RECLAMATION
&
CLOSURE PLAN

prepared by

Fairbanks Gold Mining, Inc.
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June 19, 2006

FORT KNOX MINE

RECLAMATION AND CLOSURE PLAN

Submitted to:

Alaska Department of Natural Resources
Division of Mining, Land and Water
3700 Airport Way
Fairbanks, Alaska 99709

Alaska Department of Environmental Conservation
Division of Air and Water Quality
610 University Avenue
Fairbanks, Alaska 99709-3643

and

Department of the Army
U.S. Army Engineer District, Alaska
P.O. Box 6898
Elmendorf AFB, Alaska 99506-6898

Submitted by:

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LIST OF ABBREVIATIONS

ACOE – Army Corp of Engineers
ADEC – Alaska Department of Environmental Conservation
ADF&G – Alaska Division of Fish and Game
ADNR - Alaska Department of Natural Resources
AGI – Amax Gold Inc.
AGP – Acid Generation Potential
ANP – Acid Neutralizing Potential
ARD – Acid Rock Drainage
BMP – Best Management Practice
CIC – Carbon-In-Columns
COE – Corps of Engineers
EPA – Environmental Protection Agency
FGMI - Fairbanks Gold Mining, Inc.
GVEA – Golden Valley Electric
HDPE – High Density Polyethylene
INCO – Company name-patented cyanide destruction process
K - Potassium
KGC – Kinross Gold Corporation
LCRS – Leachate Collection and Recovery System
MHTLO – Mental Health Trust Land Office
MSHA – Mining Safety & Health Administration
N - Nitrogen
NEPA – National Environmental Policy Act
NOAA – National Oceanic and Atmospheric Administration
OHM&P – Office of Habitat & Permitting
P - Phosphorous
PCMS – Process Component Monitoring System
PMC – Plant Materials Center, ADNR
QA/QC – Quality Assurance/Quality Control
TSF – Tailing Storage Facility
USF&WS – United States Fish & Wildlife Service
USGS - United States Geological Service
WAD CN– Weak Acid Dissociable Cyanide
WEWG – Wetlands Evaluation Working Group
WSR – Water Supply Reservoir

1.0 INTRODUCTION

1.1 Purpose

Fairbanks Gold Mining, Inc. (FGMI), a wholly owned subsidiary of Kinross Gold Corporation (KGC), has prepared this reclamation and closure plan to address reclamation, monitoring and post-mining land use for the Fort Knox Mine. This plan is submitted to:

- Alaska Department of Natural Resources, Division of Mining (ADNR) in accordance with AS 27.19.010 et. seq. and 11 AAC 97.100 et. seq.
- Alaska Department of Environmental Conservation (ADEC), Division of Air and Water Quality, as required by Solid Waste Permit #0031-BA008
- U.S. Army Corps of Engineers (ACOE) as required by the Clean Water Act Section 404 Permit No. N-920574, Fish Creek 23

The Fort Knox Mine reclamation and closure plan is designed to return land disturbed by mining and ore processing operations to a stabilized, near-natural condition that will ensure the long-term protection of land and water resources. Additional goals include: minimizing the effects of disturbance during mining, implementation of concurrent reclamation where appropriate, minimizing or eliminating long-term management requirements, and meeting state and federal regulatory requirements. The plan describes the schedule for reclamation, general reclamation procedures, and methods for achieving the final closure requirements and objectives. In addition, the plan serves as a basis for calculating reclamation costs (Section 10), the cost for long-term post-reclamation maintenance obligations (Appendix A), and the adjustment of financial assurance.

Final reclamation, which includes contouring of waste, dumps, tailing impoundment, facility sites, heap leach pad, and revegetation of all disturbance will be initiated immediately upon cessation of mining and milling operations. Reclamation will be completed as expeditiously as feasible. Initial reclamation is anticipated to be completed in two to three years following completion of mill production. Notification, in writing, of final closure will be provided to the ADNR and COE within 90 days after cessation of mining and milling operations (Millsite Permit ADL 414960 &ADL 414961, Item #15).

Due to the constantly changing regulatory atmosphere and the introduction of new reclamation methods, the reclamation plan may be amended as deemed necessary (**11AAC 97.330** Amendment of Reclamation Plan).

Access by Federal and State regulatory personnel to the Fort Knox Mine will be honored by FGMI, with the request that visitors contact mine security to gain access. Mining is regulated under the Mine Safety and Health Administration (MSHA) and their regulations require minimum training for employees and visitors for Hazard Recognition and Safety. Visitors, as well as employees, must wear safety equipment approved by MSHA. FGMI requests that routine inspections be conducted during weekdays when administration and process managers are available to answer questions and,

if necessary, accompany visitors to various process components.

1.2 Applicant Information

Fairbanks Gold Mining, Inc.
A Subsidiary of Kinross Gold Corp.
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Fairbanks, AK 99707-3726

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Fairbanks Gold Mining, Inc. Officer Completing Application

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Executive Vice President & COO:	Tim Baker
Senior Vice President Environment, Health & Safety:	Rick Baker
Executive Vic President & CFO:	Thomas Boehlert
Vice President Administration & Corp Secretary:	Shelley M. Riley

Fairbanks Gold Mining, Inc. is a wholly owned subsidiary of Kinam Gold Inc., (formerly Amax Gold Inc.) a precious metals corporation. Kinam Gold Inc. is in turn a wholly owned subsidiary of Kinross Gold USA, Inc. located at Scotia Plaza, 52 Floor, 40 King Street West, Toronto, Ontario,

Canada, M5H 3Y2.

Alaska Registered Agent

Name: Fairbanks Gold Mining, Inc.
Address: c/o C. T. Corporation System (Agent)
240 Main Street, Suite 800
Juneau, Alaska 99801

1.3 Location and Land Status

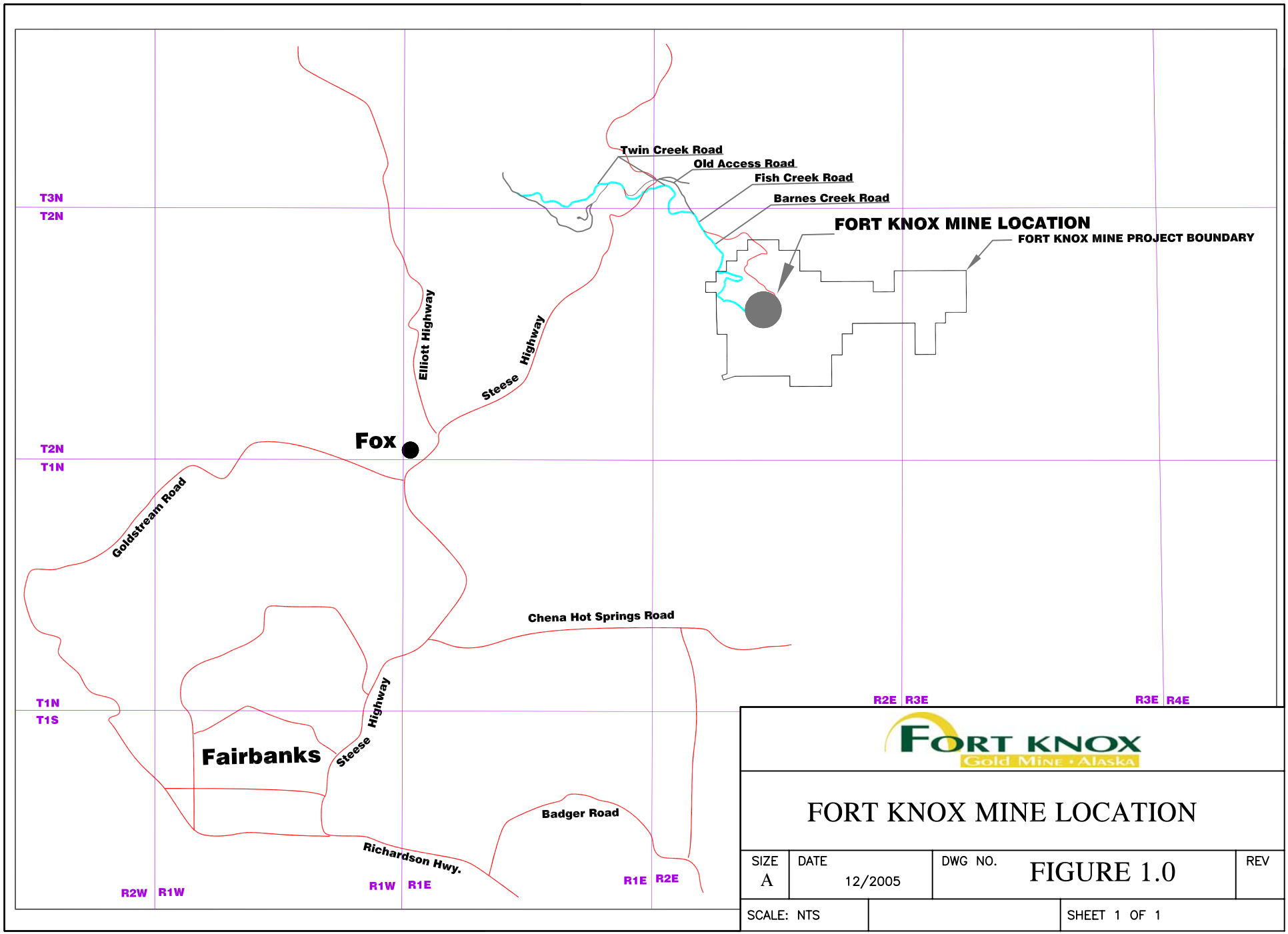
The project site is located approximately 15 air miles northeast of Fairbanks, Alaska in the Fish Creek drainage, as shown on Figure 1.0 and Figure 1.1. More specifically, the project area is located in portions of Sections 4, 8-12, 13-17, 20-23, and 26-27, T2N, R2E, Fairbanks Meridian; and Sections 7-8 and 17-19, T2N, R3E, Fairbanks Meridian.

The project area encompasses approximately 7,605 acres. The project area includes the Amended and Restated Millsite Lease, the Upland Mining Lease, and private land. The Amended and Restated Millsite Lease (amending and restating the Millsite Permit effective as of February 15, 1994, ADL # 414960 & 414961) contains approximately 7,484 acres and private land 121 acres (Figure 1.2). The Upland Mining Lease, ADL 535408 contains approximately 1139.5 acres (Figure 1.2).

FGMI submitted an application for an Upland Mining Lease (ADL #535408) covering tentatively approved lands on December 4, 1992. These lands include 48 state mining claims owned by Melba Creek Mining, Inc., an Alaska corporation, and FGMI, a Delaware corporation. FGMI, on December 4, 1992, applied for two surface leases; the Surface Lease A (ADL #414960) and Surface Lease B (ADL #414961) were tentatively approved in the vicinity of the Fort Knox lode gold deposit. ADNR issued a Millsite Permit (ADL Nos. 414960 and 414961) and Upland Mining Lease (ADL 535408) on February 15, 1994.

On July 8, 2002 the Amended and Restated Millsite Lease (amending and restating the Millsite Permit effective as of February 15, 1994, ADL # 414960 & 414961) became effective and authorized gold-bearing ores derived from outside the Millsite Lease area to be processed through the Fort Knox mill and tailing facilities. The locations of the Upland Lease and Millsite Lease areas are illustrated in Figure 1.2.

Private land included within the Fort Knox project area consists of 121.2 acres of patented claims purchased by FGMI. The narrow block of patented claims adjacent too, but not included in, the Upland Mining Lease or the Millsite Lease, were conveyed to FGMI and Melba Creek Mining, Inc. via warranty deed in August 1993. The location of the private land is identified in Figure 1.2.



FORT KNOX Gold Mine • Alaska

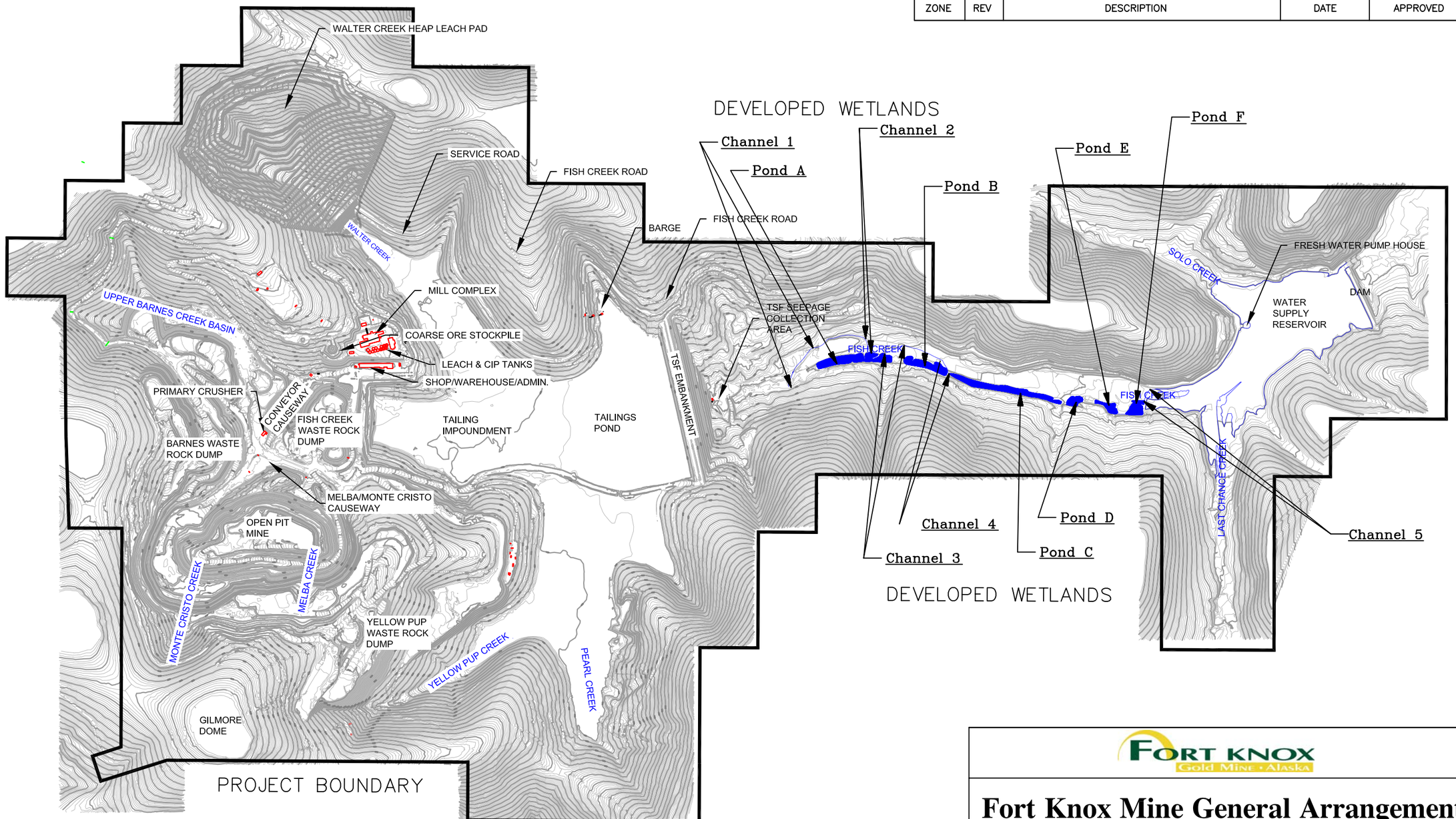
FORT KNOX MINE LOCATION

SIZE	DATE	DWG NO.	REV
A	12/2005	FIGURE 1.0	

SCALE: NTS

SHEET 1 OF 1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

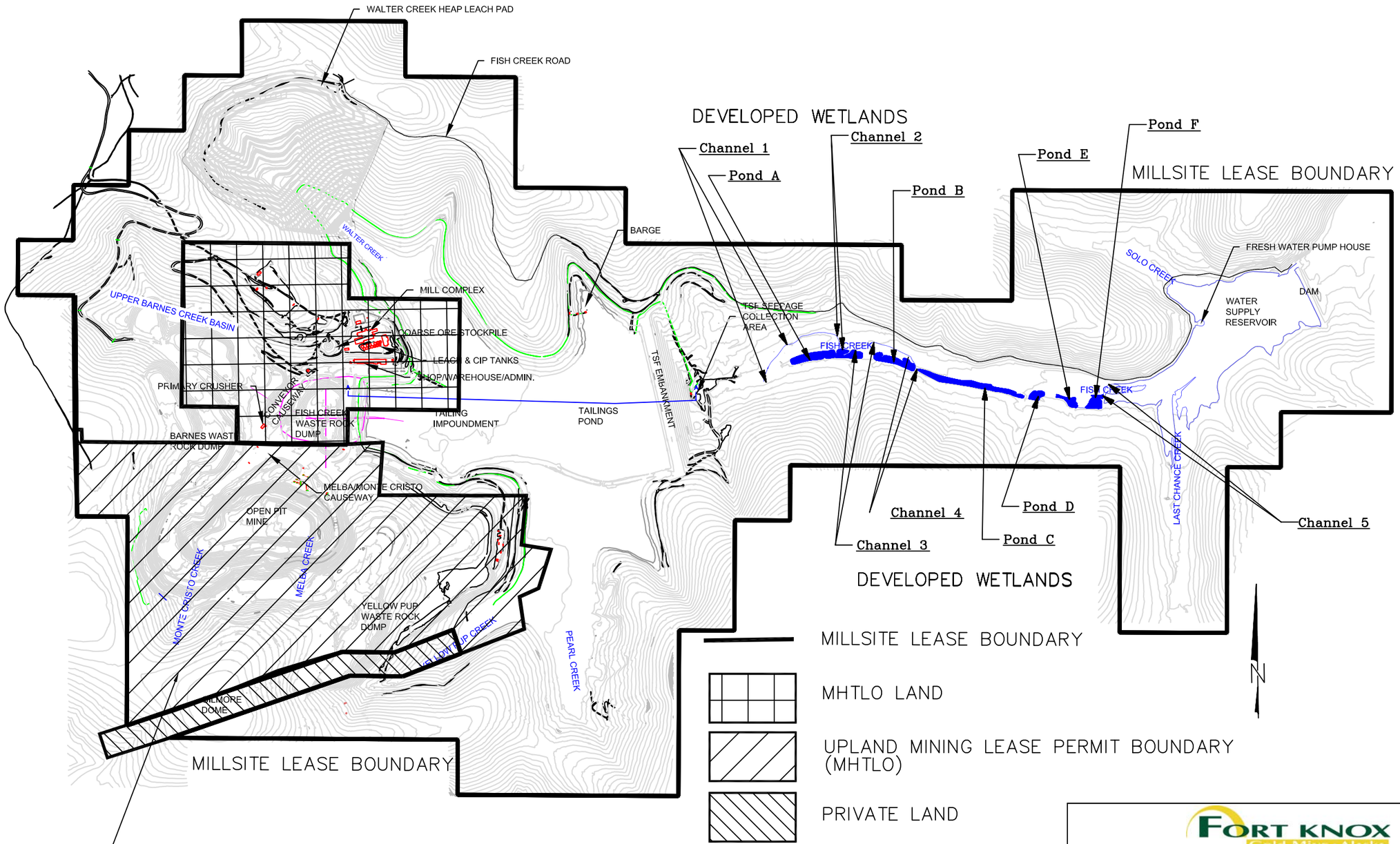


FORT KNOX Gold Mine • Alaska

Fort Knox Mine General Arrangement

SIZE	DRAWING NAME	Figure 1.1	REV
SCALE: NTS	DATE: 11/2005	SHEET 1 OF 1	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



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FORT KNOX UPLAND MINING LEASE AND MENTAL HEALTH LAND

SIZE	DWG NO.	FIGURE NO.	REV
		FIGURE 1.2	
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

The Mental Health Trust Land Office (MHTLO) owns the surface rights within the Upland Mining Lease and a portion of the Millsite Lease (the area adjacent to the Upland Mining Lease containing the mill complex and shop/administration buildings, see Figure 1.2). Appendix B contains the claim descriptions and a detailed claim map showing MHTLO lands.

There is no federal land within the project boundaries. The closest residence to the project area is approximately 2.5 miles from the project boundary and is located at Cleary Summit. Surface and mineral land descriptions are provided in Appendix B.

The ore body and the majority of the project area are located on land belonging to the State of Alaska and MHTLO. Private land and mineral rights in the project area along Fish Creek, originally patented to placer miners under the Federal Mining Law of 1872, have been purchased by FGMI. The patented private lands along Fish Creek were conveyed to the State of Alaska, at the time the Millsite Permit was issued.

The center of the ore body is located on the north side of Gilmore Dome on the ridge between Melba and Monte Cristo creeks. The mineralized zone is elongated east-west extending across both creeks. The project is located entirely within the Fish Creek drainage. Besides Melba and Monte Cristo creeks, the named tributaries of Fish Creek in the project area include Barnes Creek, Pearl Creek, Yellow Pup Creek, Walter Creek, Last Chance Creek, and Solo Creek (Figure 1.1).

1.4 History of Fort Knox Mine

On July 22, 1902, Italian prospector Felix Pedro discovered gold in the interior of Alaska. Just 19 days after making this initial discovery, Pedro staked a discovery claim on Fish Creek downstream from what is now known as the Fort Knox ore body. Intermittent drift mining occurred throughout Fish Creek valley prior to 1917 when a dredge was erected by the Tanana Valley Mining Co. (Shannon and Wilson, 1985). In the 1930's, the upper reaches of Pearl Creek and Yellow Pup Creek were mined by slackline scraper and dragline. In 1963 hydraulic stripping and bulldozer-dragline mining took place along Fish Creek, Barnes Creek and Pearl Creek (CH2M Hill, 1993). The Fairbanks Mining District has produced, from 1880 through 2004, an estimated 11,506,646 ounces of gold. Placer deposits account for 8,188,517 ounces and lode deposits for 3,318,129 ounces (Szumigala & Hughes, 2004). For a more complete discussion of the placer mining history of the Fort Knox area, see *History of Mining on Upper Fish Creek, Fairbanks, Alaska*, (Higgs and Sattler, 1994).

In 1984 geologists discovered visible gold in the granite and noted the potential importance of the Fort Knox deposit. Between 1987 and 1990, Monte Cristo Mining, Inc.; the Fort Knox Limited Partnership; Gilmore Mining, Inc; Fairbanks Gold, Ltd.; Fairbanks Gold, Inc.; and Gilmore, Inc. were involved for varying lengths of time in the exploration and pre-development program. In January 1992, Amax Gold Inc. acquired ownership of the Fort Knox project, and Fairbanks Gold Mining, Inc., an Amax Gold Inc. subsidiary, was established as the project operator.

In 1994, the environmental review (CH2M Hill, 1993) for Fort Knox was completed and in accordance with National Environmental Protection Act (NEPA) an Environmental Assessment was finalized. The required permits were issued in 1994, and the next year construction began. The first gold pour occurred in December of 1996. Kinross Gold Corp. and Amax Gold Inc. merged in 1998 and Fairbanks Gold Mining, Inc. became a wholly owned subsidiary of Kinross Gold Corporation, a Toronto based corporation. In 1999, the first million ounces of gold were produced at Fort Knox, and in 2002, the second million ounces were produced. In 2003, Kinross Gold Corp. merged with TVX and Echo Bay making Kinross Gold Corp. the 7th largest gold producer in the world.

2.0 PROJECT DESCRIPTION

Fairbanks Gold Mining, Inc. operates the Fort Knox Mine located approximately 15 air miles northeast of Fairbanks, Alaska. The mine site is located on state and private lands in the upper headwaters of Fish Creek Valley, approximately 4 miles southeast of Cleary Summit. The project site is accessible by the Twin Creeks road. The Fort Knox Mine operations include an open-pit mine, a proposed heap leach facility and related milling facilities to recover gold. The first gold pour occurred in December 1996.

Operational designs, from 2006 and forward are based on a deposit of 94 million tons of ore that is mined at an average rate of 178,000 tons a day (included ore and waste rock). The mill processes ore at a rate of 40,000 to 45,000 tons per day. The mine life is currently planned to last until 2010 with milling continuing until 2012. Both mine and mill operations could be extended if additional ore is delineated.

The mine and mill employs 400 - 425 employees. The mine operates two shifts, 24 hours per day, 365 days per year. There are no living accommodations at the project site. The daily electrical power requirement averages 35 megawatts, and is supplied by a power line extending from the Golden Valley Electric Association (GVEA) substation at Gold Hill to the mine site, a distance of approximately 29 miles.

2.1 Existing Facilities and Conditions

Mill Facilities

The gold ore mined from the Fort Knox pit is processed by the mill or placed on the heap leach pad. As part of the beneficiation procedures, the higher grade ore mined is crushed, ground and processed in the mill located adjacent to the mine. The gold is extracted in tanks containing a cyanide solution that dissolves the gold. The gold in solution is captured by activated carbon. The gold is stripped from the carbon and recovered from solution by electro-winnowing. Once the gold is removed, the remaining slurry goes to the thickener that recovers a majority of the cyanide, other reagents, and heated water before the tailing slurry is released to the tailing impoundment. The

cyanide concentration in tailing material discharged to the tailing impoundment complies with requirements of the Solid Waste Permit which limits the WAD cyanide concentration to 10 ppm for a monthly average with a maximum of 25 ppm. The cyanide concentration in the tailing is maintained within permit limits using the INCO process when necessary. The INCO process combines ammonium bisulfate and copper sulfate with air, in an agitated tank, to destroy the cyanide. Typically, maintaining the cyanide concentration in discharged tailing material does not require the use of the INCO process, but is controlled by the recovery of cyanide solution and the addition of freshwater to the thickened tailing. Tailing is piped to the tailing impoundment from the mill and deposited in the tailing impoundment sub-aerially using multiple discharge points.

Tailing Storage Facility

The tailing impoundment permitted area encompasses 1,556 acres that includes: areas of tailing material deposition, the tailing embankment (121 acres), the interceptor well area below the embankment and a portion of the heap leach pad (15 acres). The final placement of tailing material is projected to cover 1,019 acres of the tailing impoundment area. The tailing material currently covers approximately 700 acres.

The tailing dam is an earth-filled structure designed to hold all tailing and process water from the mill, as well as surface runoff water. The dam is designed and maintained to contain the 100-year, 24-hour storm event in addition to the average 30-day spring breakup. The water in the tailing impoundment contains higher levels of certain analytes (above drinking and/or aquatic water standards). Therefore, the tailing impoundment water is not discharged. However, the mill recycles water from the tailing impoundment for reuse in the beneficiation process.

The tailing dam was designed as a leaky dam construction with a seepage collection system at the toe of the dam. To ensure zero-discharge, the seepage water is collected in a sump and pumped back into the tailing impoundment. A series of six groundwater pump-back wells, immediately down gradient of tailing dam, intercept groundwater flowing from the area of the tailing structure and pump the water back into the tailing impoundment. Observation wells to monitor ground water quality are located immediately downstream of the seepage collection system and the groundwater interceptor wells.

A recent assessment of the performance of the tailing impoundment embankment drain system was performed by Water Management Consultants, Inc., resulting in the following summary (WMC, 2005a).

Vibrating wire piezometers were placed within the embankment during construction. Data is collected from the piezometers each month. The data indicate that the seal and drainage systems are functioning as designed. Key points illustrated by the data include:

- Pressures within the filter layer on the upstream face are increasing as the elevation of the decant pool increases through time.

- There is little to no head buildup in the filter at the base of the embankment indicating that the drainage system is functioning properly.

- There is a significant head drop across the seal zone indicating that the low permeability layer is effectively controlling the flow rate through the impoundment and allows higher permeability layers located downstream of the seal zone to drain.

- There is no increase in pressure within the random fill downstream of the drainage system indicating that the underlying bedrock has sufficient permeability to dissipate pressure.

Specific surface and groundwater quality and quantity data for the project area and projected post-mining water quality information is addressed in the *Fort Knox Project Water Resources Management Plan* (FGMI, 1994), *Fort Knox Tailing Facility Closure Management Plan (WMC, 2006a) and Fort Knox Closure Management Plan for the Proposed Heap Leach Facility (2006b).* The current status of the zero-discharge system and water quality monitoring are tracked through quarterly reports submitted to the Alaska Department of Environmental Conservation.

Decant Water

Water is used to slurry tailing to the tailing impoundment and accumulates in the decant pond where it is ultimately pumped back to the mill. Water quality in the decant pond is controlled by the following factors:

- chemistry of the mill feed (ore);

- chemical reagents used to process the ore;

- effluent treatment processes;

- dilution by the freshwater reservoir when makeup water is added;

- upgradient run-on;

- direct precipitation;

- geochemical processes; and

- seasonal effects (ice cover and evaporation).

Water quality in the decant pond has changed over time due principally to the mill feed. From 1996 until early 2001, the mill feed was exclusively Fort Knox ore. Water quality in the decant pond during this period was characterized by an alkaline pH of 8.8, TDS concentration of approximately 800 mg/l and relatively low concentrations of metals.

From early 2001 until January 2005, the mill processed a mixture of ore from the Fort Knox deposit as well as ore from the nearby True north deposit. True North tailing contained higher concentrations of antimony, selenium, and arsenic relative to historical levels. The True North ore required additional cyanide to process the ore, which resulted in higher concentrations in the tailing slurry. To minimize the concentrations of free and WAD cyanide concentrations in the decant pond, the INCO cyanide detoxification unit was used more frequently. This process is catalyzed by copper ions, which are added to the detoxification unit as copper sulfate and resulted in increased copper concentrations in the decant pond. INCO treatment for the blended ore also increased the sulfate and nitrate concentrations in the decant pond.

In 2002, FGMI minimized the use of the detoxification unit and managed cyanide through the use of tailing thickeners and volatilization. This led to a reduction in ammonia concentrations.

Concentrations of analytes within the decant pond also change over time as the volume of impounded water changes. During the winter, dilution from surface water run-on and rainfall is at a minimum, which results in increased concentrations of analytes. During the spring breakup concentrations tend to decrease in response to dilution from surface water run-on. After breakup, concentrations vary with the amount of fresh make up water added from the freshwater reservoir as make up for the mill (Water Management Consultants, 2005a).

Seepage Water

Seepage from the tailing impoundment is collected by two sumps located at the foot of the tailing impoundment and pumped back to the decant pond for use as makeup water. Seepage that bypasses the sumps is collected by six downgradient interceptor wells. Groundwater quality below the seepage collection system is monitored at three wells (MW-5, MW-6 and MW-7).

Composite seepage water quality samples for total concentrations have been collected quarterly for the solid waste permit since the tailing impoundment went into operation in 1996. Samples for dissolved concentrations were collected from 1996 until August of 2003.

Based on a comparison of the seepage and decant pond chemistries, the bulk of the water entering the seepage recovery system originates from the tailing impoundment. A comparison of the chloride concentrations in the decant pond water and seepage suggests that very little dilution is occurring due to groundwater flow under the tailing impoundment. The high degree of correlation between temporal variations in chloride chemistry also indicates a relatively short travel time. This suggests that any differences between the seepage and decant pond chemistries are due principally to geochemical processes such as precipitation and sorption as opposed to the effects of dilution.

Water in the seepage has an average pH of approximately 7.3 and an average TDS of 655 mg/l. Seepage water is a calcium/sodium-sulfate type solution. The water quality of the seepage is generally better than the decant pond water. The difference in concentrations between the decant pond and the seepage for a given constituent vary considerably. Several of the constituents are attenuated through the tailing, including arsenic, ammonia, antimony, copper, cyanide (total and

WAD), nitrite, and selenium.

Arsenic concentrations in the seepage decrease by almost an order of magnitude as a result of attenuation. Increases in arsenic present in the decant pond associated with processing of True North ore had only minor effects on seepage quality, indicating significant attenuation capacity within the system possibly as a result of co-precipitation with iron hydroxides. Selenium and antimony showed similar characteristics with decreases of 92% and 99%, respectively. Constituents with variable or minimal attenuation include, nitrate, sulfate and TDS. Table 2.0 summarizes the change in concentrations for selected parameters measured in the decant pond and seepage water.

Table 2.0 Comparison of Decant Pond and Seepage Water

Parameter	Average Decant Pond	Average Seepage Water	% Difference
As	0.33	<0.001	-99.7
Cd	0.001	<0.0002	-81.3
WAD CN	0.47	0.01	-97.8
Cu	0.89	<0.01	-98.9
Fe	0.40	0.09	-77.8
pH	8.4	7.1	-15.7
Se	0.025	0.002	-92.5
SO_4	373	325	-12.8

Manganese concentrations in the seepage increase relative to the decant pond water concentrations. Manganese concentrations in the decant solution range average 0.053 mg/l (dissolved), while the average concentrations in the seepage was more than ten times higher at 0.56 mg/l. This is likely a result of reducing conditions at the base of the tailing impoundment. There may be contributions from the groundwater underflow (which has naturally occurring elevated concentrations) but given the mimimal dilution these are expected to be minor.

Water Reservoir

The water reservoir including the dam, causeway, and spillway complex, encompasses approximately 173 acres and is located on Fish Creek approximately three miles below the tailings impoundment. Make-up water from the reservoir is pumped to the tailing impoundment and/or the mill for use in the beneficiation process of the gold ore.

