NIBLACK RECLAMATION AND CLOSURE PLAN

2012 Post-Construction Update

Prepared for

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
BMP	best management practice
CBR	Committee Bay Resources
LAD	land application/dispersion
LTMM	long-term monitoring and maintenance
NAG	non-acid-generating
NPLLC	Niblack Project LLC
OHM&P	Office of Habitat Management and Permitting
PAG	potentially acid-generating
SWPPP	Storm Water Pollution Prevention Plan

1 INTRODUCTION

The Niblack Exploration Project is a copper-gold- zinc-silver prospect located off Moira Sound on southeastern Prince of Wales Island, approximately 30 miles southwest of the town of Ketchikan, Alaska (Figure 1-1). The project is limited to development within patented claims, with the exception of the tideland lease area managed by the Alaska Department of Natural Resources (ADNR). A list of all properties, including legal description, of where all work will occur is detailed in Section 5. Niblack Project LLC (NPLLC) is the owner and sole operator of the property. Project activities operate under the Alaska Department of Environmental Conservation (ADEC) Waste Management Permit 2006-DB0037.

This reclamation and closure plan has been prepared as required by AS 27.05.010(b), AS 27.19.010, and 11 AAC 97.100. This document serves as an update to the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b), Appendix 6 to the Underground Exploration Plan of Operations (NMC 2007b). The original reclamation and closure plan was approved on June 29, 2007 (ADNR 2007). Updates to the 2007 plan provided herein include the following:

- Presentation of waste rock volumes produced during underground construction completed to date
- Incorporation of as-built facility footprints and areas of surface disturbance
- Incorporation of post-closure monitoring requirements specified in the Waste Management Permit
- Updates to fuel, analytical, transportation, and other costs to reflect current market values
- Expansion of the project schedule to continue through 2017, or beyond.

The principal purpose of this 2012 Reclamation and Closure Plan Post-Construction Update is to identify, describe, and cost the required reclamation tasks that are to be completed either concurrently with, or at the cessation of the project activities. Cost estimates for implementing these reclamation tasks are provided for the purpose of establishing a bond amount estimate, and determining the best bonding mechanism for the project, to ensure that adequate funds are available for reclamation, post-closure monitoring, and maintenance purposes. This document presents conceptual reclamation plans; prior to site closure, a final closure plan with details regarding the specific reclamation activities and schedules will be submitted to ADEC for approval.

The major components associated with the Project are an underground mine exploration adit and portal entrance, a temporary storage facility for potentially acid-generating (PAG) waste rock, a non-acid generating (NAG) waste rock disposal area, settling/treatment ponds, a water

land application/dispersion (LAD) discharge system, access roads, and a marine dock and barge camp facility. Ancillary facilities include topsoil stockpiles, an ore stockpile, diversion systems, fuel storage, and supply laydown and staging areas. The PAG waste pile is temporary and is designed to store PAG waste until the end of the project, after which the material will be relocated in the underground adit for permanent disposal.

The current phase of underground development on the Niblack Exploration Project was initiated by Niblack Mining Corporation on September 21, 2007, and was completed on July 12, 2008. As indicated on post-construction as-built drawings and information compiled by Niblack Exploration Project onsite staff, the site structures and facilities have been constructed in general accordance with the original design plans as presented in the Underground Exploration Plan of Operations (NMC 2007b); deviations from original design proposals were minimal. The updated cost estimate for reclamation and closure presented herein is largely based on the same assumptions and criteria outlined in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b). Updates to selected costs (e.g., fuel and analytical expenses) have been made, as appropriate. No additional expansion of the underground workings is anticipated at this time. However, if future expansion does occur, the site design plans presented in the original Niblack Solid Waste Landfill Application under the Waste Management Permit (NMC 2007a) and the Underground Exploration Plan of Operations (NMC 2007b) will be followed.

Alaska Statute AS 27.19.030(b) and Alaska Administrative Code 11 AAC 97.310(b) (6) & (7) allow the owner of private land to have an alternate post-mining (post-project) land use. The post-project land use for patented mineral claims at Niblack is mineral development or other commercial use. Access roads and other surface structures (e.g., land camp area) will be retained post-closure and bonding will not be required for their removal.

2 SUMMARY OF ACTIVITIES

This section summarizes construction activities conducted since the Niblack project was initiated on September 21, 2007. The current phase of underground construction and excavation commenced on September 21, 2007 and was completed on July 12, 2008. Placement of NAG material at construction sites was completed shortly thereafter, as was the loading of the temporary PAG waste rock storage facility, completed in spring 2008. No additional expansion of the underground workings, or associated production of waste rock, is anticipated at this time. However, if future expansion does occur, the site design plans presented in the Niblack Solid Waste Landfill Application under the Waste Management Permit (NMC 2007a) and the Underground Exploration Plan of Operations (NMC 2007b) will be followed.

Construction of the sediment ponds, and piping from the adit portal to the ponds, was complete prior to commencement of excavation activity in 2007. The water treatment plant and components of the LAD water discharge system were completed in early 2008. Land application of effluent water from the settling ponds began in October 2007.

2.1 SURFACE FEATURES

The total surface area cleared or disturbed at the project site is 13.5 acres. Photographs of site facilities are presented in the Niblack Project Underground Exploration Plan of Operations 2012 Post-Construction Update (Integral 2012b).

Surface disturbance is shown on the site-wide as-built maps (Figures 2-1 and 2-2) and includes the following:

- Access roads
- Ditches, culverts, and settling basins/sediment traps for stormwater management
- Construction of laydown areas for equipment/supply storage, including a fuel storage facility, magazine sites (currently decommissioned), portal area, shop area (old camp)
- Settling ponds and LAD water discharge system
- Barge landing and dock facilities
- Surface drilling landing
- Temporary PAG waste rock storage facility
- Temporary mineralized ore stockpile
- NAG waste disposal area
- Topsoil and growth media stockpiles

2.1.1 Waste Rock Storage Facilities

The temporary PAG waste rock storage site (Figure 2-3) was constructed on a foundation of crushed rock overlain by a 6-in. layer of compacted sand, and lined with 80-mil high-density polyethylene (geo-membrane) between two layers of geotextile fabric. The liner system was overlain by another 6-in. layer of compacted sand as a service layer. Waste rock storage size designs, assumptions, and operating considerations are described in the Geotechnical Summary of Niblack Project Waste Rock Dumps (NMC 2007a, Appendix A).

The PAG liner construction deviated slightly from the original specifications within the original Niblack Solid Waste Landfill Application under the Waste Management Permit (NMC 2007a), which specified that liner bedding would be placed in two horizontal layers of 12 in. maximum uncompacted depth. During construction, 6-in. layers of sand were used instead of the maximum of 12-in. layers originally specified. Additionally, a waiver of the intermediate cover requirement (18 AAC 60.243) under the Niblack Waste Management Permit (2006-DB0037) was granted by ADEC on January 26, 2009 (Buteyn 2009, pers. comm.). In January 2009, former site owners Committee Bay Resources requested approval to leave the pile uncovered for large-scale kinetic testing (Kleespies 2009a, pers. comm.). The leachate and runoff water captured in the PAG pond is monitored on a weekly basis, and monthly PAG monitoring reports are submitted to ADEC. A cover will be placed on the PAG pile if required due to a change in the chemistry of the PAG effluent or at the request of ADEC or ADNR.

The PAG temporary storage facility is built on a cut platform and the full base liner is sloped to collect and convey all PAG runoff and leachate to the PAG collection pond, as shown on Figure 2-4. Figure 2-5 details the engineered liner construction at the PAG site; Detail B of this figure shows how runoff captured on the PAG liner flows to the PAG pond. The QA/QC Plan for PAG/ML Temporary Storage Facility Liner Installation was submitted as Appendix C to the 2007 permit application (NMC 2007a). This plan includes the 80-mil HDPE geomembrane liner properties.

During drift construction, 574 yd^3 of well-mineralized PAG material was stockpiled for future geochemical test work and processing. This material is stored in a temporary, lined and covered stockpile adjacent to the PAG temporary storage facility. The pile is covered with 80-mil HDPE geomembrane so as to prevent any introduction of surface water onto the pile. The mineralized ore stockpile was not included in the original Underground Exploration Plan of Operations (NMC 2007b) or the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b). If the mineralized ore stockpile is not removed from the site for processing, it will be hauled back underground with the PAG materials and the stockpile site will be reclaimed.

All of the NAG material removed during underground excavation was utilized in the construction of site roads and facilities. A portion of this material, originally placed on the

lower NAG haul road, has been sorted and stored in a small fines stockpile (Figure 2-1) that is used for road maintenance. If additional underground development occurs, NAG waste will be utilized onsite and/or placed in the NAG disposal area, following the design plans presented in the Niblack Solid Waste Landfill Application under the Waste Management Permit (NMC 2007a) and the Underground Exploration Plan of Operations (NMC 2007b).

2.1.2 Water Management Features

Figures 2-1 and 2-2 present overview and detail views of stormwater and surface water control features, including diversion ditches at the PAG and NAG areas, the PAG runoff capture pond, the settling/treatment ponds, and sediment traps adjacent to the access road. Figure 2-6 shows streams, surface water bodies, and water quality monitoring stations. The PAG temporary storage facility was designed to route all run-on around the facility. PAG facility runoff and leachate are routed to the PAG pond, and then piped to the site settling/treatment ponds. The settling ponds also receive underground water from the exploration drift, which is piped from the adit portal. If necessary, water may be pumped from the first pond through a water-treatment chemical mixing tank, which can be used to increase pH and reduce trace element concentrations through lime addition and flocculation. The second pond allows for additional precipitation and settling of trace elements. From the settling ponds, water is routed to the LAD system, where it is discharged through a network of low-flow emitters for infiltration into site soils and final polishing. The treatment scheme is shown in Appendix A, Figure A-1. To date, low concentrations of trace elements in effluent water and passive treatment through settling and natural soil attenuation have controlled effluent water quality, and chemical water treatment has not been necessary. The water treatment plant was tested for effectiveness in September 2009 and is ready to begin the treatment of mine wastewater should the need arise. Regular surface water and groundwater quality monitoring is conducted, as described in the Water Quality Monitoring Plan 2012 Post-Construction Update (Integral 2012a). Water quality monitoring results are summarized in quarterly and annual reports; e.g., the Niblack Exploration Project 2011 Annual Report (Integral 2012c) submitted to ADEC on March 30, 2012.

The hydrologic analysis for stormwater management was based on a 5-in. rainfall event and is presented as Appendix B to the original Niblack Solid Waste Landfill Application under the Waste Management Permit (NMC 2007a). BMPs are described in detail in the Niblack Storm Water Pollution Prevention Plan (SWPPP) (RTR 2006) and the Niblack Wastewater Treatment and Disposal Application under the Waste Management Permit (RTR 2007a).

2.2 UNDERGROUND DEVELOPMENT

The total underground development consists of 2,772 linear ft on the main access drift, 372 ft of short cross-cuts and utility bays, and 144 ft for two sumps, one near the portal and the other

near the end of the drift (Figure 2-7). The total volume excavated during the access drift construction period (2007 through 2008) was approximately 66,150 tons (39,300 yd^3).

The Niblack exploration drift totals 3,288 linear ft (main drift plus cross-cuts and sumps) and was constructed with 286 blast rounds. Of this total, 43 rounds constituting 495 linear ft of drifting (approximately 9,960 tons or 5,920 yd^3) were determined to consist of PAG materials, the majority of which (26 rounds for 299 linear ft) consisted of sulfide mineralization within the Lookout Rhyolite, and related footwall alteration, at the end of the drift. The first four rounds excavated from the Lookout Rhyolite (48 linear ft of the drift representing approximately 965 tons or 574 yd^3 of material) consisted of well-mineralized rock and was set aside for future test work. This material is stored in the covered and lined temporary mineralized ore stockpile (Figure 2-1). The remainder of the PAG material (approximately 8,995 tons or 5,346 yd^3 of material) was placed on the temporary PAG storage site. NAG waste rock, dominated by mafic volcanic rocks and mafic dykes, totaled 2,793 linear ft of the total excavation and represented some 56,200 tons, or 33,400 yd^3 of material. All NAG waste rock has been used in construction activities, including the laydown areas expansion, the NAG site access roads and berms, the base for the temporary PAG storage facility, and road maintenance. Additional NAG material was sorted through a 6-in. grizzly to create a small "fines" stockpile for road maintenance.

Table 2-1 summarizes the waste rock volumes produced during construction of the initial 3,288 ft of adit excavation. Table 2-2 presents the estimate of the total amount of PAG material anticipated if the underground workings were developed to the full design extent of 6,000 ft. Table 2-3 presents the same information for NAG material. These tables were reproduced from the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b).

2.2.1 Waste Rock Characterization

A detailed geochemical characterization program was conducted during adit excavation in order to determine the potential for the rock comprising each blast round to be potentially acid generating or metals leaching. PAG and NAG material were segregated as described in the Niblack Project Operational Characterization Plan (Knight Piésold 2007a). Segregation of PAG versus NAG waste rock was determined by onsite analysis of a sample of blast-hole drill cuttings collected from each round of development rock for total sulfur and pH following oxidation with hydrogen peroxide. Additional waste rock characterization conducted during drift construction included acid/base accounting and total metals analysis. Analytical results are included within a master acid base accounting geochemical database. The database is included in the appendices of the 2007, 2008, and 2009 Niblack Annual Reports (Integral 2008, 2009a, 2010). Based on the quality assurance and quality control verification analyses conducted as part of the geochemical characterization program, the material in the PAG pile is expected to average approximately 1 percent total sulfur, predominately as sulfide-sulfur (pHase 2011).

Ongoing monitoring of waste rock weathering is conducted with three field barrel kinetic tests located immediately east of the PAG waste rock pile. The barrels are loaded with different sources of PAG rock. Additionally, per agreement with ADEC (Buteyn 2009, pers. comm.), the PAG temporary storage pile is uncovered in order to allow for large, field-scale monitoring and evaluation of the weathering behavior of the PAG material. NPLLC, with support from pHase Geochemistry Inc., presents the results of barrel and PAG pile kinetic monitoring in monthly reports to ADEC.

2.3 EXPLORATION DRILLING

Overall, a total of 235 surface core boreholes and 164 underground core boreholes have been drilled on the Niblack property between 1975 and late 2011. NPLLC has drilled approximately 183,727 ft in 146 holes (136 underground and 10 surface holes) since 2009.

In May and June 2011, a helicopter-supported surface drill rig was added to the Niblack exploration program to test exploration targets in the area of Lookout Mountain and the historic Niblack Mine. Surface drilling and associated reclamation activities were and will continue to be conducted as described in the Plan of Operation for Mineral Exploration at the Niblack Project (NPLLC 2012). The four areas of surface drilling are shown as black circles and lines in Figure 2-8. Seven surface holes totaling approximately 5,000 ft were drilled. Surface disturbance in 2011 was approximately 0.1 acre, including all drill sites and helicopter landing zones. The majority of surface drilling activity in 2011 took place on patented claims; nevertheless, these sites were reclaimed according to the standards for state or federal land. One location was inside the boundaries of the Tongass National Forest; the drill pad was only partially completed and no drilling activity took place before the end of the program.

2.4 RECLAMATION

Construction reclamation and interim reclamation activities have been conducted at the site in accordance with the Niblack Project Reclamation and Closure Plan (RTR 2007b). These activities are discussed in Section 3.4.

3 GUIDELINES FOR RECLAMATION AND CLOSURE

This section summarizes the guidelines for reclamation including policies, goals, requirements, principles, processes, and criteria for closing the Niblack Exploration Project. The guidelines for reclamation and closure are unchanged from those set forth in the original Reclamation and Closure Plan (RTR 2007b), except where otherwise noted.

3.1 RECLAMATION GOALS

NPLLC's long-term goals of reclamation during and after underground project activities are to return the land to a safe and stable condition, consistent with the establishment of productive post-project closure land uses. The designated post-project closure uses for the project area are defined as mineral development or other commercial use. Wildlife habitat and recreation will also be a consideration for post-project closure use.

NPLLC will develop and implement the following reclamation goals at the project site:

1. Stabilization and protection of soil materials from wind and water erosion
2. Stabilization of steep slopes through recontouring and leveling to provide rounded landforms and suitable growth media surfaces for natural invasion and recolonization by native plants
3. Establishment of long-term, self-sustaining vegetation communities by reseeding with native plants and promoting natural recolonization and succession
4. Protection of surface water and groundwater quality, and compliance with all applicable water quality standards during operation and at closure
5. Protection of public health by reducing potential hazards typically associated with construction sites
6. Protection of fisheries, wildlife habitat, and recreational resources
7. Minimization of long-term closure requirements, especially for ongoing care and maintenance.

3.2 SUMMARY OF SITE-SPECIFIC RECLAMATION GOALS

The first step in the reclamation process involves the removal and storage of topsoil and other growth media from all areas to be disturbed, prior to facility construction. Stockpiled topsoil and growth media was seeded or covered with salvaged vegetation to reduce the potential for

erosion during storage and to maintain viability. Topsoil stockpiles generated during the site construction period (2007–2008) are located adjacent to the access road, as shown on Figure 2-1.

Project closure is expected to be within 2 years of cessation of all exploration activities. At that time, PAG material will be relocated from the temporary storage site to the underground drift for permanent storage. Portal closure, including installation of cement plug, will commence after all PAG material has been relocated to the back of the adit. Other reclamation will include recontouring and topsoil placement at the PAG site, NAG site, and water treatment facility/settling ponds. Later stages of final reclamation may include the removal of stormwater diversions and sedimentation ponds/sediment traps where they are no longer needed. All reclaimed areas will be seeded to aid erosion control and re-establish natural vegetation. Finally, a monitoring program will be implemented to track reclamation success.

Roads will remain in place as required for post-closure monitoring activities and for designated post-closure land use (mineral development and other commercial uses). Post-closure operation and maintenance of the road, including culverts and bridge crossing, will be in accordance with the terms and conditions of the ADNR Office of Habitat Management and Permitting (OHM&P) Fish Habitat Permit (FH-09-VII-0021) and U.S. Army Corps of Engineers Permit (POA-1982-290-N).

Reclamation of barge landing and mooring facilities will occur upon termination of the Tideland Lease, and is bonded (performance guarantee) separately from the rest of the project site. Operation, maintenance, and ultimate reclamation of the barge landing and mooring facility will be in accordance with the terms and conditions of the ADNR Division of Mining, Land and Water Tideland Lease (ADL 107544), and U.S. Army Corps of Engineers Permits (POA-1982-290-N).

3.3 RECLAMATION AND CLOSURE PRINCIPLES

In addition to the goals discussed above, the following general reclamation and closure principles will apply for the life of the project and during closure:

1. The reclamation plan will describe reclamation requirements as they relate to interim reclamation, temporary closure, and final reclamation at closure.

2. All surface mining disturbances associated with the Niblack Construction and Exploration Project will be bonded for an amount equal to the actual cost estimate of reclaiming the disturbed areas.

3. Bond release criteria will be developed for all reclamation activities.

4. Soil or soil-like growth media (organic material and/or suitable subsoil) will be inventoried for volume and general reclamation suitability and stored for future reclamation use. Protection from erosion will be provided.

5. Disturbed areas no longer involved in project activities will receive reclamation treatment within 2 years, as described in this reclamation plan.

6. Best management practices (BMPs) for interim drainage stabilization and erosion control will be implemented during the life of the project.

7. Sediment control facilities such as dispersion terraces, ponds, dikes, and infiltration basins will be designed and installed before surface-disturbing activities begin. These facilities will be inspected regularly, and maintained according to the schedule defined in the SWPPP (RTR 2006).

8. Following construction, cut-and-fill embankments and growth media stockpiles will be seeded with native grasses or covered with salvaged vegetation to reduce the potential for soil erosion and to enhance natural plant reinvasion.

9. Unchanneled runoff from disturbed surface areas will be dispersed into undisturbed forest areas, to the extent practicable.

10. Engineered facilities and associated construction materials will be monitored during construction, operation, and a defined post-closure period. This will enhance waste management and recycle opportunities.

3.4 OVERVIEW OF THE RECLAMATION AND CLOSURE PROCESS

NPLLC considers reclamation to be a progressive process directly integrated with the design, construction, operation, and closure of the operation. Reclamation will, therefore, generally occur in the following phases, with some overlap:

1. Construction reclamation

2. Interim reclamation

3. Surface drilling reclamation

4. Temporary closure

5. Final reclamation and closure

6. Post-closure monitoring and maintenance.

Construction, interim, and surface drilling reclamation activities have been conducted at the site in accordance with the original Niblack Project Reclamation and Closure Plan (RTR 2007b), as described below.

3.4.1 Construction Reclamation

Construction reclamation activities are those activities that occur during and directly after the exploration adit and associated facilities are constructed. This phase of reclamation involves the removal and storage of topsoil and growth media from disturbed areas. During construction, vegetation was cleared from the surfaces that were developed, primarily from the PAG temporary storage area and the settling/water treatment ponds area. Topsoil and soil-like growth media were removed where possible and stockpiled for reclamation. Stockpiles are located along the outer edge of access roads and laydown areas (Figure 2-1). Following the construction of the majority of the site facilities and access roads in 2007, there has been only minor construction reclamation activity. This was limited to the completion of the NAG site, which consisted of the felling of trees and construction of access roads, run-on diversion ditches, and berms. Concurrent reclamation of the lower NAG haul road included placement of topsoil along the lower side of the road and berm.

3.4.2 Interim Reclamation

Interim reclamation is defined as temporary measures for reducing the potential for erosion and sedimentation, and other activities required to protect surface and groundwater resources. Interim reclamation will be done to stabilize road cuts, stockpiles and other disturbances that result from project activities. Interim reclamation measures may involve seeding, temporary diversions, sedimentation control systems, and other BMPs commonly used for construction and exploration projects. These are listed in the U.S. Forest Service Soil and Water Conservation Handbook (USFS 1996).

