COEUR ALASKA™

January 28, 2015

Brad Orr
USDA Forest Service
Tongass Nat'l Forest
Juneau Ranger District
8510 Mendenhall Loop Road
Juneau, AK 99801

RE: Kensington Gold Project 2014 Plan of Operations Annual Report.

Dear Mr. Orr:

Coeur Alaska is pleased to submit the attached Annual Report for calendar year 2014 as partial fulfillment of the requirements of the Kensington Gold Mine Plan of Operations.

Should you have any questions or require clarification regarding the document or on any other issue, please contact me at (907) 529-3328.

Best regards,

Kevin Eppers

Kevin Eppers
Environmental Manager

Cc: Will Collingwood, ADEC
Randal Vigil, ACOE
Kyle Moselle, ADNR
Jim Voyles, Coeur

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Kensington Gold Project
2014 Annual Report

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For:
U.S. Forest Service
Alaska Region (R-10)
Tongass Minerals Group
Juneau Ranger District
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February 2015

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2. Terrestrial Wildlife Monitoring Plan – Slate Lakes Basin, January 2014, Coeur Alaska, Juneau, AK
3. Mountain Goat Population Monitoring near the Kensington Mine, Alaska – February, 2014, ADFG
4. 2014 Re-vegetation Test Plot Monitoring Data

References

1. Coeur Alaska, Inc., 2014, Kensington Gold Project NPDES Permit AK-005057-1 Annual Water Quality Monitoring Summary Volume 1: Aquatic Resource Surveys 2014.
2. Coeur Alaska, Inc., 2014, Kensington Gold Project NPDES Permit AK-005057-1 Annual Water Quality Monitoring Summary 2014 Volume 2: Water Quality Data.

Introduction

The Kensington Gold Project is owned and operated by Coeur Alaska, Inc. (Coeur) a wholly owned subsidiary of Coeur Mining. The project is located on the western and southern flanks of Lions Head Mountain; between Berners Bay and Lynn Canal; and in the drainages of Johnson, Sherman, and Slate Creeks (See Figures 1-10). Coeur Alaska has prepared this annual report to comply with requirements of the U.S. Forest Service (USFS) Plan of Operations (POO) for the Kensington Gold Project.

The Kensington Gold Project received authorization under the POO on June 13, 2005. The Final Supplemental Environmental Impact Statement, U.S. Forest Service Record of Decision and all necessary major permits were issued prior to year end 2005. Coeur Alaska issued construction contracts and ground breaking was initiated during July 2005.

Following a suspension of construction activities during the litigation process for the 404 Permit, construction activities at the TTF that resumed in 2009 were completed in the third quarter of 2010 and operations of the facility began in June of 2010. Gold production operations continued throughout 2014 consistent with the approved POO.

Section 1.0 contains a synopsis of the activities conducted at the Kensington Gold Project during calendar year 2014, and Section 2.0 contains projections of activities planned for calendar year 2015.

Summary of 2014 Activities

1.0 Public Safety

Public access to the project site is managed as defined in the established Public Access Control Plan. Public access to the site must be controlled to ensure the safety of the public. During the construction and operational phases of the Project, hazards such as truck traffic, blasting, barge and tug operations, and earthwork could result in physical harm to unauthorized visitors.

During 2014, personnel accessed the site via boat and rotary wing aircraft. Agency inspections and other public personnel generally accessed the site by fixed winged aircraft and boat.

Supplies and equipment for the facility are delivered by barge to the Slate Creek Cove Marine Terminal.

2.0 Construction Activities

Stage 2 construction activities at the Tailings Treatment Facility (TTF) were completed in 2012, thus no construction at the TTF was conducted in 2014.

No infrastructure construction was conducted in 2014.

The majority of the surface disturbance associated with construction was completed in 2005 and 2006 as outlined in the project disturbance summary Table 1. No additional wetland fill occurred in 2014. Approximately 0.4 acres of additional disturbance occurred on private lands during 2014.

2.1 Storm Water Controls

Construction operations on both the Jualin and Comet sides of the Kensington Gold Project were conducted in compliance with the Storm Water Pollution Prevention Plan (SWPPP) requirements. Both temporary construction Best Management Practices (BMPs) and sediment pond BMPs were utilized to control excess sediment production from disturbed areas that otherwise might enter waters of the state. A full description of storm water controls can be found in the Storm Water Pollution Prevention Plan (SWPPP) for the Kensington Gold Project, February 2014.

Sediment ponds and silt fences were maintained, and existing check dams were also maintained throughout the site. Designs for these construction BMPs are discussed in the SWPPP. Most operational (long-term) sediment ponds were constructed during 2005, and all were constructed as designed in the SWPPP Addendum B. Three new sediment ponds were installed in 2014 as part of the on-going stormwater management program.

The nature of construction BMPs is transitory; i.e., they change in response to site conditions and the rapidly evolving ground conditions encountered during construction. Therefore, designs are dependent on site conditions, which may change day by day. However, as construction elements are completed, operational BMP sediment ponds have been developed, which discretely demonstrate compliance with the SWPPP as amended.

In addition to SWPPP monitoring and inspections, site receiving water monitoring was also conducted in accordance with the current site APDES permit to further document compliance with state water quality standards. Receiving water sampling data are discussed below under APDES monitoring (section 9.1).

2.2 Corps of Engineers Wetland Disturbance

An annual summary of wetland areas impacted and reclaimed is a requirement of the Corps of Engineers (COE) 404 fill permit. Wetland areas impacted are tallied in Table 2. Overall, total fill in waters of U.S. as of December 2014 is 73.5 acres. No additional wetland fill occurred in 2014.

2.3 Access Corridors

Road improvements during 2014 were an ongoing priority of the project. Continued road surfacing and interim reclamation seeding were major improvements to the road projects

in 2014. The maintenance of storm water BMPs along the Jualin and Kensington access corridors were also a major ongoing priority for 2014.

3.0 Mine Operations

3.1 Ore Production

Mine operations occurred in all 12 months during 2014. Approximately 642,249 tons of ore was mined in 2014.

3.2 Development Rock Production

Approximately 314,006 tons of development rock was mined in 2014. Approximately 244,127 tons of development rock was brought to the surface and placed into stockpiles and 69,879 tons were placed underground as backfill. Development rock sample results for 2014 are contained in Table 4.

3.3 Dust Suppression Activities

Road watering was conducted as required via a water wagon to control any fugitive dust. Dust suppression activities occurred on a limited number of occasions during the summer months of 2014.

3.4 Surface and Underground Drilling

A total of 187,558 feet of core drilling was completed in the period of January through December of 2014 for both underground and surface. The drilling was comprised of production and exploration programs.

The 2014 underground production drilling program included 88,295 feet. This drilling was completed by contracted drilling company using NQ and HQ core drill tooling. This program was accessed in the Kensington up-ramp and down-ramp.

The 2014 underground exploration drilling program included 39,374 feet. This was also completed under a drilling contract and used NQ and HQ core tooling. The underground exploration drilling was completed from various drill stations including the 520 level, 990 level, and 1170 level exploration drill sites.

The 2014 surface exploration drilling program included 59,889 feet. Diamond core drilling on the surface was planned to be conducted in 2014 and an exploration work plan was submitted to the Forest Service in March 2014. A maximum of eight drill sites were proposed to be located on Forest Service lands in 2014. Of the eight drill sites that were proposed on lands administered by the Forest Service, one of the sites was previously approved as part of the 2013 drilling program. During the 2014 drill season, five drill holes (7,120 feet) were drilled on lands administered by the Forest Service.

4.0 Mill Operations

Mill operations occurred in all 12 months during 2014. Approximately 635,961 tons of ore was processed through the mill facility in 2014.

4.1 Gold Production

Approximately 18,378 tons of concentrate was shipped from the Kensington mine to an off-site refinery. Of the 18,378 tons of concentrate shipped off-site, approximately 120,469 ounces of gold was contained.

4.2 Tailing Production

Approximately 302,414 tons of tailings were conveyed to the Tailings Treatment Facility and 245,747 tons of tailings were conveyed to the underground paste plant for disposal in the underground stopes during 2014. Tailings samples were collected in each of the four quarters of 2014 and there results are contained in Table 5.

5.0 Solid/Hazardous Waste Generation and Transport

An Integrated Waste Management and Disposal Plan dated November 2013 provides a description for the disposal of wastes from the Kensington Mine in accordance with the regulations in 18 AAC 60. A Waste Management Permit was issued by ADEC on September 20, 2013.

Solid waste was generated from the Comet and Jualin sides of the Kensington Gold Project, including: incinerator ashes, construction debris, worn cable, tires, and scrap metal. This material was managed in accordance with the approved ADEC Waste Management Permit. Coeur Alaska generated approximately 613 tons of solid waste. Approximately 307 tons of scrap metal, 3 tons of batteries, and 25,320 gallons of used oil was recycled from the site. These materials were shipped to Juneau, then transported to disposal facilities or otherwise managed according to controlling regulations and permits.

Hazardous waste, including Universal waste, generated at the site included:

- Lead/acid, nickel, cadmium, and lithium ion batteries
- Florescent and metal halide lamps
- Paint and paint related waste
- Wastes associated with the Assay Laboratory
- Water Treatment Plant laboratory waste
- Computer backup power supplies

6.0 Tailings Treatment Facility

Following the favorable decision from the Supreme Court, the Army Corp of Engineers (ACOE) issued Permit Modification POA-1990-592-M6 and lifted the suspension of Permit Modification POA-1190-592-M on August 14, 2009. Construction activities on the tailings treatment facility began after the issuance of the permit modification and continued until the 3rd quarter of 2010 at which time operation of the facility began. Stage

2 construction of the facility was conducted in 2012. Operation of the facility began in June of 2010 and continued throughout 2014.

7.0 Compliance

One Notice of Violation's (NOV) was issued to Coeur Alaska from the Alaska Department of Environmental Conservation (ADEC) during 2014. The NOV alleges that the NOV was issued as a result of a failure to notify the Department as required by 18 AAC 83.410(f) and Alaska Pollutant Discharge Elimination System (APDES) permit AK0050571, Appendix A, Section 3.4 in regard to employees tampering with monitoring equipment and samples at the Comet Water Treatment Plant.

All reporting was completed as required by permit conditions. One component of this document is the reporting of spills. Each spill that occurred during 2014 was taken very seriously and all site resources were utilized, as appropriate for each occurrence. The spills were all properly reported and cleaned up in accordance with ADEC guidelines (Table 3).

During the 2014 year, the following eight guidelines were updated in various aspects of environmental management at the site to ensure permit compliance:

- Bear Avoidance SOP
- Coeur Assay Lab Waste SOP
- Hazardous and Non-Hazardous Waste Handling SOP
- Spill Response Notification SOP
- Coeur Shotgun SOP
- Purchasing New Products or Chemicals or Materials SOP
- Paste Plant Opacity SOP
- Environmental Samples Shipping SOP
- Outfall 002 TSS Sampling SOP
- Hazardous Waste Manifest Procedure SOP

The Intelex tracking system was populated with new and/or revised permit requirements and reminders during 2014. The tracking system sends email reminders to employees responsible for the completion of the permit requirements to ensure site permit compliance.

8.0 Reclamation

No permanent concurrent reclamation was performed in 2014; however, interim seeding stabilization associated with topsoil stockpiles, road ditches, area adjacent to Tailings Treatment Facility, access roads, and tailings conveyance pipeline route was performed as a BMP under the approved SWPPP plan.

Approval was issued by the Forest Service and State of Alaska for the revised reclamation plan dated April 2013. A financial guarantee in the amount of $28,727,011 was submitted and approved by the Forest Service in 2013.

8.1 Revegetation Test Plots

Revegetation test plots were constructed in July of 2013 in the Snow-Slide Gulch area to evaluate the reclamation methods proposed in the reclamation and closure plan. Reclamation test plot monitoring was conducted spring through late fall of 2014. All sites demonstrated stable conditions with slight to no erosion noted. Moderate growth of grass occurred throughout the season at all plots. Overall, Plot #1 demonstrated the most grass growth and best soil stability, followed by Plot #3 and Plot #2. Quantitative monitoring was conducted once at Plot #1 in late July. It was found to have less than 50% grass cover, thus qualitative monitoring was resumed until grass coverage increases to 50% cover. The monitoring results are contained in attachment 4. On-going monitoring of the test plots are planned for 2015.

9.0 Monitoring

9.1 APDES

Alaska Pollutant Discharge Elimination System (APDES) permit number AK0050571 was issued on July 29, 2011 and became effective on September 1, 2011. Results of the extensive monitoring program are contained in the Kensington Gold Project APDES permit AK-005057-1 Volume 1: Aquatic Resource Surveys and Volume 2: Water Quality Data of the APDES Annual Water Quality Monitoring Summary 2014 (Coeur, 2014). These reports will be submitted to the US Forest Service, Juneau under separate cover.

9.2 Fresh Water

Fresh water monitoring requirements are contained within the USFS POO. Monitoring performed for the APDES permit are summarized in the Kensington Gold Project APDES Permit AK-005057-1 Annual Water Quality Monitoring Summary 2014 Volume 2. Water Quality Data are inclusive of the requirements under the USFS POO. This report will be submitted to the US Forest Service, Juneau and the Alaska Department of Environmental Conservation (ADEC) under separate cover, as the APDES 2014 Annual Report.

9.3 Water Usage

Under requirements of the ADNR water rights, certain water usage and stream flow submittals are prepared. Some of these filings are made monthly while others are submitted quarterly. These reports are available at ADNR offices, Juneau.

9.4 Aquatic Resource Surveys

The USFS POO references aquatic resource surveys, which are to include:

- Annual photographs of stream habitat types.

- Fish surveys and minnow trapping in Upper Slate Lake.
- Salmon escapement surveys in Sherman, Slate, and Johnson Creeks.

Annual photographs of stream habitat types are included in the Kensington Gold Project APDES Permit AK-005057-1 Annual Water Quality Monitoring Summary Volume 1: Aquatic Resource Surveys 2014.

Adult salmon escapement surveys were performed in 2014 on Sherman, Slate, and Johnson Creeks. Tabulations of these data are presented in the Kensington Gold Project APDES Permit AK-005057-1 Annual Water Quality Monitoring Summary Volume 1: Aquatic Resource Surveys 2014. These reports will be submitted to the US Forest Service, Juneau under separate cover.

9.5 Marine

The U.S. Forest Service Plan of Operations Appendix 4.d. contains a marine monitoring program for Berners Bay.

Between April 23 and May 14, one hundred and thirty two marine mammal observation surveys were completed aboard the M/V Majestic Fjord. The official eulachon run transportation regulations as determined by Coeur Alaska and NMFS were put into effect on April 23, 2014. Special measures taken during the eulachon run included: having a marine observer on the vessel during all trips and maintaining a maximum speed of 13 knots within Berners Bay. Regular transit speed is approximately 21-25 knots. Transportation vessel trips during the eulachon run were limited to 3 trips daily. No more than 3 trips per day were conducted during the 2014 eulachon spawning window.

A total of 854 Steller sea lions were counted during the observation period; 790 of these sightings (92.5%) occurred within Berners Bay. The vast majority (98.4%) of the 188 harbor seal sightings also occurred within Berners Bay. Most of these sightings were at pinniped haul out areas, such as the entrance to Slate Cove and Point Saint Mary. Gatherings of up to 20 harbor seals on haul outs and rafts of up to 70 Steller sea lions were observed. Pinniped activity was highest on April 24 with activity again from April 25 through May 3. No recordable encounters with marine mammals occurred during the 2014 eulachon spawning season. Please refer to Attachment 1 for additional information related to the marine surveys.

9.6 Air

During the reporting period, bi-annual Facility Operating Reports, including fuel use summaries, were submitted to the Fairbanks office of ADEC Air Permits Program (610 University Avenue) in compliance with ADEC air quality permits. These reports are not reproduced here, but can be provided upon request.

9.7 Archeology

Surface disturbance activities within historic areas were completed during 2005. No additional surface disturbance occurred in 2014.

Archaeological testing, monitoring, and data recovery activities were conducted at the Kensington-Jualin mine during 2013. A draft report was submitted in July 2014 for comment.

Training was conducted for all new employees as part of the new-hire environmental awareness training program in addition to the recurring annual refresher training for all Coeur employees in 2014. Additionally, all construction workers were provided this training as part of the construction environmental awareness training program. Newly hired employees and construction workers are not allowed to work on-site until they received this training. The training clearly stated Coeur's policy regarding unauthorized collections from private and public lands. Approximately 1250 hours of training, which included the Cultural Resource training was conducted in 2014 with employees and contractors.

Filming of the mine site on both the Comet and the Jualin side was conducted by Mr. Urion in the fall of 2006. He filmed at the Comet side of the mine again in spring of 2007. Mr. Urion also completed his research and a script for a DVD format film. Mr. Urion was scheduled to complete the filming in the spring of 2008 after another visit to the Jualin side of the project area, but due to the unexpected death of Mr. Urion in 2008, the filming was not completed as scheduled in 2008. Coeur obtained the existing film that was compiled by Mr. Urion, but no script could be found. Coeur was able to locate the script that accompanied the existing film during 2011. The cost of filming and preparation of the script were not invoiced by Mr. Urion prior to his unexpected death. On-going discussions were conducted in 2012 with Mr. Urion's wife on reimbursement for the cost of the filming and script preparation. An agreement was made with Mr. Urion's wife on a reimbursement for the cost of filming and preparation of the script in 2012. Resources were concentrated on finalizing the archeological testing report in 2014, thus limited work was conducted on the video tape production in 2014. Resources are planned to be focused on conducting this work in 2015 following the finalization of the archeological testing report.

9.8 Tailings Treatment Facility Ecological Monitoring Plan

The Tailings Treatment Facility Ecological Monitoring Plan was revised in June 2013 and an approval was received from the Forest Service in June of 2013. The tailings habitability study was commenced in August of 2013 as described in the approved plan. On-going monitoring was conducted by AK Fish and Game in 2014 and results will be presented in the Kensington Gold Project APDES permit AK-005057-1 Volume 1: Aquatic Resource Surveys (Coeur, 2014).

9.9 Berners Bay Transportation Plan

Marine vessel transport occurred between Juneau and Slate Cove or Comet Beach. Heavy equipment and supplies were transported via barge or landing craft and were received at Slate Cove or Comet Beach. Additionally, mine employees were transported

via boat and were also received at Slate Cove. Marine waters located around the marine facilities discussed above were open to public access.

It is a requirement of the Berners Bay Transportation Policy, Mitigation, and BMP Plan to collect information on company marine vessel encounters with special fish, marine mammals, and important bird species during the eulachon spawning season in Berners Bay. This information is documented in Attachment 1.

9.10 Development Rock, Borrow Source, and Tails Material

Development rock and tailing sampling for acid base accounting (ABA) is a requirement of the POO. Development Rock sample results for 2014 are contained in Table 4. Development rock acid-base accounting results indicate minimal potential to generate acid rock drainage.

Quarterly tailings sample results for acid base accounting is contained in Table 5. Acid-base accounting results indicate that the tailings solids are net-neutralizing, thus minimal potential exists for acid rock drainage.

The following background information is included in the SEIS for the site development rock and tailings:

Waste Rock:
SAIC (1997) compiled ABA results for 108 samples originally reported by Geochemica Inc. and Kensington Venture (1994) and SRK (1996b) (Figure 3-1). Seventy-five samples were representative of waste rock in the expected development area (Group 1A and 1B samples), while the remainder represented waste rock from nearby areas outside the expected development area (Group 2 samples). All samples had NP:AP values exceeding 3, and 42 of the 75 Group 1 samples had NP: AP values greater than 50, indicating minimal potential to generate acid rock drainage.

Tailings:
Acid-base accounting tests showed the tailing solids to be net-neutralizing. As sulfide is removed from the tailings during processing, this material is more strongly neutralizing than waste rock produced during project operations (SRK, 1996b). Montgomery Watson (1996b) determined the total sulfur content to be 0.04 percent, corresponding to an NP: AP of 83, while SRK (1996b) measured total sulfur content of 0.02 percent, corresponding to an NP:AP of 166. As is the case for ore and waste rock characterization, potential acidity was conservatively determined based on total sulfur, rather than sulfide sulfur, concentration.

The ABA results for the current development rock and tailings are consistent with what was seen in the background samples as they all have a very high neutralization potential to acid potential. All samples had NPR values, calculated as NP/AP, exceeding 2. According to the Mine Environment Neutral Drainage Program, samples with an NPR>2 are considered non-acid forming.

9.11 Construction/Excavation Dewatering (Non-Stormwater)

No construction/excavation dewatering (Non-Stormwater) occurred at the site during 2014.

Groundwater intercepted in the mine workings is treated and discharged to Sherman creek. This discharge is authorized under ADEC APDES permit AK-005057-1.

Tailings water was decanted and pumped from the TTF to the TTF Water Treatment Plant (WTP) where it was treated and discharged to East Fork of Slate Creek. This discharge is authorized under ADEC APDES permit AK-005057-1.

9.12 Tailings Treatment Facility Monitoring

Monitoring of the TTF was conducted according to the approved Operation and Maintenance (O&M) manual dated December 2012. The O & M Manual describes procedures for operating the Lower Slate Lake Tailings Dam under normal and extreme reservoir level and flow conditions. Additionally, the O&M manual describes the daily, weekly and quarterly inspections that are required to be conducted at the dam along with any actions and maintenance activities that are necessary as a result of the inspection observations.

9.13 Wildlife

9.13.1 ADFG Goat Monitoring

Mountain goat monitoring in the Lions Head Mountain area associated with the Kensington Gold Project has been conducted intermittently since the late 1980's, in part to help determine potential future mine impacts on this population. An updated ADFG goat study is included as Attachment 3. Additionally, ADFG is planning on presenting the results of the study at the annual project meeting.

9.13.2 Terrestrial Wildlife Monitoring – Slate Lakes Basin

Wildlife Monitoring was conducted during 2014 in accordance with the Kensington Project Terrestrial Wildlife Monitoring Plan. This plan was designed to ensure that environmental impacts to wildlife resources in the Slate Lakes basin area are mitigated during both construction and operation of the Kensington Project and that the reclamation process includes a plan to support and encourage use by local wildlife. See Attachment 2 for the 2014 Terrestrial Wildlife Report.

10.0 Avalanche Safety Plan

Coeur Alaska maintains an avalanche hazard awareness and mitigation safety plan during the winter season. A qualified Avalanche Program Director is retained to:

- Identify and quantify the snow avalanche safety hazard
- Prepare recommendations on managing that hazard
- Train employees and contractors in pertinent requirements of the resulting safety plan
- Prepare daily hazard forecasts and perform potential avalanche control activities

Because of the steep terrain adjacent to the site and large quantities of snow-fall, risk avoidance cannot be accomplished in all cases. Therefore, an active avalanche risk mitigation program has been conducted at the site. This involves the use of explosives to initiate controlled release of smaller avalanches so as to reduce the risk of naturally triggered larger and more destructive avalanches.

During 2014, active control work was required and performed. During the 2014 reporting period,

- Areas of avalanche risk were placarded
- Crews were informed of avalanche hazards and the appropriate responses to those hazards
- Daily risk forecasts were prepared and communicated to crews, based on site weather and snow condition data
- Avalanche rescue equipment was located on-site
- Crews were trained in their role in avalanche rescue operations and the use of the rescue equipment – as appropriate
- Avalanche control was utilized on several occasions through the use of an avalancher and explosives.

During the reporting period, site activities were not curtailed as a result of identified avalanche hazards and no personnel were caught or injured in avalanches.

11.0 Dam Safety Oversight Status

A Certificate of Approval to Operate a Dam for the stage 2 dam was issued by Department of Natural Resources (DNR) – Alaska Dam Safety (ADS) on May 6, 2013. As required by Condition #8 of the Certificate of Approval to Operate a Dam dated May 6, 2013, and Periodic Safety Inspection was performed by Golder Associates Inc. for the Lower Slate Lake Tailings Dam on June 24, 2014. A formal report was submitted to ADS for review and comment.

Projected Activities for 2015

Key Issues and Permitting Activities

Graphitic Phyllite was excavated from a stockpile located at the north end of the TTF and hauled to a temporary stockpile located within the underground workings. All of the graphitic phyllite with the exception of approximately 1000 tons was made into Cement Rock Fill (CRF) and placed into the open stopes as backfill in 2014. The disposal of the remaining graphitic phyllite as CRF into an open stope is planned for the first quarter of 2015.

Water quality monitoring from the toe of the stockpile located at the north end of the TTF will continue in 2015. Monitoring will continue until such time as the seepage from the stockpile is similar to background water quality results and approval is received from the Forest Service and State of Alaska to discontinue the monitoring.

Four field-scale test cells were constructed in August of 2013 to assess the environmental stability of the graphitic phyllite material. The testing program is aimed at providing an evaluation of the weathering behavior of the graphitic phyllite present at the TTF west abutment under ambient conditions. On-going water quality monitoring of these field cells occurred during 2014 and will continue throughout 2015.

A fuel depot was proposed to the Forest Service in June 2014. The proposed fuel depot would replace the current iso-container fuel delivery system with a state of the industry, transportable fuel depot, increasing safety and environmental protection while improving fuel quality control, reliability of supply and control. Distribution of fuel around the site will remain unchanged with the proposed system. The fuel depot will consist of seven aboveground UL142 listed 50,000 gallon dual walled storage tanks. Each tank will be equipped with an overfill prevention valve, anti-siphon valve, high level alarm with audible and visible alerts, interstitial monitoring, temperature gauge and mechanical level gauges. The tanks and piping will be protected against impact by concrete jersey barriers or similar structures. On-going permitting of the proposed fuel depot will continue in 2015.

1.0 Public Safety

No revisions to the Public Access Control Plan are contemplated for 2015.

2.0 Mine Operations

Ore production is planned throughout the entire year of 2015. Additional development of the Raven Vein will continue throughout 2015.

An additional portal and down ramp has been proposed to be constructed from the existing high wall of the mill bench in order to access a new mineralized vein system. This new vein system lies between the historic Jualin workings developed in the early 1920's, and the existing Kensington portal system. The proposed 2015 project will consist of approximately 7,700 - 8,800 feet of development face advance. An initial project proposal was submitted to the agencies in September 2014 and a revised proposal incorporating the additional information requested by the agencies is planned to be submitted in the first quarter of 2015. Pending approval from the agencies, the construction of the new portal and down-ramp is planned for the third quarter of 2015.

3.0 Mill Operations

Mill Operations are planned to be at full production throughout 2015.

Over the past 2 years, coarse pebble reject rock with little value (0.040 ounces per ton) has been produced from the mill facility. Testing of X-Ray Transmission (XRT) sorting

on pebble reject has been shown to be successful in separating the valuable rock from the low grade bulk material. A XRT machine has been ordered and is planned to begin processing of the material in the third quarter of 2015.

4.0 Tailings Treatment Facility

Engineering and permitting of the Stage 3 dam raise is planned to occur in 2015 in anticipation for construction of the stage 3 raise to occur in 2016.

5.0 Access Corridors

Most access road and corridor upgrades were completed in 2006. Road maintenance of the access corridors will continue in 2015.

6.0 Reclamation

No final reclamation is anticipated to occur in 2015. On-going monitoring of the revegetation test plots will continue throughout 2015.

7.0 Surface Exploration

During the 2014 drill season, five drill holes (7,120 feet) were drilled on lands administered by the Forest Service. Additional surface exploration is planned to be conducted on lands administered by the Forest Service in 2015 and an updated work plan will be submitted to the Forest Service describing the proposed drilling program.

8.0 Proposed Modifications to Monitoring Plans for 2014

Revisions to the Fresh Water Monitoring Plan and Quality Assurance Project Plan were made in August 2014 and approved by the Forest Service in September 2014. No further revisions to the plans are anticipated for 2015.

9.0 Bonding

A financial guarantee in the amount of $28,727,011 was submitted and approved by the Forest Service in 2013. Included in the amount is a lump sum of $695,000, which the Forest Service will hold until a Long Term Care and Maintenance (LTCM) plan and cost estimate is approved. The LTCM cost estimate will then be used to establish a funding mechanism for the inspection, maintenance, and monitoring of the TTF dam and roads in perpetuity. Once the LTCM is established and approved by the State of Alaska and Forest Service, the financial guarantee can be reduced by the lump sum of $695,000. The LTCM was submitted to the Forest Service along with a proposed funding mechanism in 2013 for review and comment. Coeur looks forward to working with the Forest Service to finalize an approved LTCM and funding mechanism in 2015.

Figures

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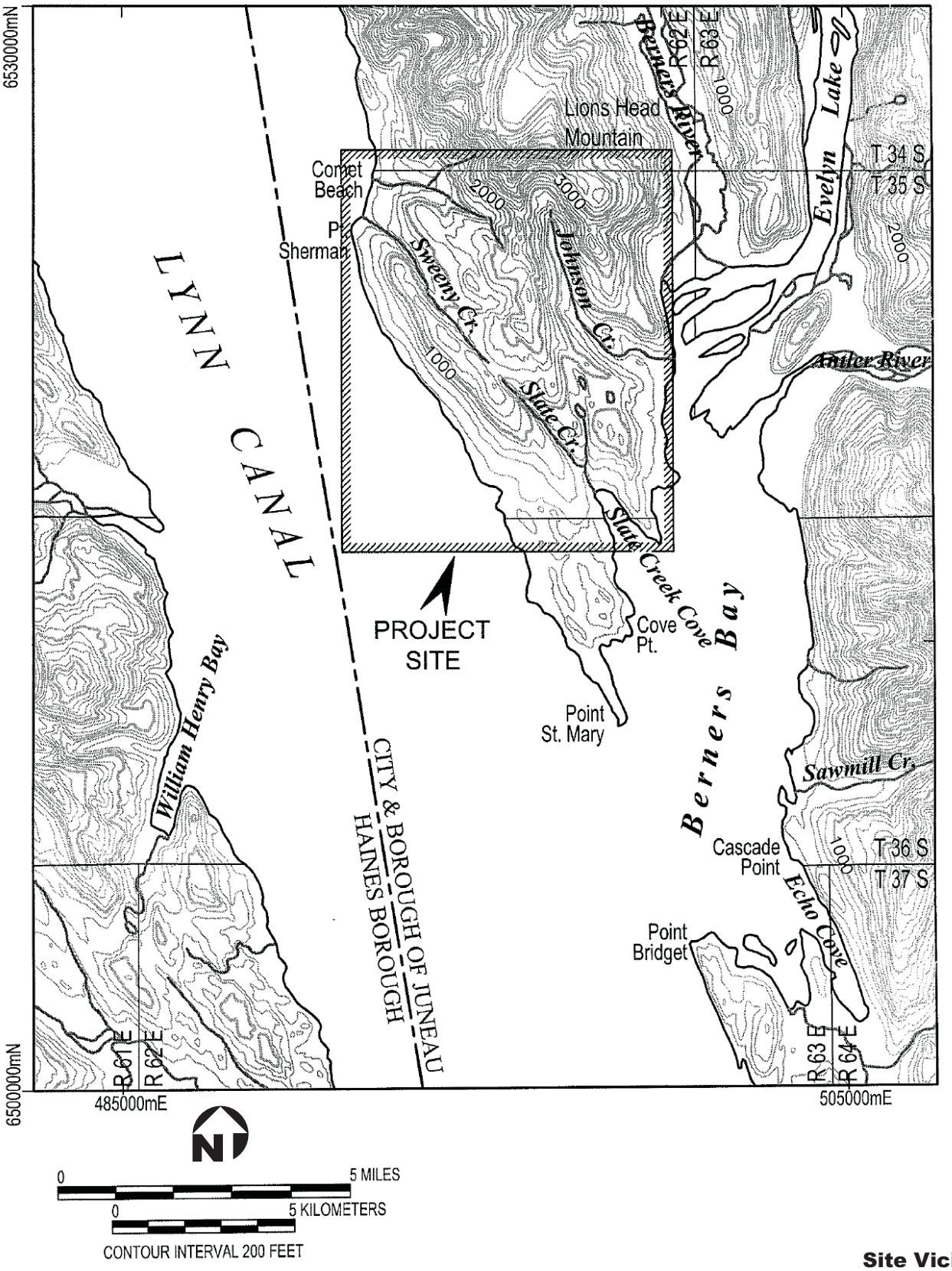


Site Vicinity

Applicant: Couer Alaska, Inc.
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

