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Agriculture

Forest  
Service

April 2008



# Draft Environmental Impact Statement

## Spencer Mineral Materials Project

Glacier Ranger District, Chugach National Forest  
Kenai Borough, Alaska



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# SPENCER MINERAL MATERIALS PROJECT

## Draft Environmental Impact Statement Kenai Borough, Alaska

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**Abstract:** This draft EIS examines the environmental effects of a proposal by the Chugach National Forest to extract mineral materials including quarry rock and gravel from a site near Spencer Glacier on the Kenai Peninsula, Alaska. Five alternatives were considered in detail. Alternative A would permit mineral material extraction on a total of 530 acres located immediately adjacent to the Alaska Railroad and the Spencer Glacier Whistle Stop developed recreation area. Alternative B would allow gravel extraction from about 200 acres on the west side of the Alaska Railroad furthest from recreation sites to minimize noise and visual intrusions, as well as, to avoid existing placer claims. Alternative C would restrict gravel operations to about 160 acres to minimize visual impacts from recreational developments and viewing locations located at higher elevations. Alternative C would also limit gravel operations to 3-4 days per week to minimize noise impacts to recreationists. Alternative D would allow gravel operations on 360 acres with modifications to the proposed operating season, operating hours, and methods of extraction to improve operational feasibility. Alternatives B, C and D would exclude existing placer claims from gravel extraction to minimize conflict. All action alternatives would allow mining of quarry rock from 30 acres near Spencer Lake.

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decision-making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, 1986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3). The opportunity to Comment ends 45 days following publication of the notice of availability (NOA) in the Federal Register. Please send comments through any of the avenues listed below:

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E-mail: Electronic comments may be sent to comments-alaska-chugach-glacier@fs.fed.us. The subject line of e-mailed comments must include "Spencer Minerals". The acceptable format(s) for electronic comments is: MS Word (.doc) or rich text format (.rtf)



## Summary

The Chugach National Forest proposes to develop and extract quarry rock and gravel aggregate from a mineral materials site near Spencer Glacier. The Spencer Mineral Materials site is situated on a glacial outwash plain at the terminus of Spencer Glacier. This action is needed to provide valuable mineral materials from the Spencer area to meet the demand for rock and gravel in Southcentral Alaska while maintaining the integrity of the recreation experience planned in the vicinity.

The Spencer Lake area is highly valued for both its recreation opportunities and mineral material production potential. This area has been a developed quarry since the early 1900s, leaving a setting that is not pristine in character. However, the unique scenic values and ease of access at Spencer Lake and Glacier have continued to draw recreationists from around the world. The Chugach National Forest Revised Land and Resource Management Plan (hereafter referred to as the “Forest Plan”) established direction to manage this area in a manner that facilitates both recreation development and mining activities. The Forest Plan management direction was designed to balance the interaction between recreation and mining at Spencer. The 600-acre Spencer Mineral Materials site was made available because of its location along the railroad, the large volume of rock and gravel available, its history as a developed quarry, and the demand for these materials. The Forest Plan also identified a Developed Recreation Complex at the Spencer site, where developed recreation facilities would be designed to provide opportunities for recreating in social groups, including frequent interactions with other parties. The Whistle Stop Record of Decision (ROD) described specific recreation facilities to be built at Spencer consistent with the developed recreation complex setting, and it included a number of measures to reduce the potential impacts to mining claims and quarry operations.

The Spencer site contains high quality deposits of both quarry rock and gravel aggregate. Few sites in Alaska have quality mineral materials with easy access to transportation. The Spencer site is located immediately adjacent to the Alaska Railroad and has provided these materials for approximately 100 years. Response to a recent solicitation of interest by the Forest Service indicates there is substantial interest from local producers in both the rock and gravel deposits at Spencer.

This project was described in a scoping letter dated November 16, 2006. Forty-one responses were received to the scoping letter. In addition, meetings were held with concerned parties upon request. Significant issues identified through scoping include effects on existing placer mining claims, recreation (including noise and visual disruption), water quality, fish and wildlife habitat, public safety, and the feasibility of mining operations as proposed.

These issues led the agency to develop alternatives to the proposed action including:

- Alternative B – This alternative was developed to reduce effects to recreation and facilitate public safety by keeping mining activities farther away from developed recreation sites. It would also avoid existing placer mining claims.
- Alternative C – This alternative was developed to minimize visual and noise impacts and minimize conflicts with existing placer claims. Active mining would be constrained to smaller areas at any one time, fewer days per week, and fewer hours per day during the peak recreation season. Mining activities would be allowed in or adjacent to areas previously disturbed by past mining activities but outside of existing placer claims.
- Alternative D – This alternative would provide greater flexibility in the operating seasons and methods and is expected to be more feasible than the proposed action. It includes extended operating season and hours. It would also avoid conflicts with existing placer mining claims.
- Alternative E – No action. No extraction of gravel or quarry rock would be permitted in the foreseeable future except in response to emergency needs (per CFR 228.59 (e)(i)).

Major conclusions include:

- Placer claims – No alternative would materially interfere with placer mining conducted under an approved plan of operations. Under all alternatives, mineral materials operators would coordinate with operators of placer mining claims. Alternative A would require the most coordination with the existing placer claims since the mineral materials permit would include the same area as the claims. Alternatives B, C, and D would not allow extraction of mineral materials from most of the placer claims. However, under Alternatives B and C use of an existing haul road to remove quarry rock is proposed. This haul road lies within the placer claims and its use would require close coordination with the mining claimants. Under Alternative D, a rail spur would be constructed to avoid using this haul road and minimize the need for coordination with mining claimants in this area.
- Effects from noise – During the 124-day peak recreation season (May 15-September 15) Alternatives A and C equally have the greatest potential to expose recreation visitors to the highest any-one-time noise event because of the possibility of blasting—although that is for a relatively very small proportion of the time (10 days). Under Alternatives A, B, and D, a recreating visitor could be exposed to increased noise levels from gravel mining activities for 12 hours per day during the entire peak recreation season. Under Alternative C, a visitor could be exposed to increased noise levels for 10 hours per day for 3 to 4 days per week during the peak recreation season. This alternative would result in about 55 percent less time (total hours) that visitors would be exposed to gravel mining and rock quarrying noise during the 124-day peak recreation season. Gravel operations under Alternative A would be most likely to mask ambient sounds at developed recreation sites at Spencer. Under this alternative, noise of operations would also be

audible above the sounds of normal recreational activities expected at Spencer Whistle Stop and other developed recreation sites at Spencer. Operations under Alternative C would be least likely to be audible at these same sites and noise from gravel operations is not expected to dominate normal recreational sounds at these same sites. Alternatives B and D would be similar to Alternative C but are more likely to be audible above normal recreational sounds at Whistle Stop and along the Placer River. During the 241-day non-peak recreation season, Alternative D would have the greatest potential to expose recreation visitors to the highest any-one-time noise event because of the extended fall blasting season. Excluding blasting, Alternatives A, B, and C appear more or less equal in terms of how many days (60) a recreating visitor could likely perceive the noise level from gravel mining activities. Gravel operations would be allowed for 76 days during the non-peak season under Alternative D.

- Effects on visual quality – Under all action alternatives, none of the mining equipment or facilities are expected to be visible from key recreation sites at Spencer Glacier Whistle Stop. Passers-by on the Alaska Railroad may briefly see equipment and facilities through openings in the trees as trains pass the Spencer site. Recreationists using future trails and cabins located on hills above Spencer would be able to see the operations clearly. However, disturbed areas will be limited to 50 acres at one time under Alternatives A, B and D. Under Alternative C, disturbed areas would be limited to 30 acres at one time. As a comparison, the disturbed area at the site of the previous mineral materials site is about 10 acres and the disturbed area at the current ARRC siding is about 25 acres. These areas would be small in comparison to the surrounding landscape from such vantage points as Center Creek Pass.
- Effects on recreation - Alternatives A and D have the potential to generate the highest level of effect on area recreationists. Alternative A would have the greatest effects during the peak recreation season due to the proximity to the Spencer Glacier Developed Recreation Complex and long operating hours for all types of operations. Alternative D would have the greatest impacts during the non-peak recreation season due to the extended operating seasons for both gravel removal and rock blasting, as well as the extended hours of operation for gravel and blasting during the off-season. Alternative B would have less effect on recreationists due to the more advantageous location of gravel operations and the reduced blasting season. Alternative C would have the least effects to recreationists of all the action alternatives. This is due to the more beneficial location of gravel operations, progression of gravel operations, the condensed season for rock blasting, and the reduced operating hours for gravel and rock quarry operations during the peak recreation season. Alternative E would have no effects on recreation at this time.
- Effects to wildlife and fisheries – There would be no impacts to any federally listed endangered, threatened, or proposed species under any alternative. Impacts to brown bears and salmon would be minimized by maintaining a 750-foot buffer along any

anadromous fish-bearing stream under all action alternatives. The reclamation plan would provide for construction of ponds suitable for fish spawning. Some additional mortality to moose is possible due to increased train traffic. Greater mortality is expected under Alternatives B and D; least mortality is expected under Alternative C. Impacts to migratory birds from vegetation removal would be minimized by limiting removal to the non-breeding season. Impacts to all other species are expected to be low.

- Effects to public safety – All action alternatives have the potential to pose a risk to public safety. All action alternatives would include provisions to provide warning signs and other communications to protect the recreating public. However, providing for public safety would be more expensive and more difficult for those alternatives that allow mineral operations in closer proximity to developed recreation facilities and those with longer seasons and hours of operation. Providing for public safety would be simplest and least costly under Alternative C since recreational use would have the least overlap with the minerals operations in both time and space. Providing for public safety would be most challenging under Alternative A due to proximity to recreation developments, the length of the operating season, the long hours of operation, and the spatial extent of the operations.
- Feasibility of mineral operations – All action alternatives are expected to be physically and economically feasible. Alternatives B and D would provide the lowest rates of return but the highest total revenues to the operator. Alternative C would provide the highest rate of return but the lowest total revenue. Alternative A is intermediate for both factors. Benefit-cost ratio for the operator is highest under Alternative C and lowest under Alternatives B and D.

After reviewing the proposed action, the alternatives, the environmental analysis, and considering public comment, the Forest Supervisor will reach a decision that is in accordance with the purpose and need for this project. The decision will include, but not be limited to:

- Whether to permit production of mineral materials from the Spencer site.
- What will be the size and location of the area(s) permitted for mineral materials production.
- What types of equipment and facilities will be allowed in the permitted area to support mineral materials operations.
- What methods of extraction will be allowed and/or prohibited.
- What constraints will apply to mineral materials operations to provide a high quality recreational experience at the Spencer Glacier Whistle Stop.



# Table of Contents

<b>Summary</b> .....	<b>i</b>
<b>Chapter 1. Purpose of and Need for Action</b> .....	<b>1</b>
Document Structure.....	1
Introduction .....	1
Background.....	3
Purpose and Need for Action.....	9
Proposed Action .....	10
Decision Framework .....	10
Forest Plan Direction.....	10
Public Involvement.....	11
Issues .....	11
<b>Chapter 2. Alternatives, Including the Proposed Action</b> .....	<b>15</b>
Introduction .....	15
Alternatives Considered in Detail.....	15
Design Criteria Common to All Action Alternatives .....	15
Alternative A – Proposed Action .....	19
Alternative B .....	21
Alternative C .....	23
Alternative D.....	26
Alternative E – No Action.....	28
Alternatives Considered but Eliminated from Detailed Study .....	28
Comparison of Alternatives.....	30
<b>Chapter 3. Affected Environment and Environmental Consequences</b> .....	<b>33</b>
Past, Present and Reasonably Foreseeable Actions.....	33
Other Existing or Reasonably Foreseeable Projects.....	33
Geology and Minerals .....	34
Affected Environment.....	34
Environmental Consequences .....	43
Noise.....	51
Affected Environment.....	51
Environmental Consequences .....	53
Scenic Quality .....	64
Affected Environment.....	64
Environmental Consequences .....	66
Recreation.....	69
Affected Environment.....	69
Environmental Consequences .....	71
Heritage Resources.....	78
Affected Environment.....	78
Environmental Consequences .....	79
Watershed.....	79
Affected Environment.....	79
Environmental Consequences .....	80
Fisheries.....	82
Affected Environment.....	82
Environmental Consequences .....	85
Wildlife.....	88
Affected Environment.....	88

Environmental Consequences .....	94
Botany .....	98
Affected Environment .....	98
Environmental Consequences .....	102
Economics .....	106
Short-term Uses and Long-term Productivity .....	109
Unavoidable Adverse Effects .....	109
Irreversible and Irrecoverable Commitments of Resources .....	109
Legal and Regulatory Compliance .....	109
Principle Environmental Laws .....	109
Executive Orders .....	111
Special Area Designations .....	112
<b>Chapter 4. Consultation and Coordination .....</b>	<b>113</b>
Preparers and Contributors .....	113
Distribution of the Environmental Impact Statement .....	114
<b>References .....</b>	<b>115</b>
<b>Appendices .....</b>	<b>119</b>
<b>Appendix A – Reclamation Plan .....</b>	<b>120</b>
Objectives .....	120
Design features .....	120