3.4.3 Surface Drilling Reclamation

Surface drilling reclamation activities are conducted as described in the Plan of Operation for Mineral Exploration at the Niblack Project (NPLLC 2012). The majority of surface drilling activity took place on patented claims; nevertheless, these sites were reclaimed according to the standards for state or federal land. The final location of the 2011 season was inside the boundaries of the Tongass National Forest; the drill pad was only partially completed and no drilling activity took place before the end of the program. In accordance with AS 27.19, all areas disturbed during the course of the surface drilling program were restored to the extent possible, and reasonable measures were taken to prevent and undo unnecessary degradation.

Surface drilling reclamation involves disassembly of drill pads, removal of milled timbers, and tree handling, including bucking, limbing, and laying flat on the ground. Disturbance to topsoil

is not expected to occur. Reseeding of drill sites with native species will only be conducted if specifically required to prevent the unintentional introduction of non-indigenous/invasive plants to the area. All garbage and waste from the drill sites will be removed and disposed of in the camp incinerator. Finally, drill holes will be plugged in accordance with the Annual Placer Mining Application(s) and applicable Alaska regulations, as described in the Plan of Operation for Mineral Exploration at the Niblack Project (NPLLC 2012).

Because surface drilling sites are remediated individually following completion of drilling, surface drilling reclamation costs are not included in the site reclamation and closure cost estimates presented in Appendix B of this report.

3.4.4 Temporary Closure

Temporary closure means the cessation of project activities for a period of between 90 days and 3 years. If conditions require temporary closure to extend beyond 3 years, final reclamation and permanent closure activities would begin unless Niblack is granted an approval for extension by ADNR and ADEC. Temporary closure scenarios that require modifications to the plan of operations or reclamation plan would be coordinated with and submitted to ADNR and ADEC for approval.

The Niblack Exploration Project underwent a period of temporary closure from January 13, 2009 to August 26, 2009. This closure was requested in order to provide Committee Bay Resources (CBR; the project owners at that time) an opportunity to compile and examine the data and findings generated during Phase I of the underground drill program (Kleespies 2009a). The site was maintained in accordance with all operating permits, and environmental monitoring continued on a regular basis. A small care and maintenance crew remained onsite throughout the temporary closure period, allowing for continuous visual monitoring of site conditions. Interim reclamation activities during this time included ditch and grade stabilization. During the temporary closure period, the water was allowed to accumulate in the underground exploration drift. CBR requested, and received, approval from ADEC (Kleespies 2009b, pers. comm.) to conduct a dewatering operation to remove water that had accumulated in the underground exploration drift while the project was in temporary closure. The dewatering was initiated on August 26, 2009 and completed on September 11, 2009. During this period, approximately 2.4 million gallons of water were removed from the underground exploration drift (Turner 2009, pers. comm.). Additional water quality monitoring was conducted during and after mine dewatering. Water quality results from this monitoring indicated that drift dewatering did not negatively impact surface or groundwater quality; the results are included in the Third Quarter 2009 Water Quality Monitoring Report (Integral 2009b).

The Niblack Project underwent a second period of temporary closure between October 26, 2011 and June 30, 2012. This closure was necessary to provide NPLLC an opportunity to compile and

examine the data and findings generated during the previous two years of underground drilling. Similar to the previous period of temporary closure, the site was maintained in accordance with all operating permits, and environmental monitoring continued on a regular basis. A small care and maintenance crew remained onsite throughout the temporary closure period, allowing for continuous visual monitoring of site conditions. Interim reclamation activities during this time included ditch and grade stabilization. As most of the underground water sources had been plugged or sealed, the drift was not setup for water accumulation. Water was routinely pumped from the underground sumps to the settling ponds and discharged through the LAD system.

As NPLLC's 2012 exploration program will involve surface drilling only, the drift will remain under temporary closure, likely for the remainder of 2012. Water will continue to be routinely pumped from the underground sumps and all environmental monitoring will continue as if there were fulltime underground activity. As water flow is significantly reduced and will not accumulate in the drift, a major dewatering program is not anticipated upon reopening of the drift.

The following paragraphs set out general guidelines to be followed if future periods of temporary closure are warranted for the Niblack Project.

Temporary closure may include planned or unplanned cessation of project activities. Planned temporary closures that have specific conditions defining their beginning and end include the following:

- Temporary halt in activity to evaluate exploration results and plan further development
- Ongoing permitting requiring plan amendment based on exploration results
- Change in ownership requiring the temporary cessation of operations while operating permits are transferred to the new owner/operator.

Unplanned temporary closures may include the following:

- Closure because of significant weather events
- Discontinuation of operations due to temporary market conditions or unforeseen labor disputes
- Interruptions in work schedule due to underground conditions
- The discontinuation of operations due to litigation or other legal constraints.

NPLLC will notify ADNR (authorized officer) in writing at least 30 days prior to any planned temporary closure of 90 days or longer. For any unplanned temporary closure expected to last 90 days or longer, NPLLC would notify ADNR within 10 days of the first day of the temporary closure. These notifications will include a written description of the nature of

actions to be implemented by the company to maintain full compliance with applicable permits and plan approvals. If a temporary closure extends beyond 3 years, it is understood that ADNR may deem exploration to be permanently abandoned. This situation would require that final reclamation must commence.

NPLLC's objective during temporary closure would be to maintain the site and facilities in a safe condition. This would include proactive temporary sediment and erosion control BMPs. All related water management activities and monitoring would also be carried out by the company.

Notification principles or requirements include the following:

- Reasons for shutdown
- Estimated schedule for resuming constructions
- Outline of reclamation, water management, and monitoring activities to be implemented by NPLLC during this period.

During temporary closure, NPLLC would also maintain compliance with all environmental permits and programs as applicable. Interim reclamation activities would continue as planned, and all permit requirements would be met.

3.4.5 Final Reclamation and Permanent Closure

Closure is defined as the cessation of all project activities upon project completion, or because the further development of the project is no longer feasible. Final reclamation and closure activities will occur according to the provisions of this reclamation and closure plan. A final closure plan that includes detailed design and construction plans and schedules will be submitted to ADEC for approval prior to initiating permanent site closure reclamation.

Notification of final closure would be given to the state agencies 60 days prior to cessation of project activities. This notice will include the date on which final reclamation activities would begin. Final reclamation involves relocation of PAG material to underground workings, portal plug and closure, and surface reclamation, including recontouring, topsoil placement, and reseeding at disturbed surface areas. A reclamation schedule detailing estimated timelines to complete reclamation tasks is provided in Appendix B. Physical reclamation is estimated to take 8 weeks to complete, and would be completed within approximately 2 years after cessation of project activities.

3.4.6 Post Closure Monitoring and Maintenance

Post-closure reclamation activities consist of monitoring and maintenance until closure and reclamation performance standards are achieved. General post-closure

reclamation/revegetation monitoring is expected to be required for up to 10 years, whereas visual and water quality monitoring is expected to be required for up to 30 years (as dictated by relevant ADEC and ADNR permits); this condition would be reviewed annually, and reclamation progress may result in a reduction or extension of the post-closure monitoring period. The post-closure monitoring and maintenance program is discussed in further detail in Section 4.7 and within the Niblack Water Quality Monitoring Plan 2012 Post-Construction Update (Integral 2012a).

3.5 SOIL SALVAGING, VEGETATION SALVAGING AND REVEGETATION METHODS

3.5.1 Topsoil Salvage and Stockpiling

For the purposes of this plan, the term "growth media" is defined as all native soil material with physical and chemical properties capable of establishing and sustaining vegetation with or without soil amendments. Growth media can also be glacial till. Upland soils in the Niblack area are generally moderately well drained silt or sandy soils spread over bedrock or glacial till. Salvaged material will consist of A and B horizon material and will include some underlying glacial till in order to obtain the required volume. Topsoil (Horizons A and B) would be salvaged and stored separate from other acceptable growth media.

A summary of requirements for reclaiming facilities that require topsoil is presented in Table 3-1. Estimates of topsoil requirements are based a planned 0.5-ft topsoil layer placed over post-construction footprints of surface areas which will be reclaimed upon site closure. These estimates show that a total volume of approximately 4,000 yd^3 of topsoil will be needed for site reclamation. During construction activities conducted in 2007 and 2008, approximately 3,500 yd^3 of topsoil was stockpiled along the access road (Figure 2-1). If additional topsoil is needed for final reclamation activities, material may be sourced from another location.

If additional construction occurs at the site in the future, topsoil stripping and stockpiling will continue as the facilities are developed. In some cases, topsoil will be stripped and directly placed on areas undergoing reclamation. All topsoil stockpiles will be located and shaped so that run-on and run-off is controlled. Stockpiled topsoil would be seeded or covered with salvaged vegetation to reduce the potential for erosion during storage and to maintain viability. Where adequate topsoil is not available, a replacement scheme involving other growth media would be developed for agency approval.

During reclamation, topsoil will be placed over all disturbed areas selected for reclamation excluding rock cuts, areas of riprap, open water, and slopes too steep to retain topsoil. Development rock storage piles would be treated as described later in this document.

A minimum of 6 inches of topsoil is the goal for application to disturbed areas. The quantity of topsoil is expected to be limited based on measured depths of the A- and B-horizons throughout the planned disturbance area. Therefore, an average application rate 6 inches has been used for the inventory calculations.

3.5.2 Revegetation Methods and Materials

The overall goal of disturbed site revegetation is to mimic the adjacent undisturbed vegetation communities, to the extent possible. The focus of the revegetation effort will be on establishing grasses, shrubs, and forbs to stabilize the reclaimed landforms and to provide successful plant communities that would lead to the natural recolonization of the appropriate vegetation community.

In general, revegetation methods and materials will be as follows:

Growth Media Placement and Grading. Topsoil salvaged from the disturbed areas will be used for the growth media source (see Section 3.5.1 above). A minimum of 6 inches of stockpiled topsoil will be placed and graded over areas identified in Section 3 as requiring topsoil. During the distribution process, some areas may receive more or less material than the target numbers; however, the average distribution of topsoil within a particular site will be near the target depth.

Growth Media Scarification. Where necessary, growth media will be scarified. A roughened configuration will serve to trap moisture, reduce wind shear, and minimize surface erosion by increasing infiltration. These areas will also serve to create micro-habitats conducive to seed germination and revegetation.

Seeding. The focus of initial revegetation is on establishing grasses for growth media stabilization that allow successional plant communities of forbs, alder, and native evergreen species to establish. All of the construction and development activities are scheduled to take place solely in upland areas. The seed mix proposed for reclamation is presented in Table 3-2. Any changes to the proposed seed mix, or the use of non-Alaskan seed sources, must be approved by ADNR.

Consideration will be given to inclusion of a 10 percent annual rye grass mix for treatment of localized areas subject to high erosion potential. Selective application of erosion blankets may also be used in these locations. Native Alaskan plants are available through various suppliers in Alaska and will be pursued as the preferred species as recommended by agency specialists. The species list for the project site is based on current and projected availability of native species and their projected success.

Revegetation will be implemented using broadcast seeding. Because of rough terrain, restricted access, and relatively small acreage of disturbance of areas being reclaimed, for costing

purposes it has been assumed handseeders will be used to spread seed. Generally, seeding will be implemented from spring (May) until mid-September, during periods with minimum standing water to maximize germination. Seed will be applied at the rate of 30 to 45 pounds per acre (pure live seed).

3.6 RECLAMATION PERFORMANCE CRITERIA

3.6.1 General Reclamation Completion Criteria

The Project will be considered successfully reclaimed when all activities identified in the final closure plan have been completed. This will include facility and reclamation shutdown and reclamation tasks such as relocation of PAG waste rock, portal closing, regrading and revegetation, in accordance with the facility-specific plans described below in Section 4. NPLLC will seek release of the reclamation surety on a phased basis, as quantitative data indicate that the agreed-upon reclamation and revegetation criteria have been met. The following summarizes general site reclamation and closure completion criteria proposed by NPLLC for the project. These completion criteria are unchanged from those set forth in the original Reclamation and Closure Plan (RTR 2007b).

1. All applicable activities have been completed consistent with this reclamation plan and the final closure plan, including demolition, regrading, and other applicable activities.

2. Absence of erosional features of sufficient size and/or density to effect long term stability and vegetation cover. Any reclaimed area of 0.5 acre or more which exhibits more than 10 rills and gullies greater than 6 inches deep (or other erosional feature that clearly effects long term stability) will be filled with borrow material, regraded and seeded. Remediation of the site drainage contributing to the rills and gullies will be completed. Subsequent inspections will be completed to verify rills and gullies do not persist.

3. Establishment of vegetative cover meeting the revegetation success criteria (Section 3.6.2 below). If vegetative cover does not meet the success criteria 3 years after seeding, NPLLC will assess the conditions and initiate mitigation, such as fertilizer, seed mixture change, re-seeding, or remediation of soil contamination. If 2 years after these specific mitigation efforts are implemented and the site still does not meet the criteria, then NPLLC will submit a plan to ADEC for approval and propose further action, consisting of either remedial measures or criteria modification.

4. Establishment of plant diversity. If after 3 years a diverse plant community cannot be re-established at the site using the above-mentioned seed mix and reclamation activities, NPLLC will assess the condition and determine appropriate action(s). If 2 years after these specific mitigation efforts are implemented and the site still does not meet the

criteria, then NPLLC will submit a plan to the state for approval and propose further action, consisting of either remedial measures or criteria modification.

5. Establishment of natural succession. Natural succession will be determined by the plant species present for a given site, and be considered successful if two or more native species from natural succession are present and the site is free of invasive species (to the extent practicable). If after 3 years natural succession has not been established, NPLLC will assess the condition and determine appropriate action(s). If 2 years after these specific mitigation efforts are implemented and the site still does not meet the criteria, then Niblack will submit a plan to the state for approval and propose further action, consisting of either remedial measures or criteria modification.

As specified in the Reclamation Plan Approval (ADNR 2007), erosion features, such as rills and gullies, which form in areas that have been regraded and covered with topsoil, will be stabilized if they affect the long-term stability of the reclaimed area, or if they may lead to additional erosion and sedimentation. Actions to stabilize erosional features will be conducted in a manner that minimizes disturbance to adjacent areas. Subsequent inspections will be completed to verify that erosion features do not persist. If chronic or long-term erosion features are identified, remediation of the drainage that is contributing to the erosion will be completed. Areas that have been regraded will also be monitored for conditions of slope saturation caused by subsurface flow. If such conditions are observed and may result in instability, measures will be taken to remediate the drainage that is contributing to the saturation.

3.6.2 Revegetation Success Criteria

Post-closure monitoring plans described in Section 4.7 call for soil and vegetation monitoring for all reclaimed areas for the first 3 years following site closure. Additional soil and vegetation monitoring will be conducted in post-closure years 5 and 10 in conjunction with the water quality monitoring events. As specified in the Reclamation Plan Approval, a vegetative cover of 70% should be achieved 3 years after the last application of topsoil, seed, or fertilizer is placed before financial assurance will be released for reclaimed areas. Requests may be made to ADNR to waive the 70% cover criteria for areas that are stable, have minimal potential to adversely impact surface water quality, and are consistent with post-mining land use.

This program will focus on monitoring reclaimed areas for vegetation success and identifying any erosion problems. Monitoring may consist of digital photography of the reclaimed sites and transmittal of photos, with a photo-location map, to ADNR. Quantitative vegetative surveys may also be completed to evaluate revegetation success criteria.

Revegetation criteria will be used to quantify revegetation success. Undisturbed reference sites will be used to judge revegetation performance for reclaimed areas. The reference sites will be used to assess the existing percent aerial cover required as release criteria.

Representative reference sites will be selected and agreed upon by the ADNR and Niblack. Quantitative analysis would be conducted at the end of the growing season (end of August) by a qualified agency representative or an independent professional.

3.7 UPDATING THE RECLAMATION PLAN

Additional updates to this reclamation and closure plan will be submitted in the future if the project is materially changed. Updated as-built maps will be presented to delineate new areas of disturbance and update quantities estimated in the previous plan. Additional information including characterization of site conditions and soils, closure water quality standards, and data compiled from ongoing monitoring will be considered in revising the reclamation plan. A final closure plan and schedule will be prepared prior to closure.

The reclamation bond will be recalculated each time that the reclamation plan is updated. The updated bond calculation will include adjustment to reclamation quantities based on current conditions at the time the estimate is prepared, adjustments to labor and equipment rates, appropriate adjustments to indirect rates, and recalculation of the estimated inflation cost. The reclamation plan will be submitted to ADNR and ADEC for review and comment during each revision. Any modifications to the reclamation plan must be approved by the responsible agencies.

4 FACILITY-SPECIFIC RECLAMATION AND CLOSURE PLANS

This section describes the specific reclamation and closure guidelines for facilities and areas which currently exist at the Niblack Project. The facility-specific plans for reclamation and closure presented here are unchanged from those set forth in the original Reclamation and Closure Plan (RTR 2007b), except where otherwise noted.

4.1 SITE DISTURBANCE SUMMARY

For the purposes of this reclamation and closure plan, the Niblack Exploration Project has been delineated into five primary reclamation zones or task areas. These represent the main areas of disturbance for project activities that are to be reclaimed: the PAG temporary storage facility, the portal, the NAG disposal area, the water treatment/settling ponds, and the stormwater management areas.

Facility-specific reclamation plans, including goals and objectives, reclamation and closure tasks, post-closure monitoring and maintenance, and estimated reclamation costs are described below for each of the task areas. Acreage of disturbance for the various facilities is tabulated in Section 3.5.1 and presented in Table 3-1. The volume of waste rock generated during excavation of the currently active exploration drift is presented in Table 2-1. Tables 2-2 and 2-3 summarize the estimated volumes of PAG and NAG material which would be generated if the drift were expanded to the full design length of 6,000 ft. No additional material is currently anticipated; however, the total volume of PAG material estimated based on the full design drift length of approximately 6,000 ft is presented here and utilized in the cost estimate calculations to allow for possible future expansion of project activities. These plans form the basis for the reclamation cost estimate provided as Appendix B, Project Reclamation Cost Estimate.

4.2 TASK 1 – PAG FACILITY (WASTE ROCK RELOCATION AND SITE RECLAMATION)

Reclamation of the PAG temporary waste rock facility will commence once the project activities have been terminated. Concurrent reclamation opportunities at adjacent cut and fill slopes will be continuously assessed during operations to determine if stabilization of the area can be achieved prior to the closure period. If material remains in the mineralized ore stockpile located adjacent to the PAG facility, this material will be managed in the same manner as the PAG waste rock, and the stockpile site will be reclaimed as described below.

The reclamation and closure plan for the PAG temporary storage facility is a requirement of the Industrial Solid Waste Monofill Permit Application, and is prepared in accordance with 18 AAC 60.200, 18 AAC 60.485(b), and 18AAC 60.485(d). A total of 66,160 tons of waste rock (39,300 yd^3 expanded waste volume) was generated from 2007 through 2008 during excavation of the underground workings to 3,288 ft. Of this total, approximately 9,960 tons (5,920 yd^3) was classified as PAG material based on geochemical analyses (Table 2-1). This includes 8,995 tons of material placed in the PAG temporary storage facility, and 965 tons of material placed in the mineralized ore stockpile. To allow for possible future expansion of the adit to the full design length of 6,000 ft, the total volume of PAG material anticipated in design plans (24,310 tons or 14,300 yd^3)[1] was used to develop the reclamation and closure schedule and cost estimates presented herein.

4.2.1 Reclamation Goals and Objectives

Reclamation activities for the PAG temporary waste rock storage site and adjacent mineralized ore stockpile are focused on protecting local surface water and groundwater quality long-term after the cessation of the project, and returning the land to a safe and stable condition, suitable for use as wildlife habitat. PAG waste rock and mineralized ore will be removed and placed back underground, followed by grading, stabilization, and establishment of a long-term, self-sustaining vegetation community at the temporary storage area.

4.2.2 Reclamation and Closure Tasks

The total amount of PAG material and mineralized ore extracted during excavation (currently 5,920 yd^3, up to 14,300 yd^3 may be generated if the drift is expanded in the future) will be placed back underground at the southern-most segment of the adit. This design leaves PAG waste rock isolated underground below the water table, where oxidation and acid generation will cease as oxygen is excluded by the flooding groundwater. To reduce the potential for PAG waste to cause short-term degradation of the groundwater that floods the drift, the paste pH or drainage quality of the PAG waste will be measured before it is placed back in the drift, and if it is acidic, lime will be added to neutralize porewater acidity before placement.

PAG material would be hauled, end-dumped, and pushed in a typical backfill mode. Other activities include removal of the PAG facility HDPE liner and disposal underground[2], removal of the cover and liner from the mineralized ore stockpile and disposal underground, filling of

[1] A conversion factor of 1.7 tons/yd^3 is used in this report for PAG material. This factor is based on the measured volumes of PAG (9,960 tons / 5,920 yd^3 = 1.68 tons/yd^3) reported by Niblack project managers. The original estimates of PAG material (21,500 tons or 14,300 yd^3), presented RTR (2007b) and reproduced in Table 2-2 of this report, are based on a conversion factor of 1.5 tons/yd^3.

[2] Section 1.14 of the Niblack Waste Management Permit (2006-DB0037) lists the types of solid waste which may be disposed of underground at closure. Approved materials include waste rock, drill steel, tubing, tires, geosynthetic liners, settled solids, and used plastic and glass.

the PAG pond, and reclamation of other water management structures such as the PAG liner leak detection system. Topsoil and/or growth media will be used to cover the footprint of the site, and the area will be seeded. The PAG site would then be recontoured, and stormwater conveyance cleaned and stabilized. Figures A-1 (Site Overview) and A-2 (Site Detail) present the current post-construction footprint of the PAG facility and the mineralized ore stockpile, superimposed over the original design drawings. Figure 2-3 provides an as-built cross section of the PAG pile.

4.2.3 Post-Closure Monitoring and Maintenance

Post-closure monitoring and maintenance for the PAG site will evaluate the success of vegetation, and provide periodic maintenance of erosion controls if required. Section 4 describes the scope of anticipated monitoring and maintenance programs. Post-closure monitoring is also a requirement of the SWPPP (RTR 2006) and the Niblack waste management permit (2006-DB0037). These programs will all be integrated into a single monitoring scheme.

4.2.4 Estimated Reclamation and Closure Costs

Closure costs for the PAG temporary storage site are outlined in Table 5-1 and Appendix B (Task 1), and are estimated at approximately $186,280. This subtotal includes cost of hauling waste underground, earthworks to regrade the rock storage facility, place growth media, and seeding the area. The time required to reclaim the PAG storage facility is estimated at 30 days. Cost and time estimates to reclaim the mineralized ore stockpile are included in the Task 1 calculations.

