall either be tested and segregated, or if untested, shall be classified as mineralized and deposited in the dry-stack facility. The classification procedure for

mineralized/nonmineralized should be clearly outlined in the monitoring plan, rather than referenced.

Response: The development rock segregation and tracking procedures have been added Appendix A of the Pogo Project Solid Waste Monitoring Plan. As stated in section 1.2.1 of the final permit, mineralized development rock is expected to be placed underground to the maximum extent practicable over the life of the project.

Comment: NAEC
Section 1.2.7
Limitation 1.2.7 should be modified such that the surface storage of waste rock prior to treatment/disposal is constrained to specific sites identified in the permit and plan of operations. There should also be a time limitation established on how long waste rock may remain in a temporary storage site prior to segregation and disposal.

Response: Section 1.2.7 of the final permit has been updated to stipulate that the permittee may only temporarily store mineralized development rock within the catchment area of the RTP and shall place the temporarily stored mineralized development rock in the drystack as soon as practicable.

Comment: NAEC
Section 1.2.1
Restore the mineralized cut-off level for arsenic to 200 mg/kg rather than the proposed 600 mg/kg. There is no supporting test data provided in the plan of operations, the proposed Solid Waste Disposal Permit or the proposed monitoring plan that supports the elevation of the arsenic cut-off level. The justification for this elevation contained in Teck's Plan of Operations, February 2002 (and removed from the updated Plan of Operations, November 2002) is that this change is "based on the low arsenic values observed in seepage from the development rock stockpiles to date as well as updated test results…" (page 2-7, February 2002). Since this reference is deleted in the latest revision of the Plan of Operations, and no supporting data are provided to justify the decision, at a minimum, 200 mg/kg should remain the cut-off level, and the sulfur percentage and the arsenic concentration should both be stipulated in the limitations.

Response: The cutoff criteria for mineralized/non-mineralized development rock has been set at either greater than 0.5% sulfur content or greater than 600 mg/kg As content. The cutoff criteria were chosen based on water quality of the seepage from the exploration waste rock piles, acid-base accounting and kinetic test results. In five years (1999-2003) of water quality monitoring of the seepage from the mineralized development rock pile (average As content of 592 mg/kg As) the highest dissolved As concentration that occurred was 17 µg/L (highest total concentration observed was 18.5 µg/L). The current Alaska Water Quality Standard for Arsenic is 50 µg/L. NP/AP data for development rock indicated that samples with a sulfer content less than 0.5% had a low potential to generate acid (SRK, 6/3/2002). The amount of development rock that falls between 200 mg/kg As and 600 mg/kg As, about 4% of the development rock encountered in the exploration phase, was also considered in the cutoff criteria decision.

The fact that the majority of the non-mineralized development rock to be used in construction will be placed within the catchment area of the RTP was also considered in the cutoff criteria decision. The mineralized vs. non-mineralized cutoff criteria has been added to the final permit in section 1.2.1.

The segregation and tracking procedures for development rock have been added to the Pogo Project Solid Waste Monitoring Plan as Appendix A. Section 1.5.1.6 has been added to the final permit requiring that the QA/QC procedures for the classification and segregation of the development rock are contained in the QAPP. The mineralized/non-mineralized classification and segregation data will be reported in the quarterly reports submitted to the department for review.

Comment: NAEC
Monitoring Plan
[T]here are no stipulations in the Solid Waste Disposal Permit or in the proposed monitoring plan for testing and monitoring for acid generation potential in the waste rock brought to the surface.

Response: Quarterly ABA and metals monitoring (similar to tailings monitoring) of the development rock placed in drystack has been added to the Pogo Project Solid Waste Monitoring Plan in Tables 4.4-4 and 4.4-5.

Comment: CSP^2
Section 1.9.3
More detailed description of revegetation requirements is recommended. The permit should also specify what next step(s) will take place if the revegetation standard is not met. The vegetation standard should remain a part of the permit, and should be changed only according to the standard permit modification procedures.

Response: The revegetation requirements are not contained directly in the final waste management permit. Instead the requirements are contained in section 3.5 of the October 2003 Reclamation and Closure Plan for the facility and are referenced in the final permit section 1.9.3.2. By reference the revegetation requirements become an enforceable requirement under the authority of the ADEC waste management permit. The ADNR is the land manager which has the authority to require a Reclamation and Closure Plan for the facility. The ADEC has, and will continue to work with the ADNR on the approval of any Reclamation and Closure Plan for the facility to ensure that the facility is left in a stable condition appropriate for the post mining land use.

Comment: CSP^2
Section 3
CSP^2 has calculated several estimates of the Pogo reclamation bond based on several scenarios, described below. At a minimum, we believe that the reclamation bond should be increased to $27,786,454 (Scenario 1), and possibly to $34,491,185 (Scenario 2). In order to choose a "recommended" scenario, we need additional information/detail on some of the reclamation details. Scenario 3 and Scenario 4 are provided to estimate what

the State's financial liability should water treatment be required for longer than the 10 year term assumed in the reclamation plan – a term that can probably be described as an estimate.

Response: The financial responsibility amount for the closure and post-closure monitoring at the facility was adjusted to $22,135,567 in the final permit. The financial responsibility amount in the draft permit was $21,651,000. The direct costs in the financial responsibility were decreased from the draft permit to the final permit due to Teck-Pogo overestimating the post-closure monitoring costs. The total indirect costs were increased from $3,608,000 (20% of direct costs) in the draft permit to $5,238,187 (31% of direct costs) in the final permit. The ADEC believes that $22,135,567 is an adequate amount for the closure and post-closure monitoring for the Pogo facility based on current information. As stipulated in section 1.11.2.7 and 1.11.3.4 of the final permit, the adequacy of the financial responsibility amount will be reviewed by a 3rd party auditor as part of the environmental audit on a schedule of once every five years. Additionally, sections 1.6.1 and 1.10.2 of the final permit require review of the adequacy of the financial responsibility amount by the permittee in the annual report submitted to ADEC.

Comment: Tanacross
Monitoring Plan
Teck Monitoring Plan – Table 4.2.1 – Explain exactly when the Facility Safety Inspection will be conducted. The table says annually with a footnote of "during years when Facility Safety Review is carried out". Which is every three years starting at year three?

Response: The language in Table 4.2.1 of the Pogo Project Solid Waste Monitoring Plan has been changed to clarify the inspection schedule.

Comment: Tanacross
Monitoring Plan
RTP Dam will be visually inspected at least once per week. There should be a stipulation of more inspections during heavy rainfall.

Response: The Department believes that visual monitoring of the RTP dam of at least once per week allows the permittee to adequately monitor the condition of the RTP dam. Additional monitoring requirements may be contained in the RTP dam Operations and Maintenance Manual which is required to be developed for the Certificate to Operate a Dam under the authority of ADNR, Dam Safety Division.

Comment: Tanacross
Monitoring Plan
Table 4.6.6. No mention of Thallium in the parameters. Is Thallium a concern?

Response: Based on generally undectable levels of Thallium in baseline surface and groundwater monitoring at the site and the low potential for release, Thallium is not a

parameter of concern for release from the Pogo facility. Levels of Thallium found in the surface water sediments were also not in a range that would indicate potential to release Thallium in quantities that could cause water levels to increase above the water quality standard.