## List of Figures and Tables

Figure 1. Vicinity map of the proposed Spencer Mineral Materials site .....	2
Figure 2. Location map of proposed mineral materials site at Spencer Glacier showing gravel and rock deposits .....	3
Figure 3. Map of approved Developed Recreation Complex at Spencer Glacier in relation to the proposed mineral materials sites .....	5
Figure 4. Map of existing mining claims in relation to the proposed mineral materials site .....	7
Figure 5. Map of proposed mining area and developments at Spencer under Alternative A. Red inset boxes provide a reference of relative areas from 25 acres to 1 acre. ....	20
Figure 6. Photo of old gravel extraction area proposed for mining under Alternative A.....	21
Figure 7. Map of proposed mining area and developments at Spencer under Alternative B.....	22
Figure 8. Large-sized gravel operation in the Wasilla area .....	23
Figure 9. Map of proposed mining area and developments at Spencer under Alternative C.....	24
Figure 10. Small-sized gravel operation in the Anchorage area .....	25
Figure 11. Map of proposed mining area and developments at Spencer under Alternative D.....	27
Figure 12. Photo of typical kettle pond.....	35
Figure 13. Map of geologic units and fault lines near Spencer area .....	36
Figure 14. Map of 1999 mineral withdrawal and 2007 segregation in relation to valid existing claims at Spencer .....	39
Figure 15. Map showing area of former mineral materials permit held by Spruce Sand & Gravel.....	41
Figure 16. Photo of current gravel pit under permit to Alaska Railroad.....	42
Figure 17. Spencer area as seen from the Alaska Railroad.....	65
Figure 18. Three-foot diameter red balloon used to evaluate visibility of gravel extraction equipment from key viewpoints at Spencer .....	66
Figure 19. Aerial photograph displaying balloon location in relation to key viewpoints at Spencer .....	67
Figure 20. Stream Class designation and location in the Placer River watershed. Class 1 contains resident and anadromous fish species, Class 2 contains only resident fish species, and Class 3 has no fish species. ....	83
Figure 21. Invasive plant locations in the Spencer area.....	101

Figure 22. Aerial photograph showing a likely development scenario for ponds at Spencer mineral materials site following reclamation .....122

Table 1. Comparison of alternatives and their environmental effects for the Spencer Mineral Materials Project .....30

Table 2. Likelihood of Spencer Minerals project alternatives to conflict with valid existing rights .....50

Table 3. Existing sources and levels of noise currently estimated to be occurring at Spencer Mineral Materials project area .....53

Table 4. Summary of season, days, and hours of operations under the various alternatives for the Spencer Mineral Materials project .....54

Table 5. Major noise sources and estimated noise output (dB) associated with proposed mineral operations at Spencer .....54

Table 6. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative A .....58

Table 7. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative B .....58

Table 8. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative C .....59

Table 9. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative D .....59

Table 10. Timing and duration of various minerals operations for the Spencer mineral materials project under each alternatives .....72

Table 11. Threatened and endangered species considered for the Spencer Mineral Materials project .....89

Table 12. Weed species found in the Spencer area .....100

Table 13. Location and population size of weed species found in the Spencer area .....100

Table 14. Approximate acres of disturbed ground disturbance by alternative .....103

Table 15. Table of values used for costs and benefits associated with the Spencer Mineral Materials project. ....106

Table 16. Table of comparative economic measures for various alternatives for the Spencer Mineral Materials project.....107



# Chapter 1. Purpose of and Need for Action

## Document Structure

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The Forest Service has prepared this environmental impact statement in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This environmental impact statement discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters:

- **Chapter 1. Purpose and Need for Action:** This chapter briefly describes the proposed action, the need for that action, and other purposes to be achieved by the proposal. This section also details how the Forest Service informed the public of the proposed action and how the public responded.
- **Chapter 2. Alternatives, including the Proposed Action:** This chapter provides a detailed description of the agency's proposed action as well as alternative actions that were developed in response to comments raised by the public during scoping. The end of the chapter includes a summary table comparing the proposed action and alternatives with respect to their environmental impacts.
- **Chapter 3. Affected Environment and Environmental Consequences:** This chapter describes the environmental impacts of the proposed action and alternatives.
- **Chapter 4. Consultation and Coordination:** This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental impact statement.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Glacier Ranger District.

## Introduction

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The goal of this project is to continue to provide valuable mineral materials from the Spencer area to meet the demand for rock and gravel in Southcentral Alaska while maintaining the integrity of the recreation experience planned in the vicinity. The Spencer site contains high quality deposits of both quarry rock and gravel aggregate. Few sites in Alaska have quality mineral materials with easy access to transportation. The Spencer site is located immediately adjacent to the Alaska Railroad and has provided these materials for approximately 100 years. While supplies of such materials are running low in other locations (e.g. Portage Valley), the Spencer site still contains large amounts of high quality gravel and rock. Response to a recent solicitation of interest

indicates there is substantial interest from local producers in both the rock and gravel deposits at Spencer.

The Spencer Mineral Materials site is situated on a glacial outwash plain at the terminus of Spencer Glacier, within the Glacier Ranger District of the Chugach National Forest, Kenai Peninsula Borough, Alaska. It is about 54 miles south of Anchorage, 20 miles south and west of Whittier by rail, 19 miles south of Girdwood and 60 miles north of Seward (see Figure 1). The project area includes about 530 acres located north and east of the Placer River (see Figure 2).

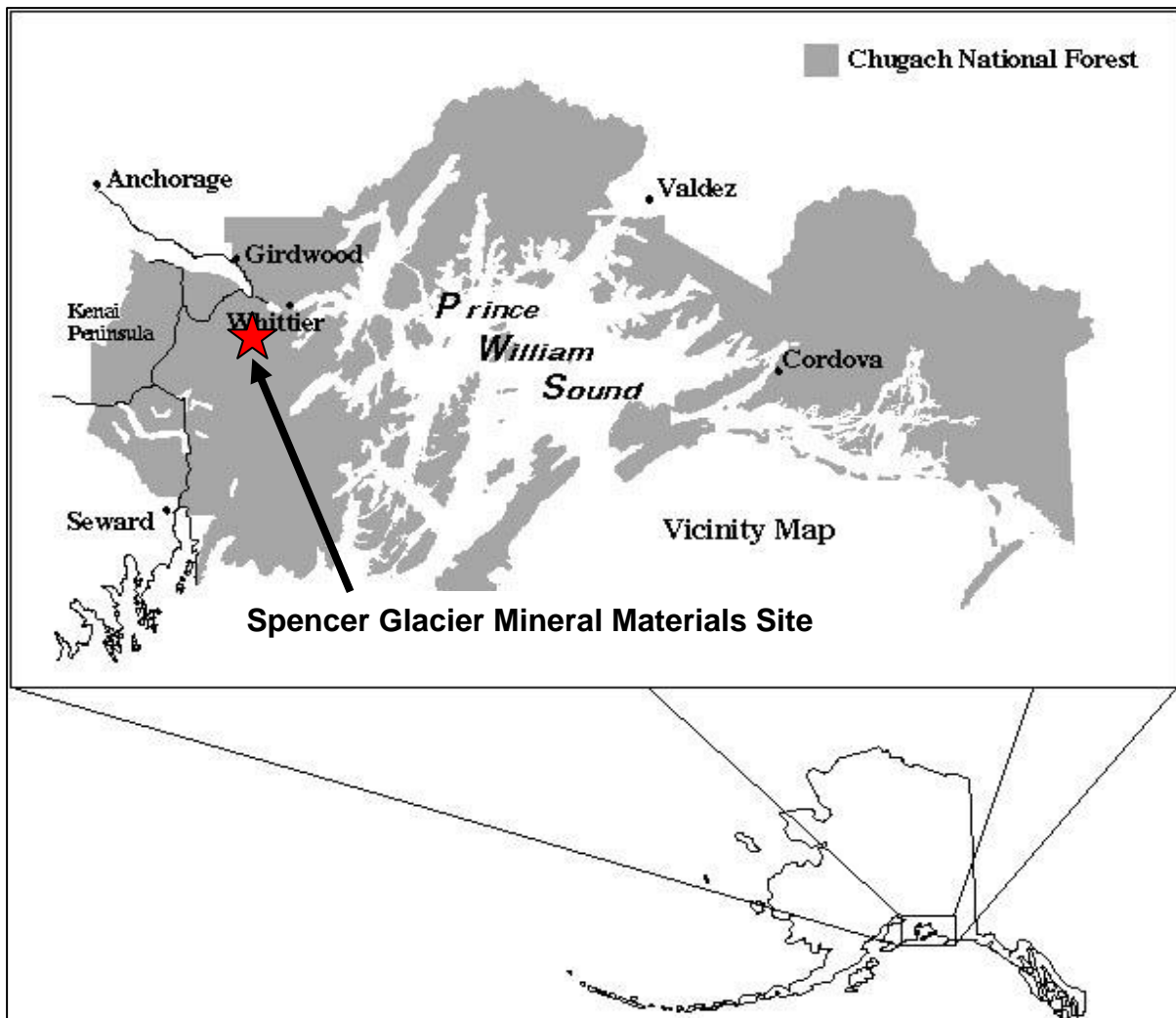
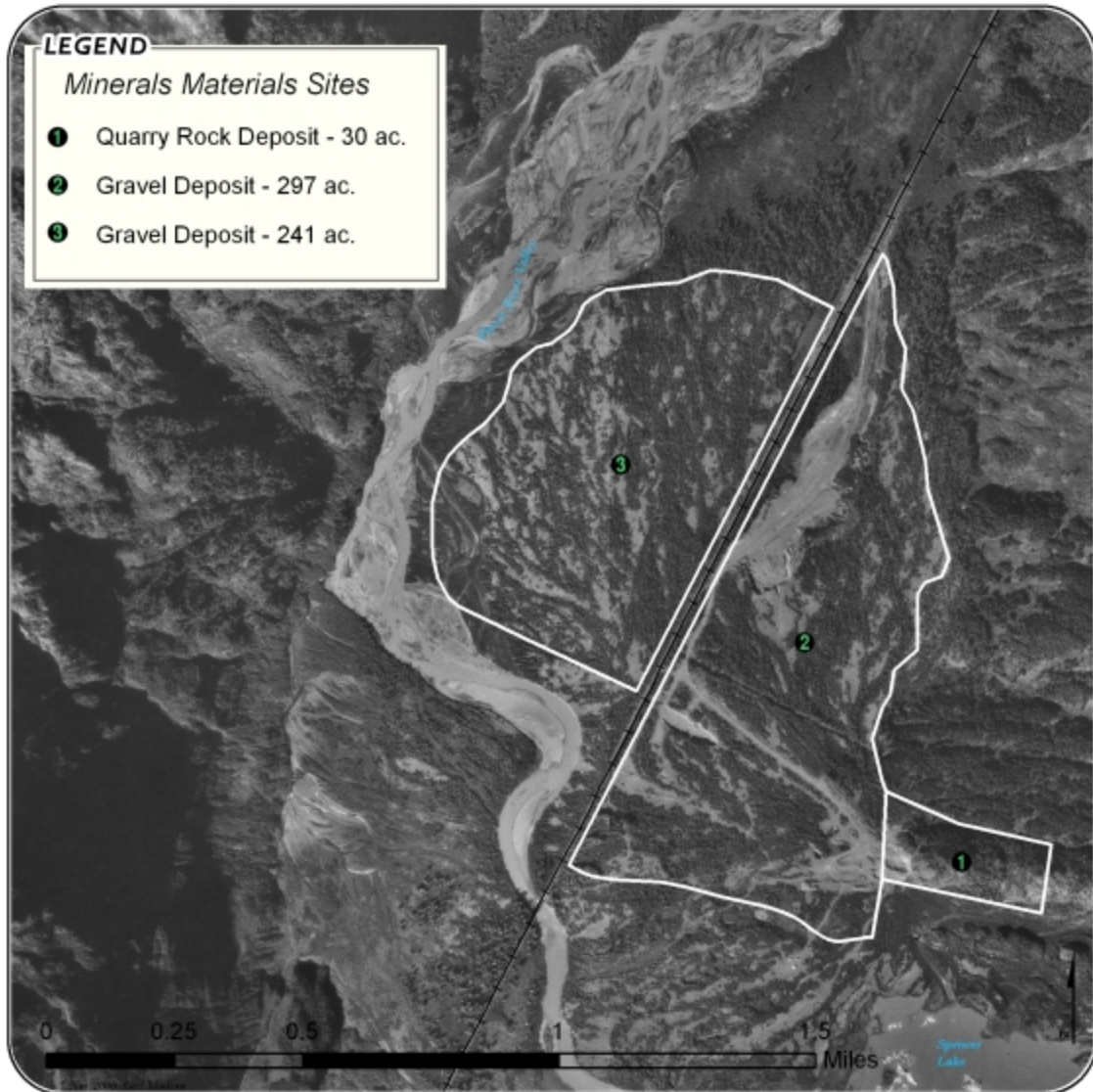


Figure 1. Vicinity map of the proposed Spencer Mineral Materials site



**Figure 2. Location map of proposed mineral materials site at Spencer Glacier showing gravel and rock deposits**

## **Background**

The Spencer Lake area is highly valued for both its recreation opportunities and mineral material production potential. This area has been a developed quarry since the early 1900s, leaving a setting that is not pristine in character. However, the unique scenic values and ease of access at Spencer Lake and Glacier have continued to draw recreationists from around the world. The Forest Plan established direction to manage this area in a manner that facilitates both recreation development and mining activities. The Forest Plan management direction was designed to balance the interaction between recreation and mining at Spencer. The 600-acre Spencer Mineral Materials site was made available because of its location along the railroad, the large volume of rock and gravel available, its history as a developed quarry, and the demand for these materials.

The Forest Plan also identified a Developed Recreation Complex at the Spencer site, where developed recreation facilities would be designed to provide opportunities for recreating in social groups, including frequent interactions with other parties. The Whistle Stop ROD described specific recreation facilities to be built at Spencer consistent with the developed recreation complex setting and it included a number of measures to reduce the potential impacts to mining claims and quarry operations.

The Spencer area contains a vast, high quality, sand and gravel deposit. Mineral materials consisting of rock (stone) and gravel have been mined at Spencer for over a century. The railroad extracted gravel in the early 1900s and built a rock levee in 1917 to divert water from their gravel pit. Past mining activity is clearly visible in the Spencer area. Exposed rock faces, gravel piles, berms, and access roads are present between the railroad tracks and Spencer Lake. Many areas were leveled and several pits are present, but vegetation in the form of brush and trees has reestablished in many disturbed areas.

About 330 acres of the proposed extraction area is located along the east side of the Alaska Railroad line and directly north of the Spencer Glacier Whistle Stop Developed Recreation Complex Management Area (see Areas 1 and 2 in Figure 3). The area includes the current Alaska Railroad siding area. These areas contain known deposits of high quality quarry rock and gravel aggregate.