4.3 TASK 2 – ADIT PLUG AND PORTAL ENTRANCE RECLAMATION

Reclamation activities for the adit and portal entrance area will commence after all PAG waste has been relocated back underground. The 14.5 ft. x 13 ft adit extends through approximately 2,800 linear ft of drift, as shown on Figure 2-7. Because the adit opening and portal entrance were constructed to the same dimensions proposed in the original design plans, no changes have been made to the original plans for adit plug and portal entrance reclamation presented in RTR (2007b).

This document presents conceptual reclamation plans; prior to site closure, a final closure plan with details regarding the specific construction and placement of the adit plug will be submitted to ADNR for approval. As specified in the Reclamation Plan Approval (ADNR 2007), the final adit plug design will include consideration of the chemical stability of the concrete, grout, and surrounding rock in the anticipated post-closure groundwater environment. The plan must also evaluate groundwater quantity and quality discharging from drill holes.

4.3.1 Reclamation Goals and Objectives

A cement plug will be installed to seal the PAG waste rock in the adit to prevent seepage. All temporary structures at the portal entrance not required for designated post-closure land uses will be removed from the property, followed by grading, stabilization, and establishment of a long-term, self-sustaining vegetation community.

4.3.2 Reclamation and Closure Tasks

The 14.5 ft. x 13 ft adit extends through 2,772 ft of drift. The adit will be closed after the PAG material backfill is complete, using a cement plug and NAG material at the portal. The exact location of this plug will be determined at cessation of all project activities based on actual underground geotechnical conditions, safety and groundwater quality and quantity. The over-sized plug zone would be grouted to limit hydrostatic pressures and adit drainage. The portal entrance/laydown area, which involves about 0.25 acre, would be cleared of all buildings and/or appurtenances and utilities. The area would then be topsoiled and seeded. The stormwater conveyance network would be stabilized for long-term stormwater management.

4.3.3 Post-Closure Monitoring and Maintenance

Post-closure monitoring and maintenance for the adit and portal area will evaluate the success of vegetation, and provide periodic maintenance of erosion controls if required. If water discharges from the adit following plugging and closure, a water quality monitoring program will be initiated. Section 5 describes the scope of anticipated monitoring and maintenance programs. Post-closure monitoring is also a requirement of the SWPPP (RTR 2006) and the Niblack waste management permit (2006-DB0037). These programs will all be integrated into a single monitoring scheme.

4.3.4 Estimated Reclamation and Closure Costs

Closure of the adit, including installation of an engineered cement plug and regrading the portal entrance, is estimated at $161,832, Appendix B (Task 2). Appendix B includes detailed analysis of unit cost, production, and other assumptions used to estimate cost for each item.

4.4 TASK 3 – NAG WASTE ROCK STORAGE AREA

Reclamation activities in the NAG waste rock storage area will commence once the project activities have been terminated. Concurrent reclamation opportunities will be continuously assessed during operations to determine if stabilization of the area can be achieved prior to the closure period. Table 2-1 provides a breakdown of development rock generated during the project. Approximately 56,200 tons (33,400 yd^3) of NAG material was generated from 2007

through 2008 during excavation of the underground workings to 3,288 ft. All NAG waste rock generated was used in construction activities. To allow for possible future expansion of the adit to the full design length of 6,000 ft, the total volume of NAG material anticipated in design plans (46,600 yd^3, Table 2-2) was used to develop the reclamation and closure schedule and cost estimates presented herein.

This document presents conceptual reclamation plans; prior to site closure, a final closure plan will be submitted to ADNR for approval. As specified in the Reclamation Plan Approval (ADNR 2007), the final closure plans must include consideration of water quality monitoring data and waste rock geochemical monitoring results. Exceedances of water quality related to the NAG waste rock are not expected; however, if seepage from the NAG waste area were to exceed water quality standards, ADNR may require reclamation of this facility to minimize infiltration. The final facility closure plans must specify slopes, growth medium replacement depths, erosion control measures, and surface flow diversion ditches.

4.4.1 Reclamation Goals and Objectives

Reclamation activities will focus on closure of the NAG development rock disposal area. The NAG development rock will be left in place, graded, stabilized, and protected from erosion. The reclaimed surface will be treated to establish a long-term, self-sustaining vegetation community.

4.4.2 Reclamation and Closure Tasks

During construction and operation of the underground access tunnel, it is estimated that any NAG material which is not used in facility construction or reclamation will be stored within the NAG waste rock disposal area. Figures A-1 (Site Overview) and A-2 (Site Detail) present the current post-construction footprint of the NAG disposal area, superimposed over the original design drawings. Figure A-4 presents the conceptual NAG waste rock pile pre-reclamation cross-section design. During closure, the deposit will be graded to reduce the slope to conform to local topography in a stable configuration.

The closure surface will be graded using an excavator to cut material from the upper section of the slope and fill along the slope toe. The conceptual grading plan shows a final crest elevation that will be back-sloped during grading to reduce runoff to the slope face. Final contouring of the material will be dependent upon the quantity of rock placed in the facility, and grading will likely include a mid-slope bench to reduce the length of the continuous slope. A volume of approximately 18,250 yd^3 of grading at closure was estimated for the conceptual closure surface (RTR 2007b).

The graded development rock surface will be covered with a minimum thickness of 6 in. of topsoil or other growth media. The treated surfaces will be scarified with an excavator along contour where practical and seeded using the upland seed mixture discussed in Section 3.5.2.

4.4.3 Post-Closure Monitoring and Maintenance

Post-closure monitoring and maintenance for the NAG facility will evaluate the success of vegetation, and provide periodic maintenance of erosion controls if required. Section 5 describes the scope of anticipated monitoring and maintenance programs. Post-closure monitoring is also a requirement of the SWPPP (RTR 2006) and the Niblack waste management permit (2006-DB0037). These programs will all be integrated into a single monitoring scheme.

4.4.4 Estimated Reclamation and Closure Costs

Closure costs for the NAG waste rock storage site are outlined in Appendix B (Task 3), and are estimated at approximately $25,520. This subtotal includes cost of earthworks to regrade the development rock storage facility, place growth media, and seeding the area. Appendix B includes detailed analysis of unit cost, production and other assumptions used to estimate cost for each item.

4.5 TASK 4 – WATER TREATMENT AND SETTLING PONDS

Reclamation and closure of the settling ponds and water treatment/discharge system will be initiated following placement of the adit plug and reclamation of the waste rock disposal areas. At closure, the site water treatment/settling ponds and PAG leachate capture pond would be filled. Prior to filling, the geosynthetic liners would be cut, folded, and sealed in place. Fill material from the NAG pile would be used.[3] Drip emitter lines, piping conveyance, and all other appurtenances and utilities would be removed from the area for reuse, and/or demolition and shipment offsite, and/or disposed underground. The settling pond areas would then be regraded and topsoil applied, followed by seeding.

4.5.1 Reclamation Goals and Objectives

The primary reclamation goal for the settling pond area is to return the land to a safe and stable condition, suitable for use as wildlife habitat. Closure may include converting part of the facility to a wetland; otherwise, upland vegetation species as listed in section 3.5.2 will be used.

[3] Note that this reclamation and closure plan assumes that sufficient volumes of NAG material will be available for reclamation purposes (e.g., filling of the settling ponds). For the purpose of estimating conceptual closure costs, it has been assumed that, at closure, the site will contain the originally estimated quantity of about 46,600 yd^3 of NAG development rock. Consistent with the 2007 design, this material will provide a source of clean fill material.

4.5.2 Reclamation and Closure Tasks

Reclamation and closure of the settling ponds and water treatment/discharge system will be initiated following placement of the adit plug and reclamation of the waste rock disposal areas, and subsequent monitoring to confirm that reclamation was successful and that impacts to site water quality are not expected. At closure, the geosynthetic pond liners will be cut, folded, and sealed in place. The ponds will then be filled using material from the NAG pile. The LAD system drip emitter lines, piping conveyances, and all other appurtenances and utilities would be removed from the area for reuse, and/or demolition and shipment offsite, and/or disposed underground. The settling pond areas will then be regarded, capped with topsoil, and seeded. If the final reclamation plan specifies that part of the settling pond area is to be reclaimed as a wetland, a portion of the facility will be graded to allow for ponding and the establishment of a shallow wetland feature, and an appropriate vegetation mix will be applied. Otherwise, upland vegetation species as listed in section 3.5.2 will be used.

4.5.3 Post-Closure Monitoring and Maintenance

Post-closure activities for the settling ponds and water treatment areas will consist of monitoring to evaluate the success in establishment of a long-term, self-sustaining vegetative community. Section 5 describes the scope of anticipated monitoring and maintenance programs. Post-closure monitoring is also a requirement of the SWPPP (RTR 2006) and the Niblack waste management permit (2006-DB0037). These programs will all be integrated into a single monitoring scheme.

4.5.4 Estimated Reclamation and Closure Costs

Water treatment/settling pond closure costs are outlined in Appendix B (Task 4) and are estimated at approximately $20,055. This subtotal includes cost for hauling fill, removing piping (including LAD drip emitters), regrading, seeding and planting. Appendix B includes detailed analysis of unit cost, applications and other assumptions used to estimate cost for each item included.

4.6 TASK 5 – STORMWATER MANAGEMENT AREAS

Stormwater capture, conveyance, settling, and dispersion structures downgradient of the NAG site will be closed and reclaimed following stabilization of the reclaimed NAG waste pile, and once subsequent water quality monitoring shows that the site exhibits baseline conditions. The reclamation activity would include placement of the originally excavated soil (stored beside the storm management structures) back into the diversion ditches, sediment ponds and sediment traps. The backfill will be graded to mimic the surrounding topography, and reseeded. Stormwater management structures associated with the access road will be retained and

maintained in accordance ADNR OHM&P permit (FH-09-VII-0021) and COE permit (POA-1982-290-N) stipulations, in order to keep the access road available for designated post-closure land use.

4.6.1 Reclamation Goals and Objectives

The primary reclamation goal for the stormwater management areas is to return the land to a safe and stable condition, suitable for use as wildlife habitat and for recreational use.

4.6.2 Reclamation and Closure Tasks

Reclamation activities for the stormwater management facilities will be completed once facilities are no longer required. This will follow stabilization of the reclaimed NAG waste pile, and following water quality monitoring to establish that the site exhibits baseline conditions. This will be accomplished prior to Niblack leaving the site. Filling and grading of the stormwater management areas will be completed to contour and smooth the areas. A minimum of 6 in. of topsoil or other growth media will be placed on the sites. The sites will be scarified along contours and seeded using the upland seed mixture presented in Section 3.5.2. Natural succession of upland species from surrounding areas will occur once activities within the area are discontinued. Niblack will monitor the success of establishing upland habitat prior to closure and determine if any additional reclamation measures are required.

4.6.3 Post-Closure Monitoring and Maintenance

Post-closure activities for the stormwater management areas will consist of monitoring and maintenance of BMPs for erosion control and monitoring of seeded areas to evaluate revegetation success. Section 5 describes the scope of anticipated monitoring and maintenance programs. Post-closure monitoring is also a requirement of the SWPPP (RTR 2006) and the Niblack waste management permit (2006-DB0037). These programs will all be integrated into a single monitoring scheme.

4.6.4 Estimated Reclamation and Closure Costs

Closure costs for the stormwater management facilities are estimated at $6,139, and are outlined in Appendix B (Task 5). This subtotal includes cost for regrading the area growth media placement and seeding. Appendix B includes unit cost, production and other assumptions used to estimate cost.

4.7 TASK 6 – POST-CLOSURE MONITORING AND MAINTENANCE

A long-term monitoring and maintenance (LTMM) program is included with the reclamation and closure plan cost estimates presented in Appendix B. Specific LTMM plans regarding each facility and parcel are discussed above in Sections 4.2 through 4.6.

Post-closure visual and water quality monitoring will be performed according to the Water Quality Monitoring Plan 2012 Post-Construction Update (Integral 2012a), and as stipulated in the Niblack Waste Management Permit (2006-DB0037). The post-closure water monitoring schedule includes visual monitoring and biannual water quality sampling at four groundwater wells and two surface water stations in years 1 and 2. Additional water quality sampling will be conducted at one groundwater well and two surface water stations once annually in years 5, 10, 20 and 30. Additionally, if the closed adit fills and water discharges from the portal, post-closure monitoring of the discharge water is required for years 1, 2, 5, 10, 20, and 30.

During project activities, inspections and monitoring will be part of the normal project operation and maintenance schedule. Therefore, important information necessary for developing detailed post-closure monitoring and maintenance schedules and costs and related financial assurance requirements would be collected during this time. This would involve special efforts necessary to document unusual climatic events that could result in extraordinary maintenance needs. Monitoring would continue after project activities cease and would include inspections during the vegetation reestablishment period. The LTMM schedule would include the following:

- Visual and water quality monitoring as required by applicable permits still in force
- Sediment and debris build-up in the diversions would be assessed annually during operation
- Annual inspections of the site would occur during the first 3 years after cessation of project activities, or until release from the reclamation surety
- Any necessary remedial work would be carried out as needed, based on site inspections
- Maintenance of the physical integrity of the adit portal closure, diversions, and roads.

Soil and vegetation monitoring will also include all reclaimed areas (site-wide), with inspections and maintenance activities planned during years 1, 2, and 3 during the post-closure period. Additional soil and vegetation monitoring will be conducted in post-closure years 5 and 10 in conjunction with the water quality monitoring event. This program will focus on monitoring reclaimed areas for vegetation success and identifying and correcting any erosion problems.

Goals for the Niblack Exploration Project reclamation were described above in Section 3. The objective of the LTMM program is to monitor the success of reclamation by comparing monitoring results with performance standards associated with each reclamation goal.

Reclamation bond release or initiation of contingency actions can be triggered if a reclamation goal is met or not.

4.7.1 Estimated Monitoring and Maintenance Costs

Post-closure monitoring costs for the Niblack site are estimated at $94,827, including inflation. Appendix B includes analytical, materials, and labor costs used to estimate the total.

5 RECLAMATION ASSURANCES

The cost estimates presented herein update the cost estimates provided in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b). The overall estimated cost to reclaim the Niblack Exploration Project is $1,278,768. This total includes direct costs to complete the physical reclamation and post-closure monitoring, indirect costs, and inflation. The cost breakdown tables and supporting assumptions are summarized below and presented in Appendix B. Table B-2 summarizes overall costs by task. Tables B-3 through B-8 detail cost calculations and assumptions by component. The cost estimates were compiled from current equipment rental, fuel, analysis, and other costs. They reflect actual site conditions, topography, and equipment and utilization factors that are representative of southeast Alaska. The updated cost estimate for reclamation and closure is largely based on the same assumptions and criteria outlined in RTR (2007b). Updates to selected costs (e.g., fuel and analytical expenses) have been made, as appropriate. Accordingly, Tables B-2 through B-8 provide an up-to-date cost estimate, as well as the original 2007 costs for comparison purposes.

5.1 SUMMARY OF ESTIMATED RECLAMATION COSTS

Cost estimates for reclaiming and closing each facility are discussed above in Section 4. The total estimated cost for physical reclamation at the Niblack Exploration Project (Tasks 1 through 5) is $1,179,200 (Table B-2). The cost breakdown tables and supporting assumptions are presented in Tables B-3 through B-8. The most significant changes from the 2007 cost estimates were related to the increase in fuel costs, as shown in Table B-8.

5.2 SUMMARY OF POST-CLOSURE MONITORING AND MAINTENANCE COSTS

The total estimated cost for post-closure monitoring in years 1, 2, 3, 10, 20, and 30, is $99,568 (Table B-2). Table B-4 presents the estimated material, transportation, and analytical costs for post-closure monitoring as lump sums. Table B-7 details estimated monitoring labor rates, and total monitoring costs (including materials and transportation) for each monitoring year.

5.3 INDIRECT COSTS, CONTINGENCY AND INFLATION

Indirect costs have been either included in the cost estimate as line items or applied as a percentage of the direct cost total. The approach used in estimating each indirect cost is discussed below. The indirect cost assumptions are unchanged from those set forth in the original Reclamation and Closure Plan (RTR 2007b).

5.3.1 Mobilization/Demobilization

A separate mobilization/demobilization allowance of $80,000 is provided in the estimate (Table B-6). An allowance of $16,800 is also shown for the cost for personnel transportation (floatplane or air taxi) and periodic deliveries (landing craft). Demobilization cost includes cost for removing salvaged equipment and materials, and demobilization of construction equipment.

5.3.2 Contractor Overhead and Profit

Overhead and profit were estimated at 10% and 15% respectively, as a percentage of the total estimated direct physical reclamation costs. Contractor overhead totals $73,166, and contractor profit totals $109,749. These estimates are shown as line items in Table B-2.

5.3.3 Other Indirect Costs

Other indirect costs were estimated as a percentage of the total estimated direct costs. Engineering and redesign are estimated at 5% of direct costs (Tasks 1 through 5), and totals $36,583, as shown on Table B-2.

5.3.4 Contingency

A 5% contingency was applied to all direct cost estimates. These estimates are shown as line items in Table B-2.

5.3.5 Agency Oversight

A cost estimate for agency oversight of the reclamation totals $8,650. This total is based on two trips by ADNR and ADEC during active reclamation and 3 follow-up site inspections in post-closure years 1, 2 and 3. It was assumed the oversight would be completed by one ADNR staff person from the Fairbanks office, and one ADEC staff person from the Juneau office.

5.3.6 Contract Performance and Payment Bond

A contract performance and payment bond of 1.5% of the total direct costs totals $10,975, as shown on Table B-2.

5.3.7 Inflation Cost

Inflation was added to the total direct and indirect cost to account for the potential period of time that could elapse between updating the reclamation plan and completing reclamation activities. A 5-year term is used for calculating inflation assuming that the project forfeits the

bond at the end of the 30 month cycle for updating the reclamation plan, that 1 year passes before reclamation begins, and that reclamation occurs over a 2-year period. A construction cost inflation rate of 3.2 percent was used to calculate the inflation cost. Additional information on the inflation cost calculation is presented in Table B-2.

Inflation for Task 6, reclamation and water quality monitoring, was calculated based on individual sub-tasks and is included in the Task 6 total cost estimate. Post-closure water quality sampling is anticipated to be performed once annually for years 1, 2, 5, 10, 20 and 30.

5.4 POST-CLOSURE FINANCIAL ASSURANCE

For the purposes of reclamation bonding, there will be three distinct phases of closure:

- Phase I will cover the period after operations cease and reclamation is actively under way.
- Phase II will cover the period after final reclamation has been completed; monitoring and maintenance would be ongoing. Phase II bonding would still be provided by the reclamation bond.
- Phase III will cover the period when all agencies accept the reclamation effort and release the bonds. Phase III financial assurance would be provided in accordance with the negotiated terms.

NPLLC will provide an acceptable financial assurance as a condition of the approval for the Plan of Operations. NPLLC anticipates applying for partial release of reclamation surety bond monies in subsequent years following cessation of project activities, as allotting credit for successfully completed discrete reclamation procedures reduces the final reclamation costs. A full release of the surety would be requested when all requirements of the final reclamation and closure plan have been met. The funds for long-term monitoring and maintenance costs, however, would still be guaranteed by establishment of a trust agreement.

In the event a new operator assumes control of the project, the new operator or landowner would agree to assume full responsibility for the reclamation and maintenance of all affected land and structures that are the subject of these principles. The new owner/operator would also be required to assume all related permit conditions that may apply to the overall reclamation process. The new operator would transfer to its name all applicable state and federal permits and provide evidence that a surety acceptable to the agency covering the reclamation of disturbed land, including post-closure monitoring and maintenance, is filed.

6 ADMINISTRATIVE INFORMATION AND LIST OF PROPERTIES

6.1 PROJECT OWNERSHIP AND CONTACT INFORMATION

Owner/Operator: Niblack Project LLC
1040 W. Georgia St., 15th Floor
Vancouver, British Columbia
Canada V6E 4H8

U.S. Incorporation: Niblack Project LLC
c/o Corporation Service Company
2711 Centerville Road, Suite 400
Wilmington, Delaware 19808
U.S.A.

Contact: Patrick Smith
President and CEO
Niblack Project LLC
1040 W. Georgia St., 15th Floor
Vancouver, British Columbia
Canada V6E 4H8
Telephone: (604) 684-6365

All notices or other communication related to the Reclamation Plan under 11 AAC 97.310 are to be directed to the Contact listed above.

6.2 LIST OF PROPERTIES AND CLAIMS WHERE WORK WILL BE CONDUCTED

The Niblack property is located approximately 30 miles southwest of the town of Ketchikan in the mouth of Moira Sound, Prince of Wales Island (Figure 1). The property is composed of 16 patented claims, 296 staked federal lode claims and 5 Alaska State tideland claims. The claims are shown on Figure 6-1 and listed in Table 6-1. The claims are within Township 78 South, Range 88 East, Copper River Meridian, Sections 27, 28, 29, 32, 33, 34 and 35; and Township 79 South, Range 88 East, Copper River Meridian, Sections 1, 2, 3 and 4, Ketchikan Recording District, Alaska. All claims are owned 100 percent by Niblack Project LLC.