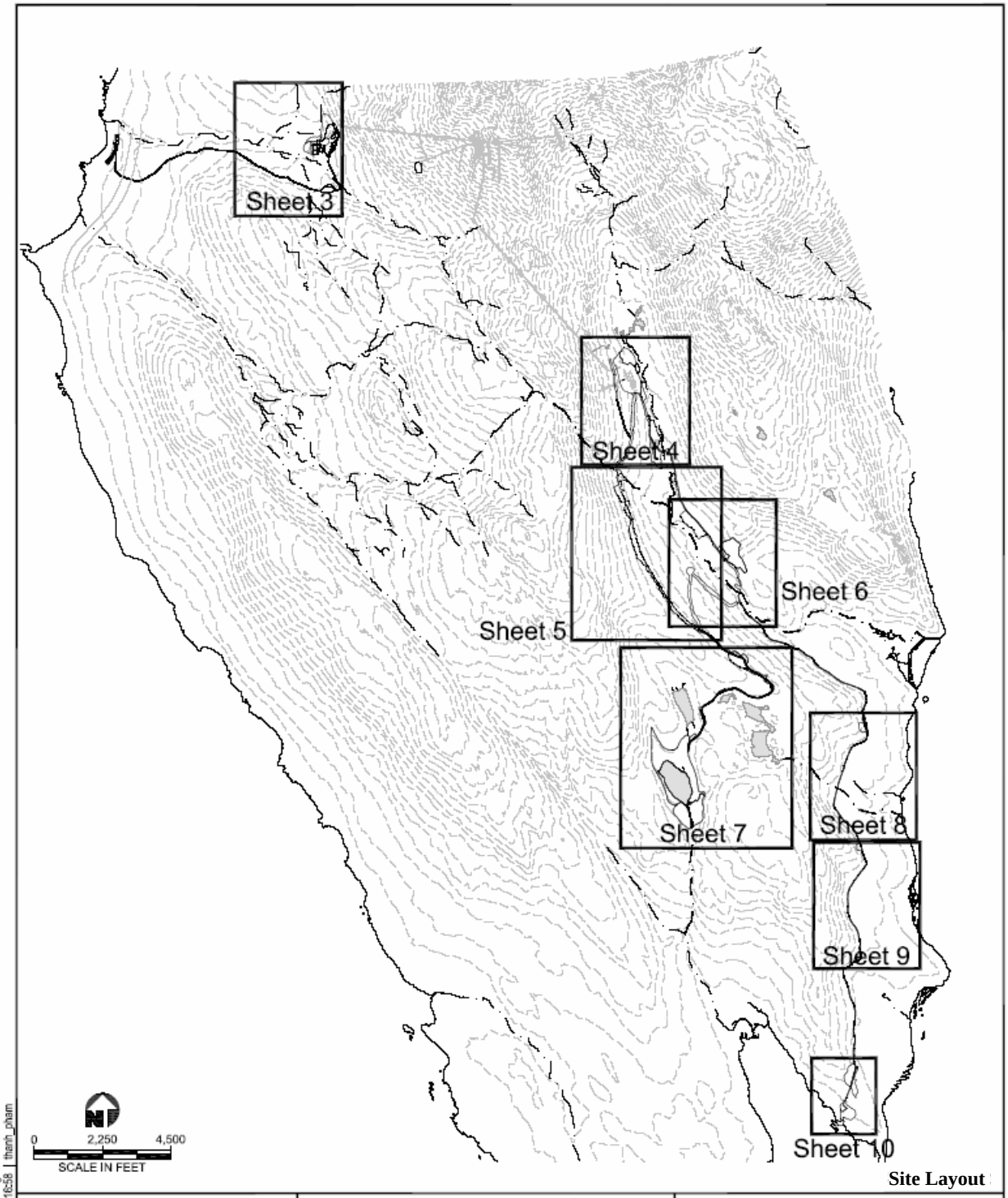
Adjacent Property Owners:
1. U.S. Forest Service

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances

Near/At: T35S, R62E
Municipality: City and Borough of Juneau
State: Alaska

Sheet: 1 of 10
Date: December 2008



Site Layout

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances,

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 2 of 10
Date: December, 2008

T:\Misc-Jobs\Coeur Alaska\JA\RPA\Sheet 1 Site.dwg
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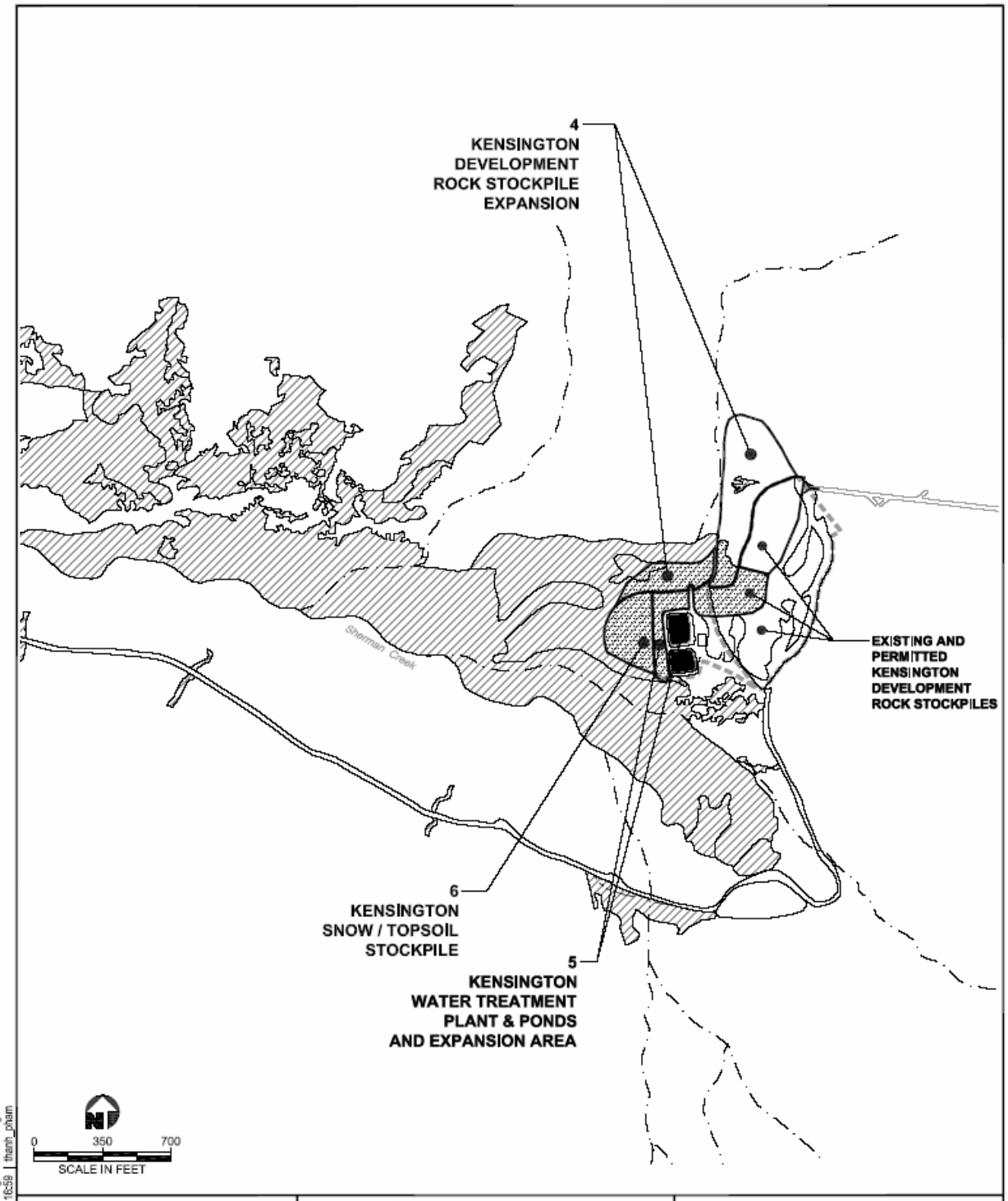

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Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact
- Existing Prior to Permitting

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

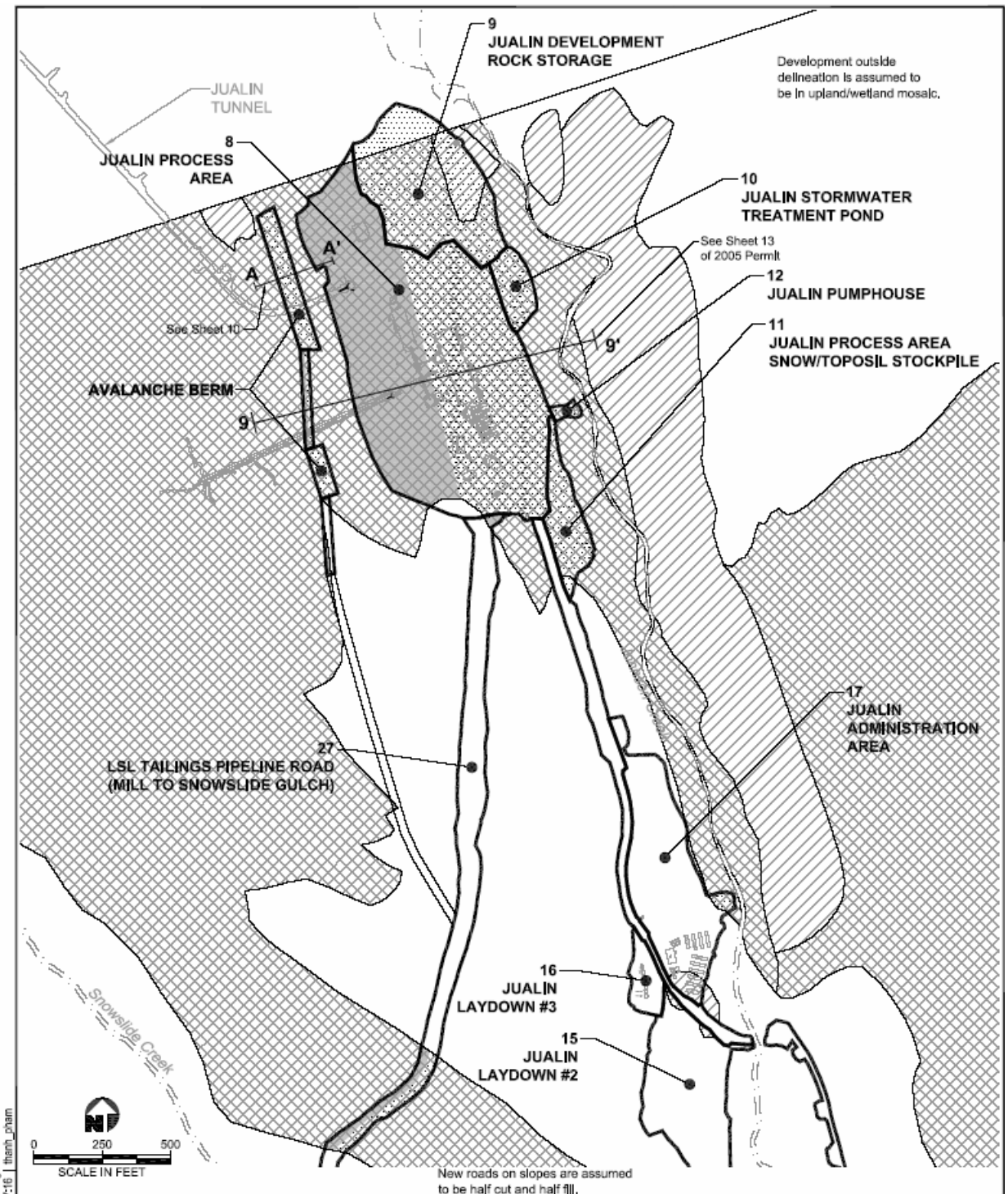
Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 3 of 10
Date: December, 2008



Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

Datum: Alaska State Plane Zone 1 NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 4 of 10
Date: December, 2008

T:\Misc-Jobs\Coeur Alaska\JARPA\Sheet 3 Jualin.dwg
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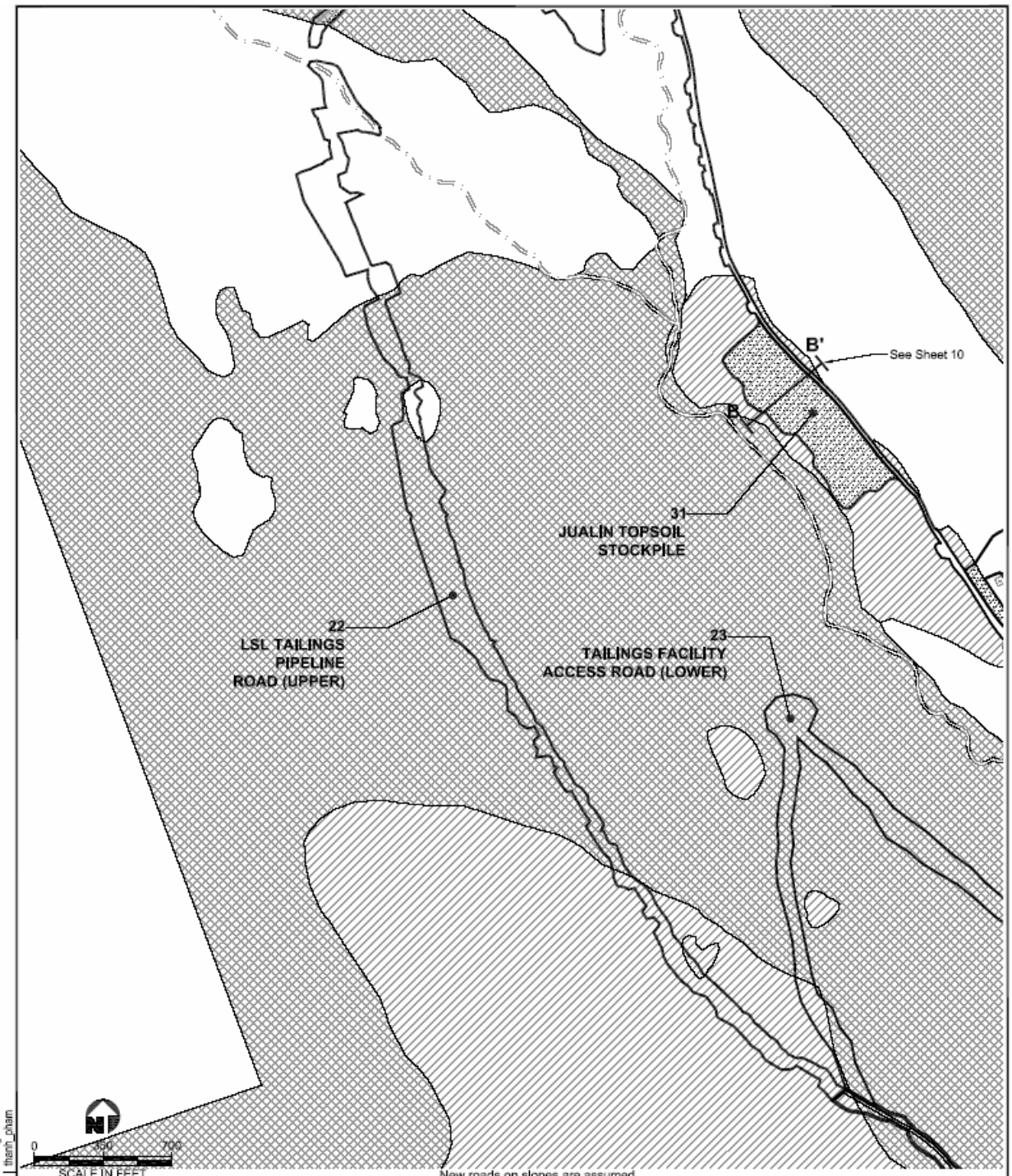

New roads on slopes are assumed to be half cut and half fill.

Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 5 of 10
Date: December, 2008

T:\Misc-Jobs\Coeur Alaska\JARPA\Sheet 4 Pipeline Road.dwg
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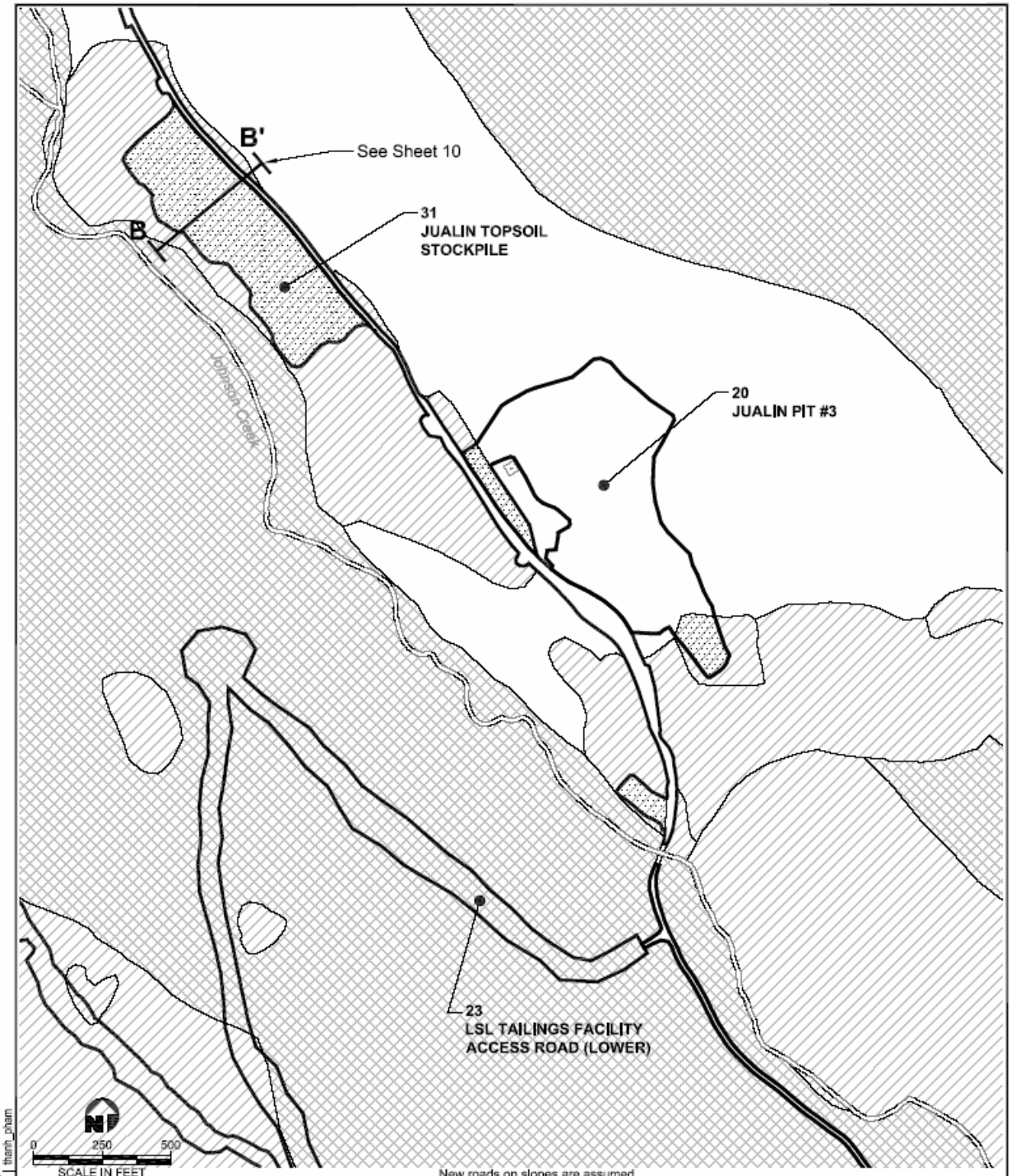


New roads on slopes are assumed to be half cut and half fill.

Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

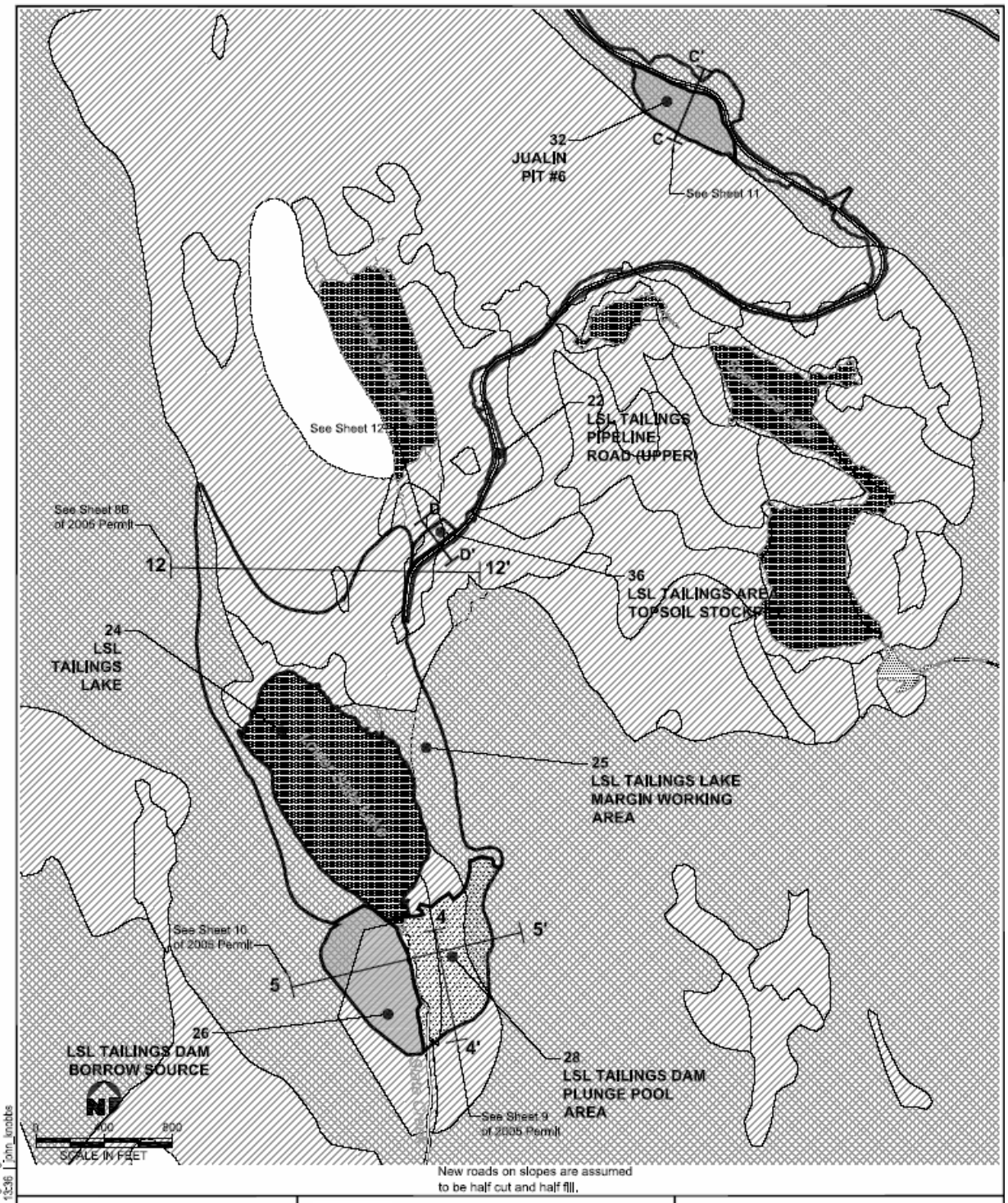
Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 6 of 10
Date: December, 2008

T:\Misc-Jobs\Coeur Alaska\JARPA\Sheet 5 Jualin.dwg
Mod: 12/19/2008, 17:02 | Plotted: 12/19/2008, 17:14 | thanh_pham



T:\Misc-Jobs\Coeur Alaska\JARPA\Sheet 7 Tailings.dwg
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Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

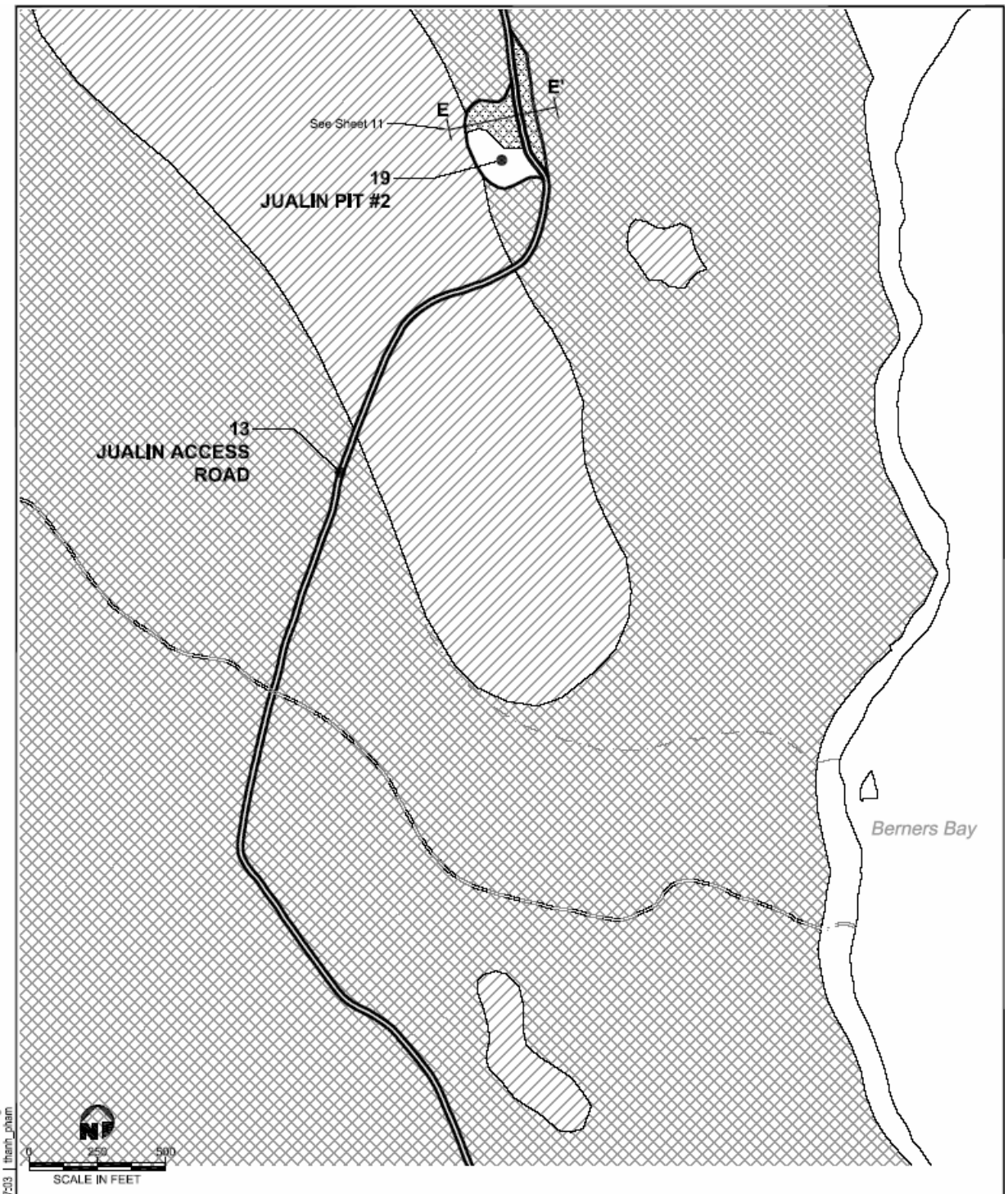
Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 7 of 10
Date: December, 2008



T:\Misc-Jobs\Coeur Alaska\JARPA\Sheet 7 Jualin Access Road.dwg
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Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

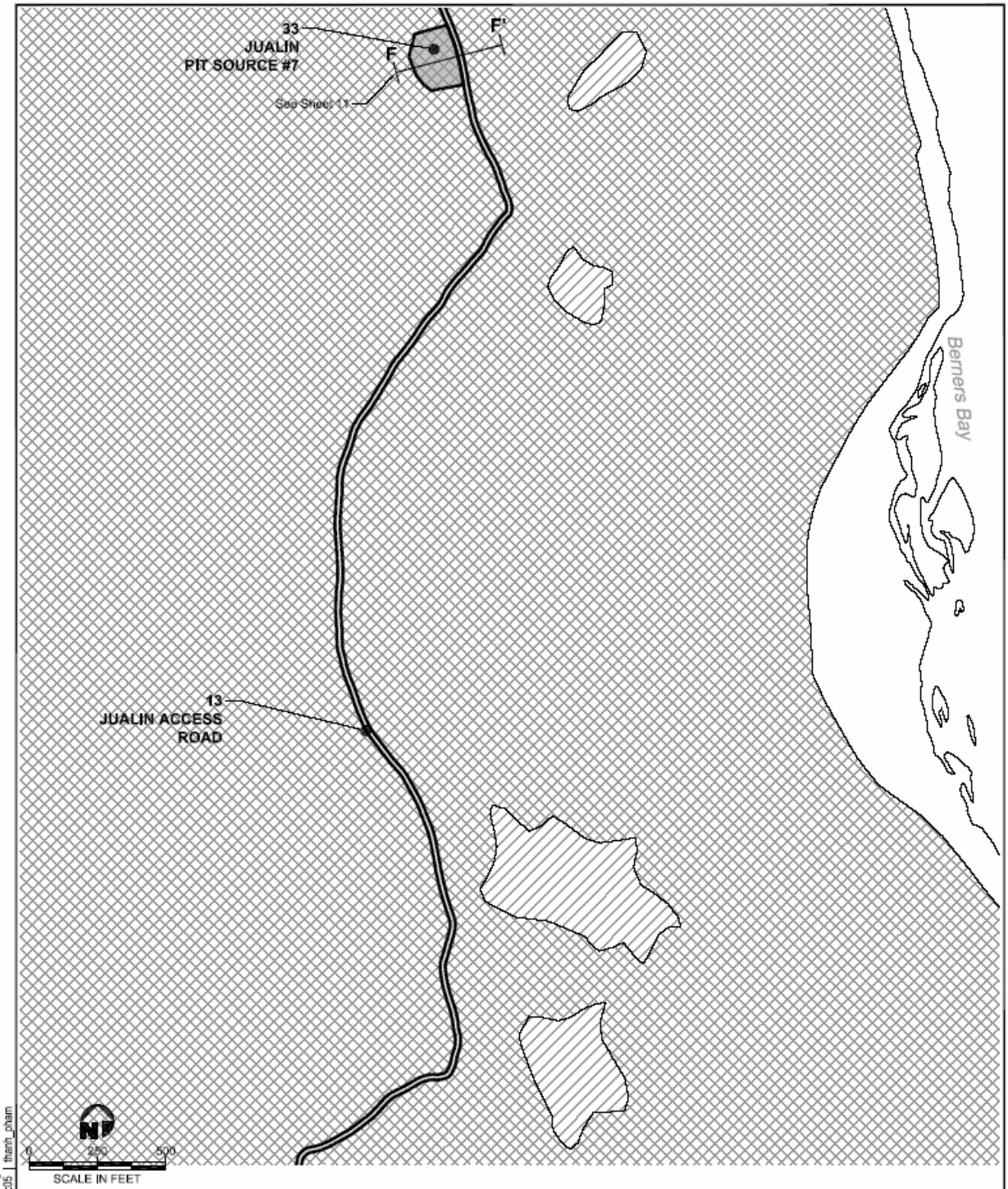
Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 8 of 10
Date: December, 2008



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Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

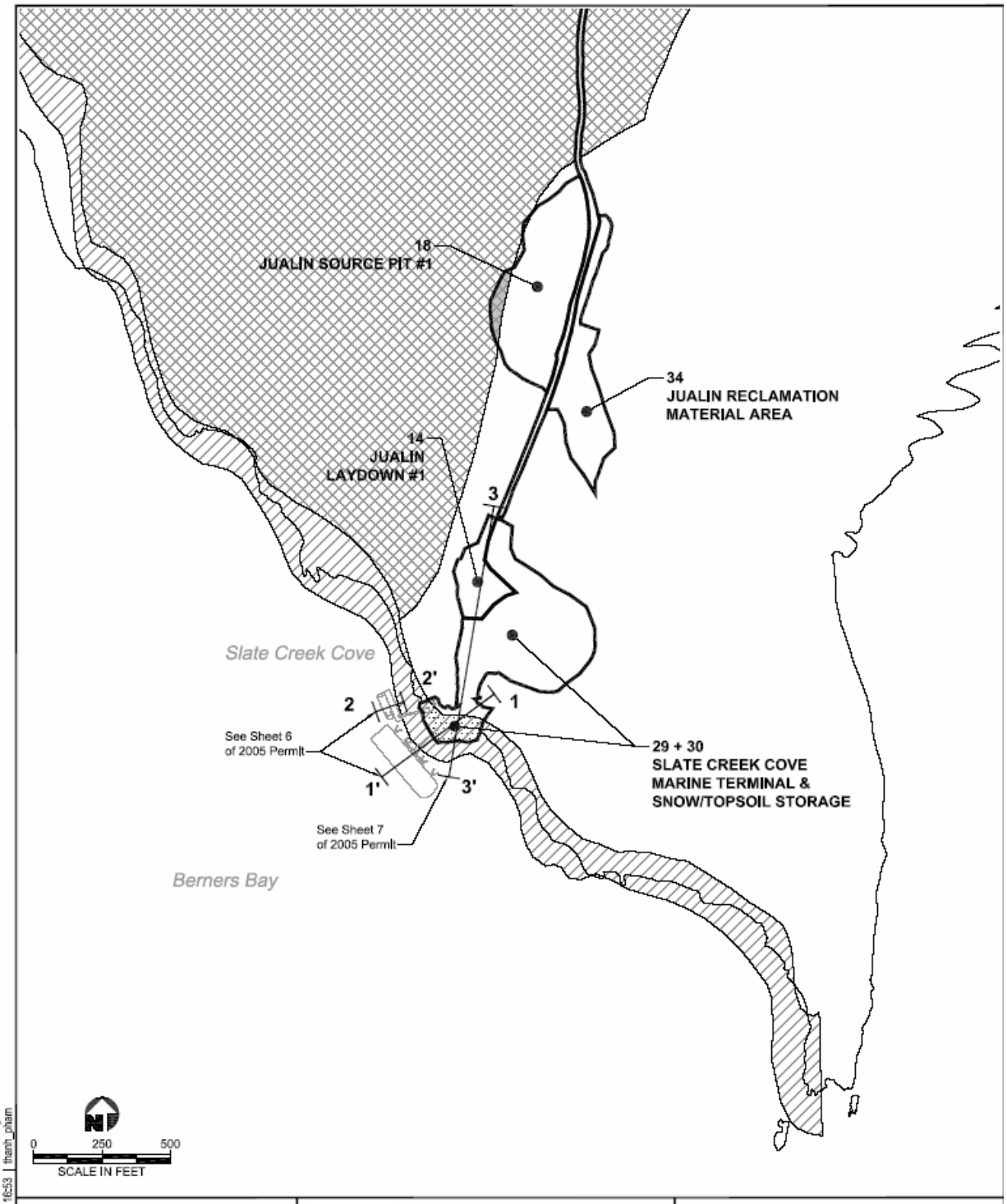
Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 9 of 10
Date: December, 2008



T:\Misc-Jobs\Coeur Alaska\JARPA\Sheet 9 Slate Creek Cove.dwg
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Legend

- Work Area Boundary
- Wetland
- 25% Wetland Mosaic
- Upland or Bay
- Fill Impact
- Cut Impact

Applicant: Coeur Alaska, Inc
Permit No:

Location Address: Approximately Lynn Canal at Berners Bay, Juneau, Alaska

Adjacent Property Owners:
1. U.S. Forest Service

Datum: Alaska State Plane Zone 1
NAD 83 on a NAD 27 Baseline

Proposed: Kensington Gold Project

Purpose: Construction of mining related facilities and appurtenances.