Another approximately 240-acre site on the west side of the Alaska Railroad right-of-way has not been previously mined and has a natural landscape. Superficially, this area appears to contain a similar deposit of gravel aggregate although no testing has been done to verify the quantity or quality of this deposit. This area may be suitable for mineral materials production in conjunction with, or instead of, production at the known deposit.

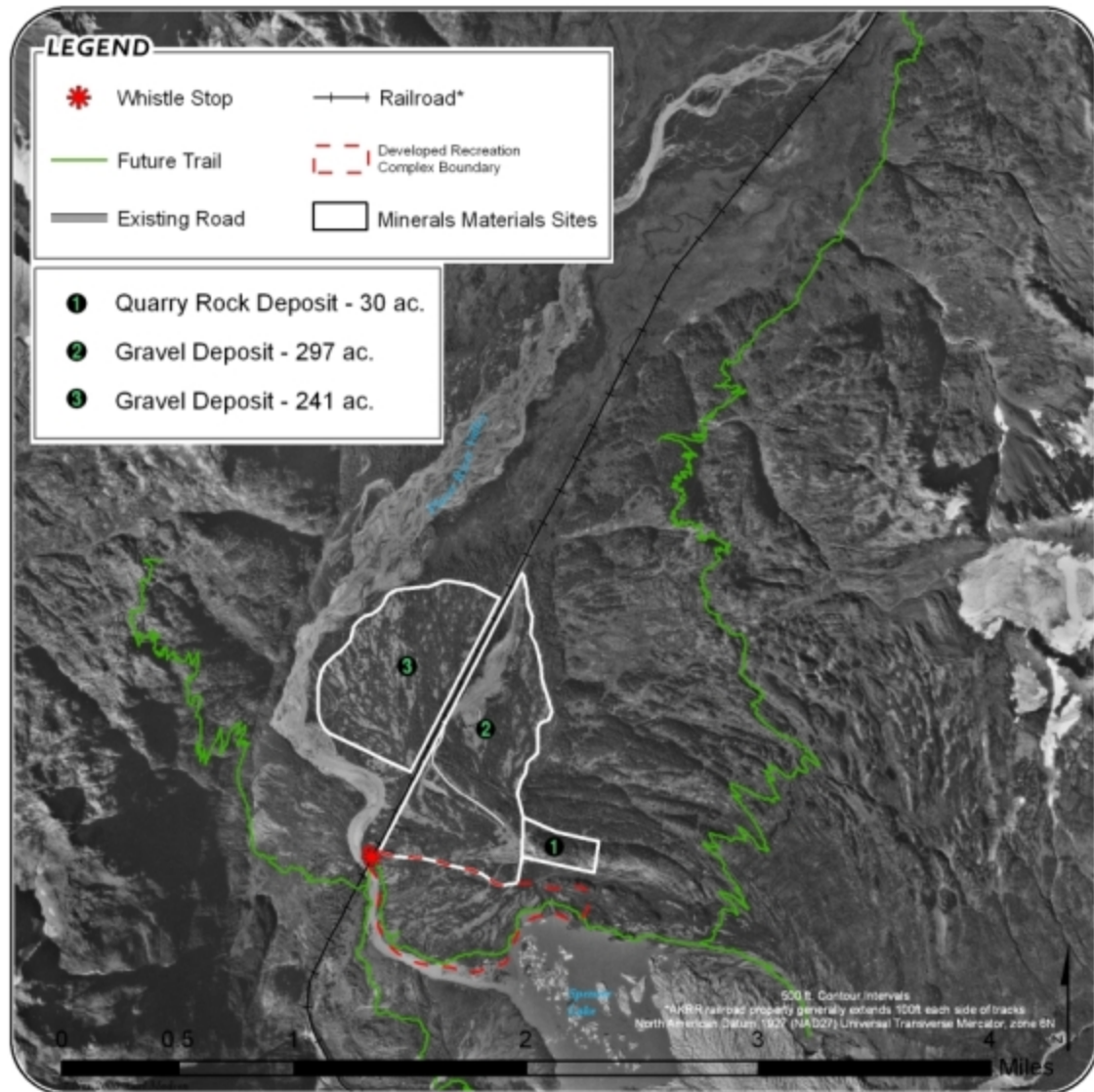
The quarry rock is primarily a massive metamorphosed graywacke, located in two elongated rock knobs situated on the north side of Spencer Lake. The deposit is a proven, valuable commodity for large-sized armor stone, riprap, and other construction uses. From 1991 through 1997, quarry rock was produced for construction projects around the state.

On June 3, 1997, at the request of the Forest Service, a notice was published in the Federal Register that segregated 600 acres at Spencer Glacier from operation under the U.S. mining laws (mining claims cannot be located) for a period of 2 years. Public Land Order 7393 subsequently withdrew the same lands for 15 years, effective May 28, 1999, until May 28, 2014. This withdrawal was done for the stated purpose of making the site available for development and production of mineral materials. The withdrawal prevents future claims for locatable<sup>1</sup> minerals but does not affect valid existing claims.

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<sup>1</sup> In general, the locatable minerals are those hard rock minerals, which are mined and processed for the recovery of metals. They also may include certain nonmetallic minerals and uncommon varieties of mineral materials, such as valuable and distinctive deposits of limestone or silica.





**Figure 3. Map of approved Developed Recreation Complex at Spencer Glacier in relation to the proposed mineral materials sites**

There are valid placer<sup>2</sup> mining claims, located for placer gold, covering a portion of the project area (see Figure 4). These placer mining claims (approximately 360 acres) have existed since 1984 and predate the 1997 segregation and withdrawal per PLO 7393. A mining claim validity examination was done by Forest Service personnel, and the report concluded that the mining claims did not have a discovery and therefore, recommended contest. The report also concluded that stone within the mining claims was a common variety stone that was not subject to location under the mining laws. In 1999, the BLM Office of Hearings and Appeals held a validity hearing, and the Administrative Law Judge (ALJ) subsequently made a decision that the claims had a discovery (disagreed with the Forest Service validity report) and therefore, had valid existing rights. This means that even though the lands at Spencer Glacier are withdrawn from

<sup>2</sup> A sand or gravel deposit containing particles of gold or other valuable minerals

mineral entry, mining claims that pre-existed the withdrawal (the nine PR Association placer mining claims) and are supported by a discovery, as determined by the hearing, continue to exist.

The ALJ also reached a decision that the stone was clearly not locatable, and was in fact a common variety. Should the claimants fail to maintain their claims by making the appropriate annual filing and paying the required fees, they would be declared null and void and could not be relocated during the term of the withdrawal. The withdrawn lands however, remain open to the disposal of mineral materials. The claimants appealed the portion of the ALJ decision regarding the stone. That case was decided by the Interior Board of Land Appeals (IBLA) in 2007 (171 IBLA 170, 177-84 (2007)), and the ALJ decision was upheld.

The 1872 mining law gives the claimant the right to develop the locatable mineral resources which do not include the sand and gravel deposit. Gravel has been produced from the placer claims but no placer gold has been produced. There is currently an approved plan of operations for low-impact hand sampling across the claim block. The Forest Service manages the surface activities on claims and, if there is no timely development, the Forest Service retains the right to dispose of salable mineral resources<sup>3</sup> embraced by such mining claims.

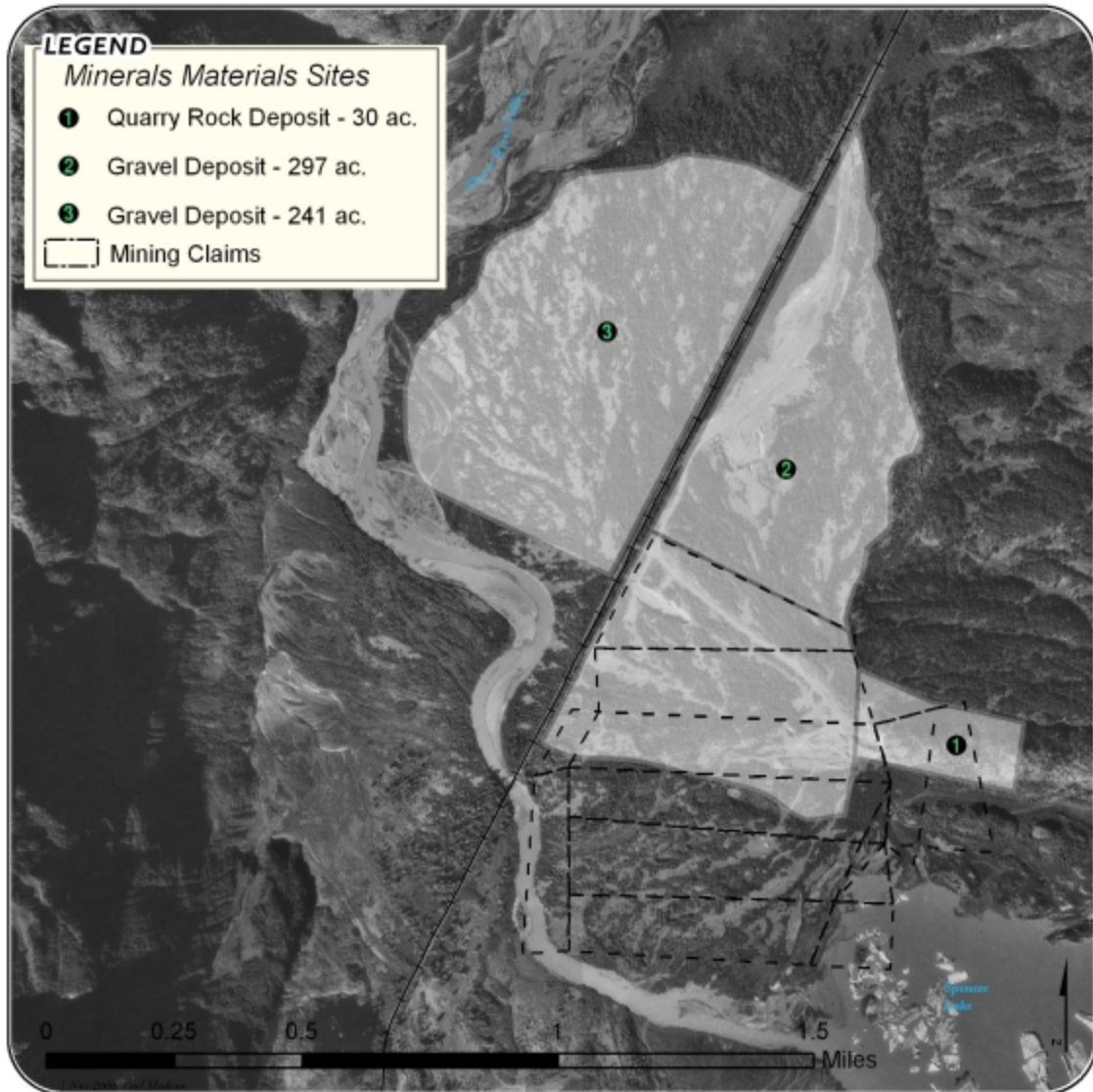
On February 27, 2007, at the request of the Forest Service, a notice was published in the Federal Register that segregated an additional 720 acres at Spencer Glacier from operation under the U.S. mining laws (mining claims cannot be located) for a period of 2 years. This segregation generally does not affect existing mining claims (except for small pieces of PR Association Nos. 12, 11, 10, and 9), and no additional mining claims can be located within the boundaries. This segregation lies adjacent to and north of the PLO 7393 area (see Figure 14). Both areas together cover the entire mineral material site. Mineral material sales are allowed in both areas.

Prior to the expiration of the segregation, the Forest Service must complete the withdrawal application package, which consists mostly of a mineral potential report and an environmental analysis of the withdrawal action. The stated purpose of the withdrawal is making high quality mineral materials available under the Materials Act of 1947, to nearby communities for private and public works projects. The withdrawal application area would include future recreational development for public access and recreation associated with a railroad stop and trails to access the National Forest for recreation. The withdrawal application can be approved or denied by BLM.

This segregation and the withdrawal (PLO 7393) have a total of 1,320 acres. Mining claims with valid existing rights occupy 360 of those acres.

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<sup>3</sup> Salable minerals include sand, gravel, and stone.