7 REFERENCES

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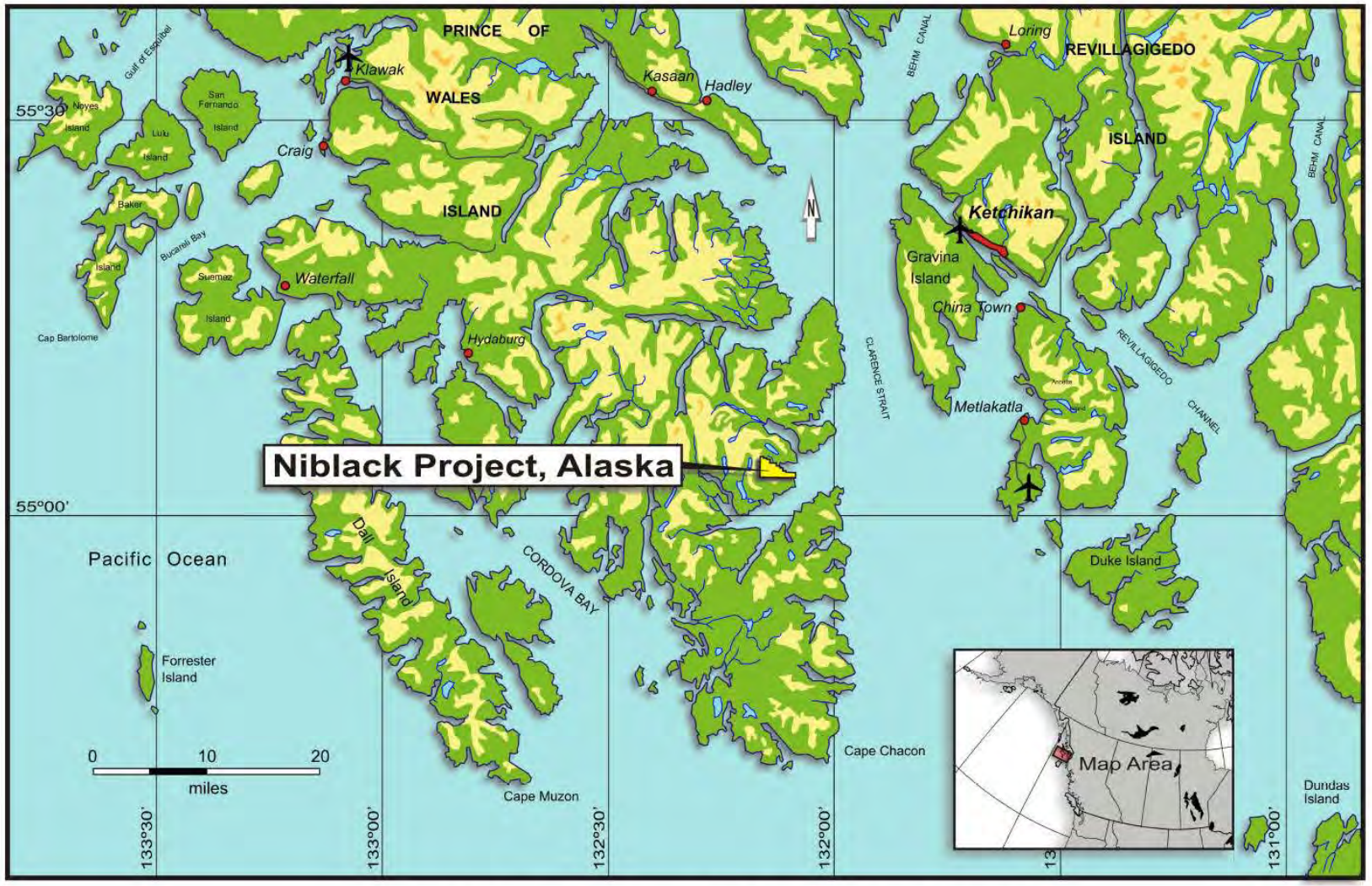
FIGURES

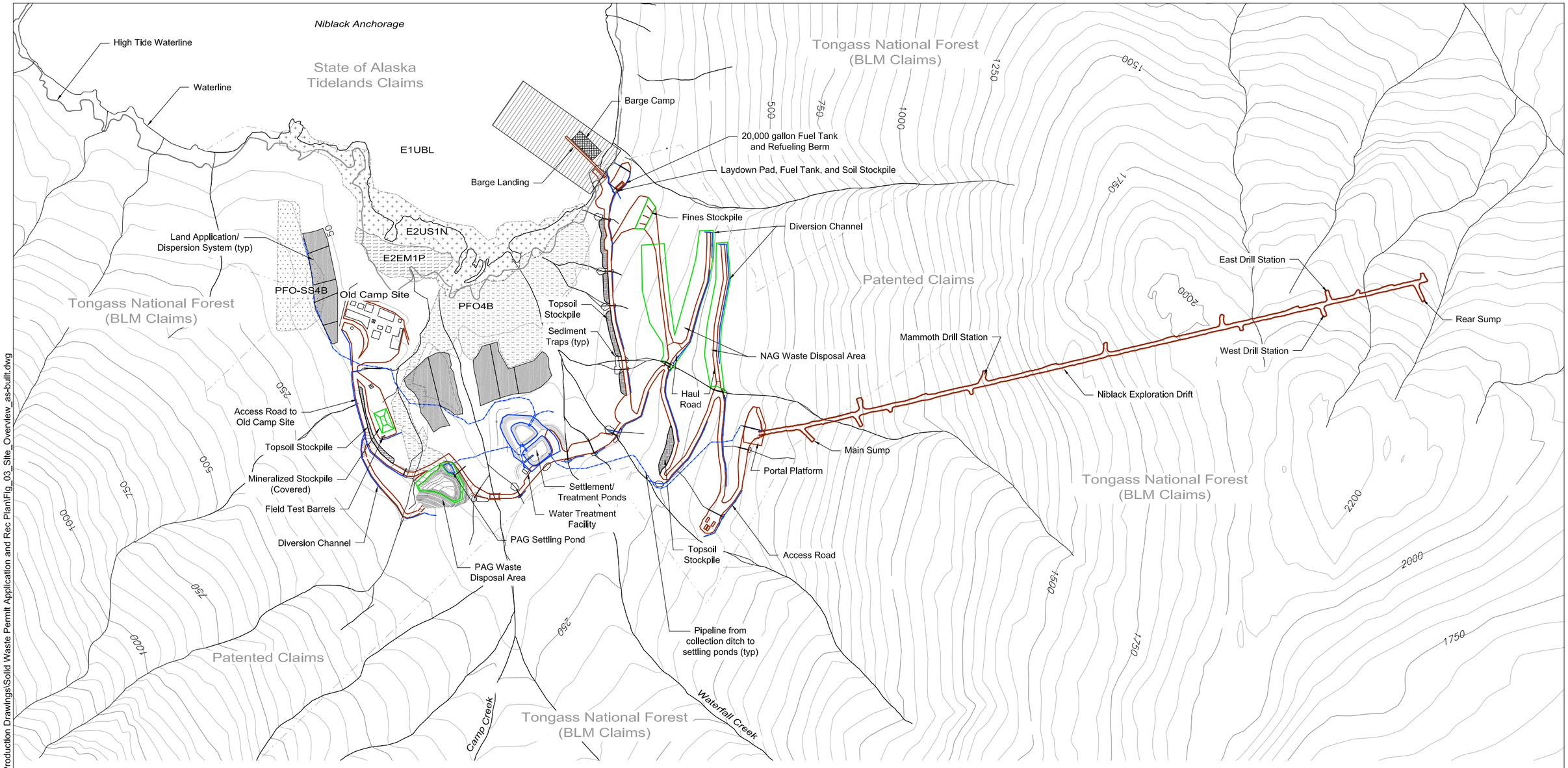


Niblack Project Location Map

May, 2006

NIBLACK PROJECT LLC integral consulting inc.

Figure 1-1
Niblack Project Location Map
Niblack Reclamation and Closure Plan
2012 Post-Construction Update



P:\Projects\C384_NiblackAK\CAD\Production Drawings\Solid Waste Permit Application and Rec Plan\Fig_03_Site_Overview_as-built.dwg

LEGEND

- E1UBL Estuarine - Subtidal
- E2US1N Estuarine - Unvegetated Intertidal
- E2EM1P Estuarine - Emergent Intertidal
- PFO-SS4B - Needleleaf Forest/Scrub - Shrub Wetland
- PFO4B - Needleleaf Forest Wetland
- Land Application Areas
- Tideland Lease Area
- Property/Patented Claim Boundary
- Waste Rock Storage Facilities
- Water Management Features
- Roads and Exploration Access Drift

NOTE

1. All dimensions and elevations are in feet unless otherwise noted

SOURCES

1. As-built drawings provided by Niblack Project LLC (2011)
2. Land application area boundaries from Turner (2009, personal communication)

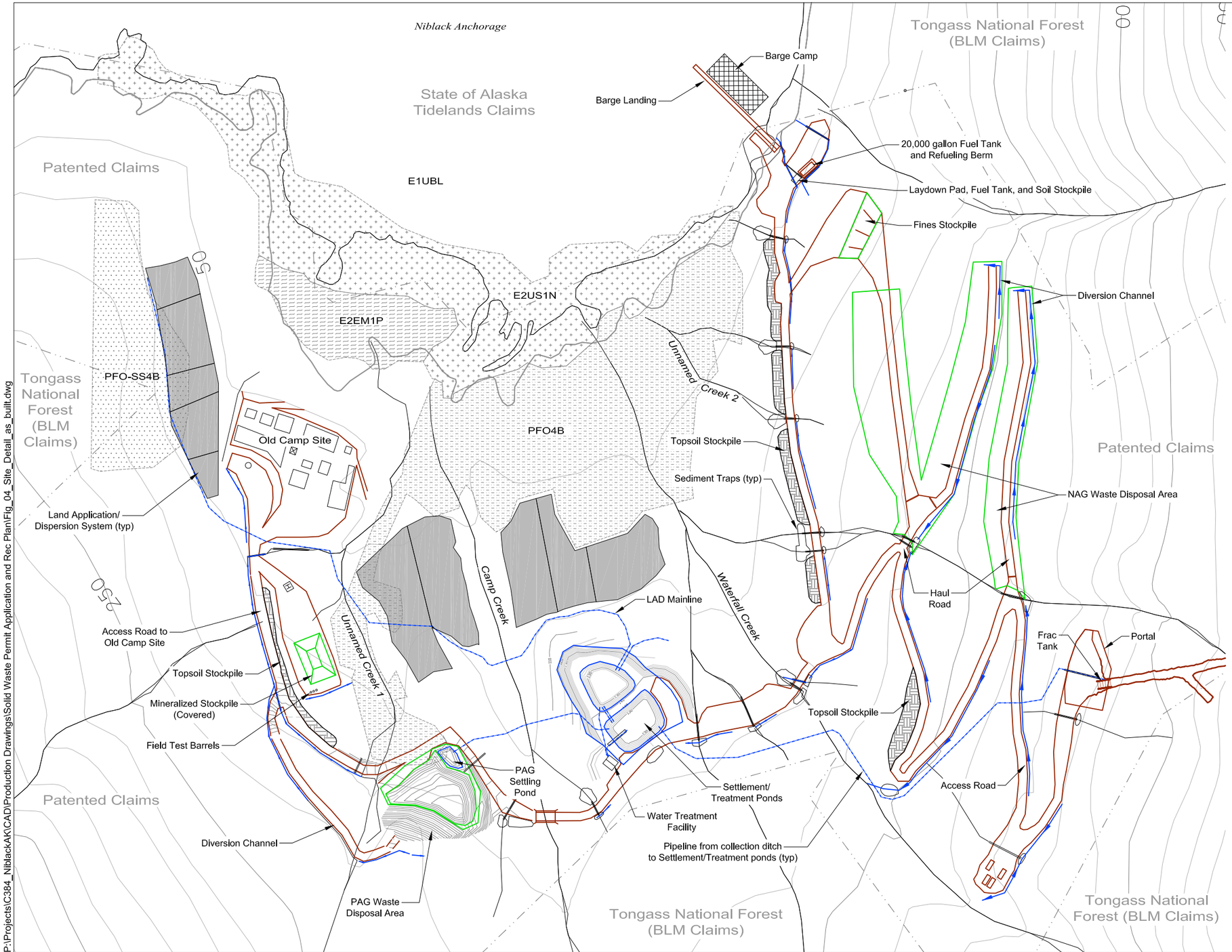
NIBLACK PROJECT LLC

integral consulting inc.

0 200 400 Feet

N

Figure 2-1
General Site Plan
Niblack Reclamation and Closure Plan
2012 Post-Construction Update



LEGEND

- E1UBL Estuarine - Subtidal
- E2US1N Estuarine - Unvegetated Intertidal
- E2EM1P Estuarine - Emergent Intertidal
- PFO-SS4B - Needleleaf Forest/Scrub - Shrub Wetland
- PFO4B - Needleleaf Forest Wetland
- Land Application Areas
- Property/Patented Claim Boundary
- Waste Rock Storage Facilities
- Water Management Features
- Roads and Exploration Access Drift

NOTE

1. All dimensions and elevations are in feet unless otherwise noted

SOURCES

1. As-built drawings provided by Niblack Project LLC (2011)
2. Land application area boundaries from Turner (2009, personal communication)

NIBLACK PROJECT LLC

integral consulting inc.

0 100 200 Feet

N

Figure 2-2
Site Plan Detail
Niblack Reclamation and Closure Plan
2012 Post-Construction Update

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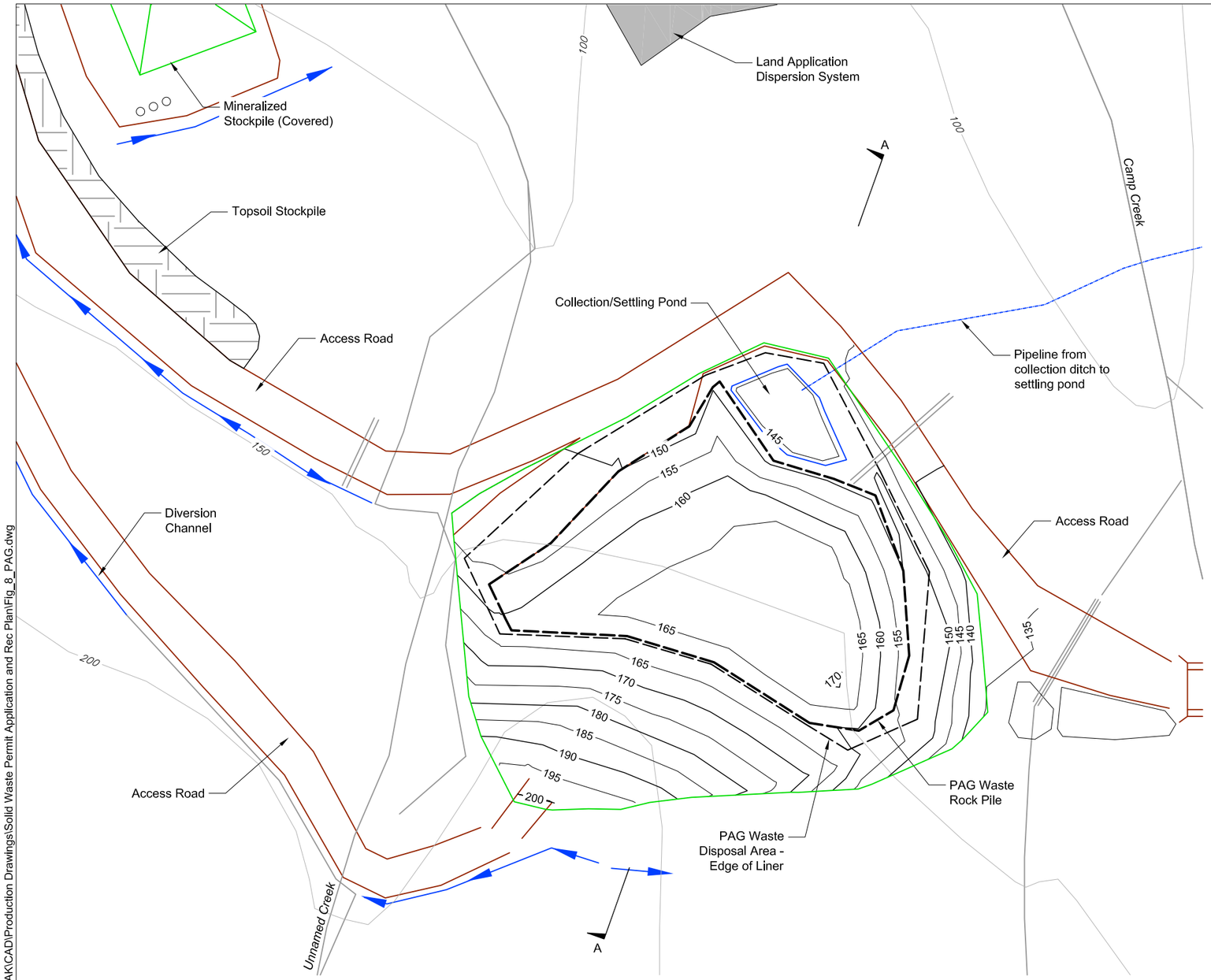

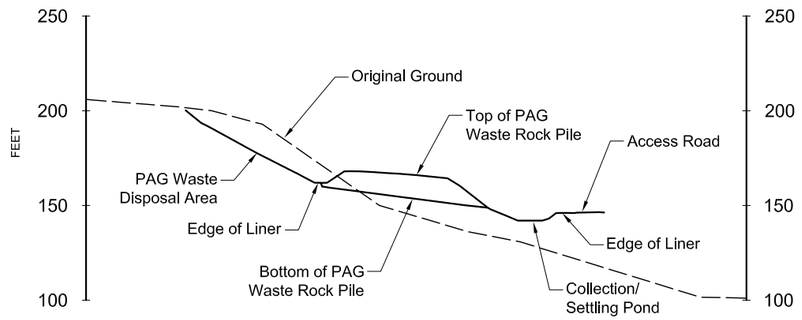

SECTION A
Section Thru PAG Waste Disposal Area

0 40 80 Feet

LEGEND

- PFO4B - Needleleaf Forest Wetland
- Land Application Area
- Waste Rock Storage Facilities
- Water Management Features
- Roads

NOTE

1. All dimensions and elevations are in feet unless otherwise noted

SOURCES

1. As-built drawings provided by Niblack Project LLC (2011)
2. Land application area boundaries from Turner (2009, personal communication)

NIBLACK PROJECT LLC

integral consulting inc.

0 25 50 Feet

N

Figure 2-3
PAG Waste Rock Pile
Niblack Reclamation and Closure Plan
2012 Post-Construction Update

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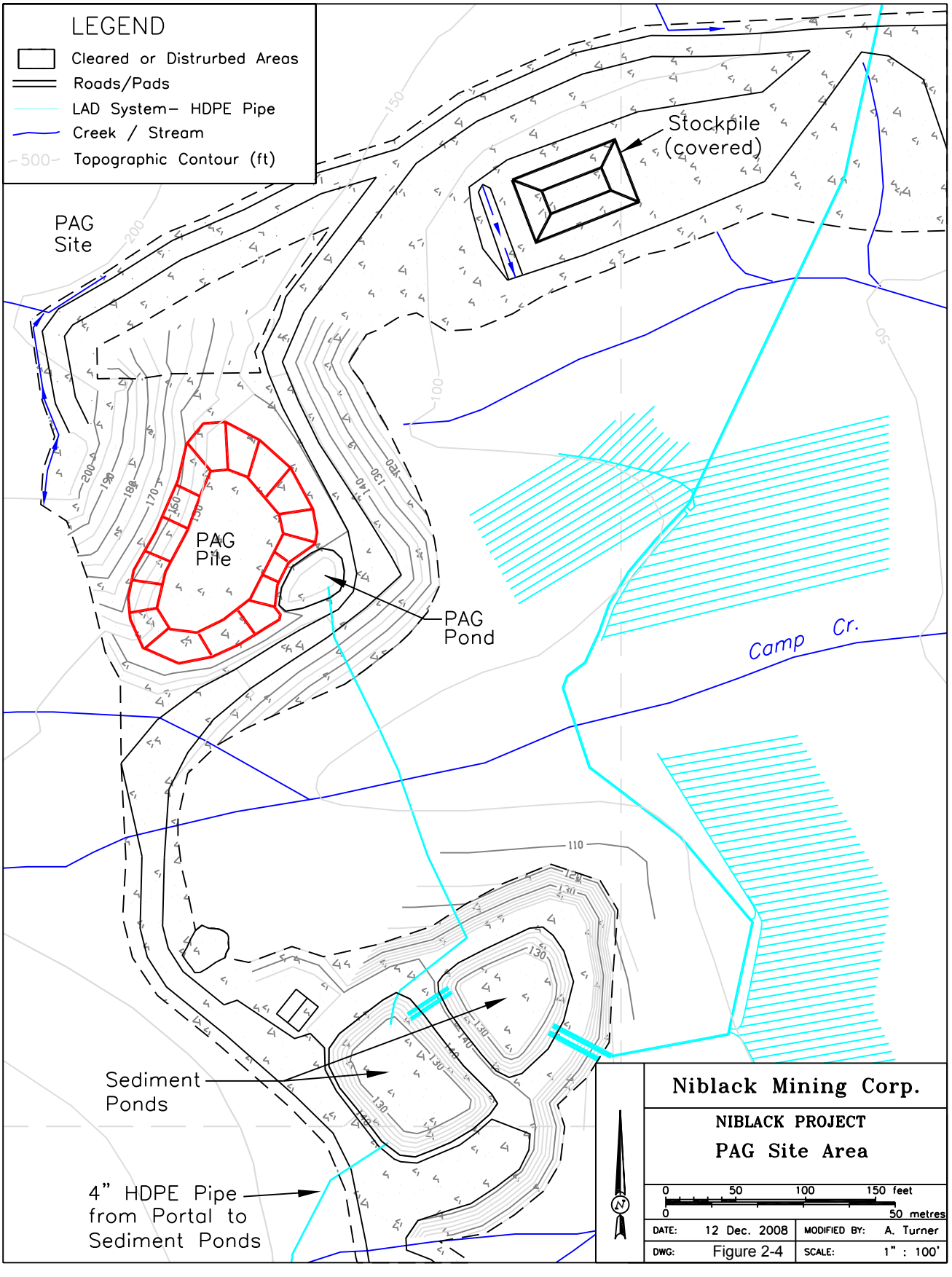
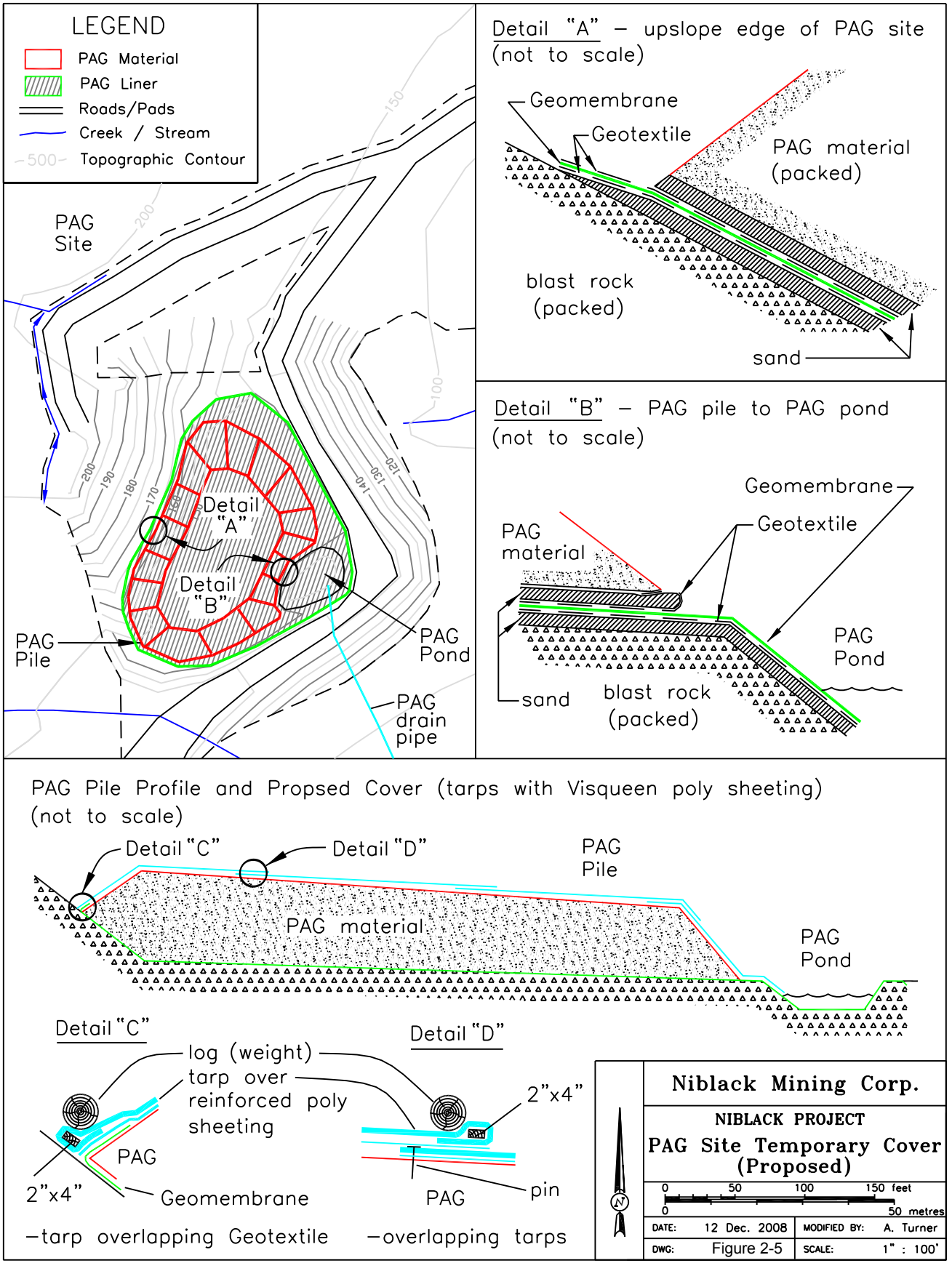