Near/At: T35S, R62E
Municipality: City and Burough of Juneau
State: Alaska

Sheet: 10 of 10
Date: December, 2008

Tables

Table 1 Kensington Gold Project – Surface Disturbance

Area	Description	Status 2014	Permitted Disturbance Acreage – Total	Actual Disturbance - Acreage- Total
1	Kensington Comet Beach Camp	Existing / Permitted	3.2	3.2
2	Kensington Access Road	Existing / Permitted	5.7	5.7
4	Kensington Development Rock Stockpile	Existing / Permitted	13.0	13.0
5	Kensington Water Treatment Plant & Ponds	Existing / Permitted	3.7	3.7
6	Kensington Snow / Topsoil Stockpile	Existing / Permitted	3.2	3.2
7	Kensington 2050 Level Portal Development Rock Storage	Existing / Permitted	1.5	1.5
8	Jualin Process Area	Built	17.4	17.4
8A	Jualin Avalanche Berms & Road	Partially built	1.25	0.4
9/9A	Jualin Development Rock Storage	Mostly Built	4.7	4.7
10	Jualin Storm Water Treatment Pond	Built	0.7	0.7
11	Jualin Process Area Snow/Topsoil Stockpile Area	Built	1.3	1.3
12	Jualin Pumphouse	Built	0.1	0.1
13	Jualin Access Road	Existing / Built	28.4	28.4
14	Jualin Laydown #1	Built	0.9	0.9
15	Jualin Laydown #2	Built	3.7	3.7
16	Jualin Laydown #3	Built	0.6	0.6
17	Jualin Administration Area	Built	4.5	4.5
18	Jualin Pit Source #1	Built	3.8	3.8
19	Jualin Pit Source #2	Built	1.3	1.3
20	Jualin Pit #3	Built	11	11
22	LSL Tailings Pipeline & Access Road (Upper)	Built	9.6	9.6
23	LSL Tailings Facility Access Road (Lower)	Built	9.1	9.1
24	LSL Tailings Lake	Partially occupied	23.5	23.5
25	LSL Tailings Lake Margin Working Area	Partially occupied	49.8	49.8
26	LSL Tailings Dam Borrow Source	Partially built	4.9	4.9
27	LSL Tailings Pipeline Road (Mill to Snowslide Gulch)	Built	20.7	20.7
28	LSL Tailings Dam & Plunge Pool Area	Built	5.4	5.4

Area	Description	Status 2013	Permitted Disturbance Acreage – Total	Actual Disturbance - Acreage- Total
29	Slate Creek Cove Marine Terminal	Built	4.1	4.1
30	Slate Creek Cove Snow/Stockpile Area	Built	0	0
31	Jualin Topsoil Stockpile	Built	6.8	6.8
32	Jualin Borrow Source #6	Partially built	3.5	3.5
34	Jualin Reclamation Materials Area	Built	2.1	2.1
36	Tailings Area Topsoil Stockpile	Built	0.6	0.6
	TOTALS		**250.1**	**249.2**

Table 2 - Kensington Gold Project – Wetlands Disturbance

Area	Description	Status 2014	Permitted Acres of Fill in Waters of the U.S. per 2005 Permit Table 1	Actual Waters of U.S. Acres Filled as of December 2014	Requested Acres of Total Fill in Waters of the U.S. 2009 update	Fill Volume (Cubic Yards)	Acres to be Reclaimed as Wetlands or Waters
1	Kensington Comet Beach Camp	Existing / Permitted	0	0	0	0	NA
2	Kensington Access Road	Existing / Permitted	0.9	0	0	0	NA
3	Kensington Borrow Pit #1	Not built	0.3	0	0	0	NA
4	Kensington Development Rock Stockpile Expansion	Existing / Permitted	5.1	1.1	4.5	220,000	8
5	Kensington Water Treatment Plant & Ponds and Expansion Area	Existing / Permitted	2.6	2.9	3.5	85,000	3.5
6	Kensington Snow / Topsoil Stockpile	Existing / Permitted	2.1	0	2.1	10,000	2.1
7	Kensington 2050 Level Portal Dev. Rock Storage	Existing / Permitted	0	0	0	0	0
8	Jualin Process Area	Built	1.1	2.0	2.0	97,000	NA
8A	Jualin Avalanche Berms & Road	Not built		0	0.3	23,000	NA
9/9A	Jualin Development Rock Storage	Mostly Built	4.3	2.0	2.5	121,000	1.7
10	Jualin Storm Water Treatment Pond	Built	0	0.1	0.1	1,500	NA
11	Jualin Process Area Snow/Topsoil Stockpile	Built	0	0.2	0.2	3,000	0.6
12	Jualin Pumphouse	Built	0.1	0.1	0.1	1,500	NA
13	Jualin Access Road	Existing / Built	8.2	7.7	7.7	37,000	0.6
14	Jualin Laydown #1	Built	0.4	0	0	0	NA
15	Jualin Laydown #2	Built	3.5	0	0	0	NA
16	Jualin Laydown #3	Built	0.8	0	0	0	NA
17	Jualin Admin. Area	Built	2.5	0.1	0.1	1,500	2.5
18	Jualin Borrow Source #1	Built	0	0	0		0.2
19	Jualin Borrow Source #2	Built	0.1	1.1	1.1	10,500	
20	Jualin Borrow Source #3	Built	2.4	1.2	1.2	11,500	6.0
21	Jualin Borrow Source #4	Not built	0.7	0	0	0	NA

Area	Description	Status 2014	Permitted Acres of Fill in Waters of the U.S. per 2005 Permit Table 1	Actual Waters of U.S. Acres Filled as of December 2014	Requested Acres of Total Fill in Waters of the U.S. 2009 update	Fill Volume (Cubic Yards)	Acres to be Reclaimed as Wetlands or Waters
22	LSL Tailings Pipeline & Access Road (Upper)	Built	4.7	4.3	4.3	41,500	4.3
23	LSL Tailings Facility Access Road (Lower)	Built	0.3	1.3	1.4	13,500	2.8
24	LSL Tailings Lake (tailings as fill)	Occupied	23.5	23.5	23.5	3,920,000	(23.5)
25	LSL Tailings Lake Margin Working Area	Partially occupied	8.5	10.9	10.9	500	8.7 (38.5)
26	LSL Tailings Dam Borrow Source	Partially built	0.3	0.3	0.3	3,000	0
27	LSL Tailings Pipeline Road (Mill to Snowslide Gulch)	Partially built	3.0	0.4	0.4	3,500	2.2
28	LSL Tailings Dam & Plunge Pool Area	Built	5.9	6.1	6.1	236,000	2.4
29	Slate Creek Cove Marine Terminal	Built	1.9	0.5	0.5	12,000	3.2
30	Slate Creek Cove Snow/Stockpile Area	Built	0.2	0	0	0	0.5
31	Jualin Topsoil Stockpile	Built	0	6.8	6.8	300,000	6.8
32	Jualin Borrow Source #6	Partially built	0	0.1	0.1	1,500	0
33	Jualin Borrow Source #7	Not Built	0	0	0	0	NA
34	Jualin Reclamation Material Area	Built	0	0.8	0.8	0	0
36	LSL Tailings Area Topsoil Stockpile	Not built	0	0	0.6	14,500	0.6
	TOTALS		**83.4**	**73.5**	**80.3**	**5,168,500**	**110.0**

TABLE 3: ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ANNUAL SPILL LOG

FACILITY NAME, ADDRESS & Phone #: Coeur Alaska - Kensington Gold Mine, (907) 523-3337

REPORT MONTH/YR: 2014 Summary

Date of Spill	Time of Spill	Product Spilled	Quantity Spilled	Location of Spill	Cause of Spill or additional information	Area(s) Affected	Clean Up (Y/N)	Reported to State
1/17/2014	12:00 PM	Diesel Fuel	550-600 gallons to secondary containment structures	Mill Bench - 30,000 gallon tank	An investigation was conducted by site personnel following the spill and a ball valve on the inlet piping filter vessel of the 30,000 gallon tank was found slightly open. The valve could have been forced open by snow and ice falling from the top of the tank. The slightly open ball valve is believed to be the source of the spill. As an Isotainer of diesel fuel is transferred to the 30,000 gallon tank, fuel would be forced through the open valve and leak to the containment. Also once the transfer was complete the filter vessel would drain to the containment.	All spilled material was contained within the secondary containment structures	The spilled diesel fuel and water mixture was pumped into empty chemical totes. Fuel absorbent pads and booms were also utilized to clean-up the diesel. Diesel will be pumped off and reused to the extent possible. The remaining water/diesel fuel mixture will be shipped off-site to a permitted TSDF capable of fuel/water separation and fuel recycling for final disposal.	Yes, Verbally reported to ADEC on 1/19/14 and Incident Report Submitted to ADEC on 1/21/14
3/2/2014	6:00 AM	Grey Water	50 Gallons	Sewer Treatment Plant	The gate valve on the pumper truck malfunctioned causing approximately 50 gallons of grey water to be spilled onto the ground.	Frozen Ground	The area was immediately flagged-off to prevent access to the area. The spill occurred on frozen ground so the spilled material could be cleaned up utilizing the pumper truck. The spill area was disinfected with a 5% chlorine solution and the area remained flagged-off for 24 hours.	Yes, Verbally Reported to ADEC on 3/2/14, 2:00 PM, and Report submitted on 3/3/14
3/27/2014	7:20 AM	Diesel Fuel	35 gallons	Underground Mine	Check Valve on the underground mucker in the breather failed causing fuel to be leaked onto the ground within the underground mine. See attached completed DEC spill notification form.	Underground Mine Workings	Adsorbent pads and booms were utilized to clean-up the spilled diesel fuel. The spend adsorbent pads were disposed of in the site incinerator.	Yes, Verbally reported to ADEC on 3/28/14 at 11:40 AM
4/7/2014	9:00 AM	Motor Oil	2 gallons	Mill Bench adjacent to Generator #1	While filling the oil reserve tank on Generator #1, approximately two gallons of oil was spilled onto the frozen ground at that location.	Mill Bench - Frozen Ground	Adsorbent pads were utilized to clean-up the spilled motor oil. The spend adsorbent pads were disposed of in the site incinerator.	Yes, Site Monthly Report
5/19/2014	7:10 AM	Hydraulic Oil	2 gallons	Portal Bench	A fitting on the hydraulic line of the mill excavator failed causing hydraulic oil to be spilled onto the ground.	Portal Bench - Hard packed soil pad	Adsorbent pads were utilized to clean-up the spilled hydraulic oil. The spent adsorbent pads were disposed of in the site incinerator.	Yes, Site Monthly Report

Date of Spill	Time of Spill	Product Spilled	Quantity Spilled	Location of Spill	Cause of Spill or additional information	Area(s) Affected	Clean Up (Y/N)	Reported to State
5/29/2014	2:30 AM	Hydraulic Oil	8 gallons	Portal Bench	A plug and seal failed on the hydraulic line of the rock breaker attachment for the mill excavator causing hydraulic oil to be spilled onto the ground.	Portal Bench	Adsorbent pads were utilized to clean-up the spilled hydraulic oil. The spent adsorbent pads were disposed of in the site incinerator. Additionally, soil and rock was excavated and placed into 55 gallon drums. Five drums were filled with the contaminated soil. The contaminated soil is planned to be disposed of with Clean Harbors, Inc. The material is planned to be shipped off-site in the next 30-60 days.	Yes, Site Monthly Report
7/7/2014	1:30 PM	Hydraulic Oil	4.5 gallons	Portal Bench	The hydraulic line on the boom of the excavator failed causing a spill of hydraulic oil.	Portal Bench	Adsorbent pads were utilized to clean-up the spilled hydraulic oil. The spent adsorbent pads were disposed of in the site incinerator.	Yes, Site Monthly Report
7/24/2014	11:00 AM	Hydraulic Oil	9.5 gallons	Comet Beach	Spilled hydraulic oil was identifed during a routine site inspection on 7/24/14. On-going investigations are being conducted to identify the cause of the spilled hydraulic oil.	Comet Beach	A contamination area of 8 ft by 10 ft by 3ft deep was excavated and the soil was placed into a lined secondary containment. Soil samples were collected and sent to a third party laboratory to confirm that all of the contaminate soil has been excavated. The excavation will then be back-filled and the ecavation soil is planned to be sent off-site for disposal.	Yes, Site Monthly Report
8/9/2014	3:30 PM	Diesel Fuel	7.5 gallons	Mill Bench	A leak occurred on the iso-container valve while transferring fuel from an iso-container to the site 30,000 gallon fuel tank.	Mill Bench	Adsorbent pads were utilized to clean-up the spilled diesel fuel. The spent adsorbent pads were disposed of in the site incinerator.	Yes, Site Monthly Report
8/17/2014	11:00 AM	Diesel Fuel	2 gallons	Top of Pipeline Road	Diesel fuel was spilled onto the ground as a result of diesel fuel being spilled into the bed of a pick-up truck while Timberline drilling was conducting fueling operations	Top of Pipeline Road	The spent adsorbent pads were disposed of in the site incinerator.	Yes, Site Monthly Report
8/20/2014	1:30 PM	Diesel Fuel	20 Gallons	Portal Bench	A faulty fuel filter on the primary gen-set #4 caused a spill of approximately 20 gallons of diesel fuel adjacent to the stationary gen-set.	Pipeline Road	Adsorbent pads were utilized to clean-up the spilled diesel fuel. The spent adsorbent pads were disposed of in the site incinerator. The contaminate soil was excavated and placed into three fifty-five gallon drums for disposal. Coordination is being conducted with Clean Harbors for disposal	Yes, Verbally to DEC SPAR on 8/21/14 @ 8:50 AM.

Date of Spill	Time of Spill	Product Spilled	Quantity Spilled	Location of Spill	Cause of Spill or additional information	Area(s) Affected	Clean Up (Y/N)	Reported to State
8/23/2014	1:00 PM	Diesel Fuel	5 gallons	Pipeline Road	Diesel fuel was spilled onto the ground as a result of over-filling the fuel tank located adjacent to the gen-set powering timberline drilling operations.	Pipeline Road	Adsorbent pads were utilized to clean-up the spilled diesel fuel. The spent adsorbent pads were disposed of in the site incinerator. The contaminate soil was excavated and placed into three fifty-five gallon drums for disposal. Coordination is being conducted with Clean Harbors for	Yes, Site Monthly Report
9/28/2014	11:30 PM	Hydraulic Oil	35 gallons	Portal Bench on Ore Pad	A Wheel Seal and Bearing on a Haul Truck failed causing hydraulic oil to be spilled onto the ground.	Portal Bench on existing ore pad	Adsorbent rolls, pads, and booms were utilized to clean-up the spilled hydraulic oil. The spent adsorbent pads were disposed of in the site incinerator.	Yes, Verbally to DEC-SPAR on 9/30/14 at 9:20 AM
10/8/2014	2:30 PM	Hydraulic Oil	2 gallons	Comet Water Treatment Plant Pad	While operating a fork-lift adjacent to the treatment plant, a hydraulic hose burst with approximately 2 gallons of hydraulic oil being spilled onto the ground.	Comet Water Treatment Plant Pad	Adsorbent pads were utilized to clean-up the spilled hydraulic oil. The spent adsorbent pads were disposed of in the site incinerator.	Yes, Monthly Report
10/24/2014	3:00 PM	Transmission Oil	5 gallons	Ore Stockpile Portal Pad	The O-ring on a transmission oil filter failed on an underground haul truck resulting in approximately 5 gallons of transmission oil being spilled onto the ground.	Ore Stockpile Portal Pad	Adsorbent pads and booms were utilized to clean-up the spilled transmission oil. The spent adsorbent materials were disposed of in the site incinerator.	Yes, Monthly Report
11/12/2014	3:30 PM	Hydrochloric Acid	50 gallons	Warehouse Storage Space	The valve on a plastic chemical tote was broke off while loading the hydrochloric acid tote into a connex. The tote was going to be moved with a forklift when the fork on forklift struck the valve and broke it causing hydrochloric acid to be spilled into the connex.	Warehouse Storage Space	Yes, Approximately 200 gallons of hydrochloric acid was spilled out of the tote as a result of a broken valve on the tote. The area was barricaded off to prevent employees from entering other than spill response personnel. Of the 200 gallons, 100 gallons of the acid was recovered and placed into a new tote and 50 gallons was recovered utilizing adsorbent pads. Approximately 50 gallons of acid reported to land. Adsorbent pads were utilized to clean-up as much of the acid as possible. The majority of the acid was cleaned up with the adsorbent pads. Baking soda was utilized to neutralize the soil where the acid reported to land.	Yes, Verbally to SPAR on 11/12/14 and Final Incident Report submitted on 11/24/14

Date of Spill	Time of Spill	Product Spilled	Quantity Spilled	Location of Spill	Cause of Spill or additional information	Area(s) Affected	Clean Up (Y/N)	Reported to State
12/23/2014	9:30 AM	15/40 motor oil	2 gallons	Mill Bench	One spill of approximately 2 gallons of motor oil occurred on the Mill Bench. The spill was the result of the valve on the bottom of the oil tank leaking out oil which passed through a torn liner containment and flowed onto the ground.	Mill Bench	Adsorbent pads were utilized to clean-up the motor oil. Additionally, 1-55 gallon drum of contaminated soil was removed from the spill site.	Yes, Monthly Report

Table 4

2013/2014 Development Rock MWMP Results	TDS (mg/L)	pH	NH_3 (mg/L)	Al (ug/L)	Ar (ug/L)	Cd (ug/L)	Cr (ug/L)	Cu (ug/L)	Fe (ug/L)	Pb (ug/L)	Hg (ug/L)	Ni (ug/L)	Se (ug/L)	Ag (ug/L)	Zn (ug/L)	Nitrate as N (mg/L)	Sulfate as SO4 (mg/L)
2013 Development Rock 1st Quarter	91	7.98	0.71	96	ND	ND	ND	1.02	ND	ND	ND	ND	ND	ND	ND	3.76	25.2
2013 Development Rock 2nd Quarter	174	8.42	1.15	314	ND	ND	ND	ND	ND	ND	ND	1.09	ND	ND	ND	13.1	38.8
2013 Development Rock 3rd Quarter	221	7.58	1.00	114	ND	ND	ND	1.36	ND	ND	ND	ND	ND	ND	ND	5.27	97.6
2013 Development Rock 4th Quarter	97	7.45	1.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.28	37.2
2014 Development Rock 1st Quarter	73	7.58	0.9	81.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.37	17.0
2014 Development Rock 2nd Quarter	164	7.65	2.95	ND	ND	ND	ND	1.23	ND	ND	ND	1.00	ND	ND	ND	7.27	64.8
2014 Development Rock 3rd Quarter	ND	7.30	0.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	1.7
2014 Development Rock 4th Quarter	80	7.52	1.87	ND	ND	ND	ND	ND	ND	ND	ND	1.71	ND	ND	ND	6.77	7.81

2013/2014 Development Rock ABA Results	*Sulfur, Total*	*Sulfur Forms (Acid Extractable and Non-extractable Sulfur) 3.2.6*			*Acid Potential*	*Neutralization Potential*	*Acid - Base Accounting*
	3.2.4	*Sulfate*	*Pyritic*	*Non-extractable*	*1.3.1*	*3.2.3*	*1.3.1*
	wt%	*wt%*	*wt%*	*wt%*	*t CaCO3/1000t*	*t CaCO3/1000t*	*t CaCO3/1000t*
2013 Development Rock 1st Quarter	0.15	ND	0.16	0.16	4.9	39.2	34.3
2013 Development Rock 2nd Quarter	0.03	0.03	ND	ND	ND	85.9	85.9
2013 Development Rock 3rd Quarter	0.04	0.02	0.02	ND	0.5	9.3	8.8
2013 Development Rock 4th Quarter	0.15	0.07	0.09	ND	2.7	91.2	88.5
2014 Development Rock 1st Quarter	0.03	0.03	ND	ND	ND	78.4	78.4
2014 Development Rock 2nd Quarter	0.17	0.03	0.14	ND	4.4	71.1	66.7
2014 Development Rock 3rd Quarter	0.02	0.02	ND	ND	ND	65.3	65.3
2014 Development Rock 4th Quarter	0.07	0.04	0.03	ND	0.8	65	64.2

2013/2014 Tails MWMP Results	TDS (mg/L)	pH	NH_3 (mg/L)	Al (ug/L)	Ar (ug/L)	Cd (ug/L)	Cr (ug/L)	Cu (ug/L)	Fe (ug/L)	Pb (ug/L)	Hg (ug/L)	Ni (ug/L)	Se (ug/L)	Ag (ug/L)	Zn (ug/L)	Nitrate as N (mg/L)	Sulfate as SO4 (mg/L)
2013 Tails 1st Quarter	2380	7.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.3	ND	ND	ND	5.26	1580
2013 Tails 2ndQuarter	1720	7.84	0.52	489	ND	ND	ND	1.07	ND	ND	ND	16.2	31.8	ND	ND	ND	1240
2013 Tails 3rd Quarter	1700	7.53	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.11	1120
2013 Tails 4th Quarter	2440	7.52	0.14	ND	ND	ND	ND	ND	ND	ND	ND	16.3	ND	ND	ND	4.50	1690
2014 Tails 1st Quarter	2360	7.44	9.53	ND	ND	ND	ND	ND	ND	ND	ND	21.2	ND	ND	ND	5.47	1710
2014 Tails 2nd Quarter	316	7.92	1.16	ND	ND	ND	ND	ND	ND	ND	ND	2.46	ND	ND	ND	ND	190
2014 Tails 3rd Quarter	891	7.87	0.47	ND	ND	ND	ND	ND	ND	ND	ND	6.3	ND	ND	ND	11.00	543
2014 Tails 4th Quarter	1240	7.72	1.72	ND	ND	ND	ND	ND	ND	ND	ND	0.81	ND	ND	ND	4.98	829

2013/2014 Tails ABA Results	*Sulfur, Total*	*Sulfur Forms (Acid Extractable and Non-extractable Sulfur) 3.2.6*			*Acid Potential*	*Neutralization Potential*	*Acid - Base Accounting*
	3.2.4	*Sulfate*	*Pyritic*	*Non-extractable*	*1.3.1*	*3.2.3*	*1.3.1*
	wt%	*wt%*	*wt%*	*wt%*	*t CaCO3/1000t*	*t CaCO3/1000t*	*t CaCO3/1000t*
2013 Tails 1st Quarter	0.16	0.14	0.02	0.02	0.5	110	110
2013 Tails 2ndQuarter	0.54	0.24	0.3	ND	9.3	88.9	79.7
2013 Tails 3rd Quarter	0.09	0.08	0.01	ND	0.3	115	115
2013 Tails 4th Quarter	0.22	0.18	0.03	ND	1.1	121	120
2014 Tails 1st Quarter	0.14	0.14	ND	ND	ND	120	120
2014 Tails 2nd Quarter	0.05	0.05	ND	ND	ND	93.5	93.5
2014 Tails 3rd Quarter	0.05	0.05	ND	ND	ND	116	116
2014 Tails 4th Quarter	0.18	0.11	0.07	ND	2.2	95.6	93.3

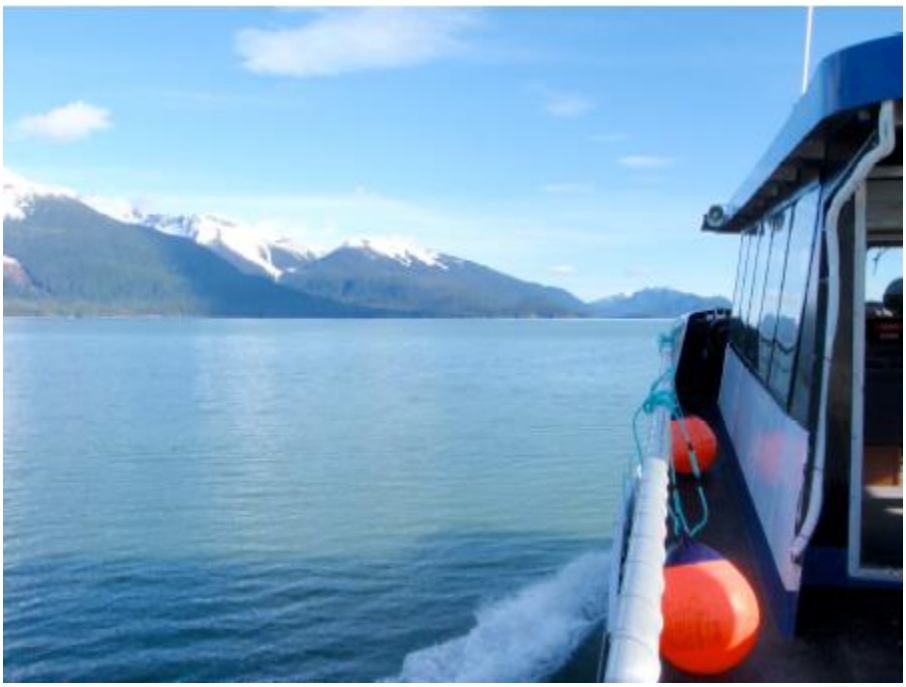
Attachment 1

Marine Mammal Monitoring Report - 2014

2014 Transportation Action Strategy

Marine Mammal
Survey Report

Coeur Alaska
Kensington Mine



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May 2014

Introduction

Coeur Alaska's Berners Bay/Lynn Canal Transportation Plan (January 2008) includes the adoption of standard operating guidelines to ensure minimal disruption of marine mammals in the area from marine traffic. Some guidelines are designed to minimize impacts throughout the year, while others are specific to the spring eulachon and herring spawning runs when marine mammals congregate in large groups within Berners Bay. This report describes monitoring activities conducted during the April/May 2014 eulachon spawning season. The Coeur Alaska crew transportation vessel during this period was the M/V Majestic Fjord, a 65ft catamaran with four inbound diesel jet engines and crew of three people that transited between Yankee Cove and Slate Cove daily (Figure 1). A one-way trip from Yankee Cove to Slate Cove takes approximately 40 minutes and consumes around 55-60 gallons of fuel (personal comm. Clint Songer, F/V Majestic Fjord captain).

Methods

Designation of the eulachon spawning season requires some information to be gathered regarding marine mammal activity within Berners Bay as this is a good indicator that eulachon migration is underway. One source of this information is the ADFG herring spawning aerial survey data for Lynn Canal, posted on the internet. These updates usually include a brief summary of the location of marine mammal concentrations. Coeur also conducts marine based surveys to monitor marine mammal numbers within Berners Bay. These surveys are undertaken by Coeur environmental personnel or contractors with marine mammal observation experience. Survey results are faxed to the NMFS Office of Protected Resources within 48 hours. When Coeur's marine mammal surveys and ADFG herring surveys show a substantial increase in marine mammals within Berners Bay the eulachon spawning season is declared to have commenced.

During the eulachon spawning run a marine mammal observer accompanies the Coeur transportation vessel on all crew transfers to help adjust the daily routing into Slate Cove to avoid congregations of fish and marine mammals. The marine observer keeps

watch from the bridge of the vessel and uses binoculars as needed to identify marine mammals.

Vessel trips are also kept to no more than three per day (except for emergency environmental or safety situations), and the vessel is required to maintain a maximum speed of 13 knots within the bay (with Berners Bay designated as the area inside of Point St. Mary and Point Bridget, see Figure 1). Fuel and, if possible, concentrate shipments by barge are also restricted during the eulachon spawning period. The spawning period typically occurs approximately April 15 to May 15, typically about 2-3 weeks. Marine mammal observations are categorized into two zones: Berners Bay and outside Berners Bay. All observations, including date, time, observer, weather, visibility, wave height/conditions, and counts of marine mammals, are recorded on a data sheet (see Figure 2). Each one-way trip is recorded on its own sheet.

Results

Between April 23 and May 14, one hundred and thirty two marine mammal observation surveys were completed aboard the M/V Majestic Fjord (see Table 2). The official eulachon run transportation regulations as determined by Coeur Alaska and NMFS were put into effect on April 23, 2014. Special measures taken during the eulachon run included: having a marine observer on the vessel during all trips and maintaining a maximum speed of 13 knots within Berners Bay. Regular transit speed is approximately 21-25 knots. Transportation vessel trips during the eulachon run were limited to 3 trips daily (see Table 1). No more than 3 trips per day were conducted during the 2014 eulachon spawning window.

The majority of pinniped activity was observed inside Berners Bay (see Table 3). A total of 854 Steller sea lions were counted during the observation period; 790 of these sightings (92.5%) occurred within Berners Bay. The vast majority; (98.4%) of the 188 harbor seal sightings also occurred within Berners Bay. Most of these sightings were at pinniped haulout areas, such as the entrance to Slate Cove and Point Saint Mary. Gatherings of up to 20 harbor seals on haulouts and rafts of up to 70 Steller sea lions

were observed. Pinniped activity was highest on April 24 and again from April 28 through May 3.

The majority of cetaceans were observed outside of Berners Bay with 328 humpback whale, 160 porpoise, and 24 killer whale sightings (69.5%, 80.0% and 82.8% of the total sightings respectively). Humpback sightings were fairly consistent through the observation period, with at least one humpback being spotted most days and 10 or more humpbacks sighted April 23 – 29. Killer whales were first seen on April 23 and were most commonly seen moving in small pods. Porpoise sightings were inconsistent and sporadic, ranging in group size from 2 - 20 individuals, during the duration of the observation period. No recordable encounters with marine mammals occurred during the 2014 eulachon spawning season.

Discussion

Historic records showed eulachon arriving in the Berners Bay area usually in late April and early May (Harris et al 2005). .

The three week restrictions were placed at the right time in 2014 to cover the greatest marine mammal activity surrounding the herring run. Careful observation of marine mammals and birds from the end of March is necessary in order to prepare for the official three-week period of transportation restrictions and ensure the goal of minimizing marine mammal encounters is achieved. The speed restriction is based on NMFS recommendations for Coeur Alaska vessels and may minimize potential impacts to marine mammals. The population of humpback whales in the North Pacific increased at around 7% per year since commercial whaling ceased in 1966 (Calambokidis et al 2008), but they are still considered endangered species owing to a worldwide population estimate being at only 8% of the historical population size (NMFS 1991). The Steller sea lion population east of Cape Suckling is not considered endangered, but vessel operations must still comply with the Marine Mammal Protection Act of 1972. The measures taken under Coeur's Transportation Action Strategy are designed to ensure compliance with this Federal law.

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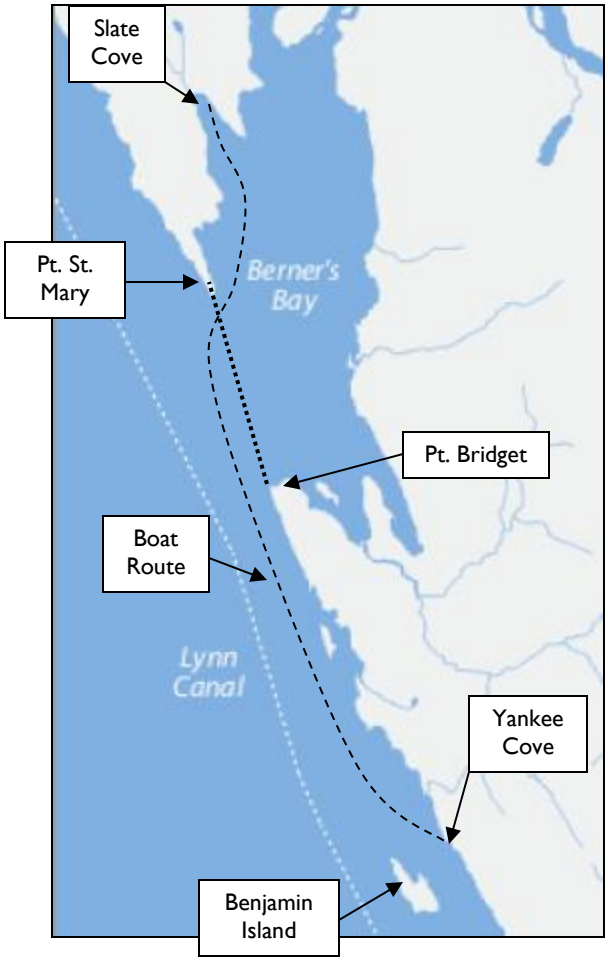

Figure 1: Boat route to Slate Cove from Yankee Cove. Line between Pt Bridget and Pt St Mary defines the area inside which the 13 knot speed limit applies.