**Figure 4. Map of existing mining claims in relation to the proposed mineral materials site**

This project is the next step in the planning process for the Spencer area. The recent Forest Plan revision process considered the value of both minerals and recreation in management of the Chugach National Forest. The Final Environmental Impact Statement (FEIS) for the Chugach National Forest Revised Land and Resource Management Plan (“Forest Plan”) discussed the Spencer mineral site and acknowledged the potential for conflicts between recreation and minerals operations at this location. Specifically the Forest Plan FEIS states:

*“One important source of riprap and armor stone on the Forest, the 600-acre Spencer Glacier Mineral Materials Site, would be available under all alternatives. This source is significant because of its location along the railroad, large volume of material available, being a developed quarry, and containing a type of material that is in demand. The Spencer Glacier site lands were withdrawn from mineral entry under the U.S. Mining Law, for the*

*specific purpose of a mineral materials source. In the Preferred Alternative and Alternatives C and D, there could be a developed recreational complex (about 50 acres) at Spencer Glacier. Although the complex and quarry could co-exist side-by-side physically, there would likely be conflicts because the quarry would be considered to be a visual impact to the glacier scene and the natural quiet would be disrupted in the vicinity by blasting and heavy equipment operating at the quarry.” (USDA Forest Service 2002b, page 3-506)*

In the Forest Plan Record of Decision, the Regional Forester selected the preferred alternative, including a developed recreation complex at Spencer, in part because it provided for more active management on the Kenai Peninsula including minerals operations:

*“In summary, for the Kenai Peninsula, I focused on more active management, to allow for a broad range of recreation opportunities on the Peninsula, and to allow for continuing mineral exploration and possible development. All the prescriptions (except for rivers recommended for Wild designation) allow for mineral exploration and possible development...” (USDA Forest Service 2002c, page 8)*

Development of the Spencer mineral materials site was also acknowledged as a reasonably foreseeable future action in the FEIS for the Whistle Stop project:

*“...just to the north-west of Spencer Lake, approximately 245 acres have been managed as a mineral materials site since 1978. Although the site has not been in operation for several years, there is the potential for future mining of resources; multiple responses were received to a solicitation of interest issued by the Forest Service for potential removal of rock, sand and gravel. The environmental analysis for this project will be initiated by the Chugach National Forest in 2006.” (USDA Forest Service 2006a, page 3-2)*

During the public comment period on the Whistle Stop project, some members of the public expressed concern regarding the compatibility of both recreation and mining at Spencer. The Forest responded to these comments in the FEIS:

*“The relationship between mining activities and recreation was identified as a significant issue in the EIS. In response to this issue, the Interdisciplinary team (IDT) developed and disclosed the effects of Alternative 1, which locates all recreation development south of the Spencer Lake outlet. The EIS describes the effects of the alternatives on mining operations, and specifically the effects on the approved mining plans of operation and mineral materials sales in the project area. The EIS recognizes that recreation use will likely increase in the project area and could affect these mining operations. However, at this time, the analysis has not determined that these uses are entirely incompatible or interfere with any of holder’s rights.” (USDA Forest Service 2006a, page 4-11)*

The Whistle Stop ROD further expanded the developed recreation complex at Spencer Glacier:

*“The Chugach National Forest Revised Forest Plan identifies a Developed Recreation Complex Management Area in the vicinity of Spencer Lake. Exact boundaries of this site*

*were to be developed on a project specific basis. My decision identifies approximately 187 acres as a Developed Recreation Complex in the Spencer region”. (USDA Forest Service 2006a, page 5)*

In addition, the ROD for the Whistle Stop project acknowledged specifically for the Spencer Glacier Whistle Stop that:

*“Due to the nature of designated Whistle Stops, there will be small, essential nodes of development and high levels of encounters at these locations as visitors utilize these facilities to safely exit the train and disperse use accordingly.... It is only at Spencer Lake, which is classified as a Developed Recreation Complex, where facilities will be designed to accommodate a large number of people, and hence, encounters.” (USDA Forest Service 2006a, page 10)*

While the Whistle Stop FEIS acknowledged the potential for conflicts between recreation and mineral materials production at Spencer, the Forest Supervisor in his Record of Decision for the project concluded that:

*“Recreation and minerals development are not incompatible. We can allow the two uses to co-exist with either movement of recreation facilities or staging of minerals development. Finally, not only are recreation and minerals development not incompatible with project implementation, but they are not incompatible legally. Mining claims validated subsequent to [Multiple Surface Use Mining]Act of 1955, such as those in the project area, do not carry the exclusive right to the surface. Lands containing such claims are subject to the rights of the United States to manage and dispose of the vegetative resources, to manage other resources except locatable minerals, and to the right of the United States, its permittees and licensees, to use so much of the surface area necessary for such purposes and for access to adjacent lands (30 U.S.C. 612, UFSM 2813.13bU).” (USDA Forest Service 2006a, page 13)*

Thus, recent planning efforts on the Forest, including the Forest Plan and the Whistle Stop project, have acknowledged that the Spencer site contains valuable deposits of mineral materials, as well as valuable recreational opportunities. Environmental analyses and decisions made during both these planning efforts have also discussed the challenge of mining operations in close proximity to recreational developments. However, based on past successful experiences in Portage Valley, we believe these two valid multiple uses can coexist at Spencer if properly designed and operated.

## **Purpose and Need for Action**

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The Forest Service seeks to continue to provide high quality mineral materials from the Spencer site as a valid use, while maintaining the integrity of the recreational experience at Spencer and restoring a more natural landscape. Response to a Forest Service solicitation of interest indicates there is a demand for gravel and quarry rock from this location.

The objectives for this project are to:

- Provide high quality mineral materials to support the growing economy of Southcentral Alaska.
- Provide a high quality recreational experience consistent with the goals and objectives of the Whistle Stop project.
- Restore a more natural landscape through reclamation of historic and planned mining areas.

Implementation of the Spencer Mineral Materials project will help meet the following goal and objective for minerals outlined in the Forest Plan:

**Goal**

- Provide opportunities to develop minerals for personal and commercial uses.

**Objective**

- Provide areas for salable mineral materials (sand, gravel, and stone). Current community pits and valuable materials sites are managed with a prescription that permits salable mineral activity.

**Proposed Action** \_\_\_\_\_

The Forest Service will evaluate, analyze, and determine the ability to develop and extract quarry rock and gravel aggregate from a mineral materials site at Spencer. Production of these materials will be permitted on all or a portion of the approximately 530-acre site for up to 15 years. The site(s) chosen for mineral material extraction would be situated and operated so as not to conflict with a high quality recreation experience at the Spencer Glacier Whistle Stop. The proposed action is described in more detail in Chapter 2 under Alternative A.

**Decision Framework** \_\_\_\_\_

Given the purpose and need, the deciding official will review the proposed action, the other alternatives, and their environmental consequences, to determine whether to implement the proposed action as described, select a different alternative or take no action at this time.

**Forest Plan Direction** \_\_\_\_\_

The proposed action and alternatives are guided by the Forest Plan (USDA Forest Service 2002a). The Forest is subdivided into land allocations (management areas) with established desired conditions and associated management direction (standards and guidelines). Land allocations that apply to this proposal include:

**MA 210 – Backcountry:** Backcountry management areas are managed to emphasize a variety of recreational opportunities for backcountry activities in natural appearing landscapes. However, as mentioned above, the Record of Decision for the Forest Plan specifically states that Backcountry Management Areas are open to mineral exploration and development. All of the Spencer project area outside of developed recreation complexes and areas with current minerals plans of operations is designated as MA 210 Backcountry.

**MA 441 – Developed Recreation Complexes:** Developed Recreation Complexes are managed to provide developed recreation opportunities in which there are facilities for user comfort and convenience and the ability to accommodate large numbers of people in a natural appearing setting. This MA designation applies to about 187 acres of the Spencer area recently designated as the Spencer Glacier Whistle Stop.

**MA 521 - Minerals Management:** Minerals management areas are managed for the exploration, development, extraction, and processing of locatable (base and precious metals, such as gold, silver, and copper, etc.), leasable (oil, gas, coal, hardrock minerals in the Copper River addition, etc.), and salable (sand, gravel, and quarry stone, etc.) minerals. This management area prescription is applied to project areas with approved plans of operations for minerals. Standard 1 for minerals states: *“Prior to and following mineral activities, these lands will be managed according to the underlying (initial) management area prescription. With the initiation of mineral activities, apply reasonable regulation of surface occupancy and use to manage the mineral activities to be as compatible as possible with the underlying (initial) management area prescription.”* The Alaska Railroad currently holds a permit with an approved plan of operations for extraction of gravel from a portion of the Spencer project area. This permit expires in 2008.

## Public Involvement

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A scoping letter was sent to interested parties on November 16, 2006. The letter asked that comments on the proposed action be received within 30 days. In addition, as part of the public involvement process, the Forest Service posted the scoping letter on the Forest’s website. Comments were accepted via e-mail, letter, phone, fax, and in person. Approximately 41 comments on the proposed action were received. After reviewing the comments, the responsible official decided that the appropriate level of NEPA analysis was an environmental impact statement. A notice of intent (NOI) to prepare an environmental impact statement for the Spencer Mineral Materials Project was published in the Federal Register on March 2, 2007.

## Issues

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Comments from the public and other agencies were used to formulate issues concerning the proposed action. The Forest Service separated the issues into two groups: significant and nonsignificant. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Nonsignificant issues were identified as those: 1) outside the

scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)...". A list of nonsignificant issues and reasons why they were considered nonsignificant may be found in the project record located at Glacier Ranger District. As for significant issues, the Forest Service identified the following issues during scoping:

**Issue #1 - Effects of mineral materials operations on mining operations on placer claims:**

Several commenters were concerned about conflicting operators on the existing placer claims. The claimants felt that the mineral materials operators would adversely affect their placer operations. Other respondents felt that the claimants would interfere with the mineral materials operations.

**Response:** This issue was used to develop Alternatives B, C, and D and was carried forward for analysis.

**Measures:** Alternatives were compared based on acres of overlap between placer claims and mineral materials permit area.

**Issue #2 - Effects of mining operations noise on recreationists:** Several commenters were concerned about the effects of noise on backcountry recreational values of the area.

**Response:** This issue was used to develop Alternative B and was carried forward for analysis.

**Measures:** Alternatives were evaluated based on estimated decibel output and duration at eight selected locations using local ambient noise levels and measured noise levels at gravel operations.

**Issue #3 - Effects of mining operations on the visual enjoyment of recreationists:** Many commenters were concerned about the visual impacts of the project on the backcountry recreational experience at Spencer Lake and the surrounding proposed trail system.

**Response:** This issue was used to develop Alternatives B, C, and D and was carried forward for analysis.

**Measures:** Alternatives were evaluated based on "seen area" from eight locations. Two analysis techniques were used: geographic information systems (GIS) and actual visibility.

**Issue #4 - Effects of mining operations on water quality in the Placer River:** One commenter was concerned that the project might have adverse impacts on water quality.

**Response:** This issue was carried forward for analysis and alternative will be compared in the effects analysis. Alternative E (no action) eliminates these concerns.



**Measures:** Alternatives were compared based on estimated increases in turbidity.

**Issue #5 - Effects of mining operations on fish and wildlife species and their habitat:** Some commenters were concerned about adverse impacts to habitat for the Kenai brown bear. Others were concerned that increased train traffic would result in more moose being killed by the train. Others were concerned there might be adverse impacts to salmon.

**Response:** This issue was carried forward for analysis and alternative will be compared in the effects analysis. Alternative E (no action) eliminates these concerns.

**Measures:** Alternatives were evaluated based on acres of brown bear habitat affected and miles of affected streams for anadromous fish. Effects to moose were compared based on the number of gravel trains expected per day and evaluated based on Alaska Railroad standard operating procedures.

**Issue #6 - Effects on public safety:** Several commenters were concerned about public safety due to the proximity of recreational users to the mining operations site.

**Response:** This issue was used to develop Alternative B and was carried forward for analysis.

**Measures:** Alternatives were evaluated based on distance of active operations from developed recreation sites, days of overlap of operating and recreation seasons (summer and winter), and total acres of mineral operations.

**Issue #7 - Feasibility of mineral material operations:** Several interested parties had questions and concerns about the physical and economic feasibility of the proposed action with regard to operational constraints and design features including hours of operation, methods of operation, limits on stockpiling, construction of facilities, treatment of invasive weeds, and reclamation. Several commenters included specific suggestions to make the project more feasible.

**Response:** This issue was used to develop Alternative D and was carried forward for analysis.

**Measures:** Alternatives will be evaluated based on length of operating season, hours of operation, and whether stockpiling and on-site processing are allowed.

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## **Chapter 2. Alternatives, Including the Proposed Action**

### **Introduction**

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This chapter describes and compares the alternatives considered for the Spencer Mineral Materials Project. It describes both alternatives considered in detail and those eliminated from detailed study. The end of this chapter presents the alternatives in tabular format so that the alternatives and their environmental impacts can be readily compared.

### **Alternatives Considered in Detail**

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Based on the issues identified through public comments on the proposed action, the Forest Service developed three alternative proposals that achieve the purpose and need differently than the proposed action. Specific comments and suggestions submitted during scoping were used to develop the alternatives. (A list of the specific comments can be found in the project record located at the Glacier Ranger District.) In addition, the Forest Service is required to analyze a “no action” alternative. The proposed action, alternatives, and no action alternative are described in detail below.

For the purpose of comparing alternatives, the IDT developed a “likely development scenario” for each alternative including estimates of acreages, volumes, heights, and locations for the proposed minerals operations. The maps for each alternative are based on the “likely development scenario”. These scenarios do not represent formal “plans of operation”. Actual locations, acreages, heights, and volumes may vary somewhat but are expected to remain within the constraints of the design criteria for each alternative. The actual locations of facilities will move within the authorized mining area as time progresses. For reference purposes, each map contains an inset of nested boxes displaying a range of acreages to help the reader visualize the size of the operations and various facilities relative to the mining area. Assumptions used in developing the scenarios are documented in the project record located at the Glacier Ranger District.

### **Design Criteria Common to All Action Alternatives**

The Forest Service developed the following design criteria to be implemented as part of all action alternatives.

#### **Operations**

- The length of the permit would be 15 years. The permit may be renewed for subsequent 15-year periods based on successful performance. (Additional NEPA analysis would be required prior to permit renewal.)

- Sampling of gravel deposit to determine depth and quality would be the responsibility of the successful bidder.
- Excavation would be limited to 5 feet above average water table level except where indicated in the reclamation plan (see Appendix A).
- Stockpiling and loading of materials would be allowed only at locations designated by the Forest Service to protect visual quality.
- High utilization of quarry rock would be required to minimize the area of disturbance.
- Limited sorting of quarry rock may be allowed on-site for particular needs.
- A 200-foot buffer of vegetation will be left on both sides of the Alaska Railroad track to provide for visual screening.
- Vegetation and organic material removed during operations would be stockpiled and may be used for reclamation.
- All operations would be designed to allow immediate reclamation and avoid subsequent disturbance of reclaimed areas.
- Invasive weeds, if present, would be treated annually to prevent spread. This may require more than one treatment per operating season if multiple weed species are present.
- The following applicable Forest Service Region 10 best management practices (BMPs) would be required to protect soils and water quality including:
  - 12.8 - Oil Pollution Prevention and Servicing/Refueling Operations
  - 12.9 - Oil and Hazardous Substances Pollution and Contingency Planning
  - 12.15 - Management of Sanitary Facilities and Sanitary Guidelines for Temporary Camps and Primitive Developments
  - 14.9 - Drainage Control to Minimize Erosion and Sedimentation
  - 14.18 - Development and Rehabilitation of Gravel Sources and Quarries
  - 17.1 - Mining Site Conditions, Planning, and Design
  - 17.5 - Site Closure and Rehabilitation

## **Transportation**

- Dump trucks and rail cars would be allowed for transportation of aggregate and quarry rock.
- Use of a conveyor system would be encouraged for transporting aggregate from the excavation site to the rail spur or siding to reduce dust and noise.
- Temporary access routes would be allowed, as needed, in locations approved by the Forest Service. These routes would be reclaimed when no longer needed.