Walter Creek Heap Leach Facility

The valley fill heap leach will be located in the upper end of the Walter Creek drainage upstream from the tailing impoundment. Excluding the haul road and access roads, the heap leach pad will ultimately cover approximately 310 acres and will have a capacity of 161 million tons. The

pad is to be constructed in five stages. Initially, FGMI proposes to provide financial assurance for clearing and grubbing the entire 310 acres and for construction of the first two stages of the pad. The first two stages of the heap leach pad will have a total disturbance of approximately 155 acres that will include 130 acres of lined pad. The first two stages have a capacity for 35 million tons of ore. Financial assurance will be provided for each of the three remaining stages prior to construction.

Ore for the heap leach will consist of run-of-mine rock from the Fort Knox Pit and various stockpiles. Currently, 29 million tons of lower grade ore are located in the Barnes Creek and Fish Creek stockpiles that will be heap leached. The ore is characterized by relatively high permeability that will promote solution flow and drainage for rapid rinsing at closure.

In-heap storage of process solution and storm water will be accomplished by constructing an embankment in the downstream toe of the heap. The mechanical quality of the rock planned for construction of the in-heap storage embankment is expected to be similar to the mechanical quality of the rock that has been used to construct the downstream random fill for the Fort Knox Mine tailing dam. The liner system for the pad will consist of 12 inches of sub-base with a permeability of 10^{-5}over the entire basin. In the area of the in-heap storage reservoir, there will be a double HDPE liner over the sub-base. Beyond the limits of the in-heap storage reservoir, there will be a single HDPE liner overlaying the sub-base. Overlaying the HDPE liner, 36 inches of cover material consisting of crushed rock will be placed with a network of drainpipe to maintain low head pressures on the liner and promote a rapid flow of solution to the in-heap storage reservoir.

A Leachate Collection and Recovery System (LCRS) constructed in conjunction with the double liner in the area of the in-heap storage reservoir will provide leak detection. A Process Component Monitoring System (PCMS) will be constructed under the main header lines for the solution collection system providing leak detection in those areas of high flow where leaks are most probable. An underdrain system consisting of a network of drainage channels containing slotted pipe in drain rock will route water from seeps and springs under the sub-liner to the tailing impoundment.

Barren solution will be applied on the heap leach using drip emitters. The solution will flow through the run-of-mine ore. Pregnant solution will flow to the in-heap storage reservoir, which will have a capacity of 70 million gallons. The pregnant solution that collects in the in-heap storage reservoir will be pumped to the Carbon-In-Columns (CIC) plant using vertical pumps located in the in-heap storage reservoir. Barren solution and pregnant solution will be pumped in pipes between the pad and the CIC plant. Loaded carbon will be processed in the Fort Knox mill facilities.

The tailing dam is an earth-filled structure designed to hold all tailing and process water from the mill, as well as surface runoff water. The dam is designed and maintained to contain the 100-year, 24-hour storm event in addition to the average 30-day spring breakup. The construction of the heap leach pad will have no significant affect on the freeboard of the TSF. The heap leach

pad is also designed to store the 100year/24-hour storm event. In essence this reduces the amount of storage required in the TSF, but no reduction in the permitted 3-foot freeboard was considered.

The tailing impoundment will be managed to maintain adequate freeboard to contain all heap leach solution in the event of a catastrophic failure of the heap leach embankment. The potential impact on the freeboard for the TSF was evaluated using a very conservative dam break analysis. Because the existing TSF is located immediately downstream from the in-heap dam, an outflow from a dam break would be contained by the downstream TSF. Based on the most recent dam safety inspection of the TSF (Knight Piésold, 2004), the designed freeboard for the TSF is 3 feet. The existing tailing dam crest is at elevation 1453 feet msl. The available storage volume between elevation 1450 and 1453 feet msl, or in the 3 feet of freeboard, is approximately 27.6 million cubic feet. Since this is an extreme event, the design is predicated on storing: (1) the process solution, (2) the 24-hour draindown, and (3) runoff from the 100-year/24-hour storm event in the 3-foot freeboard limit provided for the TSF. Given that the volume of fluid that would be released by the liner failure is 9.2 million cubic feet, this provides three times the needed storage. The TSF will be operated such that there is always available storage volume for the design release event. Therefore, it is concluded that if a complete failure of the Walter Creek in-heap storage dam liner system were to occur, the water that may flow out of the facility would be completely stored in the downstream TSF. Owing to the coarse nature of the ore and dam fill, if a debris-type failure occurred at the in-heap dam, the failure time would be very slow. The debris which would flow into the TSF would be slow enough that the likelihood of a "landslide" wave being generated in the TSF is extremely low to negligible.

The water in the tailing impoundment currently contains elevated levels of certain analytes that exceed drinking and/or aquatic water standards. No tailing impoundment water is discharged. The mill recycles water from the tailing impoundment for reuse in the beneficiation process. Water in the tailing impoundment will also be utilized for the heap leach process.

2.2 General Environmental Information

The Fort Knox project area is in the Yukon-Tanana Uplands, characterized by rounded, even topped ridges with gentle slopes. The deposit is located on the north flank of Gilmore Dome at elevations ranging between 1,000 and 2,100 feet.

The Fairbanks mining district is a celebrated placer gold camp. Although a significant mining district in terms of total production, it had only limited lode production until the discovery and development of the Fort Knox deposit in the 1990's. Since the 1930's, extensive placer mining has occurred in the project area. Tailings piles, ponds, levees, channels and ditches have been constructed along the valley floor, extending from approximately midway up Monte Cristo Creek downstream to the confluence of Solo and Fish creeks. Monte Cristo, Barnes, Yellow Pup, Pearl, Fish and Last Chance creeks have been placer mined in the past. As a result of this placer mining, the thick cover of loess and alluvium covering the valley floor has been removed. Solo Creek and a major portion of Upper Barnes Creek have not been impacted by placer mining.

Geology

The Fort Knox mine is located in the Fairbanks Mining District, in the northeast part of the Yukon-Tanana Upland. The mining district is divided into four metamorphosed stratigraphic groups; the Chatanika sequence, the Fairbanks Schist, the Chena River sequence, and the Birch Hill sequence.

The area of the mine is underlain by the Fairbanks Schist unit and the Cleary Sequence of the Fairbanks Schist unit. The Fairbanks Schist consists largely of muscovite-quartz schist and micaceous quartzite. The Cleary Sequence consists of calcareous actinolitic greenschist, impure marble, muscovite quartz schist, and potassium feldspar white schist. The schist is host to younger granitic intrusions, such as the one outcropping at the mine site. The Fairbanks Schist and other metamorphic rocks range in age from late Precambrian to lower Paleozoic. The intrusive granodiorites and quartz monzonite are most likely Cretaceous to Tertiary in age (Knight Piesold, 1994).

The Gilmore Dome pluton, which consists of granodiorite and quartz monzonite, is present in the pit area of the mine site. Prior to opening the pit, granodiorite outcropped in the Melba and Monte Cristo Creeks and is the main host rock for the gold mineralization of the Fort Knox deposit. This pluton has intruded into the Fairbanks Schist, which makes up the upper portion of the pit wall.

Mineralization occurs in quartz and pegmatite veins, stock work zones, and mineralized shear zones. Gold occurs in and along the margins of quartz veins, quartz-filled shears, and sericite altered fractures within the granite. Pre-mineralization fractures resulting from magmatic doming provided conduits for mineralizing fluids. Stockwork veins (randomly oriented) strike west-northwest with variable dips. Shear zones generally strike northwest and dip moderately to the southwest or are northeast striking with dips northwest to southeast.

Gold mineralization in the quartz-filled shears is distributed relatively evenly, and individual gold grains are generally less than 100 microns in size. The stockwork veins are more erratic in gold particle size and distribution. Both gold mineralized occurrences have markedly low sulfide content.

Climate

The climate is continental sub-arctic, known as the Interior Basin of Alaska, with annual precipitation ranging from 13 to 22 inches (America North, 1992). Historically the wettest months include June to September with August usually being the wettest. The driest months are historically February through April.

Vegetation, Soils and Permafrost

The area is predominantly forested. Well-drained soils of the uplands and alluvial plains are covered mainly with white spruce (*Picea glauca*) and a mixture of broadleaf trees such as paper birch (*Betula*

paprifera) and quaking aspen *(Populus tremuloides*). The climax forest on well-drained soils in the area is white spruce.

The moderately well drained and imperfectly drained soils may support forests similar to those on the well-drained soils, but more commonly black spruce (*Picea mariana*) and willow (*Salix spp.*) are found. Mosses (*Sphagnum* spp.), along with horsetail (*Equisetum* spp.) and grass, typically cover the ground. Shrubs such as willow, however, are also prevalent.

The poorly drained soils with a high permafrost table generally support communities of black spruce, willow, and alder (*Alnus* spp.). A thick moss mat, principally *Sphagnum* spp., covers the ground. Lichens such as *Cladonia* spp. and *Peltigera* spp. are common in the moss mat also. This mat supports a dense cover of shrubs, primarily bog birch (*Betula glandulosa*), spirea (*Spirea beauverdiana*), Labrador tea (*Ledum decumbens*), cranberry (*Vaccinium vitis-idaea*), and blueberry (*Vaccinium uliginosum*). Tussocks of cottongrass (*Eriophorum* spp.) are also common, especially along the toe slopes.

Poorly drained soils with a high permafrost table may be found on the northern exposures of the mountain slopes, especially those areas that are concave or broken. Spindly black spruce and a thick moss mat are typical on these sites. Permafrost is discontinuous throughout the project area, and does not exist on some north-facing mountain slopes where it normally would be expected. South-facing slopes receive much more radiation from the sun, and generally support white spruce, paper birch, and quaking aspen (America North, 1992).

Data collected from exploration boreholes and thermistors installed in the area of the embankment prior to construction indicate the presence of localized permafrost. Temperature surveys of the monitoring wells indicate that frozen conditions exist mostly on north-facing slopes and in shaded areas on the valley floor. Thermistor readings indicated that temperatures ranged from 1 to 10°C. The majority of soil and rock temperatures in frozen areas ranged from 0 to -1°C indicating warm permafrost. Data collected during drilling suggests that at some locations the bedrock aquifer may be frozen to significant depths (in excess of 100 ft). Frozen bedrock in the embankment area was left in place prior to construction. Because the permafrost was warm the rate of thaw was likely rapid once seepage from the facility began (Knight Piesold, 1994).
There are no known federal or state threatened or endangered plants or wildlife species inhabiting any portion of the Fort Knox site (CH2M Hill, 1993).

Surface Water

The principal surface water features in the mine area include:

- Solo Creek
- Last Chance
- Fish Creek
- Barnes Creek
- Pearl Creek

overlie fine-grained silts and sands. Numerous pockets of predominantly fine-grained materials from the old settling ponds exist throughout the valley. Similarly, local lenses of well-sorted and well-stratified sands and gravel deposited by stream flow are also present. Much of this re-worked valley fill may now be thawed and subject only to seasonal frost action (WMC, 2005a).

Bedrock

The underlying bedrock aquifer consists primarily of schist (referred to as the Fairbanks schist) and is interpreted to be a pre-Cambrian Age. This schist is host to younger granitic intrusions, such as the one outcropping at the Fort Knox mine site.

The upper portion of the bedrock (ranging up to 100 ft in thickness) is highly weathered. The degree of weathering depends on the original lithologic content of the bedrock and exposure. Weathering characteristics consist of intense fracturing, alteration of primary minerals to clays and oxides (such as iron oxide), dislocation from soil creep and the filling of fractures with sand, silt, and clay.

Movement of groundwater in the bedrock aquifer occurs in open fractures. The degree of fracturing observed during the drilling of bedrock monitoring wells was variable, as indicated by the range of hydraulic conductivities calculated from pump test data ranging from 280 to 0.28 ft/day (10^{-2} to 10^{-5} cm/sec). The greatest fracturing, and hence higher hydraulic conductivities, is found in the valley floor locations. Hydraulic conductivities are observed to be lower in wells completed at the hillside locations. This is related to two factors:

1) The greater degree of fracturing observed in the valley floors is related to the shallow depth to bedrock and more intense weathering, and ;

2) The greater degree of fracturing observed in the valley floors is likely related to shear zones that control the development of local drainages. Based on drilling completed as part of initial site characterization, the estimated depth of effective fracturing below the permafrost in the bedrock is expected to be 300 to 500 ft. Below this depth, fracture frequency and permeability decrease significantly.

Data from pumping tests also indicate that the bedrock fracture systems at most of the locations are directly connected with the overlying alluvial aquifer system. Water level declines observed in alluvial wells completed adjacent to bedrock pumping wells were relatively instantaneous and similar in magnitude, suggesting a strong hydraulic connection between the alluvial system and the underlying fractured bedrock (Water Management Consultants, 2005a).

Background Water Chemistry

Background chemistry for surface water and groundwater reflects the mineralized nature of the rocks within the Fish Creek drainage and the historical placer mining activity that occurred in the area. Pre-mining groundwater within the Fish Creek drainage has circum-neutral pH values and

is generally a calcium-bicarbonate compositional type. Values of TDS and alkalinity are low to moderate. Shallow bedrock and alluvial groundwater compositions are generally similar as a result of the hydraulic connection between the two systems. Deep bedrock groundwater tends to be more variable in composition as a result of compartmentalization. Background sampling indicates that metals present in concentrations above the standards include arsenic, cadmium, copper, iron, manganese, and zinc.

Because of the inter-connection between the surface water and groundwater systems the pre-mining chemical character of the two are similar. Background surface water is characterized by circum-neutral pH values, low TDS values, moderate alkalinity and the presence of trace metals in relatively high concentrations. Metals that are present in background concentrations that exceed numerical standards include arsenic, cadmium, copper, iron, manganese, selenium and zinc (Water Management Consultants, 2005a).

3.0 FORT KNOX WETLANDS

3.1 Jurisdictional Wetland Survey

American North/EMCON, Inc. conducted fieldwork in 1990 and 1992 to map the jurisdictional wetlands within the Fort Knox Project area. The resulting survey (American North/EMCON, 1992) showed that historical mining had occurred within the five drainages in the project area. All five drainages were disturbed to some degree by historical or recent mining activity. Disturbance had altered some wetlands to the point they no longer meet regulatory criteria for wetlands. As of August 1992, 2,526 acres met the definition of wetlands. Tables 3.0 and 3.1 summarize the jurisdictional wetlands identified in 1992.

Table 3.0 Jurisdictional Wetlands Summary, 1992

Total Project Footprint	4,640 acres
Uplands	-3,307 acres
Non-Jurisdictional Wetlands	-222 acres
Total Jurisdictional Wetlands	1,112 acres

Table 3.1 Jurisdictional Wetlands Breakdown, 1992

Undisturbed Wetlands	784 acres
Historically Disturbed Sites	172 acres
Recently Disturbed Areas	133 acres
Existing Sediment settling Ponds	23 acres
Total Jurisdictional Wetlands	1,112 acres

3.2 Department of the Army Section 404 Permit

In May 1994, Department of the Army Permit No. 4-920574, Fish Creek 23, was issued by the U.S. Army Engineer District, Alaska to FGMI. It allowed the disturbance of 377 acres of wetlands and the discharge of approximately 4,526,140 cubic yards of fill into approximately 103 acres of waters of the United States in conjunction with mining activities. In mitigation for the disturbance, Special Condition 9 of this permit requires that FGMI reclaim the tailing material deposited behind the embankment in proportions listed in Table 3.2. Exhibit E, of Permit No. 4-920574, Fish Creek 23 also prescribes additional mitigation (approximately 46 acres) of the historically disturbed area below the tailing embankment and 165 acres as the footprint of the Water Supply Reservoir including the stilling basin.

Table 3.2 Mitigation Requirements for tailing impoundment Required by 404 Permit

35% Wetlands	424.5 acres
35% Ponds	424.5 acres
30% Uplands	364 acres
Total	1,213 acres

3.3 Fish Creek Valley Developed Wetlands Delineation

To begin fulfilling mitigation requirements of the Section 404 permit, creation and enhancement of wetlands and other waters on the Fort Knox Mine site began in 1997. Old existing placer workings along the south side of the Fish Creek Valley were modified to pond water in the area between the tailing monitoring wells and the upper limit of the water supply reservoir (Figure 1.1). These wetlands and ponds were designed to offset wetland impacts from previous disturbance and the construction of project components. In addition, this wetland area was created to assist in the enhancement and maintenance of the long-term water quality in Fish Creek. Development and enhancement of the wetlands included construction of new ponds and improving existing ponds. A total of six ponds were developed that promoted development of wetland vegetation (emergent, riparian shrub scrub and forested).

Specific Criteria:

- Re-contouring of placer mining disturbances has established a series of channels, wetlands and shallow ponds in Fish Creek between the tailing impoundment and the water reservoir.

- Organic material cleared from past placer mining activities was placed in designated portions of the ponded areas to aid in the re-establishment of vegetation.

- Natural invasion by native species was encouraged and has been successful in the creation of this wetland.

- Flow-through structures have been designed as passive sediment traps and to decrease velocity of channel flows sufficiently to prevent down cutting and channel migration.

- Continuous monitoring of these structures allows for modification and improvement prior to final closure. The flow regime through these developed wetlands will remain fairly constant throughout the mine life and after final closure.

The development and enhancement of wetlands and water resources include:

- A series of wetlands and connecting channels designated as Ponds A-F (Figure 1.1) created in the Fish Creek valley between the tailings dam and the water supply reservoir,

- The water supply reservoir and stilling basin, and

- Last Chance Creek floodplain enhancement activities.

Golder performed a delineation of the developed wetlands (DeFrancesco, 2004) during the periods of July 29 through July 31, 2003 and August 6 through 8, 2003, in accordance with the US Army Corps of Engineers *Wetlands Delineation Manual January 1987*. In terms of overall wetlands and other aquatic sites created, FGMI has to date developed a total of 204.8 acres, including wetlands below the tailings dam and the water reservoir with its associated wetlands. Wetlands and other aquatic sites created by FGMI below the tailings dam were primarily aquatic (pond) sites surrounded by Palustrine Scrub-Shrub (PSS) wetlands. The water reservoir and associated wetlands (including the stilling basin) are primarily open water sites surrounded by Palustrine Forested wetlands and PSS wetlands. The water reservoir and associated sites created by FGMI total 184.3. Additional habitat enhancement on Last Chance Creek which flows into the water reservoir was completed by FGMI and was non-prescribed. Neither the lake within the pit, nor the wetlands/ponds/uplands on the reclaimed tailing impoundment, have been created to date, but they are planned for development upon mine closure. Currently the final pit lake is projected to be approximately 150 acres. Table 3.3 summarizes the current status of wetlands development/enhancement as compared to what is required by the 404 permit.

Table 3.3 Wetland Acres Created/Enhanced and 404 Permit Prescribed Mitigation Acres

Reclamation Type	404 Permit* Prescribed Acres	Created Acres	Additional Acres Needed
DA Permit Special Conditions for Reclaimed Tailings Impoundment (Combination of wetlands/ponds)	425 ac pond 425 ac. wetland	**	425 ac pond 425 ac. wetland
Below the Tailings Dam	45 acres	20.5	24.5
Lake within Pit (not required by 404 permit)	148 acres	**	148
Water Reservoir and Associated Wetlands (Includes Stilling Basin)	165 acres	184.3	-19.3
Additional Habitat Enhancement (Last Chance Creek)	NA	Fish passage and spawning improvements	NA

* Based on Department of Army Permit issued in 1994
** Indicates activity not yet completed by FGMI

The acres of wetlands and open water to be developed through implementation of the currently proposed reclamation and closure plan are provided in Table 3.4.

Table 3.4 Summary of Wetland and Open Water Acres To Be Created

Facility	Open Water	Wetlands
Fort Knox Pit Lake	148	
TSF Open Water	481	
Water Reservoir and Associate Wetlands	184	
TSF Wetlands		286
Fish Creek Wetlands North (Planned)		14
Fish Creek Wetlands South (Existing)		20.5
Total	813	320.5

At present both the pond wetlands and the water reservoir with its associated wetlands are providing fish habitat. ADNR, Office of Habitat Management & Permitting (OHM&P) has conducted annual monitoring of Arctic grayling (*Thymallus arcticus*) and burbot (*Lota lota*) populations in the water reservoir, stilling basin, and created wetlands in Fish Creek since development of the wetlands and reservoir. Successful spawning of Arctic grayling has been documented every year since 1999, and

there is evidence of substantial recruitment to the population. Substantial out migration of Arctic grayling is also occurring to the Chena River system. Information on these fisheries is documented in *Arctic Grayling and Burbot Studies at the Fort Knox Mine, 2005* (Ott and Morris, 2005).

3.4 Developed Wetlands Functional Analysis

An analysis of wetland functions and values was performed as part of the Fort Knox project development strategy in 1993. This pre-development analysis was summarized in a report to FGMI (Buell 1993) and was based in large part on principles and procedures established by the Wetlands Evaluation Working Group (WEWG) within the Joint Pipeline Office originally established to assess

wetlands impacts of the Trans-Alaska Gas Pipeline. Procedures established by WEWG were modified and expanded to better fit the environmental setting of the Fort Knox project. The approach assigned a set of numeric positive (gained) and negative (lost) scores to each wetland area for each of eleven functions/values distributed among three major categories: Aquatic Use Support, Terrestrial Use Support and Human Use Support. This approach corresponded generally to those identified as important for central Alaska by WEWG:

- Water source (quantity)
- Water quality
- Food chain; primary productivity
- Wildlife habitat
- Fish habitat
- Recreation/subsistence
- Vulnerability to disturbance.

These functions and values were rearranged into three major categories and further sub-divided into individual functions: Aquatic Use Support, Terrestrial Use Support and Human Use Support. Scores were awarded according to specific criteria and multiplied by the number of acres in each wetland unit to derive the functional value of the wetland unit.

The 2004 wetlands and aquatic functional value analysis (Buell and Moody, 2004), serves as a *present status* evaluation of the Fort Knox project. However, plans for development of a heap leach project were not envisioned at the time of the evaluation in 2004, and therefore, some modification of the evaluation to account for the heap leach disturbance will be necessary. The approach used in 1993 was also used in the 2004 analysis for comparative purposes. The results of the functional value analysis are summarized by support service category (Figure 3.0) and for each use (Figure 3.1).

Conclusions of the 2004 re-assessment of wetland and aquatic functions and values associated with the Fort Knox gold mine include:

- The current (interim) functional status of most mitigation/restoration measures is nearly at parity with overall functional impacts projected for mine development in the 1993 analysis;
- Functional status of the fresh water reservoir is significantly higher than projected in all use support categories;
- Significant opportunities exist within some areas for additional wetland and aquatic feature functional gains;
- Functional gains remaining as an obligation for FGMI, either under its final reclamation plan (to be implemented upon mine closure) or by means of additional interim mitigation/restoration measures, are relatively minor compared to gains made to date;
- Very significant opportunities remain within the tailings disposal area and the all other areas to exceed the wetlands functional status; and
- By any reasonable measure, the Fort Knox project is very significantly ahead of schedule in terms of meeting its mitigation obligations for wetlands functions and values.

A letter from ACOE, dated June 22, 2005, accepted the rational and current accounting of the wetlands and aquatic functional value analysis. The letter noted that the current accounting of functions provides FGMI flexibility in the final reclamation design for the tailing impoundment and mine site.

3.5 Heap Leach Wetland Impacts

In 1992, a jurisdictional wetland survey was completed for the Fort Knox Project. Additional acreage has been identified based on current conditions and current regulations. Figure 3.2 illustrates the planned heap leach pad and the 54.7 acres of jurisdictional wetlands that will be impacted by the pad. An additional 2.91 acres of jurisdictional wetlands identified on figure 3.2 will be disturbed by roads and pipelines to be constructed in conjunction with the heap leach pad. Within the footprint of the heap leach pad, 15.3 acres of wetlands were previously permitted to receive fill as part of the tailing impoundment.

Figure 3.0 Summary of Wetland Functional Scores by support service category (Buell and Moody, 2005)

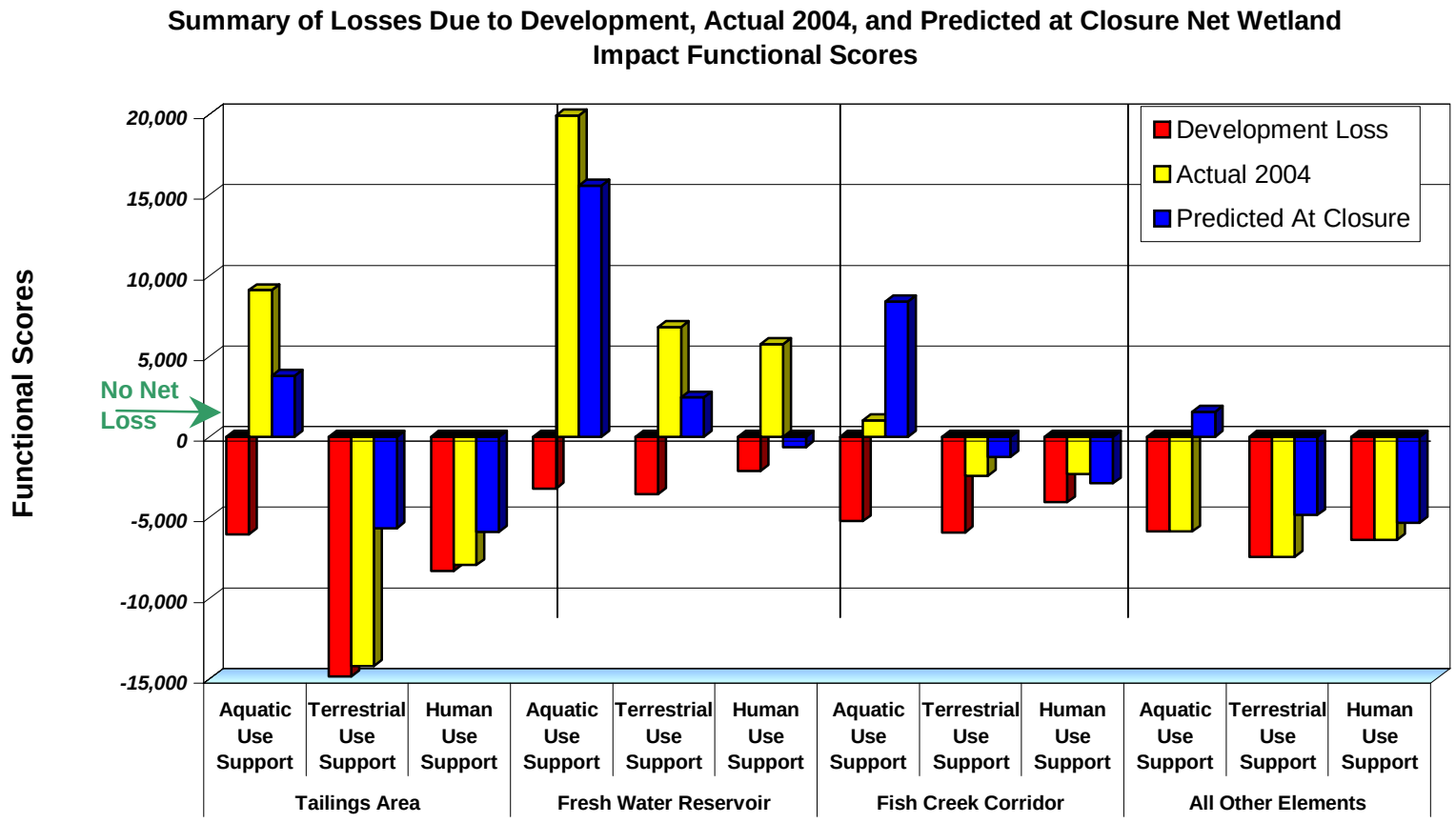
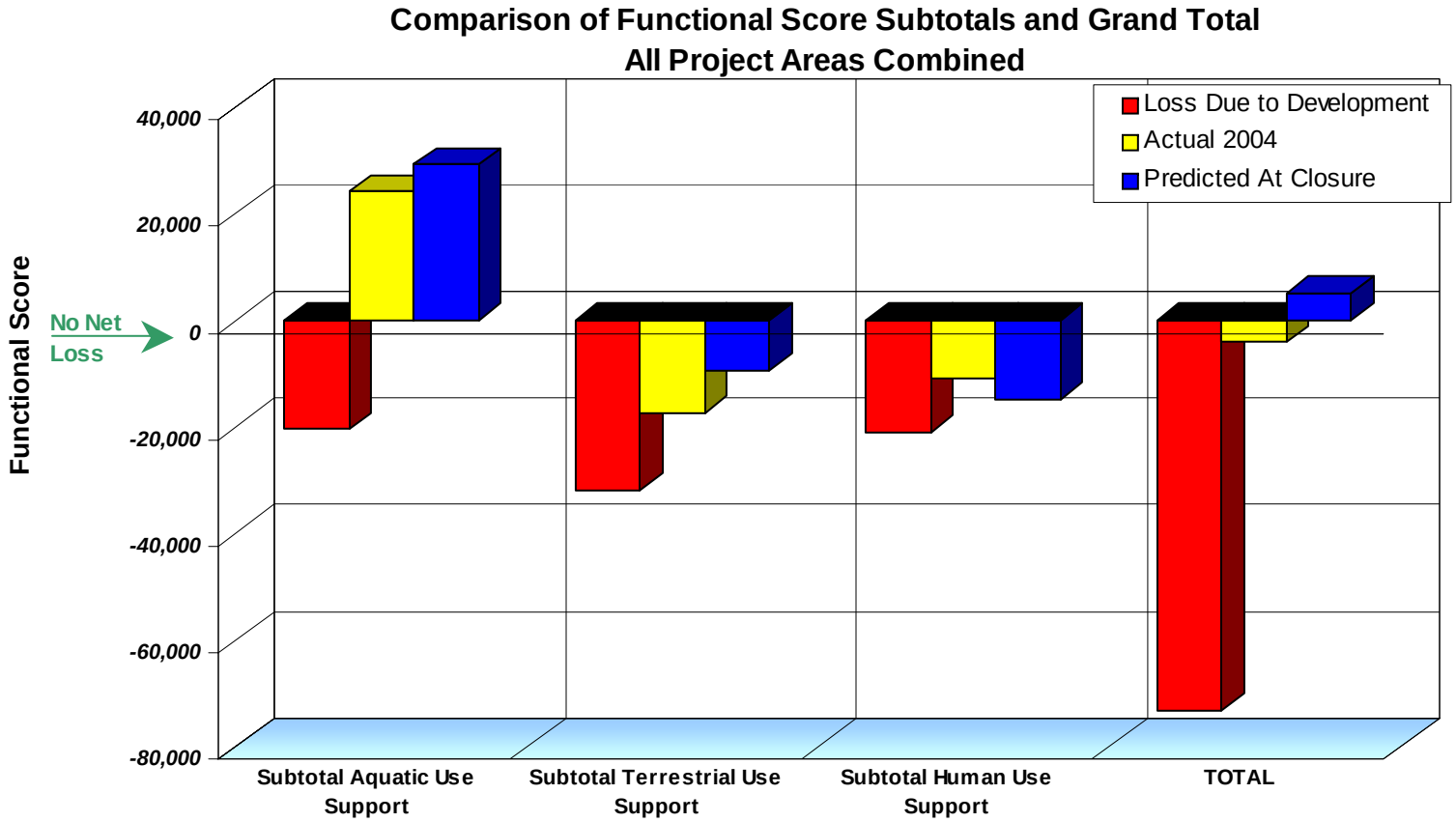


Figure 3.1 Comparison of Functional Scores by use (Buell and Moody, 2005)



EXISTING FORT KNOX MINE ACCESS ROAD

EXISTING FORT KNOX MINE ACCESS ROAD

WALTER CREEK VALLEY FILL HEAP LEACH FACILITY ULTIMATE LIMIT

WEXISTING UTILITY ROAD WILL BE INCORPORATED IN FACILITY PERIMETER ROAD

EXISTING UTILITY ROAD

WALTER CREEK

EXISTING WALTER CREEK CROSSING

IN-HEAP STORAGE EMBANKMENT DOWNSTREAM TOE

EXISTING PIPELINE ROAD

BH-5 (NE/10.5/50)

BH-4 (NE/157/75)

BH-3 (NE/1/75)

BH-2 (NE/17/100)

BH-1 (NE/10.5/75)

N 20,000

N 18,000

WETLANDS IMPACTED BY PAD

Length 480'
Width 210'
Fill 30,000 CY

Length 210'
Width 175'
Fill 25,000 CY

Length 290'
Width 200'
Fill 59,000 CY

WETLANDS IMPACTED BY ROAD AND PIPELINE

LEGEND:

- 2200 — EXISTING GROUND SURFACE CONTOUR AND EL, FEET
- PROPERTY BOUNDARY
- EXISTING PIPELINE
- EXISTING DRAINAGE/DIVERSION
- Existing Utility Pole — EXISTING POWER LINE
- EXISTING ROAD
- EXISTING CULVERT
- EXISTING SPRING
- Tailing Permit Boundary
- Heap Leach Boundary
- Wetlands Boundary
- 1992 Jurisdictional Wetlands
- EXISTING SITE ACCESS ROAD FILL
- Jurisdictional Wetlands
- TAILING (CONFIGURATION AS OF 4/30/2005)

NOTES:

1. SUMMARY LOGS OF THE TEST HOLES AND TEST PITS ARE INCLUDED IN THE WALTER CREEK VALLEY FILL HEAP LEACH FACILITY DESIGN REPORT.
2. BOREHOLES BH-1 THROUGH BH-5, DRILLED FOR SOIL SAMPLING, DUPLICATE THE LOCATIONS OF BH-WSS1 THROUGH BH-WSS5, DRILLED FOR ROCK, RESPECTIVELY.
3. TEST PITS TP-5, 9, 10, 11, AND 15 WERE NOT COMPLETED DUE TO INACCESSIBILITY CAUSED BY DENSE FORESTED AREAS.