Table 1: M/V Majestic Fjord Schedule, Spring/Summer 2014

Day	**Morning Boat Departure**	**Evening Boat Departure 1st Run**	**Evening Boat Departure 2nd Run**	**Departure**	**Total trips**
Monday	05:35	16:05	17:45	Yankee Cove	3
Tuesday	05:35	16:05	17:45	Yankee Cove	3
Wednesday	05:35	16:05	17:45	Yankee Cove	3
Thursday	05:35	16:05	17:45	Yankee Cove	3
Friday	05:35	16:05	17:45	Yankee Cove	3
Saturday	05:35	16:05	17:45	Yankee Cove	3
Sunday	05:35	16:05	17:45	Yankee Cove	3

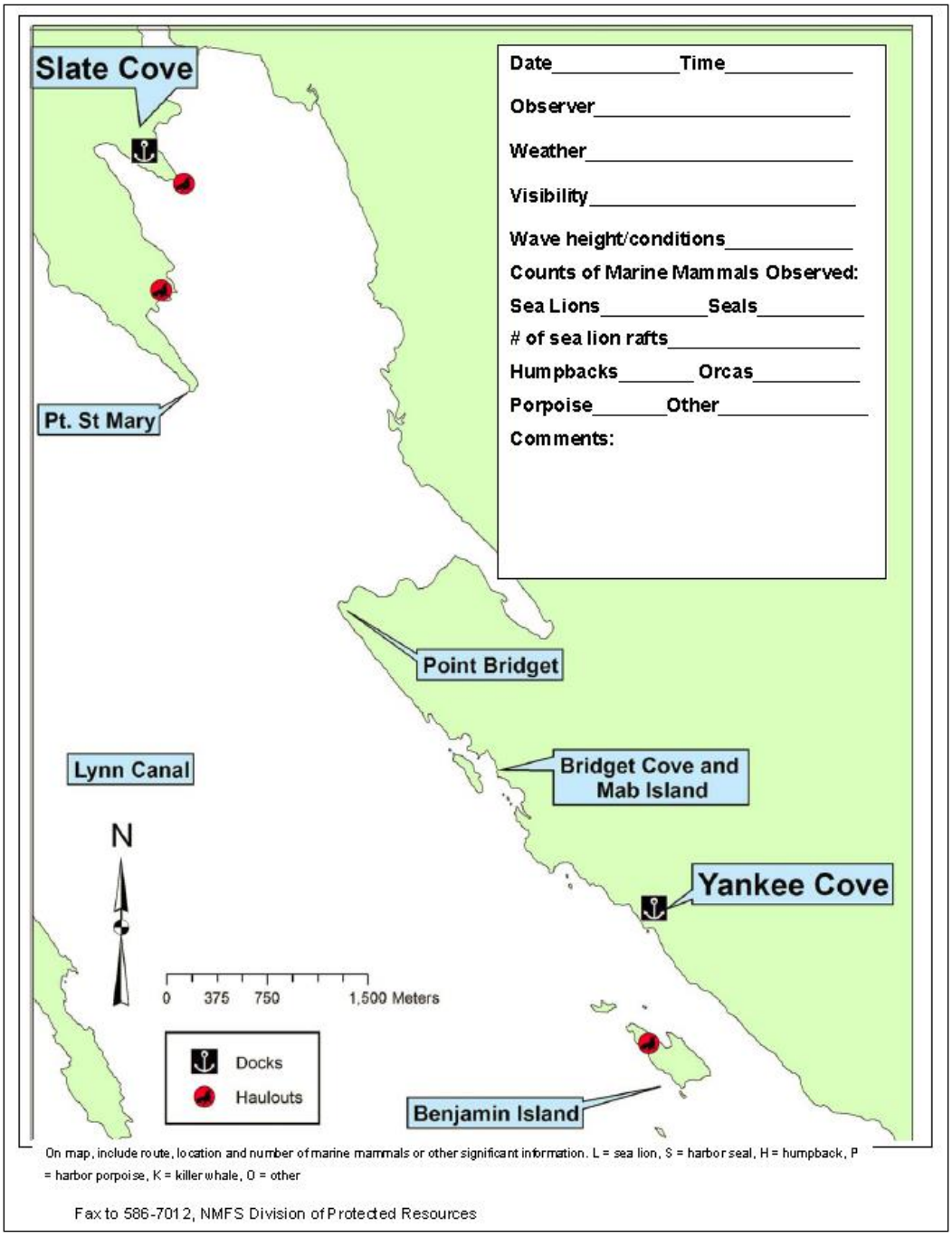

Figure 2: Data sheet

Table 2: Summary of Marine Mammal Observations

No.	Date	Time	Observer	Vessel	Route	Weather	Visibility	Wave Ht
1	4/23/2014	5:45	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Mostly Cloudy	13+ miles	0 ft.
2	4/23/2014	6:30	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Mostly Cloudy	13+ miles	0 ft.
3	4/23/2014	16:00	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy/Rain	10+ miles	0 ft.
4	4/23/2014	17:03	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
5	4/23/2014	17:49	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
6	4/23/2014	18:31	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
7	4/24/2014	5:37	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
8	4/24/2014	6:25	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	0 ft.
9	4/24/2014	16:08	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
10	4/24/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
11	4/24/2014	17:45	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
12	4/24/2014	18:26	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
13	4/25/2014	5:34	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	0 ft.
14	4/25/2014	6:21	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	0 ft.
15	4/25/2014	16:01	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	0 ft.
16	4/25/2014	16:51	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	0 ft.
17	4/25/2014	17:41	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	0 ft.
18	4/25/2014	18:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	0 ft.
19	4/26/2014	5:34	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10 miles	0 ft.
20	4/26/2014	6:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13 miles	0 ft.
21	4/26/2014	16:10	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13 miles	0 ft.
22	4/26/2014	16:58	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	0 ft.
23	4/26/2014	17:42	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13+ miles	0 ft.
24	4/26/2014	18:25	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	0 ft.
25	4/27/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	1 - 2 ft.
26	4/27/2014	6:18	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	1 - 2 ft.
27	4/27/2014	16:02	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
28	4/27/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Partly sunny	13+ miles	0 ft.

Table 2: Summary of Marine Mammal Observations

No.	Date	Time	Observer	Vessel	Route	Weather	Visibility	Wave Ht
29	4/27/2014	17:42	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13+ miles	1 - 2 ft.
30	4/27/2014	18:25	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Partly Cloudy	13+ miles	1 - 2 ft.
31	4/28/2014	5:32	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13+ miles	0 ft.
32	4/28/2014	6:19	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	0 ft.
33	4/28/2014	16:09	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy/Rain	6 miles	0 ft.
34	4/28/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy/Rain	6 miles	0 ft.
35	4/28/2014	17:46	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	4 miles	0 ft.
36	4/28/2014	18:31	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	4+ miles	0 ft.
37	4/29/2014	5:35	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	4+ miles	0 ft.
38	4/29/2014	6:24	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	4+ miles	0 ft.
39	4/29/2014	16:12	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
40	4/29/2014	17:04	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
41	4/29/2014	17:49	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
42	4/29/2014	18:32	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
43	4/30/2014	5:37	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	1 - 2 ft.
44	4/30/2014	6:23	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	1 - 2 ft.
45	4/30/2014	16:02	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	1 - 3 ft.
46	4/30/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 3 ft.
47	4/30/2014	17:45	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	1 - 3 ft.
48	4/30/2014	18:27	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 3 ft.
49	5/1/2014	5:32	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	1 - 3 ft.
50	5/1/2014	6:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	1 - 3 ft.
51	5/1/2014	16:09	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	3 - 5 ft.
52	5/1/2014	17:01	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	3 - 5 ft.
53	5/1/2014	17:48	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	3 - 5 ft.
54	5/1/2014	18:30	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	3 - 5 ft.
55	5/2/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	1 - 3 ft.
56	5/2/2014	6:23	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	3 - 5 ft.

Table 2: Summary of Marine Mammal Observations

No.	Date	Time	Observer	Vessel	Route	Weather	Visibility	Wave Ht
57	5/2/2014	16:00	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	3 - 5 ft.
58	5/2/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	3 - 5 ft.
59	5/2/2014	17:42	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	1 - 3 ft.
60	5/2/2014	18:26	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 3 ft.
61	5/3/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	1 - 3 ft.
62	5/3/2014	6:19	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 3 ft.
63	5/3/2014	16:06	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13 miles	1 - 3 ft.
64	5/3/2014	16:57	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13 miles	1 - 3 ft.
65	5/3/2014	17:40	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13 miles	1 - 3 ft.
66	5/3/2014	18:21	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13 miles	1 - 3 ft.
67	5/4/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	0 ft.
68	5/4/2014	6:19	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	0 ft.
69	5/4/2014	16:11	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
70	5/4/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
71	5/4/2014	17:44	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
72	5/4/2014	18:26	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
73	5/5/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
74	5/5/2014	6:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
75	5/5/2014	16:12	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	1 - 2 ft.
76	5/5/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Partly sunny	13+ miles	1 - 2 ft.
77	5/5/2014	17:44	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Partly	13+ miles	1 - 3 ft.
78	5/5/2014	18:27	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 3 ft.
79	5/6/2014	5:36	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10 miles	1 - 3 ft.
80	5/6/2014	6:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	1 - 3 ft.
81	5/6/2014	16:12	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
82	5/6/2014	17:04	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
83	5/6/2014	17:48	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
84	5/6/2014	18:33	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.

Table 2: Summary of Marine Mammal Observations

No.	Date	Time	Observer	Vessel	Route	Weather	Visibility	Wave Ht
85	5/7/2014	5:37	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
86	5/7/2014	6:23	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
87	5/7/2014	16:00	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
88	5/7/2014	17:03	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
89	5/7/2014	17:47	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
90	5/7/2014	18:30	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
91	5/8/2014	5:35	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
92	5/8/2014	6:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
93	5/8/2014	15:47	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Partly Cloudy	13+ miles	1 - 2 ft.
94	5/8/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 3 ft.
95	5/8/2014	17:45	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	1 - 2 ft.
96	5/8/2014	18:26	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	1 - 2 ft.
97	5/9/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Clear	13+ miles	0 ft.
98	5/9/2014	6:18	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Clear	13+ miles	0 ft.
99	5/9/2014	16:13	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
100	5/9/2014	16:58	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
101	5/9/2014	17:42	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Sunny	13+ miles	0 ft.
102	5/9/2014	18:25	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Sunny	13+ miles	0 ft.
103	5/10/2014	5:34	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
104	5/10/2014	6:25	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
105	5/10/2014	15:58	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	10+ miles	1 - 2 ft.
106	5/10/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	10+ miles	1 - 2 ft.
107	5/10/2014	17:46	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	10+ miles	1 - 2 ft.
108	5/10/2014	18:31	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	10+ miles	1 - 2 ft.
109	5/11/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	5+ miles	1 - 2 ft.
110	5/11/2014	6:18	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	5+ miles	1 - 2 ft.
111	5/11/2014	16:07	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	10+ miles	1 - 2 ft.
112	5/11/2014	17:02	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	10+ miles	1 - 2 ft.

Table 2: Summary of Marine Mammal Observations

No.	Date	Time	Observer	Vessel	Route	Weather	Visibility	Wave Ht
113	5/11/2014	17:45	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	10+ miles	0 ft.
114	5/11/2014	18:22	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	10+ miles	0 ft.
115	5/12/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	1 - 2 ft.
116	5/12/2014	6:23	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	1 - 2 ft.
117	5/12/2014	16:12	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13+ miles	0 ft.
118	5/12/2014	17:01	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	0 ft.
119	5/12/2014	17:48	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13+ miles	1 - 2 ft.
120	5/12/2014	18:31	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	1 - 2 ft.
121	5/13/2014	5:33	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	13+ miles	0 - 1 ft.
122	5/13/2014	6:21	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	13+ miles	0 - 1 ft.
123	5/13/2014	16:09	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	10+ miles	0-1 ft.
124	5/13/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	10+ miles	0 ft.
125	5/13/2014	17:44	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain	10+ miles	1 - 2 ft.
126	5/13/2014	18:25	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain	10+ miles	1 - 2 ft.
127	5/14/2014	5:35	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain/Fog	5 miles	1 - 2 ft.
128	5/14/2014	6:16	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Rain/Fog	5 miles	1 - 2 ft.
129	5/14/2014	16:01	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Rain/Fog	10+ miles	1 - 2 ft.
130	5/14/2014	17:00	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.
131	5/14/2014	17:44	Lani Murawski	M/V Majestic Fjord	Yankee Cove to Slate Cove	Cloudy	10+ miles	0 ft.
132	5/14/2014	18:23	Lani Murawski	M/V Majestic Fjord	Slate Cove to Yankee Cove	Cloudy	10+ miles	0 ft.

Table 3: Summary of Marine Mammal Counts

			Counts of MM Observed Berners Bay							Counts of MM Observed Outside Berners Bay							Counts of MM Observed - Total							
No.	Date	Time	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	Notes
1	4/23/2014	5:45	3		1	2							4				3	0	1	6	0	0	0	
2	4/23/2014	6:30	1										5				1	0	0	5	0	0	0	
3	4/23/2014	16:00	2	1		3				8		1	7		5		10	1	1	10	0	5	0	
4	4/23/2014	17:03	2		1	8				6		2	4		2		8	0	3	12	0	2	0	
5	4/23/2014	17:49				1	4			2			4		5		2	0	0	5	4	5	0	
6	4/23/2014	18:31	2										3				2	0	0	3	0	0	0	
7	4/24/2014	5:37				4							6				0	0	0	10	0	0	0	
8	4/24/2014	6:25	42		2					1			4				43	0	2	4	0	0	0	
9	4/24/2014	16:08	12		1	5							5				12	0	1	10	0	0	0	
10	4/24/2014	17:00	12		1	4							3				12	0	1	7	0	0	0	
11	4/24/2014	17:45								2		1	3				2	0	1	3	0	0	0	
12	4/24/2014	18:26				1							3				0	0	0	4	0	0	0	
13	4/25/2014	5:34	3		1	5				3		1	5				6	0	2	10	0	0	0	
14	4/25/2014	6:21				5		2		6		2	8	12			6	0	2	13	12	2	0	
15	4/25/2014	16:01								5	1	1	2				5	1	1	2	0	0	0	
16	4/25/2014	16:51	1										3				1	0	0	3	0	0	0	
17	4/25/2014	17:41	3	6	1								1				3	6	1	1	0	0	0	
18	4/25/2014	18:22	2							3	1	1	7	5			5	1	1	7	5	0	0	
19	4/26/2014	5:34	4	5	1	4							8				4	5	1	12	0	0	0	
20	4/26/2014	6:22	2		1	3							3				2	0	1	6	0	0	0	
21	4/26/2014	16:10	6	10	2	1				1			3				7	10	2	4	0	0	0	
22	4/26/2014	16:58	18	13	4	2							2				18	13	4	4	0	0	0	
23	4/26/2014	17:42	6		2								6				6	0	2	6	0	0	0	
24	4/26/2014	18:25	5		1	1				2		1	7				7	0	2	8	0	0	0	
25	4/27/2014	5:33	6		1	5							6				6	0	1	11	0	0	0	
26	4/27/2014	6:18	2		1	5							8				2	0	1	13	0	0	0	
27	4/27/2014	16:02	12		3								4	2			12	0	3	4	2	0	0	
28	4/27/2014	17:00	3			3							3				3	0	0	6	0	0	0	
29	4/27/2014	17:42	5		1								4				5	0	1	4	0	0	0	
30	4/27/2014	18:25	5		2	1							2				5	0	2	3	0	0	0	
31	4/28/2014	5:32	8		4								9	15			8	0	4	9	15	0	0	

Table 3: Summary of Marine Mammal Counts

			Counts of MM Observed Berners Bay							Counts of MM Observed Outside Berners Bay							Counts of MM Observed - Total							
No.	Date	Time	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	Notes
32	4/28/2014	6:19	5		2	1							6				5	0	2	7	0	0	0	
33	4/28/2014	16:09	20		2								10				20	0	2	10	0	0	0	
34	4/28/2014	17:00	15	20	5	1							9			1	15	20	5	10	0	0	1	Other: Sea Otter
35	4/28/2014	17:46	12	12		3				1							13	12	0	3	0	0	0	
36	4/28/2014	18:31	14	12	2								1				14	12	2	1	0	0	0	
37	4/29/2014	5:35	16		1	5							7		1		16	0	1	12	0	1	0	
38	4/29/2014	6:24	10		2	4							2				10	0	2	6	0	0	0	
39	4/29/2014	16:12	1	12									8				1	12	0	8	0	0	0	
40	4/29/2014	17:04	1	10		1							5				1	10	0	6	0	0	0	
41	4/29/2014	17:49	8		1								1				8	0	1	1	0	0	0	
42	4/29/2014	18:32	12		1								1				12	0	1	1	0	0	0	
43	4/30/2014	5:37	2										3				2	0	0	3	0	0	0	
44	4/30/2014	6:23	1										1				1	0	0	1	0	0	0	
45	4/30/2014	16:02	48	8	3	1							2				48	8	3	3	0	0	0	
46	4/30/2014	17:00	67		6	1											67	0	6	1	0	0	0	
47	4/30/2014	17:45	15	2	2	1							4				15	2	2	5	0	0	0	Eagles: Fifty or more observed at Bridget Cove
48	4/30/2014	18:27	6		2	1											6	0	2	1	0	0	0	
49	5/1/2014	5:32	4		1	1											4	0	1	1	0	0	0	
50	5/1/2014	6:22	2			1							2				2	0	0	3	0	0	0	
51	5/1/2014	16:09	85	2	6	1							3				85	2	6	4	0	0	0	
52	5/1/2014	17:01	17		3	2											17	0	3	2	0	0	0	
53	5/1/2014	17:48	60	8	3	1											60	8	3	1	0	0	0	
54	5/1/2014	18:30	70	8	1	1				1							71	8	1	1	0	0	0	
55	5/2/2014	5:33	4	1		1							3				4	1	0	4	0	0	0	
56	5/2/2014	6:23	2		1	2		3									2	0	1	2	0	3	0	
57	5/2/2014	16:00	25		2	2				2		1	2				27	0	3	4	0	0	0	
58	5/2/2014	17:00	30		4	1							5				30	0	4	6	0	0	0	
59	5/2/2014	17:42				1							3				0	0	0	4	0	0	0	
60	5/2/2014	18:26				1							2				0	0	0	3	0	0	0	
61	5/3/2014	5:33				2							2				0	0	0	4	0	0	0	
62	5/3/2014	6:19				2							1				0	0	0	3	0	0	0	

Table 3: Summary of Marine Mammal Counts

			Counts of MM Observed Berners Bay							Counts of MM Observed Outside Berners Bay							Counts of MM Observed - Total							
No.	Date	Time	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	Notes
63	5/3/2014	16:06	11		3	2											11	0	3	2	0	0	0	
64	5/3/2014	16:57	10		1	4							3	6			10	0	1	7	6	0	0	
65	5/3/2014	17:40	8		2	1							1	17			8	0	2	2	17	0	0	
66	5/3/2014	18:21	8		2	6											8	0	2	6	0	0	0	
67	5/4/2014	5:33	2		1	2								10			2	0	1	2	10	0	0	
68	5/4/2014	6:19	2		1	1								14			2	0	1	1	14	0	0	
69	5/4/2014	16:11	4		1	2											4	0	1	2	0	0	0	
70	5/4/2014	17:00	6		2								1				6	0	2	1	0	0	0	
71	5/4/2014	17:44				1											0	0	0	1	0	0	0	
72	5/4/2014	18:26											1	15			0	0	0	1	15	0	0	
73	5/5/2014	5:33											4	12			0	0	0	4	12	0	0	
74	5/5/2014	6:22											1				0	0	0	1	0	0	0	
75	5/5/2014	16:12	2		1								1				2	0	1	1	0	0	0	
76	5/5/2014	17:00	4		1												4	0	1	0	0	0	0	
77	5/5/2014	17:44															0	0	0	0	0	0	0	
78	5/5/2014	18:27	1														1	0	0	0	0	0	0	
79	5/6/2014	5:36											2				0	0	0	2	0	0	0	
80	5/6/2014	6:22															0	0	0	0	0	0	0	
81	5/6/2014	16:12		1													0	1	0	0	0	0	0	
82	5/6/2014	17:04															0	0	0	0	0	0	0	
83	5/6/2014	17:48				1	20										0	0	0	1	20	0	0	
84	5/6/2014	18:33				1	11										0	0	0	1	11	0	0	
85	5/7/2014	5:37											5				0	0	0	5	0	0	0	
86	5/7/2014	6:23				2							6				0	0	0	8	0	0	0	
87	5/7/2014	16:00											2	4			0	0	0	2	4	0	0	
88	5/7/2014	17:03											1				0	0	0	1	0	0	0	
89	5/7/2014	17:47											1				0	0	0	1	0	0	0	
90	5/7/2014	18:30															0	0	0	0	0	0	0	
91	5/8/2014	5:35								1			3			1	1	0	0	3	0	0	1	Other: Mink in the water at Yankee Cove
92	5/8/2014	6:22								1			1				1	0	0	1	0	0	0	
93	5/8/2014	15:47		2						1			1				1	2	0	1	0	0	0	

Table 3: Summary of Marine Mammal Counts

			Counts of MM Observed Berners Bay							Counts of MM Observed Outside Berners Bay							Counts of MM Observed - Total							
No.	Date	Time	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	Notes
94	5/8/2014	17:00											2	5			0	0	0	2	5	0	0	
95	5/8/2014	17:45					3										0	0	0	0	3	0	0	
96	5/8/2014	18:26								3			1				3	0	0	1	0	0	0	
97	5/9/2014	5:33	2		1	1							1				2	0	1	2	0	0	0	
98	5/9/2014	6:18											1				0	0	0	1	0	0	0	
99	5/9/2014	16:13	2	1	1		2							14			2	1	1	0	16	0	0	
100	5/9/2014	16:58											1		3		0	0	0	1	0	3	0	
101	5/9/2014	17:42				1							1		1		0	0	0	2	0	1	0	
102	5/9/2014	18:25				1							3	3			0	0	0	4	3	0	0	
103	5/10/2014	5:34				1							2				0	0	0	3	0	0	0	
104	5/10/2014	6:25											7				0	0	0	7	0	0	0	
105	5/10/2014	15:58											2				0	0	0	2	0	0	0	
106	5/10/2014	17:00									1		3				0	1	0	3	0	0	0	
107	5/10/2014	17:46				2							2				0	0	0	4	0	0	0	
108	5/10/2014	18:31				2							2				0	0	0	4	0	0	0	
109	5/11/2014	5:33											4				0	0	0	4	0	0	0	
110	5/11/2014	6:18				1				2		1	1	8			2	0	1	2	8	0	0	
111	5/11/2014	16:07	2			1				2			1				4	0	0	2	0	0	0	
112	5/11/2014	17:02				2							3				0	0	0	5	0	0	0	
113	5/11/2014	17:45				1				4		1	1				4	0	1	2	0	0	0	
114	5/11/2014	18:22											1	6			0	0	0	1	6	0	0	
115	5/12/2014	5:33											2	2			0	0	0	2	2	0	0	
116	5/12/2014	6:23				1									1		0	0	0	1	0	1	0	
117	5/12/2014	16:12				1							5				0	0	0	6	0	0	0	
118	5/12/2014	17:01	2		1	1							2				2	0	1	3	0	0	0	
119	5/12/2014	17:48											3				0	0	0	3	0	0	0	
120	5/12/2014	18:31											2	8			0	0	0	2	8	0	0	
121	5/13/2014	5:33		6		2							2		3		0	6	0	4	0	3	0	
122	5/13/2014	6:21	2	5	1	1									3		2	5	1	1	0	3	0	
123	5/13/2014	16:09											4				0	0	0	4	0	0	0	
124	5/13/2014	17:00											4				0	0	0	4	0	0	0	

Table 3: Summary of Marine Mammal Counts

			Counts of MM Observed Berners Bay							Counts of MM Observed Outside Berners Bay							Counts of MM Observed - Total							
No.	Date	Time	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	L	S	Rafts	H	P	K	O	Notes
125	5/13/2014	17:44											2				0	0	0	2	0	0	0	
126	5/13/2014	18:25											2				0	0	0	2	0	0	0	
127	5/14/2014	5:35											1				0	0	0	1	0	0	0	
128	5/14/2014	6:16	1														1	0	0	0	0	0	0	
129	5/14/2014	16:01	1			1											1	0	0	1	0	0	0	
130	5/14/2014	17:00	1										1				1	0	0	1	0	0	0	
131	5/14/2014	17:44		20						7		2		2			7	20	2	0	2	0	0	
132	5/14/2014	18:23		20													0	20	0	0	0	0	0	

Attachment 2

Wildlife Monitoring Report – 2014

2014 TERRESTRIAL WILDLIFE MONITORING REPORT OF THE SLATE LAKES BASIN

Coeur Alaska - Kensington Gold Mine
3031 Clinton Drive Suite 202
Juneau, AK 99801

January 2015

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1.0 Introduction

This report describes the 2014 wildlife monitoring season (May-October) in accordance with the Kensington Project Terrestrial Wildlife Monitoring Plan. Coeur Alaska and resource agencies designed this plan to monitor wildlife resources in the Slate Lakes basin. Monitoring recorded the effectiveness of mitigation during mine operations that encourages use by local wildlife.

The Kensington Gold Project Final Supplemental Environmental Impact Statement (FSEIS) (USFS 2004) documented the occurrence of wildlife species in the Slate Lakes basin prior to construction activity. Coeur Alaska conducted a baseline survey in 2005 (Living System Designs 2005). Management indicator species in the Berners Bay area include black and brown bear, Sitka Black-tailed deer, Alexander Archipelago wolf, Bald Eagle, red squirrel, river otter, marten, Red-breasted sapsucker, Brown creeper, and Vancouver Canada goose.

Sightings of wildlife or their sign within the Slate Lakes basin include moose, black bear, brown bear, Canada geese, ducks, red squirrels, porcupine, river otter, old beaver cuttings, Bald Eagles and various mustelid species. A lack of prey, including Sitka Black-tailed deer, in the Slate Lakes area is suspected to be caused by wolves.

Coeur Alaska monitored wildlife in 2006 and 2007 during the first phase of construction. Due to no construction activity during 2008, no wildlife monitoring was conducted during this period. Wildlife monitoring resumed in early September 2009 at the start-up of constructing the Tailings Treatment Facility (TTF), and continued through the 2011 summer season. Monitoring continued in 2012 during the construction of stage two of the tailings dam. After completion of stage two of the tailings dam, monitoring continued through 2014.

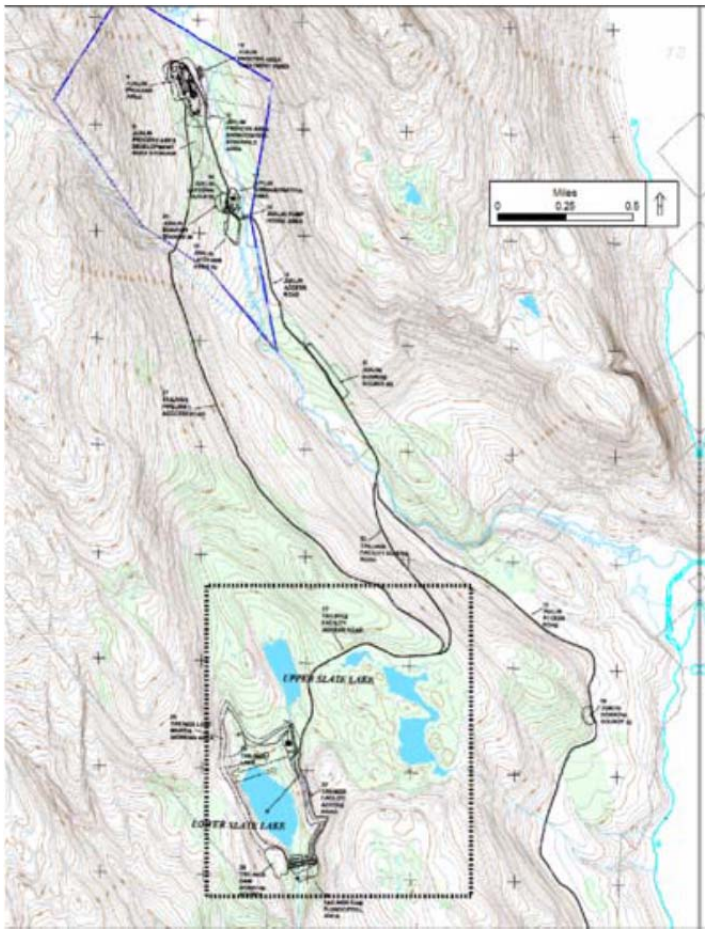

Figure 1: Slate Lakes basin in relation to access roads and the Tailings Treatment Facility (TTF). The access road to the TTF was constructed in 2006. The tailings dam was constructed between August 2009 and August 2010. The TTF was actively in use during the 2014 monitoring season.

1.1 **Wildlife Monitoring Objective**

The objectives of the Kensington Project Wildlife Monitoring Plan are to

- Supplement the regional resource knowledge base with site-specific data
- Gather new information on specific wildlife habitats and species that could be affected by increased activity at the project site with specific attention to sensitive species
- Identify concentrations of wildlife near specific resources (e.g., stream mouth marshes, anadromous streams, lakes, wetlands, bird nesting/feeding areas, large mammal crossing areas, etc.)
- Conduct wildlife observations along an established route surrounding the Slate Lakes basin on a frequent basis from spring through fall
- Collect data and other information that can be used to shape the subsequent year's studies and long-term monitoring

Figure 2: The Slate Lakes basin in 2005, prior to construction of the access road and the Lower Slate Lake Tailings Treatment Facility.

2.0 Survey Area

The wildlife monitoring survey area lies within the confines of the Slate Lakes basin, an area of approximately two square kilometers, ranging in elevation from 200 meters at the mouth of Lower Slate Lake, to 300 meters on the ridge to the west of Lower Slate Lake (Figure 1). Water bodies within the basin include Lower and Upper Slate Lakes to the west and the Spectacle Lakes complex to the east. Both Lower and Upper Slate Lake have steep western slopes, but much of the remaining area around Upper Slate Lake is flat with a mild slope to the east. The area around Spectacle Lake is also fairly flat. There is drainage from the southeast corner of Spectacle Lake into Berners Bay, while Fat Rat Lake drains into Upper Slate Lake (Figure 2). Upper Slate Lake drains to Lower Slate Lake via Mid-Lake Slate Creek and Lower Slate Lake drains to East Fork Slate Creek.

Prior to construction, terrestrial vegetation types around Upper and Lower Slate Lakes were fairly similar and included mixed spruce and hemlock forest to the west of both lakes and to the southeast of Lower Slate Lake. The north and east shores of both lakes were characterized by wetlands containing sedge meadow and scrub muskeg. The periphery timber of Lower Slate Lake was clear-cut by September 2005 and the TTF access road along the north of Spectacle Lakes was constructed by August 2006. The immediate vicinity of Upper Slate Lake has not been impacted by the project. The vegetation around the Spectacle Lake complex included sphagnum bogs and sedge fens with brushy, scrub forest in elevated areas. All of the lakes contained various species of aquatic vegetation, though not in high volume (Living System Designs 2005). Spectacle Lake contained the greatest concentration of aquatic vegetation, mainly in three sloughs and in Fat Rat Lake.

3.0 Methods

Kate Savage, who conducted wildlife monitoring in 2006, 2007, and 2010 established transects that were used in all surveys, including the 2014 season. There are 20 transects around the basin, each transect is 50 meters long and runs in a north-south direction (see Appendix A). The transects provide a systematic method for recording wildlife sign throughout the season. The north and south ends of each transect were marked with stakes and survey flagging. GPS coordinates of each transect were also recorded (see list in Appendix B).

Environmental technicians visited each transect once per week during the 2014 season when the area was free of snow. The following methodology was followed during each survey.

Coeur Alaska Environmental technicians located the north stake of each transect and strung a 50-meter measuring tape to reach the south stake. The technicians then walked the length of the tape examining the ground within one meter on either side.

Signs such as tracks, scat, or digging were recorded along with their position along the tape to the nearest 0.1 meter and whether they lay on the left, center or right side of the transect. In this way, the precise location of wildlife sign was recorded so that fresh wildlife sign could be more easily separated from older, previously recorded sign. Scans with binoculars were also made from the access road to detect the presence of wildlife from afar. This method was most effective for observing waterfowl on the lakes. Lower Slate Lake was easily visible from almost any aspect on the TTF road. Viewing locations were optimum in the Spectacle Lakes area from the western edge of Lower Spectacle Lake, the southern tip of lower Spectacle Lake, which also afforded a good view of the adjacent southern slough, and the northern tip of upper Spectacle Lake.

Environmental technicians collected data on wildlife sign along transects to ensure that observations and data collection were as standardized and unbiased as possible. Other information collected included weather conditions, visibility and the time at the start and end of each survey.

Species of special interest included herons, waterfowl such as Vancouver Canada geese, and raptors such as Bald Eagles and Northern Goshawks. No special surveys to detect the presence of goshawks using standard broadcast methods were conducted in 2014.

Figure 3: Spectacle Lakes basin with access road to the Tailings Treatment Facility 2010.

4.0 Survey Results

Field technicians determined the presence of wildlife within the Slate Lakes basin through actual sightings and identification of wildlife sign (tracks, digs and scat). Data collected during surveys included direct observations of wildlife species with photographs when possible, date and time, location, and behavior. The use of motion sensor trail cameras also helped determine the presence of wildlife within the area. The cameras were moved to various transects throughout the monitoring season. A complete photo log of all monitoring photos during the 2014 season is located in Appendix D. Table 1 through Table 4 summarize wildlife sign by the main species present in the Slate Lakes basin (All species, Bear, Moose, Goose). Charts 1 through 3 compare data collected on these species from 2012 to 2014 by month.

4.1 Mammals

Indications of bear activity included tracks, scat and digs, which were most prevalent in the month of July and through the fall. The greatest amount of bear sign and sightings were noted at T1, T5, T10 and T18. Only one transect, T20, had no sign of any bear activity throughout the season. Bear activity appeared in high concentrations at those transects located adjacent to the TTF access road and around the Spectacle Lakes. It is likely that bears frequently use this corridor for travel. There were several occasions where bears were sighted crossing the TTF access road. There were also several other sightings of black bears around the TTF throughout the season. It can sometimes be difficult to distinguish between certain bears and to identify specific characteristics of each individual animal. However, throughout the 2014 monitoring season, environmental technicians sighted what was thought to be no less than four different bears in the area based on size, color and distinctive markings.