- Use of water as dust abatement would be required as necessary to avoid impairment of natural scenery.

### **Facilities**

- Allowable site facilities may include a semi-permanent camp for up to 20 people, a workshop to repair equipment, fuel storage, and acceptable Alaska State-compliant waste disposal methods.
- Location and color of all buildings and facilities would be designed to blend with the natural landscape.
- Locations of generators used to power equipment and facilities would require approval by the Forest Service.
- All facilities in support of mineral materials operations would be constructed and paid for by the operator.
- Generators used for camp facilities during nighttime hours will be required to use the latest “Super Quiet” technology.

### **Invasive Species**

- Washing of equipment would be required before moving onto the site to prevent introduction of invasive weeds.
- Natural revegetation would be used where seed source and site conditions are favorable.
- Native plant species would be used in reclamation projects when natural revegetation conditions are not favorable. Preference would be given to plant materials from the local environment of the project area to maximize adaptation to that environment and maintain local genetic composition.
- All hay, straw, or mulch used on for the project would be free of invasive plant species. This includes materials used for mulching, erosion control, reclamation, or other uses.
- In areas where ground-disturbing activities are scheduled to occur within invasive plant infestations, appropriate invasive plant treatment applications would be conducted prior to mining operations to reduce future spread and establishment. Any chemical approved under the upcoming Spencer Invasive Plant Control EA may be used at Spencer site.

### **Safety**

- Operations would be conducted in accordance with all applicable OSHA and MSHA regulations.
- Explosives required for rock blasting may be properly stored on-site while the site is occupied in accordance with 30 CFR Parts 56 and 57, Safety Standards for Explosives at

Metal and Nonmetal Mines. At times when the site is not occupied (e.g., winter), storage of explosives will be prohibited.

### **Coordination**

- Mineral materials operations would be conducted so as not to materially interfere with placer mining operations conducted under an approved plan of operations.
- Placer claimants would be notified annually of areas to be excavated or crossed prior to the operating season.
- The Forest Service and any active recreational permittees would be notified of any blasting operations at least 48 hours in advance.
- Winter recreation use would be allowed in the permitted area.
- Signing would be required to prevent inadvertent access by recreationists to active mining areas.
- Eligible historic sites would be avoided or mitigated in consultation with the Alaska State Historic Preservation Officer.

### **Monitoring**

- The Forest Service will monitor compliance with the terms of the permit as well as compliance with the plan of operations.

### **Reclamation**

A Forest Service approved reclamation plan would be required including the following provisions:

- The reclaimed gravel extraction areas would emulate an undulating kame and kettle topography typical of glacial outwash areas.
- The reclaimed rock quarry face would be artificially weathered.
- The reclaimed landscape would provide a series of interconnected ponds suitable for anadromous and resident fish spawning and rearing.
- All equipment and supplies would be removed.
- The rail spur would be removed if not needed for other purposes.
- Temporary access routes would be reclaimed if not needed for other purposes.
- All camp and other facilities would be removed.

The proposed reclamation plan is included in Appendix A of this DEIS.

### **Bond requirements**

A bond sufficient to cover reclamation objectives would be required.

## **Alternative A – Proposed Action**

This is the proposed action as described in the scoping letter (dated 11/16/2006) for this project. The Forest Service would permit production of gravel aggregate on up to 500 acres (see Areas 2 and 3 in Figure 5) and production of quarry rock on up to 30 acres for a period of 15 years (see Area 1 in Figure 5). The area of development would include the previous gravel mining area (see Figure 6). Operations would likely start in the previously mined area and move north. The site(s) chosen for mineral material extraction would be situated and operated so as not to conflict with a high quality recreation experience at the Spencer Glacier Whistle Stop. Alternative A would not materially interfere with placer mining operations conducted under an approved plan of operations. Every effort would be made to coordinate gravel operations with placer claim operations in areas of overlap. Estimated annual production is expected to be 250,000 tons of gravel aggregate and 20,000 tons of quarry rock.

### ***Design Features Specific to Alternative A:***

The IDT developed the following design features to provide a high quality recreational experience while allowing extraction of high quality rock and gravel from this valuable and accessible location.

### **Operations**

- Areas of active extraction for sand and gravel would not exceed 25 acres at any one time. Any previously disturbed 25-acre areas would be reclaimed before the next area may be accessed so that no more than 50 acres at one time is in an active or disturbed condition.
- Operations would not materially interfere with placer mining operations conducted under an approved plan of operations.
- Gravel extraction would begin on the south end of the permitted area (Area 2 in Figure 5) and would proceed in a northerly direction to minimize impacts on recreation. Extraction of stone would be allowed from the one rock outcrop where rock quarrying has previously occurred to minimize visual impacts (Area 1 in Figure 5).
- Blasting season for quarry rock would be from May 1 to the Friday before Memorial Day and from September 15 to October 30 to minimize conflict with summer recreation (Note: exceptions may be approved by the Forest Service only to provide rock for emergency needs).
- Operating season would be from May 1 to October 31 for excavating quarry rock, sand, and gravel to prevent conflict with winter recreation.

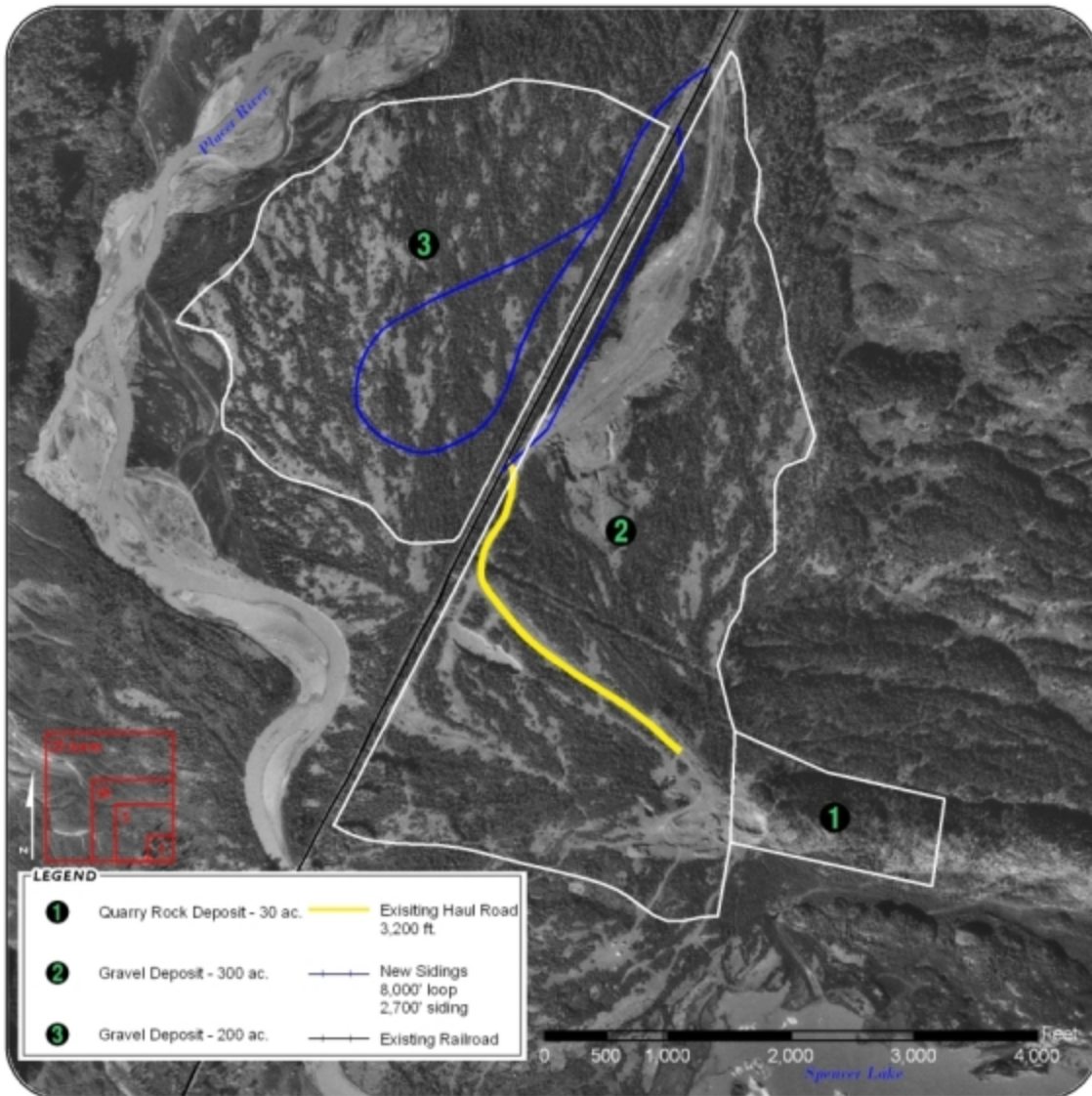


Figure 5. Map of proposed mining area and developments at Spencer under Alternative A. Red inset boxes provide a reference of relative areas from 25 acres to 1 acre.

- Daily hours of operation would be 6 a.m. to 10 p.m. to allow for quiet nighttime.
- To limit noise, no on-site processing of aggregate would be allowed. The primary products (aggregate and quarry rock) must be moved off-site for further processing. Limited sorting of quarry rock may be allowed on-site for particular needs.
- Excess materials may be stockpiled on-site for short periods but must be hauled off-site before the end of each operating season. Stockpiles would not be allowed where visible from recreation developments to protect visual quality.
- The existing haul road (approximately 3,200 feet) would be used when needed to transport rock from the rock quarry to the rail spur (see Figure 5).





**Figure 6. Photo of old gravel extraction area proposed for mining under Alternative A**

### **Alternative B**

This alternative was designed to address Issue 1 (effects on placer claims), Issue 2 (effects of noise on recreationists), Issue 3 (effects on visuals), and Issue 6 (effects on public safety). This alternative would exclude the existing placer claims from the permit area for gravel extraction. It would also exclude operations within the Spencer Glacier Developed Recreation Complex. Mining of gravel would be allowed only from about 200 acres west of the Alaska Railroad tracks (see Area 2 in Figure 7) with an estimated annual production of 500,000 tons. This location would provide the greatest separation from the recreation sites at Spencer Glacier and the Whistle Stop. The railroad right-of-way would provide a visual and sound barrier between the recreational developments at Spencer Glacier and Spencer Glacier Whistle Stop. The greater physical separation from concentrations of visitors provided by the railroad corridor would make it easier to provide for public safety. Mining of quarry rock would be allowed on 30 acres (see Area 1 in Figure 7) with an estimated annual production of 20,000 tons. The mining operation under this alternative is expected to be a large-sized gravel extraction operation similar to that depicted in Figure 8.

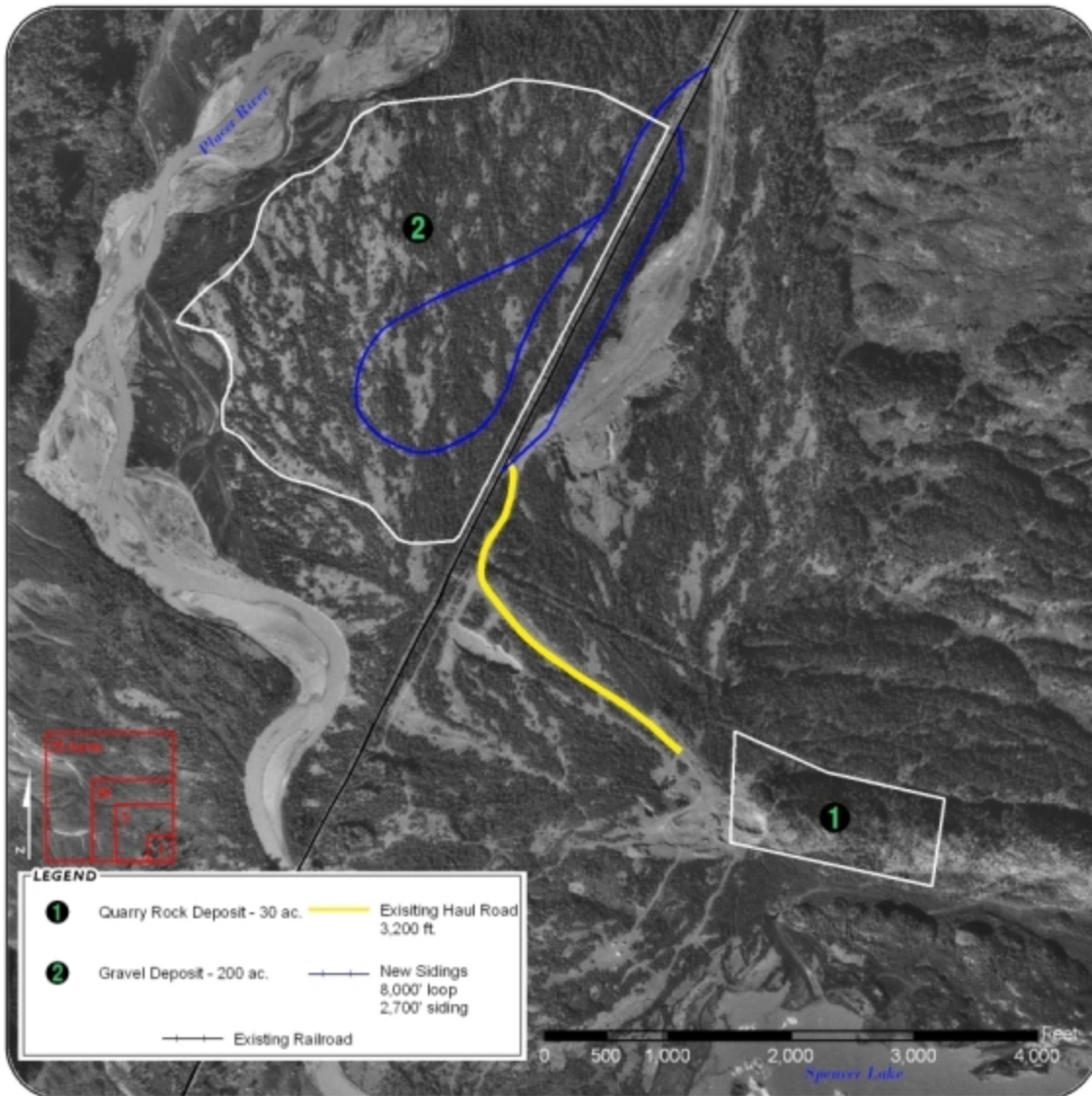


Figure 7. Map of proposed mining area and developments at Spencer under Alternative B

### ***Design Features Specific to Alternative B:***

#### **Operations**

- Areas of active extraction for sand and gravel will not exceed 25 acres at any one time.
- Equipment storage would not be allowed on-site during winter.
- Gravel extraction would begin farthest from tracks and work north to protect reclaimed areas.
- Blasting season would be from September 15 to November 30 with exceptions for emergency projects.
- Daily hours of operation for the gravel operations and or sorting and hauling at the rock quarry would be from 6 a.m. to 10 p.m.