LEGEND
Cleared or Distrurbed Areas
Roads/Pads
LAD System– HDPE Pipe
Creek / Stream
500 Topographic Contour (ft)
PAG Site
Stockpile (covered)
PAG Pile
PAG Pond
Camp Cr.
Sediment Ponds
4" HDPE Pipe from Portal to Sediment Ponds
Niblack Mining Corp.
NIBLACK PROJECT
PAG Site Area
0 50 100 150 feet
0 50 metres
DATE: 12 Dec. 2008
MODIFIED BY: A. Turner
DWG: Figure 2-4
SCALE: 1" : 100'


LEGEND
PAG Material
PAG Liner
Roads/Pads
Creek / Stream
500 Topographic Contour
PAG Site
Detail "A"
Detail "B"
PAG Pile
PAG Pond
PAG drain pipe
Detail "A" – upslope edge of PAG site (not to scale)
Geomembrane
Geotextile
PAG material (packed)
blast rock (packed)
sand
Detail "B" – PAG pile to PAG pond (not to scale)
Geomembrane
Geotextile
PAG material
PAG Pond
sand
blast rock (packed)
PAG Pile Profile and Propsed Cover (tarps with Visqueen poly sheeting) (not to scale)
Detail "C"
Detail "D"
PAG Pile
PAG material
PAG Pond
Detail "C"
log (weight)
tarp over reinforced poly sheeting
PAG
2"x4"
Geomembrane
–tarp overlapping Geotextile
Detail "D"
2"x4"
PAG
pin
–overlapping tarps
Niblack Mining Corp.
NIBLACK PROJECT
PAG Site Temporary Cover (Proposed)
0 50 100 150 feet
0 50 metres
DATE: 12 Dec. 2008
MODIFIED BY: A. Turner
DWG: Figure 2-5
SCALE: 1" : 100'

Baseline/Reference Monitoring Locations

- Groundwater (Active)
- Surface Water (Active)
- Mine (Active)
- Groundwater (Discontinued in Q3 2008)
- Surface Water (Discontinued in Q3 2008)
- Portal Drain Pipe and Drain Line
- Temporary Access/Haul Road
- Treatment Ponds
- Waste Rock Pile
- Topsoil Stockpile Area
- High Tide Waterline
- Waterline
- Local Streams
- Topographic Contours (50 ft interval)
- Topographic Source Boundary
- Land Application Area
- E2EM1P Estuarine-Emergent Intertidal
- E2US1N Estuarine-Unvegetated Intertidal
- PFO-4B Needleleaf Forest Wetland
- PFO-SS4B Needleleaf Forest/Scrub-Shrub Wetland

MW7
MW1
MW4
MW3
MW2
MW9
MW8
WQ13
WQ4
WQ6
WQ10
WQ12
WQ7
WQ8
EFF1
Waterfall Creek
Unnamed Creek 2
Camp Creek
Unnamed Creek 1
20,000 Gallon Fuel Tank and Refueling Berm
Laydown Pad, Fuel Tank, and Soil Stockpile
Fines Stockpile
NAG Waste Disposal Area
Topsoil Stockpile
Topsoil Stockpile
Topsoil Stockpile
Portal Platform
Mineralized Stockpile (Covered)
Field Test Barrels
PAG Waste Disposal Area
PAG Pond
PAG Settling Pond
Water Treatment Facility
Settlement/ Treatment Ponds

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NIBLACK PROJECT LLC

integral consulting inc.

0 125 250 500 Feet

N

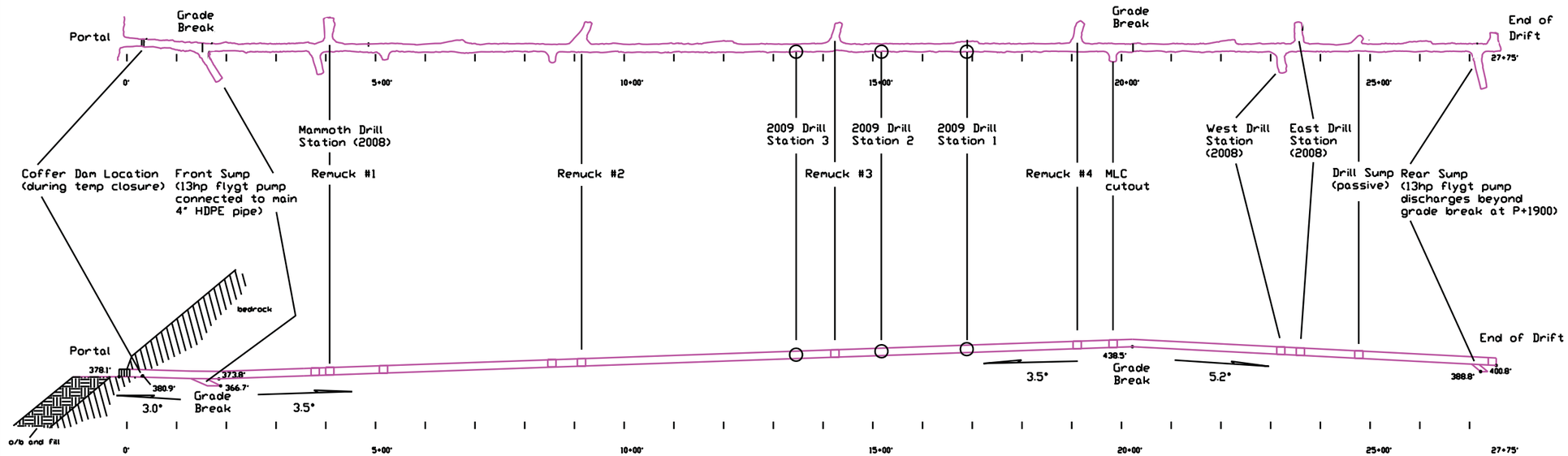
Feature Sources:
Base layers from Knight Piesold, 2007. Water Quality Baseline and Site Monitoring Plan.
Land Application Area from Turner, 2009. Personal communication.
Waste rock areas, portal drains, roads, and ground cover zones from Niblack Project LLC.

Figure 2-6
Water Quality Monitoring Stations
Niblack Reclamation and Closure Plan
2012 Post-Construction Update

N

S
(165°)

Plan View



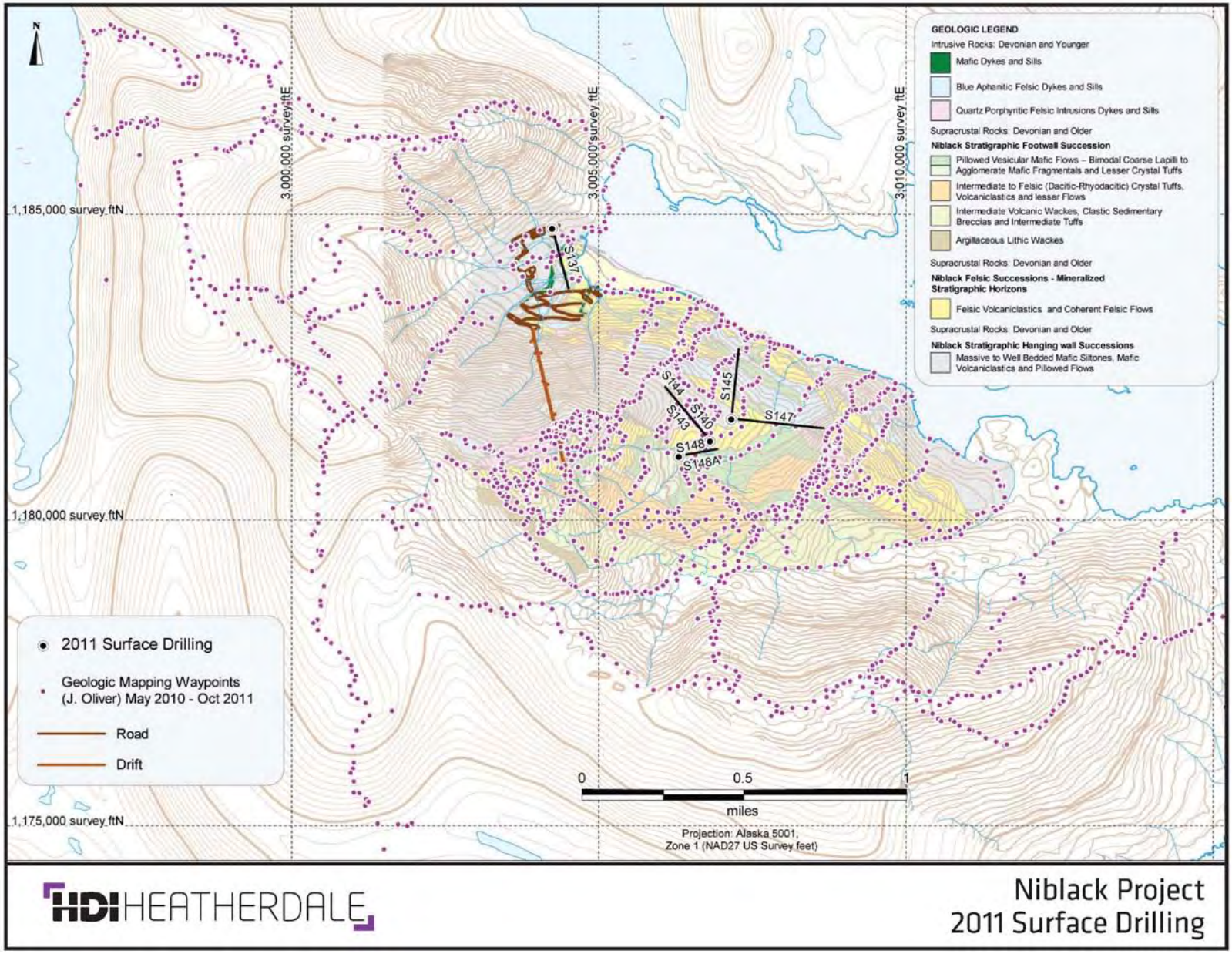
Section View

NIBLACK PROJECT LLC

Figure 2-7
Niblack Project Exploration Drift
Plan and Section Views

Scale in Feet
0 50 100 150 200 400
Scale in metres
0 125

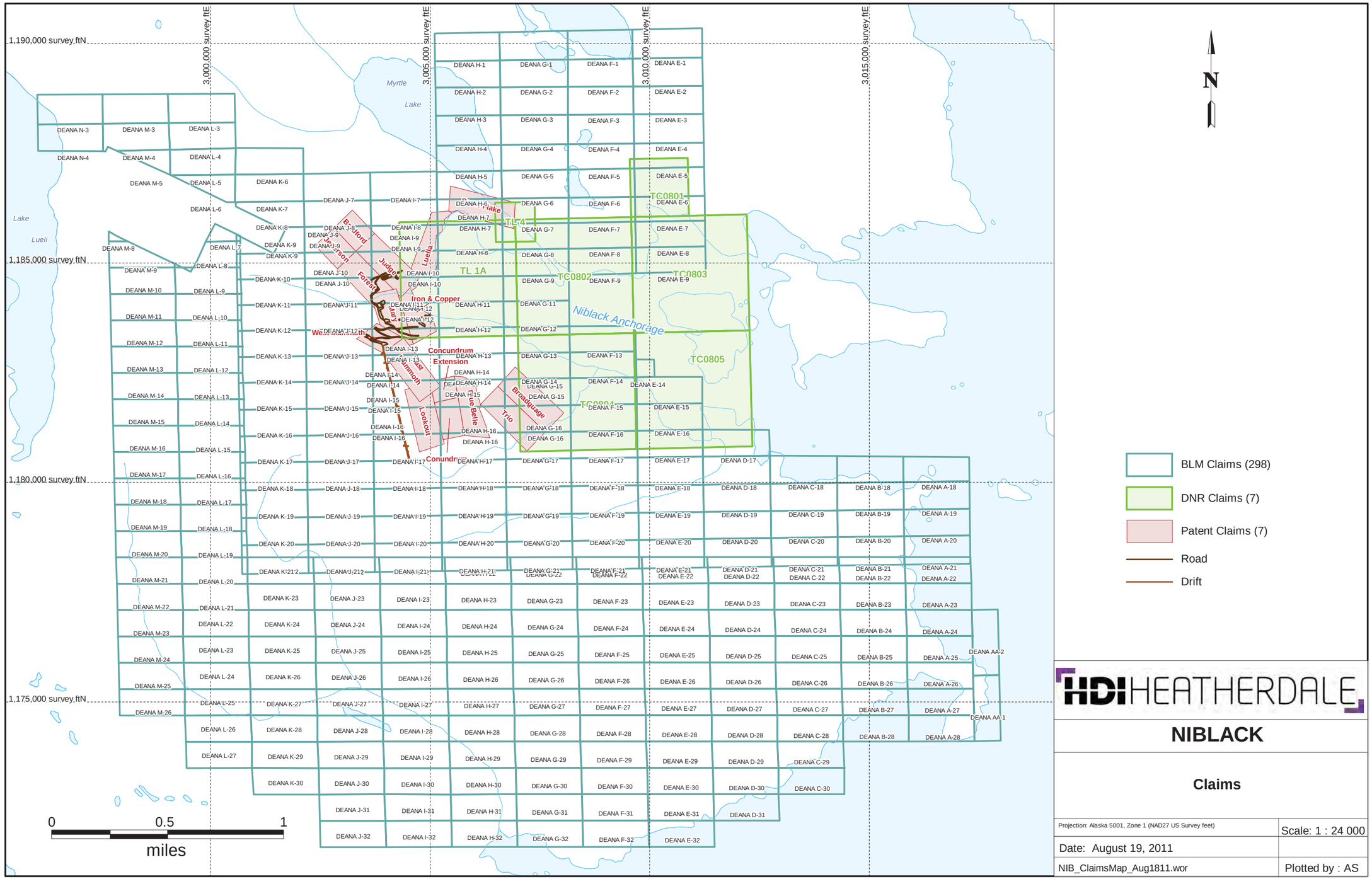
DATE:	23 November 2009	MODIFIED BY:	A. Turner
DWG:	Portal_091123.dwg	SCALE:	1" : 300'



Source: Heatherdale (2011)

NIBLACK PROJECT LLC integral consulting inc.

Figure 2-8
Niblack Project Surface Drilling, 2011
Niblack Reclamation and Closure Plan
2012 Post-Construction Update



NIBLACK PROJECT LLC integral consulting inc.

Figure 6-1
Claims Map
Niblack Reclamation and Closure Plan
2012 Post-Construction Update

TABLES

Table 2-1. Volumes of Potentially Acid-Generating and Non-Acid-Generating Waste Rock Produced during Excavation of the Niblack Exploration Drift

Description	Volume Generated (cubic yards)	Volume Generated (tons)	Drift Length (linear feet)	Number of Blast Rounds	Primary Composition	Notes
PAG Waste Rock	5,346	8,995	447	39	Sulfide mineralization within the Lookout Rhyolite and related footwall alteration	Stored in temporary PAG facility
Mineralized Ore Stockpile	574	965	48	4	Lookout Rhyolite	Well-mineralized PAG material stockpiled for potential future testing; stored adjacent to temporary PAG facility
NAG Waste Rock	33,400	56,200	2,793	243	Mafic volcanic rocks and mafic dykes	All NAG materials were used in site construction
Totals	**39,320**	**66,160**	**3,288**	**286**		

Source: pHase Geochemistry, Vancouver, BC. Monthly Report. December 2011. Uncovered (PAG) Waste Rock Storage Facility, Monitoring Program. Niblack Project, Alaska. Report prepared for Niblack Project LLC. 2/29/2012.

Notes:
NAG = non-acid-generating
PAG = potentially acid generating

Table 2-2. Estimated Volumes of Potentially Acid-Generating Waste Rock Produced by the Niblack Exploration Drift

	2007 Volume Estimates from Design Plans								
			Chemical Analyses				PAG Rock[a]		
Unit	Tunnel Length (ft)	PAG[a] NP/MPA <3 (number samples)	NAG[b] NP/MPA >3 (number samples)	PAG[a] (%)		Tunnel Length (ft)	Volume in-situ[c] (ft^3)	Volume in-situ[d] (yd^3)	Volume as waste[e] (yd^3)
Hanging Wall	4,440	6	52	10%		459	86,810	3,247	4,383
Lookout	275	11	15	42%		116	21,989	822	1,110
Foot Wall	1,225	14	7	67%		817	154,350	5,773	7,793
Totals:	5,940	31	74	- -		1,392	263,149	9,842	14,300[f]

Source:
The waste rock estimates presented here are reproduced from Table 1 of the Niblack Project Operational Characterization Plan (Knight Piésold 2007a).

Notes:

[a] PAG = Potentially acid-generating/potentially metals-leaching rock, defined as: (neutralizing potential) / (maximum potential acidity) <= 3.

[b] NAG = Non-acid-generating rock, defined as: (neutralizing potential) / (maximum potential acidity) >3

[c] Nominal 13.5 X 14 ft tunnel dimension - multiply linear footage totals by 189 to get cubic footage (unbroken).

[d] Volume in cubic yards = cubic ft * 0.0374.

[e] Waste volume assumes 45% expansion of waste relative to in-situ volume.

[f] Adjusted for additional expansion factor.

Table 2-3. Estimated Volumes of Non-Acid-Generating Waste Rock Produced by the Niblack Exploration Drift

	2007 Volume Estimates from Design Plans								
			Chemical Analyses				NAG Rock[b]		
Unit	Length Tunnel (ft)	PAG[a] NP/MPA <3 (number samples)	NAG[b] NP/MPA >3 (number samples)	NAG[b] (%)		Tunnel Length (ft)	Volume in-situ[c] (ft^3)	Volume in-situ[d] (yd^3)	Volume as waste[e] (yd^3)
Hanging Wall	4,440	6	52	90%		3,981	752,350	28,138	37,986
Lookout	275	11	15	58%		159	29,986	1,121	1,514
Foot Wall	1,225	14	7	33%		408	77,175	2,886	3,897
Totals:	5,940	31	74	- -		4,548	859,511	32,146	**46,600[f]**

Source:
The waste rock estimates presented here are reproduced from Table 1 of the Niblack Project Operational Characterization Plan (Knight Piésold 2007a).

Notes:

[a] PAG = Potentially acid-generating/potentially metals-leaching rock, defined as: (neutralizing potential) / (maximum potential acidity) <= 3.

[b] NAG = Non-acid-generating rock, defined as: (neutralizing potential) / (maximum potential acidity) >3

[c] Nominal 13.5 X 14 ft tunnel dimension - multiply linear footage totals by 189 to get cubic footage (unbroken).

[d] Volume in cubic yards = cubic ft * 0.0374.

[e] Waste volume assumes 45% expansion of waste relative to in-situ volume.

[f] Adjusted for additional expansion factor.