Moose sign consisted of mostly tracks with little scat, browse, or bedding sites seen. The greatest concentrations of moose signs were seen along T5, T6, T18 and T20. The concentrations of moose at these transects is consistent with the data obtained from surveys from 2010 through 2013. The primary areas utilized by the moose remain largely unchanged from previous years. Moose tracks can form deep depressions in soft, wet ground that persist for months. A single moose can also leave a large number of signs by simply walking parallel with a transect. These factors were taken into consideration when making any conclusions about levels of activity over time.

4.2 Avian Species

The avian species identified through direct sightings or indirectly through songs or calls included both resident and migratory wading birds, non-passerine land birds, passerines and species of special interest, which include waterfowl, raptors and herons.

A primary summer use of the area was as a refuge for Canada Geese, which arrived in July and were observed intermittently through September. High numbers of goose sign were counted at T4, T5, T14 and T20. All of these transects are located in close proximity to water. Primary goose sign observed was in the form of scat, most frequently noticed at T4 and T5, which is a flat open area good for grazing. Several goose feathers were also noted on a few transects, which may be an indication of summer molting.

As environmental technicians conducted surveys, geese could often be observed swimming in a group on Upper and Lower Spectacle Lakes. The highest number of geese observed at one time was around fourteen, which is consistent with previous year's survey results.

Throughout June and early July, an adult female Sooty Grouse with chicks was observed between T17 and T12. It is likely that the same adult female and chicks were seen over and over. A lone adult female was observed again in late October, but no chicks were visible.

A pair of Lesser Yellowlegs appeared to be nesting near T12 this monitoring season. No ground nest or signs of chicks were observed, however the pair behaved very defensively whenever technicians attempted to survey the area. Ducks appear to make some use of Spectacle Lakes and Upper and Lower Slate Lake continually during summer and fall months. Goldeneyes, Mallards, and Common Mergansers were observed throughout the basin. Belted Kingfishers were seen several times throughout the season on Lower Slate Lake. Bald Eagles were sighted soaring over the Slate Lakes basin from May to October with increased presence during the summer months coinciding with salmon runs. Two Great Blue Herons were observed flying over the Spectacle Lakes in August. Other bird species observed during 2014 included Dark-Eyed Juncos, Steller's Jays, American Robins, Varied Thrushes, Chestnut-backed Chickadees, American Dippers, Common Ravens, Winter Wrens, Tree Swallows and Olive-sided Flycatchers. A complete avian species list is located in Appendix E.

4.3 Other Sightings

Sitka black-tailed deer (Odocoileus hemionus sitkensis) tracks were observed once in May on T5, and once in October on T6 in 2014. Compared to the 2013 monitoring season, there were less deer signs observed in 2014. Alexander Archipelago wolf (Canis lupus ligoni) signs were not observed in 2014, which is also down from the 2013 season. Both western toads (Bufo boreas) and wood frogs ((Lithobates sylvaticus) have not been sighted since the 2012 season when they were very numerous. Porcupines were often spotted along roadsides, but tend to avoid travel though open areas where most monitoring transects were located. It is likely that smaller mammals are just as active (if not more so) in summer, but their sign (tracks and scat) show up more in snow. Current monitoring practices were not conducive to obtaining representative data on small mammal and rodent populations within the Slate Lakes basin.

4.4 Human Activity

The access road to the TTF has considerable traffic use at times. Heavy equipment uses the road intermittently. Noise from traffic along the access road is most noticeable at T1, T13, T14, T12, T17, and T18.

5.0 Discussion

The transects are all located in open bog and fen areas around the lakes as opposed to thick brush for ease of finding wildlife sign. Smaller, lighter mammals do not leave visible tracks in firmer ground. This led to some bias with apparent abundance of large mammals relative to smaller mammals.

Bear sign and sightings seemed to peak in July and dip noticeably before increasing again and gradually tapering off through fall. This is most likely due to bears preying on salmon along creek basins before returning to upland areas to feed on roots and berries before hibernating for the winter. Most of the bear sign found was in the form of scat and digs, with increased amounts of visible berries in scat towards fall. Moose sign reached a peak in July before gradually decreasing through October. This may be due to behavioral habits related to breeding in the fall, or moose heading to lower elevations along creek basins to feed on willow and browse.

Overall, bear and moose signs counted were relatively concentrated on the same transects and in areas similar to 2013. Comparing number of signs counted for bear and moose in total during the 2014 season, results are similar to 2013 survey season results and up in numbers from 2012.

Goose signs counted dropped in 2014 compared to the 2013 season. However, the number of geese sighted on the lakes, up to 14 geese, is relatively consistent to previous years. Use of the Slate Lakes basin as a refuge for Canada geese was previously documented in 2000 (ABR 2000), 2004 (USFS 2004), in 2005 (Living System Designs 2005), 2006, 2007 (Savage 2007), 2012 and 2013. In 2012, 13 -18 geese were present on Spectacle Lake in August and September, which is comparable to 2011 (13-15) and 2010 (19). The no-fly zone over the Spectacle Lakes basin, instigated through Coastal Helicopters in 2007 to minimize disturbance to geese, continued through 2014.

6.0 Conclusions

In total, signs of bear, moose and geese within the Slate Lakes basin showed similar trends to previous survey years. Wildlife populations within the Slate Lakes basin generally appear healthy, and abundant. Comparisons with baseline studies conducted in 2004 and 2005, mining operations have had little impact on the abundance or habits of terrestrial wildlife in the area.

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USFS 2004. Kensington Gold Project Final Supplemental Environmental Impact Statement (FSEIS) USFS 2004.

Table 1: Total Wildlife Sign Data (highlighted cells = highest counts)

ALL	13-May	21-May	29-May	5-Jun	11-Jun	19-Jun	25-Jun	3-Jul	10-Jul	16-Jul	22-Jul	31-Jul	7-Aug	13-Aug	20-Aug	26-Aug	4-Sep	10-Sep	16-Sep	22-Sep	4-Oct	8-Oct	17-Oct	23-Oct	30-Oct	SUM
T1		1						1	2			4	3		1		1	2	1	1	1	1	4		1	24
T2		1	1		1		2	1	1	1	2	4					2	1	2		1					20
T3						1	1	1	1		1	3	1		1	2										12
T4		1	1	1	1			3	4	2	2	5			1		2		1		1	1			1	27
T5		2	1		1	1		5	6	1	1	13		5	2		3	1		4	1	2		1	1	51
T6		4	2		1	1	4	3	4	2	4	2	3		1	1	1	1		1	3	1	1		1	41
T7		1		1			2	2		1		3	2				2	2	1		1		1		1	20
T8			1	1				1	2			3			1		1	1	1		1		1			14
T9					1			3	2			4			3	5	3		5					2		28
T10	1	2	2	1	1		2	3		1		1			1	1	1		1		3		2	1		24
T11	1	1							2			2				1	1	3	3			1				15
T12	3		4	1	1	2		1	3								1		1		1				1	19
T13		1								1	4	3				1		1			2	2				15
T14	1	1			1		1	4	1	1	2	4	2		1			1		1	1					22
T15	2		1					5	3	1						2		1		1	2				1	19
T16		1	2				2	3		2		3		1			1				1			1		17
T17	1		1						2			1			1		1		1		1					9
T18		3	1	1	3	1	1	5	5		4	4	2	1			1	2				2				36
T19				1	2		2	2		2	2	1		1		1		1		1						16
T20		1		2			1		8	1	1					2	2	1	1		2	1			1	24
TOTAL	9	20	17	9	13	6	18	43	46	16	23	60	13	8	13	16	23	18	18	9	22	11	9	5	8	453

Table 2: Bear Sign Data

BEAR	13-May	21-May	29-May	5-Jun	11-Jun	19-Jun	25-Jun	3-Jul	10-Jul	16-Jul	22-Jul	31-Jul	7-Aug	13-Aug	20-Aug	26-Aug	4-Sep	10-Sep	16-Sep	22-Sep	4-Oct	8-Oct	17-Oct	23-Oct	30-Oct	SUM
T1		1										4	3		1		1	2				1	2		1	16
T2		1							1		2	3					2	1	1		1					12
T3								1	1		1	3														6
T4											1	5			1		1		1		1					10
T5								1	2	1		11		1			2			2	1			1	1	23
T6		1	1				2	2	1		1		2			1					3					14
T7		1										1					1	1	1		1		1		1	8
T8			1	1					1			2			1				1		1					8
T9					1			2	1			2				1			5					2		14
T10	1	1	2	1	1		2	3		1		1				1			1		3		1	1		20
T11	1	1							1			2				1	1		3			1				11
T12	2		3			1			3								1		1		1				1	13
T13											3	2						1			2	1				9
T14									1		1	1									1					4
T15	2		1					1	3	1						2		1		1	2					14
T16		1	1				1	2		2		3					1				1			1		13
T17	1		1						2			1					1		1		1					8
T18		3	1		2			3	1		1	2					1	1				1				16
T19					1			2		1	1							1		1						7
T20																										0
TOTAL	7	10	11	2	5	1	5	17	18	6	11	43	5	1	3	6	12	8	15	4	19	4	4	5	4	226

Table 3: Moose Sign Data

MOOSE	13-May	21-May	29-May	5-Jun	11-Jun	19-Jun	25-Jun	3-Jul	10-Jul	16-Jul	22-Jul	31-Jul	7-Aug	13-Aug	20-Aug	26-Aug	4-Sep	10-Sep	16-Sep	22-Sep	4-Oct	8-Oct	17-Oct	23-Oct	30-Oct	SUM
T1								1	2										1	1	1		2			8
T2			1		1		2	1		1		1							1							8
T3						1	1						1		1	2										6
T4		1	1	1	1				2	2	1											1			1	11
T5		2	1		1	1		2	3		1	2		1	1		1	1				2				19
T6			1		1	1	2	1	3	2	3	2	1		1		1	1		1		1	1		1	24
T7				1			2	2		1		2	2				1	1								12
T8								1	1			1					1	1					1			6
T9								1	1			2			3	4	2									13
T10		1													1		1						1			4
T11									1									3								4
T12	1		1	1	1	1		1																		6
T13		1								1	1	1				1						1				6
T14	1	1	1		1		1	4		1	1	2	1					1		1						16
T15								4																	1	5
T16			1				1	1																		3
T17																										0
T18				1	1	1	1	2	4		3	2	2	1				1				1				20
T19				1	1		2			1	1	1		1		1										9
T20		1		2			1		5	1	1					2	2	1	1		2	1			1	21
TOTAL	2	7	7	7	8	5	13	21	22	10	12	16	7	3	7	10	9	10	3	3	3	7	5	0	4	201

Table 4: Goose Sign Data

GOOSE	13-May	21-May	29-May	5-Jun	11-Jun	19-Jun	25-Jun	3-Jul	10-Jul	16-Jul	22-Jul	31-Jul	7-Aug	13-Aug	20-Aug	26-Aug	4-Sep	10-Sep	16-Sep	22-Sep	4-Oct	8-Oct	17-Oct	23-Oct	30-Oct	SUM
T1																										0
T2																										0
T3																										0
T4								3	2								1									6
T5								2	1					3	1					2						9
T6																										0
T7																										0
T8																										0
T9																	1									1
T10																										0
T11																										0
T12																										0
T13																										0
T14													1		1											2
T15																										0
T16														1												1
T17															1											1
T18																										0
T19																										0
T20									3																	3
TOTAL	0	0	0	0	0	0	0	5	6	0	0	0	1	4	3	0	2	0	0	2	0	0	0	0	0	23

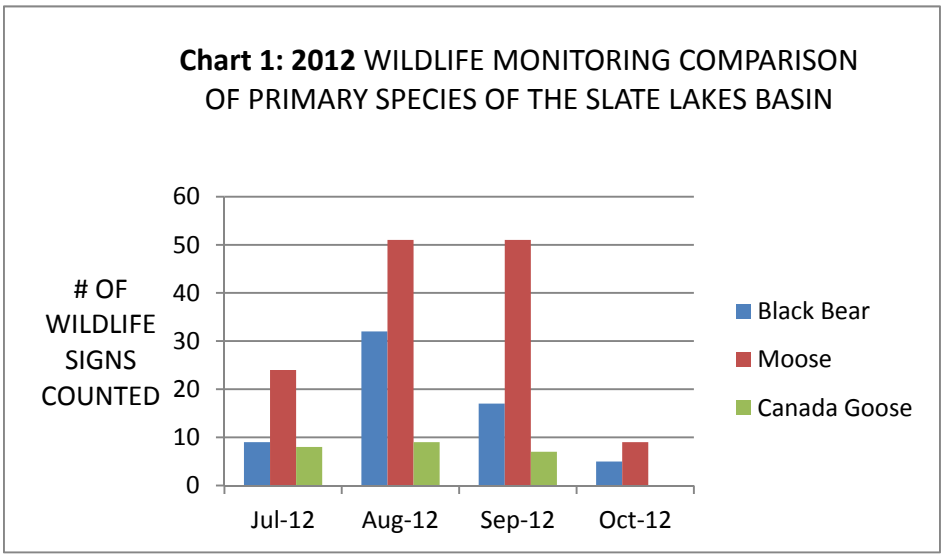


Chart 1: 2012 WILDLIFE MONITORING COMPARISON OF PRIMARY SPECIES OF THE SLATE LAKES BASIN
OF WILDLIFE SIGNS COUNTED
60
50
40
30
20
10
0
Jul-12
Aug-12
Sep-12
Oct-12
Black Bear
Moose
Canada Goose

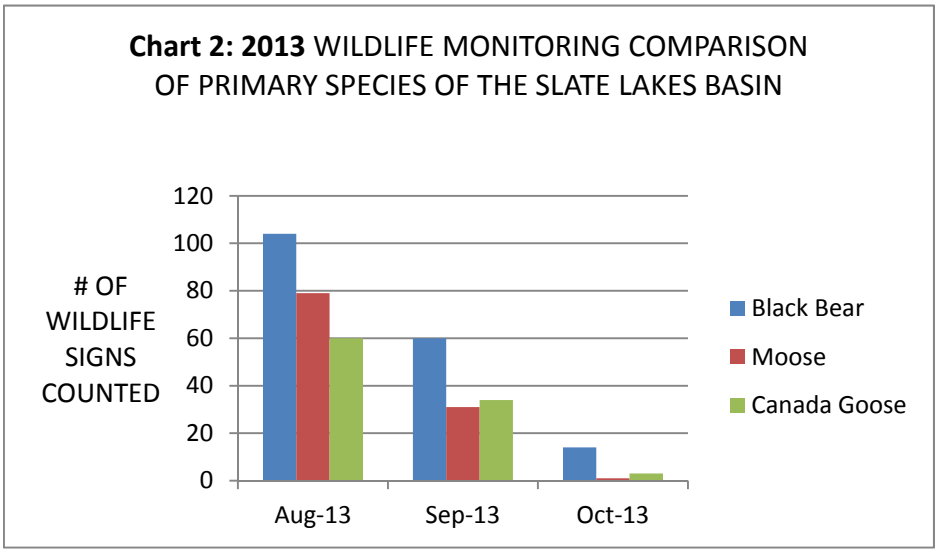


Chart 2: 2013 WILDLIFE MONITORING COMPARISON OF PRIMARY SPECIES OF THE SLATE LAKES BASIN
OF WILDLIFE SIGNS COUNTED
120
100
80
60
40
20
0
Aug-13
Sep-13
Oct-13
Black Bear
Moose
Canada Goose

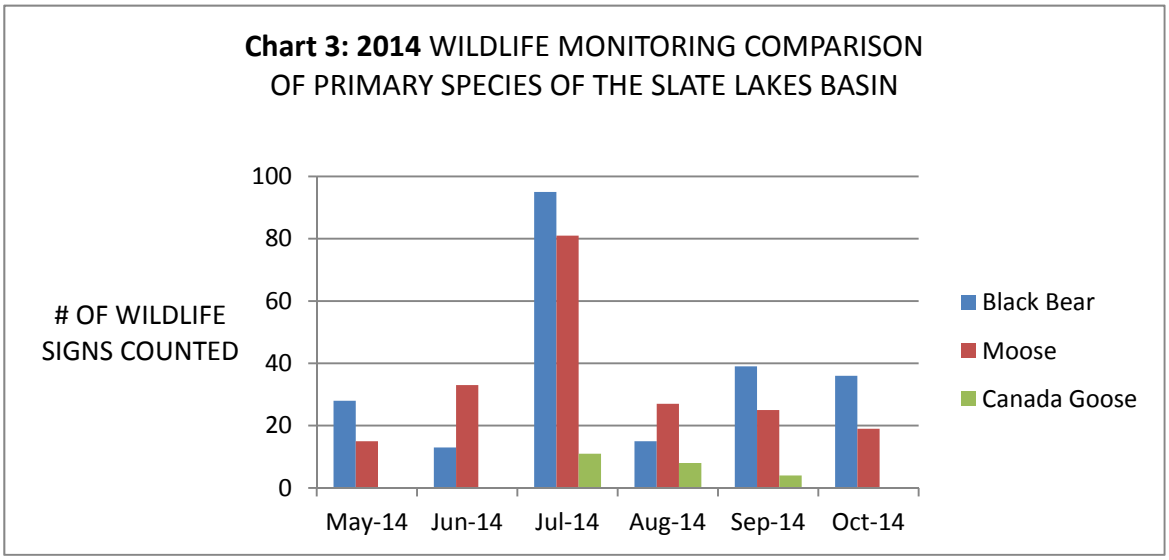
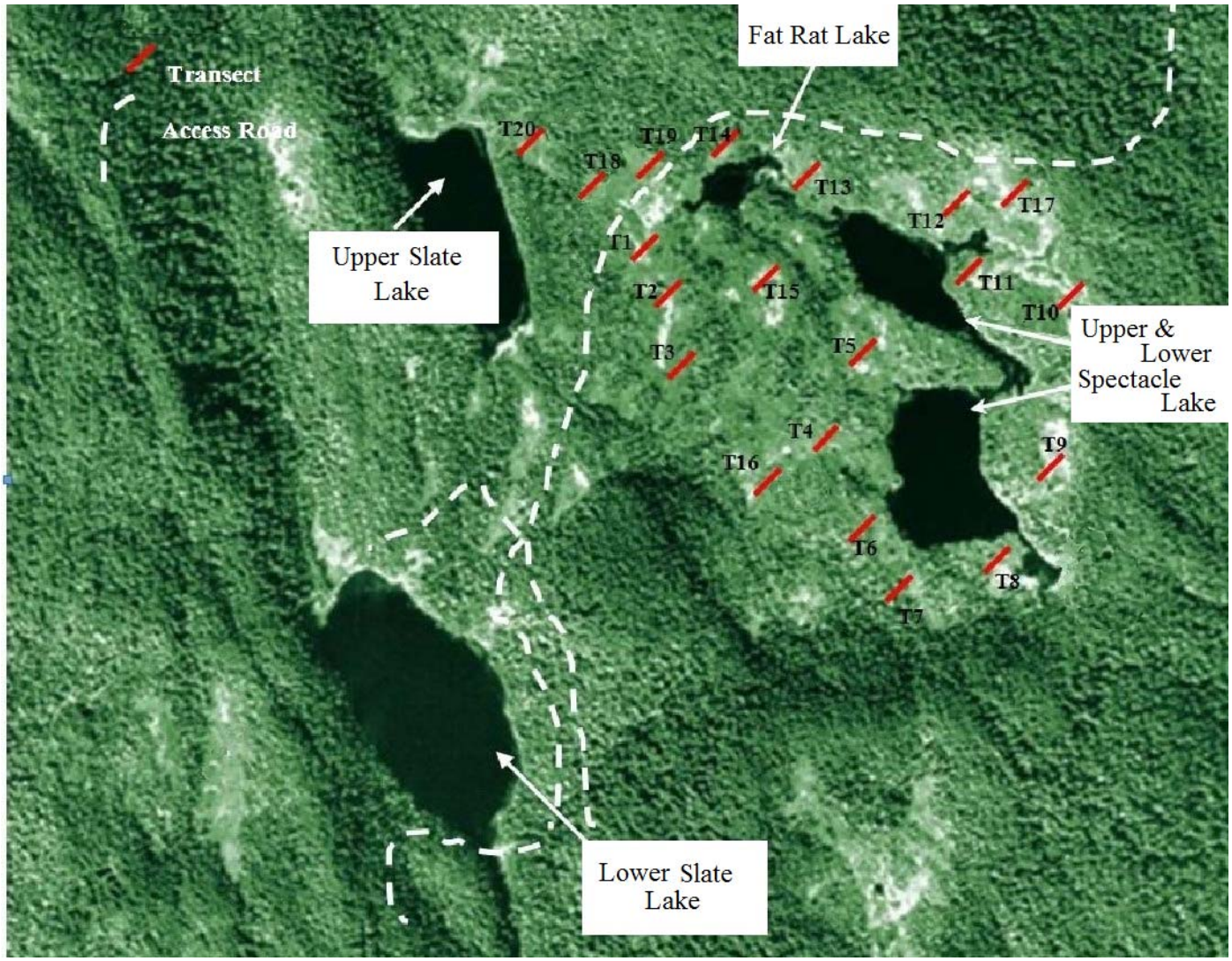


Chart 3: 2014 WILDLIFE MONITORING COMPARISON OF PRIMARY SPECIES OF THE SLATE LAKES BASIN
OF WILDLIFE SIGNS COUNTED
100
80
60
40
20
0
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Black Bear
Moose
Canada Goose

APPENDIX A: SITE MAP WITH TRANSECTS



APPENDIX B: TRANSECT GPS COORDINATES

(All North End Coordinates)

T1 N 58.81712N/135.03537W
T2 N 58.81631N/135.03036W
T3 N 58.81509N/135.03416W
T4 N 58.81410N/135.03032W
T5 N 58.81537N/135.02911W
T6 N 58.81288N/135.02849W
T7 N 58.81182N/135.02705W
T8 N 58.81250N/135.02471W
T9 N 58.81377N/135.02370W
T10 N 58.81657N/135.02342W
T11 N 58.81678N/135.02596W
T12 N 58.81765N/135.02682W
T13 N 58.81788N/135.03061W
T14 N 58.81834N/135.03325W
T15 N 58.81660N/135.03181W
T16 N 58.81410N/135.03157W
T17 N 58.81782N/135.02492W
T18 N 58.81820N/135.03523W
T19 N 58.81812N/135.03630W
T20 N 58.81844N/135.03839W

APPENDIX C: 2014 DATA SHEETS – TRANSECT DATA

Transect Data

Transect: T1-T20

Personnel: S.LAMMERS
R.BAILEY

Date: 5/13/2014

Weather: OVERCAST, LIGHT BREEZE, 45°F

Time: 1300 (START)
1500 (END)

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18				NO	NO	
T19						
T20						
T2						
T14 @49	L	T	M			
T1						
T3						
T15 @49	L	S	B			
42	C	D	B			
T5						
T4						
T16						
T6						
T7						
T8						
T9 ~~@15~~	~~L~~	~~M~~	~~OLD TRACK~~			
T10 @0	R	D	B			
T11 @35	R	D	B			
T17 @44	R	D	B			
T12 @18	C	D	B			
25	L	D	B			
50	R	T	M			
T13						

Transect Data

Transect: T1-T20
Personnel: SIERRA LAMMERS
RYAN BAILEY

Date: 5/21/2014
Weather: SUNNY, LIGHT BREEZE, 50°F

Time: START @ 1330
END @ 1500

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18	10m	C	S	B	N	N	
	12m	R	T	B			
	50m	R	D	B			
T19							
T20	21m	LCR	T	M			
T14	47m	R	T	M			
T1	30m	LCR	D	B			
T2	2m	L	D	B			
T3							
T5	25m	L	T	M			
	40m	LCR	T	M			
T4	25m	LCR	T	M			
T16	47m	R	T	B			
T6	19m	LCR	T	D x 2			→ TWO SETS OF TRACKS, DIFF SIZES
	31m	C	T	D			
	40m	R	D	B			
T7	24m	LC	T	B			
T8							
T9							
T10	30m	R	D	B			
	25m	LCR	T	M			
T11	28m	R	D	B			
T17							
T12							
T13	20m	LCR	T	M			

T15 = Ø

* OBSERVED TWO 2-3 YEAR OLD BLACK BEARS CROSSING TTF ROAD @ 1315

* 3 PAIRS OF GOLDENEYES ON UPPER SPECTACLE LAKE

Transect Data

Transect: All

Personnel: Ryan Bailey / Kristi Asplund

Date: 5-29-2014

Weather: Overcast 50°

Time: 13:15 → 15:00

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-18 @ 9m	R	Scat	Bear			
T-19	∅	∅				
T-20	∅	∅				
T-14	∅	∅				
T-1	∅	∅				
T-2 @18m	C	track	moose			
T-3	∅	∅				
T-15 @ 42m	L	Dig	Bear			
T-5 @ 40m	L,C,R	Track	Moose			
T-4 @ 26m	C,R	track	moose			
T16 @ 47m	R	track	Bear			
@ 4m	L	scat	moose			
T-6 @ 19m	L,C,R	track	moose			
@ 38m		dig	Bear			
T-7	∅	∅				

Transect Data

Transect: All

Personnel: Ryan Bailey / Krish Asplund

Date: 5-29-14 cont.

Weather: overcast 50°

Time: 13:15 → 15:00

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-8 @38m	R	track	Bear			
T-9	ø	ø				
T-10 @26m	R	dig	Bear			
@30	R	dig	Bear			
T-11	ø	ø				
T-17 @40m	R	dig	Bear			
T-12 @10m	L	dig	Bear			
@25m	L	dig	Bear			
@30m	L	dig	Bear			
@48m	R	track	mouse			
T-13	ø	ø				

Transect Data

Transect: T1-T20 - ALL
Personnel: S. LAMMERS
R. SIMENVHOIS

Date: 6/5/2014
Weather: P. CLOUDY, BREEZY, 55°F

Time: START @ 1300
END @ 1500

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18 @30m	L/R	~~M~~ T	~~F~~ M	N	N	
T19 @23m	L/R	~~M~~ T	~~F~~ M			
T20 @20m	L/R	~~M~~ T	~~F~~ M			- Mallards on Fat Rat Lake
23m	L/R	~~M~~ T	~~F~~ M			
T4	Ø					
T1	Ø					
T2	Ø					- Olive sided Flycatcher @ end of T15
T3	Ø					
T15	Ø					
T5	Ø					
T4 @20m	L	~~M~~ T	~~F~~ M			- Pair of yellowlegs defending possible nest site around T11 T17 & T12, very aggressive
T16	Ø					
T6	Ø					
T7 @20m	R	~~M~~ T	~~F~~ M			
T8 @50	R	D	B			
T9	Ø					
T10 @25	L	D	B			- Black Bear ~~@~~ between T12 & T13 heading north across road
T11	Ø					
T17	Ø					
T12 @50	R	T	M			
T13	Ø					

Transect Data

Transect: ALL

Personnel: S. Lawless, R. Simpson

Date: 6/11/14

Weather: ⊕, Calm, 53°F

Time: 13:30 START
15:00 END

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18 @10	L	S	B	Y		
@30	CROSS	T	M	N		
@50	R	Dig	B			
T19 @2	R	S	B			
@22	LCR	T	M			
T20 —						
T14 @49	L	T	M			
T1 —						
T2 @26	LCR	T	M			
T3 —						
T15 —						
T5 @40	LRC	T	M			
T4 @25	LRC	S	M			
T-16 —						
T-6 @30	LRC	T	M			
T-7 —						
T-8 —						
T9 @25	L	D	B			
T10 @25	R	D	B			
T11 Ø						Goldeneyes @ end of T12 on lake
T7 Ø						1 M, 1 F
T12 @49	R	T	M			
T13 Ø						

Transect Data

Transect: ALL T1-T20
Personnel: SIERRA LAMMERS
RON SIMENHOIS

Date: JUNE 19, 2014
Weather: MOSTLY SUNNY, BREEZY, 50°F - 60°F

Time: START @ 1330
END @ 1445

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18	35m	LCR	T	M			
T19	Ø						
T20	Ø						
T4	Ø						
T1	Ø						OLIVE SIDED FLY CATCHER @ END OF T1, ATOP TREE
T2	Ø						
T3	23m	L	T	M			
T5	Ø						
T5	35m	LCR	T	M			
T4	Ø						
T6	Ø						
T6	20m	LCR	T	M			
T7	Ø						
T8	Ø						
T9	Ø						
T10	Ø						
T11	Ø						
T17	Ø						
T12	5m	L	D	B			
	50	R	T	M			
T13	Ø						BLACK BEHR END OF ~~T13~~ T13

Transect Data

Transect: ALL T1-T20
Personnel: SIERRA LAMMERS, RON SIMENHOIS, ZACH BICKNELL

Date: JUNE 25, 2014
Weather: OVERCAST, BREEZEY, 55°F

Time: START = 1350
END = 1530

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18	@20	LCR	T	M			BLACK BEAR CROSSING RD BETWEEN T19-T20
T19	@10	LCR	T	M			
	23	LCR	T	M			
T20	15	LCR	T	M			
~~T14~~	~~Ø~~						
T1	Ø						
T4	48	L	T	M			
T2	@1	L	T	M			
	10	R	T	M			
T3	25	L	T	M			
~~T15~~	~~Ø~~						
T5	Ø						
T4	Ø						
T16	1m	C	S	B			BLACK BEAR END OF T16 PROBABLY SAME
	28	LCR	T	M			
T6	66	C	S	B			
	32	LCR	T	M			
	33	LCR	T	M			
	36	R	D	B			
T7	25	LCR	T	M			
	28	C	T	M			
T8	Ø						
T9	Ø						
T10	24	R	D	B			
	39	R	D	B			
T11	Ø						
T17	Ø						
T13	Ø						GROUSE w/ chicks
T12	Ø						

Transect Data

Transect: All

Personnel: R. Bailey

Date: 7-3-14

Weather: Cloudy 58°

Time: 13:30 – 15:30

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18 @4	L/C/R	T	M			
@18	R	S	B			
@ 12	L	S	B			
@ 35	C	T	M			TN=Ø
@50	R	Dig	B			
(1) T-19 @ 3m	R	S, T	B, B			
T-14 @20m	C	T	M			
@10m	L	T	M			
@ 48m	L	T	M			
@ 50m	L	T	M			
T-1 @31m	L,C,R	T	M			
T-2 @1m	L	T	M			
T-3	no go	Black Bear (B) on transect		medium size		chocolate
T-15 @44m	L	S	B			
@32m	L,L	T	M			
@ 20m	R	T	M			
@ 17m	C	T	M			
@ 2m	C	T	M			
T-5 @23m	R	T	M			
@ 24m	L	S	Goose,			
@30m/@ 27m	L	S	Goose			
@ 33m	R	T	B			
@ 38m/40m	L,C,R	T	M			

Transect Data

Transect: All

Personnel: R. Bailey

Date: 7-3-14

Weather: Cloudy 58°

Time: 13:30-1530

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-4 @10m	C,R	S	Goose			
@10 @12	C,R	S	Goose			
@28-30	L,C,R	S	Goose			
T-16 @34	L	T	B			
@42	L	T	M			
@44	R	T	B			
X @26		Live Grouse chick	Grouse	Y video		Mom close by
X @29		Live Grouse chick	Grouse	Y video		
T-6 @29	L,C,R	T	M			
@32	C	T	B			
@38	R	D	B			
T-7 @25	L,C	T	M			
@26	L	T	M			
T-8 @40	L,C,R	T	M			
T-9 @15	R	T	B			
@1	C	T	M			
@1	C	T	B			
T-10 @29	R	D	B			
@26	R	D	B			
@2	R	D	B			
T-11						

Transect Data

Transect: All
Personnel: R. Bailey

Date: 7-3-14
Weather: Cloudy 58°

Time: 13:30 - 1530

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-17		—	—			major mosquitoes
		—	—			on survey route
T-12 @ 47	C,R	T	M			
T-13		—	—			
		—	—			

Transect Data

Transect: ALL

Personnel: ZACH BICKNELL, KRISTI ASPLUND

Date: 7/10/14

Weather: 50°F, CALM

Time: 1:30 pm

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T 18 @ 5	R	S	B			
10	R	M T	T M			
12	L/R/C	M T	T M			
18	C	M T	T M			
46	L	M T	T M			
T 20 2	C	M T	T M			
6	L	M T	T M			
15	R	S	Goose			
16	R	M T	T M			
32	C	M T	T M			
47	R	S	G			
48	L	S	G			
22	L	T	M			
T 14 @ 19	C	T	B			
T 1 @ 30	L	T	M			
49	L	T	M			
T 2 2	L	D	B			
T 3 @ 24	C	D	B			
T 5 @ 46	L	S	B			
T 5 @ 3	C	T	M			
# @ 17	L	S	M			
28	L	T	M			
35	R	D	B			
36	R	S	G			
40	C	T	B			
T 4	L	T	M			
26	C	T	M			
27	L	S	G			
	C	S	G			

Transect Data

Transect: _____

Personnel: _____

Date: 7/10/14 cont.