REFERENCE:
TOPOGRAPHIC MAPPING PROVIDED BY CLIENT DATA FILE NAMED: FORT_KNOX_2005_LOCAL.DWG. DATED: 07/06/05 RECEIVED BY KNIGHT PIESOLD ON 7/2005. SEE G:\101\00089.08\A\Data_Info\External\TOPO\071505

PLAN

300 0 300 600 FEET

PLOT SCALE 1:2 | XREF: NO

FORT KNOX Gold Mine • Alaska

Heap Leach Pad Jurisdictional Wetlands

Figure 3.2

REV

SCALE: 1" = 1000' | DATE: 5/2006 | SHEET 1 OF 1

3.6 Fishery Development and Enhancement

The primary land use objectives for reclaiming Fort Knox are the development of wildlife habitat and the fishery potential throughout the mine site but particularly in the developed Fish Creek wetlands and the water supply reservoir. In cooperation with OHM&P and ADNR, FGMI has strived to maximize the potential for development of a fishery resource within the water supply reservoir and the associated Fish Creek wetlands. Design of the project facilities (i.e., road crossing of Solo Creek, development of wetlands upstream of the freshwater lake, material borrow sites adjacent to and connected to the reservoir lake) and the construction plans for the freshwater dam were developed to facilitate the establishment of a fishery resource in the water supply reservoir. The long-term goal is to establish a productive and sustaining fishery resource upon completion of mining and reclamation.

A two-year fisheries study, initiated in 1992, was conducted to gather baseline data on fisheries resources, water quality and quantity, and benthic invertebrates in that portion of Fish Creek proposed for mine development. Based on sample results, it was documented that Arctic grayling, burbot, and slimy sculpin (*Cottus cognatus*) occur in a limited area of Fish Creek upstream of the proposed water supply reservoir. Arctic grayling spawn, rear, and overwinter in the upstream area of Fish Creek drainage near Solo and Last Chance creeks. Spawning was confirmed by the presence of adult and young-of-the-year Arctic grayling.

Since November 1995 when FGMI began impounding water within the water supply reservoir, ADF&G (now OHM&P) has been monitoring both the fishery and water quality. In 2005, it was determined that the Arctic grayling successfully spawned in the Fish Creek wetland Complex and Last Chance Creek. The estimated grayling population in the spring of 2004 was 6,614, which is unchanged from the spring of 2002 and 2003. The burbot population in the spring of 2004 was 2,100, which is a slight increase from the spring of 2003. OHM&P has compiled the monitoring and sampling data (Ott and Morris, 2005).

4.0 SURFACE DISTURBANCE AND LAND USE

4.1 Surface Disturbance

Placer and Other Mining Disturbances as of August 1992

Extensive placer mining in the project area since 1917 disturbed a substantial portion of the surface landscape in the valley bottom along the entire length of Fish Creek. Considerable placer mining disturbance was also apparent along Monte Cristo, Barnes, Pearl, Yellow Pup, and Last Chance creeks. Generally, the disturbances extended across valley bottoms of these creeks and ranged in depth from about 10 to 40 feet. Many of these areas had ice-rich permafrost that was thawed by hydraulic mining. Year-round placer operations occurred during 1991, 1992, and 1993.

Prior to construction of the Fort Knox Mine facilities, placer or other mining activity had disturbed approximately 904 acres within the Millsite Permit area. Of this, approximately 367 acres was classified as historically disturbed (characterized by some revegetation), and 511 acres as recently disturbed (characterized by a lack of vegetation). An additional 26 acres were characterized by large sediment settling ponds. These acreage figures did not include areas encompassed by roads, trails, historic ditches, cabin sites, and small, localized disturbances.

Reclamation of Pre-Mining Disturbances

Prior to discovery and development of Fort Knox, more than 90 years of placer mining activities had substantially affected the Fish Creek drainage. Approximately 904 acres (CH2M Hill, 1993) had been previously disturbed, and this disturbance substantially contributed to poor surface water quality.

Construction of the tailing impoundment and the water reservoir has stabilized the existing placer disturbances and greatly improved water quality. Both structures have increased the retention time of average surface flows and storm events, thus moderating total suspended solids and turbidity in Fish Creek. Reclamation during and directly after construction of the dams concentrated on the existing placer disturbances between the tailing impoundment and the water reservoir. Construction, development and enhancement of the area resulted in a wetland complex that includes a series of sedimentation ponds and the revegetation of the area.

Fort Knox Mine Disturbance

The area disturbances listed in Table 4.0 include State, MHTLO, and private lands over the life-of-mine of Fort Knox Mine operations. These acreages reflect life-of-mine disturbance.

4.2 Land Use

Land Use Prior to Fort Knox

Mining activities have been continuous in the Fish Creek drainage since 1902. Mineral exploration and placer mineral extraction produced the greatest visible impact to surface features including cuts, tailing mounds, sediment ponds and areas damaged by erosion. Recreational uses of the area included hiking, biking, berry picking, cross country skiing, snowmobiling, dog mushing, horseback riding, trapping and small/large game hunting.

The site supports those wildlife species typically inhabiting taiga (subarctic evergreen forest). Avian species include numerous migratory birds and raptors. Mammals range from small shrews, voles, mice, lemmings, Red squirrels, porcupines and Snowshoe hares to larger species including foxes, wolves, Black bears, Brown bears, and moose.

Table 4.0 Areas and Acreage of Disturbance

Location	Acres Disturbed
Tailing Impoundment	1019
Tailing Dam	121
Open Pit	478
Waste Rock Dumps	790
Ore Stockpiles	98
Roads	260
Building and Complexes	126
Borrow Sites	311
Power Lines	39
Growth Media Stockpiles	44
Developed Wetlands	99
Water Supply Reservoir & Dam	173
Water Storage Dam	30
Walter Creek Heap Leach Pad	315
Heap Leach Haul Road	20
Total	3923

Land Use During Fort Knox Operation

State surface land use authorizations allow limited access by the general public. Restricted access is due to the inherent hazards associated with the operation of large mine equipment and process components. Compliance with requirements of MSHA regulations limits access to personnel trained to recognize hazards and observe safety rules to insure the health and safety of employees and visitors. In order to ensure the safety of mine employees and the public, all hunting, fishing, and trapping within the Millsite Lease area are prohibited.

Post-Mining Land Uses

The Fort Knox operation will alter the landscape of the site for the long-term. The pit will be reclaimed as a lake that is approximately 750 feet deep and covering approximately 150 acres, creating a source of open water in a landscape that contains very few large bodies of water. The water supply reservoir and developed wetlands with their associated open water have altered, diversified and increased the functional value (Buell & Moody, 2005) of the reclaimed area. These areas will continue to be of great interest to OHM&P and the ACOE for their potential for fish and wildlife resources. Future proposed reclamation will produce both wetland and upland sites to increase productivity of post-mining land use as wildlife habitat.

ADNR, Alaska Department of Fish and Game (later to become OHM&P), and FGMI entered into an agreement titled *Agreement For Funding Post-Reclamation Obligations* dated February 1994 (Appendix A). The agreement specifies that after ten years of post-closure monitoring (Phase II Reclamation) a portion of the project area that includes the developed Fish Creek wetlands and the freshwater reservoir is to be transferred to an organization to be formed that includes the State of Alaska and FGMI. All remaining permits and obligations for the Millsite Lease will be transferred to the organization at this time. The organization is to be funded by FGMI. Once transferred to the State of Alaska, an area downstream of the tailing impoundment including the freshwater reservoir is to be managed as a public use/recreation site.

5.0 RECLAMATION PRACTICES

FGMI's long-term goals for reclamation performed during and after mining and milling operations are to contour, stabilize, and revegetate disturbed areas in order to return the land disturbed to a safe, stable and productive condition. The current designated post-mining uses for the Fort Knox Mine area are for wildlife habitat and recreation as prescribed by the Tanana Basin Area Plan (ADNR, 1985 & 1991). FGMI is contouring and stabilizing disturbed areas to create ground conditions that promote vegetation development and provide conditions for colonization by native species. Native grass species available commercially are used for rapid soil stabilization. Trial plots using native grasses, forbs and shrubs commercially available are being developed to identify species that perform well for reclamation seeding. The ADNR Plant Material Center (PMC) recommended fertilizer formulas are being used.

The objectives of the reclamation and closure plan are:

- Stabilization and protection of soil materials from wind and water erosion;
- Stabilization of steep slopes through contouring to provide rounded land forms with erosion control; and
- Establishment of long-term, self-sustaining vegetation communities conducive to natural invasion and succession.

FGMI will continue working with ADNR, Division of Agriculture Plant Materials Center, and Office of Habitat Management & Permitting to achieve the successful implementation and subsequent evaluation of both concurrent and long-term reclamation activities. FGMI considers reclamation to be a progressive process that includes the design, construction, operation, and closure of the mining operation. Reclamation will or has occurred in the following phases, with some overlap:

- Reclamation completed during and directly after process component construction (includes interim reclamation to stabilize and maintain viability of topsoil stockpiles):

- Reclamation concurrent with mining;

- Final reclamation will commence upon cessation of mining, milling and heap leach operations. Final reclamation will include removal of process components, contouring, and revegetation. Final reclamation will be initiated immediately upon cessation of mining, heap leaching, and milling operations. Major earthwork will be completed within 2 to 5 years; and

- Post-closure monitoring will consist of monitoring and maintenance after the reclamation performance standards and the water quality standards established by the Solid Waste Disposal Permit issued by the Alaska Department of Environmental Conservation are achieved. After water quality standard are achieved and a period of post-closure monitoring has been completed to ensure that the reclamation and closure are performing as planned, the *Agreement for Funding Post-Reclamation Obligations* (Appendix A) becomes active.

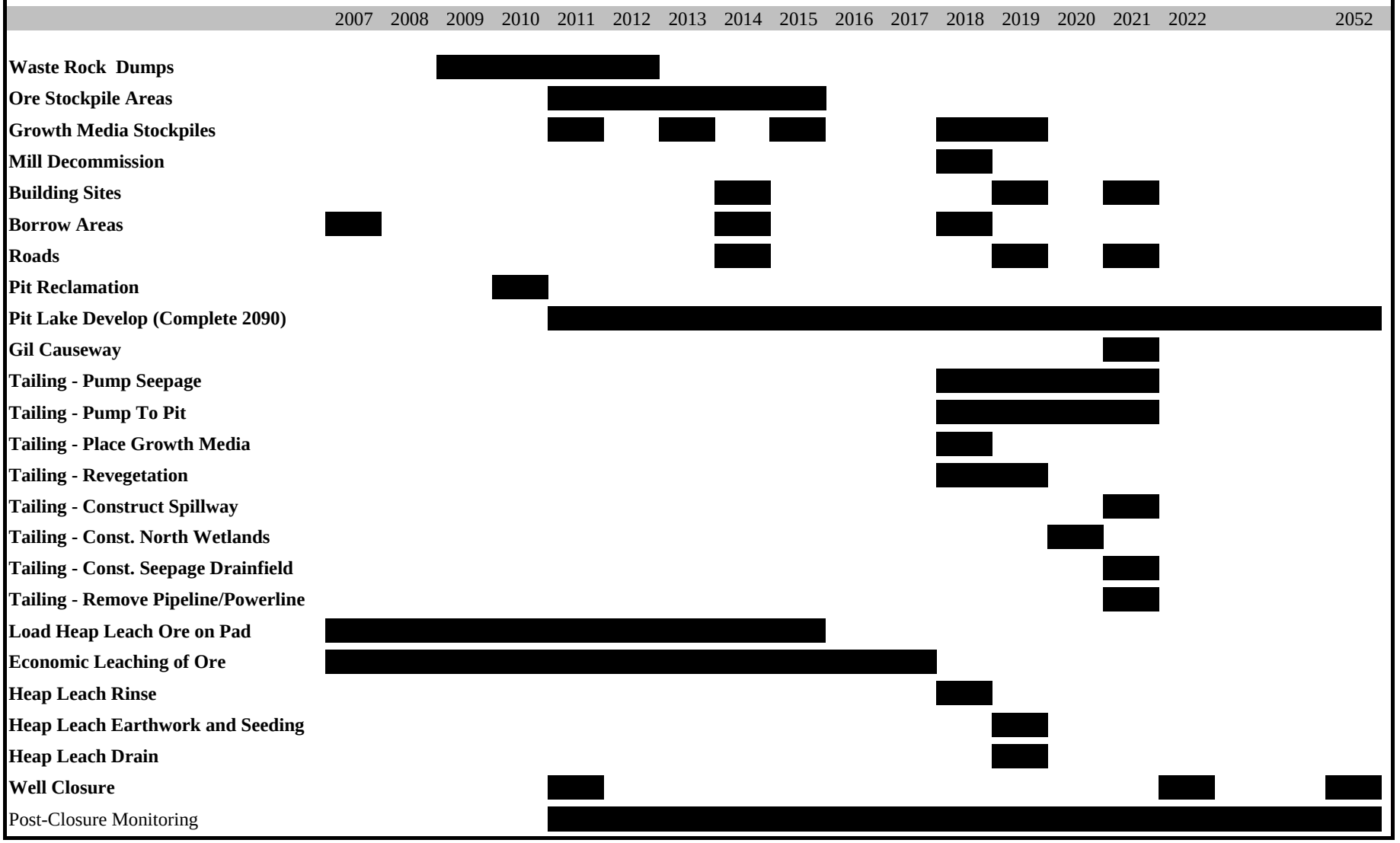
The general reclamation procedures are discussed in Section 5.2. The details and procedures for area specific reclamation such as the pit, waste rock dumps, tailing impoundment, heap leach facility, etc. are discussed in Section 6.0.

5.1 Schedule of Reclamation Activities

Reclamation Schedule

The planned schedule for major reclamation activities is illustrated in Figure 5.0. Mining will cease in 2010 and milling will cease in 2012. The heap leach operation will continue to have ore loaded from stockpiles until 2015. An additional two years of economic heap leaching is projected after the date that all ore is loaded on the pad. Reclamation will begin in 2007 with the reclamation of borrow areas. The dewatering wells in the pit will be abandoned in 2010. During the next two years, waste rock dumps will be reclaimed. By 2014, the crusher and the conveyor/stockpile will be removed and the areas reclaimed. Portions of the mill may be removed at that time but parts of the mill such as the cyanide detox, carbon stripping and regeneration and the refinery will remain until 2018 when the economic recovery of gold from the heap leach has been completed. Closure of the heap leach pad is projected to be completed in 2019. The tailing impoundment will not be closed until heap leaching is completed. It will remain to provide emergency containment for the heap leach for so long as the heap leach is in operation. Closure of the tailing impoundment is projected to begin in 2018 as tailing water is pumped into the pit. The placement of growth media and revegetation of the tailing surface will occur over the next two years as conditions allow. In 2021, the interceptor well system will be turned off providing that water quality standards are achieved.

FIGURE 5.0
RECLAMATION & CLOSURE SCHEDULE



In 2021, the tailing impoundment spillway will be constructed, and the wetland treatment system on the north side of Fish Creek Valley will be in place. The demolition of the freshwater barge and the seepage pump house complex will also be completed in 2021. The various roads remaining will be reclaimed if agreed upon by ADNR and MHTLO and the administration building will be removed. Post closure monitoring begins for each mine facility when reclamation of that facility is successfully completed and continues for thirty years thereafter. The last major facility to be reclaimed will be the tailing impoundment and closure of the tailing is projected to be completed in 2021. After approximately ten years of post-closure monitoring demonstrating successful reclamation and closure, monitoring will be conducted in accordance with the *Agreement for Funding Post Reclamation Obligations* (Appendix A).

Reclamation of Construction Sites

During stripping operations for construction of the process components (tailing dam, freshwater dam, mill site, crusher, maintenance shops, etc.) growth media was selectively stockpiled. Additional stockpiles will be developed with growth media and organics from the heap leach disturbance. Figure 5.1 illustrates the location of growth media stockpiles existing and planned. Topsoil and overburden stripping will continue as the ore body, waste rock dumps and heap leach facilities are fully developed. High quality growth media will continue to be stockpiled throughout the mine life. Growth media stockpiles will be located near their sites of origin or in areas of future use. Interim reclamation of the growth media stockpiles will proceed after placement to stabilize and protect stockpiled material for final reclamation should the material be needed. Areas disturbed during construction that would not be re-disturbed during operations have been reclaimed, as will be any future areas disturbed for construction. Areas identified for final reclamation, during or immediately after construction, included material borrow sites and pre-development placer disturbances (wetlands below the tailing dam).

Concurrent Reclamation

FGMI implements interim reclamation at inactive areas within the mine site, such as borrow areas, until final reclamation can be completed. Soil stabilization and erosion control measures are used on all disturbed and unprotected areas prior to the end of a normal operating season.

Opportunities for concurrent reclamation of waste rock dumps and overburden dumps have not occurred to date, as these sites have remained active during mining operations. Small areas of the waste rock dumps have been used for temporary revegetation trial plots. However, these sites will likely become active again before mine closure. Trial plots on deposited tailing have been short lived since tailing deposition has not reached its maximum elevation. Concurrent reclamation will take place when opportunity allows, and these opportunities will increase as Fort Knox nears the end of mine life.

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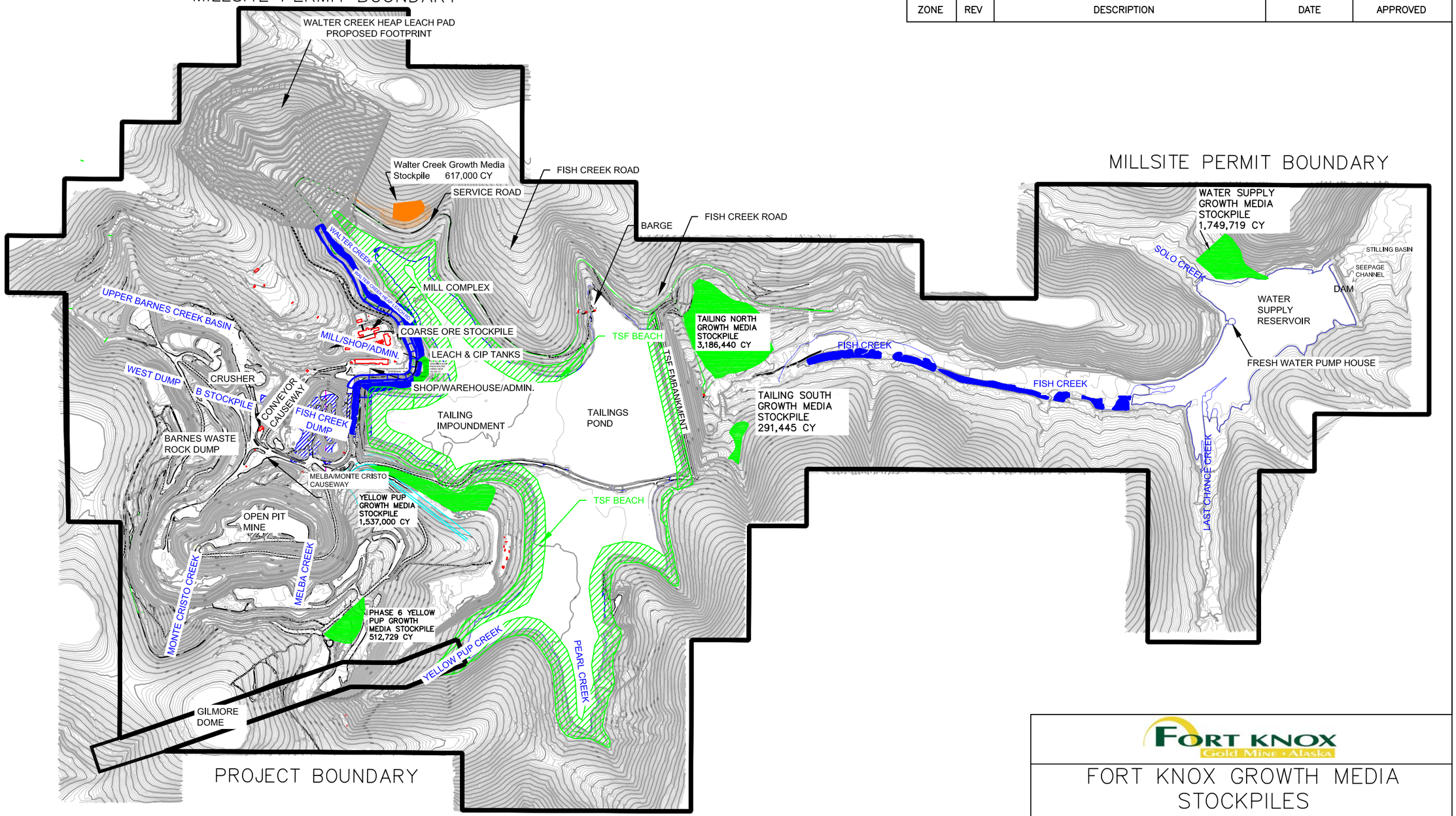

FORT KNOX Gold Mine • Alaska

FORT KNOX GROWTH MEDIA STOCKPILES

SIZE	DRAWING NAME	Figure 5.1	REV
SCALE: NTS	DATE: 11/2005	SHEET 1 OF 1	

Final Reclamation

Under the current permitting, engineering, economic scenario and mine plan, production will continue until 2012. Final reclamation will be initiated as activity on each area is completed. Final reclamation that includes contouring and revegetation will be initiated immediately after cessation of mining, heap leaching, and milling operations and be completed within 2 to 5 years. Reclamation will be implemented as concurrent with mining operations as mining activities allow. Written notification of final closure will be given to the ADNR and ACOE within 90 days after cessation of mining, heap leaching, and milling operations. The notice will state the date on which final reclamation activities will begin.

Once mining ceases, reclamation will begin on the pit, waste rock dumps, and portions of the tailing facility. The crusher, shop, office, warehouse and mill will be decommissioned and those sites reclaimed at the completion of mining, heap leaching and milling.

Temporary Closure

Temporary closure means the cessation of the mining, heap leaching, and milling operations for a period of not more than three years. If conditions require temporary closure to extend beyond three years, final reclamation will begin, unless an extension is requested by FGMI and approved by ADNR. Temporary closure scenarios that require modifications to the plan of operations, reclamation plan or 404 Permit will be coordinated with the appropriate Federal and State agencies for approval.

Temporary closure may include planned and unplanned cessation of the mining, heap leaching, and milling processes. Planned temporary closures, which have specific conditions defining their beginning and end, include, but are not limited to, the following:

- Interruptions in the active beneficiation processes to provide planned periods of inactivity for metallurgical or operating reasons.

- Any other planned condition that will interrupt the active beneficiation process including modification to process components or suppressed metal market conditions.

- Change in ownership requiring the temporary cessation of operations while operating permits are transferred to the new owner/operator.

Unplanned temporary closures may include, but are not limited to, the following:

- Closure because of unforeseen weather events.

- A failure in a major system component or a process failure that causes the fluid management system, or a portion of it, to shut down.

- The cessation of operations due to litigation.

5.2 General Reclamation Procedures

The primary components of reclamation for the Fort Knox Reclamation Plan include earthwork, growth media placement, seedbed preparation, fertilizing, seeding, and monitoring. FGMI will manage these components keeping in mind that the ultimate goal is to achieve a stable revegetated post-mining land surface that will promote natural invasion by native plants. FGMI will continue to work in coordination with OHM&P to develop and enhance the fish and wildlife potential throughout the project area.

Earthwork

Reclamation of Fort Knox will require extensive earthwork. Waste rock dumps, the tailing impoundment and the pit will require major grading, contouring, and possible growth media application. Generally, slopes will be graded to 2.5H:1V or shallower.

Earthwork will utilize heavy equipment typical to the industry. It is anticipated that the equipment list will include (or equivalents thereof): D10N Cat., D9N Cat., D8L Cat., rubber-tired scraper, water truck, and motor graders. Other equipment such as (but not limited to) front-end loaders, track and tire mounted backhoes, and haul trucks may be substituted for or included with this general equipment list. Equipment needs and use must and will remain dynamic, as specific conditions require during implementation of the plan.

Control of Sedimentation

Implementation of Best Management Practices (BMP) to control erosion during active mining will be designed to minimize re-disturbance during reclamation. The BMPs will be consistent with those measures and practices identified in Alaska Department of Transportation and Public Facilities, *Alaska Storm Water Pollution Prevention Plan Guide* (DOT, 2005).

Temporary control devices will be removed when the site-specific threat of erosion has been minimized through earthwork or revegetation. There may be sound reasons to continue maintenance of some control structures depending on final recreational use areas and other types of use.

Growth Media

"Growth media" is defined herein as all native soil (in-place) material with the physical and chemical properties capable of germinating and sustaining vegetation growth with or without amendments. At the Fort Knox site, the term "growth media" is interchangeable with the terms "topsoil" and "overburden". Overburden material, suitable for use as growth media, is the unconsolidated material that lies between the topsoil horizon (where present) and bedrock and exhibits no chemical characteristics that will inhibit vegetation development.

Growth media (topsoil and overburden) will be stockpiled at Fort Knox in anticipation of future reclamation needs. Table 5.1 provides a summary of growth media salvaged and that planned for salvage as operations progress. Growth media will be applied only to those sites where required to achieve satisfactory vegetation establishment and growth. Application depth may vary depending upon the facility, but a depth of six inches is assumed in this plan. Assuming a disturbed area of 3,923 acres applying 6 inches of growth media over the entire area would require 3,164,555 CY of growth media. Growth media will be applied by scraper or dump truck and spread by a dozer. Figure 5.1 illustrates the location of growth media stockpiles that exist and that are planned.

Table 5.1 Estimated Growth Media Volumes

Growth Media Salvage Volumes

Site	Volume (CY)
Yellow Pup Growth Media Stockpile	1,537,000
Yellow Pup Phase 6 Grow Media Stockpile	512,729
Walter Creek Growth Media Stockpile	617,000
Tailing South Grow Media Stockpile	291,445
Tailing North Grow Media Stockpile	3,186,440
Water Supply Growth Media Stockpile	1,749,719
Total	7,894,333

Seedbed Preparation

Mine and mine related disturbances can result in compacted surfaces unsuitable for revegetation. Thus, preparation of a seedbed suitable for plant germination and growth can be a critical task in any successful land reclamation project. At Fort Knox, the general method of seedbed preparation will be ripping or scarifying on the contour using a D8N Cat (or equivalent) equipped with a 2 or 3 shank ripper. Ripping will occur along contours of sloped areas to promote erosion control in addition to creating a suitable seedbed. Highly compacted areas such as equipment lots and roads will be ripped

in a linear fashion. Following the application of growth media if necessary, the specific site will be prepared for seeding by ripping on the contour to roughen the surface. A broken, roughened surface will serve to trap moisture, reduce wind shear, minimize surface erosion by increasing infiltration, and create micro-habitats conducive to seed germination and development.

Fertilizer and Fertilization

Prepared seedbeds will be fertilized prior to, after, or during the seeding operation. Specific fertilization requirements will depend on the quality of growth media used. Growth media will be tested for standard soil agricultural constituents including nitrogen, phosphorus and potassium. Based on limited field-testing and soil test results at Fort Knox, the general recommended rate of fertilizer application will range from 100 to 300 pounds per acre of 20N-20P-10K for a spring seeding or 10N-20P-10K for a fall seeding. Final fertilizer and application rates for the tailing will consider information acquired from current reclamation, trial plots and soil tests. Tailing impoundment revegetation test plots utilizing varying rates of fertilizer will be established when areas can be located on the tailing that will not be subjected to further disturbance for at least one year.

Seed and Seeding

The grass seed mix presently used at Fort Knox is listed in Table 5.2. The primary purpose of this seed mix is to achieve quick vegetative cover that will help minimize soil erosion. Test plots are being established to help identify desirable forbs to include in the seed mix. Forb species currently being considered for revegetation include: Silverberry, Lupin, Oxytropis, Wild Sweet Pea, Sweetbroom, Burnet, Siberian Aster, Goldenrod, Alpine Milk Vetch, Wild Sage, Dragonshead Mint and Wild Rhubarb. However, these varieties are not currently available commercially, and a commercial source must be located if they are to be incorporated in the seeding mix. The seed mix may change over time in response to such factors as internal and external research results, changes in technology, changes in land management philosophy, and commercial availability. Native species will be the preferred mix. However, other species may be used some years due to availability or if deemed to better meet the post-mining land use criteria and approved by ADNR.

Table 5.2 Seed Mix

ARCTARED RED FESCUE	50%
GRUENING ALPINE BLUEGRASS	20%
TUNDRA GLAUCOUS BLUEGRASS	20%
NORTRAN TUFTED HAIRGRASS	10%

Seeding will be accomplished using broadcast methods that may include but not be limited to hand broadcasting, dozer or off-road vehicle mounted broadcasting and aerial broadcast application. The application rate for broadcast seeding using the presently proposed grass seed mix will be 11-18

pounds of pure live seed per acre.

In some instances, mulch has been found to be useful in conserving moisture, moderating soil temperatures, and improving erosion control. The cool moist summers of the Interior generally bring adequate rainfall to achieve a high seed germination rate. The practice of ripping the seedbed on the contour prior to seeding minimizes the potential for erosion. Mulch will be evaluated if seed germination becomes a limiting factor in the reestablishment of vegetation.

Revegetation Timing

Seeding will be conducted as soon as possible following seedbed preparation. Since ground conditions suitable for large scale earthwork occur primarily during the spring and summer months. Research and experience with concurrent reclamation will be used to evaluate the potential of dormant seeding. Generally, seeding is implemented after spring break-up until mid-July. Such seeding allows the seed to take advantage of the summer moisture period. However, actual experience has shown that all seedbed preparation on large-scale mine reclamation projects cannot and does not occur at one point in time. Thus, while every effort will be made to conduct the majority of seeding after spring break-up and before mid-July, seeding actually may occur during spring, summer or fall. If a seeding is unsuccessful for any reason, the area will be reseeded the following year.

Fort Knox Vegetative Restoration Studies

FGMI currently uses a native grass seed mix and fertilizer/seeding rates recommended by the Plant Materials Center. The grass mix was developed during the construction of the wetlands below the tailing impoundment and is still being used for concurrent reclamation projects. Planting of dormant willow cuttings and encouraging the natural invasion of adjacent native species are methods used in the past to promote species diversity. However, an increase in plant species diversity was recommended to improve the wildlife habitat surrounding the developed wetlands in the Environmental audit of 2003 (Golder, 2004). Opportunities to increase species diversity in all areas of the mine site will continue to be pursued.

Revegetation Cover Criteria

A vegetative cover criterion of 70% will be achieved prior to requesting final release of financial assurance for each reclaimed area. The 70% cover criteria may be waived upon the concurrence of ADNR or the land owner for specific areas that are deemed stable, have minimal potential to adversely impact surface water quality, and are consistent with the post mining land use.

Percent live foliar cover will be determined using a method such as the Point-Intercept Method described in National Park Service's fire monitoring handbook (Appendix C). Other more suitable methods to determine percent cover may become available and will be used upon approval from

ADNR.

For a seeding determined to be unsuccessful, FGMI will implement appropriate action, which could include reseeding the area, fertilization, and/or placement of growth media on the site.

5.3 Post-Mining and Post-Reclamation Topography

Figure 5.2 is an aerial photo of the Fish Creek Valley showing pre-development ground conditions and topography at the Fort Knox Mine site. Figure 5.3 illustrates the post-mining topography before reclamation occurs. Post-reclamation topography (Figure 5.4) on the Fort Knox Mine site will consist of a rolling landform that blends with the hills along the south and north sides of Fish Creek. In addition to the creation of open water areas within the pit, developed wetlands and fresh water reservoir, a large relatively flat tailing impoundment with uplands, wetlands and open water will further diversify the post-mining topography and habitat.

Drainage

Pre-mining site drainage was and remains to the east down Fish Creek Valley to the confluence with Fairbanks Creek and eventually to the Little Chena River. Melba and Monte Cristo creeks, Barnes, Pearl, Yellow Pup, Walter, Last Chance, and Solo creeks are all named tributaries to Fish Creek within the project boundaries (Figures 1.1 and 5.3). Post-mining drainage patterns will be similar in overall gradient and direction. Melba and Monte Cristo creeks will be totally mined out, and the drainage area will become part of the pit. Eventually, the outflow water from the pit will flow subsurface through the Melba/Monte Cristo causeway to the reclaimed tailings impoundment. Surface flow in Walter creek will be diverted around the heap leach pad to the tailing impoundment. The heap leach pad underdrain system will capture water from springs and seeps beneath the pad and discharge to the tailing impoundment. Pearl creek and Yellow Pup creek will have tailings deposited in the lower reaches of their drainage basin. In addition a portion of the Yellow Pup drainage will be filled with waste rock. Surface and groundwater will continue to flow from the drainage basins into the tailings impoundment.

Storm flows and perennial flows will feed into a centrally located pond on the tailing impoundment and through the tailing impoundment spillway. The tailing impoundment spillway discharges into a stilling pond. Water will flow from the stilling basin through constructed wetlands on the north side of the Fish Creek channel and continue to the freshwater reservoir. The freshwater reservoir will discharge through the spillway at the north end of the dam to lower Fish Creek at the eastern property boundary. Solo creek and Last Chance creek will continue to drain into the fresh water reservoir. They remain the primary sources of water for the water storage reservoir.