Table 3-1. Estimates of Topsoil Requirements for Surface Reclamation

Area Description	2012 Estimates (Updated Based on As-Built Dimensions)		2007 Estimates (Based on Design Plans, Presented for Comparison Purposes)		Notes
	Surface Area to be Reclaimed (acres)	Required Topsoil (cubic yards)*	Surface Area to be Reclaimed (ac.)	Required Topsoil (cubic yards)*	
PAG Temporary Storage Facility	0.82	662	0.85	686	Surface area includes the PAG pile base liner and PAG pond.
Mineralized Ore Stockpile	0.16	126	--	--	The mineralized ore stockpile is a covered and lined facility of well-mineralized PAG material reserved for potential future testing; this was not included in 2007 cost estimates.
Portal Platform / Entrance Area	0.25	201	0.25	202	The original design estimate of 0.25 acres was used in the 2012 estimates in order to provide a conservative estimate of required topsoil. The as-built size of the portal platform is 0.0087 ac.
NAG Waste Rock Stockpile Area	2.5	2,040	3.1	2,501	
Water Treatment Facility (Settling Ponds)	0.79	637	0.75	605	
Stormwater Management Features	0.50	403	0.5	404	Features include sediment traps adjacent to access roads. The original design estimate of 0.5 acres was used in the 2012 estimates in order to provide a conservative estimate of required topsoil. The as-built size of the existing sediment traps is 0.1 ac.
Total Topsoil Required	**5.1**	**4,069**	**5.5**	**4,398**	

Notes:
* Based on 0.5 foot average cover
-- Not included in 2007 estimates
NAG - non-acid-generating
PAG - potentially acid-generating

2007 estimates based on design plans and presented in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b).
2012 estimates based on post-construction as-built facility dimensions.

Table 3-2. Seed Mix Proposed for Surface Reclamation

Species	Percent Seed Mixture
Boreal red fescue (Festuca rubra)	30
Nortan tufted hairgrass (Deschampsia caespitosa)	60
Blue joint (Calamogrostis Canadensis)	10

Source: Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007b)

Table 5-1. Summary of Total Estimated Reclamation Costs, including Reclamation, Mobilization, and Monitoring

Task Number	Reclamation Task	2012 Cost	2007 Cost (for comparison)
Task 1	Relocation of PAG and site reclamation	$186,280	$163,968
Task 2	Portal closure, plugging, and site reclamation	$161,832	$170,234
Task 3	Fill placement and grading, final contouring at NAG site	$25,520	$24,202
Task 4	Reclaim water treatment facilities site and sediment pond areas	$20,055	$18,950
Task 5	Reclaim stormwater management system	$6,139	$5,857
	Equipment mobilization and demobilization	$80,000	$46,400
	Personnel transport	$16,800	$12,240
	Equipment standby	$43,229	$34,114
	Support equipment including barge camp	$191,808	$167,469
Subtotal		**$731,663**	**$643,436**
Contractor Overhead (10%)		$73,166	$63,344
Contractor Profit (15%)		$109,750	$96,515
Engineering Design at 5%		$36,583	$32,172
Contingency (5%)		$36,583	$128,688 [a]
Agency Oversight		$8,650	$8,650
Contract Performance & Payment Bond (1.5%)		$10,975	$19,303
Direct and Indirect Costs Subtotal		**$1,007,370**	**$993,107**
Inflation at 3.2% per year for 5 years		$171,830	$169,397
Total Tasks 1 through 5		**$1,179,200**	**$1,162,505**
Task 6	Reclamation and Water Quality Monitoring (including 3.2% inflation per year)	$94,827	$68,011
Contingency (5%)		$4,741	$6,801 [b]
Total Task 6 (including 3.2% inflation per year)		**$99,568**	**$74,813**
Grand Total =		**$1,278,768**	**$1,237,317**

Notes:

a. 2007 estimate included a combined 20% contingency on direct reclamation costs.

b. 2007 estimate included a 10% contingency on post-closure monitoring costs.

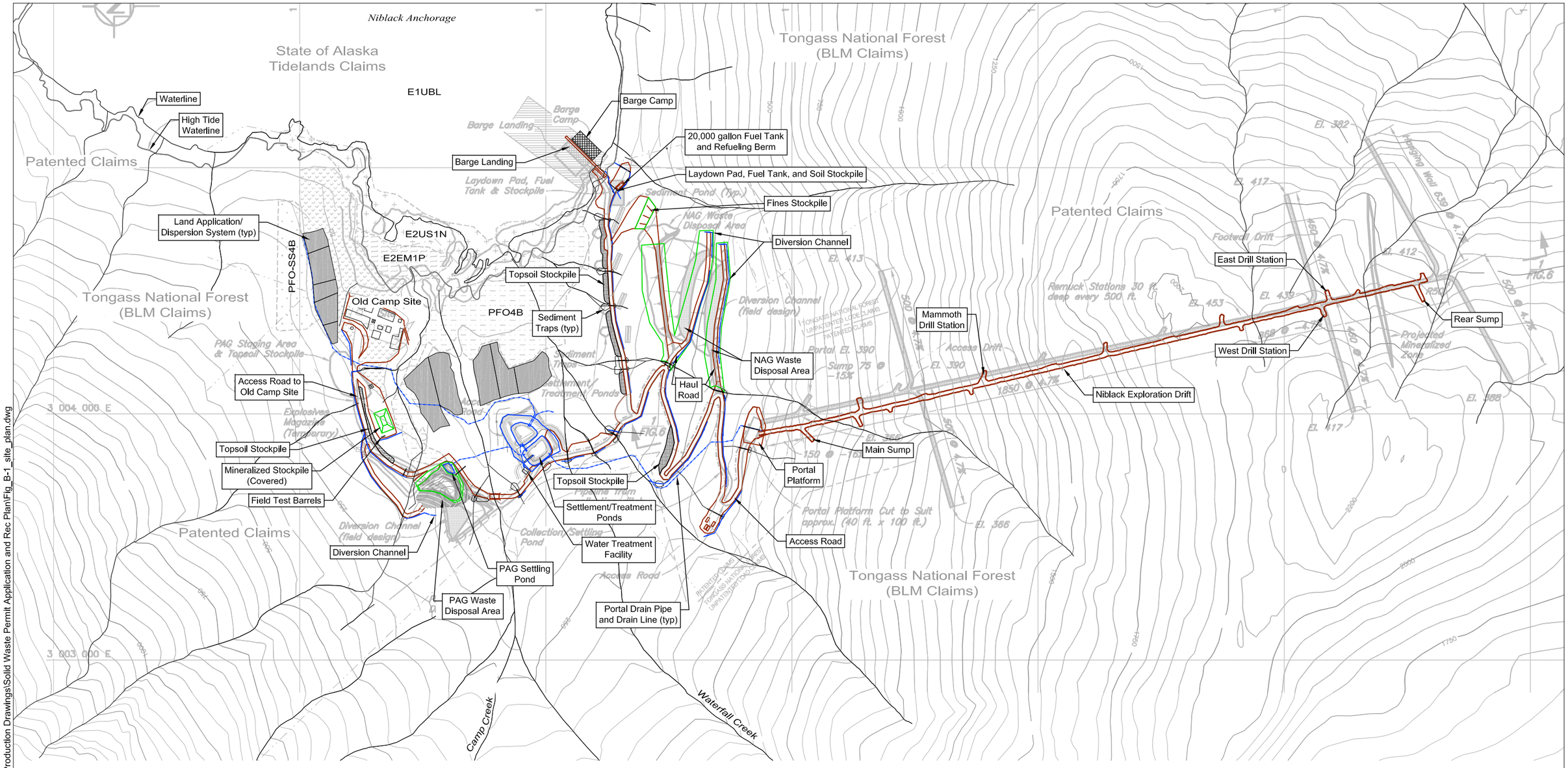
Table 6-1. Patented Claims Controlled by Niblack Project LLC

Patented Claims Controlled by Niblack Project LLC		
Mineral Survey #	**Recording District**	**Claim(s)**
533	Ketchikan[a]	Parcel No. 1: Lookout Lode (Mining Claim), Conundrum Lode (Mining Claim), Conundrum Extension Lode (Mining Claim), Blue Bell[b] Lode (Mining Claim), West Mammoth Lode (Mining Claim), East Mammoth Lode (Mining Claim)
644	Ketchikan	Parcel No. 2: Judge Lode (Mining Claim), Bradford Lode (Mining Claim), Jefferson Lode (Mining Claim), Forest Lode (Mining Claim), Iron and Copper Lode (Mining Claim), Luella Lode (Mining Claim)
1437	Ketchikan	Parcel No. 3: Mary Lode (Mining Claim)
1438	Ketchikan	Parcel No. 4: Pride Lode (Mining Claim)
1436	Ketchikan	Parcel No. 5: Snow Flake (Mining Claim)
1585	Ketchikan	Parcel No. 6: Beach Lode (Mining Claim)
1009	Ketchikan	Trio Lode (Mining Claim), Broadgauge Lode (Mining Claim)

Notes: [a] Ketchikan Recording District, First Judicial District, State of Alaska
[b] In some documentation, listed as Blue Belle claim

APPENDIX A

SITE DESIGN PLANS



P:\Projects\C384_NiblackAK\CAD\Production Drawings\Solid Waste Permit Application and Rec Plan\Fig_B-1_site_plan.dwg

LEGEND

- E1UBL Estuarine - Subtidal
- E2US1N Estuarine - Unvegetated Intertidal
- E2EM1P Estuarine - Emergent Intertidal
- PFO-SS4B - Needleleaf Forest/Scrub - Shrub Wetland
- PFO4B - Needleleaf Forest Wetland
- Land Application Areas
- Land Application Areas (2007)
- Tideland Lease Area
- Property/Patented Claim Boundary
- 2007 Design Plan (RTR 2007)
- Waste Rock Storage Facilities
- Water Management Features
- Roads and Exploration Access Drift

NOTE

1. All dimensions and elevations are in feet unless otherwise noted

SOURCES

1. Original design drawings reproduced from Figure 2 of the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007)
2. As-built drawings provided by Niblack Project LLC (2011)
3. Land application area boundaries from Turner (2009, personal communication)

NIBLACK PROJECT LLC

integral consulting inc.

0 200 400 Feet

N

Figure A-1
General Site Plan - As-built Drawings and Design Plans
Niblack Reclamation and Closure Plan
2012 Post-Construction Update

Niblack Anchorage

State of Alaska Tidelands Claims

Tongass National Forest (BLM Claims)

Barge Landing

Barge Camp

Barge Landing

Barge Camp

20,000 gallon Fuel Tank and Refueling Berm

Laydown Pad, Fuel Tank & Stockpile

Laydown Pad, Fuel Tank, and Soil Stockpile

E1UBL

Sediment Pond (Typ.)

Fines Stockpile

NAG Waste Disposal Area

Land Application/ Dispersion System (typ)

E2US1N

E2EM1P

PFO-SS4B

Diversion Channel

Tongass National Forest (BLM Claims)

PFO-SS4B

Unnamed Creek 2

Diversion Channel (field design)

Camp

Old Camp Site

PFO4B

Topsoil Stockpile

Sediment Traps (typ)

Staging Area

Topsoil Stockpile

Sediment Traps

NAG Waste Disposal Area

Patented Claims

Haul Road

Camp Creek

Waterfall Creek

Settlement/ Treatment Ponds

Access Road to Old Camp Site

Access Road to Old Camp

Magazine (Temporary)

Unnamed Creek 1

Portal

LAD Mainline

1 FIG 6

Mineralized Stockpile (Covered)

Topsoil Stockpile

PAG Settling Pond

Settlement/ Treatment Ponds

Access Road

Field Test Barrels

Patented Claims

Water Treatment Facility

Pipeline from collection ditch to Settlement/Treatment ponds (typ)

Topsoil Stockpile

Diversion Channel, Field Design

Diversion Channel (field design)

Collection/ Settling Pond

Tongass National Forest (BLM Claims)

PAG Waste Disposal Area

Tongass National Forest (BLM Claims)

P:\Projects\C384_NiblackAK\CAD\Production Drawings\Solid Waste Permit Application and Rec Plan\Fig_B-2_site_plan_detail.dwg

LEGEND

- E1UBL Estuarine - Subtidal
- E2US1N Estuarine - Unvegetated Intertidal
- E2EM1P Estuarine - Emergent Intertidal
- PFO-SS4B - Needleleaf Forest/Scrub - Shrub Wetland
- PFO4B - Needleleaf Forest Wetland
- Land Application Areas (2007)
- Land Application Areas
- Property/Patented Claim Boundary
- 2007 Design Plan (RTR 2007)
- Waste Rock Storage Facilities
- Water Management Features
- Roads and Exploration Access Drift

NOTE

1. All dimensions and elevations are in feet unless otherwise noted

SOURCES

1. Original design drawings reproduced from Figure 2 of the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007)
2. As-built drawings provided by Niblack Project LLC (2011)
3. Land application area boundaries from Turner (2009, personal communication)

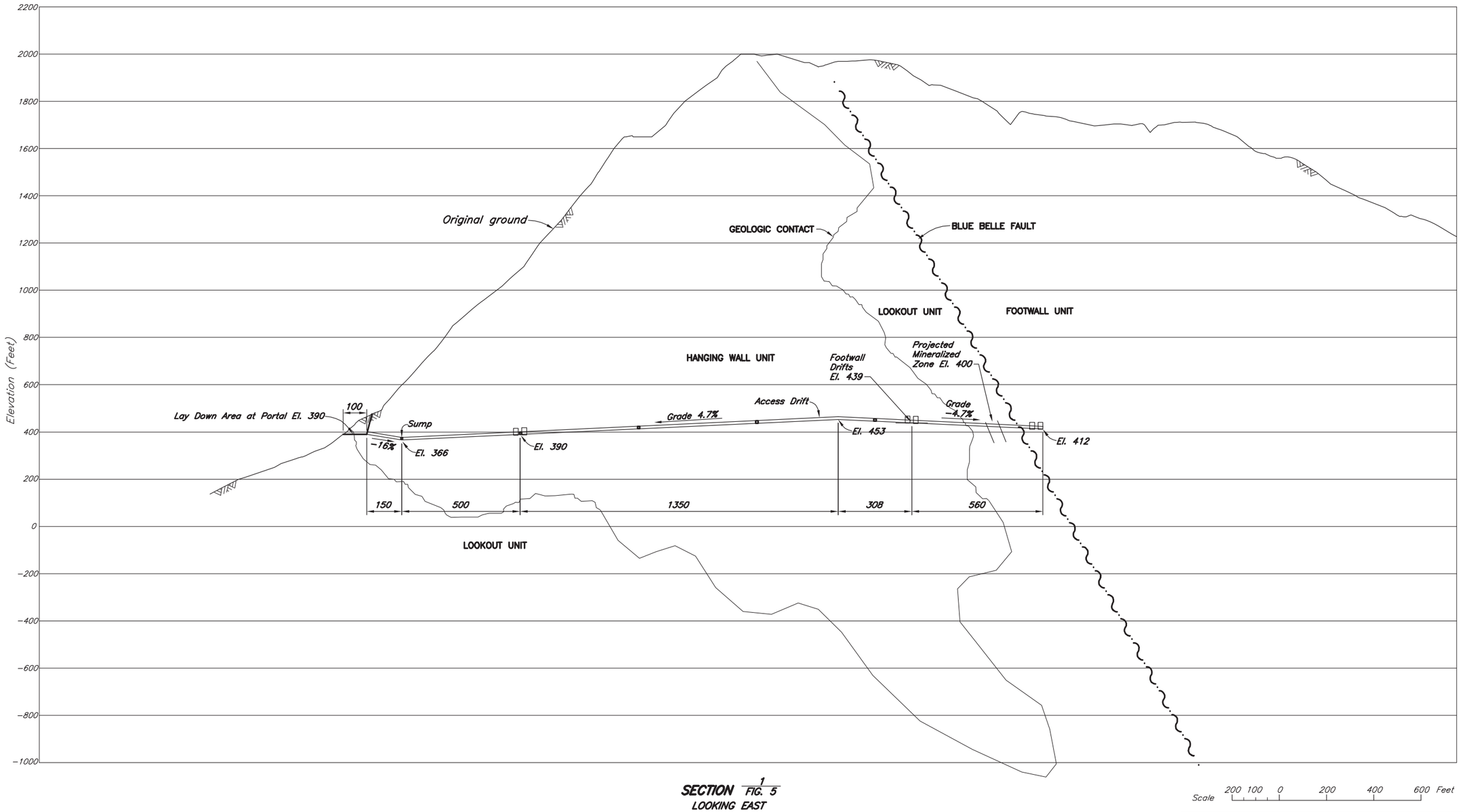
NIBLACK PROJECT LLC

integral consulting inc.

0 100 200 Feet

N

Figure A-2
Site Plan Detail - As-built Drawings and Design Plan
Niblack Reclamation and Closure Plan
2012 Post-Construction Update



SECTION 1 / FIG. 5
LOOKING EAST

NOTES

1. This figure produced from information provided by Beacon Hill Consultants (1988) Ltd.
2. All dimensions and elevations are in feet unless otherwise noted.

NIBLACK MINING CORP.	
PROPOSED EXPLORATION PROGRAM	
PROPERTY SECTION	
Knight Piésold CONSULTING	PROJECT/ASSIGNMENT NO. VA102-205/2 · REF. NO. VA07-00494 · FIGURE 6 · REV. 0

REV. 0 | 13APR'07 | ISSUED IN FINAL

XREF FILE :

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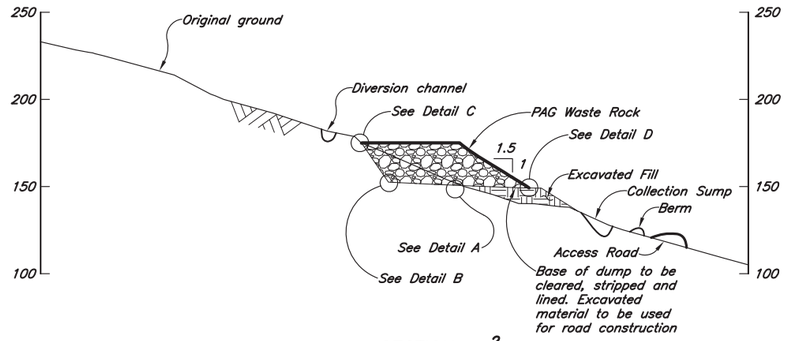
VANCOUVER B.C.

NIBLACK PROJECT LLC integral consulting inc.

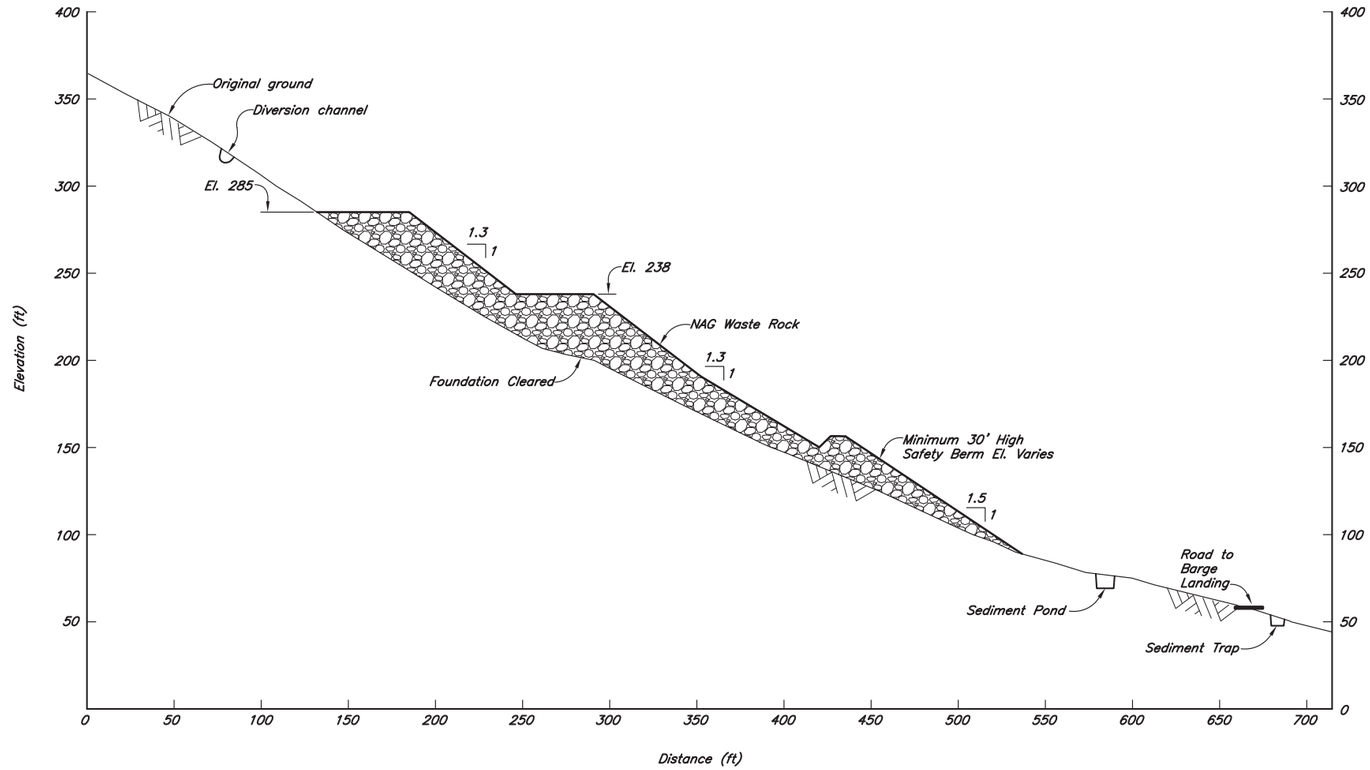
Source: NMC 2007a

Figure A-3
Property Section
Niblack Reclamation and Closure Plan
2012 Post-Construction Update



SECTION 2/FIG.2

SECTION THRU PAG WASTE ROCK DUMP



SECTION 3/FIG. 2

SECTION THRU NAG WASTE ROCK DUMP

NOTE

1. All dimensions and elevations are in feet unless otherwise noted.

Scale 40 0 40 80 120 Feet

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VANCOUVER B.C.

XREF FILE :

REV.	DATE	ISSUED IN FINAL
0	13APR'07	

NIBLACK MINING CORP.