Weather: _____

Time: 1400

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T15 @43	R	D	B			
45	L	T	B			
T6 @7	C	T	M			
15	L	T	M			
16	C	T	M			
30	R	D	B			
T8 6	R	T	M			
46	L	S	B			
T9 49	L/R	D	B			
2	L	D T	M			
T11 @28	R	T	M			
@30	R	D	B			
T17 47	R	D	B			
49	R	D	B			
T12 @15	L	D	B			
40	L	D	B			
49	R	S/T	B			
T3						
T7						
T10						
T13						
T16						
T19						

Transect Data

Transect: ALL T1-T20

Personnel: S. LAMMERS, R. BAILEY, Z. BICKNELL

Date: 7/16/2014

Weather: OVERCAST, 45°F, -55°F TO P. CLOUDY, LIGHT BREEZE

Time: START: 1400 END: 1530

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18	Ø						
T19	@12	R	T	M			
	39	L	D	B			
T20	@18	LCR	T	M			
T1	Ø						
T14	@48	C	T	M			
T2	@3	L	T	M			
T3	Ø						
T15	@16	R	D	B			
T5	3	R	D	B			
T4	@26	R	T	M			
	30	LCR	T	M			
T16	@40	C	T	B			
	43	C	T	B			
T6	@15	LCR	T	M			
	31	L	T	M			
T7	@20	L	T	M			
T8	Ø						

Transect Data

Transect: _____

Personnel: _____

Date: 7/16/2014 cont.

Weather: _____

Time: END: 1530

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T9 Ø						
T10 40	C	D	B			
T11 Ø						
T17 Ø						
T12 Ø						
T13 @ 13	LR	T	M			

Transect Data

Transect: ALL (T1-T20)
Personnel: SIERRA LAMMERS, RYAN BAILEY, ZACH BICKNELL

Date: 7/22/2014
Weather: SUNNY, 70°F, Ø WIND

Time: START: 1400
END: 1600

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-18 @3m	R	T	M			
10m	L,C,R	T	M			
20m	L	S	B			
28m	L,C,R	T	M			
T-19 @12m	L	T	M			
@25m	L,C,R	T, D	B			
T-20 @24m	L, C	T	M			
T-14 @30	L	D	B			
@48	L,C,R	T	M			
T-1	—	—	—			
T-2 @15m	L	D	B			
@16	L	D	B			
T-3 @30m	R	S	B			
T-5 @1m	R	T	M			
T-4 @25m	C	T	B			
@30m	L	T	M			
T-16	—	—	—			

Transect Data

Transect: _____

Personnel: _____

Date: 7/22/2014 CONT.

Weather: _____

Time: _____

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-6 @12m	L	T	M			
@20m	L,C,R	T	M			
@25m	R	D	B			
@30m	C	T	M			
T-7	—	—	—			
T-8	—	—	—			
T-9	—	—	—			
T-10	—	—	—			
T-11	—	—	—			
T-17	—	—	—			
T-12	—	—	—			
T-13 @42	C	T	B			
@43	L	D	B			
@20	L,L	T	M			
@6	L	D	B			
T15 Ø						

Transect Data

Transect: T1-T20

Personnel: SIERRA LAMMERS
RYAN BAILEY

Date: 7/31/2014

Weather: SUNNY, 5MPH WIND, CLEAR

Time: START @1400
END @1545

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T14	@24	L	T	M			*HEARD OLIVE-SIDED FLYCATCHER BEFORE STARTING
	31	L	FEATHER	G			
	32	L	D	B			
	49	LCR	T	M			
T1	@27	R	D	B			
	28	C	D	B			
	29	L	D	B			
	45	L	D	B			
T2	@1	L	D	B			
	18	L	D	B			
	24	LR	D	B			
	26	LCR	T	M			
T3	@15	C	D	B			
	35	R	S	B			
	38	L	S	B			
T15	Ø						
T5	@21-10	LCR	D	B x5			
	26	R	D	B			
	27	L	D	B x2			
	29	C	T	M			
	30	R	D	B			
	31	R	D	B			
	35	R	T	M			
	40	R	D	B			

Transect Data

Transect: _____

Personnel: _____

Date: 7/31/2014 CONT

Weather: _____

Time: 1430-1530

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T4	@15	R	D	B			
	24	R	D	B			
	26	C	D	B x2			
	27	L	D	B			
T16	@5	L	D	B			* GOOD SPOT TO MOVE TRAIL CAM TO
	30	LCR	T	B			
	33	LCR	T	B			
T6	@5	LCR	T	M			*GEESE ON LAKE ≈14
	18	LCR	T	M			
T7	@18	L	S	B			
	20	LCR	T	M			
	23	LCR	T	M			
T8	40	LCR	T	M			
	2	L	D	B			
	0	L	D	B			
T9	52	L	D	B			
	53	R	D	B			
	16	LR	T	M			
	2	L	T	M			
T10	@32	L	D	B			
T11	40	L	D	B			
	30	R	D	B			

Transect Data

Transect: _____

Personnel: _____

Date: 7/31/2014 cont

Weather: _____

Time: START @ 1530
END @ 1545

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T17 @30	C	D	B			
T12 Ø						
T13 @18	L	D	B			
23	C	D	B			
20	CLR	T	M			
T18 @10	C	S	B			
@12	LCR	T	M			
@20	L	S	B			
@38	LCR	T	M			
T19 @12	LCR	T	M			
T20 Ø	–	–	–			

Transect Data

Transect: T1-T20 ALL
Personnel: SIERRA LAMMERS
ZACH BICKNELL

Date: AUG 7, 2014
Weather: OVERCAST, CALM, 55°F

Time: START: 1430
END: 1545

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18 @2m	LCR	T	M			
17	LCR	T	M			
T19 Ø						
T20 Ø						
T14 @11	C	FEATHER	GOOSE			
@49	LCR	T	M			
T1 @28	R	D	B			
30	C	D	B			
50	L	D	B			
T2 Ø						
T3 @24	C	T	M			
T15 Ø						
T5 Ø						
T4 Ø						
T16 Ø						
T6 @37	R	D	B			
@17	L	T	M			
@25	R	D	B			
T7 @20	LCR	T	M			
@23	LCR	T	M			
T8 Ø						
T9 Ø						

T10 Ø

T11, T17, T12, T13 = Ø

Transect Data

Transect: ALL (T1-T20)

Personnel: PETE GROW
ZACH BICKNELL

Date: 8/13/2014

Weather:

Time:

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T18 @5	L	T	M			
T19 @25	L	M T	M			
T5 @2	L	T	M			
T.5 @24	L	S	G			
@26	L	F	G			
@24	R	D	B			
28	L	S	G			
Tiger	L	S	G			

Transect Data

Transect: ALL (T1-T20)
Personnel: S. LAMMERS & R. BAILEY

Date: 8/20/2014
Weather: SUNNY, 65°F, NO WIND

Time: START @ 1440
END @ 1545

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13 Ø						
T12 Ø						
T7 @42	L	FEATHER	GOOSE			
T11 Ø						
T10 @17	LCR	T	M			
T9 @47	R	T	M			
43	R	T	M			
42	LR	T	M			
T8 @25	R	D	B			
T7 Ø						
T6 @20	LCR	T	M			
T16 Ø						
T4 @45	DL	ED	B			
T5 @48	LR	T	M			
26	L	FEATHERS	GOOSE			
T15 Ø						
T3 @18	R	T	M			
T2 Ø						
T1 @50	L	D	B			
T14 @50	C	FEATHERS + POOP	GOOSE			
T18 Ø						
T19 Ø						
T20 Ø						

Transect Data

Transect: ALL (T1-T20) Date: 8/26/2014 Time: START @ 1410

Personnel: S. LAMMERS + R. BAILEY Weather: RAIN, 50°F, Ø WIND END @

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13	19 ~~14~~	LCR	T	M			SOW + TWO CUBS @ BLOWDOWN AREA AROUND NOON (BLACK BEARS)
T12	Ø						
T7	Ø						
T11	10	L	D	B			
T10	11	L	D	B			
T9	50	L R	~~D~~ T	~~B~~ M			
	49		T	M			
	45	L R	T	M			
	29	L R	T	M			
	10	R	D	B			
T8	Ø						
T7	Ø						
T6	1	C	S	B			
T16	Ø						
T4	Ø						
T5	Ø						TWO GREAT BLUE HERONS FLEW OVER LAKE
T15	16	R	D	B			
	43	R	D	B			
T3	12	LCR	T	M			
	20	R	T	M			
T2	Ø						
T1	Ø						
T14	Ø						

T20 @11 LCR M T
14 CLR M T

T18 Ø

T19 T Moose @ 40 on the (L)

Transect Data

Transect: ALL T1-T20
Personnel: SIERRA LAMMERS
R. BAILEY

Date: 9/4/2014
Weather: OVERCAST / LIGHT RAIN
Ø WIND 50°F

Time: START: 1315
END: 1430

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13	Ø						
T12	25	L	D	B			DUCK - LARGE GRAY/DARK BODY, WHITE WINGS
T11	10	C	D	B			MALLARD-SIZED
T17	45	R	D	B			
T10	18	LCR	T	M			
T9	44	R	T	M			
	29	R	T	M			
	21	L	S	G			
T8	26	~~R~~	T	M			
T7	20	R	D	B			
	35	LCR	T	M			
T6	20	LCR	T	M			
T16	3	L	D	B			
T4	28	L	T	B			
	28	LCR	S	~~MARTEN~~ GOOSE			
T5	40	LCR	T	M			
	38	R	D	B			
	2	L,R	D	B			
T15	Ø						
T2	25	L	D	B			
	15	L	D	B			
T3	Ø						

Transect Data

Transect: _____ Date: 9/4/2014 cont. Time: _____

Personnel: _____ Weather: _____

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T1 30	C	D	B			
T14 ~~8~~						
T18 3	L	S	B			
T19 ~~0~~						
T20 15	LCR	T	M			
18	LCR	T	M			

Transect Data

Transect: _____ Date: 9-10-14 Time: 13:45-15:45

Personnel: Ryan Bailey/Pete Straw Weather: Cloudy 55°

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-13 28m	L	D	B			
T-12 Ø	–	–	–			
T-17 Ø	–	–	–			
T-11 @ 25m	L,C,R	T	M			
@ 12m	R	T	M			
@ 6m		T	M			
T-10 Ø	–	–	–			
T-9 Ø	–	–	–			
T-8 @ 10m	L,C,R	T	M			
T-7 33m	R	S	B			
34m	R	T	M			
T-6 @ 18m	L,C,R	T	M			
T-16 Ø	–	–	–			
T-4 Ø	–	–	–			T6-Ø
T-5 @ 40m	L,C,R	T	M			
T-15 @ 8m	L	D	B			

Transect Data

Transect:

Date: 9-10-14

Time: 13:45- 15:45

Personnel: Ryan Bailey / Pete Strow

Weather: Cloudy 55°

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-2 @ 38m	R	D	B			
T-3 Ø	—	—	—			
T-14 @ 49m	R	T	M			
T-1 @ 24m	R	D	B			
@ 30	AC	D	B			
T-18 @ 24m	L,C,R	T	M			
@ 50m	L,CR	Digs	Bears!!			
T-19 @ 35m	L	D	B			
T-20 @ 18m	L,C,R	T	M			

Transect Data

Transect: ALL T1-T20
Personnel: SIERRA LAMMERS
KRISTI ASPLUND

Date: 9/16/2014
Weather: OVERCAST CHANGING TO P.CLOUDY/SUN
50°F Ø WIND

Time: START: 14:45
END: 16:15

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13	Ø						
T17	47	R	D	B			
T12	49	R	D	B			
T11	5	L	D	B			
	43	R	D	B			
	45	R	D	B			
T10	26	R	D	B			
T9	4	L	D	B			
	23	R	D	B			
	40	R	D	B			
	45	L	D	B			
	49	L	D	B			
T8	25	R	D	B			
T7	30	R	S	B			
T6	Ø						
T16	Ø						Ø PICS ON CAM
T4	15	C	D	B			
T5	Ø						

Transect Data

Transect: _____

Personnel: _____

Date: 9/16/2014 CONT.

Weather: _____

Time: 15:40 / 16:15

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T15	Ø						
T3	Ø						
T2	26	RLC	T	M			
	4	R	T	Bear			
T1	45	L	T	M			
T14	Ø						
T19	Ø						
T20	Ø						
	18	LCR	T	M			
T18	Ø						

Transect Data

Transect: T1-T20
Personnel: SIERRA LAMMERS, RYAN BAILEY

Date: 9/22/2014
Weather: OVERCAST, Ø WIND, 47°F

Time: START: 1345
END: 15:45

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-13	—	—	—			
T-12	—	—	—			
T-17	—	—	—			
T-11	—	—	—			
T-10	—	—	—			
T-9	—	—	—			
T-8	—	—	—			
T-7	—	—	—			
T-6 @19	L,C,R	T	M			
T-16		—	—	—		
T-4	—	—	—			
T-5 @47	L	~~B~~ D	~~D~~ B			
@46	C	~~B~~ D	~~D~~ B			
@28	L	~~@~~ Scat	G			
@18	L	S	G			
T-15 - @6	L	D	B			

Transect Data

Transect: _____ Date: 9/22/2014 Cont. Time: END @ 15:45

Personnel: _____ Weather: _____

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-3	—	—	—			
T-2	—	—	—			
T-1 @32	L,C,R	T	M			
T-14 @48	L,C,R	T	M			
T-18	—	—	—			
T-19 @47	R	D	B			
T20 Ø						

Transect Data

Transect: T1- T20

Personnel: Kristi Aspelund, Justin Powell

Date: 10/04/2014

Weather: OVERCAST / RAINING 49°F

Time: 15:30 START, 17:10 FINISH

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-14 10	C	S	B	NO	NO	
T13 40	L	D	B			
T-13 2	L/R	D	B			
T12 5	L	D	B			
T-11 NONE						
T17 ~~38~~	R	D	B			
T10 26	R	D	B			
28	L	D	B			
40	R	D	B			
T-9 NONE						
T-9 12	R	D	B			
T-7 ~~NONE~~						Right when you cross the
↳ 25	L	S	B			creek pouring out from
T-6 30	R	D	B			spect. lake it smelled like
39	L	D	B			wet bear / animal. strong
41	L	D	B			present smell.
T-4. 20	R	S	B			
						Coming up the hill from
T-16 4	L	D	B			T-4 there was clear
T-5 1	C	Dins	B			movement in the bushes
T-15 4	L	D	B			(not birds) likely a bear
16	R	D	B			due to the mass movement
T-3 NOTHING						
T-2 32	R	D	B			
T-1 40	R/L/C	T	M DINGE			
~~T-19 NONE~~						
T-18/19 NONE						
T-20 10	R/C/L	T	M DINGE			
21	C	T	M			

Transect Data

Transect: T1-T20 Date: 10/8/2014 Time: START: 1440

Personnel: SIERRA LAMMERS, RYAN BAILEY Weather: PARTLY CLOUDY, LIGHT BREEZE, °F END: 1600

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13	12	C	S	B	Y	N	FULL OF BERRIES
	44	L	T	M	N		
T12	Ø						
T17	Ø						
T11	28	C	D	B			
T10	Ø						
T9	Ø						5 DUCKS ON LAKE
T8	Ø						
T7	Ø						
T6	28	LCR	T	M			
T16	Ø						
T4	35	LCR	T	M			
T3	44	LCR	T	M			
	42	LCR	T	M			
T15	Ø						
T3	Ø						
T2	Ø						
T1	46	L	D	B			
T18	7	LCR	T	B			
	10	LCR	T	M			
T19	Ø						
T20	Ø						
	19	LCR	T	M			
T14	Ø						

Transect Data

Transect: All

Personnel: Ryan Bailey

Date: 10-17-2014

Weather: Sunny 50°

Time: 1400-1600

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-13	–	–	–			
World's fattest porcupine on road @ Blowdown near T-13 to start						
T-12	–	–	–			
T-17	–	–	–			
T-11	–	–	–			
T-10 @ 5m	L/LR	T	B			
@ 11m	LCR	T	M			
T-9	–	–	–			
T-8 @ 42m	LCR	T	M			
T-7 @ 37	R	S	B			
T-6 @ 19m	LCR	T	M			
T-16	–	–	–			
T-4	–	–	–			
T-5 @ 40m	R	T	Deer			
T-15	–	–	–			
T-3	–	–	–			

Transect Data

Transect: All

Personnel: Ryan Bailey

Date: 10-17-2014

Weather: Sunny 50°

Time: 14:00-16:00

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T-2	—	—	—			
T-1 @48m	LCR	T	M			
@44m	R	D	B			
@33m	LCR	T	M			
@23m	R	D	B			
T-14	—	—	—			
T-18	—	—	—			
T-19	—	—	—			
T-20	—	—	—			

Transect Data

Transect: ALL T1-T20
Personnel: S. LAMMERS
R. STROW

Date: 10/23/2014
Weather: OVERCAST, CALM, COLD, °F
NO PRECIP

Time: START: 1400
END: 1545

Location		L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13	Ø						LOTS OF CHICKADEES
T12	Ø						
T17	Ø						
T11	Ø						
T10	24	L	D	B			
T9	3	L	D	B			
	35	L	D	B			
T8	Ø						
T7	Ø						
T6	Ø						
T16	4	L	D	B			
T4	Ø						
T5	1	C	D	B			
T15	Ø						GROUSE BETWEEN T5 & T15
T3	Ø						
T2	Ø						
T1	Ø						
T14	Ø						
T18	Ø						
T19	Ø						
T20	Ø						

Transect Data

Transect: ALL

Personnel: S. LAMMERS
L. ASPLUND

Date: 10/30/2014

Weather: OVERCAST / FOG / LIGHT SPRINKLES

Time: 1445
END @ 15:30

Location	L/R	Sign Type (Track, Scat, etc)	Species	Photo (Y/N)	Sample (Y/N)	Notes
T13 - None						
T12	L	D	B			
T17/T11 - NONE						
T10 - None						
T9 - NONE						
T8 - None						
T7 40	R	S	B			
T6 20	C/R	T	M			
T4 38/37	L	T	M			
T16 - NONE						
T5 - 0	C	D	B			
T15 - 3	C	S	M			
T3 - NOTHING						
T2 - NOTHING						
T1 18	L	D	B			
T14 NOTHING						
T19/T18 - NONE						
T20 23	L/C/R	T	M			

APPENDIX C CONTINUED: 2014 DATA SHEETS – MOBILE OBSERVATIONS

Mobile Observation Data

Area Traversed: —

Personnel: SIERRA KAMMERES

Date: 6/9/2014

Weather: RAIN, CALM, 60°F

Sighting Location	Time	?	Species	Photo (Y/N)	Description/Notes
BETWEEN T12-3 T17	1100		GROUSE	Y	ADULT FEMALE W/ TWO (ATLEAST) CHICKS
* OBSERVED GROUSE JUST SOUTH OF ROAD WHILE DRIVING PAST					

Mobile Observation Data

Area Traversed: ——

Personnel: SIERRA LAMMERS

Date: 6/25/2014

Weather: RAINY, CALM, 53°F

Sighting Location	Time	Species	Photo (Y/N)	Description/Notes
ALPINE CORNER BETWEEN T17 & T12	1000	CAGO	NO	1 ADULT CANADA GOOSE PREENING IN FIELD, OBSERVED WHILE DRIVING BY

Mobile Observation Data

Area Traversed: _____

Personnel: SIERRA LAMMERS

Date: 11/15/2014

Weather: SUN, Ø WIND, 24°F

	Sighting Location	Time	Species	Photo (Y/N)	Description/Notes
1.	LOWER SLATE LAKE	1100	COMMON MERGANSER	N	TWO COMMON MERGANSERS HAVE BEEN ON THE LAKE THIS PAST WEEK TWO FEMALES
2.	LOWER SLATE LAKE	1100	AMERICAN DIPPER	N	SPOTTED ALONG EDGE OF LAKE

APPENDIX D: COEUR KENSINGTON WILDLIFE MONITORING PHOTO LOG

Black bear traveling through survey area – May 21, 2014

Moose track

Yellowlegs near T12 - June 5, 2014

Adult female Sooty Grouse – June 25, 2014

Black bear foraging near Upper Spectacle Lake
September 25, 2014

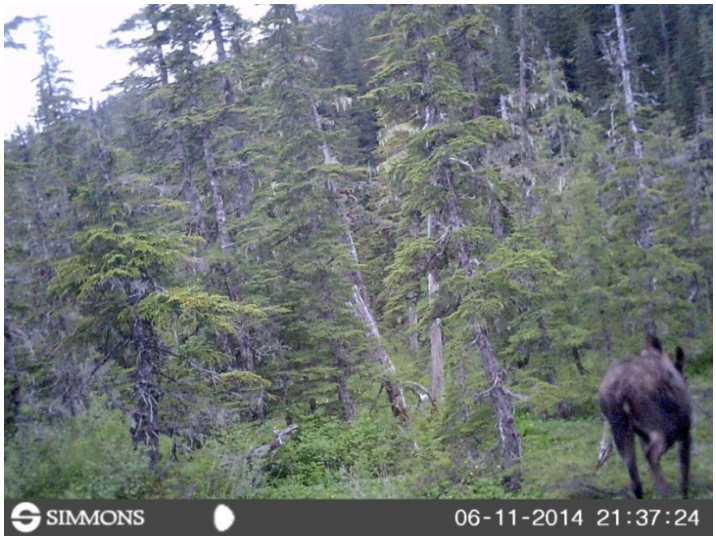
Transect marker

Same black bear as seen above, foraging on Skunk Cabbage
September 25, 2014

Bear scat – October 8, 2014

<u>PHOTO LOG CONTINUED</u>: MOTION SENSOR TRAIL CAMERA PHOTOS

Black bear between T12 & T13 – July 5, 2014



Moose between T19 & T20
June 11, 2014

Chestnut-backed Chickadee – August 3, 2014

Moose between T7 & T8
June 25, 2014

Two moose browsing together (note time) T16
August 24, 2014

APPENDIX E: 2014 AVIAN SPECIES LIST

Waterfowl
American Wigeon *(Anas Americana)*
Blue-winged Teal (*Anas discors)*
Canada Goose (*Branta canadensis*) **S, Common**
Common Goldeneye (*Bucephala clangula*) **S**
Common Merganser *(Mergus merganser)* **S**
Greater Scaup (*Aytha marila*)
Hooded Merganser (*Lophodytes cucullatus*)
Mallard (*Anas platyrhynchos*) **S, Common**
Red-throated Loon (*Gavia stellata*)
Ring-necked Duck (*Aythya collaris*)
White-winged Scoter (*Melanitta fusca*)

Raptors
Bald Eagle (*Haliaeetus leucocephalus*) **S, Common**
Northern Harrier *(Circus cyaneus)*
Northern Pygmy Owl (*Glaucidium gnoma*)
Red-tailed Hawk (*Buteo jamaicensis*) **S**
Sharp-shinned Hawk (*Accipiter striatus*)

Other
Belted Kingfisher (*Ceryle alcyon*) **S, Common**
Bohemian Waxwing (*Bombycilla garrulous*)
Cedar Waxwing (*Bombycilla cedrorum*)
Chestnut-backed Chickadee (*Poecile rufescens*) **S, Common**
Common Raven (*Corvus corax*) **S, Common**
Dark-eyed Junco (*Junco hyemalis*) **S, Common**
Great Blue Heron *(Ardea herodias)* **S**
Hermit Thrush (*Catharus guttatus*) **S**
Least Sandpiper (*Calidris minutilla*)
Lesser Yellowlegs (*Tringa flavipes*) **S**
Northwestern Crow (*Corvus caurinus*)
Olive-sided Flycatcher (*Contopus borea*lis) **S, C**
Orange-crowned Warbler (*Vermivora celata*)
Pine Grosbeak (*Pinicola enucleator*)
Red-breasted Sapsucker (*Sphyrapicus rubber*) **C**
Ruby-crowned Kinglet (*Regulus calendula*)
Rufous Hummingbird (*Selasphorus rufus*)
Savannah Sparrow (*Passerculus sandwichesis*)
Solitary Sandpiper (*Tringa solitaria*)
Song Sparrow *(Melospiza melodia*)
Sooty Grouse (Dendragapus fuliginosus) **S**
Steller's Jay (*Cyanocitta stelleri*) **S, Common**
Tree Swallow (*Tachycineta bicolor*) **S, Common**
Varied Thrush (*Ixoreus naevius*) **S, C**
White-crowned Sparrow (*Zonotrichia albicollis*)
Wilson's Warbler (*Wilsonia canadensis*)
Winter Wren (*Troglodytes troglodytes*) C

Common = multiple sightings throughout season

S = identified through sighting

C = identified through call or song

Attachment 3

Mountain Goat Population Monitoring near Kensington Mine, Alaska – March, 2014

Wildlife Research Annual Progress Report

Mountain goat population monitoring and movement patterns near the Kensington Mine, Alaska

Kevin S. White, Neil L. Barten, Ryan Scott and Anthony Crupi

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February 2014

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Cover Photo: An adult male mountain goat (LG-162) on the north side of Lions Head Mountain, August 2013 ©2013 ADF&G/photo by Kevin White.

Mountain goat population monitoring and movement patterns near the Kensington Mine, Alaska

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February 2014

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INTRODUCTION

This report was prepared to meet the annual reporting requirements for Coeur Alaska, Inc.. Funding for this project was made available in September 2005 and this report summarizes activities completed by December 30, 2013.

Background

In 2005, Coeur Alaska, Inc. re-initiated development activities at the Kensington mine site, located a short distance northwest of Berners Bay. In addition, the Alaska Department of Transportation and Public Facilities (ADOT/PF) proposed construction an all-season highway between Echo Cove and the Katzehin River. In the context of these proposed industrial development activities, mountain goats were identified as an important wildlife species likely to be affected by mine development and road construction activities.

A small-scale study of mountain goats conducted in the vicinity of the Kensington mine by Robus and Carney (1995) showed that goats moved seasonally from high alpine elevations in the summer and fall to low, timbered elevations during winter months. One of the main objectives of the Robus and Carney (1995) study was to assess the impacts of the mine development activities on habitat use, movement patterns and, ultimately, productivity of mountain goats. However, the mine never became operational, thus these objectives could not be achieved, and by 1995 goat monitoring in the area wound down and eventually ended. In 2005, when the mine development activities were re-initiated, the Alaska Department of Fish and Game (ADFG) maintained that many of the same concerns that prompted the Robus and Carney (1995) study were still valid and needed to be addressed. In addition, large-scale plans for development of the Juneau Access road raised new and potentially more substantial concerns regarding not only the enlarged "footprint" of industrial development activities in eastern Lynn Canal, but also the cumulative impacts of both development projects on wildlife resources.

The potential effects of mining and road development activities on local mountain goat populations in the vicinity of the Kensington mine and eastern Lynn Canal have potentially important ramifications for management and conservation of the species in the area. Studies conducted elsewhere indicate that mountain goats can be negatively impacted by industrial development activities. Such effects include temporary range abandonment, alteration of foraging behavior and population decline (Chadwick 1973, Foster and Rahs 1983, Joslin 1986, Cote and Festa-Bianchet 2003, Cote et al. 2013). Consequently, information about the distribution of mountain goats proximate to the mine and road development corridor is critical for determining the extent to which populations may be affected by associated industrial activities. Information collected by Robus and Carney (1995), in the vicinity of Kensington mine, as well as Schoen and Kirchhoff (1982) near Echo Cove, suggest that spatial overlap between mountain goats and the proposed industrial activity will be most pronounced when goats are over-wintering in low-elevation habitats.

In response to the above concerns, ADFG, with operational funding provided by ADOT/PF, Federal Highway Administration (FHWA) and Coeur Alaska, Inc., initiated monitoring and assessment activities to determine possible impacts of road construction and mine development on mountain goats and identify potential mitigation measures, to the extent needed. Assessment and monitoring work included collection of vital rate, habitat use and movement data from a sample of radio-marked mountain goats, in addition to conducting annual aerial population abundance and productivity surveys. These efforts are aimed at providing the ADFG with information necessary to appropriately manage mountain goats in the proposed areas of development.

Implementation of field objectives were initiated in 2005 and consisted of a 5-year monitoring program (2005-2011) jointly funded by ADOT/PF, FHWA, Coeur Alaska, Inc. and ADFG. Beginning in 2007, the ADFG committed additional annual funding for a complementary aerial survey technique development project within and adjacent to the project area. In 2009, the USDA-Forest Service (Tongass National Forest) also began contributing funding to further support aerial survey technique development data collection efforts. And, in 2010, Coeur Alaska, Inc. resumed funding of mountain goat monitoring near the Kensington Mine and adjacent areas (as per the Kensington Plan of Operations, USFS 2005). In 2012, the project components funded by ADOT/PF and associated with the Juneau Access project were completed (see White et al. 2012). Currently, mountain goat monitoring activities are focused on the area surrounding the Kensington mine and north to the Katzehin river, an area considerably smaller than the original Juneau Access/Kensington joint study area.

STUDY OBJECTIVES

Research efforts were designed to investigate the spatial relationships, vital rates, and abundance of mountain goats in the Berners Bay and upper Lynn Canal area. The research objectives were to:

1) determine seasonal movement patterns of mountain goats;

2) characterize mountain goat habitat selection patterns;

3) estimate reproductive success and survival of mountain goats; and

4) estimate mountain goat population abundance and composition.

STUDY AREA

Mountain goats were studied in a ca. 1077 km^2 area located in a mainland coastal mountain range east of Lynn Canal, a post-glacial fiord located near Haines in southeastern Alaska (Figure 1). The study area encompassed the Kakuhan Range and was oriented along a north-south axis and bordered in the south by Berners Bay (58.76N, 135.00W) and the Katzehin River (59.29N, 135. 35W) in the north (Figure 2).

Elevation within the study areas range from sea level to 6300 feet. This area is an active glacial terrain underlain by late cretaceous-paleocene granodiorite and tonalite geologic formations (Gehrels 2000). Specifically, it is a geologically young, dynamic and unstable landscape that harbors a matrix of perennial snowfields and small glaciers at high elevations (i.e. above 4000 feet) and rugged, broken terrain that descends to a rocky, tidewater coastline. The northern part of the area is bisected by the Katzehin River, a moderate volume (ca. 1500 cfs; USGS, unpublished data) glacial river system that is fed by the Meade Glacier, a branch of the Juneau Icefield.

The maritime climate in this area is characterized by cool, wet summers and relatively warm snowy winters. Annual precipitation at sea-level averages 55 inches and winter temperatures are rarely less than 5º F and average 30º F (Haines, AK; National Weather Service, Juneau, AK, unpublished data). Elevations at 2600 feet typically receive ca. 250 inches of snowfall, annually (Eaglecrest Ski Area, Juneau, AK, unpublished data). Predominant vegetative communities occurring at low-moderate elevations (<1500 feet) include Sitka spruce (*Picea sitchensis*)-western hemlock (*Tsuga heterophylla*) coniferous forest, mixed-conifer muskeg and deciduous riparian forests. Mountain hemlock (*Tsuga mertensiana*) dominated 'krummholtz' forest comprises a subalpine, timberline band occupying elevations between 1500-2500 feet. Alpine plant communities are composed of a mosaic of relatively dry ericaceous heathlands, moist meadows dominated by sedges and forbs and wet fens. Avalanche chutes are common in the study area, bisect all plant community types and often terminate at sea-level.

METHODS

Mountain Goat Capture

Mountain goats were captured using standard helicopter darting techniques and immobilized by injecting 3.0 - 2.4 mg of carfentanil citrate, depending on sex and time of

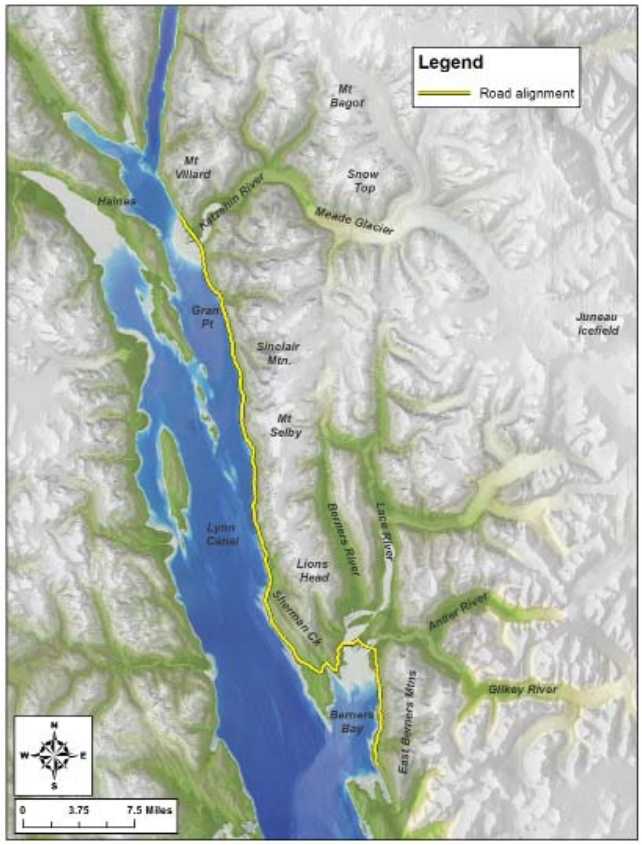

Figure 1: Map of the Lynn Canal and Berners Bay area. Local place names referenced in this report are identified. Mountain goats were studied in this area during 2005-2013.