Figure 5.2 Pre-development Ground Conditions at the Fort Knox Mine

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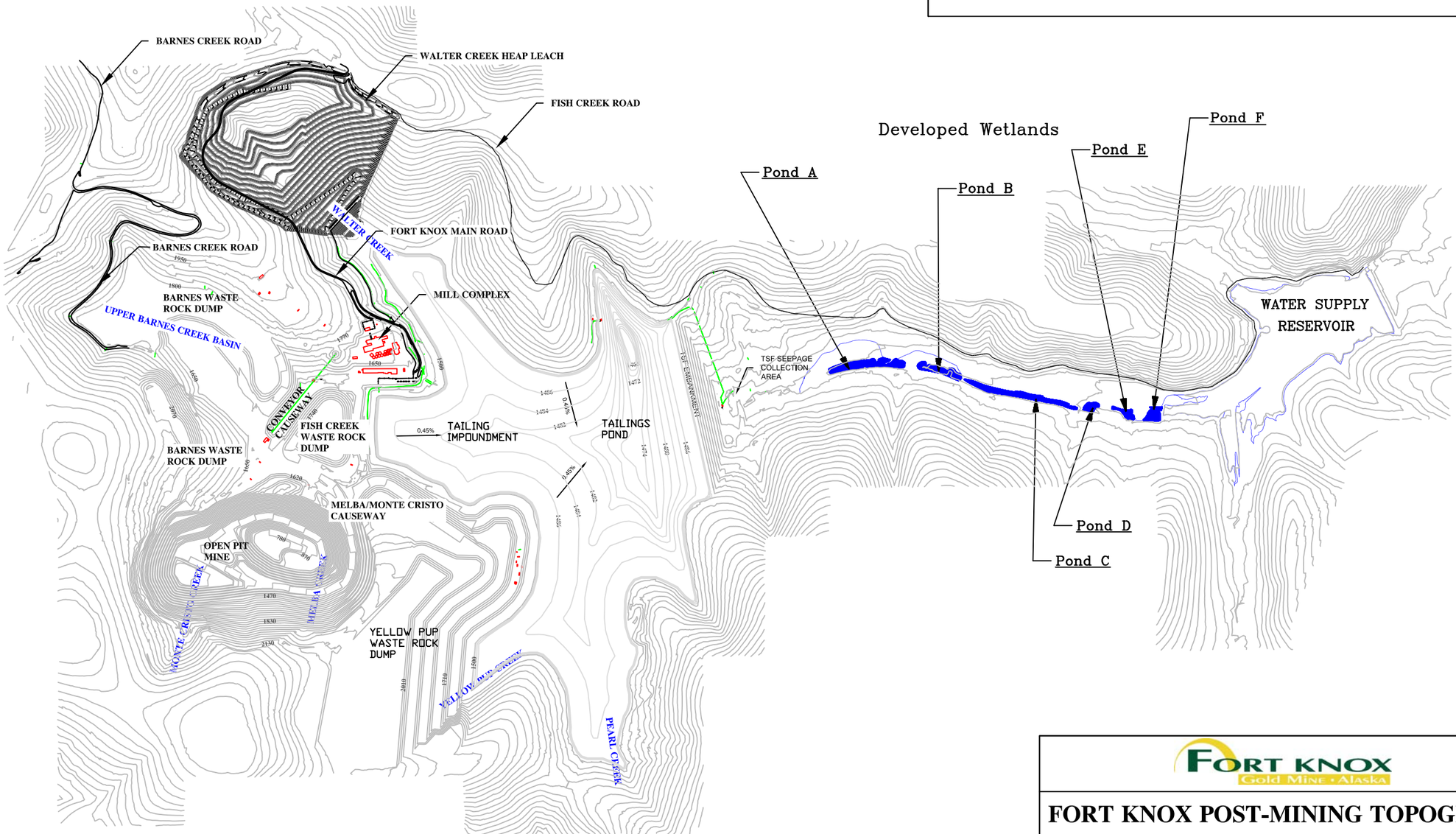

FORT KNOX
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FORT KNOX POST-MINING TOPOGRAPHY

SIZE	FIGURE NO.	DWG NO.	REV
		FIGURE 5.3	
SCALE: NTS	DATE: 12/2005	SHEET 1 OF 1	

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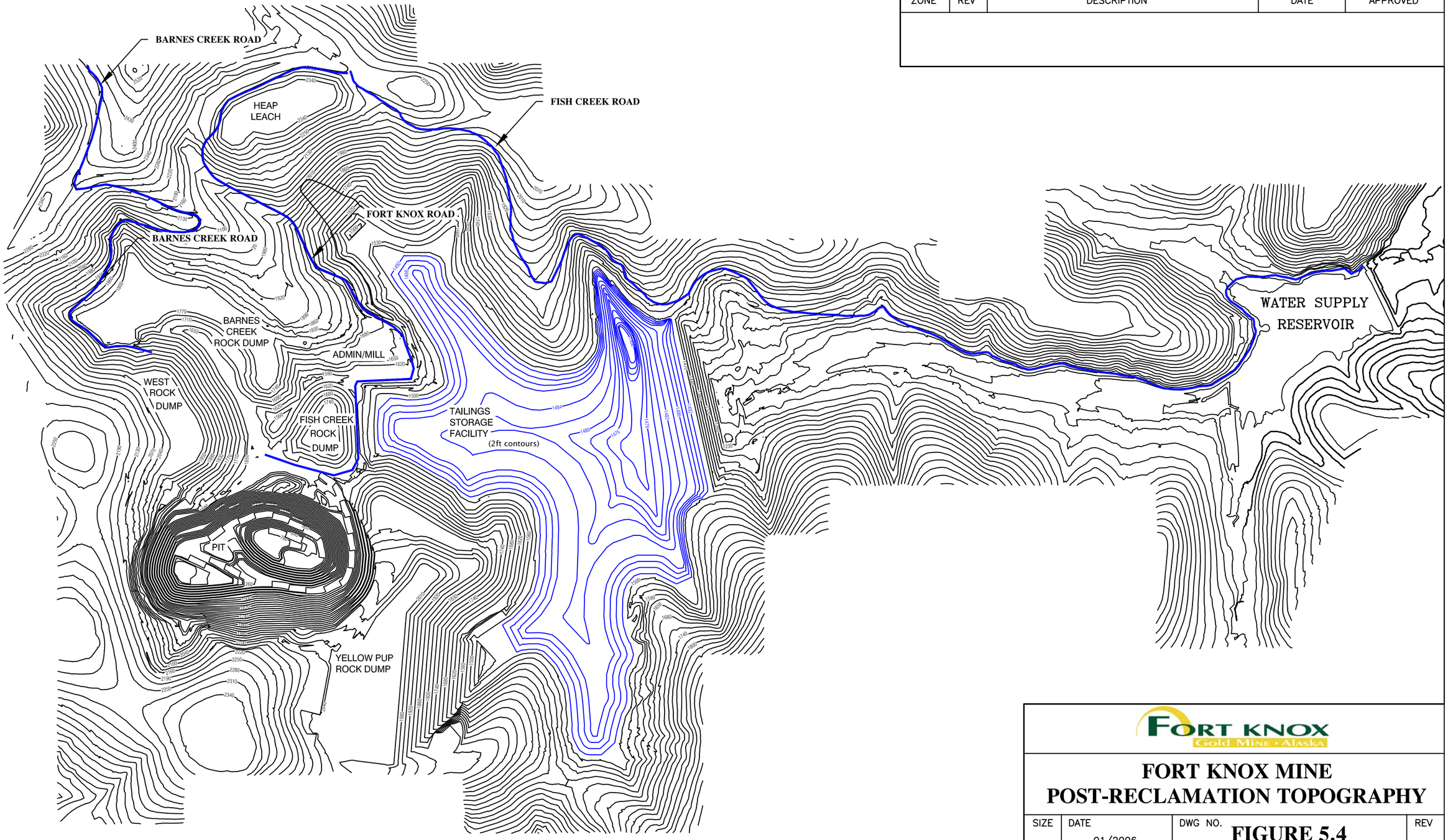

FORT KNOX Gold Mine • Alaska

FORT KNOX MINE
POST-RECLAMATION TOPOGRAPHY

SIZE	DATE	DWG NO.	REV
	01/2006	FIGURE 5.4	
SCALE: NTS			SHEET 1 OF 1

Pit Slope Stability

Pit slopes are designed to maximize safety and minimize stability risks during mining. The pit has three different rock types. In the upper reaches of the pit is schist, which is waste rock. Benches in the schist are 20-30 feet wide with a 38 degree overall slope angle. Below the schist is weathered granite. Benches in the weathered granite are 30-40 feet wide with a 32 degree overall slope. Lastly, the granite rock type has benches 15-20 feet wide with a 45 degree overall slope angle. The weathered granite and the granite can be ore or waste depending upon the gold content.

Figure 5.5 illustrates a cross section of the final mine pit (post reclamation) with the pit water level at 1,470-foot elevation. As the pit fills with water, the walls of the pit will be subject to localized failures. While the pit is filling to its final elevation, the pore pressure will increase within the pit walls creating unstable conditions. Once the pit lake reaches its final elevation, the pore pressure within the pit walls will equilibrate and the result will be stability of the pit walls. Figure 5.6 illustrates a plan view of the final pit.

EBA Engineering Consultants (EBA, 1990) and Knight Piésold Company (Knight Piesold, 1994) assessed permafrost conditions at the project site during site investigation work. This was accomplished through the introduction of thermistor instrumentation into a number of boreholes at the mine, tailing dam, water supply reservoir, and plant site. In the mine area, the initial borehole readings indicated that the permafrost encounters would be sporadic and shallow. The discontinuous nature of the permafrost has led to localized ground water blockages that have opened upon thawing, resulting in minor water inflows to the mine.

Knight Piésold Company assessed permafrost conditions in the Walter Creek heap leach footprint utilizing test pits and borings. No permafrost was encountered except along the south toe of Walter Creek valley bottom. In those areas, the permafrost was about 6 feet thick. Any permafrost that could melt and provide unsuitable support for the heap leach pad and its related facilities will be removed.

Acid Rock Drainage (ARD) Potential

FGMI has evaluated overburden, ore and waste rock for potential to generate ARD. The Acid/Base Accounting analysis and Humidity Cell Testing during baseline studies indicated no potential for acid generation. Both static and kinetic testing of materials indicates no potential for acid formation in the waste rock, open pit or tailing impoundment. Results of analysis from baseline studies are further supported by the quarterly submittals of the Fort Knox Mine Compliance Sampling Data.

Water quality will continue to be monitored and annual characterization of overburden, waste rock, and ore will continue over the life of the operation and throughout final reclamation. If FGMI becomes aware of acid formation occurring or the potential thereof, the issue will be managed according to Best Management Practices specific to ARD. If routine characterization of material

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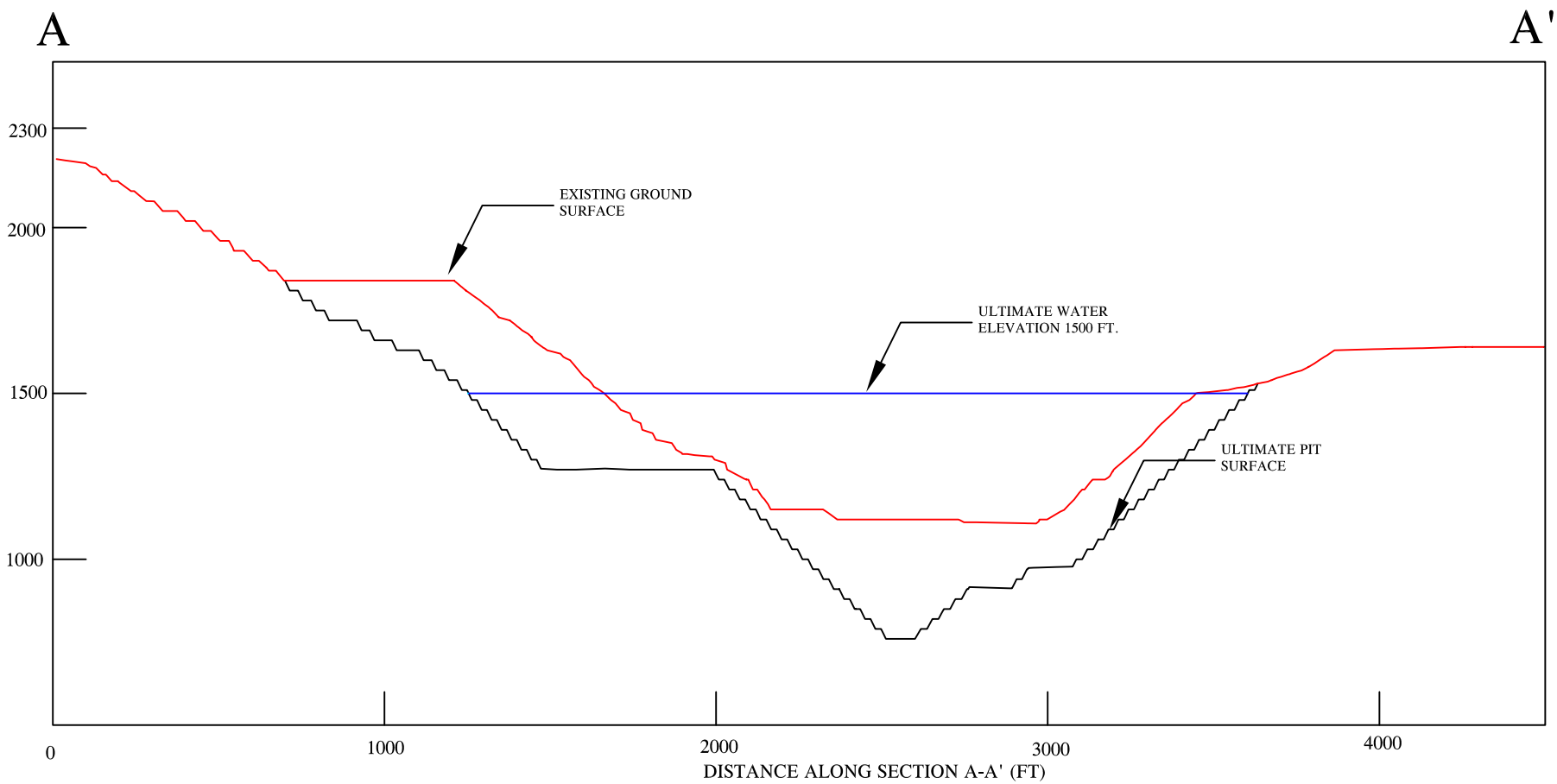
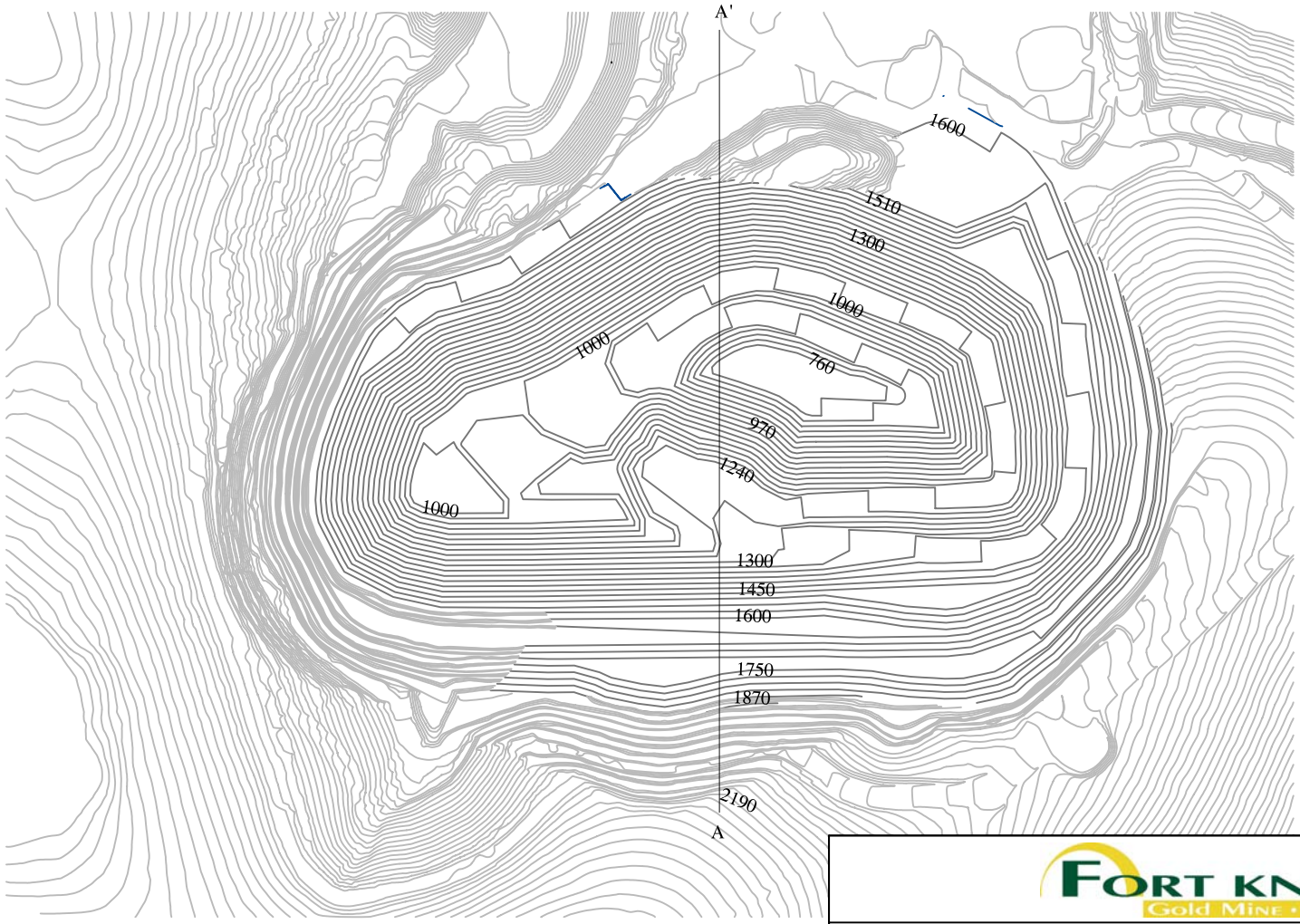


FORT KNOX Gold Mine • Alaska

CROSS-SECTION OF FINAL PIT

SIZE	FGMI NO.	DWG NO.	REV
A		FIGURE 5.5	
SCALE 1"=500'		SHEET 2 OF 2	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



FORT KNOX Gold Mine • Alaska

PLAN VIEW OF FINAL PIT

SIZE	FGMI NO.	DWG NO.	REV
A		FIGURE 5.6	

SCALE 1"=1000'	DATE: 11/2005	SHEET 1 OF 2

indicates a potential for acid rock drainage, then a specific management plan for material handling will be developed by FGMI. This plan will be submitted to ADNR and ADEC for approval, and the reclamation plan modified according to ***11 AAC 97.240*.**

Water quality will continue to be monitored and annual characterization of overburden, waste rock, and ore will continue over the life of the operation and throughout final reclamation. If FGMI becomes aware of acid formation occurring or the potential thereof, the issue will be managed according to Best Management Practices specific to ARD. If routine characterization of material indicates a potential for acid rock drainage, then a specific management plan for material handling will be developed by FGMI. This plan will be submitted to ADNR and ADEC for approval, and the reclamation plan modified according to ***11 AAC 97.240*.**

5.4 Public Access

Public access to the Fort Knox site will be restricted until reclamation and closure are completed. Once FGMI relinquishes the Millsite Lease property in accordance with the *Agreement For Funding Post-Reclamation Obligations* (Appendix A*),* public access to the Fort Knox site will be managed by the State of Alaska. The existing Fish Creek road will remain to provide access to the water supply reservoir. Roads to be left in place following completion of reclamation will be determined by ADNR and MHTLO.

Public safety is a principal concern in closure and reclamation of mining operations. The Fort Knox pit high wall interceptor ditches and safety berms will remain in place to restrict access to the pit area along Gilmore Dome. Generally, berms four to six feet in height will be utilized to restrict access to the steeper highwall sections of the pit and other potentially hazardous areas. Signs will be posted to provide additional warning of potentially hazardous areas.

6.0 FACILITY SPECIFIC RECLAMATION AND CLOSURE

The reclamation and closure activities specified for each mine facility have been chosen to attain two goals:

- establishment of a stable, self-sustaining vegetated surface consistent with post-mining land uses; and
- creation of conditions that ensure the water quality of site runoff and drainage protect post-mining beneficial uses of water.

Operational performance has confirmed the pre-mining test results indicating no potential for acid rock drainage or significant metals mobility in Fort Knox ores. In the long term, the general reclamation activities described in Section 4 are directed at creating self-sustaining vegetation

communities on tailings, heap leach pad, and waste rock dumps that will provide protection for water resources.

Immediately after closure not all site runoff and drainage will meet water quality standards for all designated uses. In particular, this is true of tailings and heap water compared with water quality standards established for aquatic life. A comprehensive water balance model approach has been used to evaluate the reclamation alternatives for specific facilities. Based upon the results of this evaluation, an overall, integrated water management and reclamation strategy has been developed to ensure runoff and drainage water quality will not adversely impact designated use standards in the receiving water. The objective of this strategy is to allow Fort Knox to achieve the designated post-mining land uses as soon as possible after mining and milling are finished.

6.1 Water Management

The goal of the water management plan will be to protect designated use standards in the receiving water. The strategy outlined is based on model predictions, and as such, it will be subject to review and refinement during the closure period when actual conditions become known.

Receiving Water Beneficial Use

By default, natural waters in Alaska are protected for all designated uses established by regulation. Prior to construction of the Fort Knox mine, baseline water quality in Fish Creek was affected by naturally occurring iron, manganese, and arsenic as well as by extensive alluvial placer mining operations, with seven parameters having values exceeding the state maximum contaminant levels for drinking water, and three others just below those levels (CH2M Hill, 1993). Since construction of the mine, surface water quality in Fish Creek has improved, in large part due to successful reclamation of pre-existing placer mining disturbance in the Fish Creek drainage between the Fort Knox tailings storage facility and the fresh water reservoir. The Fish Creek water supply reservoir now supports a robust population of grayling and burbot (Ott and Morris, 2005).

Mine Site Surface Water

In comparison to the water supply reservoir, the tailing impoundment is considered a treatment facility during operation and closure. It is operated as a zero discharge facility, and as such the water quality standards for the state's designated uses do not apply (CH2M Hill, 1993, p 4-27). As outlined in the original EA (CH2M Hill, 1993) for the project, the use of the water pool in the tailing impoundment as a habitat resource for wildlife (fish, migratory birds, and mammals) would be considered only after reclamation is complete, depending on characterization of the tailings during operations (CH2M Hill, 1993, p 2-70).

Water Management Consultants (2005a) has evaluated observed water quality trends to date and predicts that the water quality of the water pool in the tailing impoundment, pit lake, and heap leach drainage will meet the water quality standards for discharge except for some constituents in which the natural condition of the groundwater and surface water in Fish Creek is of lower quality than the criteria for discharge. As a result, site-specific criteria for some constituents that take into account background conditions as outlined in 18 AAC 60.825 may be appropriate. These regulations outline the methodology for establishing tolerance intervals that the owner/operator of a solid waste facility must utilize to evaluate potential changes in groundwater quality.

Once water quality standards for discharge are met, site runoff and drainage will be discharged to a wetland treatment system that will provide a final polishing treatment. The wetland system will not be the primary means utilized to meet water quality standards. All water reporting to the wetlands will meet standards prior to discharge from the tailing impoundment. No seepage water is planned for a surface discharge. When standards are achieved, the mine will enter the post-closure monitoring phase. Incorporation of the wetland system will not influence the post-closure monitoring period since it is planned to receive water that meets water quality standards. However, through the years of post-closure monitoring and thereafter, the benefits of the wetland will available to be taken advantage of if needed.

Summary Water Management Strategy

Using the comprehensive water balance model developed for closure planning, the key activities designed to protect all designated uses in the water supply reservoir on Fish Creek are as follows:

- At closure, the tailings decant pond will initially be dewatered by pumping to the pit during which time the inflow of runoff water will mix with the decant water to improve quality. Pumping will maintain the pond elevation such that sufficient storage volume will be available to contain the 100-yr 24-hour storm event and spring runoff volume with the required amount of freeboard.

- During this time, the seepage collection system will continue to operate and provide containment resulting from a contiguous cone of depression at the toe of the facility. Therefore the tailing impoundment will continue to function as a “zero-discharge facility” until the seepage will not cause exceedances of water quality standards at the downgradient monitoring location.

- After approximately two years, pumping to the pit will be discontinued and fresh water will be allowed to create a water pool on the tailings.

- By the time the fresh water pool is allowed to reach the spillway elevation, water quality

in the pool will meet standards for discharge, and water will be allowed to flow by gravity to a series of wetland pools to be constructed below the tailings.

- The wetland treatment system will be designed to provide physical separation from the existing wetland system of overflow from the fresh water pool on the reclaimed tailings,. The wetland system will provide contingency treatment capacity in order to ensure the discharge will not affect designated uses in the freshwater reservoir. However, it is not intended that the wetlands would have to function in a manner to meet water quality standards prior to discharge at the Freshwater Reservoir.

- At the point in time when the tailings decant pond is dewatered and the process of developing a fresh water pool on the tailings begins, seepage collection at the toe of the tailings will be discontinued, provided that this will not impact designated uses of surface water in Fish Creek. Prior to that time, contingencies will be developed if needed for in-situ groundwater treatment of the seepage.

- When heap leaching is complete, rinse and/or recirculation water will be applied to the spent ore until the water quality of the drainage is such that drainage can be allowed to flow by gravity to the fresh water pool on the tailings without impacting water quality standards.

- During rinsing and initial draindown of the heap, some water may be directed to the pit.

- The amount of water pumped to the pit from the tailing and/or the heap leach will be limited by the chemical mass in the water pumped to ensure that the pit water meets water quality standards when the pit lake achieves final elevation.

- Directing water from the tailings decant pool and possibly from the heap leach pad will accelerate the filling process for the pit. Without these measures, modeling estimates it will take approximately 100 years to fill the pit to its long-term stable water elevation (Doubek, 2004). With these measures, modeling estimates filling will take approximately 80 years, and will result in lake water quality that meets the water quality standards for discharge (Water Management Consultants, 2005a).

6.2 Tailing Storage Facility Reclamation & Closure

The tailing impoundment and associated appurtenances are permitted under Solid Waste Disposal Permit 9331-BA008 by ADEC for the operation, closure (reclamation), and post-closure monitoring. The boundary of the area covered by ADEC for the purposes of reclamation and post-closure monitoring is shown on Figure 6.1. Reclamation goals for the tailings impoundment are as follows:

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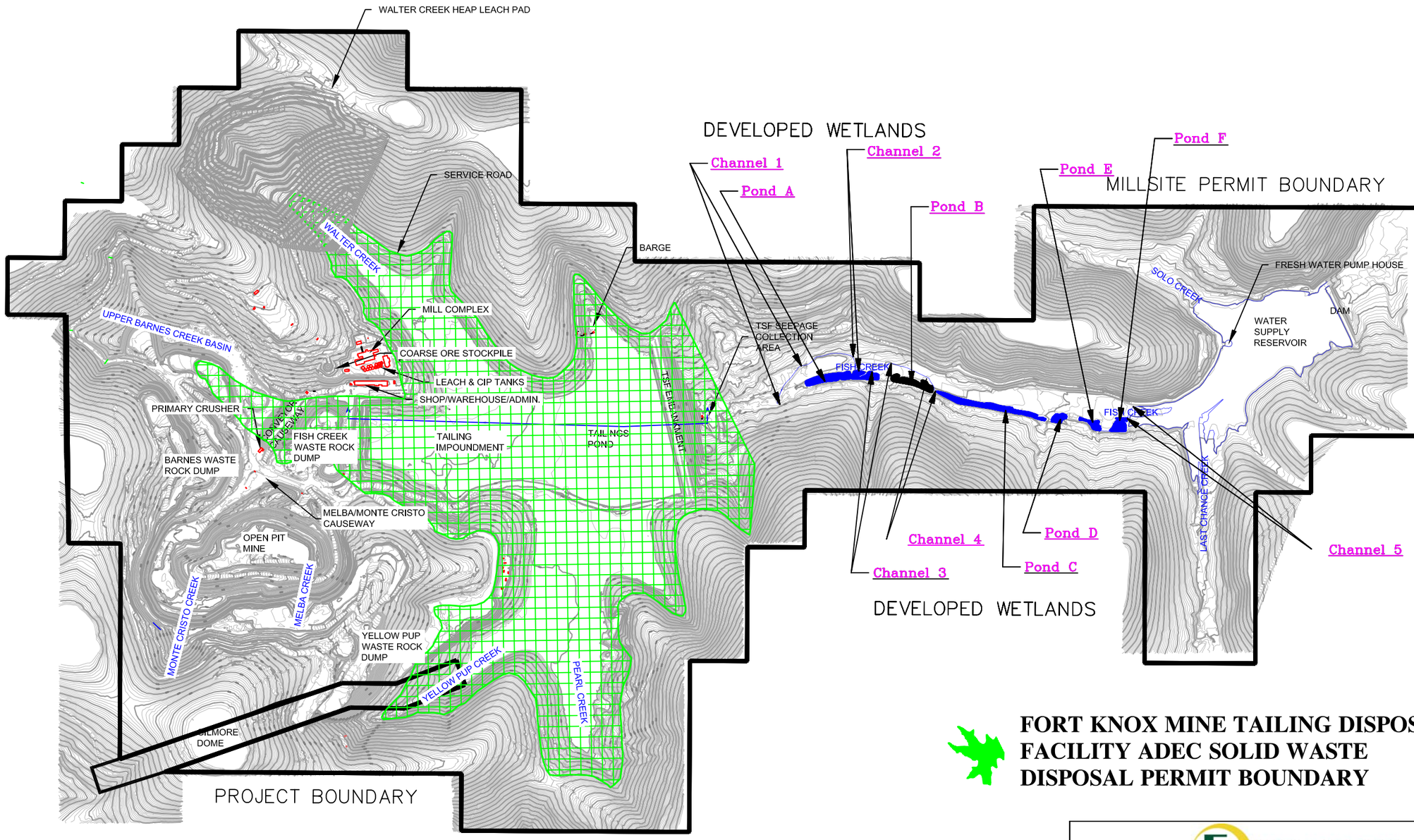
ZONE	REV	DESCRIPTION	DATE	APPROVED



FORT KNOX MINE TAILING DISPOSAL FACILITY ADEC SOLID WASTE DISPOSAL PERMIT BOUNDARY

FORT KNOX Gold Mine • Alaska

ADEC SOILID WASTE DISPOSAL PERMIT BOUNDARY

SIZE	DWG NO.	FIGURE NO.	REV
		FIGURE 6.1	
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

- Allow the tailings to consolidate;
- Establish a mixture of aquatic, wetland, and upland habitat;
- Ensure that water quality meets applicable standards as described in Section 6.1.

Based on the analyses presented in the report *Fort Knox Mine Tailing Facility Closure Management Plan* (Water Management Consultants, 2005a), a closure plan has been developed that describes the activities that will be performed to allow final stabilization of the tailing. Closure activities will begin when production from the mill ceases. Major earthwork for the reclamation and closure of the tailing will be completed within 3 years.

Closure Sequence

Reclamation of the tailings impoundment will be integrated with the overall mine water management strategy. Operational measures during the last two to three years of mill production will be implemented to prepare for efficient closure of the tailings once milling is complete.

- During operations, tailings will be deposited from the upstream face of the tailings dam in order to create a "beach" along the dam. This will push the decant pond away from the dam, reducing the amount of seepage through the dam and eliminating conditions of standing water against the dam.
- During operations, use of fresh water for process make-up needs will be minimized or eliminated so that, by closure, the volume of water in the decant pond will be reduced to the operational minimum.
- At the point in time when mining and milling are complete, the volume of water remaining in the pond will be further reduced by pumping water to the pit. It is anticipated that water would be pumped to the pit over a period of two years, at which time there would be a very small pond left on the tailings.
- A fresh water pond would be established on the tailings in order to bring the water level to the level of the closure spillway. The source of fresh water for the closure pond would be runoff from areas upgradient of the pond.
- Based upon long-term average climate conditions, it is expected that the pond level would reach the proposed spillway elevation after approximately 12 years.
- After the fresh water pond fills to the spillway elevation, water would be discharged to

the wetland treatment system. The level of water in the pond would fluctuate by about 4 feet annually.

- The surface of the tailings not covered by water will be reclaimed to include upland (dry cover), and a transition zone of wetland vegetation within the zone of annual water level fluctuation.

Tailings Surface

Establishment of the final tailing surface was initiated in June, 2005 when the tailing discharge spigot was moved to the east part of the causeway in order to begin establishing the beach adjacent to the upstream face. This will begin to push the decant pond away from the embankment face toward the west. Based on current projections, the final tailing surface will have elevations ranging from about 1,488 ft amsl to a low point less than 1,460 ft amsl. The beach on the upstream face of the embankment will vary between 300 and 500 ft wide.

The closure spillway invert elevation will be designed to coincide with the final tailings surface elevation along the north abutment of the dam. Based on the final tailings surface as currently projected, the total storage volume of the final surface will be approximately 5,500 acre-ft at a spillway invert elevation of 1,485 ft amsl (WMC, 2005a). The pond elevation will fluctuate annually. The size of the water pool will vary from approximately 400 acres to 600 acres. The spillway will be designed such that water will not be impounded immediately adjacent to the dam face at any time after closure.