**Figure 8. Large-sized gravel operation in the Wasilla area**

- Designated material handling area would be allowed in a location approved by the Forest Service.
- Excess materials may be stockpiled on-site for short periods of time but must be hauled off-site before the end of each operating season. Stockpiles would not be allowed where visible from recreation developments to protect visual quality.

### **Facilities**

- One approximately 2,700-foot rail spur would be allowed on the east side of the project area (see Figure 7) for transport of quarry rock. An additional approximately 8,000-foot spur would be developed on the west side of the project area for gravel extraction.
- The existing haul road (approximately 3,200 feet) would be used when needed to transport rock from the rock quarry to the rail spur (Figure 7).
- The camp area may require up to 3 acres.

### **Alternative C**

This alternative was designed to address Issue 1 (effects on placer claims) and Issue 3 (effects on visuals). This alternative would exclude the existing placer claims from the permit area for gravel extraction. It would also exclude operations within the Spencer Glacier Developed Recreation Complex. The permit area would be located in the vicinity of the old Alaska Railroad spur in an area that has previously been disturbed to minimize additional visual disturbances from recreation



sites located above the mineral material site (e.g., Glacier Discovery Trail and the Alaska Railroad Spencer overlook). Areas of active mining would be smaller than under the other alternatives. An existing levee would provide a visual and sound barrier between the recreational developments at Spencer Glacier and Spencer Glacier Whistle Stop. Mining of gravel aggregate would be allowed only from the approximately 160 acres north of the old levee and east of main Alaska rail line (see Area 2 in Figure 9) with an estimated annual production of 100,000 tons. Mining of quarry rock would be permitted on about 30 acres with an estimated annual production of 10,000 tons. Alternative C is expected to be a small sized mining operation similar to that depicted in Figure 10.

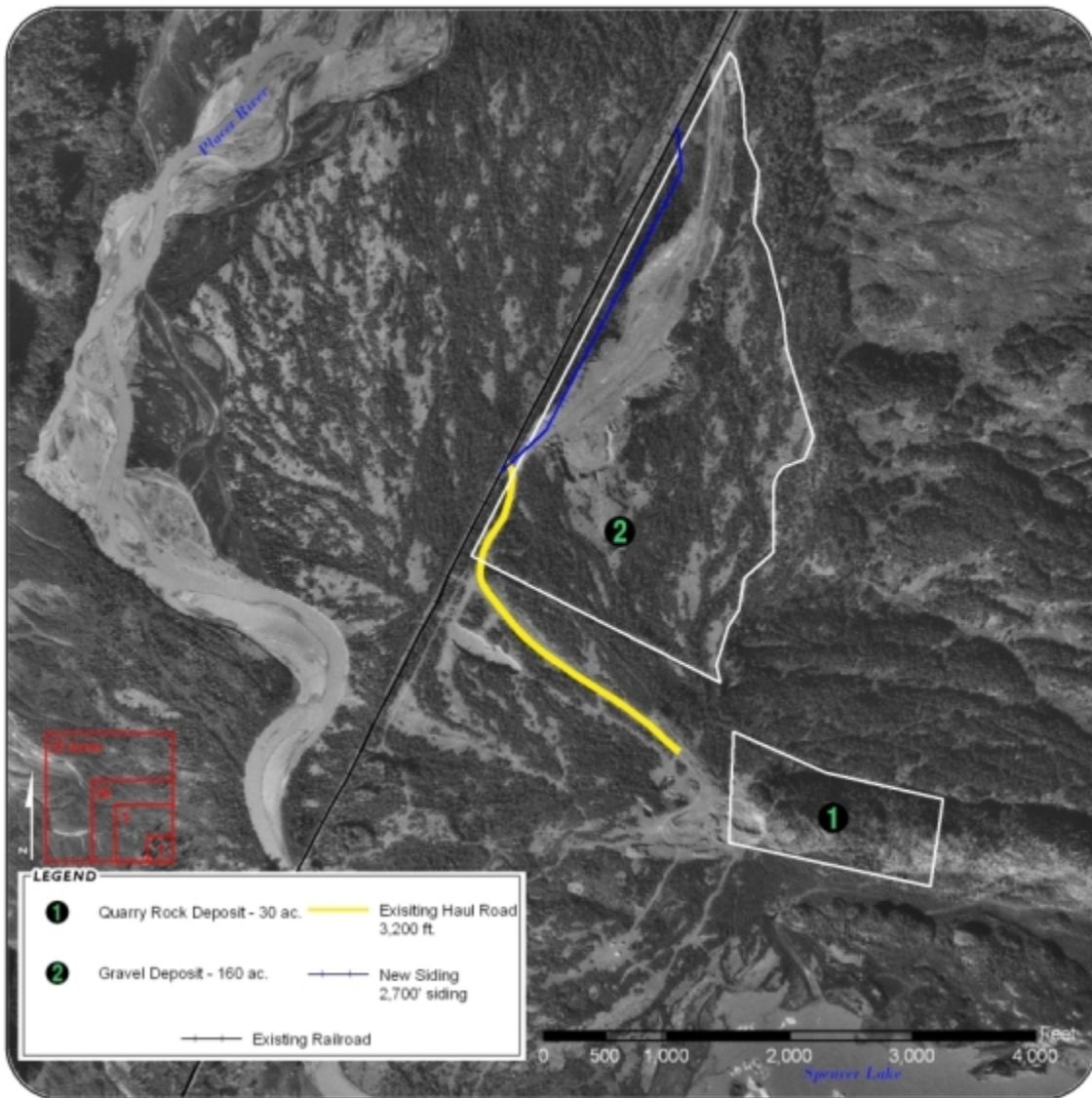


Figure 9. Map of proposed mining area and developments at Spencer under Alternative C



Figure 10. Small-sized gravel operation in the Anchorage area

### ***Design Features Specific to Alternative C:***

#### **Operations**

- Areas of active extraction for sand and gravel would not exceed 15 acres at any one time.
- Storage of equipment would not be allowed on-site during winter.
- Gravel extraction would begin on the north and proceed south and east.
- Blasting season would be from May 1 to the Friday before Memorial Day with exceptions for emergency projects.
- Gravel operations would be allowed on a maximum of four non-peak recreation days per week and would not be allowed on holidays during the peak recreation season (May 15 – September 15). Outside the peak recreation season, operations would be allowed 7 days per week.
- Daily hours of gravel operations would be from 8 a.m. to 6 p.m. during the peak recreation season (May 15 to September 15) and from 6 a.m. to 10 p.m. outside the peak recreation season.
- Daily hours of operation would be from 8 a.m. to 1 p.m. for rock sorting and hauling at the rock quarry during the peak recreation season (May 15 – September 15) and from 6 a.m. to 10 p.m. outside the peak recreation season

- Designated material handling area would be allowed in a location approved by Forest Service.
- Excess materials may be stockpiled on-site for short periods but must be hauled off-site before the end of each operating season. Stockpiles would not be allowed where visible from recreation developments to protect visual quality.

### **Facilities**

- One approximately 2,700-foot rail spur would be allowed on the east side of the project area (see Figure 9).
- The existing haul road (approximately 3,200 feet) would be used when needed to transport rock from the rock quarry to the rail spur (see Figure 9).
- The camp area may require about one acre.

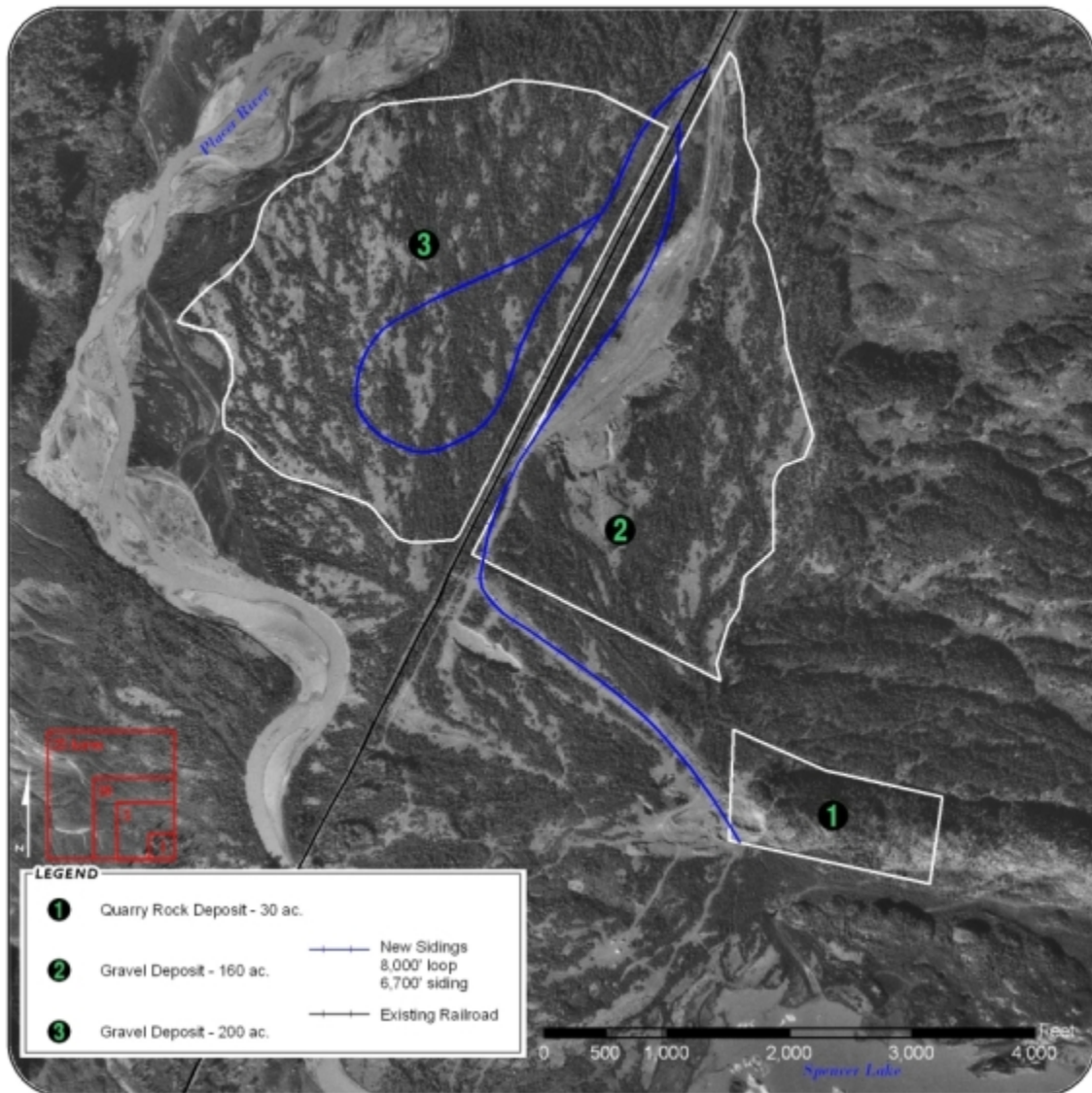
### **Alternative D**

This alternative was designed to address Issue 1 (effects on placer claims) and Issue 7 (feasibility of mining operations). This alternative would exclude the existing placer claims from the permit area for gravel extraction. It would also exclude operations within the Spencer Glacier Developed Recreation Complex. It was designed to provide more flexibility to avoid conflicts with recreationists as well as to allow sequencing of the areas to best meet market demands as well as reclamation objectives. This alternative also includes design features to make the project more feasible for the permit holder (e.g., stockpiling of materials and on-site processing). Areas of active mining would be larger than under other alternatives. Gravel extraction would be allowed from about 200 acres west of Alaska Railroad tracks and from about 160 acres north of the levee and east of Alaska Railroad tracks (see Areas 2 and 3 in Figure 11), with an estimated annual production of up to 500,000 tons. Mining of quarry rock would be permitted on 30 acres (see Area 1 in Figure 11) with an estimated annual production of 20,000 tons. The mining operation under this alternative is also expected to be a large-sized operation as depicted above in Figure 8.

### ***Design Features Specific to Alternative D:***

#### **Operations**

- Areas of active extraction for gravel aggregate would be restricted to one year's production at any one time up to 25 acres. Active areas will be reclaimed at the end of each operating season.
- On-site processing of gravel and rock would be allowed.
- Storage of equipment would be allowed on-site over winter. Equipment must be consolidated in one location and appropriately marked.