Teck-Pogo Inc.
3520 International Street, Fairbanks, Alaska 99701 ■ telephone: 907 455.8325 ■ facsimile: 907 455.8326

Pogo Project

Chapter 4: Solid Waste Monitoring Plan

This chapter describes monitoring plans that meet the requirements of solid waste regulations 18 AAC 60.800 - 860 and includes monitoring of the drystack tailings facility and recycle tailings pond (RTP), the surface solid waste facility, and associated facilities. The solid waste monitoring plan includes the following components:

- Visual monitoring program;
- Geotechnical monitoring plan;
- Geochemical monitoring plan, including rock segregation;
- Surface water monitoring plan;
- Groundwater monitoring plan;

4.1. Permit Management

The stewardship of the solid waste permit will fall under the mine Environmental Manager (EM). The EM will have direct reporting responsibilities to Teck's corporate environmental manager.

Permit compliance with sampling and reporting activities will be tracked through the in-house permit database manager. Water quality data will be managed using EQWin™, an environmental data management software system.

Copies of all inspection and sampling logs will be filed in the Pogo project files for a minimum of five years.

4.2. Visual Monitoring Plan

The visual monitoring program will include daily, weekly and annual facility inspections of the project facilities comprising the solid waste management system. These facilities are described in the solid waste application and shown schematically in plan on **Drawing 2** and **Drawing 3**.

4.2.1. Drystack

The physical characteristics of the dry stack will be most effectively monitored/evaluated by regular visual inspections by operating personnel and periodic inspections by a qualified engineer. **Table 4.2-1** presents the details of the visual inspection plan for the drystack.

Table 4.2-1. Visual Monitoring of Drystack Physical Condition

Item	Personnel	Scope	Frequency	Deliverable
Daily Inspections*	Operational personnel	Visual assessment	Daily*	Daily Log
Facility Safety Inspection (FSI)	Qualified engineer	Thorough visual assessment and review of all placement records	Annually	Will be comparable to Dam Safety Inspection format.
Facility Safety Review (FSR)	Qualified engineer	Per FSI plus review of design basis and compliance of as-built with closure plan. Risk assessment.	Every Three Years (starting at Year Three)	Will be comparable to Dam Safety Review

* Daily inspections completed on all days when mechanical equipment is operating on drystack.

For the daily inspections, operations personnel will be instructed to look for unusual cracks, bulging, signs of settlement, seepage and erosion on the drystack as part of their regular daily routine. An operations manual will include the various items to be included in the routine visual inspections. A qualified engineer will conduct formal annual visual inspections of all the waste management facilities, including the drystack, using a checklist form appropriately adapted from the *Visual Inspection Checklist,* from the Alaska Dam Safety Program, ADNR Division of Land and Water Management. The inspection will include a review of all compaction and instrumentation data. Every three years, a qualified engineer will conduct a formal inspection and submit a report to the owner and the appropriate agencies.

4.2.2. RTP Dam

An operations individual will view the dam at least once per week and maintain a record of observations. The visual observations will include looking for unusual cracks, bulging, settling, seepage and erosion on the RTP dam. A complete checklist will be developed as part of the operating plan. As discussed in **Section 4.2.1**, a qualified engineer will conduct formal annual visual inspections of all the waste management facilities, including the RTP dam. Once every three years, as stipulated by the regulations, a formal dam safety review (DSR) will be completed and the result shared with the State Dam Safety official.

4.2.3. Surface Solid Waste facility

The visual monitoring program for the surface solid waste facility will involve having operations personnel make regular observations of the facility. These observations will include looking for unusual movements, seepage and any other signs of instabilities in the rock slopes that will confine the solid waste facility. As discussed in **Section 4.2.1**, a qualified engineer will conduct formal annual visual inspections of all the waste management facilities, including the solid waste facility together with the surrounding cut rock slopes.

4.2.4. Monitoring Wells

An operations individual will view the monitoring wells at least once per week for physical damage and maintain a record of observations.

4.2.5. Wildlife

The Environmental Manager (EM) or designate will monitor wildlife interaction with the surface waste disposal facilities in order to evaluate impacts that operations may have on wildlife. Records of wildlife interactions observed during the visual site inspections will be recorded. The drystack operating personnel will be trained to record observations of wildlife interaction with the drystack, the surface solid waste facility, and the RTP reservoir. Any wildlife mortalities that are observed will be recorded in a log maintained at the project site and the EM or designate will contact the Alaska Department of Fish & Game (ADF&G) to report wildlife mortalities.

4.3. Geotechnical Monitoring Plan

4.3.1. Drystack

The drystack facility has been designed using soil strength parameters determined based on site investigation and laboratory testing. The drystack has also been designed with a robust geometry that has inherent geotechnical stability. Formal placement and compaction is not required for structural integrity, although such measures will enhance erosion resistance, construction trafficability and closure works. The soil strength assumptions will be monitored to either confirm that the assumed conditions/parameters are indeed present or to suggest a re-evaluation using revised parameters. Achieving the assumed design parameters are not essential to ensure that overall geotechnical stability of the facility assured. However, as noted, the overall performance of the drystack includes issues other than geotechnical stability and evaluating actual strength parameters will be important to overall drystack stewardship. The following sections address the construction requirements and the proposed geotechnical monitoring program for the drystack.

4.3.1.1. Confirmation of Design Parameters

The soil parameters from production tailings samples will be tested to compare with the samples used for design. Testing will be carried out initially during the commissioning period for the mill and then periodically throughout the project as shown in **Table 4.3-1**.

Table 4.3-1. Monitoring of Physical Parameters of Tailings Material

Test Description	ASTM Method	Sampling Method	Frequency	Test Criteria and Design Basis
Grain size distribution	D-422	grab	Bi-weekly for 8 weeks, then quarterly	% passing the 200 Mesh (74 mm) – 90%
Atterberg limits	D-4318	grab	Bi-weekly for 8 weeks, then quarterly	Plasticity index (PI) <10%
Standard Proctor	D-698	grab	Bi-weekly for 8 weeks	Optimum moisture and allowable moisture range to meet density requirements (see Table 3.2)
Isotropically-consolidated undrained triaxial test	D-4767	grab	Once at week 4*	Shear strength parameters – $c'=0$, $\phi'=38°$
Triaxial saturated hydraulic conductivity	D-5084-90	grab	Once at week 4*	Saturated hydraulic conductivity – 10^{-8} –10^{-9} m/s
Moisture-retention tests (Tempe Cell Test)	D-2325-68	grab	Once at week 4*	Moisture retention curve – characteristic curve (not a single point)

* The parameters will be evaluated following the initial testing and compared with the baseline laboratory samples on pilot plant samples. Further testwork will not be required unless directed by a qualified engineer based upon a material change in either the tailings gradation or mineralogy.

4.3.1.2. Evaluation of Drystack Tailings Placement

4.3.1.2.1. General

There are two tailings placement areas within the tailings drystack facility, the shell zone and the general placement area. The shell zone will be constructed solely in “summer” conditions and will be built entirely with tailings. The general placement area will be constructed during the remainder of the year and will incorporate both tailings and development rock. Although meeting compaction criteria is not strictly required for drystack integrity, good stewardship practices require that compaction of the drystack shell be carried out. The geometry adopted has made an allowance for a general

placement area with very little structural integrity and therefore compaction would not be required in the general placement zone. However, in practice, similar compaction methodology would be applied to the general placement area to improve trafficability.

4.3.1.2.2. Compaction Objectives

Although there is not a definitive value required, feasibility work based upon experience and laboratory testwork has identified a nominal 95% Standard Proctor objective for the shell area, as being a reasonable average target.