Areas that will be saturated at least part of the year due to seasonal water level fluctuations (currently projected to be about 286 acres) will be revegetated to support wetland species. Figure 6.2 illustrates the distribution of open water, wetland and upland habitat as projected.

Upland vegetation will be established along the margins of the facility where tailing have dewatered sufficiently to allow access (166 acres). Reclamation of upland areas will utilize the general reclamation techniques described in Section 4. If trial plots prior to final closure demonstrate than vegetative cover can be established without the use of growth media, none will be used. If growth media is required, placement will commence once the tailings have consolidated sufficiently to allow equipment access, and revegetation with the upland seed mix will follow. If additional growth media is required to establish a vegetative cover, select areas directly above the final tailings will be partially stripped of organics and growth media to be spread over the tailings surface. This reclamation method will provide suitable growth media, woody debris on the tailings surface, and open the borrow areas to the establishment of early succession vegetation (grasses and willows) that has a higher habitat value for the larger terrestrial species present at the site.

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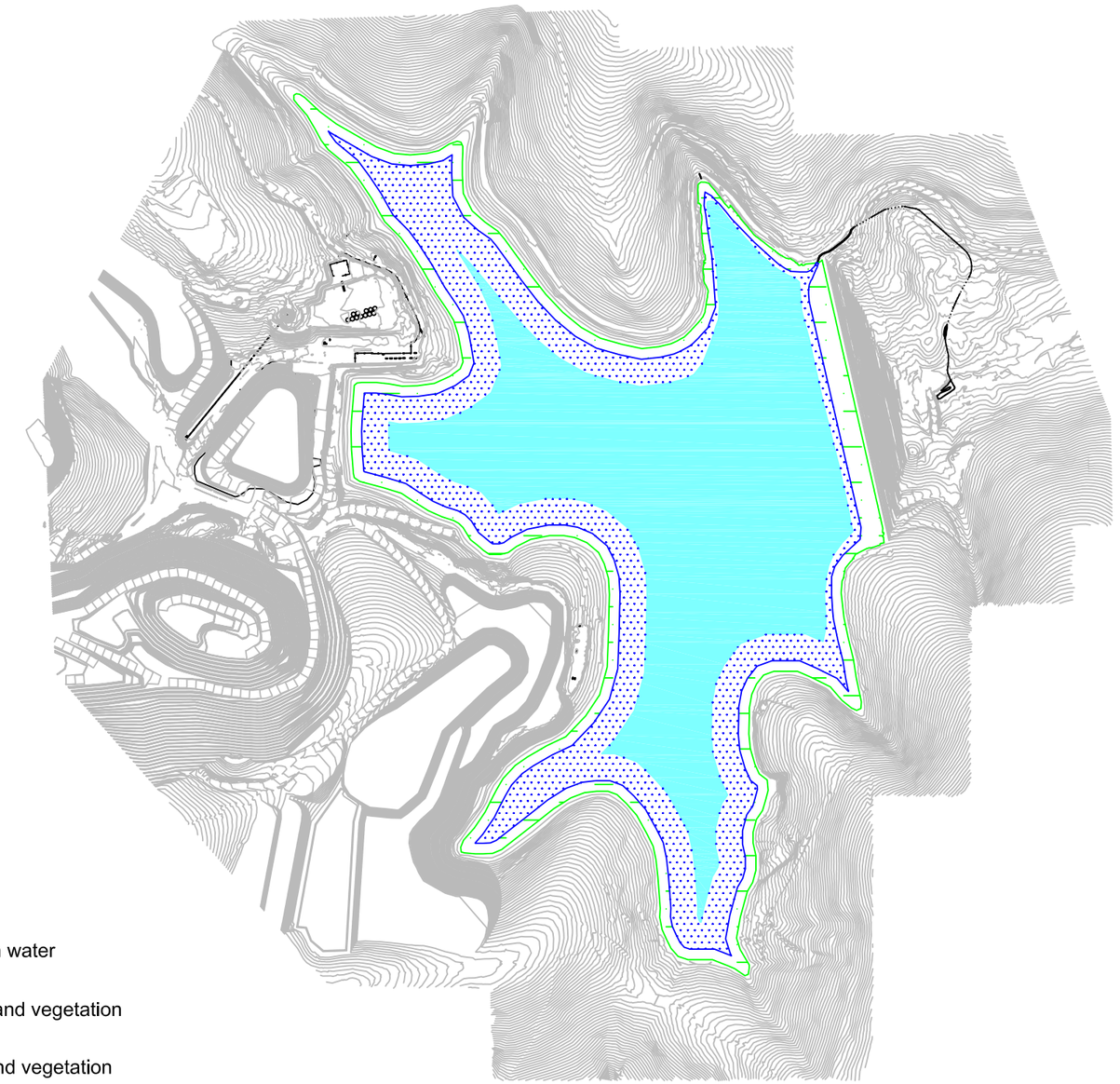
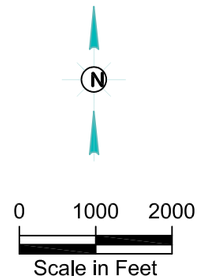
ZONE	REV	DESCRIPTION	DATE	APPROVED



	Calculated areas (acres)	Elevation from final tailing surface topography (ft amsl)
Upland vegetation	166	1490
Wetland vegetation	286	1486
Open water	481	1484



EXPLANATION

Open water

Wetland vegetation

Upland vegetation

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PLAN VIEW OF TAILING RECLAMATION AND REVEGETATION MAP

SIZE	DWG NO.	FIGURE NO. FIGURE 6.2	REV
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

Tailing Spillway

The tailing spillway, discharge channel and stilling basin have been designed by Water Management Consultants (2005a). The spillway for the tailings impoundment will be a trapezoidal, broad-crested weir designed to safely pass the design storm event (PMP) assuming that the water pool will be at 1,486 ft amsl (i.e. spillway elevation 1,485 ft amsl plus the average spring breakup volume of 950 ac ft) (Water Management Consultants, 2005a). The peak flow and maximum storm volume for the spillway will be 195 cfs and 2,700 ac ft, respectively. The spillway will be excavated in bedrock at the north abutment of the dam. The channel conveying flow from the spillway will be routed to the existing pond located at the toe of the tailing. The channel will be armored with rip rap where necessary to prevent erosion. Figure 6.3 illustrates the location of the spillway, channel, stilling basin, and wetland treatment system.

Wetland Treatment System

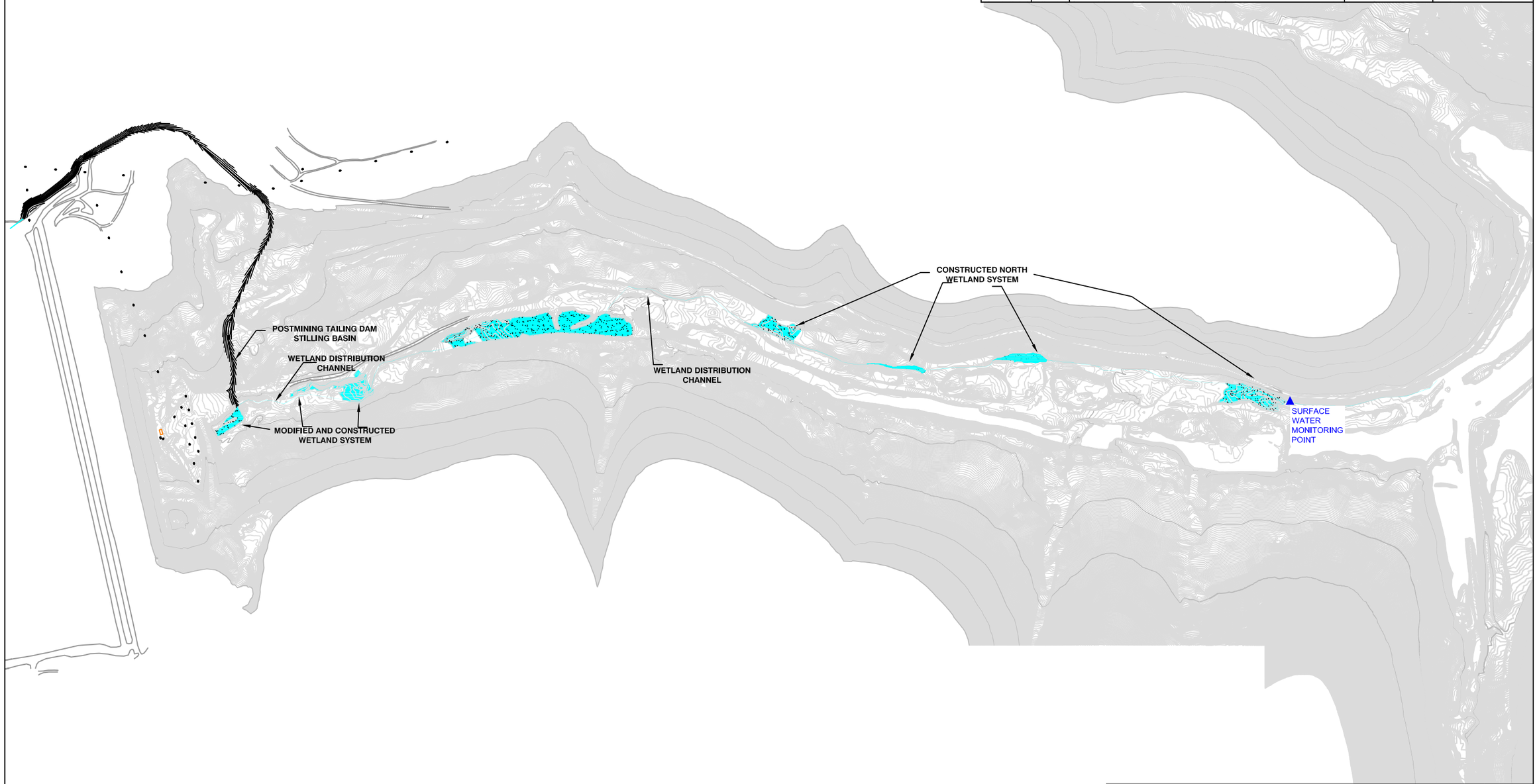
There will be no discharge from the tailing impoundment until after the fresh water pond is established and reaches the proposed spillway elevation. When the pond level reaches the spillway elevation, the water in the pond will be derived almost entirely of natural runoff and drainage from reclaimed surfaces that meets the water quality criteria for discharge. While all discharge will meet water quality standards, as a contingency measure, a wetland treatment system will be constructed to provide a final polishing treatment.

The wetland treatment system that will be constructed on the north side of Fish Creek where placer mining has completely disturbed the original stream morphology is illustrated in Figure 6.3. Currently, little to no surface water flow occurs in the area planned for construction of the wetlands. The channel, stilling basin and wetlands to be constructed from the north abutment of the tailing dam along the north side of the valley to the water supply reservoir will be designed to pass spring breakup and storm events. In addition to the additional wetland habitat that will be provided, the design will help to dissipate energy from storm water runoff and minimize impacts from storm events on the developed wetlands located along the south side of the valley. The wetland system will be separated from the grayling ponds on the south side of the drainage by a ridge developed during placer mining.

The wetland system will consist of a series of interconnected detention basins, which will ultimately terminate above the freshwater reservoir (Figure 6.3). A series of retention basins and channels will provide retention volume for sediment control, followed by alternating basin/channel systems to create alternating aerobic/anaerobic conditions for contingency water quality polishing. The wetland treatment system will discharge to the west end of the Fish Creek Reservoir. The monitoring point will be immediately upstream of the reservoir.

The basins will be excavated to depths ranging from 3 to 6 ft depending on the local topographic gradients. The total storage capacity of the detention basins is approximately 5 to 7 acre-ft. The

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



FORT KNOX Gold Mine • Alaska

PLAN VIEW OF WETLAND TREATMENT SYSTEM

SIZE	DWG NO.	FIGURE NO.	REV
		FIGURE 6.3	
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

geometry of the basins has been defined based on the existing topography and the gradient of the drainage. The conveyance channel interconnecting the basins will be approximately 14-ft wide with a trapezoidal section. The channel side slopes will be 3H:1V. It is likely that the channel bottom will be comprised of placer tailings (coarse gravel to cobbles) and will not require significant armoring or erosion control. Riprap will be placed where local ground conditions require stabilization and erosion control.

The contoured slopes along the edges of the wetland treatment system will be seeded and fertilized to encourage natural invasion of native species. Willow cuttings will be planted along the edges of the constructed wetlands where appropriate hydric soils exist. The various detention ponds of the wetland treatment system will be planted with a mixture of wetland plant sprigs and/or seed of commercially available native species of sedges, rushes, wetland grasses, iris, bulrush and cattail where water depth is appropriate for each species.

Tailings Embankment

The downstream face of the tailings embankment is constructed of durable rock, and is resilient to erosion. The downstream face of the tailing embankment will not be capped with growth media. The armored slope that remains will be stable, will not be subject to erosion and will not support vegetation that could potentially compromise the integrity of the dam.

6.3 Seepage Interception System

The water quality in the seepage interception system is influenced by natural groundwater conditions, and by seepage from the tailings impoundment. Water Management Consultants has developed a water balance / water chemistry model that accounts for the natural groundwater chemistry, the chemistry and volume of seepage, the hydraulic effects of beach development and creation of a fresh water pool on the tailings after closure (Water Management Consultants, 2005a). The model indicates that development of a tailings beach, as described in Section 6.2, will reduce the rate of seepage from the tailings and consequently improve seepage water quality in the short term. Seepage water quality is predicted to further improve in the initial period following cessation of operations. During the initial closure period, the seepage interception system will continue to operate, and the seepage water will be pumped to the pit as the tailings decant pool is dewatered. During this time sufficient storage capacity will be available to contain the 100-year, 24-hour storm plus spring runoff with the required freeboard. At the point in time when the decant pond dewatering is complete and the process of developing a fresh water pool on the tailing begins, seepage collection at the toe of the tailings will be discontinued based upon a demonstration that the discharge criteria has been achieved and is approved by ADEC.

If during the initial closure period water quality trends indicate discontinuation of seepage collection could affect designated uses in the water supply reservoir, additional test work and

characterization will be conducted to develop contingencies. Contingencies would most likely involve development of a passive treatment zone within the groundwater flow path downgradient of the tailings dam. The parameters currently above drinking water standards (e.g. sulfate and nitrate) are amenable to treatment using bacteriological activity to create anaerobic conditions. In groundwater applications this can be accomplished by injecting an organic food source (methanol or other) into the groundwater flow path, or by excavating an interception trench and backfilling the trench with an organic mixture.

Closure of the seepage collection system will include:

- discontinuation of pumping from the seepage collection gallery and wells;
- removal of pumps, piping, and surface structures for salvage or disposal;
- backfill of the collection gallery using alluvial material;
- plugging and abandonment of the seepage collection wells per regulation.

6.4 Pit Lake

Based on the estimated water quality pumped from the tailing impoundment and the anticipated pit inflow quality, the final pit lake quality is expected to meet compliance standards by the time discharge occurs. Exceptions will likely include manganese and iron, which have background concentrations above standards. Pre-mining iron concentrations in surface water ranged from 9.5 to 17 mg/l. Current concentrations measured in the wetlands ranged from 2 to 30 mg/l. Manganese concentrations ranged from 0.3 to 0.4 mg/l in Fish Creek prior to mining. Current concentrations are similar in magnitude; therefore, these constituents will not degrade existing water quality. Table 6.0 provides a summary of the expected pit lake quality at the time of closure. The estimates are based solely on conservative mixing calculations and do not account for stratification or reactions that would likely result in lower concentrations (WMC, 2005a).

Table 6.0 Predicted pit lake quality at full recovery

Parameter	Standard (mg/l)	Pit lake concentration (mg/l)
As	0.01	0.009
Sb	0.006	0.005
CN (free)	0.0052	0.002
SO4	250	50
TDS	500	145
Cd	0.0003	0.0002
Cu	0.009	0.007
Se	0.005	0.005
Zn	0.12	0.009

6.5 Heap Leach Closure

The proposed method of closure for the Fort Knox heap leach pad is based on site-specific conditions, facility design, currently available test work, and the technical analyses completed as part of this project evaluation. The supporting data and concepts for the closure of the heap leach pad is provided in *Fort Knox Mine Closure Management Plan for Proposed Heap Leach Facility* (Water Management Consultants, 2005b). Key aspects of the site and operation that are considered for closure include the following:

- The climate at the site is characterized by moderate precipitation, moderate evaporation, and cold temperatures. As a result, the long-term drainage from the pad after closure is predicted to be minimal.

- Laboratory test work shows that cyanide concentrations will decrease rapidly through recirculation with freshwater if reagents are not added to maintain process-level concentrations.

- The tailing is located directly downgradient from the proposed heap leach pad and will be used as an integral part of the long-term solution management scheme.

- To facilitate closure management and if approved by ADEC, a portion of the solution inventory can be directed to the pit or treated once residual leaching is no longer economic. Long-term seepage will be routed to the surface of the tailing.

- The facility will be regraded to an overall 3:1 slope and covered with growth media. The regrading design will include erosion control measures as necessary to avoid loss of growth media.

- Due to the presence of tailing directly downgradient of the heap leach facility, no suitable locations for groundwater monitoring wells exist. The presence of the tailing limits the effectiveness of monitoring wells in detecting potential seepage. However, underdrain quality will be monitored via a well installed through the base platform and into the drainrock. In addition, monitoring will occur in the PCMS and LCRS systems during early stages of closure. Post-closure discharge from the drainage system will be monitored.

Heap Leach Closure Procedures And Schedule

The closure schedule will include the following components:

- Residual leaching until uneconomic.

- Solution recirculation/rinsing to destroy cyanide and meet compliance standards
- Release of draindown to the tailing impoundment
- Release of minor long-term seepage to the tailing impoundment
- Regrading and cover

Residual Leaching

Following completion of mining in the pit and final placement of ore on the pad, it is anticipated that leaching and gold recovery will continue for one to several years. As the recovery of gold begins to decline, the addition of cyanide will be discontinued. Heap leach pads often continue to economically recover gold for a number of years after the addition of cyanide is discontinued. During this period, barren solution will be applied to recover gold held in inventory. The exact duration of residual leaching will be dependent on continuing gold recovery.

Solution Recirculation/Rinsing

After economic leaching has been completed, solution will continue to be re-circulated on the pad to promote cyanide destruction. No cyanide will be added to the solution during this step. Freshwater will be added to the system as required to facilitate rinsing and removal of metals. Column testing currently underway will provide more detailed information on the quality of rinse water at the completion of rinsing and the time required for rinsing. The column testing will be completed in the summer 2006, and a supplementary report will be prepared to address water quality associated with rinsing. If the data warrants, the closure plan for the heap leach will be modified to address any issues identified.

During the rinsing, it may be necessary to direct solution to the pit or to a treatment facility in order to manage the water balance and remove chemical mass from the system. However, no action will be taken without the approval of ADEC. Routing solution to the pit will improve the effectiveness of rinsing by minimizing the influence of evapo-concentration and reducing cyanide and metals concentrations. Although the chemical mass to be pumped to the pit from heap leach and the tailing is believed to be less than the amount that would compromise the water quality in the pit long term, the chemical mass pumped will be monitored closely, and if necessary, a treatment system will be implemented to reduce the chemical mass going to the pit. Treatment options being investigated include engineered wetlands, reverse osmosis, oxide scavenging, chemical reduction and biologically mediated reduction.

Since there is anticipated to be an extended period of residual leaching without the addition of cyanide and considering the high permeability of the heap leach ore, rinsing will likely be of short duration. The rinsing rate will be 8,000 gpm. The actual duration of this step will be controlled by

the time required for the water quality to achieve discharge standards. Following approval by ADEC, the heap leach water will be released to tailing when the quality meets the standards for discharge to the tailing.

Release Of Draindown To The Tailing Impoundment

Once the compliance standards are met, solution will be directed to the tailing impoundment. The solution remaining in the in-heap storage impoundment will be released to flow to the tailing impoundment by penetrating the primary and secondary liners of the LCRS and the prepared sub-base utilizing a drilling rig. A minimum of three holes will be drilled to allow the solution to drain.

Release of minor long-term seepage to the tailing impoundment

Once the standards for discharge are achieved in the rinse water, the long-term seepage will be directed to the tailing impoundment and managed according to the closure plan for that facility. The surface of the tailing impoundment will be a combination of impounded water, wetland, and upland vegetation (Water Management Consultants, 2005a). Discharge from the heap leach pad will mix with the water impounded on the surface of the tailing impoundment and be subject to further treatment by the wetlands encountered on the tailing surface.

Regrading and cover

Following completion of rinsing, the heap will be regraded to an overall 3H:1V slope. The grading plan will include erosion control measures as appropriate to avoid loss of growth media. A nominal 1 ft soil cover will be placed on the regraded surface. The soil material will be sourced from stockpiles created during foundation preparation. The cover material will be seeded and vegetated subsequent to placement.

6.6 Water Supply Reservoir, Solo Creek Causeway and Gil Causeway

FGMI will leave the water supply reservoir and Solo Creek causeway in place to allow for the long-term use and maintenance of the area as a recreational lake and wetland area (Figure 6.4). Following reclamation and closure of the project process components, the dam, access road and Solo Creek causeway will be maintained according to the terms defined in the *Agreement for Funding Post-Reclamation Obligations* between FGMI, ADNR and ADF&G (Appendix A).

The Gil causeway (Figure 6.4) will be breached to allow the free movement of fish from the main lake body into upper reaches of the lake and Last Chance Creek. The Gil Causeway Reclamation Plan (Appendix D) was submitted to OHM&P on March 29, 2001. It describes the removal of the existing four culverts along the Gill Causeway to restore the original Fish Creek channel as nearly as can be replicated while working below the level of the water in the reservoir. Material removed will be placed along remaining portions of the causeway to create additional shoreline, which will be

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

Boat Launch Area

Parking , Picnic & Boat Launch Area

Water Reservoir

Recreation Area Access Road

Boat Launch Area

BREACH

BREACH

GIL CAUSEWAY

FORT KNOX
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FORT KNOX WATER RESERVOIR RECREATION AREA CONCEPTUAL LAND USE PLAN

SIZE	DATE	FIGURE NO.	REV
	12/2005	FIGURE 6.4	
SCALE: NTS			SHEET 1 OF 1

contoured, ripped and seeded if required. The remaining road surface and safety berms will be graded and revegetated.

The lake will not be available for public use until final reclamation and a period of post-closure monitoring (approximately ten years) is complete and the area is transferred to the State.

6.7 Roads

For purpose of this reclamation plan, FGMI has assumed the following however the roads to be reclaimed will be determined by ADNR and MHTLO:

- Access to the mine pit and mill areas will be provided via service roads. These roads will consist of the Fort Knox road and a service road from the reclaimed mill site to the pit. Access to the developed wetlands and water supply reservoir will be available using the Fish Creek Road. A service road linking various points within the site will be necessary to provide access for maintenance and long-term monitoring. These permanent roads and access roads are illustrated in Figure 5.4.

- All road acreage not identified in Figure 5.4 is planned for reclamation. However, roads will be individually analyzed by ADNR, MHTLO and FGMI to determine which roads will remain permanently.

- Reclamation procedures will be similar for all types of roads that are to be reclaimed. Culverts will be removed; natural drainage areas restored or stabilized and roadbeds will be graded where necessary to provide adequate drainage. Following grading, roadbeds will be scarified/ripped and revegetated. If determined necessary for successful revegetation, growth media will be placed. Water bars to manage surface runoff and control erosion and berms to restrict human access will be incorporated where necessary.

6.8 Open Pit / Melba Monte Cristo Causeway

During active mining, reclamation activity in and around the open pit will be limited to controlling erosion on the haul roads. Upon final mine closure, haul roads in and around the pit will be smoothed of all berms except those necessary for erosion control and safety. Road cuts and fills will be recontoured as much as feasible, and the roadbeds will be ripped and scarified where necessary. After pit dewatering ceases, the pit will fill with water. The ultimate water surface in the pit will be at approximately 1,470 feet amsl and will cover approximately 150 surface acres. FGMI proposes to divert all flows up gradient of the pit into the pit, where possible, to fill the pit and bring it to a stable condition more rapidly.

The Melba/Monte Cristo causeway is constructed of schist and granite bedrock mined from the open pit at Fort Knox. This material, as tested by Knight Piesold during design of the tailing impoundment, has a coefficient of permeability of 560 feet/day (2 x 10-1 cm/sec). Due to the permeable nature of the material in the causeway, any water flowing over the crest of the pit at the original ground surface will continue to flow through the causeway and not be impounded upstream of the embankment. The Melba/Monte Cristo causeway will never impound more than a few feet of water. Since the flow will be subsurface, there will not be a need to establish an outflow channel from the pit lake.

6.9 Waste Rock Dumps

Upon cessation of mining at Fort Knox, the waste rock dumps will contain approximately 200 million tons of overburden and waste rock. Figure 5.4 illustrates the location of the West, Barnes Creek, Fish Creek and Yellow Pup waste rock dumps. Based on current life of mine plans, there will be an estimated 790 acres of waste rock dumps requiring reclamation. Reclamation of waste rock dumps will be initiated once that they are no longer required for waste rock disposal. FGMI will concurrently reclaim inactive dumps that will not be subject to future disturbance. Based on the current mining schedule, concurrent reclamation of waste rock dumps is scheduled to begin in 2009.

Reclamation of the waste rock dumps will entail sloping and contouring of the dumps. The crests of the waste rock dumps will be rounded with material pushed outward to establish a slope of approximately 2.5H:1V or flatter. Most waste rock dump side slopes will be constructed with multiple lifts to minimize the cost of sloping. The tops of the dumps will be rounded to minimize impoundment of storm waters and snowmelt. Large boulders that are uncovered during sloping may be left on the surface to provide topographic diversity, microhabitats for wildlife and vegetation, and to break the linear appearance of the final slope.

Following sloping and contouring, the existing waste rock will be evaluated for its suitability as a growth media to establish vegetative cover. The waste rock dumps at Fort Knox will contain variable amounts of finer grained material that may be suitable as a growth media. If it is determined by FGMI that the waste rock does not provide a growth medium that will support the successful establishment of vegetation, a minimum of six inches of growth media will be placed. If attempts to establish vegetation on waste rock prove not to be successful, growth media will be placed. Where growth media is determined to be needed, the depth of growth media placed will be dependent upon the quality of the underlying waste rock, but typically, a minimum of six inches of growth media will be placed.

When final sloping, contouring, and growth media placement (if required) have been completed, waste rock dumps will be ripped along the contour. Contour ripping will reduce the erosion potential by reducing smooth slope length with the series of furrows created that will also increase infiltration. Ripping on the contour will provide micro-habitats for increased moisture retention and

seed germination. Brush berms and/or sedimentation berms will be constructed at the toe of dumps where feasible. The berms will remain until a vegetative cover is established and the potential for erosion is minimized.

Waste rock dumps will be revegetated following completion of earthwork. Due to the rocky, irregular nature of the final slopes, broadcast-seeding methods will be utilized. Seed and fertilizer will be applied as discussed in Section 5.2.

6.10 Building and Equipment Sites

As facility components of the site are decommissioned, materials, equipment, and buildings will be removed. Non-hazardous and nontoxic solid waste such as lumber and non-salvageable metal scrap will be burned and/or disposed in the permitted solid waste landfill. Hazardous and toxic materials such as reagents, petroleum products, acids, and solvents will be moved off-site by licensed transporters and either returned to the vendor or disposed at licensed facilities. Equipment and piping not needed for the reclamation and monitoring process will be utilized at another mining site, sold, salvaged or disposed in an approved manner. Past experience indicates that most equipment will be either utilized at other facilities or sold.

Buildings remaining at Fort Knox when the mine ceases production will include the mill building, portable office buildings, truck shop, warehouse, and other buildings as listed in Table 6.1. As the various site components cease operation, associated buildings will be emptied, dismantled, and removed from the site unless otherwise agreed upon by FGMI, ADNR and MHLTO. These

Table 6.1 List of Fort Knox Buildings at Completion of Mining

Buildings	Square Feet
Crusher	6,700
Pump Houses	3,400
Mill	60,000
Administration Building	6,200
Mine Shop, Dry and Warehouse Complex	49,500
Process Plant Offices and Shops	8,730
Assay and Metallurgical Laboratory	5,360
Reagent Storage Facilities	11,920
Tailing Detox Plant	6,600

structures may be utilized at other operations, sold, or salvaged. If sold or salvaged, it is likely that the purchaser or salvager will do removal. Above ground foundations will be reduced to rubble down to ground level and buried in-place with a minimum of two feet of material. Material used for burying foundations will be a combination of waste rock and growth media.

Reclamation of building and equipment sites will follow procedures outlined previously. Sites will be graded for proper drainage, ripped and scarified and revegetated. If growth media is needed it will be placed at a depth of approximately six inches.

6.11 Wells and Well Closure

Because of the need for constant dewatering of the pit during operation, several groundwater wells have been drilled at Fort Knox. All wells will be plugged and abandoned when no longer required. Figure 6.5 shows current locations of existing monitoring and dewatering wells. Well abandonment will be conducted according to ADEC regulations (**18 AAC 80.015**) in effect for water production wells at the time of abandonment.

Abandonment procedures will include:

- removal and disposal of pumps and piping,
- plugging of the well with an approved sealing material at total depth,
- removal of the collar,
- minor grading around the well site, and
- revegetation.

6.12 Miscellaneous Sites

Fence Removal

The mill, shop, and reagent storage areas are fenced with approximately 3,500 feet of 8-foot high chain-link. Fencing around reagent storage areas will remain in place until the reagents and chemicals are removed from the site. Fencing will be removed and salvaged, buried in the permitted landfill or buried in an approved landfill.

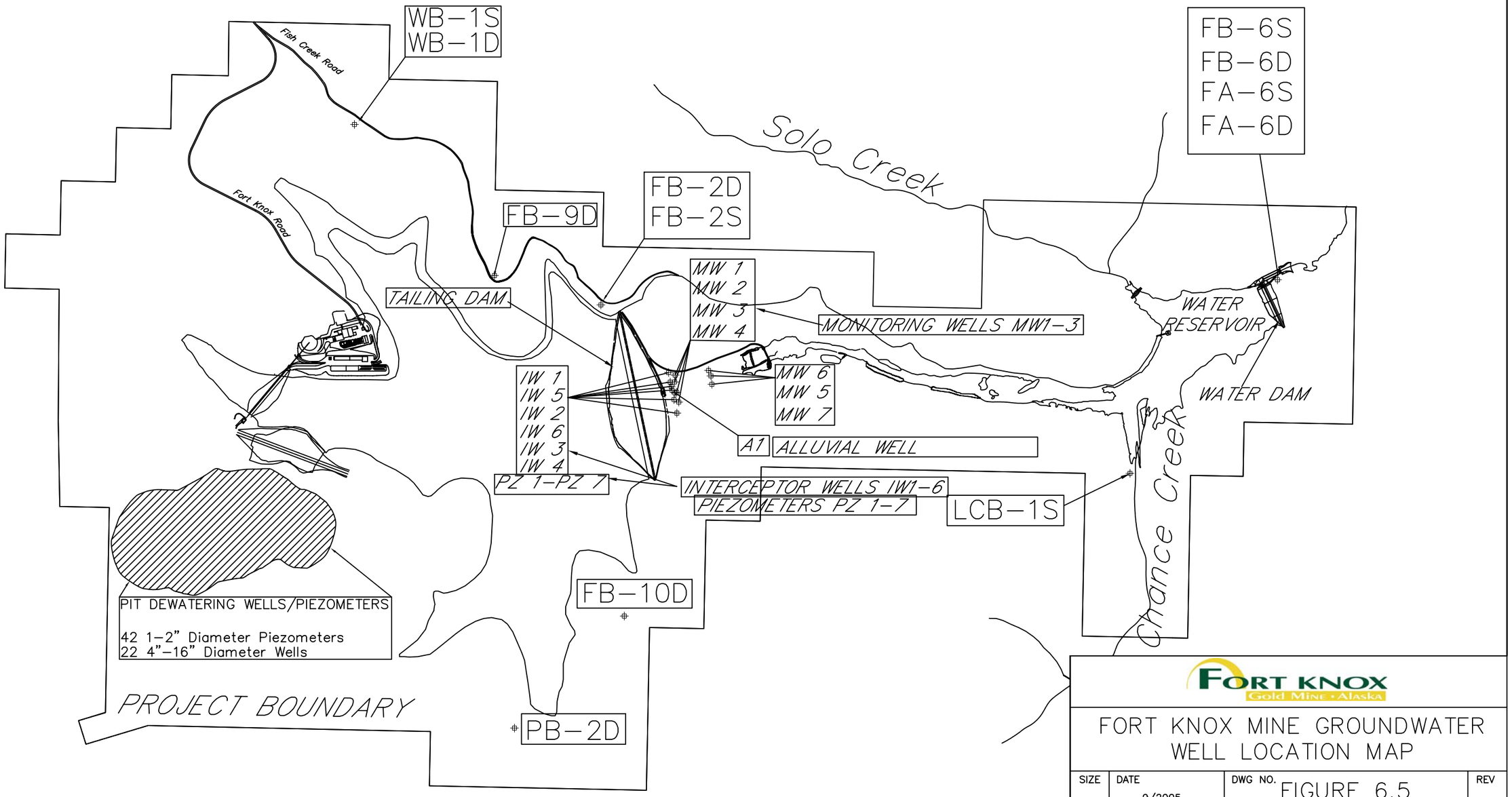
Electrical Power Facilities

One primary and four secondary electrical power substations service Fort Knox. When large electrical power requirements are no longer necessary, the secondary substations and associated facilities will be removed from the site. All overhead power lines located on the Millsite Lease will be removed unless approved to remain by ADNR and MHTLO and agreed to by FGMI. All materials removed will be salvaged or disposed in an approved facility.