**Figure 11. Map of proposed mining area and developments at Spencer under Alternative D**

- The blasting season would be from April 15 to May 15 and September 15 to November 30 with exceptions for emergency projects.
- The daily hours of operation would be from 6 a.m. to 10 p.m. from May 15 to September 15.
- Daily hours of operation would be 24 hours/day from April 15 to May 15 and from September 15 to October 30 for gravel and to November 30 for quarry rock.
- A designated material handling area would be allowed in a location approved by the Forest Service.
- Excess materials may be stockpiled on-site. Stockpiles would be located to minimize visibility from recreation developments.

- Any chemical approved under the upcoming Invasive Weeds EA may be used to treat weeds at the site.

### **Facilities**

- One approximately 6,700-foot rail spur would be allowed on the east side of the project area (see Figure 11). This spur would be used for transport of both gravel and quarry rock. An additional approximately 8,000-foot spur would be developed on the west side of the project area when needed for gravel extraction.
- The camp area may require up to 5 acres accommodating more workers for this size operation.

### **Alternative E – No Action**

The no action alternative is the most constrained but would still allow extraction of quarry rock, gravel and sand in response to emergency needs (per CFR 228.59 (e)(i)). This alternative would avoid conflicts with existing placer claims and recreationists. It would not have any impacts on fish and wildlife habitat or water quality. However, this alternative would not help meet the goals of the Forest Plan for minerals (specific effects to resources would be analyzed in the appropriate NEPA document at the time the emergency needs were identified.)

### **Alternatives Considered but Eliminated from Detailed Study** \_\_\_\_\_

Federal agencies are required to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods to achieve the purpose and need. Some of these alternatives may have been outside the scope of the need for the proposal, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below:

1. **Another location for mineral materials site:** One commenter suggested that the Forest Service consider another location besides Spencer for gravel and rock extraction to avoid impacts to the viewshed. Other locations were considered but the preliminary analysis showed that moving the operations to another site would have even greater effects to backcountry views. Although the gravel operations would impact the view at Spencer, visual impacts would be less than if it were moved to another more pristine location.
2. **Use an approved chemical for treating invasive plants:** One commenter suggested that the Forest Service consider the use of chemicals to treat invasive weeds at Spencer. Another NEPA analysis is currently underway to assess methods of treating invasive plants at Spencer. Any methods approved for use under that analysis may be used at the Spencer mineral materials site.



3. **Few restrictions on mineral materials operations:** Another commenter suggested that the Forest Service consider an alternative that did not restrict the hours of operation or the season of operation so that the operator could better meet market demands. This alternative was not considered because it would not be compatible with recreation at Spencer and thus does not meet the purpose and need for the project.
4. **Gravel extraction during winter only:** One individual requested that the Forest Service consider an alternative that only allowed gravel extraction during the winter to avoid conflict with the recreation season. This alternative was not feasible due to the gravel freezing in rail cars during transport.
5. **Winter blasting season:** Similarly, the same individual requested an alternative that focused on a winter blasting season. This is not feasible due to deep snow and ice that would make blasting unsafe.
6. **No extraction of quarry rock:** Some people felt that blasting impacts could be avoided by not allowing extraction of quarry rock. The quarry rock is the most marketable commodity at Spencer. As such, it is a key component in the feasibility of the mineral materials operation. Not allowing extraction of quarry rock could make the entire operation uneconomical.
7. **Alternative with a delayed/accelerated timeline to avoid conflicts with recreation projects:** One individual suggested that the operations be either expedited or delayed to avoid impacts on the Whistle Stop project and the previously proposed Hut-to-Hut Project. The Whistle Stop project has already begun operations so accelerating the gravel extraction project to avoid impacts is not feasible. Delaying the gravel extraction could possibly benefit the initial years of the Whistle Stop project but could have greater impacts later. The proposed Hut-to-Hut project has been withdrawn; there will be no impacts. Neither alternative is likely to achieve the desired results of avoiding conflicts with recreation.

## Comparison of Alternatives

This section summarizes the effects of implementing each alternative in a table format. Information in Table 1 focuses on activities and effects when different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

**Table 1. Comparison of alternatives and their environmental effects for the Spencer Mineral Materials Project**

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Total acres open to minerals operations	Gravel – 500 Rock - 30	Gravel – 200 Rock - 30	Gravel – 160 Rock - 30	Gravel – 360 Rock - 30	0
Total available mineral materials (tons)	Gravel – 27.5 million Rock – 20 million	Gravel – 12 million Rock – 20 million	Gravel – 7 million Rock – 20 million	Gravel – 19 million Rock – 20 million	0
Estimated annual production (tons)	Gravel - 250,000 Rock - 20,000	Gravel - 500,000 Rock - 20,000	Gravel - 100,000 Rock - 10,000	Gravel - 500,000 Rock - 20,000	0
Season of gravel operations	5/1-10/31	5/1-10/31	5/1-10/31	4/15-10/31	None
Blasting season	5/1-5/25 <sup>1</sup> ; 9/15-10/31	9/15-11/30	5/1-5/25 <sup>1</sup>	4/15-5/15; 9/15-11/30	None
Days of gravel operations	7 days per week	7 days per week	Max. 4 days per week from 5/15-9/15; 7 days per week other dates	7 days per week	None
Hours of operation	6 am – 10 pm	6 am – 10 pm	8am - 6 pm for gravel operations and 8am-1pm for rock quarry from 5/15-9/15; 6 am –10 pm other dates	6 am –10 pm except 24 hr. 4/15-5/15 and 9/15-11/30	None
Estimated daily production (tons/day) <sup>2</sup>	Up to 1,500	Up to 3,000	Up to 600	Up to 3,000	0
Number of trains per week	1-2	2-3	1	2-3	0
Number of loaders	1-2+	1-2	1	2+	0
Number of conveyors	1-2	2	1	2	0
Number of generators	1-2	2	1	2	0
Number of buildings	1-3	1-2	1	1-3	0

**Table 1. Comparison of alternatives and their environmental effects for the Spencer Mineral Materials Project**

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Height of loadout facility (feet)	65	65	25	110	0
Height of stockpiles (feet)	60	60	25	100	0
Size of stockpile area (acres)	2	2	1	5	0
Size of loadout area (acres)	5	5	2	5	0
Size of active mining area (acres)	25	25	15	One year's production up to 25 acres	0
Size of area being reclaimed (acres)	25	25	15	One year's production up to 25 acres	0
Size of camp area (acres)	3	3	1	5	0
Total disturbed acres at one time	Up to 60	Up to 60	Up to 34	Up to 65	0
Types of equipment to be operating	Drill rig, loaders, trucks, train, conveyors	Drill rig, loaders, train, trucks, conveyors	Drill rig, loaders, trucks, train	Drill rig, loaders, train, conveyors, trucks, crushers	N/A
Hours of drilling/day	16	16	16	16-24	0
Number of blasts/day	4-8	4-8	4-8	4-12	0
Number and length of rail siding(s)	1- 2700' in same location as existing spur 1- 8,000' loop on west side of tracks when needed	1- 2700' in same location as existing spur 1- 8,000' loop on west side of tracks	1- 2700' in same location as existing spur	1 - 8,000' loop on west side of tracks 1 - 6700' to rock quarry	0
Feet of haul road	3,200	3,200	3,200	0	0
Number of trains expected per week	1-2 per week	2-3 per week	1 per 2 weeks	2-3 week	0
Acres of overlap with placer claims	~140	0	0	0	0
Estimated noise (dbA) at Spencer Lake	35-67	35-67	35-67	35-67	35-62

**Table 1. Comparison of alternatives and their environmental effects for the Spencer Mineral Materials Project**

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Estimated noise (dba) at Center Creek pass	35-54	35-54	35-54	35-54	35-54
Visibility from Spencer Lake	Rock quarry only	Rock quarry only	Rock quarry only	Rock quarry only	None
Visibility from Center Creek Pass	Visible	Visible	Visible	Visible	None
Distance between gravel operations and Spencer Lake viewing platform	1,600' to 8,650'	5,050' to 8,650'	3,550' to 8,650'	3,550' to 8,650'	N/A
Distance between rock quarry and Spencer Lake viewing platform	2,300' to 3,400'	2,300' to 3,400'	2,300' to 3,400'	2,300' to 3,400'	N/A
Days of gravel operations during peak recreation season	124	124	71	124	0
Days of blasting operations during peak recreation season	10	None	10	None	None
Estimated increase in turbidity in Placer River	Low	Low	Low	Low	None
Acres of brown bear habitat affected	None	None	None	None	None
Miles of anadromous streams affected	None	None	None	None	None
Benefit-Cost ratio – All Parties	2.05	1.80	2.23	1.78	N/A
Estimated annual revenue - Operator	\$2,800,000	\$3,901,000	\$1,337,000	\$3,874,000	N/A
Estimated annual revenue – Forest Service	\$87,000	\$190,000	\$18,000	\$190,000	N/A

## Chapter 3. Affected Environment and Environmental Consequences

This chapter describes aspects of the environment likely to be affected by the proposed action and alternatives. Also described are the environmental effects (direct, indirect, and cumulative) that would result from undertaking the proposed action or alternative. Together, these descriptions form the scientific and analytical basis for the comparison of effects in Chapter 2.

### **Past, Present and Reasonably Foreseeable Actions**

According to the Council on Environmental Quality (CEQ) NEPA regulations, a “cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such actions (40 CFR 1508.7). In determining cumulative effects, the effects of the following past, present and foreseeable actions were added to the direct and indirect effects of the proposed action and alternatives.

### **Other Existing or Reasonably Foreseeable Projects**

Any action that results in more disturbances of natural settings in or near the project area or more people in the backcountry has the potential to cause cumulative impacts to recreation settings and wildlife. The following existing or potential future projects may have environmental impacts in the project area:

#### ***Whistle Stop Project***

The recently approved Whistle Stop project includes a number of recreational developments near Spencer including trails, a group campsite, public-use cabins, a viewing platform, and a Whistle Stop station. The Alaska Railroad will stop at Spencer to unload visitors. Recreationists are expected to use the Spencer Glacier Whistle Stop as an access point to the backcountry for multi-day trips, as well as a destination for day trips to Spencer Glacier, Spencer Lake, and for raft trips on the Placer River. Operations at Spencer Whistle Stop began in August, 2007.

#### ***Outfitter/Guide Use***

Currently there is limited outfitter/guide use throughout the Spencer area. Existing permits cover a variety of recreational pursuits (rafting, canoeing, hiking and fishing), yet the majority of outfitting use is through one permittee who conducts rafting and canoeing trips on Spencer Lake and down the Placer River. With increased visitation to the area, there is a high likelihood for an increased need and opportunity for a variety of outfitting and guiding ventures, including rafting, hiking, mountain biking and mountain climbing. There is additional outfitting and guiding that occurs in the winter months.

### ***Dispersed Winter Recreation***

As with many areas of Alaska, recreation use in the Spencer area increases in the winter due to a firm snowpack and frozen waterways. Heavy snow machine and moderate backcountry ski use occurs throughout the entire Placer River drainage from November – April. Helicopter assisted skiing also takes place in various locations throughout the Placer River Valley.

### ***Existing Placer Claims***

Approximately 400 acres of placer mining claims are located in the Spencer Lake area, located at the Spencer Lake outlet north of the Placer River. Minimal activity has taken place with these claims over the past several years. A recently approved plan of operations allows motorized use to occur in the area in conjunction with development of these claims. Further development could take place depending on the outcome of the current sampling effort.

### ***Commercial Recreation Leasing on State Land at Grandview***

In their Kenai Area Plan, the State of Alaska Department of Natural Resources (DNR) identifies the potential for commercial recreation leasing on some amount of approximately 320 acres of State lands in the Grandview area. However, the plan mentions that the “*DNR is not proposing to develop the unit at this time, nor has it received an application for this type of use* (State of Alaska. 2000. DNR Kenai Area Plan, pg. 3-37)”, and “*at Grandview, state lands will be managed to provide opportunities for train passengers both in summer and winter* (ibid, pg. 3-30).” It is possible that with development of Whistle Stop service at Grandview, there could be increased interest in commercial recreation development in the area, thereby bringing more visitors to Spencer as well.

### ***Spencer Integrated Weed Management Project***

The Glacier Ranger District is in the process of analyzing a project to reduce and eliminate invasive plants (weeds) in the Spencer Area. This project would include, but not be limited to, the lands proposed for mineral materials extraction. This project would consider a variety of treatment methods including manual methods and the use of chemical herbicides. Any treatment method approved under the Integrated Weed Management Project might eventually be used in the mineral materials site. Weed management is being analyzed separately because that analysis will look at lands outside of those proposed for mineral materials extraction and will address all uses occurring at Spencer, not just mineral extraction.

## **Geology and Minerals**

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### **Affected Environment**

#### ***Geology***

Placer Valley is a broad U-shaped, glacier-carved valley, bordered by the rugged Kenai Mountains. Placer Valley is generally wet and marshy, whereas the Spencer Glacier outwash

plain is well drained and generally dry. Spencer Glacier once occupied Placer Valley; it is currently receding. Placer River flows into Spencer Lake from the south and exits, along with drainage from Spencer Glacier, at the northeast end of the lake into Placer Valley. Although drainage from the glacier has moved back and forth across its outwash plain over time, the lake currently captures the glacial melt water, which then flows out into Placer River as a single channel. The adjacent mountains reach between 3,000 and 6,500 feet elevation.

The outwash plain is typical kame and kettle topography. Kames are the irregularly shaped mounds composed of sorted or stratified sand and gravel that was deposited in contact with the glacial ice.



**Figure 12. Photo of typical kettle pond**

A kettle is a fluvio-glacial landform that occurred as the result of blocks of ice calving from the front of the receding glacier and becoming partially to wholly buried by glacial outwash. Once the ice melts, a depression is left behind. There are four relatively large kettle ponds (see Figure 12) on the site and several smaller ones. The water level in the kettle ponds roughly corresponds to the groundwater table, Placer River, and the lake water level. Most of the kettles are dry for much of the year.