The compaction target of 95% of the tailing's Standard Proctor Maximum Dry Density would be assessed in accordance with ASTM D-698. A trial compaction program will be carried out under the direction of a qualified engineer when tailings are first placed in the shell area. The purpose of the program would be to determine the most efficient means of compacting the tailings (number of passes, lift thickness, vibration benefits, etc.) to the design intent for the drystack. In other words, based upon experience, the aim is to establish a method specification versus a strict performance specification. Until the trial compaction program is carried out, it is recommended that tailings be placed in maximum 12-inch loose lifts and compacted with approximately eight passes of a 10-ton smooth drum roller is the planning basis. The merit of static versus vibratory compaction would be evaluated during the trial compaction and during ongoing operations. While intended primarily for the drystack shell, the adopted method specification would also be carried out in the general placement area. Based upon the results of the trial compaction program, the target Standard Proctor value may be modified.

During construction of the drystack shell, compaction assessment will be carried out on a regular basis. Compaction tests consisting of evaluating grab samples would be used to optimize the method specification. A known volume of in-situ placed material will be taken to the laboratory for moisture content evaluation. The moisture content will allow calibration to periodic Standard Proctor tests to indicate the degree of achieved compaction. The moisture contents would be obtained twice per week and the Proctor Tests carried out once every two weeks during summer placement in the shell.

In addition to the method specification and summer compaction assessment testing, periodic larger scale integrity testing of the drystack shell will be carried out. This testwork would be to confirm overall integrity for closure planning purposes and to assess the stress level effects on material density (e.g. the increase in tailings density due to self-weight consolidation). The most effective tool for carrying out this large scale testing is the piezometer cone penetration test. Piezocone penetration tests (CPTU) should be conducted every three years in the shell zone, starting at the end of the first year of summer operation.

Table 4.3-2 provides the monitoring program for tailings placement in the drystack.

Table 4.3-2. Monitoring of Tailings Placement Characteristics in Shell Area

Test Description	ASTM Method	Sample Method	Frequency	Target Range
Method Specification	N/A	Defined during placement tests and modified, as required, as project proceeds	Maintain daily operating logs	Follow specified placement plan
Moisture Content	D-2216	Grab	Twice a week during summer placement	Within 3% of optimum moisture content of 15.5%
Standard Proctor	D-698	Grab	Every second week during summer placement	95% of maximum dry density*
Piezocone penetration tests (CPTU)	D-3441	Per ASTM procedure. Push from drill rig.	Every three years after initial program at end of first year	To be defined during initial CPTU program. Generally, material to be above Relative Density of 60%
Air Temperature	N/A	Daily weather station readout	Daily	Average daily air temperature to be above 32°F for shell tailings placement.

· Target may be modified following trial placement during project start-up.

4.3.1.2.3. Development Rock Placement

Development rock will not be placed in the shell area. For the general placement area, development rock will be placed in the drystack under the following conditions:

- only after a minimum 10 feet of compacted tailings is placed over native ground
- not within 20 feet of the drystack margins
- minimum of two feet of compacted drystack tailings placed above each zone of rock placement
- minimum separation distance of 20 feet between each zone of rock placement
- rock placed as “road” material to improve trafficability will be considered as a zone of rock placement and will conform to the same criteria as other rock zones
- final tailings lift will ensure a minimum cover of five feet of compacted tailings over any development rock

4.3.2. RTP Dam

4.3.2.1. Construction Inspection

A qualified engineer will be onsite during dam construction to monitor the excavation, grout curtain construction, rockfill placement, liner construction and filter placement and inspect the foundation. Piezometers will be installed in the rockfill and the foundation to monitor pore pressures to confirm design assumptions.

4.3.2.2. Instrumentation

Proposed instrumentation monitoring requirements for the RTP dam consists of four settlement gauges and two inclinometers installed at the crest of the dam with piezometers in both the rockfill and foundation of the RTP dam.

The settlement gauges and inclinometers should be monitored quarterly for the first year of operation and annually thereafter. Piezometers in the foundation and rockfill downstream of the liner, number and location to be determined during detailed engineering but not to be fewer than three each, will be monitored twice a year.

A water level monitoring device will be installed to measure the reservoir water level during operations. This water level information will be used to manage RTP water use as a part of the overall water management plan.

4.4. Geochemical Monitoring Plan

4.4.1. Drystack

4.4.1.1. Tailings Geochemistry

The purpose of the geochemical monitoring program is to compare the geochemical nature of the tailings material to the test work and assumptions used for the drystack design.

Quarterly composites of monthly tailings samples collected from the process plant will be submitted for geochemical analysis. The solid samples will be analyzed for acid-base account using procedures generally recommended by Sobek et al (1978) see **Table 4.4-1**. The samples will also be analyzed for concentration of arsenic and selected metals (iron, copper, zinc and lead) see **Table 4.4-2**. Process water will be extracted from the tailings and analyzed for the parameters indicated in **Table 4.4-3**.

Table 4.4-1. Flotation Tailing Acid-Base Accounting

Parameter	Units	Method	Sample Type & Frequency	Target Range
Paste pH	pH units	Standard	Quarterly composite of Monthly samples	**N/A**
S	%	Sobek	Quarterly composite of Monthly samples	**N/A**
S-SO_4	%	Sobek	Quarterly composite of Monthly samples	**N/A**
NP/AP	Ratio	Sobek	Quarterly composite of Monthly samples	**1.4**
TIC	% CO_2	Sobek	Quarterly composite of Monthly samples	**N/A**

Notes:

- S - total sulfur, S-SO4 - sulfur as sulfate, TIC - total inorganic carbon, NP - Neutralization Potential, AP - Acid Potential.
- NP/AP target range developed from average flotation tailings test material characteristics shown in Table 8 of the SRK 3rd Kinetic Report.
- The Sobek method is the most commonly used ABA method - Sobek A. A., W. A. Schuller, J. R. Freeman and R. M. Smith, 1978, "Field and Laboratory Methods Applicable to Overburdens and Minesoils," prepared for U.S. Environmental Protection Agency, EPA-600/2-78-054, Cincinnati, Ohio.

Table 4.4-2. Flotation Tailings Whole Rock Chemistry

Parameter	Units	Method	Sample Type & Frequency
As	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Fe	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Cu	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Zn	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Pb	mg/kg	ICP-MS	Quarterly composite of Monthly samples

Table 4.4-3. Flotation Tailing Interstitial Water Chemistry

Parameter[4]	Units	Method	MRL[2,3]	Sample Type & Frequency	Target Range
TDS	mg/L	EPA 160.1	50	Quarterly grab	3000
Cl, total	mg/L	EPA 300.0	0.5	Quarterly grab	34
SO4, total	mg/L	EPA 300.0	0.3	Quarterly grab	2000
Ammonia as TKN	mg/L	EPA 357.3 or 351.2	0.5	Quarterly grab	17.8
NO3	mg/L	EPA 300.0	0.2	Quarterly grab	4
CN-free as WAD	ug/L	SM4500 – CN I or OIA 1677	9 or based on site-specific MDL[5]	Quarterly grab	NC
As	ug/L	EPA 200.8	2	Quarterly grab	5100
Cd	ug/L	EPA 200.8	0.25	Quarterly grab	5
Cr	ug/L	EPA 200.8	4	Quarterly grab	14
Cu	ug/L	EPA 200.8	1	Quarterly grab	34
Fe	ug/L	EPA 200.7 or 6020B	100	Quarterly grab	29600