Material Borrow Areas

During initial site construction and periodic raises to the tailing dam, several material borrow areas were used to provide the necessary construction material (road base, rip-rap, seal, and filter

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



FORT KNOX
Gold Mine • Alaska

FORT KNOX MINE GROUNDWATER WELL LOCATION MAP

SIZE	DATE	DWG NO.	REV
	9/2005	FIGURE 6.5	
SCALE: NTS		SHEET 1 OF 1	

materials). All borrow areas disturbed will be reclaimed with the exception of the following:

- Borrow Area #8 is located adjacent to the north side of the water reservoir spillway. This rock-terraced area provides potential nesting habitat for swallows and raptors.

- Borrow Area #11, located directly west of the fresh water pump station, has been designated as a post-closure parking area for day users expected at the water supply reservoir.

7.0 MONITORING

The *Fort Knox Mine Monitoring Plan* (FGMI, 2005) gives a detailed description of the monitoring requirements for the site, including the Tailing Storage Facility, the pit lake, the stream corridor/wetlands and the Water Supply Reservoir. The monitoring plan includes:

- Water quality sampling procedures and analytical profiles and sampling schedules;
- Characterization of acid rock drainage and processed tailing;
- Monitoring of solid waste landfill leachate;
- Potable Water Monitoring Requirements;
- Wildlife mortality reporting procedures;
- Documentation, record keeping and reporting requirements;
- Quality Assurance/Quality Control manual

7.1 Tailing Impoundment

The monitoring plan will include water quality sampling, water level measurements, and observations of the success of revegetation. The frequency of sampling events will be adjusted as appropriate between the pre- and post-stabilization phases based on observed improvements in water quality. Table 7.0 summarizes the monitoring program.

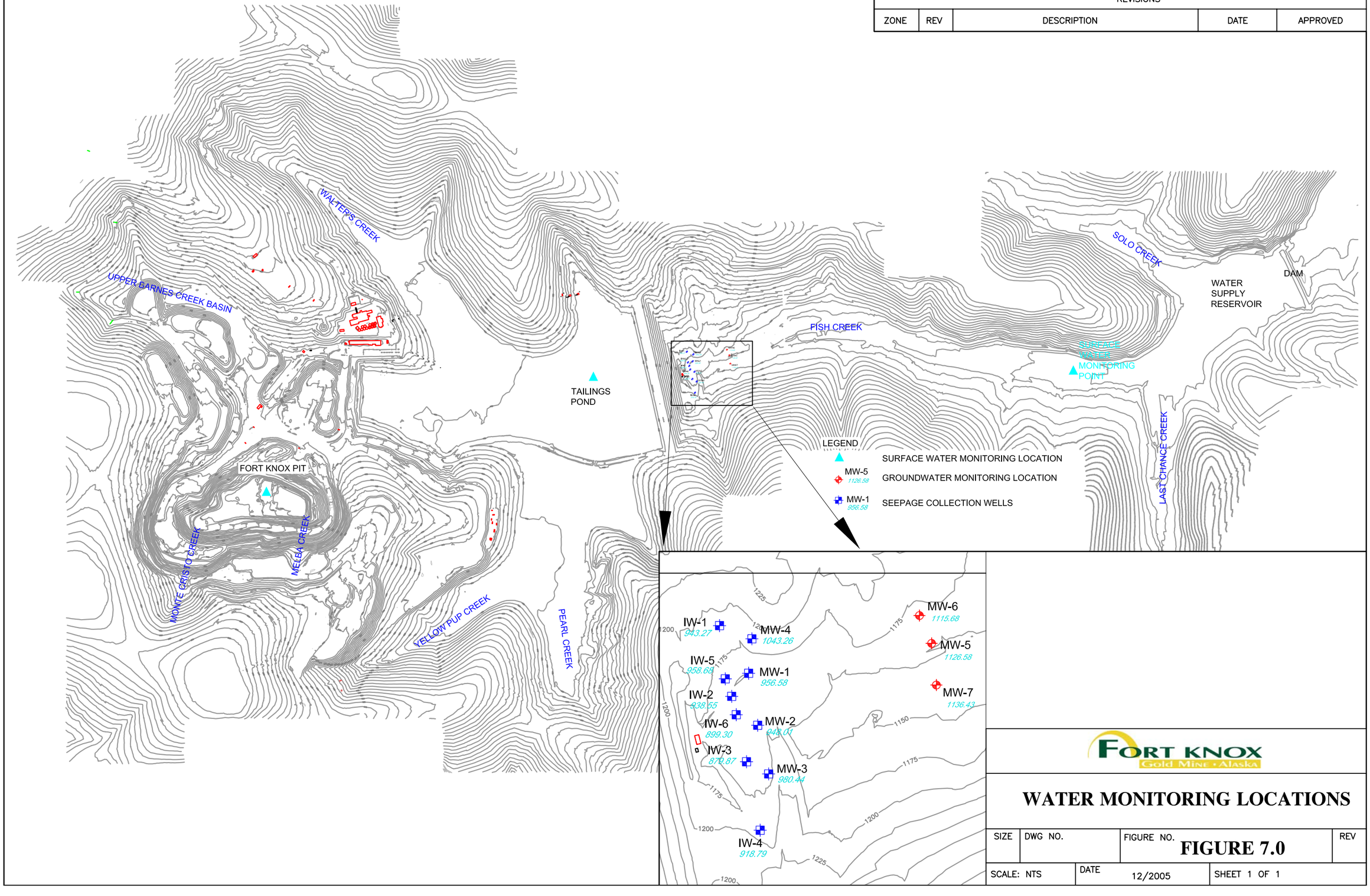
During the closure process, monitoring of groundwater quality will occur at the existing monitoring wells. Prior to the completion of closure, a surface water monitoring point will be established near the terminus of the wetland treatment system. Figure 7.0 illustrates the water monitoring locations.

Table 7.0 Summary of Closure Monitoring for the Tailing Impoundment

Monitoring location	0 to 2 years		3 to 5 years		+ 6 years	
	Frequency	**Parameter list**	**Frequency**	**Parameter list**	**Frequency**	**Parameter list**
Decant pond	Quarterly	Complete	Quarterly	Complete	Quarterly	Complete
Pit lake	Annual	Complete	Annual	Complete	Annual	Complete
Seepage collection system	Monthly	Complete	Quarterly[1]	Complete	NA	NA
Groundwater monitoring wells	Monthly	Complete	Quarterly	Complete	Annual	Complete
Interim wetland treatment monitoring	NA	NA	Quarterly[2]	Complete	Quarterly[2]	Complete
Surface water monitoring point	NA	NA	Monthly[3]	Indicator	Monthly[3]	Indicator

Notes:
1 Only if operational
2 Monitoring point located at outfall of wetland treatment system
3 Discharges predicted to begin after about 2 to 3 years

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



FORT KNOX Gold Mine • Alaska

WATER MONITORING LOCATIONS

SIZE	DWG NO.	FIGURE NO.	REV
		FIGURE 7.0	
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

During the pre-stabilization phase, the tailing pond will be sampled on a quarterly basis. After pre-stabilization, seasonal water discharges will begin from the tailing impoundment (Section 6.2). Discharges will flow into the wetland treatment system on the north side of Fish Creek Valley. Currently, there is no water flow in the north side of Fish Creek and it is expected take a number of years, depending on the seasonal water flow, for the wetland treatment system to reach hydraulic equilibrium. During this phase, water may not be present at the terminus of the wetland treatment system.

It is estimated that it will require 2 to 3 years for the treatment system to reach equilibrium and allow monitoring at the terminus of the treatment system on a consistent basis. Once this occurs, water quality will be monitored near the terminus of the wetland treatment system at a surface water monitoring point (a point of monitoring to be specified by ADEC) on a monthly basis during active flow for the first two years. Monthly samples will be analyzed for the indicator parameters summarized in Table 7.1.

The interceptor and monitoring wells will be sampled quarterly until the seepage collection system is shutdown. Once the seepage collection system is shutdown, the monitoring wells will be sampled quarterly for the first two years. At the end of two years the interceptor wells will be plugged and abandoned. The monitoring wells will be sampled annually years three through ten. All samples will be analyzed for analytes in Table 7.1.

The water quality in the pit will be monitored on a quarterly basis throughout the closure period when decant water is being pumped to the pit. Sampling will occur annually thereafter.

Water Level Monitoring

Groundwater levels will be monitored in the interceptor wells and monitoring wells on a quarterly basis. Subsequent to decommissioning the interceptor well system, water levels will be monitored concurrent with each water quality sampling event.

Inspection of Surface Stabilization

Visual observation of revegetation success will be performed on an annual basis during the pre-stabilization phase. Inspection for erosion and formation of gullies will be completed quarterly. Pond elevations will be measured on a quarterly frequency until the spillway invert elevation is reached.

7.2 Heap Leach

The *Walter Creek Heap Leach Facility Project Description* (FGMI, 2006b*)* has a complete description of the various process components associated with the heap leach. Please refer to this document for more in-depth explanations of the heap leach processes. The *Fort Knox Monitoring*

Table 7.1 Summary of Monthly and Quarterly Analyte Lists

Monthly samples	Quarterly samples
pH	pH
TDS	TDS
Sulfate	TSS[1]
Alkalinity	Calcium
Arsenic	Magnesium
Antimony	Sodium
Cadmium	Potassium
Copper	Chloride
Iron	Sulfate
Manganese	Alkalinity
Selenium	Arsenic
Cyanide	Antimony
WAD cyanide	Cadmium
	Copper
	Iron
	Manganese
	Selenium
	Zinc
	Nitrate
	Nitrite
	Ammonia
	Cyanide
	WAD cyanide

Note: Monthly sampling analyte list will be used as indicator parameters per Table 7.0

Plan,(FGMI, 2006) outlines the operational monitoring and response plan in detail. The principal components of the operational monitoring plan include the LCRS, PCMS, underdrain system, pregnant solution composition and pond levels.

The operational monitoring of solution chemistry and pond levels will continue after economic leaching has been completed and recirculation/rinsing of the heap leach is in progress. During the recirculation/rinsing period samples will be collected on a quarterly basis to assess the composition and the rate at which the solution chemistry is improving. Recirculation/rinsing will continue until water quality meets standards for discharge.

Once solution composition meets discharge standards, monitoring of the heap leach LCRS and

PCMS and the underdrain system will occur on a quarterly basis (Table 7.2). The underdrain system will be sampled on a semi-annual basis for the Profile II list of analytes (Table 7.3). The underdrain system will be sampled via a monitoring well installed from the crest of the base platform fill that bottoms in the thalweg of the former Walter Creek drainage. It will be screened over its full length to accommodate the rise in water level that will result from the deposition of tailings against the downstream slope of the base platform fill in the location of the former Walter Creek drainage. This monitoring well will be used to monitor the waters in the underdrain during the active life of the heap leach pad and after its closure.

Once water quality meets discharge standards the quarterly samples will be analyzed for WAD CN and pH. Once the liner has been punctured sample collection from the pond recovery wells will cease, but quarterly measurements of water levels will be made.

Table 7.2 Summary of Heap Leach Closure Monitoring Requirements

Identification	Parameter	Frequency
LCRS	Flow	Quarterly (during recirculation)
PCMS	Profile II WAD CN/pH	Quarterly (during recirculation) Quarterly (after recirculation)
Underdrain (via monitoring well)	Profile II WAD CN/pH	Quarterly (during recirculation) Quarterly (after recirculation)
Residual Solution (via Storage Pond recovery wells	Profile II WAD CN/pH	Quarterly (during recirculation) Quarterly (after recirculation)
In-Heap Storage Pond	Elevation	Quarterly

Note: Residual solution samples will be collected as possible until the liner is punctured.

Table 7.3 Analytical Profile II -- Groundwater Inorganic Parameters

Major Ion Chemistry	Minor Ion Chemistry	Trace Ion Chemistry
Lab pH	*Arsenic	*Antimony
Lab Conductivity	Cyanide	*Barium
Temperature (field)		*Bismuth
	Total	*Cadmium
Turbidity	WAD	*Chromium
Total Suspended Solids	Fluoride	*Copper
Total Dissolved Solids	*Iron	*Lead
*Calcium	*Manganese	*Mercury
*Magnesium	Nitrogen, Ammonia	*Selenium
*Potassium	Nitrate as Nitrogen	*Silver
*Silicon	Nitrite as Nitrogen	*Zinc
*Sodium	Total Phosphorus	
Chloride	TPH	
Alkalinity (as $CaCO^3$)		
Bicarbonate		
Total		
Calcium Hardness		
Magnesium Hardness		

* Dissolved

7.3 Long-Term Maintenance and Monitoring

Long-term Monitoring

Monitoring systems for process components will remain in place until each specific facility has been chemically stabilized to the satisfaction of the agencies. The long-term monitoring will occur downgradient of the facility at the surface water and groundwater monitoring points established as part of the tailing impoundment closure plan (WMC, 2005a). The water quality monitoring locations are illustrated on Figure 7.0.

Long-term Maintenance

Once physical reclamation has started, temporary diversions and sedimentation control systems will be monitored on a routine basis by FGMI personnel. These systems will be cleaned, repaired, and

altered as necessary. Long-term or permanent diversions and the safety fencing and signage will be monitored and maintained as needed until the reclamation sureties have been released.

Success of reclamation will be monitored by visual observation to identify erosion problems. Remedial action to correct instability will be taken as soon as feasible following detection of substantial erosion or loss of growth media. Vegetation success will be monitored qualitatively by visual inspection on an ongoing basis by FGMI and ADNR personnel. When warranted quantitative data will be collected. Quantitative analyses will be conducted late in the growing season (August). The performance criterion for vegetation success is outlined in Section 5.2. FGMI will request partial release of the reclamation surety when significant reclamation work is completed (as per **11 AAC 97.435**). In no event will the release of financial assurance requested reduce the financial assurance amount to less than the estimated cost of completing reclamation and closure responsibilities.

8.0 APPLICANT STATEMENT OF RESPONSIBILITY

FGMI recognizes its responsibility in the use of public (State) lands and accepts that responsibility in agreeing to reclaim the Fort Knox site. FGMI will meet the requirements of its reclamation plan and return the site to a safe and stable condition consistent with the approved post-mining land use. FGMI will meet required local, State, and Federal regulations regarding reclamation of any surface area affected by the mining and processing operations. Reclamation activities and post-reclamation maintenance of remaining structures (tailings dam, water supply reservoir, Solo Creek causeway, and access roads) are FGMI's responsibility. In the event a new operator/land owner assumes control of the Fort Knox Mine, at that time, the new operator or land owner will agree to assume responsibility for the reclamation and maintenance of any affected land and structures that are the subject of this plan or existing permits. The new operator/land owner will request transfer of all applicable state and federal permits. The new operator/land owner will provide evidence that a surety acceptable to the U.S. Army Corps of Engineers will be filed with ADNR that will cover reclamation of disturbed land, including privately owned and State land and post-reclamation maintenance of remaining structures.

9.0 ESTIMATE OF RECLAMATION AND CLOSURE COSTS

9.1 Reclamation Cost Estimates and Financial Assurance Adjustment

The total estimated cost to reclaim the Fort Knox site is $**20,551,994** dollars. Table 9.0 provides a breakdown by facility of the costs comprising the estimate.

Table 9.0 Reclamation and Closure Cost Estimate

Facility	Projected Cost
Waste Rock Dumps	6,065,676
Ore Stockpiles	327,748
Growth Media Stockpiles	22,111
Mill Decommission	207,308
Building Foundations	87,296
Building Sites	312,635
Borrow Areas	85,076
Roads	30,313
Pit	64,667
Pit Powerline	14,519
Gil Causeway	12,306
Tailing - Earthwork	1,108,089
Tailing - Spillway Construct	1,466,015
Tailings Water Mgmt	1,742,779
Heap Leach Earthwork	1,512,931
Heap Leach Water Mgmt	1,280,143
Well Closure	35,782
Post-Closure Monitoring	734,704
TOTAL DIRECT COSTS	**15,110,097**
Mobilization/Demobilization (5% of Direct)	755,505
Engineering/Redesign (4% of Direct)	604,404
Contractor Profit & Overhead (10% of Direct)	1,511,010
Performance Bond (1.5% of Direct)	226,651
Payment Bond (1.5% of Direct)	226,651
Contract Administration (8% of Direct)	1,208,808
Contingencies (4% of Direct)	604,404
Insurance Premiums (1.5% of Labor)	50,614
Indirect Costs (21% of Contract Administration)	253,850
TOTAL INDIRECT COSTS	**5,441,897**
TOTAL	**20,551,994**

FGMI will reclaim affected land as contemporaneously as practicable. The five-year plan and cost estimate provides the ADNR, ADEC and FGMI an opportunity to review and, if necessary, modify the reclamation plan as required under provision of the Millsite Lease and Solid Waste Disposal Permit.

Under the provisions of **11 AAC 97.0320.(a)**, FGMI will file an Annual Activity Report that includes the volume of material mined in that year, the total acreage reclaimed in that year, and a statement as to whether the reclamation plan is on schedule.

Reclamation plans typically are updated to account for the additional disturbance planned to occur during the next five years. However, since during the next five years FGMI will initiate all currently planned disturbances, all planned disturbance is included in the cost estimate. The cost estimates provided represent life of mine or total reclamation costs for the Fort Knox Mine based on current plans for mining.

The reclamation-related financial assurance for the area within the boundaries covered by Solid Waste Disposal Permit 9331-BA008 for the purposes of reclamation and post-closure monitoring (Figure 5.1) will be held by ADEC, as permitted under **11 AAC 97.400 (3)**. The portion of the financial assurance applicable to the solid waste permit is estimated to be $10,669,914. The reclamation estimate and financial assurance amount will be adjusted every five-years during permit renewal or when the operation has a significant change in the Plan of Operations.

Since the various facilities such as the pit, the tailing impoundment, the waste rock dumps, and the water supply reservoir have different reclamation requirements, successful reclamation will be achieved much more rapidly for some facilities than others. Therefore, FGMI will seek incremental surety release on each facility or affected acreage as successful reclamation is completed as required in **11 AAC 97.435.**

9.2 Agreement for Funding Post-Reclamation Obligations

FGMI, ADNR and ADF&G have entered into an agreement (Appendix A) for funding post-reclamation obligations. The agreement calls for the establishment of an “Organization” to be utilized for the purpose of determining and financing all maintenance obligations reasonably required to be performed after completion of final reclamation and post-closure monitoring. The bonding obligation began following the issuance of the Dam Safety Certificate of Approval to operate the water supply reservoir dam. The financial assurance will be adjusted according to provisions set forth in the Agreement for Funding Post-Reclamation Obligations (Appendix A). The current financial amount posted is $734,536.84.

10.0 ACKNOWLEDGEMENTS

A. It is understood that should the nature of the operation change a modified or supplemental plan of operations and reclamation may be required.

B. It is understood that approval of this reclamation plan does not constitute:
(1) Certification of ownership to any person named herein; and
(2) Recognition of the validity of any mining claim herein.

C. It is understood that a financial assurance equivalent to the estimated cost of performing the agreed upon reclamation measures will be required before this plan can be approved. Financial assurance and any financial assurance reduction amounts will be set on a site-specific basis by ADNR in coordination with the cooperating agencies.

D. It is understood that any information provided with this plan or provided in the future, that is marked Confidential will be treated by the agency in accordance with that agency's laws, rules and regulations.

E. FGMI will conduct an Environmental Closure Audit to determine if any previously unknown environmental liabilities exist as a direct or indirect result of the Fort Knox Mine.

Fairbanks Gold Mining, Inc. has reviewed and agrees to comply with all conditions in the plan of reclamation. Fairbanks Gold Mining, Inc. understands that the bond will not be released until ADNR gives written approval of the reclamation work.

FAIRBANKS GOLD MINING, INC.

By: Robert M Taylor

Title: VP & General Manager

Signature:

Date: June 19, 2006

11.0 REFERENCES

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APPENDIX A

AGREEMENT FOR FUNDING

POST RECLAMATION OBLIGATIONS

AGREEMENT FOR FUNDING POST-RECLAMATION OBLIGATIONS

This agreement is made and entered into this 15TH day of FEBRUARY, 1994, by and between FAIRBANKS GOLD MINING, INC. ("FGMI"), a Delaware corporation, and the STATE OF ALASKA, Department of Natural Resources, Divisions of Land and Mining ("DNR") and the Department of Fish and Game ("ADF&G").

R E C I T A L S:

WHEREAS, pursuant to AS 38.05.255, FGMI has applied for a millsite permit from DNR for operation of the Fort Knox Mine Project ("the Project"); and

WHEREAS, in accordance with such application DNR has issued FGMI Millsite Permit ADL Nos. 414960 and 414961 (the "Millsite Permit"); and

WHEREAS, pursuant to AS 27.19 and the Reclamation Plan, FGMI is required to perform reclamation on lands which are subject to the Millsite Permit (the "Permit Area"), which Permit Area is depicted on Exhibit A hereto; and

WHEREAS, the Project requires the construction of a tailings dam, a water supply dam, and certain other facilities within the Permit Area, all of which facilities are depicted on Exhibit B hereto; and

WHEREAS, construction, operation and maintenance of such facilities require: a permit from the Army Corps of Engineers ("COE") pursuant to Section 404 of the Clean Water Act ("the Section 404 Permit"); Certificates of Approval to Operate the water

supply dam (the "Water Dam Approval to Operate") and the tailings dam, conveyer crossing and Melba/Monte Cristo Rock Dump (collectively the "Tailings Dam Approval to Operate") from DNR, three Fish Habitat Permits (the "Fish Habitat Permits") from ADF&G; and a Solid Waste Disposal Permit ("the Solid Waste Disposal Permit") from the Alaska Department of Environmental Conservation ("DEC") for a tailings impoundment (collectively the "Permits"); and

WHEREAS, AS 27.19.030(b) provides:

> In reviewing a reclamation plan for state, federal, or municipal land under (a) of this section, the commissioner may consider, after consultation with the Commissioners of Environmental Conservation and Fish & Game and with the concurrence of the miner and landowner, uses to which the land may be put after mining has been completed, including trails, lakes, recreation sites, fish and wildlife enhancement, commercial, and agricultural uses;

and

WHEREAS, the Reclamation Plan provides that following cessation of mining and milling operations in the Permit Area, FGMI will immediately initiate and complete within two years active reclamation ("Phase I Reclamation") followed by a period of passive reclamation now estimated to be 10 years ("Phase II Reclamation"), such reclamation phases having the meanings set forth in the Reclamation Plan; and

WHEREAS, DNR, ADF&G, and FGMI desire that the portion of the Permit Area depicted on Exhibit C hereto, or an area substantially similar thereto, be managed as a public

use/recreation site (the "Public Use Site") following completion of Phase II Reclamation by FGMI; and

WHEREAS, DNR has issued a Final Finding and Decision that the Project is in the best interests of the State of Alaska and has agreed to use its best efforts to amend the Tanana Basin Area Plan to classify the Public Use Site as public recreation and wildlife habitat to facilitate its eventual use by the public; and

WHEREAS, use of the area as a public use/recreation site requires the construction of a more substantial water supply dam than would otherwise be required by the Project, which dam, along with certain other facilities, hereinafter defined as "Improvements", will require monitoring and maintenance after DNR approval of completion of Phase II Reclamation by FGMI; and

WHEREAS, the parties desire to leave the water supply dam and lake in place in perpetuity, to provide mitigation that might otherwise be required under the Section 404 Permit and the Fish Habitat Permits under AS 16.05.840-.850; and

WHEREAS, the fulfillment of all provisions of this agreement satisfies Sections 4.2.4(3) and 4.2.6(2) and (3) of the Reclamation Plan; and

WHEREAS, it is thus in the mutual benefit of the State and FGMI that the Improvements remain in place; and

WHEREAS, it is not in the best interests of the State for the monitoring and maintenance of the Improvements and the Permits to create a financial burden on the State; and

WHEREAS, FGMI is willing to construct the Improvements and provide funds for the monitoring and maintenance thereof following completion of Phase II Reclamation only on the condition that FGMI be released from any and all Future Obligations, as hereinafter defined, under the Transferred Permits, as hereinafter defined, pursuant to Sections 4 and 5 hereto, including any future reclamation obligations; and

WHEREAS, the Solid Waste Disposal Permit and the Reclamation Plan provide that post-closure monitoring and maintenance may be required to continue in the Permit Area, which activities may continue for a period of thirty (30) years or longer; and

WHEREAS, FGMI, ADF&G, and DNR have agreed that the most desirable form of organization to accomplish the post-closure monitoring and maintenance in the Permit Area following completion of Phase II Reclamation by FGMI, would be best determined in the latter stages of Phase II Reclamation.

NOW, THEREFORE, the parties agrees as follows:

1. Definitions.

(a) "Maintenance Obligations" means the performance of all inspections, repairs and other activities that would be FGMI's obligations in the absence of this Agreement necessary to (1) maintain the Improvements in a condition for the protection of the public health and safety and (2) maintain the Transferred Permits in compliance with applicable law until termination or expiration. Exhibit D attached hereto contains a list of

Maintenance Obligations currently contemplated. This list may be revised during the term of this Agreement as mutually agreed between DNR and FGMI or as determined through arbitration as hereinafter provided.

(b) "Post-closure monitoring and maintenance" means monitoring and maintenance occurring after DEC's determination under the Solid Waste Disposal Permit that the criteria for permanent closure have been met and after the 70% vegetative cover criteria has been achieved pursuant to the Reclamation Plan.

(c) "Reclamation Plan" means the Fort Knox Project Reclamation Plan as approved by DNR and COE prior to or concurrently with the execution hereof and as amended and approved by DNR from time to time hereafter.

(d) "State" means DNR for all purposes of administering this Agreement.

(e) "Transferred Permits" has the meaning set forth in Section 4.1.

(f) "Future Obligations" means those legally enforceable duties under the Transferred Permits that arise following the fulfillment of all conditions under Sections 4 and 5 of this agreement (hereinafter referred to as the "Effective Date of Transfer") except that FGMI is not relieved of liability that accrues following the Effective Date of Transfer which arises out of operations conducted under the Transferred Permits prior to the Effective Date of Transfer.

(g) "Improvements" means those facilities identified in Exhibit B.

2. FORMATION OF ORGANIZATION. Not less than 90 days prior to the anticipated completion of Phase II Reclamation, the State and FGMI shall agree upon the organization to perform the Maintenance Obligations as provided in this Agreement and to hold and invest principal and to disburse the income from FGMI's funding of the post-reclamation expenses as set forth in this Agreement. The State and FGMI may elect (i) to form a nonprofit corporation at FGMI's expense; (ii) that FGMI endow a statutory fund (such as, but not limited to, the "fish and game fund" under AS 16.05.100 (Section 17 art I ch 9 SLA 1959; am Section 3 ch 132 SLA 1984)); (iii) to use a combination of the above or (iv) to use another mutually agreeable organizational form (the preferred funding mechanism being hereafter referred to as "Organization"). The State and FGMI intend that such Organization shall be formulated so that it shall not be considered the alter ego of FGMI under Alaska law. Within 10 days following the decision on the form of the Organization, the State and FGMI shall commence establishment of the Organization and diligently proceed to create the Organization, if necessary. If a nonprofit corporation is utilized the State and FGMI shall agree upon the contents of the Articles of Incorporation and Bylaws that are consistent with this Agreement unless otherwise agreed. If a statutory fund is to be endowed or other organization utilized, the endowment shall not be used except as specified in this Agreement unless the DNR and the agency with control over the

statutory fund utilized and FGMI agree otherwise. If a statutory fund is utilized the agency controlling the statutory fund shall agree to the terms of the endowment

2.1 Purpose. Subject to the terms of this Agreement, the Organization shall be utilized for the purpose of determining and financing all Maintenance Obligations reasonably required to be performed under this Agreement after completion of Phase II Reclamation by FGMI, and to perform those administrative functions necessary and directly related to the existence and purpose of the Organization.

3. APPLICATIONS BY FGMI. Not more than 180 days after the State and FGMI determine and create the Organization pursuant to section 2, FGMI shall diligently and in good faith make all applications and take all reasonable steps necessary (a) to obtain termination or abandonment of the Millsite Permit, the Tailings Dam Approval to Operate and the Fish Habitat Permit for the wetlands and fish barrier; (b) to obtain, to the fullest extent possible, termination or abandonment of the Section 404 Permit and the Solid Waste Disposal Permit, and, to the extent FGMI is unable to obtain full termination and abandonment of such permits, to seek transfer to the Organization of the unterminated and unabandoned portion of such permits; and (c) to seek transfer to the Organization of the Water Dam Approval to Operate, the Fish Habitat Permits for the Solo Creek Causeway and culvert battery and the water supply dam. FGMI may transfer the permits listed in (b) and (c) above to the Organization provided that the Organization is adequately funded as

provided in this Agreement and that the relevant agency approves transfer. The transfer shall be subject to Section 5.2 of this Agreement. The State shall cooperate fully and in good faith with FGMI to effect the transfer of the permits as provided in this Agreement.

4. TRANSFERS. Subject to Sections 3 and 5, FGMI shall transfer to the Organization the following:

4.1 Permits. The permits listed in Section 3 (b) and (c) above (the "Transferred Permits"). The Organization shall assume all Future Obligations under such permits from and after the Effective Date of Transfer.

4.2 Funds. The sum established in accordance with Section 7 of this Agreement, which shall be deposited into a mutually acceptable depository in the name of the Organization;

4.3 Maintenance Records. FGMI's historical records relating to Maintenance Obligations; and

4.4 Other Obligations. Such other permits or obligations, other than Maintenance Obligations, which may arise during the course of the Project provided that the State and FGMI agree in writing and the additional responsibilities are adequately funded as provided in this Agreement.

5. CONDITIONS TO TRANSFER. FGMI's obligation to make the transfers set forth in Section 4 is subject to the satisfaction of the following conditions prior to or simultaneously with FGMI's satisfaction of its obligations under Section 4.

5.1 Termination of Permits. The permits listed in Section 3(a), and, to the extent not transferred to the Organization under Section 4.1, the permits listed in Section 3(b), shall have been terminated or abandoned.

5.2 Transfer of Permits. The Transferred Permits shall have been transferred to the Organization in accordance with Section 4.1 and FGMI released from Future Obligations thereunder. FGMI shall be responsible for satisfying any reasonable conditions required or permitted by law imposed by the permitting agency for transfer of the permits.

5.3 Release of Reclamation Bond. DNR shall have released FGMI from any undertaking or security posted pursuant to the Millsite Permit and given written approval of the reclamation work.

5.4 Release of Solid Waste Disposal Permit Bond. DEC shall have released FGMI from any undertaking or security pursuant to the Solid Waste Disposal Permit.

5.5 Release of Bond Under Section 6 of this Agreement. DNR shall have released FGMI from the undertaking set forth in Section 6 of this Agreement.

5.6 Final Determination of Funding Amount. The amount to be transferred to the Organization by FGMI pursuant to Section 4.2 of this Agreement shall have been finally determined in accordance with Section 7 of this Agreement.

6. SECURITY FOR FUNDING. Upon the issuance of the Water Dam Approval to Operate, FGMI shall deliver to DNR a bond in

the amount of $667,000 as security for FGMI's funding obligation pursuant to Section 4.2 of this Agreement. The $667,000 bond amount covers FGMI's bonding obligation under this section for the first year following issuance of the Water Dam Approval to Operate. The bond shall be adjusted annually for years 2 through the first five year anniversary of the Millsite Permit for inflation and such other factors as DNR and FGMI agree. Subsequently the amount of such bond shall be adjusted as follows:

(a) Not less than 90 days prior to the fifth anniversary of the issuance of the Millsite Permit, and each successive fifth year anniversary thereafter until its termination, FGMI shall transmit to DNR all historical records and future projections of costs, if any, relating to Maintenance Obligations which have not been previously transmitted under this Section 6 (a).

(b) Not more than 30 days after transmittal of the records pursuant to Section 6 (a), DNR and FGMI shall meet for the purpose of adjusting the anticipated amount of funding which, if invested on the expiration date of the succeeding bond, would be sufficient to generate an amount of income that would adequately fund the Maintenance Obligations in perpetuity. This process will yield an anticipated bond amount for the first year of each five year period. DNR and FGMI shall meet annually within each five year period to adjust the amount of the bond based upon then current information on inflation and upon such other factors as DNR and FGMI may agree. If DNR and FGMI reach an agreement on the

amount, the amount of the succeeding bond shall be adjusted to the agreed upon amount.

(c) If DNR and FGMI are unable to reach agreement under Section 6 (b), the adjusted amount of the bond shall be determined under the Alaska Uniform Arbitration Act, in accordance with Section 8 of this Agreement.