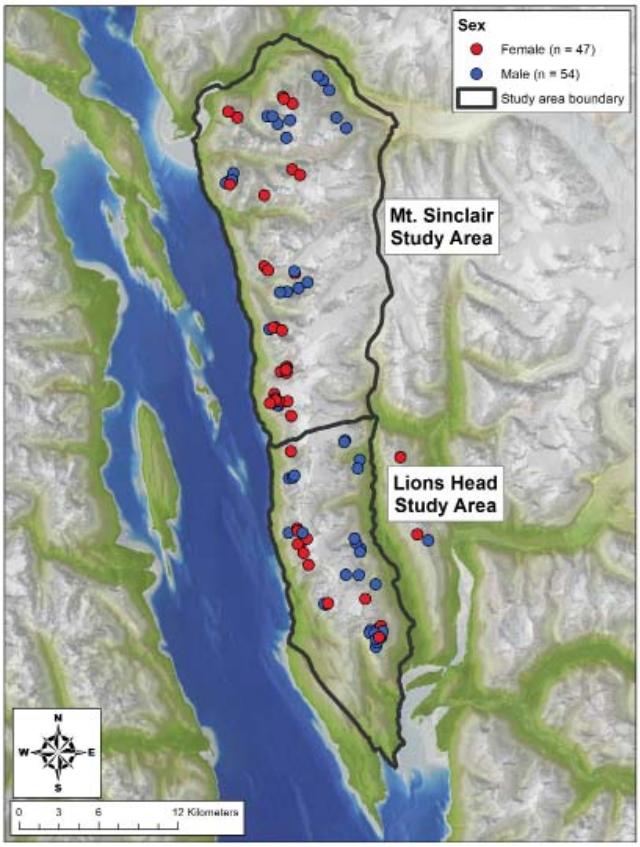

Figure 2: Locations of mountain goats captured and subsequently monitored in the Lynn Canal study area, 2005-2012.

year (Taylor 2000), via projectile syringe fired from a Palmer dart gun (Cap-Chur, Douglasville, GA). During handling, all animals were carefully examined and monitored following standard veterinary procedures (Taylor 2000) and routine biological samples and morphological data collected (Figure 3). Following handling procedures, the effects of the immobilizing agent was reversed with 100mg of naltrexone hydrochloride per 1mg of carfentanil citrate (Taylor 2000). All capture procedures were approved by the State of Alaska Animal Care and Use Committee.

GPS Location Data

Telonics TGW-3590 or TGW-4590 GPS radio-collars (Telonics, Inc., Mesa, AZ) were deployed on most animals captured. Telonics MOD-500 VHF radio-collars were been deployed on a subset (n = 23) of animals to enable longer-term monitoring opportunities. During 2009-2012, animals were simultaneously marked with GPS and lightweight (Telonics MOD-410) VHF radio-collars (370g). Double-collaring animals was conducted to extend the period of time individual animals could be monitored (lifespan, GPS: 3 years, VHF: 6 years), thereby increasing the long-term opportunity to gather mountain goat survival and reproduction data and reducing the frequency that mountain goats must be captured. The combined weight of radio-collars attached to animals comprise 1.2% of average male body weight and 2.0% of average female body weight and is well within the ethical standards for instrument deployment on free-ranging wildlife.

GPS radio-collars were programmed to collect location data at 6-hour intervals (collar lifetime: 2-3 years). During each location attempt, ancillary data about collar activity (i.e. percent of 1-second switch transitions calculated over a 15 minute period following each GPS fix attempt) and temperature (degrees C) were simultaneously collected. Complete data-sets for each individual were remotely downloaded (via fixed-wing aircraft) at 8-week intervals. Location data were post-processed and filtered for "impossible" points and 2D locations with PDOP (i.e. position dilution of precision) values greater than 10, following D'Eon et al. (2002) and D'Eon and Delparte (2005).

Movement Patterns and Habitat Selection

Diet Composition.—Fresh fecal pellets were collected from live-captured animals during the summer-fall period (late-July to mid-October). Fecal pellet samples were also collected opportunistically during winter reconnaissance and snow surveys. Samples were sent to Washington State University (Wildlife Habitat Analysis Lab, Pullman, WA) for dietary analyses. Specifically, microhistological analyses of plant cell fragments in pellet samples were conducted to provide an estimate of diet composition for individual mountain goats and a composite winter sample.

Figure 3: ADFG wildlife biologist, Neil Barten, handling a 3-yr old male mountain goat (LG-163) captured in Lynn Canal, near Met Point, August 2013.

Activity, Movement Patterns and Resource Selection.—Analyses of mountain goat GPS location data (i.e. data collected during 2005-2011) to characterize activity, movement and resource selection patterns were summarized in White (2006), Shafer et al. (2012) and White et al. (2012). Additional analyses will be conducted in the future to update previous analyses as new data are collected.

Snow and Winter Severity Monitoring.—Winter distribution of mountain goats is strongly influenced by snow depth and distribution. Since patterns of snow accumulation vary at both small and large spatial scales it is often necessary to collect site-specific field data in order to accurately characterize these relationships within focal areas. Unfortunately, standardized snow depth monitoring information is extremely limited within the study area and additional information is needed in order to properly characterize spatial patterns of snow accumulation and, ultimately, mountain goat winter distribution. Consequently, in 2006 we initiated field efforts designed to create a snow depth database in order to generate spatially explicit snow depth models within the study area.

Standardized field surveys were conducted in order to estimate patterns of snow depth as it related to habitat type (i.e. forested/non-forested), altitude, and slope aspect. These efforts focused on four sites located in different mountain goat winter ranges in 2007 but consistent annual monitoring was conducted at only one site located on Echo Ridge, near Davies Creek. During surveys snow depth was measured at geo-referenced locations along an altitudinal gradient (beginning at sea level). Snow measurements were replicated at each sampling location (n = 5) and associated covariate information was collected. Sampling locations were spaced at regular (100-200m) intervals, depending upon terrain complexity. Steep (>35 degrees),

exposed slopes were, generally, not sampled due to safety considerations. In addition, daily climate information for reference weather stations was acquired from the National Weather Service (Haines COOP Weather Station).

Reproduction and Survival

Kidding rates and subsequent survival were estimated by monitoring individual study animals during monthly surveys using fixed-wing aircraft (usually a Piper PA-18 Super Cub) equipped for radio-telemetry tracking or via ground-based observations. During surveys, radio-collared adult female mountain goats were observed (typically using 14X image stabilizing binoculars) to determine whether they gave birth to kids and, if so, how long individual kids survived. Monitoring kid production and survival was only possible during the non-winter months when animals could be reliably observed in open habitats. We assumed that kids did not survive winter if they were not seen with their mothers the following spring. Cases in which kid status assessments were equivocal were filtered from the data set and not used for subsequent estimates of kid survival.

Mortality of individual radio-collared mountain goats was determined by detecting radio-frequency pulse rate changes during monthly monitoring surveys. In cases where mortality pulse rates were detected, efforts were made to investigate sites as soon as possible via helicopter or boat. To the extent possible, all mortalities were thoroughly investigated to ascertain the cause of death and relevant biological samples collected (Figure 4). We determined date of mortalities via examination of activity sensor data logged on GPS radio-collars. Annual survival of radio-collared animals was estimated using the Kaplan-Meier procedure (Pollock et al. 1989). This procedure allows for staggered entry and exit of newly captured or deceased animals, respectively.

Figure 4: Remains of a radio-collared adult female mountain goat (LG-008) discovered in a steep, alder thicket located near Ophir Creek, August 2013.

Population Abundance and Composition Estimation

Aerial Surveys.—Population abundance and composition surveys were conducted using fixed-wing aircraft (Heliocourier and PA-18 Super Cub) and helicopter (Hughes 500) during August-October, 2005-2011. Aerial surveys were typically conducted when conditions met the following requirements: 1) flight ceiling above 5000 feet ASL, 2) wind speed less than 20 knots, 3) sea-level temperature less than 65 degrees F. Surveys were typically flown along established flight paths between 2500-3500 feet ASL and followed geographic contours. Flight speeds varied between 60-70 knots. During surveys, the pilot and experienced observers enumerated and classified all mountain goats seen as either adults (includes adults and sub-adults) or kids. In addition, each mountain group observed was checked (via 14X image stabilizing binoculars) to determine whether radio-collared animals were present.

Population estimation.—The number of mountain goats in each study area was estimated using Bayesian procedures that involved statistically integrating survey-specific mark-resight estimates and modeled covariate-based survey-level estimates (White and Pendleton 2011). Briefly, logistic models were fit to predict average sighting probability for all goats in an area during a given survey as a function of survey level covariates that included: survey date, time of day, aircraft type, temperature, sky conditions, wind (median and maximum), and the number of observers (≤2 vs. 3); models were fit using Bayesian procedures with the program OpenBUGS. Bayesian models allowed for including results from each survey along with covariate-based sighting functions produced across many surveys to improve the precision of the population estimates (relative to Lincoln-Petersen type estimates) and provide estimates when no marked goats were seen or when there were no marked goats in the area (with certain assumptions). These models also accounted for observed goats whose collar status could not be determined (i.e. cases where the view was insufficient to determine whether a goat was collared or not).

Sightability Data Collection.-During aerial surveys, data were simultaneously collected to evaluate individual- and survey-level "sightability". For accomplishing survey-level objectives, we enumerated the number of radio-collared animals seen during surveys and compared this value to the total number of radio-collared animals present in the area surveyed. To gather individual-based "sightability" data, we characterized behavioral, environmental and climatic conditions for each radio-collared animal seen and not seen (i.e. missed) during surveys. In cases where radio-collared animals were missed, it was necessary to back-track and use radio-telemetry techniques to locate animals and gather associated covariate information. Since observers had general knowledge of where specific individual radio-collared animals were likely to be found (i.e. ridge systems, canyon complexes, etc.), it was typically possible to locate missed animals within 5-15 minutes after an area was originally surveyed. In most cases, it was possible to completely characterize behavioral and site conditions with minimal apparent bias, however in some cases this was not possible (i.e. animals not seen in forested habitats, steep ravines, turbulent canyons) and incomplete covariate information was collected resulting in missing data.

RESULTS AND DISCUSSION

Mountain Goat Capture and Handling

Capture Activities.—During August 2013, 5 animals were captured in the Lions Head-Mt. Sinclair areas. All animals were simultaneously marked with GPS (TGW-4590) and lightweight VHF (Telonics MOD-410) radio-collars. Since 2005, 105 mountain goats have been radio-marked in the Lions Head and Sinclair Mountain study areas. Currently, 18 animals are marked in these two areas; all other previously deployed collars have either remotely released or animals have died. Annual capture activities are important for maintaining adequate sample sizes and compensating for natural or scheduled collar losses.

Helicopter captures were attempted during periods when mountain goats were distributed at high elevations and weather conditions were favorable (i.e. high flight ceiling and moderate wind speed). Additionally, captures were scheduled to avoid periods within 8 weeks of parturition in order to avoid unnecessary disturbance of adult females and associated neonates. Captures were attempted in areas where mountain goat access to dangerously steep terrain could be reasonably contained. As a result of these constraints, opportunities to capture mountain goats were fairly limited. Nevertheless, given the fairly large area of study and decent summer weather conditions, it was typically possible to capture approximately six mountain goats per day of effort.

Biological Sample Collection.—During handling procedures, standard biological specimens were collected and morphological measures recorded. Specific biological samples collected from study animals included: whole blood (4 mL), blood serum (8 mL), red blood cells (8mL), ear tissue, hair and fecal pellets. Whole blood, serum, red blood cells and fecal pellet sub-samples were either sent to Dr. Kimberlee Beckmen (ADFG, Fairbanks, AK) for disease and trace mineral screening or archived at ADFG facilities in Douglas, AK. During 2010, nasal and pharyngeal swab samples were collected from 5 animals to index prevalence of respiratory bacteria.

Genetic Analyses.—Tissue samples from all mountain goats captured between 2005-2011 have been genotyped by Aaron Shafer (University of Alberta, Edmonton, AB). These data have been analyzed and included in continent-wide analyses of mountain goat population genetics (Shafer et al. 2010). Shafer et al. (2010) indicated that substantial genetic structuring exists among mountain goats in southeastern Alaska (and across the western North American range of the species). More recent analyses indicated that three genetically distinct mountain goat populations occur in our study area [east Berners mountains, Kakuhan range (including Lions Head and Sinclair Mountain), and Mt. Villard]; population boundaries generally coincide with our specific study area boundaries (Shafer et al. 2012). These findings indicate that gene flow between our study areas (with the exception of the Lion Head and Sinclair study areas, which are genetically indistinct) is limited. Additional analyses examined the extent to which mountain goat habitat selection characteristics and landscape configuration are linked to genetic relatedness across the study area (Shafer et al. 2012). Results from this analyses indicated that small- (i.e. distance to cliffs, heat load) and large-scale (i.e. river valleys and marine waterways) landscape features are key determinants of mountain goat gene flow across our study area (Shafer et al. 2012).

Disease Surveillance.—In 2010, a subset of captured animals (n = 5) were tested (Washington Animal Disease Diagnostic Laboratory, Pullman, WA) for prevalence of respiratory bacteria associated with incidence of pneumonia (specifically *Pasteurella trehalosi* and *Mycoplasma ovipneumonia*). Results of these analyses were summarized in White et al. (2012).

Blood serum samples collected from captured animals have been tested each year for a suite of 15 different diseases relevant to ungulates (Appendix 1). Of particular interest was contagious ecthyma (CE), a viral disease previously documented among mountain goats in Juneau, Haines and other areas of southeastern Alaska. Common

symptoms of CE include presence of grotesque lesions on the face, ears, and nose which can lead to death of animals, primarily those in young or old age classes; healthy adults commonly survive the disease. Of the 49 animals successfully tested for CE in the Lions Head and Mt Sinclair areas, three animals (6%) tested positive for CE-specific antibodies; a level of prevalence comparable to other southeastern Alaska populations tested.

Trace Mineral Testing.—In 2010-2012, whole blood and serum samples were analyzed to determine trace mineral concentration for 19 mountain goats in order to examine whether mineral deficiencies were prevalent in our study population (Appendix 2). However, limited comparable data are available to interpret our findings and documented deficiency threshold values are incomplete for mountain goats. Nonetheless, data collected in this study will be useful for future comparisons within and between populations.

GPS Location Data

GPS System Performance.—The performance of GPS radio-collars (Telonics TGW-3590) was evaluated for 124 collars deployed since the beginning of the study (see White et al. 2012). In general, the remote GPS data collection system used in this study worked as expected. Specifically, we did not encounter any significant problems with GPS collar performance, nor did any notable problems occur with remote data download attempts. This high level of success was achieved despite occasionally poor weather conditions and, in some cases, substantial download distances between aircraft and mountain goats (i.e. up to 3 miles). However, several pre-programmed bi-monthly GPS data download periods were missed due to weather conditions. Nevertheless, it was always possible to download missed GPS data on subsequent surveys.

Winter Severity and Snow Modeling

Snow Surveys.—Field-based snow surveys were conducted within 5 days of April 1 during 2007-2008, 2010-2013 on Echo Ridge. Analyses of these data quantified the degree to which snow depth differs with increasing elevation between forested and non-forested sites (White et al. 2012). Overall, these data quantify the extent to which snow depth varied relative to elevation and habitat type (i.e. open vs. forest). Specifically, snow depth was 30-40 inches deeper in open relative to forested habitats, on average. Further, snow depth increased 2.3-2.7 inches per 100 foot gain in elevation, on average (White et al. 2012). Importantly, these data provide quantitative information about winter severity in areas representative of where mountain goats in our study area are wintering. Such data will be able to be used as covariates in future analyses of survival, reproduction and resource selection.

Climate Data.—Daily climate data were archived from the National Weather Service database to characterize broader scale climate patterns. Mean daily snow depth and snowfall data were summarized from data collected at the National Weather Service station in Haines, AK (Appendix 3). Mean snowfall in Haines during the study period (2005-2012) was 148% of the long-term normal (i.e. 1950-2013). Overall, snowfall in Haines during 5 of the 8 winters of the study was above normal (including 5 of the 10 highest snowfall winters on record; 38 years of data). The winter of 2012/2013 was 84% of normal.

Reproduction and Survival

Kid Recruitment.—Kid recruitment of radio-marked female mountain goats was estimated by determining the percentage of radio-marked females seen with kids during

Table 1: Proportion of radio-marked adult female mountain goats observed with kids at heel during parturition in the Lynn Canal study area, 2005-2013. Data are also presented from other study areas, for comparative purposes.

Area	Year	Kids	AdF	Prop	SE
Baranof					
	2010	4	4	1.00	0.00
	2011	5	6	0.83	0.15
	2012	3	5	0.60	0.22
	2013	5	10	0.50	0.16
	Total	17	25	0.68	0.09
Haines-Skagway					
	2010	5	10	0.50	0.16
	2011	8	10	0.80	0.13
	2012	8	11	0.73	0.13
	2013	10	12	0.83	0.11
	Total	31	43	0.72	0.07
Lynn Canal					
	2005	8	12	0.67	0.14
	2006	16	25	0.64	0.10
	2007	20	32	0.63	0.09
	2008	19	33	0.58	0.09
	2009	15	25	0.60	0.10
	2010	18	26	0.69	0.09
	2011	18	27	0.67	0.09
	2012	9	15	0.60	0.13
	2013	8	12	0.67	0.14
	Total	131	207	0.63	0.03

Table 2: Estimates of mountain goat survival for different sex classes during 2005-2013, Lynn Canal, AK. Data are also presented from other study areas, for comparative purposes.

	Males				Females				Total			
	At Risk	Died	Ŝ	SE	At Risk	Died	Ŝ	SE	At Risk	Died	Ŝ	SE
Baranof Island												
2010/2011	6.0	1	0.88	0.11	3.0	0	1.00	0.00	9.0	1	0.92	0.08
2011/2012	10.8	0	1.00	0.00	5.5	0	1.00	0.00	16.3	0	1.00	0.00
2012/2013	15.0	3	0.82	0.09	6.0	0	1.00	0.00	21.0	3	0.87	0.07
All years	31.8	4	0.89	0.05	14.5	0	1.00	0.00	46.3	4	0.92	0.04
Cleveland Pen.												
2009/2010	5.0	0	1.00	0.00	2.0	0	1.00	0.00	7.0	0	1.00	0.00
2010/2011	5.8	2	0.67	0.16	5.0	0	1.00	0.00	10.8	2	0.83	0.10
2011/2012	4.0	2	0.50	0.18	6.0	0	1.00	0.00	10.0	2	0.80	0.11
2012/2013	1.6	1	0.50	0.35	6.0	0	1.00	0.00	7.6	1	0.88	0.12
All years	15.1	5	0.71	0.10	18.5	0	1.00	0.00	33.6	5	0.86	0.05
Haines-Skagway												
2010/2011	11.6	4	0.69	0.13	9.2	3	0.70	0.14	20.8	7	0.70	0.10
2011/2012	13.2	2	0.87	0.09	9.0	1	0.90	0.09	22.2	3	0.88	0.06
2012/2013	16.3	2	0.89	0.07	10.3	1	0.91	0.08	26.6	3	0.90	0.06
All years	39.1	8	0.83	0.06	27.0	5	0.84	0.06	66.1	13	0.83	0.04
Lynn Canal												
2005/2006	9.6	2	0.79	0.13	10.0	1	0.90	0.09	19.6	3	0.85	0.08
2006/2007	25.4	11	0.57	0.10	22.1	4	0.82	0.08	47.5	15	0.68	0.07
2007/2008	26.5	6	0.79	0.07	20.8	3	0.88	0.07	47.3	9	0.83	0.05
2008/2009	24.2	10	0.66	0.09	21.4	6	0.73	0.09	45.6	16	0.69	0.06
2009/2010	25.1	4	0.86	0.07	22.3	4	0.85	0.07	47.4	8	0.85	0.05
2010/2011	24.3	3	0.88	0.06	23.2	2	0.91	0.06	47.5	5	0.90	0.04
2011/2012	17.9	6	0.72	0.10	15.3	3	0.85	0.08	33.2	9	0.77	0.07
2012/2013	16.8	8	0.59	0.10	13.6	7	0.60	0.11	30.4	15	0.59	0.07
All years	167.5	51	0.73	0.03	146.1	31	0.81	0.03	313.6	82	0.77	0.02

At Risk = average number of animals monitored per month (per time period)

May-June aerial telemetry surveys (Table 1). Since each radio-marked female was not observed daily during the kidding period, it was not possible to determine if kids were born and subsequently died prior to, or between, surveys. As such, estimates of kid production reported here are presumably lower than the actual percentage of females that gave birth. Nevertheless, our estimates of kid production were similar to estimates of kidding rates reported elsewhere (Festa-Bianchet and Cote 2007).

Annual estimates of kid production in Lynn Canal ranged from 58-69% between 2005-2013 (Table 1). During 2013, 67% of radio-marked females (n = 12) had a kid at heel. A relatively high estimate for the population but not statistically different from most previous years or from other southeastern Alaska populations studied (Table 1).

Survival.—Mountain goats were monitored monthly during fixed-wing aerial telemetry flights and/or via GPS-telemetry. During 2012/2013 biological year, 15 radio-marked animals died. Seven animals died in avalanches, 3 from suspected wolf predation, 1 from an unknown non-predation cause and 4 from unknown causes. Overall, 59±7% of animals survived during 2012/2013. The winter of 2012/2013 was characterized by relatively moderate winter conditions (see Winter Severity and Snow Modeling section above) but a significant snowfall event occurred in late-April. Overall, annual mortality and the percent of avalanche related mortalities (46.6%) is substantially higher than normal. The observed low survival rate is likely to result in further declines in local populations (see White et al. 2012).

Population Abundance and Composition

Aerial Surveys.—During September 2013, we conducted three aerial surveys in the Lions Head and Sinclair Mountain study areas and the Berners-Lace ridge area (Appendix 4). The Berners-Lace ridge was surveyed because seasonal movement (albeit limited) by male mountain goats has been documented from the Lions Head study area to this site in past years. Other nearby areas were also surveyed (i.e. East Berners mountains and Mt. Villard) as part of a separate research project. Overall, data from all these survey areas are presented (Appendix 4) for comparative purposes.

Sightability Modeling and Population Estimates.-During all surveys, data were collected for purposes of developing individual-based and population-level sighting probability models (exceptions occurred when surveys were conducted prior to marking). In addition, complementary aerial surveys were conducted in areas outside of the study area (Haines, Baranof Island) where mountain goats were marked as part of independent studies. Collection of data in other areas enabled acquisition of additional sightability data resulting in opportunity to more accurately parameterize sightability models; however, a majority of the data used to develop models was collected in the Lynn Canal/Berners Bay study areas.

Table 3: Population-level aerial survey sighting probabilities, based on surveys conducted between 2010-2013 in Lynn Canal and other areas in southeastern Alaska.

Area	Seen	Total	Prop. seen	SE
Baranof				
2010	--	--	--	--
2011	12	18	0.67	0.11
2012	11	21	0.52	0.11
2013	16	22	0.73	0.09
Total	39	61	0.64	0.06
Cleveland Pen				
2010	--	--	--	--
2011	--	--	--	--
2012	3	16	0.19	0.10
2013	10	21	0.48	0.11
Total	13	37	0.35	0.08
Haines-Skagway				
2010	14	20	0.70	0.10
2011	20	32	0.63	0.09
2012	8	18	0.44	0.12
2013	24	31	0.77	0.08
Total	66	101	0.65	0.05
Lynn Canal				
2010	39	73	0.53	0.06
2011	19	28	0.68	0.09
2012	21	32	0.66	0.08
2013	13	22	0.59	0.10
Total	92	155	0.59	0.04
Overall total	210	354	0.59	0.03

During 2013, we collected individual-based sightability modeling data from 22 radio-marked animals in the Lynn Canal study areas. In addition we collected population-level data during 5 surveys. Preliminary estimates indicate that we observed 59% of animals during aerial surveys in the Lynn Canal areas during 2013 (Table 3). Overall, the sightability estimate for 2013 was moderate and statistically comparable to surveys conducted in previous years and areas (Table 3).

Estimation of population sizes for each study area and year is a computationally intensive process (White et al. 2012). In White et al. (2012), population estimates for 2005-2011 were provided for each study area. Computer programming efforts to automate estimation procedures are ongoing (White and Pendleton 2012) and in the future population estimates are expected to conducted annually. In the interim, population estimates will be provided at

multi-year intervals.

FUTURE WORK

The mountain goat population monitoring and assessment work in the vicinity of the Kensington Mine is planned to continue during the operational phase on mining operations (the current funding agreement between ADFG and Coeur Alaska, Inc. continues through 2015 but is expected to be renewed by Coeur Alaska, Inc. thereafter). The project area for ongoing mine-related monitoring work encompasses the area between Slate cove and the Katzehin River (i.e. the "Lions Head" and "Sinclair" study areas). In this area study animals (2013, n = 18) will continue to be monitored monthly to assess reproductive status and survival. Additionally, at 8-week intervals GPS data will be downloaded from each animal during aerial surveys. These data will be post-processed and integrated with the existing GPS location database. During late-summer 6-8 mountain goats will be captured to ensure scientifically defensible sample sizes are maintained. Three replicate aerial surveys will be conducted in early-fall 2014, weather permitting, in order to estimate mountain goat sightability, population abundance and composition. Results of these efforts will be summarized and submitted to Coeur Alaska, Inc. and associated stakeholders as an annual research project report in spring 2015.

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Appendix 1: Incidence of disease prevalence of mountain goats in the Lions Head, Sinclair, Villard and East Berners study areas, 2010-2012. Results are also provided for three other populations in southeastern Alaska in 2010-2012, for comparison. (Kakuhan includes the Lions Head and Sinclair study areas combined).

	Baranof			Cleveland			Haines			Berners			Kakuhan			Villard			Total		
Disease	n	Pos.	Prop	n	Pos.	Prop	n	Pos.	Prop	n	Pos.	Prop	n	Pos.	Prop	n	Pos.	Prop	n	Pos.	Prop
Contagious Ecthyma	23	1	0.04	10	1	0.10	26	3	0.12	20	1	0.05	49	3	0.06	24	0	0.00	152	9	0.06
Chlamydia	11	1	0.09	12	1	0.08	22	0	0.00	27	2	0.07	29	1	0.03	30	0	0.00	131	5	0.04
Q Fever	19	0	0.00	11	0	0.00	32	0	0.00	29	0	0.00	50	3	0.06	32	1	0.03	173	4	0.02
Bluetongue	17	0	0.00	10	0	0.00	20	0	0.00	20	0	0.00	17	0	0.00	18	0	0.00	102	0	0.00
Bovine respiratory synctial virus (BRSV)	17	0	0.00	10	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	16	0	0.00	101	0	0.00
Infectious bovine rhinotrachetis (IBR)	17	0	0.00	10	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	17	0	0.00	102	0	0.00
Parainfluenza-3 (PI-3)	17	0	0.00	10	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	17	0	0.00	102	0	0.00
Epizootic hemorrhagic disease (EHD)	17	0	0.00	9	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	17	0	0.00	101	0	0.00
Caprinae arthritis encephalitis (CAE)	17	0	0.00	9	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	16	0	0.00	100	0	0.00
Malignant cataharral fever-ovine (MCF)	17	0	0.00	9	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	16	0	0.00	100	0	0.00
Leptospirosis cannicola	17	0	0.00	9	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	17	0	0.00	101	0	0.00
Leptospirosis grippo	17	0	0.00	9	0	0.00	20	1	0.05	21	0	0.00	17	1	0.06	17	1	0.06	101	3	0.03
Leptospirosis hardjo	17	0	0.00	9	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	17	0	0.00	101	0	0.00
Leptospirosis ictero	17	0	0.00	9	0	0.00	20	3	0.15	21	2	0.10	17	3	0.18	17	3	0.18	101	11	0.11
Leptospirosis pomona	17	0	0.00	9	0	0.00	20	0	0.00	21	0	0.00	17	0	0.00	17	0	0.00	101	0	0.00

Positive titers: PI3>1:120, IBR> 1:64, BRSV >1:32, Leptospirosis sp.>1:100

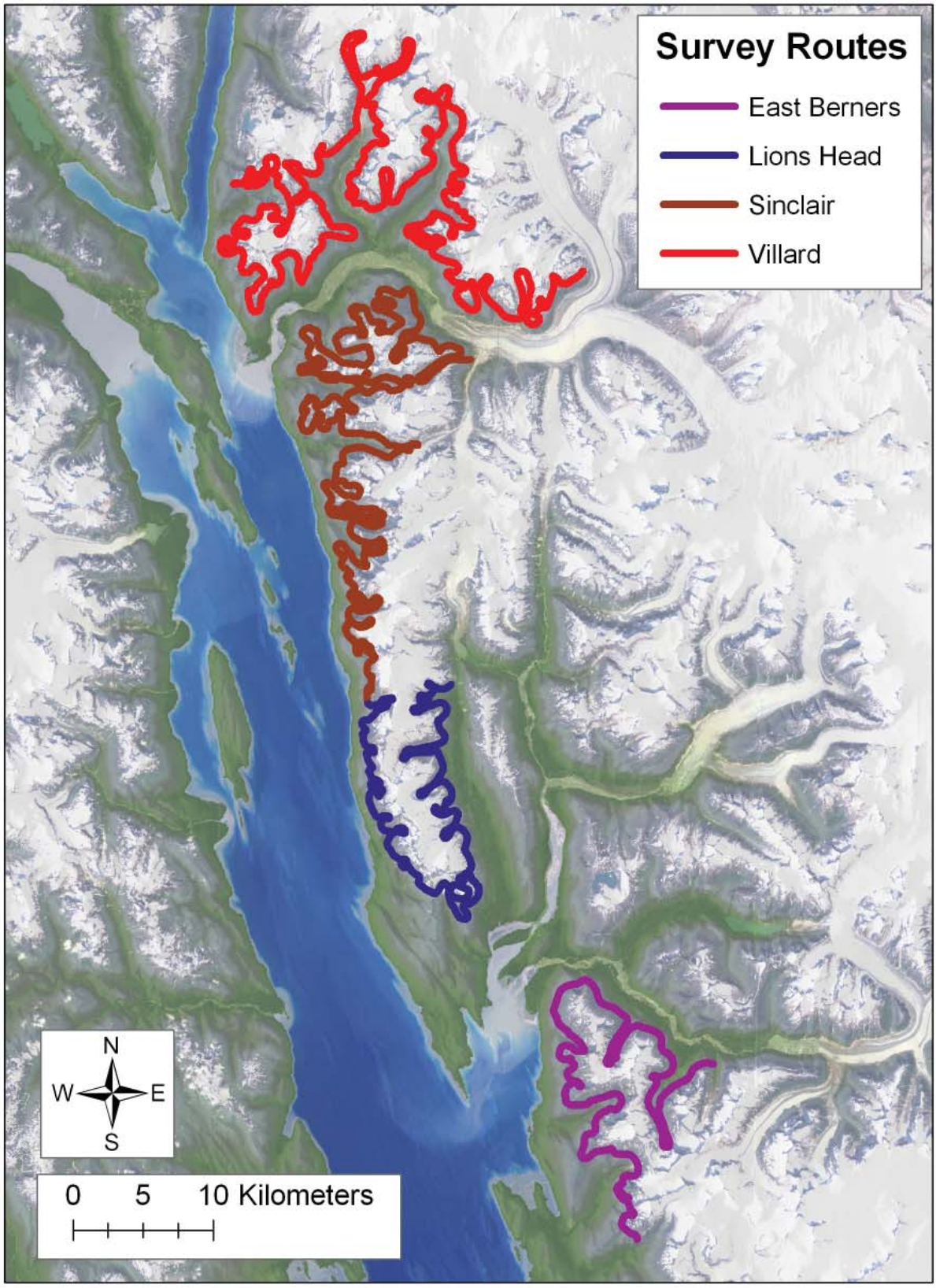
Appendix 2: Trace mineral concentration documented for mountain goats in the Lions Head and Sinclair study areas, 2010-2011. Results are also provided for three other populations in southeastern Alaska in 2010-2012, for comparison. (Kakuhan includes the Lions Head and Sinclair study areas combined).

	Se			Fe			Cu			Zn			Mo			Mn		
Area	mean	SE	n	mean	SE	n	mean	SE	n	mean	SE	n	mean	SE	n	mean	SE	n
Baranof	0.32	0.01	24	1.78	0.09	24	1.08	0.03	24	0.82	0.03	24	0.05	0.00	24	0.01	0.00	24
Cleveland	0.26	0.01	5	1.71	0.09	5	0.81	0.03	5	0.70	0.04	5	0.05	0.00	5	0.01	0.00	5
Grandchild	0.27	0.08	2	2.86	0.03	2	1.07	0.05	2	0.77	0.06	2	0.05	0.00	2	0.01	0.00	2
Kakuhan	0.17	0.02	19	1.75	0.11	19	0.96	0.05	19	0.82	0.04	19	0.05	0.00	19	0.01	0.00	19
Haines	0.25	0.03	38	1.94	0.08	37	1.07	0.04	37	0.81	0.03	37	0.05	0.00	37	0.01	0.00	37
Average	0.25	0.01	88	1.86	0.05	87	1.04	0.02	87	0.81	0.02	87	0.05	0.00	87	0.01	0.00	87

Appendix 3: Monthly snowfall (in.) recorded at the NWS weather station in Haines, AK between 2005-2013.

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	% of normal
2005	0	30	9	40	22	16	0	0	118	74%
2006	0	42	78	81	28	78	3	0	309	195%
2007	0	6	56	78	41	31	3	0	214	135%
2008	22	24	56	62	45	43	9	0	261	165%
2009	0	48	19	68	8	59	0	0	202	128%
2010	0	24	25	19	20	3	3	0	93	59%
2011	0	126	40	121	20	56	0	0	363	230%
2012	4	20	41	21	23	10	14	1	133	84%
Average, Study period	3	40	40	61	26	37	4	0	212	134%
Average, Long-term[1]	3	23	38	40	29	20	4	0	158	100%

Appendix 4a: Mountain goat aerial survey routes in the Lynn Canal study area. Each area was surveyed by fixed- and/or rotor-wing aircraft during August-October, 2005-2013.



Appendix 4b: Summary of mountain goat population composition and minimum abundance data collected during aerial surveys on the East Berners Mountains survey route, 2006-2013. These data do not account for differences in mountain goat sighting probabilities that occur between surveys. As a result, the number of mountain goats recorded represent the minimum number of animals on the survey route during a given survey.