Parameter[4]	Units	Method	MRL[2,3]	Sample Type & Frequency	Target Range
Pb	ug/L	EPA 200.8	0.4	Quarterly grab	5
Hg	ug/L	EPA 1631A	0.010	Quarterly grab	2
Mn	ug/L	EPA 200.8	5	Quarterly grab	4750
Ni	ug/L	EPA 200.8	3	Quarterly grab	240
Se	ug/L	EPA 200.8	2	Quarterly grab	130
Ag	ug/L	EPA 200.8	1	Quarterly grab	2
Zn	ug/L	EPA 200.8	2	Quarterly grab	700

Notes:

- [2] Method Reporting Limit (MRL). The concentration at which confidence in the reported value requires no qualifying remarks. The MRL should be 3-5 times the MDL. A standard is run at the MRL to verify acceptable data quality. The MRL may be affected by sample size, sample dilution, and matrix interference.
- [3] MRL from discussion with laboratory.
- [4] Dissolved unless indicated.
- [5] Method chosen will be that shown to produce the most consistent and reproducible results based on testing of actual effluent, with the MRL for OIA 1677 established at 3.18 times the site-specific MDL.
- Target Range values are for Reasonable Worst Case for DRY STACK SEEPAGE as presented in Table 4.3-4 of the PDEIS. The PDEIS uses a CN-T value of 50 ug/L.
- NC – not calculated
- Note: sample results between the MDL and the MRL will be qualified and results below the MDL will be reported as <MDL

The tailings geochemical results will be used to detect trends in tailings composition and for comparison with tailings composition and water quality predictions made prior to mining. Further investigations to determine an appropriate plan of action will be instituted with the agencies in the event that water chemistry exceeds the RWC concentrations predicted in the Water Management Plan for four consecutive sampling rounds.

Tables 4.4-4 and 4.4-5 present quarterly ABA and metals monitoring of development rock placed in the drystack. During quarters where no development rock is placed in drystack, ABA and metals monitoring will not be required for development rock.

Table 4.4-4. ABA Monitoring of Rock Placed in Drystack

Parameter	Units	Method	Sample Type & Frequency	Target Range
Paste pH	pH units	Standard	Quarterly composite of Monthly samples	**N/A**
S	%	Sobek	Quarterly composite of Monthly samples	**N/A**
S-SO_4	%	Sobek	Quarterly composite of Monthly samples	**N/A**
NP/AP	Ratio	Sobek	Quarterly composite of Monthly samples	**N/A**
TIC	% CO_2	Sobek	Quarterly composite of Monthly samples	**N/A**

Table 4.4-5. Metals Monitoring of Rock Placed in Drystack

Parameter	Units	Method	Sample Type & Frequency
As	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Fe	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Cu	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Zn	mg/kg	ICP-MS	Quarterly composite of Monthly samples
Pb	mg/kg	ICP-MS	Quarterly composite of Monthly samples

4.4.2. Development Rock Segregation & Storage

4.4.2.1. General

During development and operations, all rock from underground will be handled as "mineralized" unless otherwise analyzed and segregated on a round-by-round basis.

Development rock will be mined, brought to surface, segregated by individual blasted rounds, and held for assay. When the assays are complete, the material will be classified as "mineralized" (>0.5% sulfur or 600 mg/kg arsenic) or "non-mineralized" (<0.5% sulfur and 600 mg/kg arsenic), based on the classification procedure previously submitted to ADEC and presented in **Appendix A. Development Rock Segregation and Tracking Procedures (Oct 15, 2003)**.

4.4.3. Cyanide Destruction in Paste Backfill

4.4.3.1. General

Prior to disposal as part of the paste backfill tailings, the CIP tailings shall be subjected to cyanide destruction using the SO_2 /air process or other suitable cyanide destruction process approved by ADEC. At least 90% of the samples shall contain less than 10mg/kg of WAD cyanide and none of the samples shall contain more than 20 mg/kg of WAD cyanide as determined in the whole rock chemistry by SM4500 – CN I. Monthly samples shall be taken for the first year of discharge and quarterly samples thereafter, if objectives are met.

4.5. Surface Water Monitoring Plan

The surface water quality monitoring program is designed to detect potential impacts to the surface water quality in the Goodpaster River (**Drawing 2**). Two existing surface water quality monitoring stations and one new station will be used to monitor surface water quality **(Table 4.5-1**)

Table 4.5-1. Goodpaster River Surface Water Sampling Station Locations

Station ID	Location	Rationale
SW01	Above the project site, between Stingray and Otter Creeks	Detect impacts from others above the project site
SW15	Below the project site	Detect impact to Goodpaster from the entire project
SW41	Below the ridge line that divides Liese Creek and Pogo Creek	Detect impact from Liese Creek WMA

4.5.1. Sampling Schedule

The following tables present the proposed sampling schedule for surface water monitoring for the background data collection period, the operating phase, and the period following the cessation of mining activity during the period of care and maintenance as the project prepares to complete closure works (**Table 4.5-2**, **Table 4.5-3**, and **Table 4.5-4**).

Operations

Table 4.5-2. Surface Water Sampling Schedule

Sample Class	Sample Location	Frequency	Sample Type	Analyses
Surface Water	SW01	4 summer, 2 winter	Grab	see **Table 4.6-6** for sample suite
	SW15			
	SW41			

Closure

Table 4.5-3. Surface Water Sampling Schedule

Sample Class	Sample Location	Frequency	Sample Type	Analyses
Surface Water	SW01	Twice annually (high and low flow)	Grab	see **Table 4.6-6** for sample suite
	SW15			
	SW41			

Post-Closure

Table 4.5-4. Surface Water Sampling Schedule

Sample Class	Sample Location	Frequency	Sample Type	Analyses
Surface Water	SW01	Twice annually (high and low flow)	Grab	see **Table 4.6-6** for sample suite
	SW15			
	SW41			

4.6. Groundwater Monitoring Plan

Groundwater flow is towards the mine from all directions during the exploration and mining operation, and for approximately 10 years thereafter. In later times, the generally northwest groundwater flow direction is gradually re-established (Adrian Brown, 2000).

Therefore, the groundwater monitoring program is designed to detect potential impacts downstream of the seepage return system and the cone of depression around the mine. A summary of proposed monitoring well locations is presented in **Table 4.6-1**.