(d) The bond proceeds shall be payable to DNR upon the occurrence of any of the following:

(1) the filing of a petition in bankruptcy by or against FGMI, or the commencement of any proceeding by or against FGMI under any federal or state insolvency or other law for the relief of debtors, in either case which is not dismissed within 60 days, or the insolvency of FGMI;

(2) DNR's termination of the Millsite Permit for breach thereof;

(3) FGMI's material breach of this Agreement; or

(4) failure of FGMI or its successors to renew the bond prior to fifteen (15) days before the bond's expiration. In the event the adjusted amount of the bond is in arbitration at such time, the bond shall be initially renewed at the existing amount and subsequently adjusted as determined by the arbiter.

(e) Any proceeds from the bond described in this section shall be applied to FGMI's obligations under this Agreement.

7. PROCEDURE FOR DETERMINING AMOUNT OF FUNDING. The sum to be transferred to the Organization under Section 4.2 of this Agreement shall be an amount which, if invested at the time of such funding, shall be sufficient to adequately fund the Organization's Maintenance Obligations in perpetuity, as determined in accordance with this Section 7.

(a) For the purpose of assisting DNR and FGMI in determining the adequacy of funding of the Organization, the parties shall use the information obtained in (1) the environmental audits required under Section 12 (Environmental Audit) of the Millsite Permit and (2) other appropriate audit performed by a contractor hired by FGMI and approved by DNR to give an opinion concerning (i) the costs to be incurred by the Organization in performing the Maintenance Obligations and (ii) such other matters as agreed upon by DNR and FGMI, which may include the need for insurance. The contractor shall be hired not less than 180 days prior to the completion of Phase II Reclamation.

(b) Not more than 180 or less than 120 days prior to completion of Phase II Reclamation by FGMI, FGMI shall transmit to DNR all historic records and projections of future costs relating to Maintenance Obligations, which have not previously been transmitted pursuant to Section 6 (a) of this Agreement.

(c) Not more than 30 days after transmittal of the records pursuant to Section 7 (a), the State and FGMI shall meet for the purpose of determining the amount to be transferred to the Organization pursuant to Section 4.2 of this Agreement.

(d) If the State and FGMI reach agreement under Section 7 (c), the amount to be transferred shall be the amount agreed upon. If the State and FGMI are unable to agree on the amount to be transferred to the Organization under Section 4.2 and this Section 7, the State and FGMI shall proceed to arbitrate the dispute under Section 8. The arbitration shall determine the amount which, if invested at the time of transfer, would be sufficient to generate an amount of income adequate to fully fund the Maintenance Obligations in perpetuity.

8. Arbitration. (a) If the State and FGMI are unable to agree on the scope of Maintenance Obligations under section 1(a), the annual inflation adjustment of the bond under Section 6, the adjusted bond amount at five-year intervals under Section 6 or the amount of funding of the Organization under Section 7 (including the need for insurance), the State and FGMI shall arbitrate the dispute under the Alaska Uniform Arbitration Act. The State and FGMI each party shall select an arbiter and the two arbiters shall jointly select a third arbiter.

(b) When resolving the foregoing disputes the State and FGMI and the arbiters shall use the following principles:

(1) The total funding shall be the sum of the following:

(a) A principal amount sufficient to generate income on a continuing basis and in perpetuity to pay those costs reasonably anticipated to perform the Maintenance Obligations;

(b) A principal amount reasonably anticipated to generate sufficient annual income to invest in principal at the end

of each fiscal year to offset the effect of inflation on the principal; and

(c) An amount to be used to pay the Maintenance Obligations until the Organization can accumulate sufficient income to pay the reasonably anticipated Maintenance Obligations as they arise, if any such monies are needed.

(2) All Maintenance Obligations shall be performed in accordance with local, state, and federal laws and to protect the public health and safety.

(3) The costs shall be based on contracting with third parties to perform the Maintenance Obligations, or on having the work performed by government employees, as appropriate.

(4) A reasonable estimate of future inflation shall be utilized.

(5) A reasonable rate of net return on principal resulting from conservative investments shall be utilized.

(6) Only income from the principal may be used to fund expenses and inflation proof.

(7) Any responsibility that is undertaken by the Organization that would be the responsibility of FGMI in the absence of this Agreement shall be adequately funded.

(8) FGMI shall not be required to fund any function that would not have been its responsibility in the absence of this Agreement.

(9) The scope of the Maintenance Obligations shall be those functions (a) necessary for physical maintenance of the

Improvements for the protection of the public health and safety; (b) required to maintain the Transferred Permits in compliance with applicable law; and (c) those administrative functions necessary and directly related to the existence and purpose of the Organization.

(10) When determining the need for insurance the parties and arbiters shall consider applicable law requiring insurance, insurance or self-insurance carried by or available to the Organization and the cost thereof, the likelihood of the event or activities that the insurance would cover, the cost of the insurance and such other reasonable considerations as the parties or arbiters deem appropriate. The intent of this provision is not to require insurance but to ensure that the need for insurance is adequately assessed and appropriate funding required if insurance is so determined to be needed by the Organization.

(11) The monitoring and maintenance of the Improvements and the Transferred Permits shall not create a financial burden on the State.

9. FAILURE OF CONDITIONS PRECEDENT. In the event that any of the conditions set forth in Section 5 of this Agreement remain unsatisfied as of one year after completion of Phase II Reclamation by FGMI, unless such period is extended by mutual agreement or unless such condition shall have been waived in writing by the State and/or FGMI, as appropriate, FGMI shall prepare an amendment to the Reclamation Plan to provide for post-closure monitoring and maintenance in substitution of this

Agreement within 180 days of the above date and the bond requirements under Section 6 shall remain in effect until DNR's approval of the amendment to the Reclamation Plan.

10. Mutual Indemnity. Simultaneously with the satisfaction of the requirements under Sections 4 and 5 thereof, the Organization and FGMI shall provide the following indemnifications. The Organization shall defend and indemnify FGMI against any and all claims, liabilities, demands, causes of action, damages, judgments, penalties, fines, and administrative actions resulting from the acts or omissions of the Organization within or relating to the Permit Area from and after the transfer of the Transferred Permits to the Organization. FGMI shall defend and indemnify the Organization against any and all claims, liabilities, demands, causes of action, damages, judgments, penalties, fines, and administrative actions resulting from the acts or omissions of FGMI within or relating to the Permit Area prior to the transfer of the Transferred Permits to the Organization.

11. Public Use Site. DNR shall seek to amend the Tanana Basin Area Plan to classify the Public Use Site as public recreation and wildlife habitat to facilitate public access and recreation. DNR agrees that following Phase II Reclamation the public shall be granted access for public use and recreation to the maximum extent allowed by law.

12. Notice: Administering Agency. DNR is the agency responsible for administering this Agreement and is the agency FGMI shall contact concerning any questions arising hereunder. DNR

shall contact and coordinate with such other state agencies as necessary for implementation of or questions arising under this Agreement. Any Notices to be given under this Agreement shall be given to FGMI at 701 Bidwill Avenue, Fairbanks, Alaska 99701 (for UPS delivery), or P.O. Box 73726, Fairbanks, Alaska 99707 (for mail delivery), or FAX no (907) 451-4305, and to DNR at: Department of Natural Resources, Division of Mining, Attention: Director, 3601 "C" Street, Suite 880, Anchorage, AK 99501, or P.O. Box 107016, Anchorage, Alaska 99510-7016 (for mail delivery), or FAX no. (907) 563-1853 or such other address as provided in writing to the other party.

13. Assignment. FGMI may assign all or part of its rights and delegate its obligations under this agreement solely as provided in this section. FGMI only may assign its rights and delegate its obligations under this agreement to the assignee of its interest under the Millsite Permit and in the same proportion as thereunder. No transfer permitted by this section shall, as between the State and FGMI, relieve FGMI of any liability, whether accruing before or after such transfer, which arise out of Permit operations conducted prior to such transfer. No transfer of an interest under this agreement is binding on the State without the express written approval of DNR. In the event of a transfer by FGMI of less than its entire undivided interest in, to, or under this agreement, FGMI and its transferee shall act and be treated as one party, except that DNR shall be required to deliver copies of all notices permitted or required under this agreement to all

parties holding interests under this agreement pursuant to transfers which have been approved by DNR as provided in this section. Transfer of all or any of FGMI's interest in, to, or under this Agreement does not relieve Amax Gold Inc. or any succeeding guarantor under the guaranty executed in conjunction with the Millsite Permit unless the requirements for such transfer of the guaranty as provided therein have been satisfied.

14. Successors. This agreement shall be binding on and inure to the benefit of the parties and their successors.

15. Monies Payable in U.S. Money. All sums payable under this agreement must be paid in money of the United States of America.

16. Severability of Clauses of Agreement. If any clause, or provision, herein contained, shall be adjudged to be invalid, it shall not affect the validity of any other clause or provision of this agreement.

17. Waiver. No delay or omission in the exercise of any right or remedy of either party shall impair such right or remedy or be construed as a waiver of such right or remedy.

18. Corporate or Partnership Authority. FGMI shall deliver to DNR upon the execution of this agreement a certified copy of a resolution of its board of directors authorizing execution of this agreement and naming the officers that are authorized to execute this agreement on behalf of the corporation. The State shall be entitled to rely upon the authority of the persons identified in the resolution to continue to act on behalf

of the corporation until otherwise notified in writing by the corporation.

19. Venue; Controlling Law. The venue for any administrative appeal or civil action relating to this agreement shall be in Fairbanks, Alaska. This agreement shall be interpreted in accordance with the law of the State of Alaska.

20. Modification of Agreement. This agreement shall not be modified except in writing executed by the parties.

21. Exhibits. All exhibits referred to herein are attached to this agreement and incorporated by reference.

22. Interpretation. This agreement shall be interpreted according to the fair intent of the agreement as a whole. This agreement has been jointly drafted by the parties following negotiations and the rule of contract interpretation construing an instrument against the drafter shall not be applied.

23. Headings. The section headings in this agreement shall have no effect on its interpretation.

STATE OF ALASKA
Department of Fish and Game

By: Frank Rue Date: 2·24·94
Frank Rue
Director, Habitat and Restoration Division

ACKNOWLEDGMENT

STATE OF ALASKA)
) ss.
FIRST JUDICIAL DISTRICT)

The foregoing instrument was acknowledged before me this 2/24/94 (date) by Frank Rue, Director, Habitat and Restoration Division.

SUBSCRIBED AND SWORN TO before me this 24 day of February, 1994

OFFICIAL SEAL
MONICA WELLARD
NOTARY PUBLIC - STATE OF ALASKA
My Comm. Expires 5/13/97

Monica Wellard
Notary Public, State of Alaska
My commission expires: 5/13/97

STATE OF ALASKA
Department of Natural Resources

By: Date: FEB. 15, 1994
Richard A. LeFebvre
Project Manager

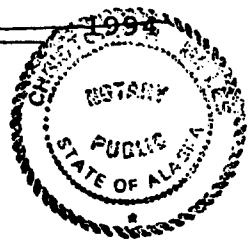
ACKNOWLEDGMENT

STATE OF ALASKA)
FOURTH) ss.
~~THIRD~~ JUDICIAL DISTRICT)

The foregoing instrument was acknowledged before me this February 15, 1994 (date) by Richard A. LeFebvre, Project Manager, Department of Natural Resources

~~SUBSCRIBED AND SWORN TO before me this _____ day of~~

~~_____, 1994~~



Christopher C Miller
Notary Public, State of Alaska
My commission expires: 1-31-95

FAIRBANKS GOLD MINING, INC.
a Delaware corporation

By: Kenneth R Pohle
Kenneth R. Pohle
President

Date: Feb. 15, 1994

ACKNOWLEDGMENT

STATE OF ALASKA)
) ss.
FOURTH JUDICIAL DISTRICT)

The foregoing instrument was acknowledged before me this February 15, 1994 (date) by Kenneth R. Pohle, President of Fairbanks Gold Mining, Inc., a Delaware corporation, on behalf of the corporation.

Christopher C Miller
Notary Public, State of Alaska
My commission expires: 1-31-95

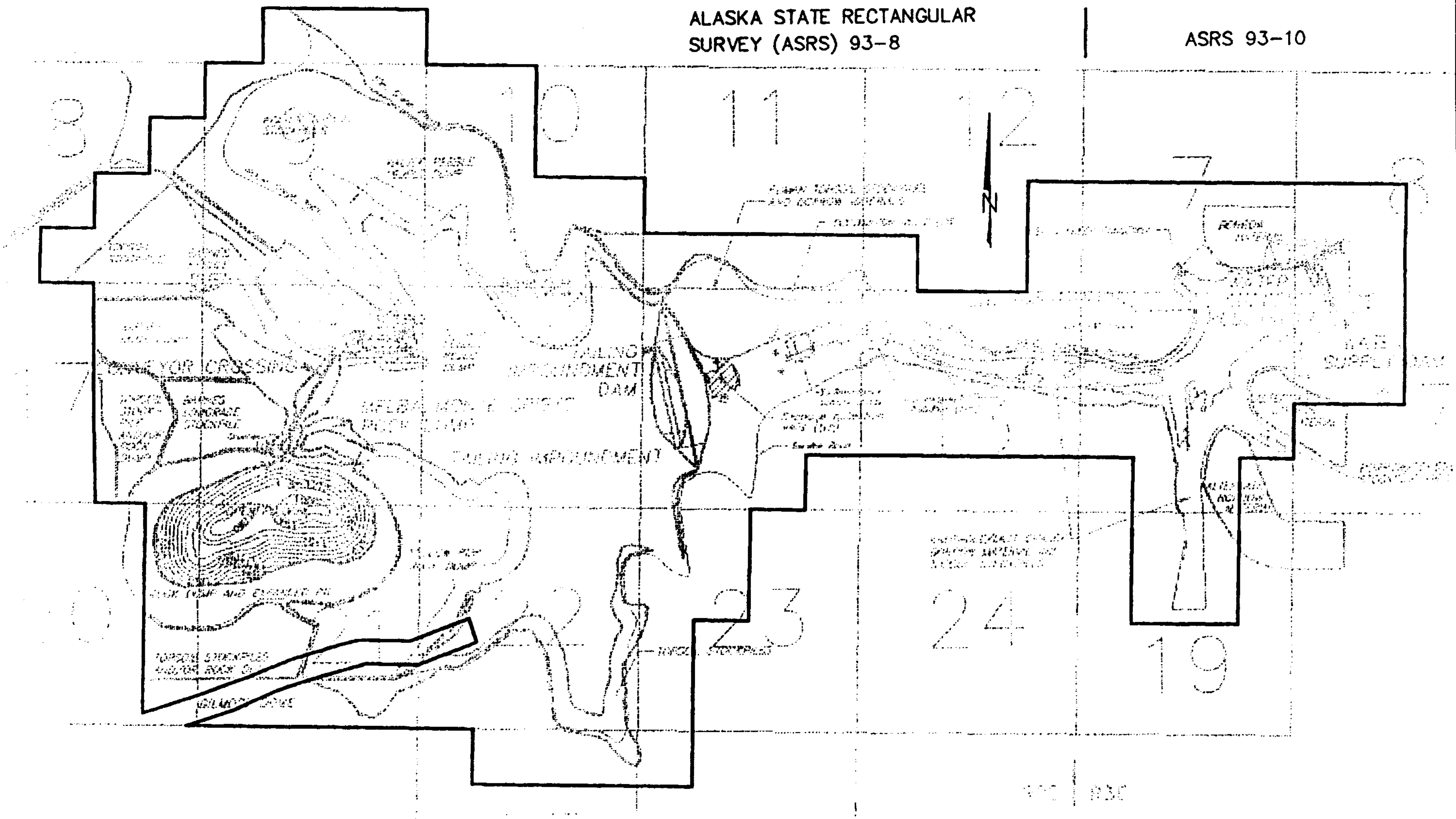
Exhibit "A"

Attached to and made part of the Agreement For Funding Post-Reclamation Obligations between Fairbanks Gold Mining, Inc. and the State of Alaska, Department of Natural Resources, Divisions of Land and Mining and the Department of Fish and Game dated February 15, 1994.

The Permit Area is that real property identified on the plat appended to this exhibit.

MILLSITE PERMIT AREA

ADL 414960
ADL 414961



FAIRBANKS GOLD MINING, INC.
FORT KNOX PROJECT
FAIRBANKS, ALASKA

MILLSITE PERMIT AREA
EXHIBIT A

DRAWING NUMBER	SCALE	DATE
MPEXHA.DWG	1" = 3500'	2/8/94

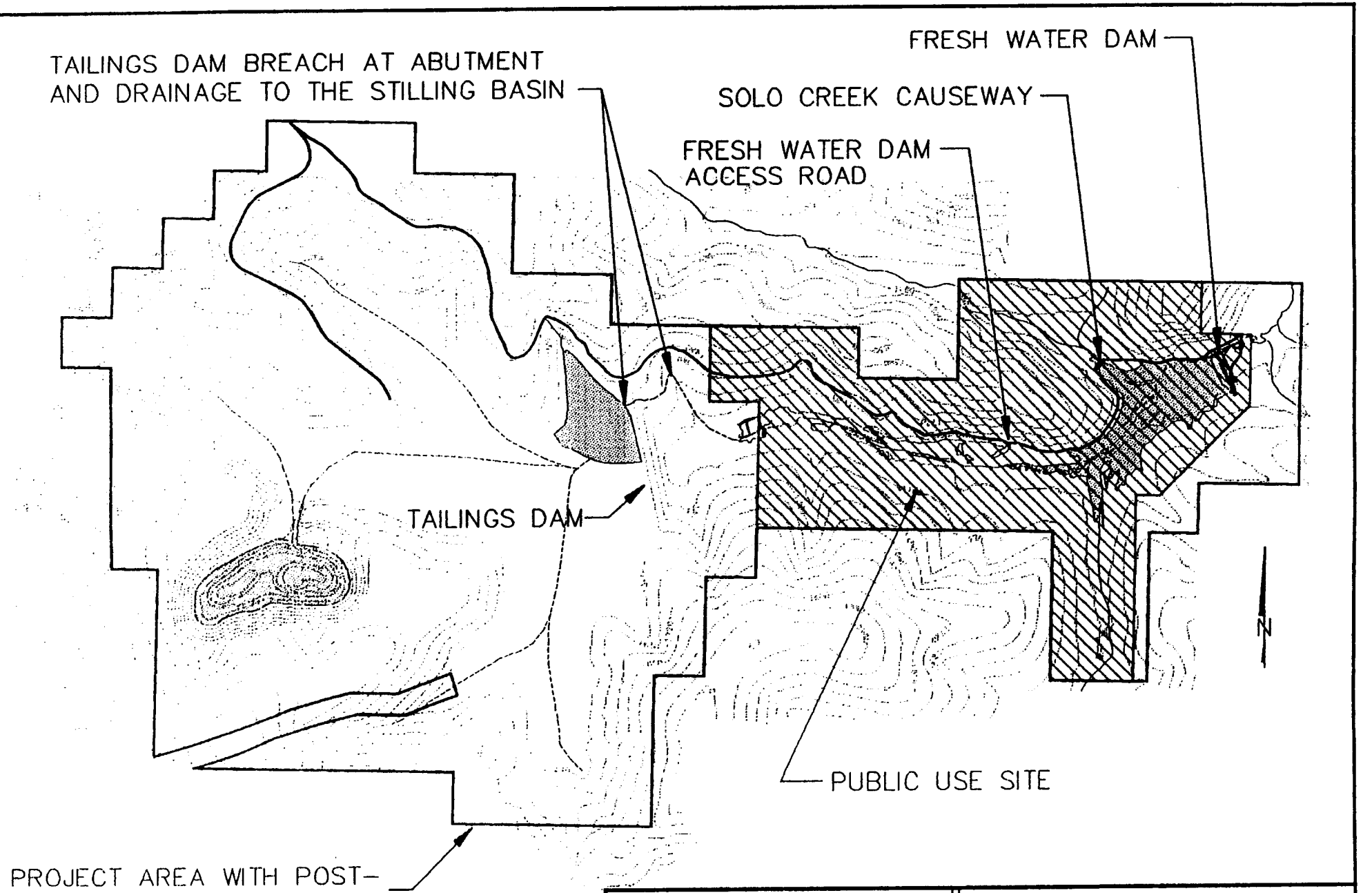
Exhibit "B"

Attached to and made part of the Agreement For Funding Post-Reclamation Obligations between Fairbanks Gold Mining, Inc. and the State of Alaska, Department of Natural Resources, Divisions of Land and Mining and the Department of Fish and Game dated February 15, 1994.

The Improvements are:

1. Fresh water dam
2. Fresh water dam access road
3. Solo Creek Causeway
4. Tailings dam
5. Tailings dam breach at abutment
6. Tailings dam drainage to the stilling basin
7. Such other roads as are necessary for access to the Improvements as determined by the parties upon implementation of this agreement.

The Improvements identified as 1 and 4 above are depicted on the plat attached to Exhibit A. The Improvements identified as 5 and 6 above are shown on the plat attached to Exhibit B. The Improvements identified as 2, 3, and 7 are not specifically identified on the plats attached to the Exhibits.



FAIRBANKS GOLD MINING, INC.
FORT KNOX PROJECT
FAIRBANKS, ALASKA

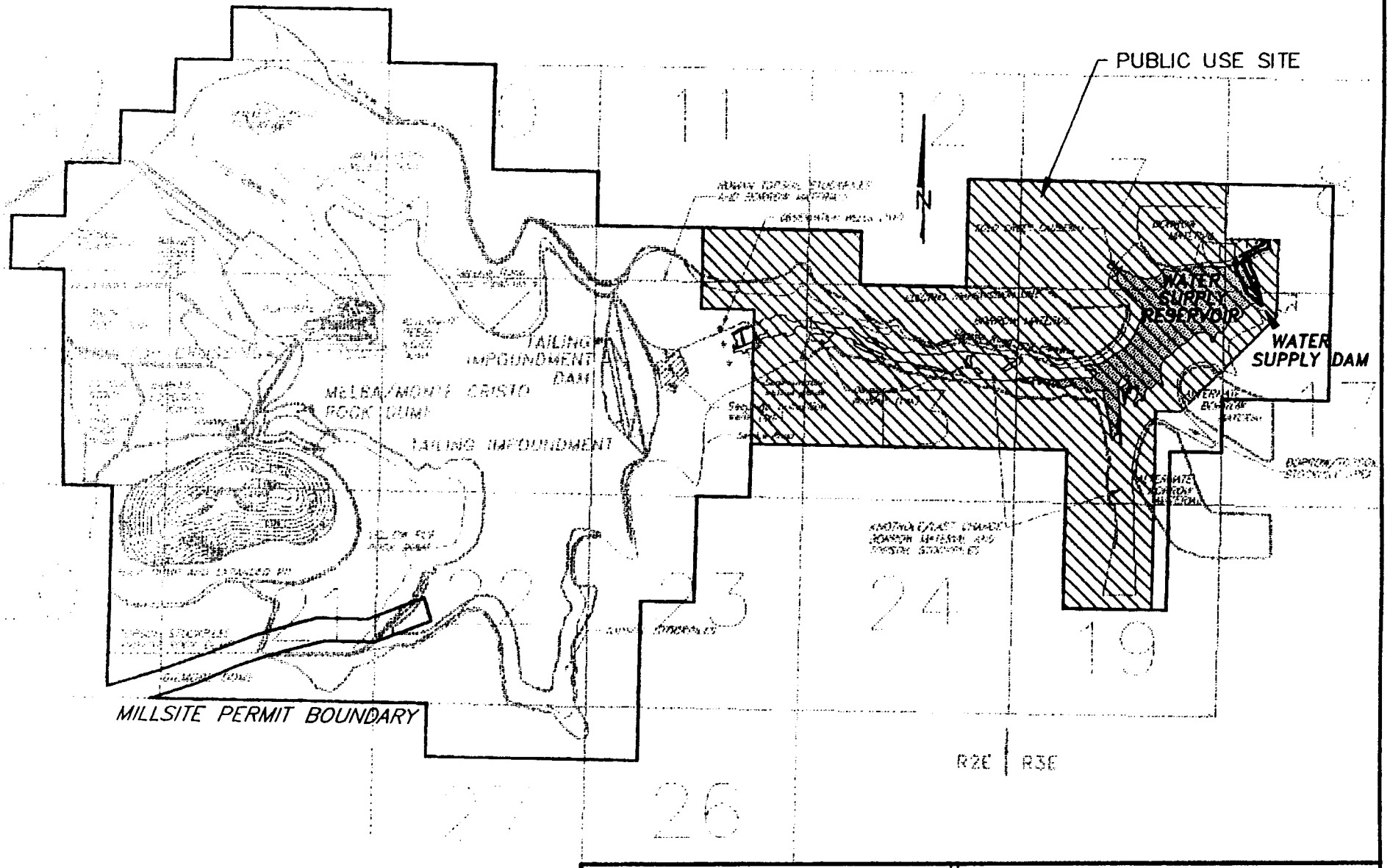
MANAGEMENT PLAN FOR PROJECT
EXHIBIT B

DRAWING NUMBER	SCALE	DATE
MPEXHIB.DWG	1" = 3500'	2/15/94

Exhibit "C"

Attached to and made part of the Agreement For Funding Post-Reclamation Obligations between Fairbanks Gold Mining, Inc. and the State of Alaska, Department of Natural Resources, Divisions of Land and Mining and the Department of Fish and Game dated February 15TH, 1994.

That portion of the Permit Area desired as a Public Use Site by the parties is identified on the attachment to this exhibit.



FAIRBANKS GOLD MINING, INC.
FORT KNOX PROJECT
FAIRBANKS, ALASKA

PROPOSED PUBLIC USE SITE
(APPROX. 1820 ACRES)
EXHIBIT C

DRAWING NUMBER	SCALE	DATE
MPEXHC.DWG	1" = 3500'	2/15/94

Exhibit "D"

Attached to and made part of the Agreement For Funding Post-Reclamation Obligations between Fairbanks Gold Mining, Inc. and the State of Alaska, Department of Natural Resources, Divisions of Land and Mining and the Department of Fish and Game dated February 15, 1994.

[FTKNOX] A:LONGTERM.5

ESTIMATED LONG–TERM DAM MAINTENANCE SCHEDULE & COSTS

Item	Interval (frequency)	Unit	Price (US$/unit)	Quantity (units)	Cost (US$)	Cost Subtotals (US$)
Monitoring – Piezometer	3 per Year	HR	$40	6	$240	$720
Monitoring – Survey	2 per Year	HR	$100	8	$800	$1,600
Inspection & Evaluation	3 Years	LS	$2,333	1	$2,333	$2,333
Maintenance Supervision	1 per Year	HR	$47	16	$747	$747
Maintenance 140G Motor Grader	1 per Year	HR	$76.05	32	$2,434	$2,434
Maintenance 950F Loader	1 per Year	HR	$72.97	32	$2,335	$2,335
Maintenance D5H Dozer	1 per Year	HR	$66.37	32	$2,124	$2,124
Mobilize/Demobilize	1 per Year	LS	$750.00	1	$750	$750
Tax Return & Audit	1 per Year	LS	$1,000.00	1	$1,000	$1,000
Subtotal 1 Year						***$14,043***
Surface Water Monitoring & Labor	5 Years	LS	$1,100	1	$1,100	
Subtotal 5 Year						***$1,100***
Clean & Repair Weep Holes	10 Years	LS	$3,800	1	$3,800	
Subtotal 10 Year						***$3,800***
Repair/Replace Gate	30 Years	LS	$2,600	1	$2,600	
Subtotal 30 Year						***$2,600***
Install/Replace Outlet Insert	50 Years	FT	$52	565	$29,380	
Repair Spillway Concrete/Joints	50 Years	CY	$371	678	$251,353	
Repair Stilling Basin Concrete	50 Years	CY	$371	53	$19,478	
Repair/Replace Trash Racks	50 Years	LS	$3,140	1	$3,140	
Subtotal 50 Year						***$303,350***
Clean & Repair Dam Faces	100 Years	AC	$2,500	7	$17,500	
Subtotal 100 Year						***$17,500***
Other Maintenance	Unknown					
Subtotal Other						

ASSUMPTIONS:

1. Only routine maintenance is required, with trouble shooting completed during mine life (approximately 16 years).
2. Engineer/Piezometer Technician includes travel (2 hr.), recording piezometers (2 hr.), and inspect (2 hr.) tailing and water dams.
   Surveying includes travel (2 men @ 2 hr.), surveying (2 men @ 5 hr.), and note reduction and brief report (1 man @ 2 hr.).
3. Inspection includes analysis and report at 3 year intervals. (3*$2,333=$7,000 per inspection)
4. Equipment rates in the Fairbanks Mining District with salvage, interest, insurance, fuel, lube, tires, cutting edges, operator, fringe benifits, and ten percent profit.
5. Maintain 4000 feet of road, tailings diversion, stilling basins and causeways.
6. 380 weep holes, approximately 2 ft. each, redrill at $5.00 per foot.
7. Gate (intake) is rebuilt for new cost ($2,600 new cost).
8. Valve (outlet) is removed during reclamation ($14,500 new cost).
9. Repair trash racks (1256 lb.) at $2.50 per pound.
10. 28 in., SDR 32.5, 50 psi, HDPE Plexco outlet pipe insert ($40/ft new cost, $12/ft installation).
11. Remove ($71/cy) and replace ($300/cy) 25% of original spillway and stilling basin reinforced concrete.
12. Water monitoring occurs in years 5, 10, 15 and 20 only.