PROPOSED EXPLORATION PROGRAM

CROSS-SECTIONS OF NAG & PAG WASTE ROCK STORAGE FACILITIES

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA102-205/2	VA07-00493
FIGURE 5	REV. 0

NIBLACK PROJECT LLC integral consulting inc.

Source: NMC 2007a

Figure A-4
Cross-Sections of NAG & PAG Waste Rock Storage Facilities
Niblack Reclamation and Closure Plan
2012 Post-Construction Update

APPENDIX B

PROJECT RECLAMATION COST ESTIMATE

1 NIBLACK PROJECT RECLAMATION COST ESTIMATES

This appendix summarizes assumptions and background information used to develop costs estimates for future reclamation and closure of the Niblack Exploration Project. The cost estimates presented herein update the cost estimates provided in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007), Appendix 6 to the Underground Exploration Plan of Operations (NMC 2007b). The original reclamation and closure plan was approved on June 29, 2007 (ADNR 2007). Updates to the 2007 plan provided herein include the following:

- Presentation of waste rock volumes produced during underground construction completed to date
- Incorporation of as-built facility footprints and areas of surface disturbance
- Incorporation of post-closure monitoring requirements specified in the Waste Management Permit
- Updates to fuel, analytical, transportation, and other costs to reflect current market values
- Expansion of the project schedule

The current phase of underground development on the Niblack Exploration Project was initiated by Niblack Mining Corporation on September 21, 2007, and was completed on July 12, 2008. As indicated on post-construction as-built drawings and information compiled by Niblack Exploration Project onsite staff, the site structures and facilities have been constructed in general accordance with the original design plans as presented in the Underground Exploration Plan of Operations (NMC 2007b); deviations from original design proposals were minimal. The updated cost estimate for reclamation and closure presented herein is largely based on the same assumptions and criteria outlined in RTR (2007). Updates to selected costs (e.g., fuel and analytical expenses) have been made, as appropriate. No additional expansion of the underground workings is anticipated at this time. However, if future expansion does occur, the site design plans presented in the original Niblack Solid Waste Landfill Application under the Waste Management Permit (NMC 2007a) and the Underground Exploration Plan of Operations (NMC 2007b) will be followed. Accordingly, the tables presented in this appendix provide an up-to-date cost estimate, as well as the original 2007 costs for comparison purposes.

Table B-1 summarizes total estimated reclamation costs. Tables B-2 through B-6 provide equipment, fuel, labor, material, and mobilization/demobilization costs with an itemized breakdown for each reclamation task. A single wage rate ($60.22 per hour) was used for estimating purposes and is assumed to include $32.92 per hour base salary, $12.60 per hour for benefits, a 15% premium for working foreman's wages, and a 26% premium for overtime.

These costs were compiled from contractor bids for work conducted at Niblack and for equipment rental estimates. To the extent practical, the estimate reflects actual site conditions, topography, and equipment and utilization factors that are representative of southeast Alaska.

1.1 TASK 1 – PAG SITE RECLAMATION AND RELOCATION OF PAG MATERIAL

All of the PAG material stored at the Niblack Project site will be placed back underground at the southern-most segment of the adit. The cost estimates are based on a total volume of 5,920 yd^3, which includes 5,346 yd^3 of PAG material stored at the engineered temporary storage facility and 574 yd^3 of well-mineralized ore that was placed in a lined and covered storage stockpile adjacent to the temporary PAG facility. At this time, additional excavation and generation of waste rock material is not anticipated; however, cost estimates are based on the originally projected volume (14,330 yd^3) of PAG waste rock material to allow for possible future expansion of exploration work. Reclamation design plans (RTR 2007) specify that material would be hauled from the PAG site to the southern end of the adit in underground haul trucks and end-dumped. An underground load-haul-dump (LHD) unit would pick up the PAG material, move it to the end of the adit, and pack it tight. The longest distance from the PAG site to the back of the adit was used in the cost estimates; this length is approximately 5,600 ft (2,800 ft from the PAG site to the portal and 2,800 ft for the full length of the drift). A 30-minute roundtrip is estimated, based on a haul truck traveling at 6 mph with loading/unloading taking a total of 10 minutes. Other activities include removal of the HDPE liner and disposal underground or recycling; recontouring, placing topsoil, and seeding the PAG site; and cleaning and stabilizing the stormwater conveyance system.

1.2 TASK 2 – PORTAL CLOSURE INCLUDING ADIT PLUG

The 14.5 ft x 13 ft adit, involving 2,772 linear ft of main drift (with potential for expansion up to 6,000 ft), will be closed after the backfill is complete, using a concrete plug in the adit and pushed NAG material (about 250 yd^3) at the portal. The plug zone would be approximately 16 ft long and excavated 2 ft oversize (nominally 18.5 ft x 17 ft). Both ends of the plug would be formed, and concrete would be batched onsite and pumped between the forms. The oversized plug "zone" would be grouted to limit ground groundwater flow past the plug. The portal entrance/laydown area, which involves about 0.25 acre, would be cleared of all buildings and/or appurtenances and utilities. The area would then be topsoiled and hydroseeded and the stormwater conveyance material network would be stabilized for long-term stormwater management.

1.3 TASK 3 – NAG SITE RECLAMATION

The NAG storage site must remain stable at closure and in a final form that blends into the local topography. It is understood that the majority of all NAG material generated by exploration activities was used in construction of roads and facilities, and consequently there is no NAG waste rock stored in the NAG disposal area.[1] Prior to closure, NPLLC will evaluate the actual closure configuration, considering the final volume of rock deposited in the facility. Limited final grading is contemplated, given the bottom up construction approach. Any final grading may include a midslope bench to reduce the length of continuous slopes. Natural succession and some peripheral seeding will be the focus of the revegetation program, given the final slope angle. Graded rock will be covered with an average of 6 in. of topsoil.

1.4 TASK 4 – WATER TREATMENT FACILITY AND SEDIMENT POND RECLAMATION

At closure, the site water treatment/settling ponds and PAG leachate capture pond would be filled. Prior to filling, the geosynthetic liners would be cut, folded, and sealed in place. Fill material from the NAG pile would be used. The NAG pile is located 0.125 mile from the settling ponds, and the roundtrip is estimated to take 15 minutes, based on a haul truck traveling at 6 mph and taking 10 minutes to load/unload. Drip emitter lines, piping conveyance, and all other appurtenances and utilities would be removed from the area for reuse, and/or demolition and shipment offsite. The settling pond areas would then be regraded and topsoil applied, followed by seeding.

1.5 TASK 5 – STORMWATER MANAGEMENT AREA RECLAMATION

Stormwater capture, conveyance, settling, and dispersion structures downgradient of the NAG site will be reclaimed following stabilization of the reclaimed NAG waste pile. On a conservative basis, this acreage is estimated at 0.5 acre. Reclamation activity would include placement of the originally excavated topsoil (stored near the barge camp) back in the sediment traps, followed by grading. This work would be completed by backhoe. Protection from erosion and sedimentation is a fundamental objective. Therefore, native species of grasses will be re-established.

[1] Note that this reclamation and closure plan assumes that sufficient volumes of NAG material will be available for reclamation purposes (e.g., filling of the settling ponds). For the purpose of estimating conceptual closure costs, it has been assumed that, at closure, the site will contain the originally estimated quantity of about 46,600 yd^3 of development rock which will provide a readily available source of clean fill..

1.6 TASK 6 – POST-RECLAMATION MONITORING AND MAINTENANCE

The post-closure water monitoring schedule includes visual monitoring and biannual water quality sampling at four groundwater wells and two surface water stations in years 1 and 2. Additional water quality sampling will be conducted at one groundwater well and two surface water stations once annually in years 5, 10, 20 and 30. Additionally, if the closed adit fills and water discharges from the portal, post-closure monitoring of the discharge water is required for years 1, 2, 5, 10, and 30.

Soil and vegetation monitoring will also include all reclaimed areas (site-wide), with inspections and maintenance activities planned during years 1, 2, and 3 during the post-closure period. Additional soil and vegetation monitoring will be conducted in post-closure years 5 and 10 in conjunction with the water quality monitoring events. This program will focus on monitoring reclaimed areas for vegetation success and identifying and correcting any erosion problems.

2 REFERENCES

ADEC. 2007. Waste Management Permit 2006-DB0037, Niblack Exploration Project. State of Alaska, Department of Environmental Conservation, Juneau, AK.

ADNR. 2007. Niblack Underground Exploration Project, Final Reclamation Plan Approval, J072711. State of Alaska, Department of Natural Resources, Division of Mining, Land, and Water, Juneau, AK. June 29, 2007.

Kleespies, P. 2009. Personal communication (letter to J. DiMarchi, Alaska Department of Natural Resources, Office of Project Management and Permitting, dated January 13, 2009, regarding notification of the temporary closure of the Niblack Project.) CBR Gold Corp./Abacus Alaska Inc., Edmonton, AB, Canada.

NMC. 2007a. Niblack Solid Waste Landfill Application under the Waste Management Permit. Submitted to the Alaska Department of Environmental Conservation. Niblack Mining Corporation, Vancouver, BC, Canada. April 2007.

NMC. 2007b. Niblack Project Underground Exploration Plan of Operations. Niblack Mining Corporation, Vancouver, BC, Canada. April 13, 2007

RTR. 2007. Reclamation and Closure Plan for the Niblack Underground Exploration Project. RTR Resource Management, Inc. Boise, ID. April 2007.

TABLES

Table B-1. Niblack Exploration Project Conceptual Reclamation Schedule

ID	Task Name	Duration *	Start	Finish
1	**Task 1: Relocation of PAG Material and Reclaim Site (14,300 CYD)**	30 days	1-Jun	7-Jul
2	Load haul trucks (Kobelco WLK25 loader)	23 days	1-Jun	24-Jun
3	Haul PAG rock from PAG site to ~6.000 ft. underground (2 - EJC 522 trucks)	23 days	1-Jun	24-Jun
4	Place PAG rock underground (6 cyd mucker w/ejector bucket)	23 days	1-Jun	24-Jun
5	Remove HDPE liner (Kobelco WLK25 loader)	1 day	24-Jun	25-Jun
6	Haul HDPE liner underground (2 - EJC 522 trucks)	1 day	24-Jun	25-Jun
7	Recontour site/restore stormwater conveyance (Volvo 290 B excavator)	4 days	1-Jul	5-Jul
8	Place topsoil (Volvo 290 B excavator)	1 day	6-Jul	7-Jul
9	Seeding	4 hrs	7-Jul	7-Jul
10				
11	**Task 2: Portal Closure Including Adit Plug**	25 days	25-Jun	27-Jul
12	Plug site excavation	4 days	25-Jun	29-Jun
13	Construct forms	4 days	29-Jun	3-Jul
14	Place concrete	1 day	3-Jul	4-Jul
15	Grout perimeter of plug	6 days	7-Jul	13-Jul
16	Remove mine utilities	4 days	13-Jul	17-Jul
17	Load NAG fill and topsoil (Kobelco WLK25 loader)	1 day	17-Jul	18-Jul
18	Haul NAG fill and topsoil (JCB 714 dump truck)	1 day	17-Jul	18-Jul
19	Backfill portal (Volvo 290 B excavator)	1 day	25-Jul	26-Jul
20	Place topsoil (Volvo 290 B excavator)	1 day	26-Jul	27-Jul
21	Seeding	2 hrs	27-Jul	27-Jul
22				
23	**Task 3: Fill Placement and Grading, Final Contouring at NAG Site**	16 days	11-Jul	28-Jul
24	Final grading (Volvo 290 B excavator)	12 days	11-Jul	23-Jul
25	Place topsoil (Volvo 290 B excavator)	2 days	23-Jul	25-Jul
26	Seeding	1 day	26-Jul	27-Jul
27	Silt fence	1 day	27-Jul	28-Jul
28				

Table B-1. Niblack Exploration Project Conceptual Reclamation Schedule

ID	Task Name	Duration *	Start	Finish
29	**Task 4: Reclaim Water Treatment Facilities and Sediment Pond Areas**	10 days	26-Jun	11-Jul
30	Remove and dispose of surface facilities (Kobelco WLK25 loader)	2 days	26-Jun	28-Jun
31	Load NAG fill material and topsoil (Kobelco WLK25 loader)	4 days	28-Jun	2-Jul
32	Haul NAG fill material and topsoil (JCB 714 dump truck)	4 days	28-Jun	2-Jul
33	Recontour site (Volvo 290 B excavator)	3 days	7-Jul	10-Jul
34	Place topsoil (Volvo 290 B excavator)	1 day	10-Jul	11-Jul
35	Seeding	3 hrs	11-Jul	11-Jul
36				
37	**Task 5: Stormwater Conveyance and Settling Ponds Below NAG Site**	3 days	27-Jul	30-Jul
38	Recontour sites replace topsoil (Volvo 290 B excavator)	3 days	27-Jul	30-Jul
39	Seeding	6 hrs	30-Jul	30-Jul
40				
41	**EQUIPMENT ON SITE**	2 mons	30-May	31-Jul
42	Barge Camp	2 mons	30-May	31-Jul
43	3/4 ton pick-up truck	2 mons	30-May	31-Jul
44	Generator/Fans/Compressor	2 mons	30-May	31-Jul
45	(2) EJC 522 underground haul trucks (22 tons)	1 mon	30-May	30-Jun
46	Jacklegs/misc. underground tools and equipment	2 mons	30-May	31-Jul
47	Tamrock 6 cyd mucker (w/ejector bucket)	2 mons	30-May	31-Jul
48	Reed concrete pump (40 cyd/hour)	1 mon	30-Jun	31-Jul
49	Grout pump	1 mon	30-Jun	31-Jul
50	Kobelco WLK25 loader (3 1/2 cyd bucket)	2 mons	30-May	31-Jul
51	Volvo 290 B excavator (1 1/2 cyd bucket)	1 mons	30-Jun	31-Jul
52	JCB 714 dump truck (9 1/2 cyd box)	1 mon	30-Jun	31-Jul

Notes:
* - This conceptual site reclamation schedule has been adjusted to reflect actual unit weight PAG rock. Otherwise, all other task durations and general sequence of activities remains similar to and based on the 2007 Reclamation Plan (RTR 2007).

Start and Finish Dates are based on a typical summer construction season. A final closure plan and schedule will be prepared prior to site closure.

Table B-2. Summary of Total Estimated Reclamation Costs, including Reclamation, Mobilization, and Monitoring

Task Number	Reclamation Task	2012 Estimates	2007 Estimates (Presented for Comparison Purposes)
Task 1	Relocation of PAG Material and Reclaim Site	$186,280	$163,968
Task 2	Portal Closure Including Adit Plug	$161,832	$170,234
Task 3	Fill Placement and Grading, Final Contouring at NAG Site	$25,520	$24,202
Task 4	Reclaim Water Treatment/Settling Pond Areas	$20,055	$18,950
Task 5	Stormwater Management Area Reclamation	$6,139	$5,857
	Equipment Mob/Demob	$80,000	$46,400
	Personnel transport	$16,800	$12,240
	Equipment standby	$43,229	$34,114
	Support equipment including barge camp	$191,808	$167,469
	Direct Costs Subtotal	**$731,663**	**$643,436**
	Contractor Overhead (10%)	$73,166	$64,344
	Contractor Profit (15%)	$109,749	$96,515
	Engineering Design (5%)	$36,583	$32,172
	Contingency (5%)	$36,583	$128,688 [a]
	Agency Oversight	$8,650	$8,650
	Contract Performance & Payment Bond (1.5%)	$10,975	$19,303
	Direct and Indirect Costs Subtotal	**$1,007,370**	**$993,107**
	Inflation (3.2% per year for 5 years)	$171,830	$169,397
	TOTAL TASK 1 THROUGH TASK 5	**$1,179,200**	**$1,162,505**
Task 6	Reclamation and Water Quality Monitoring Surveys:		
	Year 1		
	Reclamation/revegetation monitoring	$4,784	$3,842
	Water quality sampling	$14,484	$7,954
	Year 2		
	Reclamation/revegetation monitoring	$4,937	$3,964
	Water quality sampling	$14,948	$8,208
	Year 3		
	Reclamation/revegetation monitoring	$5,095	$4,091
	Year 5		
	Water quality sampling	$7,560	$6,690
	Reclamation/revegetation monitoring	$5,426	--
	Year 10		
	Water quality sampling	$8,850	$7,831
	Year 20		
	Water quality sampling	$12,126	$10,730
	Year 30		
	Water quality sampling	$16,616	$14,702
	TOTAL TASK 6 (including 3.2% inflation per year)	**$94,827**	**$68,011**
	Contingency (5%)	$4,741	$6,801 [b]
	TOTAL TASK 6 (incl. inflation and contingency)	**$99,568**	**$74,813**
	GRAND TOTAL	**$1,278,768**	**$1,237,317**

Notes:

a. 2007 estimate included a combined 20% contingency on direct reclamation costs.

b. 2007 estimate included a 10% contingency on post-closure monitoring costs.

2007 estimates based on design plans and presented in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007).

2012 estimates based on design plan estimates of material volumes generated, post-construction as-built facility

Table B-3. Materials Costs for Portal Closure and Adit Plug (Task 2)

	Cost Estimates * Materials			
	Quantity (units)	**Units**	**Unit Rate** ($/unit)	**Cost** ($)
Plug site excavation				
bits and steel	1	lump sum	$500	$500
explosives	155	rock tons	$4.00	$620
ground support	1	lump sum	$400	$400
misc.	1	lump sum	$1,000	$1,000
TOTAL				**$2,520**
Construct forms				
8 x 8 timbers	2.73	MBF	$522	$1,425
plywood (3/4" CDX)	24	sheets	$25.85	$620
2 x 6	500	lft	$0.53	$265
#5 rebar	320	lft	$0.58	$186
misc.	1	lump sum	$2,000	$2,000
TOTAL				**$4,496**
Place concrete				
concrete delivered to site	240	cyd	$261	$62,640
TOTAL				**$62,640**
Grout perimeter of plug				
portland cement (94 lb. sacks)	400	sacks	$6.70	$2,680
bits and steel	1	lump sum	$500	$500
misc.	1	lump sum	$2,000	$2,000
TOTAL				**$5,180**
Seeding				
Seed	0.25	acre	$869.57	$217
TOTAL				**$217**

Notes:
* - For the purposes of the 2012 permit renewal, it has been assumed the existing 2007 cost estimate (RTR 2007) remains reasonably representative of potential reclamation costs associated with portal closure, considering current as-built conditions. No changes have been made to the 2007 cost estimate for this task.

Table B-4. Materials, Transportation and Analytical Costs for Reclamation and Post-Closure Water Quality Monitoring (Task 6)

	2012 Cost Estimates Materials				2007 Cost Estimates (for comparison only) Materials			
	Quantity (units)	**Units**	**Unit Rate** ($/unit)	**Cost** ($)	**Quantity** (units)	**Units**	**Unit Rate** ($/unit)	**Cost** ($)
Reclamation/revegetation monitoring								
Transportation	1	lump sum	$1,400	$1,400	1	lump sum	$1,020	$1,020
TOTAL				**$1,400**				**$1,020**
Water quality monitoring - years 1 & 2 (6 sample sites, twice annually)								
Sampling materials/misc.	1	lump sum	$500	$500	1	lump sum	$500	$500
Analysis	1	lump sum	$11,880	$11,880	1	lump sum	$2,904	$2,904
Transportation	1	lump sum	$2,800	$1,400	1	lump sum	$1,020	$1,020
Data validation and reporting	1	lump sum	$3,680	$3,680	--	--	--	--
TOTAL				**$17,460**				**$4,424**
Water quality monitoring - years 5, 10, 20 & 30 (3 sample sites, once annually)								
Sampling materials/misc.	1	lump sum	$250	$250	1	lump sum	$250	$250
Analysis	1	lump sum	$5,940	$5,940	1	lump sum	$1,452	$1,452
Transportation	1	lump sum	$2,800	$1,400	1	lump sum	$1,020	$1,020
Data validation and reporting	1	lump sum	$2,840	$2,840				
TOTAL				**$10,430**				**$2,722**

Notes:

-- Not included in 2007 cost estimate

Reclamation and vegetation monitoring to occur in years 1, 2, 3, 5, and 10 post-closure. This monitoring will be concurrent with water quality monitoring years 1, 2, 5, and 10; therefore, transportation costs are shown for year 3 only. Costs for the other years are covered under water quality monitoring. No materials costs are anticipated for reclamation and vegetation monitoring.

Water quality monitoring costs are based on the current contract agreement with Columbia Analytical Services (Kelso, Washington) for analysis of the full suite of project parameters (metals, major ions, conventional parameters). The current contract price is $495 per sample.

Water quality data validation and reporting costs are based on current services provided by Integral Consulting. Validation costs are estimated at $70 per sample.

Water quality results reporting is estimated as a lump sum of $2,000. Data validation and reporting costs were not included in the 2007 cost estimates (RTR 2007).

Table B-5. Equipment Costs

Equipment	Cost Estimates * Monthly Rental	Hourly Operating Cost (less fuel)	Hourly Fuel Use (gal/hour)
Generator/Fans/Compressor (see below)	$6,535.41	$49.98	20
EJC 522 underground truck (22 tons)	$15,000.00	$20.00	8
Jacklegs, misc UG equipment	$4,000.00	$0.00	n/a
Toro 6 cyd mucker (w/ejector bucket)	$20,000.00	$35.00	10
Kobelco WLK25 loader (3 1/2 cyd bucket)	$4,045.67	$9.86	3.5
3/4 ton pickup truck	$641.58	$2.50	2
Volvo 290 B excavator (1 1/2 cyd bucket)	$8,528.05	$20.37	4
JCB 714 dump truck (9 1/2 cyd box)	$5,153.93	$10.81	2.5
Reed concrete pump (40 cyd/hr)	$2,173.91	$13.04	2
Grout pump	$2,695.65	$4.35	n/a
Barge Camp	$13,043.48	$52.17	2
Total	**$81,817.68**	**$218.08**	**54**
Generator (500kW)	*$4,269.57*	*$45.22*	*18*
Compressor (185 cfm)	*$765.84*	*$2.77*	*2*
Fans	*$1,500.00*	*$2.00*	*n/a*
Generator/Fans/Compressor (total, reports to top line item)	*$6,535.41*	*$49.99*	*20*

Notes:

* - Based on equipment costs obtained from RS Means Costworks, accessed 04/25/2012, for common earthwork equipment listed above, it has been assumed the rental and operating costs presented in the 2007 cost estimate (RTR 2007) remain reasonably representative of potential equipment and associated operating costs, with the exception of fuel prices, not shown on this table.