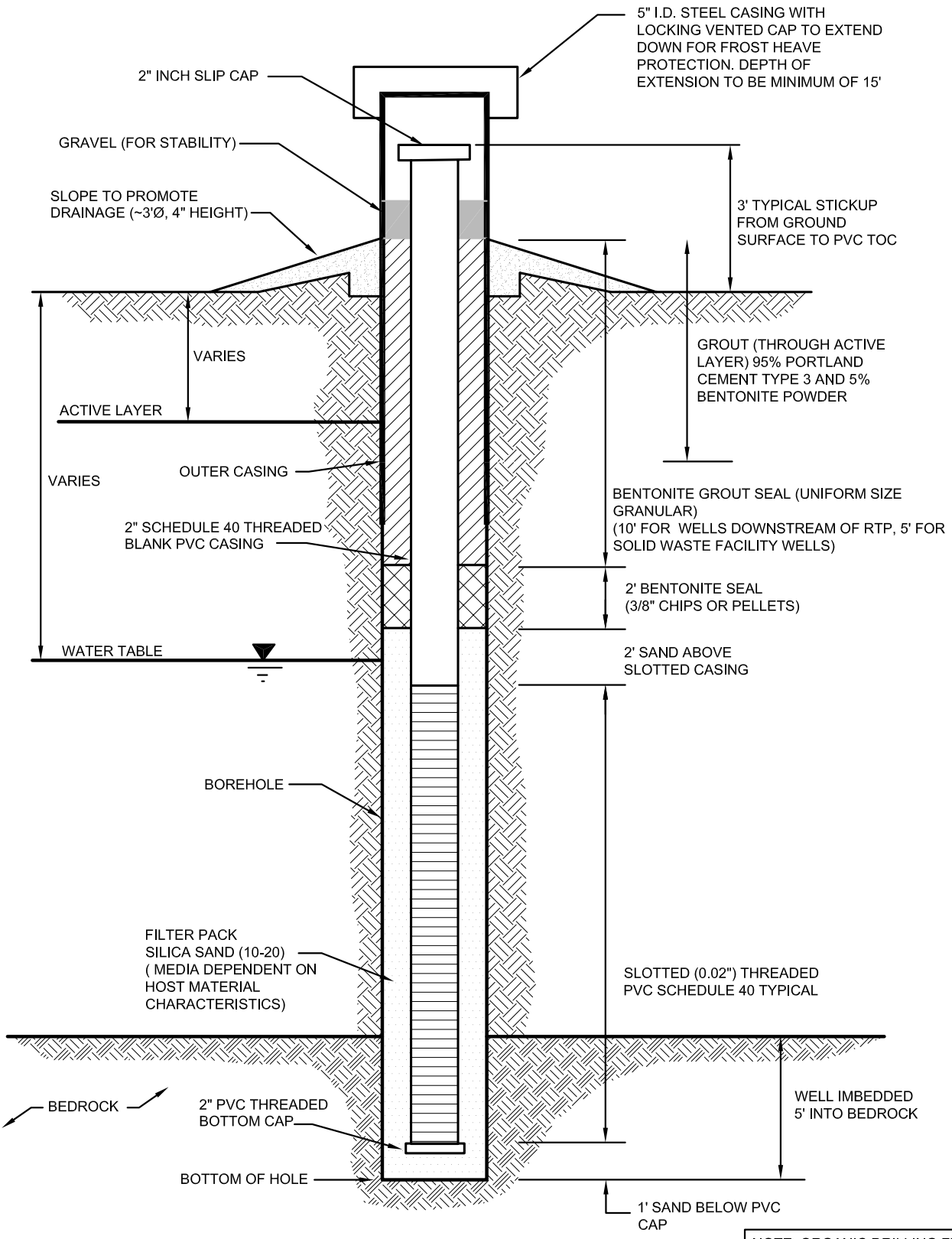
Table 4.6-1. Groundwater Sampling Station Locations

Station ID	Location	Rationale
MW99-213	Down gradient of ore body	To monitor water quality downgradient of the ore zones
MW99-216	County rock downgradient of ore body	To monitor water quality downgradient of the ore zones
MW03-500	Below RTP seepage collection wells	To monitor efficiency of RTP seepage collection wells
MW03-501	Below RTP seepage collection wells	
MW03-502	Below RTP seepage collection wells	
MW03-503	Down gradient of surface solid waste facility	To monitor water quality downgradient of the surface solid waste facility
MW03-504	Down gradient of surface solid waste facility	
LT-009	Below drystack along Liese Creek	To measure static groundwater level

Monitoring well design and installation details are provided by AGRA (2000) and AMEC (2001). **Table 4.6-2** summarizes the existing well installation data. The well diameter for all wells is ¾ inch I.D. **Figure 1** provides a schematic of the monitoring well construction methods to be used for the proposed monitoring wells.

Table 4.6-2. Well Installation Summary (AMEC, 2000)

Station ID	Installation Date	Total Depth Drilled (ft)	Screened Interval (ft)	Sand Packed Interval (ft)	Comments
MW99-213	6/19/1999	500	450-500	445-500	bedrock
MW99-216	6/19/1999	500	450-500	445-500	country rock
LT-009	8/14/2000	34.5	17.33-27.33	15.5-29	alluvium



AMEC Earth & Environmental Limited
2227 Douglas Road
Burnaby, B.C.
V5C 5A9
Tel. 294-3811
Fax. 294-4664

DWN BY:	CHK'D BY:	APP.	DATE:
SM	AC	MPD	JAN. 2003
PROJECT NO:	REV. NO.:	SCALE:	FIGURE No.
VM00172-VII-2	-	AS SHOWN	FIGURE 1

CLIENT: teckcominco

PROJECT: POGO SOLID WASTE MANAGEMENT

TITLE: TYPICAL MONITORING WELL CONSTRUCTION

4.6.1. RTP Dam

4.6.1.1. Monitoring Wells

A set of three seepage monitoring wells will be located approximately 450 feet downstream of the RTP dam toe (**Drawing 3**). These wells are designed to detect any potential bypass seepage from the RTP and the collection/return system. These wells will allow collection of water samples for testing and comparison with baseline conditions. The frequency and nature of water testing is described in **Table** 4.6-3**, Table 4.6-4**, and **Table 4.6-5.**

4.6.2. Surface Solid Waste Facility

4.6.2.1. Geochemical and Seepage Monitoring

4.6.2.1.1. Monitoring Wells

Two monitoring wells have been proposed downslope of the surface solid waste facility to collect and monitor the groundwater downstream of the facility (**Drawing 3**). The water levels will be measured twice per year and samples obtained for water quality testing.

4.6.3. Sampling Schedule

The following tables present the proposed sampling schedule for ground water monitoring for the background data collection period, the operating phase, and the period following the cessation of mining activity during the period of care and maintenance as the project prepares to complete closure works (**Table** 4.6-3, **Table 4.6-4**, and **Table 4.6-5**).

Operations

Table 4.6-3. Groundwater Sampling Schedule

Sample Class	Sample Location	Frequency	Sample Type	Analyses
Monitoring Wells	MW99-213	Semi-annually	Grab	see **Table 4.6-6** for sample suite
	MW99-216	Semi-annually		
	MW03-500	Quarterly		
	MW03-501	Quarterly		
	MW03-502	Quarterly		
	MW03-503	Semi-annually		
	MW03-504	Semi-annually		
Piezometer	LT-009	Quarterly	Measurement	static groundwater level

Closure

Table 4.6-4. Groundwater Sampling Schedule

Sample Class	Sample Location	Frequency	Sample Type	Analyses
Monitoring Wells	MW99-213	Annually	Grab	see **Table 4.6-6** for sample suite
	MW99-216			
	MW03-500			
	MW03-501			
	MW03-502			
	MW03-503			
	MW03-504			

Post-Closure

Table 4.6-5. Groundwater Sampling Schedule

Sample Class	Sample Location	Frequency	Sample Type	Analyses
Monitoring Wells	MW99-213	Annually	Grab	see **Table 4.6-6** for sample suite
	MW99-216			
	MW03-500			
	MW03-501			
	MW03-502			
	MW03-503			
	MW03-504			

4.6.4. Target Analytes and Analytical Methods

A list of proposed target analytes was developed as part of the Water Management Plan (Teck, 2002). This list was based on extensive geochemical modeling and consideration of the following:

Types, amounts, and concentrations of constituents in the water treatment plant effluent Analytes and their respective methods are presented below in **Table 4.6-6**. The selected methods are intended to provide the lowest accurate level of detection. EPA method 200.8, Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), has been selected to analyze metals. It is a fast, reliable, multi-element technique with extremely low detection limits and the technique suffers from few interferences. However, ICP-MS will not tolerate samples with high dissolved solids; therefore, analysis of environmental samples by ICP-MS is selective.