01/25/94 K. Brown

APPENDIX B

SURFACE AND MINERAL LAND DESCRIPTIONS
AND
CLAIMS MAP

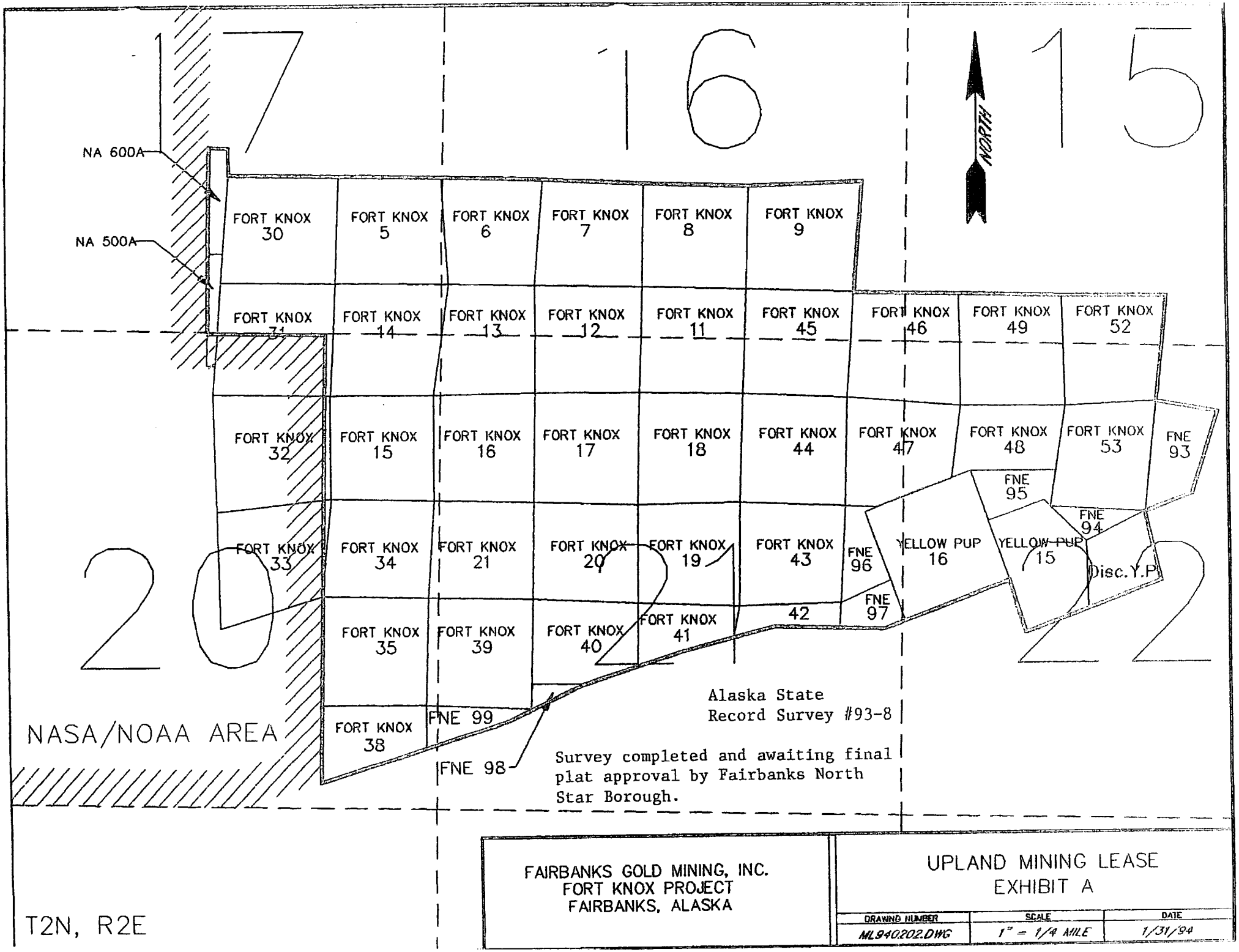
State Mining Claims Included in Mining Lease

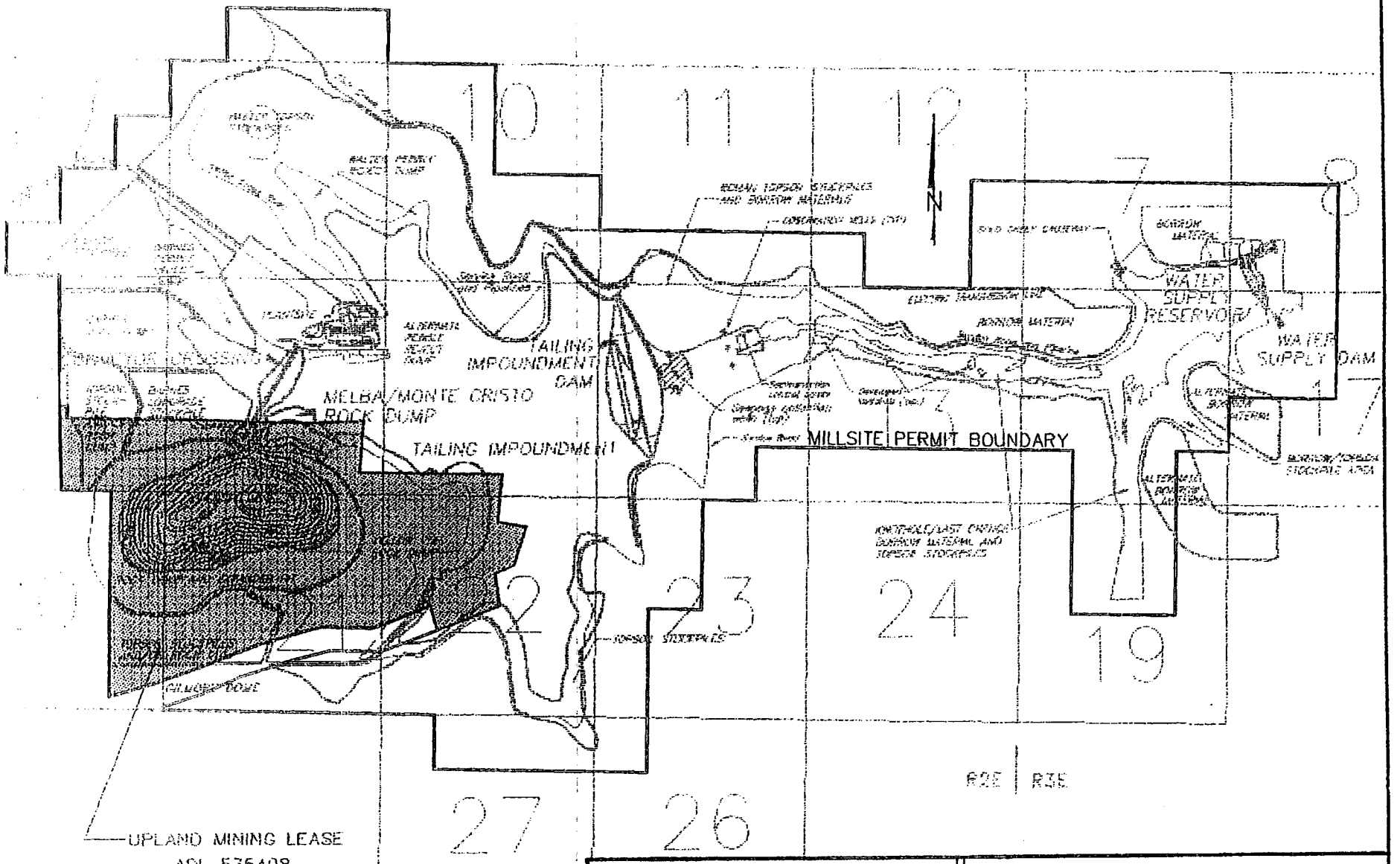
Name of Claim	Portion	Fairbanks Rec. Dist. Book\Page	ADL Number
Discovery on Yellow Pup	All	175/548 240/439	323728
Yellow Pup #15	All	178/296	320607
Yellow Pup #16	All	178/297	319075
Fort Knox #5	All	179/536 601/363-364	321080
Fort Knox #6	All	179/537 601/365-366	321081
Fort Knox #7	All	179/538 601/367-368	321082
Fort Knox #8	All	179/539 601/369-370	321083
Fort Knox #9	All	179/540	321084
Fort Knox #11	All	179/542 601/371-372	321086
Fort Knox #12	All	179/543 601/373-374	321087
Fort Knox #13	All	179/544 601/375-376	321088
Fort Knox #14	All	179/545 320/979 601/377-378	321089
Fort Knox #15	All	179/546 320/980 601/379-380	321090
Fort Knox #16	All	179/547 601/381-382	321091

Name of Claim	Portion	Fairbanks Rec. Dist Book\Page	ADL Number
Fort Knox #17	All	179/548 601/383-384	321092
Fort Knox #18	All	179/549 601/385-386	321093
Fort Knox #19	All	179/550 601/387-388	321094
Fort Knox #20	All	179/551 601/389-390	321095
Fort Knox #21	All	179/552 601/391-392	321096
Fort Knox #30	All	287/813 601/393-394	352816
Fort Knox #31	Only that portion within the S2SE4 of Section 17 and the NE4NE4 of Section 20, T2N,R2E, FM	287/814 601/395-396	352817
Fort Knox #32	Only that portion within the E2NE4 of Section 20, T2N,R2E, FM	287/815 601/397-398	530898
Fort Knox #33	Only that portion within the SE4NE4 and the NE4SE4 of Section 20, T2N,R2E, FM	287/816 601/399-400	530899
Fort Knox #34	All	287/817 601/401-402	352820
Fort Knox #35	All	287/818 601/403-404	352821
Fort Knox #38	All	287/821	352824

Name of Claim	Portion	Fairbanks Rec. Dist Book\Page	ADL Number
Fort Knox #39	All	287/822 601/407-408	352825
Fort Knox #40	All	287/823 601/409-410	352826
Fort Knox #41	All	287/824 601/411-412	352827
Fort Knox #42	All	287/825 601/413-414	352828
Fort Knox #43	All	287/826 601/415-416	352829
Fort Knox #44	All	287/827 601/417-418	352830
Fort Knox #45	All	287/828 601/419-420	352831
Fort Knox #46	All	287/829	352832
Fort Knox #47	All	~~28~~7/830	352833
Fort Knox #48	All	287/831	352834
Fort Knox #49	All	287/832	352835
Fort Knox #52	All	287/835 636/693-694	530902
Fort Knox #53	All	287/836 601/421-422	352839
FNE #93	All	601/566	527279
FNE #94	All	601/567	527280
FNE #95	All	601/568	527281
FNE #96	All	601/569	527282
FNE #97	All	601/570	527283

Name of Claim	Portion	Fairbanks Rec. Dist Book\Page	ADL Number
FNE #98	All	601/571	527284
FNE #99	All	601/572	527285
NA 500A	Only that portion in the SW4SE4 of Section 17, T2N,R2E, FM	646/821	531612
NA 600A	All	646/822	531613


17
16
15
20
22
NORTH
NA 600A
NA 500A
FORT KNOX 30
FORT KNOX 5
FORT KNOX 6
FORT KNOX 7
FORT KNOX 8
FORT KNOX 9
FORT KNOX 31
FORT KNOX 14
FORT KNOX 13
FORT KNOX 12
FORT KNOX 11
FORT KNOX 45
FORT KNOX 46
FORT KNOX 49
FORT KNOX 52
FORT KNOX 32
FORT KNOX 15
FORT KNOX 16
FORT KNOX 17
FORT KNOX 18
FORT KNOX 44
FORT KNOX 47
FORT KNOX 48
FORT KNOX 53
FNE 93
FNE 95
FNE 94
FORT KNOX 33
FORT KNOX 34
FORT KNOX 21
FORT KNOX 20
FORT KNOX 19
FORT KNOX 43
FNE 96
YELLOW PUP 16
YELLOW PUP 15
Disc. Y.P.
FNE 97
42
FORT KNOX 35
FORT KNOX 39
FORT KNOX 40
FORT KNOX 41
FORT KNOX 38
FNE 99
FNE 98
NASA/NOAA AREA
Alaska State
Record Survey #93-8
Survey completed and awaiting final plat approval by Fairbanks North Star Borough.
T2N, R2E
FAIRBANKS GOLD MINING, INC.
FORT KNOX PROJECT
FAIRBANKS, ALASKA
UPLAND MINING LEASE
EXHIBIT A
DRAWING NUMBER
ML940202.DWG
SCALE
1" = 1/4 MILE
DATE
1/31/94



FAIRBANKS GOLD MINING, INC.
FORT KNOX PROJECT
FAIRBANKS, ALASKA

UPLAND MINING LEASE
EXHIBIT A

DRAWING NUMBER	SCALE	DATE
UPLEASE.DWG	1" = 3500'	2/15/94

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

NORTH

GV FRACTION

GE

GE

FX

UB FRACTION

UB

NA

DAILY DOUBLE

GV FRACTION

MCC

FNE

FH

TAT 69

TAT 71

TAT 72

LC

SLN

GIL

LAST CHANCE

<<JJP 500A

JJP 31

JJP 32

JJP33

Disc.P.C.

ROMAN

No.1

No.2

No.3

No.4

YELLOW PUP

PEARL

LAUREL

TOM

GD

GIG

Note: Claims are state mining claims unless otherwise noted

Non–Project Land

Surface deeded to Alaska but mineral rights retained

Private Land

NOAA Site

Millsite Permit Boundary

Mining Lease

Leased To FGMI From Mental Health

FORT KNOX Gold Mine • Alaska

Fort Knox Claim Map

SIZE	FIGURE NO.	DWG NO.	REV
		APPENDIX B	
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

APPENDIX C

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR

FIRE MONITORING HANDBOOK
POINT-INTERCEPT METHOD

POINT-INTERCEPT METHOD
Sighting Devices, Pin Frames, and Point Frames

1. General Description The Point-Intercept method consists of employing a sighting device or pin/point frame along a set of transects to arrive at an estimate of cover. It measures cover for individual species, total cover, and species composition by cover. Point-Intercept is the method used in the NPS Fire Monitoring Handbook to estimate cover.

It is important to establish a photo plot and take both close-up and general view photographs. This allows the portrayal of resource values and conditions and furnishes visual evidence of vegetation and soil changes over time.

2. Areas of Use This method is suited to all vegetation types less than about 1.5 meters in height. This is because sighting devices and pin/point frames require the observer to look down on the vegetation from above in a vertical line with the ground. If the sighting device allows upward viewing, the method can also be used to estimate the canopy cover of large shrubs and trees.

3 . Advantages and Limitations Point interception measurements are highly repeatable and lead to more precise measurements than cover estimates using quadrats. The method is more efficient than line intercept techniques, at least for herbaceous vegetation, and it is the best method of determining ground cover and the cover of the more dominant species. Given the choice between sighting devices and pin/point frames, the optical sighting device is preferable.

A limitation of point-intercept sampling is the difficulty in picking up the minor species in the community without using a very large number of points. In addition, wind will increase the time required to complete a study because of the need to view a stationary plant.

One limitation that is specific to the use of point frames is that a given number of points grouped in frames gives less precise estimates of cover than the same number of points distributed individually. In fact, single-pin measurements require only one-third as many points as when point frames are used . Another problem with frames is that they overestimate the cover of large or dumped plants because the same plant is intercepted by different points on the same frame. This problem is overcome with the method described here by treating the frames as the sampling units (rather than using the individual points as sampling units). However, this approach doesn't change the fact that more points must be read than when the points are independent.

Use of a pin frame device (as opposed to a grid frame made of crossing strings) will result in overestimation of cover because the pins have finite diameter. The use of a sharpened pin will greatly reduce overestimation when only the point of the pin is used to record a hit or a miss.

4. Equipment The following equipment is needed.

A. Study Location and Documentation Data form
B. Cover Data form
C. Sighting device (A sighting device is available commercially from ESCO, P.O. Box 18775, Boulder, Colorado 80308)

D. Tripod for mounting sighting device
E. Panhead for tripod (makes possible rapid positioning of sighting device)
F. Pin or point frame. This can be a pin frame usually with 10 pins or a point frame , consisting of two superimposed string grids mounted one above the other on three adjustable legs.
G. Hammer
H. Permanent yellow or orange spray paint
I. Tally counter (optional)
J. Two stakes: 3/4 - or I -inch angle iron not less than 16 inches long
K. Compass
L. Steel post and driver
M. Tape: 50-, 100-, or 200-foot delineated in tenths and hundreds or a metric tape of the desired length.

5. Training A minimum of training is needed to make sure the examiners understand how to lay out baselines and transects and position and read the specific sighting device or pin/point frame being employed. The examiners must learn what constitutes a "hit". The technique should take about 1/2 hr training instruction and 1 day of practice to develop consistency. The examiners must also be able to identify the plant species.

6. Establishing Studies Careful establishment of studies is a critical element in obtaining meaningful data.

A. **Site Selection** The most important factor in obtaining usable data is selecting representative areas (critical or key areas) in which to run the study. Study sites should be located within a single plant community within a single ecological site. Transects and sampling points need to be randomly located within the critical or key areas (see Section III).

B. **Pilot Studies** Collect data on several pilot studies to determine the number of samples (transects or observation points) and the number and size of quadrats needed to collect a statistically valid sample.

C. **Number of Studies** Establish a minimum of one study on each study site; establish more if needed (see Section II.D and III.B).

D. **Study Layout** Data can be collected using the baseline, macroplot, or linear study designs. The baseline technique is the recommended procedure.

E. **Reference Post or Point** Permanently mark the location of each study with a reference post and a study location stake.

F. **Study Identification** Number studies for proper identification to ensure that the data collected can be positively associated with specific sites on the ground.

G. **Study Documentation** Document pertinent information concerning the study on the Study Location and Documentation Data form.

7. Taking Photographs Establish photo plots.

8. Sampling Process In addition to collecting the specific studies data, general observations

should be made of the study sites.

A. **Transects** Run a series of transects perpendicular to the baseline in both directions. The beginning points for each transect are randomly selected points along the baseline and the direction of each transect is also randomly determined.

To ensure that both transects and points/point frames are independent, spacing between transects and between points/point frames on each transect should be greater than the average diameter of the largest plants likely to be sampled. (If only basal cover is to be sampled, this diameter is the basal diameter; otherwise, it is canopy diameter.)

B. **Sampling along Transects** The first point/point frame read on each transect should be randomly determined. After the first point/point frame is read, all others are spaced the predetermined interval from the first point. If a tape is used for the transects, always read on the same side of the tape. (One of the devices manufactured by ESCO employs a mounting arm that is exactly 0.5 m long from tripod pivot to the axis of point projection. With this device, two points along each transect can be read with each placement of the tripod (assuming that I m is the selected interval between points). If this device is used, the tripod is placed at 2 m intervals along the tape (or at a number of paces approximating 2 m if no tape is used), the arm is rotated toward the baseline, the intercepted object is recorded, the arm rotated 180 degrees, the next intercepted object is recorded, and so on.)

(1) **Sighting Device** Determine hits by sighting through the device and recording the cover category in the cross hairs.

(2) **Pin/point frames** Determine hits by recording the cover category intercepted by each of the points. For pin frames, this is the cover category hit by each pin; for grid frames, this is the cover category determined by sighting through the "cross hairs" formed by each of the intersections of strings.

Hits are recorded on the Cover Data form in the following categories: vegetation (by plant species), litter, gravel, stone, and bare ground. Prior to recording data, the examiner needs to determine if canopy/foliar cover or basal cover (or both) will be recorded and if hits will be recorded in more than one canopy layer. For sighting devices and some pin/point frames, recording hits in more than one canopy layer requires that upper layers be temporarily moved out of the way to provide a direct line of sight to the lower canopy layers.

C. **Paired Samples** If the data are to be analyzed as paired samples, each transect should be permanently marked the first year at both ends. In each subsequent year of measurement, a tape should be run from one end to the other and the points/point frames read at the selected intervals along the transect. This process should then be repeated for each transect.

D. **Independent Samples** If the data are to be analyzed as independent samples, the transects do not have to be permanently marked. In this case, it is sufficient to pace each transect, taking measurements at each specified pace interval. The observer must ensure, however, that no bias is introduced by subconsciously "choosing" the point to be read. Such bias can be avoided by looking at the horizon when placing the tripod down.

9. Calculations Make the calculations and record the results on the Cover Data form.

A. **Cover of Individual Plants, Litter, Gravel, Stone, and Bare Ground**

(1) **Paired samples** Calculate the percent cover of each species along each transect by totaling all of the "hits" for that species along the transect, dividing the hits by the total number of points along the transect, and multiplying by 100. Calculate the total percent cover for the species in the sampled area by adding together all the transect cover values for the species and dividing by the number of transects. Do the same for litter, gravel, stone, and bare ground.

When point frames are used, the point frames themselves can be analyzed as sampling units. In this case, percent cover of each species is calculated for each point frame. Percent cover is calculated by totaling all of the "hits" for that species in one frame, dividing the hits by the total number of points in that frame, and multiplying by I 00. In this situation, cover data for each frame must be recorded separately on one form or on separate forms.

(2) **Independent samples: Sighting device and Pin frames** Calculate the percent cover of each species in the study area as a whole by totaling all the "hits" for that species along all of the transects, dividing by the total number of points in the study, and multiplying by 100. Do the same for litter, gravel, stone, and bare ground.

(3) **Independent samples: Point frames** For independent samples, the frames themselves can be considered the sampling units. Calculate the percent cover of each species in each point frame by totaling all the "hits" for that species in the frame, dividing the hits by the total number of points in the frame, and multiplying by 100. Calculate the total percent cover for the species in the sampled area by adding together all of the point frame cover values for the species and dividing by the number of point frames. Do the same for litter, gravel, stone, and bare ground.

(4) **Total vegetation cover** Calculate total vegetation cover by adding the study area cover percentages for all plant species. This total could exceed 100 percent if multiple hits (overlapping canopies) were recorded at each point along the transect.

B. **Species Composition** Species composition is based on the percent cover of the various species. Calculate percent composition by dividing the percent cover for each plant species by the total cover for all plant species.

10. Data Analysis The method of data analysis depends upon whether or not the transects are permanent.

A. **Permanent Transects** If the transects are permanent, the transects or point frames are the sampling units. Either a paired t test or the nonparametric Wilcoxon signed rank test is used to test for significant change in average cover between two sampling periods. Repeated measures analysis of variance is used to test for significant change in average cover between three or more sampling periods.

B. **Transects Not Permanent** If the transects are not permanent, that is, if they are randomly located in each sampling period, then the samples are independent and the points can be treated as the sampling units.

Sighting Devices: Analysis consists of a Chi Square contingency table analysis to test for significant change between years in numbers of "hits" on the key species, other plant species,

or cover classes.

Point Frames: Analysis consists of testing for significant changes in average cover between sampling periods using the independent sample t test or the nonparametric Mann Whiitney U test. Independent sample analysis of variance or the nonparametric Kruskal-Wallis test is used to test for significant changes in average cover between three or more years.

11. Cost Ten minutes per 10 pins (for a 10 pin frame).

APPENDIX D

GIL CAUSEWAY RECLAMATION PLAN

FAIRBANKS GOLD MINING, INC.

a subsidiary of

KINROSS GOLD CORP.

FORT KNOX MINE

March 29, 2001

Mr. Alvin G. Ott
Regional Supervisor, Habitat Division
Alaska Department of Fish & Game
1300 College Road
Fairbanks, AK 99701-1599

RE: Gil Causeway Reclamation Plan

Dear Mr. Ott:

Fairbanks Gold Mining, Inc. (FGMI) constructed and currently maintains the Gil Causeway through the water storage reservoir (WSR) as authorized by the Alaska Department of Fish and Game (ADF&G) in Fish Habitat Permit FG98-III-0109. Fish Habitat Permit FG98-III-0109 has been amended four times to allow for additional culverts being placed in the causeway. Currently the causeway contains a 78-inch diameter culvert at approximately elevation 1007 M.S.E., two 48-inch culverts at the 1016 elevation, and one 10-foot culvert at the 1010 elevation. The road elevation is currently constructed to the 1022 elevation where it crosses the old Fish Creek channel. This letter is being submitted to fulfill the requirements of Fish Habitat Permit FG98-III-0109 requiring FGMI to submit a rehabilitation plan for the causeway. FGMI currently intends to use the causeway for several more years to facilitate ongoing exploration drilling at the Gil project. ADF&G will be given a minimum of 30 days advance notice prior to rehabilitation work commencing at the Gil causeway.

The Fort Knox Mine location is shown on the attached Figure 1. Figure 2 shows the location of the Gil Causeway in relation to the WSR, developed wetlands, tailing impoundment, and the Fort Knox mining/milling operation. FGMI will remove the existing culverts from the causeway and restore the original Fish Creek channel as nearly as can be replicated while working below the water level in the reservoir. FGMI intends to remove the soil in the causeway, near the 78-inch culvert, to the lowest level possible using a CAT 350 track mounted excavator, bottom of the channel is expected to be at approximately the 1007 elevation. By removing the soil in the vicinity of the 78-inch culvert, FGMI will re-establish fish passage through the causeway in the area of the old Fish Creek channel. The slopes of the excavation required to re-establish the Fish Creek drainage would be constructed at a maximum of 3 horizontal to 1 vertical. A cross section showing the proposed excavation of the

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Telephone: (907) 488-4653 • Facsimile: (907) 490-2290

causeway in the vicinity of the 78-inch culvert has been included as Figure 3. Material removed from the causeway will be placed along the remaining portions of the causeway to create additional shoreline. Once the excavated material has dried sufficiently, final contouring of the material will commence, followed by contour ripping of the area and seeding, if required, with the approved FGMI seed mix.

Safety Berms along the existing roadway above the high water mark will be graded to blend into existing topography. The road surface will be ripped on the contour to provide a suitable seed bed and the roads seeded with the approved FGMI seed mix. Broadcast seeding methods will be utilized for both the excavated material and the roadways with an application rate of 11 pounds per acre.

To clarify the sequence of reclamation activities, FGMI will begin the reclamation process by removing the ten-foot diameter culvert, re-contouring the area on the south side of the causeway up to the 78-inch culvert, ripping the area and roadway as needed, and broadcast seeding as required. Removal of the 78-inch culvert and excavation of the soil in the causeway would follow completion of the reclamation on the south side of the causeway. The material excavated would be placed along the existing roadway north and west of the 78-inch culvert. Following the excavation of the causeway near the existing 78-inch culvert, the two 48-inch culverts would be removed and the excavated area backfilled. The excavated material would be allowed to dry and graded in conjunction with the surrounding area, ripped on the contour, and seeded as required.

FGMI appreciates the assistance and cooperation the Alaska Department of Fish and Game has rendered in developing the fishery in the Water Storage Reservoir and developed wetlands, along with the wildlife and waterfowl habitat in these areas. FGMI anticipates a continued cooperative effort through operation and reclamation of the Fort Knox Mine site. If you have any questions or require additional information, please call me at (907) 488-4653.

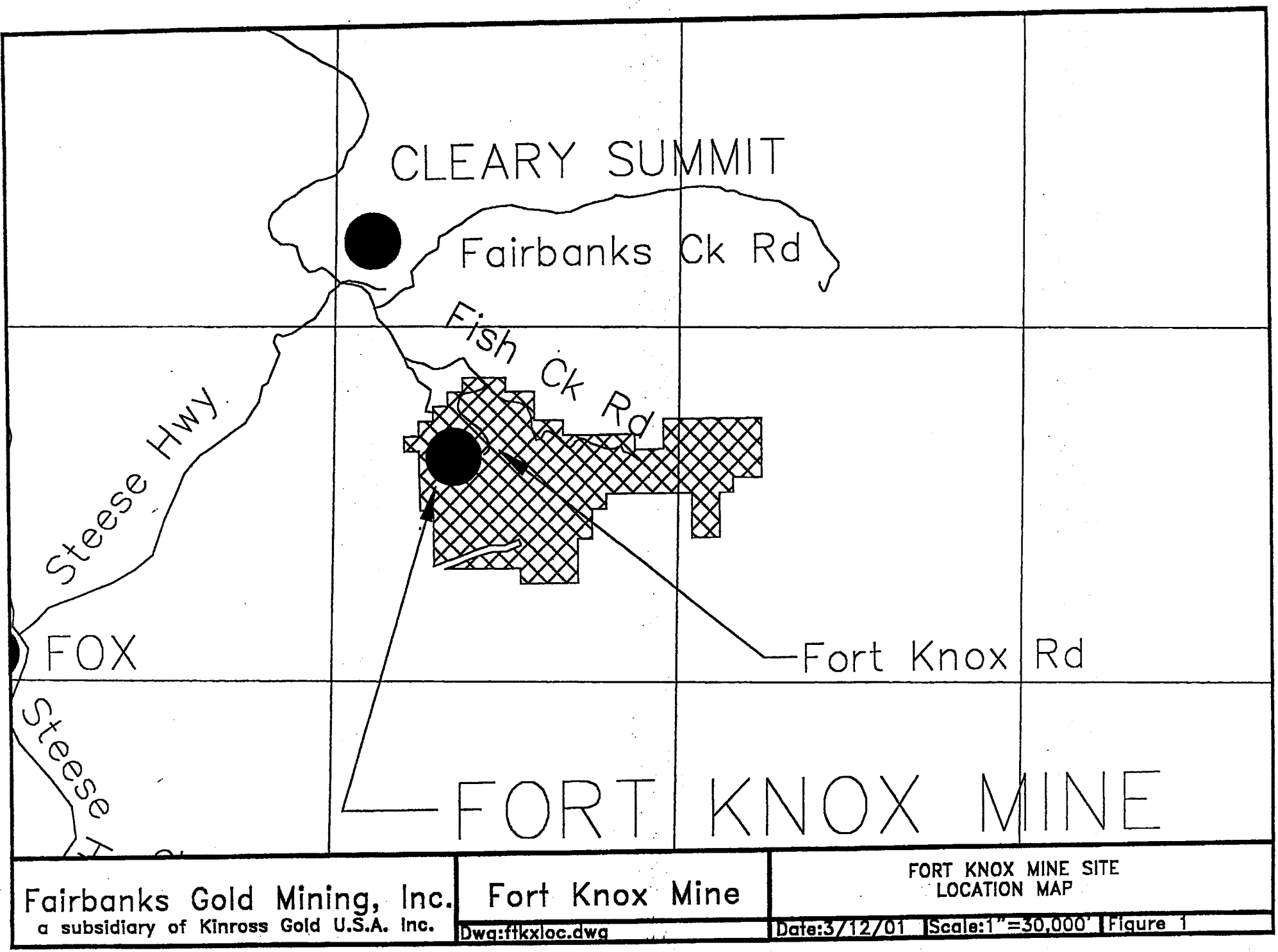
Respectfully,

Clyde D. Gillespie

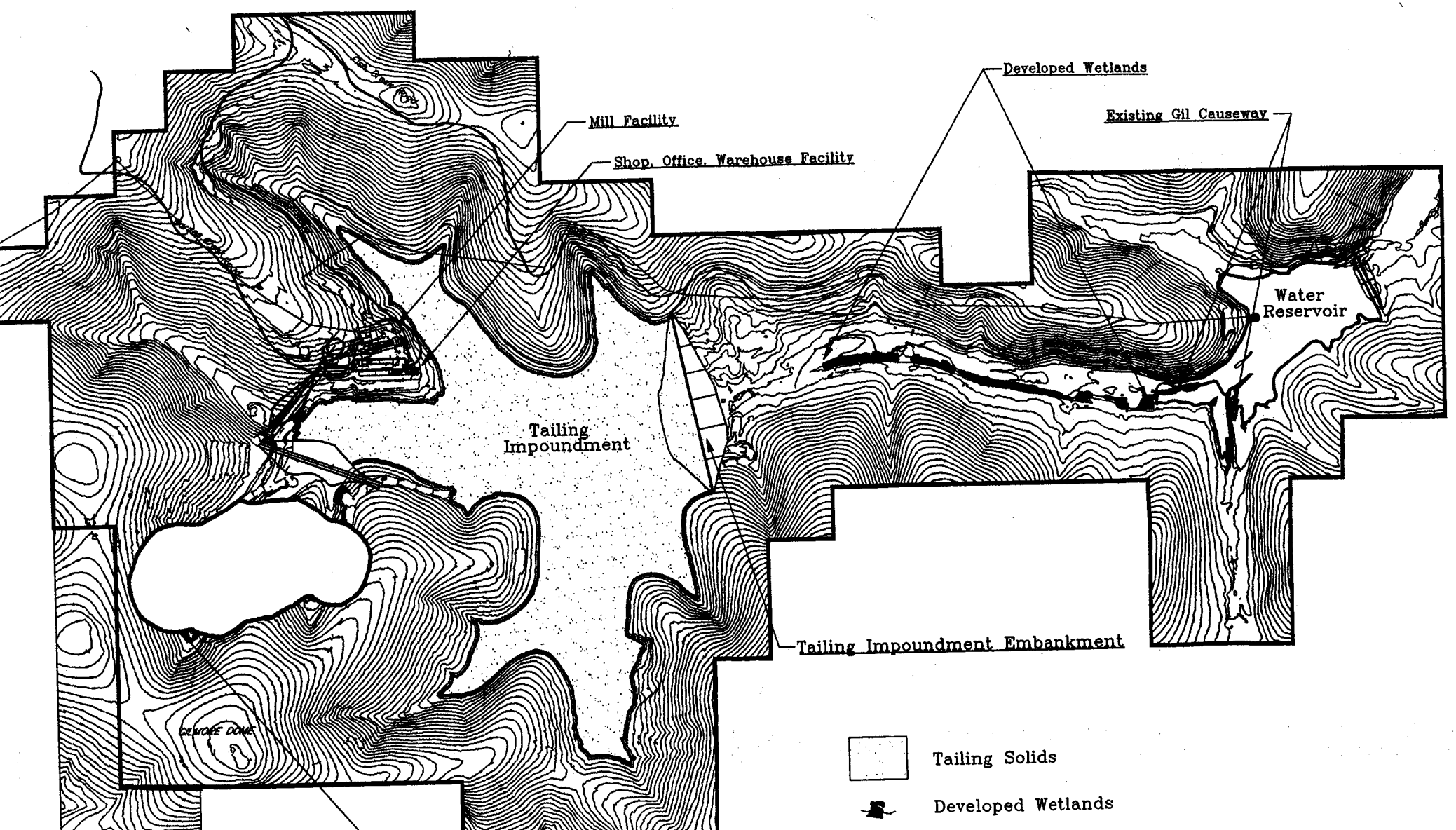
Clyde D. Gillespie
Senior Environmental Engineer

xc: (with attachments)
Steve Planchon, ADNR, Mental Health Land Trust Unit, Anchorage
Richard LeFebvre, ADNR, Division of Land, Anchorage
Bob Loeffler, ADNR, Division of Mining & Water Management, Anchorage

Jim Voden, ADNR, Division of Mining & Water Management , Fairbanks
Pete McGee, ADEC, Fairbanks
Leroy Phillips, U.S. Army Corps of Engineer, Fairbanks
Cindi Godsey, U.S. Environmental Protection Agency, Anchorage
Keith Mueller, U. S. Fish & Wildlife Service, Fairbanks
Rick Baker, FGMI
Bob Farneski, FGMI
Tom Irwin, FGMI
Bill Jeffress, FGMI
Doug Nicholson, FGMI
Dawn Sofich, FGMI
Warren Woods, FGMI



Fairbanks Gold Mining, Inc. a subsidiary of Kinross Gold U.S.A. Inc.	Fort Knox Mine	FORT KNOX MINE SITE LOCATION MAP
	Dwg:ftkxloc.dwg	Date:3/12/01 Scale:1"=30,000' Figure 1

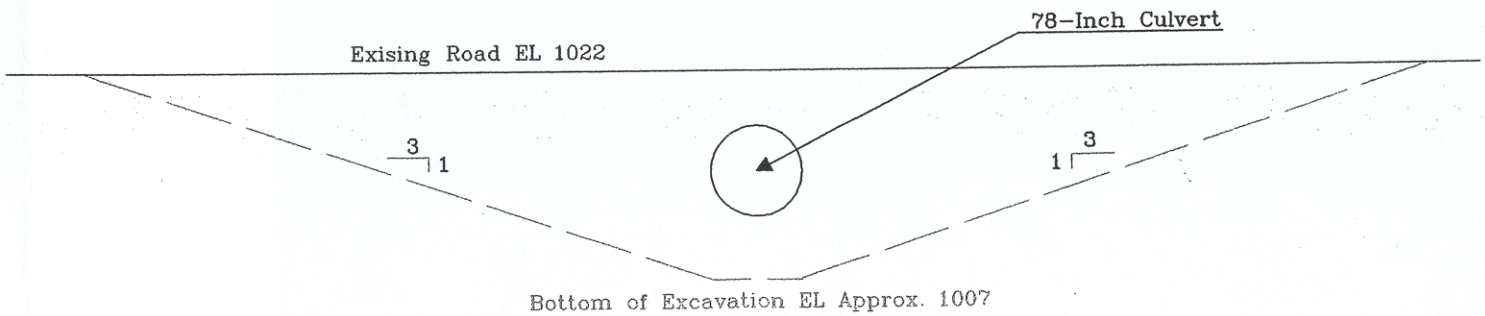


FORT KNOX MINE
GIL CAUSEWAY REHABILITATION

Fort Knox Mine

Fairbanks Gold Mining, Inc.

Gil Causeway Channel Excavation



FORT KNOX MINE
GIL CAUSEWAY REHABILITATION
Date:03/28/01 | Scale: 1" = 10' | Figure 3

Fairbanks Gold Mining, Inc.
Kinross Gold U.S.A., Inc.

Fort Knox Mine