Study area	Year	Date	Adults	Kids	Total	% Kids	Temp (F)	Weather	Median wind speed (knots)	Aircraft	# Observers	Complete survey?
East Berners	2006	8/28/06	86	42	128	32.8	40-50	Mostly Clear	5	Heliocourier	3	N
East Berners	2006	9/3/06	83	21	104	20.2	51	Partly Cloudy	5	Heliocourier	2	Y
East Berners	2006	10/3/06	70	22	92	23.9	35-40	High Overcast	10	Heliocourier	3	Y
East Berners	2007	9/2/07	105	28	133	21.1	44	Clear	3	Heliocourier	2	Y
East Berners	2007	9/22/07	97	28	125	22.4	35-40	High Overcast	5	Cub	2	Y
East Berners	2007	10/4/07	97	22	119	18.5	26-34	High Overcast	5	Cub	2	Y
East Berners	2008	9/25/08	125	38	163	23.3	40	Mostly Clear	5	Hughes 500	3	Y
East Berners	2009	8/10/09	85	28	113	24.8	46	Cloudy	8	Cub	2	N
East Berners	2009	8/20/09	23	6	29	20.7	52	Cloudy	5	Cub	2	N
East Berners	2009	10/2/09	74	26	100	26.0	37-42	High Overcast	8	Cub	2	Y
East Berners	2010	9/11/10	72	14	86	16.3	51	Clear	0	Cub	2	Y
East Berners	2010	9/22/10	67	15	82	18.3	42	Mostly Clear	5	Cub	2	Y
East Berners	2011	9/27/11	116	31	147	21.1	35	High Overcast	5	Cub	2	Y
East Berners	2012	9/19/12	141	37	178	20.8	42-43	High Overcast	3	Cub	2	1
East Berners	2013	9/25/13	78	17	95	17.9	37	High Overcast	8	Cub	2	1

Appendix 4c: Summary of mountain goat population composition and minimum abundance data collected during aerial surveys on the Lions Head survey route, 2005-2013. These data do not account for differences in mountain goat sighting probabilities that occur between surveys. As a result, the number of mountain goats recorded represent the minimum number of animals on the survey route during a given survey.

Study area	Year	Date	Adults	Kids	Total	% Kids	Temp (F)	Weather	Median wind speed (knots)	Aircraft	# Observers	Complete survey?
Lions Head	2005	8/11/05	35	5	40	12.5	70	Clear	5	Cub	2	Y
Lions Head	2005	10/3/05	55	8	65	12.3	45	Clear	5	Heliocouirer	3	Y
Lions Head	2006	8/28/06	49	9	58	15.5	40-50	Mostly Clear	5	Heliocourier	3	Y
Lions Head	2006	9/3/06	54	11	65	16.9	51	Partly Cloudy	5	Heliocourier	2	Y
Lions Head	2006	10/2/06	92	13	105	12.4	26-31	Mostly Cloudy	10	Heliocourier	3	Y
Lions Head	2006	10/16/06	91	23	114	20.2	35-42	Mostly Clear	18	Hughes 500	3	Y
Lions Head	2007	8/10/07	18	2	20	10.0	51-57	Clear	5	Heliocourier	3	Y
Lions Head	2007	8/27/07	43	3	46	6.5	44-50	High Overcast	3	Heliocourier	3	Y
Lions Head	2007	9/13/07	46	5	51	9.8	~45-55	High Overcast/ Low Fog	3	Cub	2	Y
Lions Head	2007	9/28/07	78	15	93	16.1	35-40	Mostly Clear	5	Hughes 500	3	Y
Lions Head	2007	10/4/07	78	8	86	9.3	26-34	High Overcast	8	Cub	2	Y
Lions Head	2008	9/25/08	62	18	80	22.5	40	Mostly Clear	5	Hughes 500	3	Y
Lions Head	2008	10/7/08	63	13	76	17.1	31	Clear/High Overcast	8	Cub	2	Y
Lions Head	2009	8/12/09	76	18	94	19.1	43-46	Ptly/Mostly Cloudy	5	Cub	2	N
Lions Head	2009	10/3/09	51	16	67	23.9	40	High Overcast	13	Cub	2	Y
Lions Head	2010	9/6/10	49	14	63	22.2	44-48	Mostly Clear	15	Cub	2	Y
Lions Head	2010	9/21/10	58	23	81	28.4	36-42	Clear	3	Cub	2	Y
Lions Head	2011	9/18/11	89	30	119	25.2	39-42	High Overcast	5	Cub	2	Y
Lions Head	2012	9/19/12	76	15	91	16.5	40-44	High Overcast	5	Cub	2	1
Lions Head	2013	9/23/13	66	18	84	21.4	37	Partly Cloudy	5	Cub	2	1

Appendix 4d: Summary of mountain goat population composition and minimum abundance data collected during aerial surveys on the Mt. Sinclair survey route, 2005-2013. These data do not account for differences in mountain goat sighting probabilities that occur between surveys. As a result, the number of mountain goats recorded represent the minimum number of animals on the survey route during a given survey.

Study area	Year	Date	Adults	Kids	Total	% Kids	Temp (F)	Weather	Median wind speed (knots)	Aircraft	# Observers	Complete survey?
Sinclair Mtn.	2005	8/11/05	77	17	94	18.1	70	Clear	5	Cub	2	Y
Sinclair Mtn.	2005	10/3/05	159	30	189	15.9	45	Clear	5	Heliocouirer	3	Y
Sinclair Mtn.	2006	8/28/06	86	21	107	19.6	40-50	Mostly Clear	5	Heliocourier	3	N
Sinclair Mtn.	2006	9/2/06	128	31	159	19.5	50-56	High Overcast	5	Heliocourier	4	Y
Sinclair Mtn.	2006	9/23/06	153	22	182	12.1	40-42	High Overcast	5	Heliocourier	3	Y
Sinclair Mtn.	2006	10/16/06	227	41	268	15.3	35-42	Mostly Clear	18	Hughes 500	3	Y
Sinclair Mtn.	2007	8/27/07	57	4	61	6.6	44-50	High Overcast	3	Heliocourier	3	Y
Sinclair Mtn.	2007	9/13/07	75	13	88	14.8	45-55	High Overcast/ Low Fog	3	Cub	2	Y
Sinclair Mtn.	2007	9/28/07	173	38	211	18.0	35-40	High Overcast	5	Hughes 500	3	Y
Sinclair Mtn.	2008	9/25/08	127	27	154	17.5	40	Mostly Clear	5	Hughes 500	3	Y
Sinclair Mtn.	2008	10/7/08	123	26	149	17.4	31	Clear/High Overcast	8	Cub	2	Y
Sinclair Mtn.	2010	9/6/10	62	18	80	22.5	44-48	Mostly Clear	15	Cub	2	Y
Sinclair Mtn.	2010	9/21/10	59	19	78	24.4	36-42	Clear	3	Cub	2	Y
Sinclair Mtn.	2011	9/18/11	127	33	160	20.6	39-42	High Overcast	5	Cub	2	Y
Sinclair Mtn.	2012	9/19/12	107	15	122	12.3	40-44	High Overcast	5	Cub	2	1
Sinclair Mtn.	2013	9/23/13	67	14	81	17.3	37	High Overcast	5	Cub	2	1

Appendix 4e: Summary of mountain goat population composition and minimum abundance data collected during aerial surveys on the Mt. Villard survey route, 2005-2013. These data do not account for differences in mountain goat sighting probabilities that occur between surveys. As a result, the number of mountain goats recorded represent the minimum number of animals on the survey route during a given survey.

Study area	Year	Date	Adults	Kids	Total	% Kids	Temp (F)	Weather	Med wind speed (knots)	Aircraft	# Observers	Complete survey?
Mt. Villard	2005	8/12/05	23	4	27	14.8	68	Clear	5	Cub	2	Y
Mt. Villard	2006	9/2/06	102	23	125	18.4	50-56	High Overcast	5	Heliocourier	4	Y
Mt. Villard	2006	9/23/06	90	12	102	11.8	40-42	High Overcast	5	Heliocourier	3	N
Mt. Villard	2006	10/1/06	41	12	53	22.6	31	Mostly Cloudy	10	Heliocourier	3	N
Mt. Villard	2006	10/2/06	165	28	193	14.5	26-31	Mostly Cloudy	10	Heliocourier	3	Y
Mt. Villard	2006	10/17/06	145	29	174	16.7	35-31	High Overcast	5	Hughes 500	3	N
Mt. Villard	2007	9/3/07	88	23	111	20.7	47-54	Clear	5	Heliocourier	3	Y
Mt. Villard	2007	9/14/07	74	23	97	23.7	44	Overcast/Fog	14	Heliocourier	3	Y
Mt. Villard	2007	9/22/07	132	22	154	14.3	35-40	Overcast/Lt Snow/Fog	8	Cub	2	Y
Mt. Villard	2008	9/6/08	52	10	62	16.1	45-55	Partly Cloudy/High Overcast	5	Cub	2	N
Mt. Villard	2008	9/25/08	164	30	194	15.5	40	Mostly Clear	5	Hughes 500	3	Y
Mt. Villard	2009	10/3/09	56	16	72	22.2	32	High Overcast	15	Cub	2	Y
Mt. Villard	2010	9/12/10	62	19	81	23.5	41-48	Clear	20	Cub	2	Y
Mt. Villard	2011	9/18/11	156	35	191	18.3	39-42	High Overcast	5	Cub	2	Y
Mt. Villard	2012	9/21/12	104	17	121	14.0	49-51	High Overcast	3	Cub	2	Y
Mt. Villard	2013	9/23/13	57	10	67	14.9	39-40	High Overcast	18	Cub	2	Y

Appendix 4f: Summary of mountain goat population composition and minimum abundance data collected during aerial surveys on the Berners-Lace Ridge survey route, 2007-2013. These data do not account for differences in mountain goat sighting probabilities that occur between surveys. As a result, the number of mountain goats recorded represent the minimum number of animals on the survey route during a given survey.

Study area	Year	Date	Adults	Kids	Total	% Kids	Temp (F)	Weather	Median wind speed (knots)	Aircraft	# Observers	Complete survey?
B-L Ridge	2007	9/2/07	25	4	29	13.8	51.5	Clear	3	Helio	2	1
B-L Ridge	2008	9/25/08	19	3	22	13.6	40	Clear	0	HD500	3	1
B-L Ridge	2010	9/6/10	17	4	21	19.0	48-52	Mostly Clear	10	Cub	2	1
B-L Ridge	2011	9/26/11	26	9	35	25.7	42	Clear	15	Cub	2	1
B-L Ridge	2012	9/19/12	24	3	27	11.1	43	High Overcast	3	Cub	2	1
B-L Ridge	2013	9/23/13	13	2	15	13.3	37	Clear	3	Cub	2	1

Attachment 4

2014 Re-vegetation Test Plot Monitoring Results

SURFACE STABILITY EVALUATION

Date 5/24/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #1 (NORTH)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: PHOTO # 007, 008, 009
Comments: GRASS THICKEST ON NORTH END		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		0	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 0% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #1 (NORTH) Date: 5/24/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	30									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	15	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	47	—	—	—	—		—	—	—	—
	Other Species: Grass N/A					Other Species: Grass				
	Forb —					Forb				
	Shrub —					Shrub				
	Weed —					Weed				

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover 30 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 5/24/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT # 2 (MIDDLE)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: PHOTO #: 004, 005, 006
Comments: VERY DRY		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		0	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 0% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #2 (MIDDLE) Date: 5/24/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	8									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	15	—	—	—	—		—	—	—	—
Litter	3	—	—	—	—		—	—	—	—
Bare Ground	74	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	NA	Grass
Forb	—	Forb
Shrub	—	Shrub
Weed	—	Weed

Relative % Cover 8 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 5/24/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #3 (SOUTH)		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes: PHOTO #001,002,003
Comments: VERY DRY		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	~~0~~ 3	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		~~0~~ 3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: ~~0%~~ 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3 (SOUTH) Date: 5/24/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	8									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	15	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	75	—	—	—	—		—	—	—	—

Reclamation Trial	Reference Site
Other Species: Grass NA	Other Species: Grass
Forb ~~NA~~	Forb
Shrub ~~NA~~	Shrub
Weed ~~NA~~	Weed

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover 8 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 5/29/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #1		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: SOIL VERY DRY		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	0	YES	14
Surface Litter	0	YES	14
Surface Rock Fragments	0	YES	14
Pedestals	0	YES	14
Flow Patterns	0	YES	15
Rills	0	YES	14
Gullies	0	YES	15
TOTAL	0	YES	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 0% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m² or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #1 Date: 5/29/14

Data Collector(s): P. STRAW Slope(%)/Aspect: /

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	35									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	15	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	48	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☐ None
☑ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover 35 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 5/29/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #2		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: SOIL VERY DRY		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	3	YES	14
Surface Litter	3	YES	14
Surface Rock Fragments	2	YES	14
Pedestals	0	YES	14
Flow Patterns	~~3~~ 6	YES	15
Rills	~~6~~ 3	YES	14
Gullies	0	YES	15
TOTAL	17		100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 17% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m² or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #2 Date: 5/29/14

Data Collector(s): P. STROW Slope(%)/Aspect: /

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	5									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	20	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	70	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover 5 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☐No

Canopy Cover ☐Yes ☐No

Mulch
☐ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 5/28/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #3		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: SOIL IS VERY DRY, GRASS IS SLIGHTLY BROWN IS SOME AREAS		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	~~0~~ YES	0	14
Surface Litter	~~3~~ YES	~~0~~ 3	14
Surface Rock Fragments	~~0~~ YES	0	14
Pedestals	~~0~~ YES	0	14
Flow Patterns	~~0~~ YES	0	15
Rills	~~0~~ YES	0	14
Gullies	~~0~~ YES	0	15
TOTAL	3	~~0~~ 3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PILOT #3 (BIO-POLYMER SITE) Date: 5/29/14

Data Collector(s): P STRAW Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	8									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	20	—	—	—	—		—	—	—	—
Litter	3	—	—	—	—		—	—	—	—
Bare Ground	69	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover 8 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☐No

Canopy Cover ☐Yes ☐No

Mulch
☐ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/7/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #1		Photographs taken: (circle one) (Y) N
Aspect:	Slope (degree):	Photograph notes:
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	YES	0	14
Surface Litter	YES	0	14
Surface Rock Fragments	YES	0	14
Pedestals	YES	0	14
Flow Patterns	YES	~~0~~ 3	15
Rills	YES	0	14
Gullies	YES	0	15
TOTAL		3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3%

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: (P. STROW → PLOT #1) Date: 6/7/14

Data Collector(s): Slope(%)/Aspect: /

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	35									
Forb	—									
Shrub	—									
Total	35	—	—	—	—		—	—	—	—
Weed	—									
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	15	—	—	—	—		—	—	—	—
Litter	3	—	—	—	—		—	—	—	—
Bare Ground	47	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed		Weed

Relative % Cover 35 (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☐ None
☑ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☑ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/7/14 Data Collector(s) R. STROZ

Site Data

Location Name: PLOT #2		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: SMALL ANIMAL TRACK @ CENTER OF PLOT - CAUSED SLIGHT EROSION		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	YES	3	14
Surface Litter	YES	0	14
Surface Rock Fragments	YES	0	14
Pedestals	YES	0	14
Flow Patterns	YES	0	15
Rills	YES	0	14
Gullies	YES	0	15
TOTAL		3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% 1-20% - RANGE Stable

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #2 Date: 6/7/14

Data Collector(s): P. STROW Slope(%)/Aspect: /

Vegetation – SOME GRASS APPEARS BROWN & DEAD

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	4									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	20	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	71	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/7/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #3		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: BROWN & DEAD GRASS PRESENT		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	YES	0	14
Surface Litter	YES	0	14
Surface Rock Fragments	YES	3	14
Pedestals	YES	0	14
Flow Patterns	YES	0	15
Rills	YES	0	14
Gullies	YES	0	15
TOTAL		3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3 BIO-POLYMER SITE Date: 6/7/14

Data Collector(s): P. STROW Slope(%)/Aspect: ____ / ____

Vegetation – BROWN & DEAD GRASS PRESENT

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	6									
Forb										
Shrub										
Total		—	—	—	—		—	—	—	—
Weed										
Cover Crop		—	—	—	—	—	—	—	—	—
Rock	20	—	—	—	—		—	—	—	—
Litter	3	—	—	—	—		—	—	—	—
Bare Ground	71	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover ____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 6/10/14 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT # 3 (SOUTH)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: PHOTO # 16, 17, 18
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	~~3~~ 0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		0	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 0% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3 (SOUTH) Date: 6/10/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	6									
Forb	0									
Shrub	0									
Total	6	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	18	—	—	—	—		—	—	—	—
Litter	3	—	—	—	—		—	—	—	—
Bare Ground	73	—	—	—	—		—	—	—	—

Reclamation Trial		Reference Site	
Other Species: Grass	NA	Other Species: Grass	
Forb		Forb	
Shrub		Shrub	
Weed		Weed	

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 6/10/14 Data Collector(s) SIERRA LAWLMERS

Site Data

Location Name: PLOT #2 (MIDDLE)		Photographs taken: (circle one) (Y) N
Aspect:	Slope (degree):	Photograph notes: PHOTO #22, 23
Comments: BROWN, DEAD GRASS IN MIDDLE		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	2	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		2	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 2% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT # 2 (MIDDLE) Date: 6/10/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	9									
Forb	0									
Shrub	0									
Total	9	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	2	—	—	—	—		—	—	—	—
Litter	15	—	—	—	—		—	—	—	—
Bare Ground	74	—	—	—	—		—	—	—	—
	Other Species: Grass NA					Other Species: Grass				
	Forb					Forb				
	Shrub					Shrub				
	Weed					Weed				

(SWITCH)

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/10/14 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #1 (NORTH)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: PHOTO # 24,25
Comments: CONSIDERABLY MORE GRASS ON PLOT #1 COMPARED TO #2 & 3		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		0	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 0% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #1 (NORTH) Date: 6/10/2014

Data Collector(s): SIERRA HAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	50									
Forb	0									
Shrub	0									
Total	50	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	10	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	38	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	NA	Grass
Forb		Forb
Shrub		Shrub
Weed		Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/19/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #1		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes:
Comments: MORE GRASS ON NORTH END OF PLOT		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		0	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 0% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #1 (NORTH) Date: 6/19/14

Data Collector(s): P. STROW Slope(%)/Aspect: /

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	40									
Forb	/									
Shrub	/									
Total	40	—	—	—	—		—	—	—	—
Weed	/									
Cover Crop	/	—	—	—	—	—	—	—	—	—
Rock	40	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	15	—	—	—	—		—	—	—	—

	Reclamation Trial	Reference Site
Other Species: Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☐ None
☑ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☑ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/19/14 Data Collector(s) P. STRAND

Site Data

Location Name: PLOT 2 (MIDDLE)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes:
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	3	14
Surface Litter	Y	6	14
Surface Rock Fragments	Y	5	14
Pedestals	Y	0	14
Flow Patterns	Y	3	15
Rills	Y	3	14
Gullies	Y	0	15
TOTAL		20	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 20% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: SITE #2 (MIDDLE) Date: 6/19/14

Data Collector(s): A STROW Slope(%)/Aspect: /

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	5									
Forb	/									
Shrub	/									
Total	5	—	—	—	—		—	—	—	—
Weed	/									
Cover Crop	/	—	—	—	—	—	—	—	—	—
Rock	25	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	65	—	—	—	—		—	—	—	—

Other Species: Grass	N/A	Other Species: Grass	
Forb	N/A	Forb	
Shrub	N/A	Shrub	
Weed	N/A	Weed	

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☑ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/19/14 Data Collector(s) A. STROW

Site Data

Location Name: PLOT # 3 (SOUTH)		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	~~0~~ 5	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		5	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 5% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3 (SOUTH) Date: 6/19/14

Data Collector(s): P. STROW Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	8									
Forb	/									
Shrub	/									
Total	8	—	—	—	—		—	—	—	—
Weed	/									
Cover Crop	/	—	—	—	—	—	—	—	—	—
Rock	40	—	—	—	—		—	—	—	—
Litter	10	—	—	—	—		—	—	—	—
Bare Ground	34	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☑Yes ☐No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☑ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 6/29/14 Data Collector(s) SIERRA VANMERS

Site Data

Location Name: PLOT #3-SOUTH		Photographs taken: (circle one) (Y) N
Aspect:	Slope (degree):	Photograph notes: pic # 27, 28, 29
Comments: GRASS HAS BEGUN TO GROW IN MORE		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	3	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3-SOUTH Date: 6/29/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	10									
Forb	0									
Shrub	0									
Total	10	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	20	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	68	—	—	—	—		—	—	—	—

Other Species:		Other Species:	
Grass	NA	Grass	
Forb		Forb	
Shrub		Shrub	
Weed		Weed	

Additional Monitoring Methods

Seedling Count ☐ Yes ☑ No

Canopy Cover ☐ Yes ☑ No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 6/29/14 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #2 -MIDDLE		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes: pic # 30, 31, 32
Comments: GRASS GROWING WELL AROUND ANIMAL SCAT.		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter		0	14
Surface Rock Fragments		0	14
Pedestals		0	14
Flow Patterns		2	15
Rills		0	14
Gullies		0	15
TOTAL		2	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 2% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #2 - MIDDLE Date: 6/29/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	10									
Forb	0									
Shrub	0									
Total	10	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	15 ~~[illegible]~~	—	—	—	—		—	—	—	—
Litter	4	—	—	—	—		—	—	—	—
Bare Ground	71	—	—	—	—		—	—	—	—

Other Species: Grass	NA	Other Species: Grass	
Forb		Forb	
Shrub		Shrub	
Weed		Weed	

Additional Monitoring Methods

Seedling Count ☐ Yes ☑ No

Canopy Cover ☐ Yes ☑ No

Mulch
☐ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 6/29/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT # 1 - NORTH		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes: pic # 33, 34, ~~35~~ 36
Comments: GRASS GROWING IN VERY WELL		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	↓	0	14
Surface Rock Fragments	↓	0	14
Pedestals	↓	0	14
Flow Patterns	↓	0	15
Rills	↓	0	14
Gullies	↓	0	15
TOTAL		0	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: (0 % 100) x100 0 % STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PIOT #1 - NORTH Date: 6/29/2014

Data Collector(s): SIERRA HAMMERS Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	60									
Forb	0									
Shrub	0									
Total	60	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	8	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	30	—	—	—	—		—	—	—	—

Other Species:		Other Species:	
Grass	NA	Grass	
Forb		Forb	
Shrub		Shrub	
Weed		Weed	

Additional Monitoring Methods

Seedling Count ☐ Yes ☑ No

Canopy Cover ☐ Yes ☑ No

Mulch
☐ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 7/30/14 Data Collector(s) A. STROW

Site Data

Location Name: PLOT #3		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	YES	~~0~~ 3	14
Surface Litter	YES	0	14
Surface Rock Fragments	YES	0	14
Pedestals	YES	0	14
Flow Patterns	YES	0	15
Rills	YES	0	14
Gullies	YES	0	15
TOTAL		3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT # 3 Date: 7/30/14

Data Collector(s): P. STROW Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	10									
Forb	/									
Shrub	/									
Total	10	—	—	—	—		—	—	—	—
Weed	/									
Cover Crop	/	—	—	—	—	—	—	—	—	—
Rock	50	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	35	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 7/30/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT 2		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y/N	5	14
Surface Litter	Y/N	~~5~~ 6	14
Surface Rock Fragments	Y/N	8	14
Pedestals	Y/N	3	14
Flow Patterns	Y/N	~~8~~ 6	15
Rills	Y/N	9	14
Gullies	Y/N	3	15
TOTAL		40	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 40% SLIGHT

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: ~~[illegible]~~ PLOT 2 Date: 7/30/14

Data Collector(s): P. STROW Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	9									
Forb	/									
Shrub	/									
Total	9	—	—	—	—		—	—	—	—
Weed	/									
Cover Crop	/	—	—	—	—	—	—	—	—	—
Rock	35	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	42	—	—	—	—		—	—	—	—

Other Species: Grass	N/A	Other Species: Grass
Forb	N/A	Forb
Shrub	N/A	Shrub
Weed	N/A	Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Quadrat Data: Location name PLOT 1 (NORTH) Date 7/31/14 Data Collector(s) P. STROW

% CANOPY COVER (SPECIES, LITTER, BARE GROUND, AND ROCK)

*If species are undecipherable, record as per the acronym list. Narrow down to family or genus if possible (e.g. Poa, Wheatgrass, Phlox, Aster). Record any notes below.

Transect #	Frame #	[✓] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	Rock	Litter	Bare Ground
1	1	20											60	2	18
	2	5											80	0	15
	3	10											70	0	15
	4	25											63	2	10
	5	10											79	1	10
2	1														
	2														
	3														
	4														
	5														

		[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	[ ] Grass [ ] Forb [ ] Shrub [ ] Weed	Rock	Litter	Bare Ground
3	1														
	2														
	3														
	4														
	5														
Reference Site	1														
	2														
	3														
	4														
	5														

Notes: % COVER FOR GRASS < 50%, WILL CONTINUE ~~QUALA-~~ QUALITATIVE MONITORING

KC HARVEY ENVIRONMENTAL, LLC

SURFACE STABILITY EVALUATION

Date 7/31/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT # 1		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	3	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL	Y	3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

SURFACE STABILITY EVALUATION

Date 8/31/14 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT # 3 (SOUTH)		Photographs taken: (circle one) (Y) N
Aspect:	Slope (degree):	Photograph notes: # 81, 82, 83
Comments: SMALL ROCKS PILED FROM WATER FLOWING		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	~~6~~ 1	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	3	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		4	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 4% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT 3 (SOUTH) Date: 8/31/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	8									
Forb	0									
Shrub	0									
Total	8	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	30	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	60	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb		Forb
Shrub		Shrub
Weed		Weed

Additional Monitoring Methods

Seedling Count ☐ Yes ☑ No

Canopy Cover ☐ Yes ☑ No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 8/31/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #2 (MIDDLE)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: #85, 86, 88
Comments: SURFACE ROCK FRAGMENT MOVEMENT FROM WATER FLOWING		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	3	14
Surface Litter	Y	3	14
Surface Rock Fragments	Y	5	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		11	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 11% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #2 Date: 9/31/14

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	10									
Forb	0									
Shrub	0									
Total	10	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	35	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	53	—	—	—	—		—	—	—	—

Other Species:		Other Species:
Grass	N/A	Grass
Forb		Forb
Shrub		Shrub
Weed		Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

SURFACE STABILITY EVALUATION

Date 8/31/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #1 (NORTH)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: # 91, 92, 93
Comments: CONSIDERABLY MORE GROWTH THAN OTHER PLOTS AT THIS POINT, ALDER GROWING TOP RIGHT		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	2	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		2	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 2% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT # 1 (NORTH) Date: 8/31/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	65									
Forb	0									
Shrub	~~10~~ 1									
Total	66	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	8	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	24	—	—	—	—		—	—	—	—
	Other Species: Grass N/A					Other Species: Grass				
	Forb					Forb				
	Shrub					Shrub				
	Weed					Weed				

ALGAE

Additional Monitoring Methods

Seedling Count ☐ Yes ☑ No

Canopy Cover ☐ Yes ☑ No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 10/12/14 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #3 (SOUTH)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: P # 221, 222, 223
Comments:		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	1	14
Surface Litter	Y	3	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		4	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 4%

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

JUST HAD TWO DAYS OF VERY HEAVY RAIN

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3 (SOUTH) Date: 10/2/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	10									
Forb	0									
Shrub	0									
Total	~~10~~ 10	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	30	—	—	—	—		—	—	—	—
Litter	1	—	—	—	—		—	—	—	—
Bare Ground	59	—	—	—	—		—	—	—	—
	Other Species: Grass					Other Species: Grass				
	Forb					Forb				
	Shrub					Shrub				
	Weed					Weed				

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 10/12/14 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #2 (MIDDLE)		Photographs taken: (Y) N (circle one)
Aspect:	Slope (degree):	Photograph notes: P #224,225,228
Comments: CAN SEE DEFINED AREAS WHERE ROCK FRAGMENTS HAVE PILED/MOVED		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	1	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	2	14
Pedestals	Y	0	14
Flow Patterns	Y	5	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		8	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 8%

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

JUST HAD TWO DAYS OF VERY HEAVY RAIN

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT # 2 (MIDDLE) Date: 10/12/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	40									
Forb	0									
Shrub	0									
Total	40	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	5	—	—	—	—		—	—	—	—
Litter	3	—	—	—	—		—	—	—	—
Bare Ground	52	—	—	—	—		—	—	—	—
	Other Species: Grass					Other Species: Grass				
	Forb					Forb				
	Shrub					Shrub				
	Weed					Weed				

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 10/12/2014 Data Collector(s) SIERRA LAMMERS

Site Data

Location Name: PLOT #1 (NORTH)		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes: P # 229, 230, 232
Comments: GRASS IN THIS PLOT SEEMS MORE YELLOW.		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	6	14
Surface Litter	Y	3	14
Surface Rock Fragments	Y	2	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		5	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 5%

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

JUST HAD TWO DAYS OF VERY HEAVY RAINFALL

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #1 (NORTH) Date: 10/12/2014

Data Collector(s): SIERRA LAMMERS Slope(%)/Aspect: ____/____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	60									
Forb	0									
Shrub	0									
Total	60	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	10	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	25	—	—	—	—		—	—	—	—

Other Species:	Other Species:
Grass	Grass
Forb	Forb
Shrub	Shrub
Weed	Weed

Additional Monitoring Methods

Seedling Count ☐Yes ☒No

Canopy Cover ☐Yes ☒No

Mulch
☒ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 11/26/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT # 3 (SOUTH)		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: FROZEN		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	0	14
Surface Litter	Y	3	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	0	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		3	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 3% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #3 SOUTH Date: 11/26/14

Data Collector(s): P. STROW Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	12									
Forb	0									
Shrub	0									
Total	12	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	28	—	—	—	—		—	—	—	—
Litter	1	—	—	—	—		—	—	—	—
Bare Ground	57	—	—	—	—		—	—	—	—

Other Species:	Other Species:
Grass	Grass
Forb	Forb
Shrub	Shrub
Weed	Weed

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☑ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 11/26/14 Data Collector(s) P. STROW

Site Data

Location Name: PLOT #2 (MIDDLE)		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: FROZEN		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	~~4~~ 5	14
Surface Litter	Y	2	14
Surface Rock Fragments	Y	3	14
Pedestals	Y	0	14
Flow Patterns	Y	~~5~~ 6	15
Rills	Y	3	14
Gullies	Y	0	15
TOTAL		16	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 16% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT #2 (MIDDLE) Date: 11/26/14

Data Collector(s): P. STIZOW Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	30	~~30~~								
Forb	0									
Shrub	0									
Total	30	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	30	—	—	—	—		—	—	—	—
Litter	5	—	—	—	—		—	—	—	—
Bare Ground	5	—	—	—	—		—	—	—	—
	Other Species: Grass					Other Species: Grass				
	Forb					Forb				
	Shrub					Shrub				
	Weed					Weed				

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☑ None
☐ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

SURFACE STABILITY EVALUATION

Date 11/26/14 Data Collector(s) A. STROW

Site Data

Location Name: PLOT #1 (NORTH)		Photographs taken: (circle one) Y N
Aspect:	Slope (degree):	Photograph notes:
Comments: FROZEN		

Site Stabilization Data

EROSION FEATURE	POTENTIALLY PRESENT (Yes or No)	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Y	3	14
Surface Litter	Y	0	14
Surface Rock Fragments	Y	0	14
Pedestals	Y	0	14
Flow Patterns	Y	3	15
Rills	Y	0	14
Gullies	Y	0	15
TOTAL		6	100

Procedure: (refer to Erosion Condition Classification System publication if needed)

1) Observe the total sample area and determine the average condition.
2) Determine if each item is potentially present. Only the potentially present items will be considered in the total calculation (cross out pre-entered possible factor # if it is not potentially present).
3) For items potentially present, review the Erosion Condition Class (Soil Surface Factor) sheet and assign a numerical value to each erosion feature.
4) Total both the weighted values and the possible values.
5) Calculate the Total percent SSF: (identified factors / possible factors) x 100
6) Write the total percent and corresponding condition class in the box below.

SSF Range	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

SSF % and Class: 6% STABLE

Comments (when applicable, include information on width, depth, uniformity, number per m^2 or height):

KC HARVEY ENVIRONMENTAL, LLC

KC HARVEY
ENVIRONMENTAL, LLC

Qualitative Monitoring

Site Name: PLOT # 1 NORTH Date: 11/26/14

Data Collector(s): P. STROW (FROZEN) Slope(%)/Aspect: ____ / ____

Vegetation

	Reclamation Trial					Reference Site				
	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover	Total Foliar Cover	Species 1/ % Cover	Species 2/ % Cover	Species 3/ % Cover	Species 4/ % Cover
Grass	55									
Forb	0									
Shrub	0									
Total	55	—	—	—	—		—	—	—	—
Weed	0									
Cover Crop	0	—	—	—	—	—	—	—	—	—
Rock	20	—	—	—	—		—	—	—	—
Litter	2	—	—	—	—		—	—	—	—
Bare Ground	22	—	—	—	—		—	—	—	—

Other Species:	Other Species:
Grass	Grass
Forb	Forb
Shrub	Shrub
Weed	Weed

Relative % Cover _____ (Disturbed Total (Grass+Forb+Shrub))/(Undisturbed Total (Grass+Forb+Shrub))

Additional Monitoring Methods

Seedling Count ☐Yes ☑No

Canopy Cover ☐Yes ☑No

Mulch
☐ None
☑ Fiber

Grazing
☐ Wildlife
☐ Livestock
☐ Both

Severity
☐ None 0-5%
☐ Low 5-40%
☐ Moderate 40-60%
☐ Heavy 60-100%