EPA Method 1631A, Cold Vapor Atomic Fluorescence Spectometry will be used to analyze mercury..

Table 4.6-6. Selected Groundwater and Surface Water Methods with Corresponding Limits

Water Quality Parameter[4]	Units	Method	MRL[2, 3]
Ammonia, as TKN	mg/L	EPA 357.3 or 351.2	0.5
Arsenic	ug/L	EPA 200.8	2
Cadmium	ug/L	EPA 200.8	0.25
Chloride, Total	mg/L	EPA 300.0	0.5
Chromium	ug/L	EPA 200.8	4
Copper	ug/L	EPA 200.8	1
Cyanide, free as WAD	ug/L	SM 4500-CN I or OIA 1677	9 or based on site-specific MDL[5]
Iron	ug/L	EPA 200.7 or 6010B	100
Lead	ug/L	EPA 200.8	0.4
Manganese	ug/L	EPA 200.8	5
Mercury	ug/L	EPA 1631A	0.010
Nickel	ug/L	EPA 200.8	3
Nitrate (NO_3)	mg/L	EPA 300.0	0.2
pH	s.u.	In Field	
Selenium	ug/L	EPA 200.8	2
Silver	ug/L	EPA 200.8	1
Sulfate, Total	mg/L	EPA 300.0	0.3
Total Dissolved Solids	mg/L	EPA 160.1	50
Zinc	ug/L	EPA 200.8	2

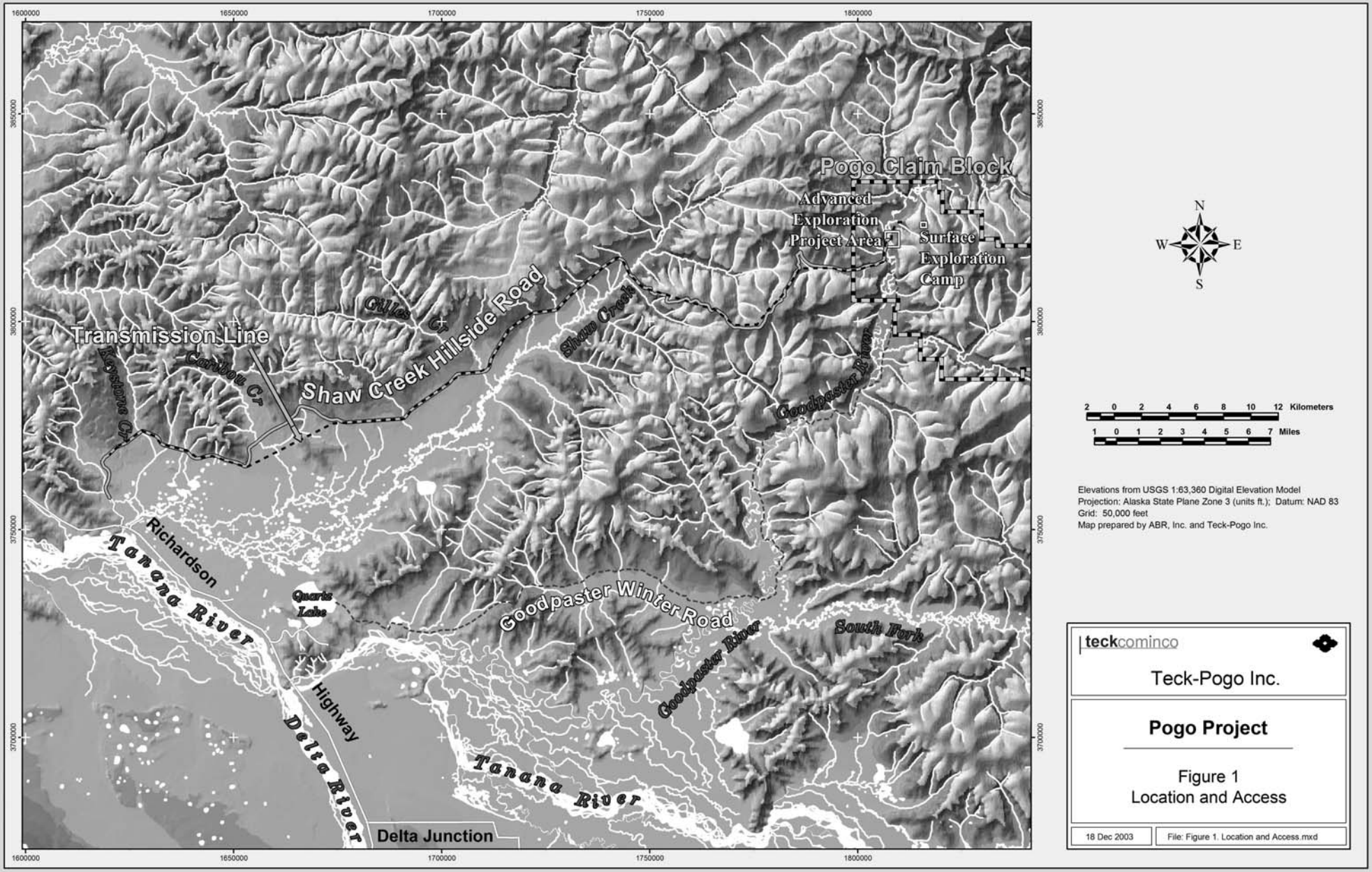
[2] Method Reporting Limit (MRL). The concentration at which confidence in the reported value requires no qualifying remarks. The MRL should be 3-5 times the MDL. A standard is run at the MRL to verify acceptable data quality. The MRL may be affected by sample size, sample dilution, and matrix interference.

[3] MRL from discussion with laboratory.

[4] Dissolved unless indicated.

[5] Method chosen will be that shown to produce the most consistent and reproducible results based on testing of actual effluent, with the MRL for OIA 1677 established at 3.18 times the site-specific MDL.

Note: sample results between the MDL and the MRL will be qualified and results below the MDL will be reported as <MDL



Elevations from USGS 1:63,360 Digital Elevation Model
Projection: Alaska State Plane Zone 3 (units ft.); Datum: NAD 83
Grid: 50,000 feet
Map prepared by ABR, Inc. and Teck-Pogo Inc.