Table B-6. Mobilization/Demobilization and Transportation Costs

Mob/Demob	2012 Cost Estimates			2007 Cost Estimates (for comparison only)		
	Rate / Trip	Number of Trips	Cost	Rate / Trip	Number of Trips	Cost
Transport underground equipment to Ketchikan	$40,000	1	$40,000	$20,000	1	$20,000
Equipment barge trips from Ketchikan to Niblack	$10,000	4	$40,000	$4,400	6	$26,400
Personnel transport	$700	24	$16,800	$510	24	$12,240

Notes:

2007 estimates based on design plans and presented in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007).

2012 estimates updated to include the following personnel travel costs from Ketchikan, AK:
Float plane/air taxi: $350 each way

Table B-7. Post Closure Labour Costs (Task 6)

	2012 Cost Estimates (Annual Costs for Each Monitoring Year)							2007 Cost Estimates (for comparison only)						
	Labor Cost				Transportation Cost ($)	Materials Cost ($)	Total Cost ($)	Labor Cost				Transportation Cost ($)	Materials Cost ($)	Total Cost ($)
	Number of staff	Time (hours)	Rate ($/hour)	Total ($)				Number of staff	Time (hours)	Rate ($/hour)	Total ($)			
Reclamation/Revegetation Monitoring (Sampling Years 1, 2, 3, & 5)														
Annual Inspection (Helper)	1	8	$50.00	$400	$0	$0	$400	1	8	$50.00	$400	$0	$0	$400
Annual Inspection (Technician)	1	24	$90.00	$2,160	$1,400	$0	$3,560	1	24	$90.00	$2,160	$1,020	$0	$3,180
TOTAL							**$3,960**							**$3,180**
Water Quality Monitoring (Sampling Years 1 & 2)														
Annual Sampling (Helper)	1	8	$50.00	$400	$0	$0	$400	1	8	$50.00	$400	$0	$0	$400
Annual Sampling (Technician)	1	24	$90.00	$2,160	$1,400	$8,030	$11,590	1	24	$90.00	$2,160	$1,020	$3,404	$6,584
TOTAL							**$11,990**							**$6,584**
Water Quality Monitoring (Sampling Years 5, 10, 20 & 30)														
Annual Sampling (Helper)	1	8	$50.00	$400	$0	$0	$400	1	8	$50.00	$400	$0	$0	$400
Annual Sampling (Technician)	1	24	$90.00	$2,160	$700	$2,258	$5,118	1	24	$90.00	$2,160	$1,020	$1,702	$4,882
TOTAL							**$5,518**							**$4,882**

Notes:

Reclamation and vegetation monitoring to occur in years 1, 2, 3, and 5 post-closure. This monitoring will be concurrent with water quality monitoring years 1, 2, and 5; therefore, transportation costs are shown for year 3 only. Costs for the other years are covered under water quality monitoring. No materials costs are anticipated for reclamation and vegetation monitoring.

2007 estimates based on design plans and presented in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007).

2012 materials estimates include sampling materials, analysis and data validation/reporting from Table B-4.

Table B-8. Reclamation Cost Estimate for Tasks 1 to 5
(Not Including Mobilization or Monitoring Costs)

Task	Equipment Used	2012 Cost Estimates															Notes and Assumptions
		Equipment Rental Cost			Equipment Operating Cost			Fuel Cost				Labor Cost			Material Cost ($)	Total Cost ($)	
		Time [a] (days)	Rate ($/month)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)	Time (hours)	Rate (gal/hour)	Price ($)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)			
Task 1: Relocation of PAG Material and Reclaim Site (14,300 CYD or 24,310 tons)																	
Load haul trucks	Kobelco WLK25 loader	23	$4,046	$3,102	276	$9.86	$2,721	276	3.5	$5.00	$4,830	276	$60.22	$16,621	$0	$27,274	14,300 cyd x 1.7 tons/cyd = 24,310 tons
Haul PAG rock to ~2500 ft underground.	(2) EJC 522 trucks	46	$15,000	$23,000	552	$20.00	$11,040	552	8	$5.00	$22,080	552	$60.22	$33,241	$0	$89,361	2 trucks, 6000 ft haul, 2 trips/hour each, 22 tons/trip
Place PAG rock underground	6 cyd mucker w/ejector bucket	23	$20,000	$15,333	276	$35.00	$9,660	276	10	$5.00	$13,800	276	$60.22	$16,621	$0	$55,414	
Remove HDPE liner from temporary PAG storage facility and ore stockpile	Kobelco WLK25 loader	1	$4,046	$135	12	$9.86	$118	12	3.5	$5.00	$210	24	$60.22	$1,445	$0	$1,908	1 operator, 1 laborer
Haul liner underground	(2) EJC 522 trucks	2	$15,000	$1,000	24	$20.00	$480	24	8	$5.00	$960	24	$60.22	$1,445	$0	$3,885	2 trucks, 1 day each
Recontour site/restore stormwater conveyance at temporary PAG storage facility and ore stockpile	Volvo 290 B excavator	4	$8,528	$1,137	48	$20.37	$978	48	4	$5.00	$960	48	$60.22	$2,891	$0	$5,965	
Place topsoil at temporary PAG storage facility and ore stockpile	Volvo 290 B excavator	1	$8,528	$284	12	$20.37	$244	12	4	$5.00	$240	12	$60.22	$723		$1,491	
Seeding at temporary PAG storage facility and ore stockpile												4	$60.22	$241	$739	$980	seed cost = $1000/acre, labor = 3 acres/day
Subtotal - Task 1				**$43,991**			**$25,242**				**$43,080**			**$73,228**	**$739**	**$186,280**	
Task 2: Portal Closure Including Adit Plug																	
Plug site excavation												192	$60.22	$11,562	$2,520	$14,082	Assumes 4-man crew
Construct forms												192	$60.22	$11,562	$4,497	$16,059	Assumes 4-man crew
Place concrete	Reed concrete pump	1	$2,174	$72	12	$13.04	$156	12	2	$5.00	$120	48	$60.22	$2,891	$62,609	$65,849	Assumes one continuous pour, including prep. time.
Grout perimeter of plug	Grout pump	6	$2,696	$539	36	$4.35	$157					288	$60.22	$17,343	$5,180	$23,219	
Remove utilities							$0					192	$60.22	$11,562		$11,562	
Load NAG fill and topsoil	Kobelco WLK25 loader	1	$4,046	$4,046	12	$9.86	$118	12	3.5	$5.00	$210	12	$60.22	$723		$5,097	450 cyd of NAG rock
Haul NAG fill and topsoil	JCB 714 dump truck	1	$5,154	$5,154	12	$10.81	$130	12	2.5	$5.00	$150	12	$60.22	$723		$6,156	1 truck, 122 ft haul, 6 trips/hour, 9cyd/trip
Backfill portal	Volvo 290 B excavator	1	$8,528	$8,528	12	$20.37	$244	12	4	$5.00	$240	12	$60.22	$723		$9,735	
Place topsoil	Volvo 290 B excavator	1	$8,528	$8,528	12	$20.37	$244	12	4	$5.00	$240	12	$60.22	$723		$9,735	
Seeding												2	$60.22	$120	$217	$337	seed cost = $1000/acre, labor = 3 acres/day
Subtotal - Task 2				**$26,867**			**$1,050**				**$960**			**$57,932**	**$75,023**	**$161,832**	
Task 3: Fill Placement and Grading, Final Contouring at NAG Site																	
Final grading	Volvo 290 B excavator	12	$8,528	$3,411	144	$20.37	$2,933	144	4	$5.00	$2,880	144	$60.22	$8,672		$17,896	
Place topsoil	Volvo 290 B excavator	2	$8,528	$569	24	$20.37	$489	24	4	$5.00	$480	24	$60.22	$1,445		$2,983	
Seeding												12	$60.22	$723	$2,696	$3,419	seed cost = $1000/acre, labor = 3 acres/day
Silt fence												12	$60.22	$723	$500	$1,223	
Subtotal - Task 3				**$3,980**			**$3,422**				**$3,360**			**$11,562**	**$3,196**	**$25,520**	

Table B-8. Reclamation Cost Estimate for Tasks 1 to 5
(Not Including Mobilization or Monitoring Costs)

		2012 Cost Estimates														
		Equipment Rental Cost			Equipment Operating Cost			Fuel Cost				Labor Cost			Material		
Task	Equipment Used	Time [a] (days)	Rate ($/month)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)	Time (hours)	Rate (gal/hour)	Price ($)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)	Cost ($)	Total Cost ($)	Notes and Assumptions
Task 4: Reclaim Water Treatment Facilities and Sediment Pond Areas																	
Remove and dispose of surface facilities	Kobelco WLK25 loader	2	$4,046	$270	24	$9.86	$237	24	3.5	$5.00	$420	48	$ 60.22	$ 2,891		$3,817	1 operator, 1 laborer
Load NAG fill material and topsoil	Kobelco WLK25 loader	4	$4,046	$539	48	$9.86	$473	48	3.5	$5.00	$840	48	$ 60.22	$ 2,891		$4,743	3000 cyd NAG rock truck, 1000FT haul, 8 trips/hour, 9cyd/trip
Haul NAG fill material and topsoil	JCB 714 dump truck	4	$5,154	$687	48	$10.81	$519	48	2.5	$5.00	$600	48	$ 60.22	$ 2,891		$4,697	
Recontour site	Volvo 290 B excavator	3	$8,528	$853	36	$20.37	$733	36	4	$5.00	$720	36	$ 60.22	$ 2,168		$4,474	
Place topsoil	Volvo 290 B excavator	1	$8,528	$284	12	$20.37	$244	12	4	$5.00	$240	12	$ 60.22	$ 723		$1,491	
Seeding												3	$ 60.22	$ 181	$ 652	$833	seed cost = $1000/acre, labor = 3 acres/day
Subtotal - Task 4				**$2,633**			**$2,207**				**$2,820**			**$ 11,743**	**$652**	**$20,055**	
Task 5: Stormwater Conveyance and Settling Ponds Below NAG Site																	
Recontour sites 7 replace topsoil	Volvo 290 B excavator	3	$8,528	$853	36	$20.37	$733	36	4	$5.00	$720	36	$60.22	$2,168		$4,474	
Seeding												6	$60.22	$361	$1,304	$1,665	
Subtotal - Task 5				**$853**			**$733**				**$720**			**$2,529**	**$1,304**	**$6,139**	
Support Equipment																	
Generator/Fans/Compressor (during Task 1 and Task 2)		43	$6,535	$9,367	516	$49.98	$25,790	516	20	$5.00	$51,600					$86,757	
Jacklegs/misc. UG equipment (during Task 1 and Task 2)		43	$4,000	$5,733												$5,733	
Tamrock 6cyd mucker w/ejector plate (during Task 2)		22	$20,000	$14,667	264	$35.00	$9,240	264	2.5	$5.00	$3,300					$27,207	
3/4 ton pick-up truck (during all Tasks)		59	$642	$1,262												$1,262	
Barge camp		60	$13,043	$26,087	720	$52.17	$37,562	720	2	$5.00	$7,200					$70,849	
Subtotal - Support Equipment				**$57,116**			**$72,592**				**$62,100**			**$0**	**$0**	**$191,808**	
Equipment Standby																	
Generator/Fans/Compressor		17	$6,535	$3,703												$3,703	
(2) EJC 522 underground haul trucks (22 tons)		37	$15,000	$18,500												$18,500	
Jacklegs/misc. UG equipment		17	$4,000	$2,267												$2,267	
Tamrock 6cyd mucker w/ejector plate		15	$20,000	$10,000												$10,000	
Kobelco WLK25 loader (3 1/2 cyd bucket)		29	$4,046	$3,911												$3,911	
Volvo 290 B excavator (1 1/2 cyd bucket)		2	$8,528	$569												$569	
3/4 ton pick-up truck		1	$642	$21												$21	
Reed concrete pump		29	$2,174	$2,101												$2,101	
Grout pump		24	$2,696	$2,157												$2,157	
Subtotal - Equipment Standby				**$43,229**			**$0**				**$0**			**$0**	**$0**	**$43,229**	
TOTAL - All Tasks				**$178,669**			**$105,246**				**$113,040**			**$156,994**	**$80,914**	**$634,863**	

Table B-8. Reclamation Cost Estimate for Tasks 1 to 5
(Not Including Mobilization or Monitoring Costs)

Task	Equipment Used	2007 Cost Estimates (for Comparison)															Notes and Assumptions
		Equipment Rental Cost			Equipment Operating Cost			Fuel Cost				Labor Cost			Material Cost ($)	Total Cost ($)	
		Time (days)	Rate ($/month)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)	Time (hours)	Rate (gal/hour)	Price ($)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)			
Task 1: Relocation of PAG Material and Reclaim Site (14,300 CYD or 24,310 tons)																	
Load haul trucks	Kobelco WLK25 loader	21	$4,046	$2,832	252	$9.86	$2,485	252	3.5	$3.04	$2,681	252	$60.22	$15,176	$0	$23,174	14,300 cyd x 1.5 tons/cyd = 21,500 tons
Haul PAG rock to ~2500 ft underground.	(2) EJC 522 trucks	42	$15,000	$21,000	504	$20.00	$10,080	504	8	$3.04	$12,257	504	$60.22	$30,352	$0	$73,690	2 trucks, 6000 ft haul, 2 trips/hour each, 22 tons/trip
Place PAG rock underground	6 cyd mucker w/ejector bucket	21	$20,000	$14,000	252	$35.00	$8,820	252	10	$3.04	$7,661	252	$60.22	$15,176	$0	$45,657	
Remove HDPE liner from temporary PAG storage facility and ore stockpile	Kobelco WLK25 loader	1	$4,046	$135	12	$9.86	$118	12	3.5	$3.04	$128	24	$60.22	$1,445	$0	$1,826	1 operator, 1 laborer
Haul liner underground	(2) EJC 522 trucks	2	$15,000	$1,000	24	$20.00	$480	24	8	$3.04	$584	24	$60.22	$1,445	$0	$3,509	2 trucks, 1 day each
Recontour site/restore stormwater conveyance at temporary PAG storage facility and ore stockpile	Volvo 290 B excavator	4	$8,528	$1,137	48	$20.37	$978	48	4	$3.04	$584	48	$60.22	$2,891	$0	$5,589	
Place topsoil at temporary PAG storage facility and ore stockpile	Volvo 290 B excavator	1	$8,528	$8,528	12	$20.37	$244	12	4	$3.04	$48	12	$60.22	$723		$9,543	
Seeding at temporary PAG storage facility and ore stockpile												4	$60.22	$241	$739	$980	seed cost = $1000/acre, labor = 3 acres/day
Subtotal - Task 1				**$48,632**			**$23,205**				**$23,943**			**$67,449**	**$739**	**$163,968**	
Task 2: Portal Closure Including Adit Plug																	
Plug site excavation												192	$60.22	$11,563	$2,520	$14,082	
Construct forms												192	$60.22	$11,563	$4,497	$16,060	
Place concrete	Reed concrete pump	4	$2,174	$290	24	$13.04	$313	24	2	$3.04	$146	192	$60.22	$11,563	$62,609	$74,920	
Grout perimeter of plug	Grout pump	6	$2,696	$539	36	$4.35	$157					288	$60.22	$17,344	$5,180	$23,220	
Remove utilities												192	$60.22	$11,563		$11,563	
Load NAG fill and topsoil	Kobelco WLK25 loader	1	$4,046	$4,046	12	$9.86	$118	12	3.5	$3.04	$42	12	$60.22	$723		$4,929	450 cyd of NAG rock
Haul NAG fill and topsoil	JCB 714 dump truck	1	$5,154	$5,154	12	$10.81	$130	12	2.5	$3.04	$30	12	$60.22	$723		$6,036	1 truck, 122 ft haul, 6 trips/hour, 9cyd/trip
Backfill portal	Volvo 290 B excavator	1	$8,528	$8,528	12	$20.37	$244	12	4	$3.04	$48	12	$60.22	$723		$9,543	
Place topsoil	Volvo 290 B excavator	1	$8,528	$8,528	12	$20.37	$244	12	4	$3.04	$48	12	$60.22	$723		$9,543	
Seeding												2	$60.22	$120	$217	$338	seed cost = $1000/acre, labor = 3 acres/day
Subtotal - Task 2				**$27,085**			**$1,206**				**$314**			**$66,608**	**$75,023**	**$170,234**	
Task 3: Fill Placement and Grading, Final Contouring at NAG Site																	
Final grading	Volvo 290 B excavator	12	$8,528	$3,411	144	$20.37	$2,933	144	4	$3.04	$1,751	144	$60.22	$8,672		$16,767	
Place topsoil	Volvo 290 B excavator	2	$8,528	$569	24	$20.37	$489	24	4	$3.04	$292	24	$60.22	$1,445		$2,794	
Seeding												12	$60.22	$723	$2,696	$3,418	seed cost = $1000/acre, labor = 3 acres/day
Silt fence												12	$60.22	$723	$500	$1,223	
Subtotal - Task 3				**$3,980**			**$3,422**				**$2,043**			**$11,563**	**$3,196**	**$24,202**	

Table B-8. Reclamation Cost Estimate for Tasks 1 to 5
(Not Including Mobilization or Monitoring Costs)

Task	Equipment Used	2007 Cost Estimates (for Comparison)															Notes and Assumptions
		Equipment Rental Cost			Equipment Operating Cost			Fuel Cost				Labor Cost			Material Cost ($)	Total Cost ($)	
		Time (days)	Rate ($/month)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)	Time (hours)	Rate (gal/hour)	Price ($)	Total ($)	Time (hours)	Rate ($/hour)	Total ($)			
Task 4: Reclaim Water Treatment Facilities and Sediment Pond Areas																	
Remove and dispose of surface facilities	Kobelco WLK25 loader	2	$4,046	$270	24	$9.86	$237	24	3.5	$3.04	$255	48	$60.22	$2,891		$3,652	1 operator, 1 laborer
Load NAG fill material and topsoil	Kobelco WLK25 loader	4	$4,046	$539	48	9.86	473	48	3.5	$3.04	511	48	$60.22	$2,891		$4,414	3000 cyd NAG rock truck, 1000FT haul, 8 trips/hour, 9cyd/trip
Haul NAG fill material and topsoil	JCB 714 dump truck	4	$5,154	$687	48	$10.81	$519	48	2.5	$3.04	$365	48	$60.22	$2,891		$4,462	
Recontour site	Volvo 290 B excavator	3	$8,528	$853	36	20.37	733	36	4	$3.04	438	36	$60.22	$2,168		$4,192	
Place topsoil	Volvo 290 B excavator	1	$8,528	$284	12	$20.37	$244	12	4	$3.04	$146	12	$60.22	$723		$1,397	
Seeding												3	$60.22	$181	$652	$833	seed cost = $1000/acre, labor = 3 acres/day
Subtotal - Task 4				**$2,633**			**$2,206**				**$1,715**			**$ 11,745**	**$652**	**$18,950**	
Task 5: Stormwater Conveyance and Settling Ponds Below NAG Site																	
Recontour sites 7 replace topsoil	Volvo 290 B excavator	3	$8,528	$853	36	$20.37	$733	36	4	$3.04	$438	36	$60.22	$2,168		$4,192	
Seeding												6	$60.22	$361	$1,304	$1,666	
Subtotal - Task 5				**$853**			**$733**				**$438**			**$2,529**	**$1,304**	**$5,858**	
Support Equipment																	
Generator/Fans/Compressor (during Task 1 and Task 2)		43	$6,535	$9,367	516	$49.98	$25,791	516	20	$3.04	$31,373					$66,531	
Jacklegs/misc. UG equipment (during Task 1 and Task 2)		43	$4,000	$5,733												$5,733	
Tamrock 6cyd mucker w/ejector plate (during Task 2)		22	$20,000	$14,667	264	$35.00	$9,240	264	2.5	$3.04	$2,006					$25,913	
3/4 ton pick-up truck (during all Tasks)		59	$642	$1,262												$1,262	
Barge camp		60	$13,043	$26,087	720	$52.17	$37,565	720	2	$3.04	$4,378					$68,030	
Subtotal - Support Equipment				**$57,116**			**$72,596**				**$37,757**	**$0**			**$0**	**$167,469**	
Equipment Standby																	
Generator/Fans/Compressor		17	$6,535	$3,703												$3,703	
(2) EJC 522 underground haul trucks (22 tons)		16	$15,000	$8,000												$8,000	
Jacklegs/misc. UG equipment		17	$4,000	$2,267												$2,267	
Tamrock 6cyd mucker w/ejector plate		17	$20,000	$11,333												$11,333	
Kobelco WLK25 loader (3 1/2 cyd bucket)		31	$4,046	$4,181												$4,181	
Volvo 290 B excavator (1 1/2 cyd bucket)		2	$8,528	$569												$569	
3/4 ton pick-up truck		1	$642	$21												$21	
Reed concrete pump		26	$2,174	$1,884												$1,884	
Grout pump		24	$2,696	$2,157												$2,157	
Subtotal - Equipment Standby				**$34,115**			**$0**				**$0**	**$0**			**$0**	**$34,115**	
TOTAL - All Tasks				**$174,414**			**$103,368**				**$66,210**	**$159,894**			**$80,914**	**$584,796**	

Notes:

a. In accordance with format of the 2007 cost estimate (RTR 2007b): assumes a 12-HR work day, work schedule including weekends and holidays, and time required for individual tasks requiring multiple pieces of the same equipment (e.g., EJC 22 underground haul truck), has been doubled. Applies to associated equipment stand-by time.

2007 estimates based on design plans and presented in the Reclamation and Closure Plan for the Niblack Underground Exploration Project (RTR 2007).
2012 estimates based on design plan estimates of material volumes generated, post-construction as-built facility dimensions, and current fuel, equipment, and labor rates.