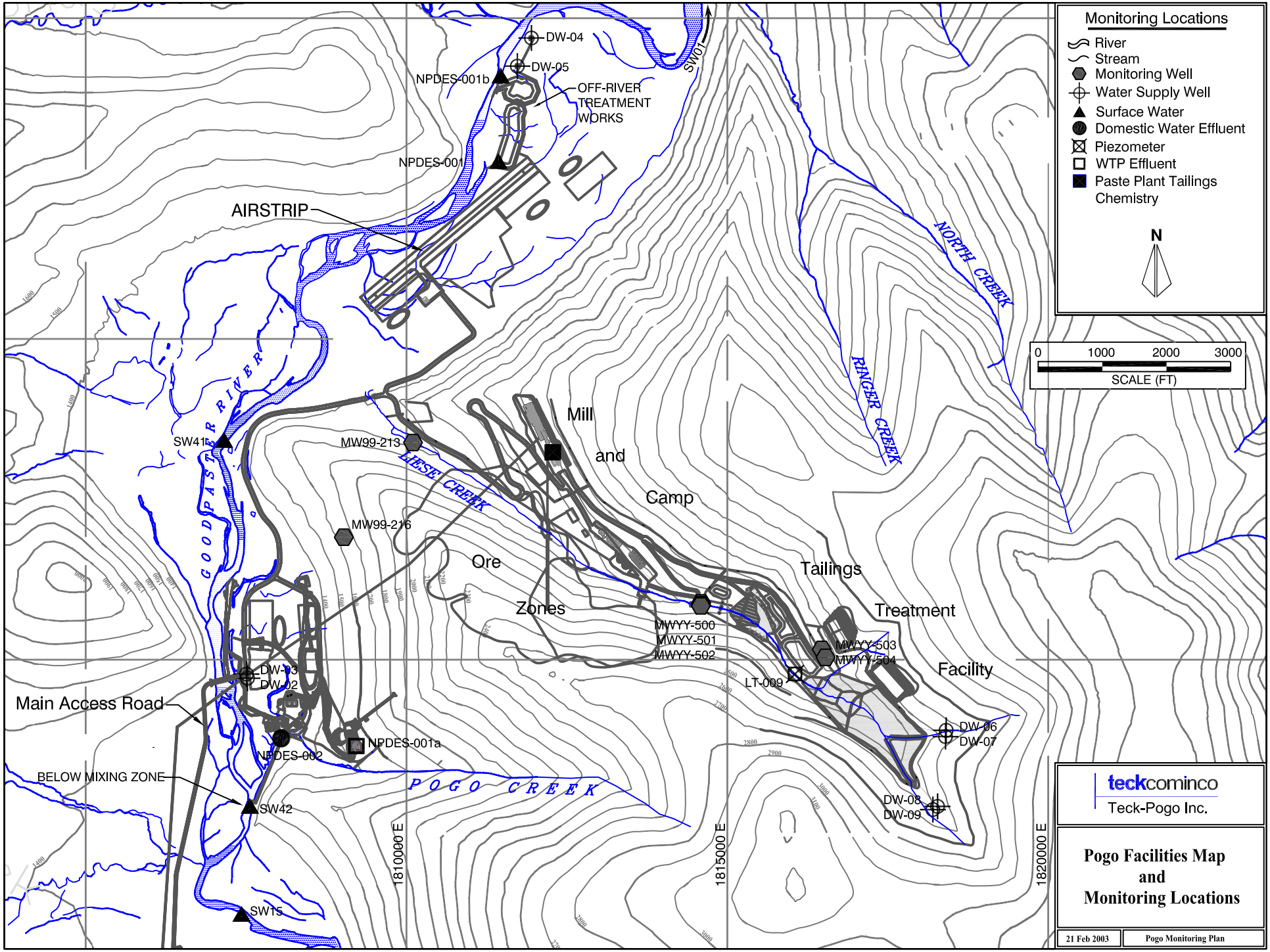
teckcominco

Teck-Pogo Inc.

Pogo Project

Figure 1
Location and Access

18 Dec 2003 | File: Figure 1. Location and Access.mxd


Monitoring Locations
River
Stream
Monitoring Well
Water Supply Well
Surface Water
Domestic Water Effluent
Piezometer
WTP Effluent
Paste Plant Tailings Chemistry
N
0 1000 2000 3000
SCALE (FT)
DW-04
DW-05
NPDES-001b
OFF-RIVER TREATMENT WORKS
SW01
NPDES-001
AIRSTRIP
NORTH CREEK
RINGER CREEK
GOODPASTER RIVER
SW41
MW99-213
LIESE CREEK
Mill
and
Camp
MW99-216
Ore
Zones
Tailings
Treatment
Facility
MWYY-500
MWYY-501
MWYY-502
MWYY-503
MWYY-504
LT-009
DW-06
DW-07
DW-08
DW-09
DW-03
DW-02
Main Access Road
NPDES-002
NPDES-001a
BELOW MIXING ZONE
SW42
POGO CREEK
SW15
1810000 E
1815000 E
1820000 E
teckcominco
Teck-Pogo Inc.
Pogo Facilities Map
and
Monitoring Locations
21 Feb 2003
Pogo Monitoring Plan
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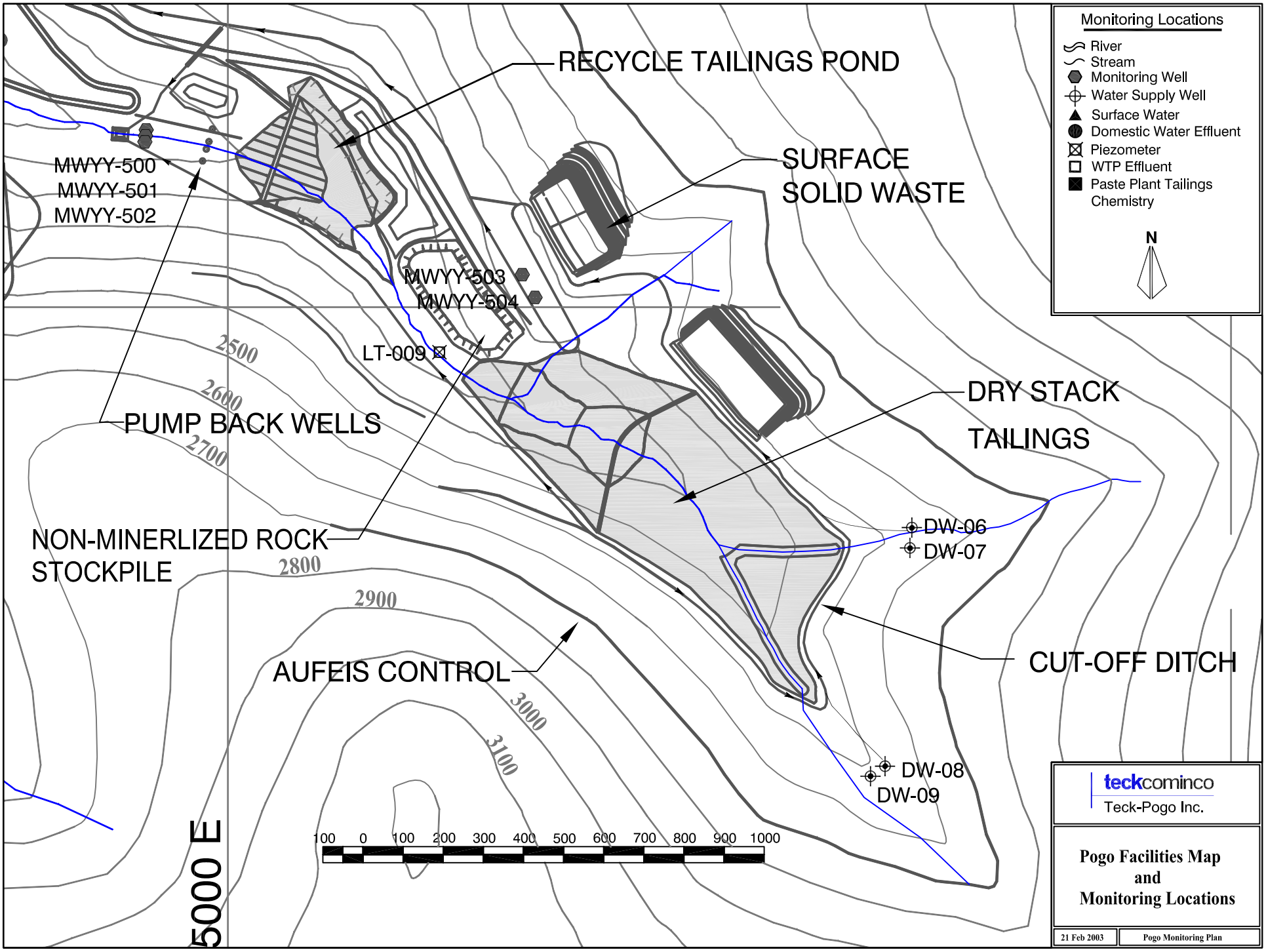
RECYCLE TAILINGS POND
SURFACE
SOLID WASTE
MWYY-500
MWYY-501
MWYY-502
MWYY-503
MWYY-504
LT-009
PUMP BACK WELLS
DRY STACK
TAILINGS
NON-MINERLIZED ROCK
STOCKPILE
AUFEIS CONTROL
CUT-OFF DITCH
DW-06
DW-07
DW-08
DW-09
2500
2600
2700
2800
2900
3000
3100
5000 E
100 0 100 200 300 400 500 600 700 800 900 1000
Monitoring Locations
River
Stream
Monitoring Well
Water Supply Well
Surface Water
Domestic Water Effluent
Piezometer
WTP Effluent
Paste Plant Tailings
Chemistry
N
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Teck-Pogo Inc.
Pogo Facilities Map
and
Monitoring Locations
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Pogo Monitoring Plan
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Appendix A. Development Rock Segregation and Tracking Procedures (Oct 15, 2003)

Pogo Development Rock Segregation and Tracking Procedures
October 15, 2003

1.0 Introduction.

Approximately 1.81 million tons of development rock will be produced during the two years of pre-production underground development and the subsequent 6 years of production. After this period, the flow of development rock will diminish.

Development rock will be classified as mineralized if it contains >600 ppm arsenic or >0.5% sulfur. Mineralized development rock will be segregated for long-term storage because of the potential for generating acid rock drainage (ARD) and/or neutral arsenic leaching as a consequence of weathering.

This section describes the procedures that will be utilized to sample, analyze, segregate, and track this development rock during the pre-production and production phases of the mine.

2.0 Development Rock Sampling

A 20 lb sample will be collected from the blasthole drill cuttings for each round prior to blasting. The sample will be hand collected from the accumulation of drill cuttings at the base of the face by a geologic technician and will be collected so as to provide a representative sample. The technician will also assign a unique number to the sample and provide the mine-crew boss with a picket consisting of 1" x 36" wood lathe annotated with a unique sample number. The geologic technician will deliver the sample to the on-site laboratory as soon as practical, ideally within 2 hours of collecting the sample.

3.0 Development Rock Geochemical Analysis

At the on-site laboratory, the samples will be wet-split into a 2lb sub sample, dried, and pulverized to -150 mesh (100 micron). The pulverized sample will be split into a 0.022 lb (10 gram) sub sample that will be mixed with a binder and compressed with 10 tons of pressure to form a pellet for analysis.

The pellet will be analyzed by a wavelength dispersive x-ray fluorescence spectrometer (XRF) to determine the sulfur (S), arsenic (As) and lead (Pb) content. Lead is analyzed because it causes interference with arsenic and can cause artificially high values if not accounted for. The lead interference is automatically incorporated into the analyses using the XRF software. Sensitivities for the XRF are 1 ppm arsenic and 0.01% sulfur. The accuracy of the XRF is maintained through the use of pure element standards and a library of known standards made previously

from Pogo development rock samples. Mineralized development rock thresholds are established at >600 ppm arsenic or >0.5% sulfur.

4.0 Development Rock Segregation

The objective of the segregation plan is to keep individual rounds of development rock separated until they can be classified as mineralized or nonmineralized and ensure that all mineralized development rock is placed in the 1525 mineralized stockpile, underground, or the tailings dry stack. All mineralized development rock that comes to the surface will eventually be placed in the dry stack for permanent storage.

Development rock will be moved from the face directly to a temporary storage pad on the surface or, most often, to a remuck bay near the face. In both cases the round (muck pile) will be kept separate from other rounds of development rock pending geochemical analysis of the sample for that round. The use of remuck bays shortens mucking time, thus enabling quicker access to the new face for another drill-load-blast cycle.

The mine-crew boss will ensure that the scoop or haul truck driver plants the numbered picket into the visible end of the muck pile after it is moved to the surface or a remuck bay. By default, any time a picketed, but unclassified (unpainted picket), muck pile must be moved to another location, the picket must be moved and re-inserted in the most visible end of the pile at the new location by the miner/operator that moves the pile.

In no circumstances shall a pile be moved without a picket. If an operator encounters a pile that does not have a picket, the operators shall not move the pile without first contacting the shift boss, who shall then contact the geology department. The geology department shall review the tracking information, including the white board described in Section 5.0, to determine if the pile can be accounted for. If so, the pile shall be re-picketed and handled appropriately. If the pile cannot be accounted for, it shall be picketed as a mineralized pile and handled as mineralized rock.

As soon as practical after the chemical analyses for a round is reported to the geologic staff by the on-site laboratory, a geologic technician will paint the appropriate picket either fluorescent green for a nonmineralized classification or white for a mineralized classification, and then communicate the classification (mineralized or nonmineralized) to the shift foreman.

Development rock that is classified while it resides underground will be hauled to the surface and added directly to the appropriate (mineralized or nonmineralized) common pile at one of the three portals. The haul truck driver will deposit the picket for that round in the receptacle labeled “nonmineralized-common pile” or “mineralized-common pile” located adjacent to the appropriate common pile. Signage bearing the name as “mineralized common pile” or “nonmineralized common pile” will be conspicuously posted at the common piles in order to clearly distinguish them. Signage at the 1525 portal mineralized common pile will further read “Mineralized rock must be moved to the 1525 mineralized

stockpile pad only." Signage at the 1525 mineralized stockpile pad will read "Mineralized rock must be moved to the tailings dry stack only." Signage at the 1690 and 1825 portal mineralized common piles will read "Mineralized rock must be moved to the tailings dry stack only."

Development rock that is classified after it is hauled to the surface can be removed to the appropriate common pile, hauled to long term storage if it is mineralized, or used for construction if it is non mineralized. If it is removed for construction the picket will be placed in a receptacle labeled "nonmineralized rock used for construction" located near each of the three portals. Pickets for individual mineralized rounds brought to the tailings dry stack or the 1525 mineralized stockpile will be deposited in receptacles at those sites.

If limited space or other operational limitations preclude the temporary segregation of any individual round, or obtaining a chemical analysis for any round, that round will be classified and picketed as "mineralized" and disposed as if it had been determined to be mineralized on the basis of a chemical analysis.

Whenever a classified round is added to a common pile at one of the three portals, the picket for that round must be deposited in the picket receptacle located adjacent to the common pile.

Picket receptacles will be maintained at: 1) the mineralized and nonmineralized common piles at the 1525, 1690 and 1825 portals, 2) the 1525 mineralized stockpile, and 3) the tailings dry stack.

5.0 Development Rock Tracking and Documentation

Each round of development rock will be tracked by its unique number from blast to its classification as mineralized or nonmineralized, further to its placement on one the common piles, and in certain instances discussed above, to the tailings dry stack or 1525 mineralized stockpile.

Geologic staff will inventory the segregated rounds pads at the 1525, 1690 and 1825 portals and collect pickets from all of the picket receptacles once per shift and record the identification and location or disposition of each round of development rock.

Documentation of the sampling, analysis, classification, tracking and disposition will include electronic surface and underground maps and several spreadsheets that will be updated daily to reflect the origin and disposition of each round. White boards will provide real-time documentation of rounds on the temporary storage pads at each portal.