Bedrock in the project area consists of the Valdez Group (see Figure 13). Rocks of this unit consist of sediments shed by a mountain range as it was uplifted and eroded. The sedimentary rocks include interbedded, impure sandstones (graywacke), siltstone, mudstone (argillite) and shale (slate/phyllite), that were laid down as turbidites. Alteration (metamorphism) occurred as the sediments were deeply buried and subjected to intense heat and pressure, changing the fabric and mineralogy of the original rock.

Quaternary deposits (see Figure 13) are undifferentiated unconsolidated, surficial deposits that are predominately outwash deposited by glacial melt water and alluvium deposited by non-glacial streams. The material is primarily well-sorted, stratified gravel and sand. Existing outside of and adjacent to the project area, wetland deposits generally consist of peat, muck and silt. The thickness of these deposits is not well known.

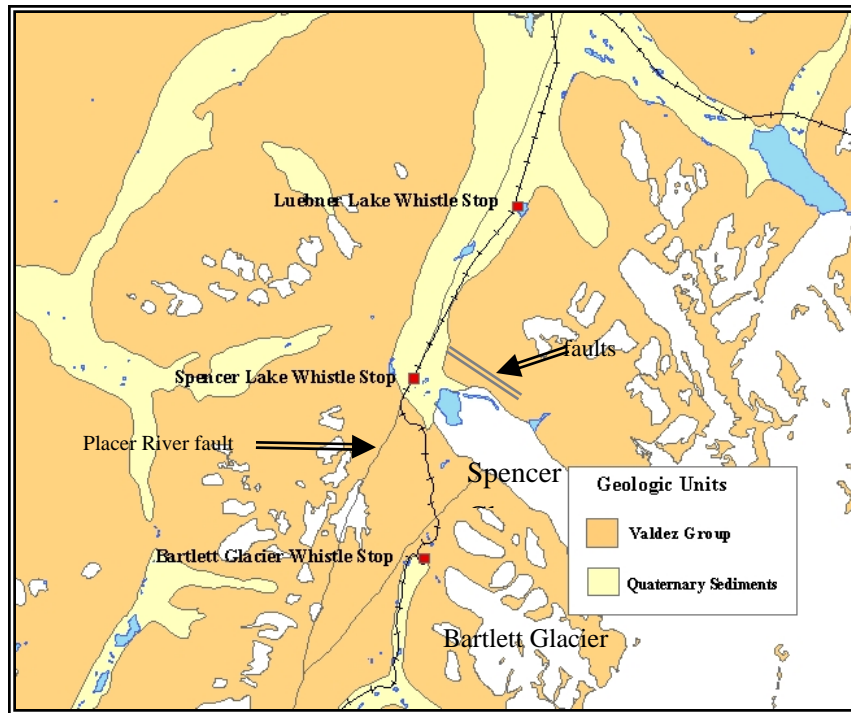


Figure 13. Map of geologic units and fault lines near Spencer area

A major thrust fault called the Placer River fault (see Figure 13), trends in a generally north/south direction through the Placer River valley and beyond. The fault consists of a shear zone that ranges from 150 to 500 feet wide. At its south end, it terminates near the head of Day Harbor, and at its north end is terminates at the head of Twenty Mile valley. In the project area, this fault generally parallels the Alaska Railroad line from Turnagain Arm to Hunter Whistle Stop. Locally, slickensides<sup>4</sup>, shear zones, and fault gouge in the vicinity of the Spencer quarry are the results of compressive stress and movement associated with this fault. Several offshoot faults from the main fault trend approximately northwest and generally parallel the north side of Spencer Glacier.

## Minerals

### Locatable Minerals

Locatable (generally metallic) minerals fall under the 1872 Mining Law as amended. Under this law, the public may acquire the right to develop and mine valuable minerals by making a discovery, locating a mining claim(s), and as appropriate, submitting a plan of operations to the Forest Service as provided for in 36 CFR 228 Subpart A. A mining plan of operations is required whenever a mining operation would cause significant surface disturbance.

Gold in the Valdez Group (as at Spencer) is found mostly in quartz veins and as placers derived from the quartz veins. Quartz veins that may or may not be mineralized, tend to develop along

<sup>4</sup> Slickensides are parallel striations on rock surfaces produced by relative motion across opposite sides of fault planes.



faults, within shear zones, and adjacent to dikes. Mineralized quartz veins were reported to have existed in the Spencer quarry, but the claimants indicated that these veins had been mined out during the quarrying operations.

According to Goldfarb and others (1986), gold occurrences in the Valdez Group rocks are restricted to medium-grade greenschist facies. Rocks that have reached upper greenschist facies or higher do not contain gold-bearing lodes. Likewise, there is a correlation with a drop in the metamorphic grade to a disappearance of lode gold occurrences. On the west side of and along the placer river fault there is high-grade metamorphism, and on the east side there is low-grade metamorphic rock. There are no lode-gold or placer-gold occurrences documented in the literature for the project area.

Minor placer gold production from recent suction dredging in the active stream channel has occurred upstream from Spencer Glacier and below Bartlett Glacier. The area begins at the mouth of an unnamed narrow canyon and then south including an approximate two-mile stretch of river. Total production has been estimated at less than 25 oz. (Jansons et al. 1984). This area is not within the project area, but lies just south of it.

Trace amounts of placer gold occur in the gravels of the Spencer Glacier outwash plain. The lands are relatively flat lying except for relief provided by kame and kettle topography. Lack of soil development could be an advantage for placer mining, provided sufficient values existed to support a mining operation. No pay zone has been identified, and fine particles of gold appear to be uniformly distributed throughout the gravels.

### **Mining Claims**

Beginning in 1984, claimants located mining claims within the Spencer Glacier outwash plain for placer gold and later for stone. Nine 40-acre association placer mining claims (see Figure 14), currently exist at Spencer Glacier, totaling 360 acres. There is a 200-foot-wide right-of-way along the Alaska Railroad. The right-of-way does not conflict with mining claim boundaries. Of the nine mining claims, seven of these overlie or partly overlie the project area (see Figure 4). There are no mining claims covering the current ARRC Permit area (see Area 2 in Figure 11) nor the gravel deposit on the west side of the railroad (see Area 3 in Figure 11).

The mining claims are accessible by railroad, helicopter, and small aircraft; there is limited access by small boat up the Placer River. The mining claimants have accessed claims by hovercraft up the Placer River, by small airplane, and rarely by train. There are no federal, state, or forest roads to the site. A local road system has been established in the immediate area of the materials site as a result of operations under the previous materials permits. The haul road, from the stone quarry to the railhead, has been used as a runway for small aircraft. The railroad provides access to and from the mining claims to Anchorage, Girdwood, Whittier, and Seward. Whittier, Seward, and Anchorage have ports that support barge shipment.

## **Mining Operations**

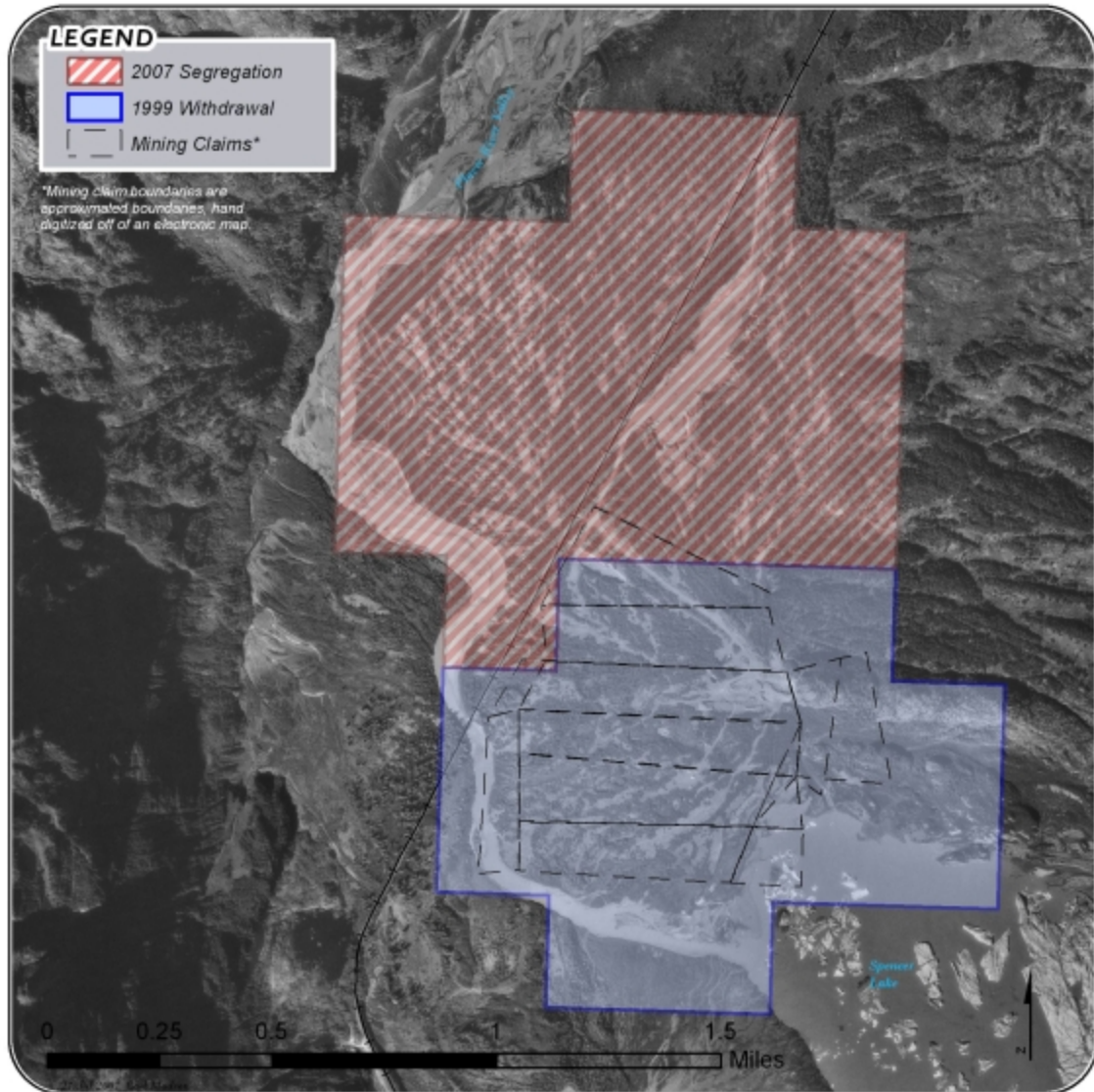
The claimants submitted a February 24, 2005, mining plan of operations for sampling activities on their mining claims. The plan was approved as amended by a modification agreement signed by both the district ranger and the claimants that included a \$1,000 reclamation bond. The approval expiration was December 31, 2005, except that the claimants did not operate that year and requested an extension; when granted, the extension changed the expiration date to December 31, 2006. Again, the claimants didn't operate in 2006 or 2007 and were granted another extension that expired December 31, 2007. The approval is for hand sampling for all the claims, and using ATVs to move buckets of sample material to a small processor set up near the center of PR Association No. 6, mining claim. A campsite is approved near the processing site. If warranted, the next step would be to conduct bulk sampling. The claimants proposed bulk sampling in their plan of operations, but that part of the plan was not approved pending additional information.

## **Mineral Withdrawal and Segregation**

On June 3, 1997, at the request of the Forest Service, a notice was published in the Federal Register that segregated 600 acres at Spencer Glacier from operation under the U.S. mining laws (mining claims cannot be located) for a period of 2 years. Public Land Order (PLO) 7393 subsequently withdrew the same lands for 15 years, effective May 28, 1999, until May 28, 2014 (see Figure 14). The withdrawal was done for the stated purpose of making the site available for development and production of mineral materials.

On February 27, 2007, at the request of the Forest Service, a notice was published in the Federal Register that segregated an additional 720 acres at Spencer Glacier from operation under the U.S. mining laws (mining claims cannot be located) for a period of 2 years. This segregation generally does not affect existing mining claims except for small pieces of PR Association Nos. 12, 11, 10, and 9, and no additional mining claims can be located within the boundaries. This segregation lies adjacent to and north of the PLO 7393 area. Figure 14 shows both areas. Both areas together cover the entire mineral material site. Mineral material sales are allowed in both areas.

Prior to the expiration of the segregation, the Forest Service must complete a withdrawal application package, which consists mostly of a mineral potential report and an environmental analysis of the withdrawal action. The stated purpose of the withdrawal is making high quality mineral materials available under the Materials Act of 1947, to nearby communities for private and public works projects. The withdrawal application area would include future recreational development for public access and recreation associated with a railroad stop and trails to access the National Forest for recreation. The withdrawal application can be approved or denied by BLM.



**Figure 14. Map of 1999 mineral withdrawal and 2007 segregation in relation to valid existing claims at Spencer**

This segregation and the withdrawal (PLO 7393) consist of a total of 1,320 acres. Mining claims with valid existing rights occupy 360 of those acres (see Figure 14). However, the Forest Service has authority under 36 CFR, 228 Subpart C, 228.41 (b)(3) to dispose of mineral materials from unpatented mining claims.

### **Salable Minerals (Mineral Materials)**

Common variety mineral materials, such as sand, gravel, and stone are not subject to the 1872 Mining Law, but instead may be purchased under provisions of Forest Service regulations found at 36 CFR 228 Subpart C. Stone and gravel in the project area fall under these regulations. This use is compatible with the purposes of national forests. Additionally, the 2002 Chugach National Forest Plan FEIS states that:

*All lands on the Chugach National Forest are open for permit application for salable minerals, with the exception of the Nellie Juan-College Fiord Wilderness Study Area and certain small withdrawn areas. Approval of permits is discretionary (USDA Forest Service 2002b, pg. 3-497).... One important source of riprap and armor stone on the Forest, the 600-acre Spencer Glacier Mineral Materials Site, would be available under all alternatives. (USDA Forest Service 2002b, pg. 3-506)*

Mineral materials consisting of stone and gravel have been mined at Spencer Glacier since the early 1900s. The railroad extracted gravel and stone in the early 1900s and built a stone levee in 1917 to divert water from their gravel pit. In recent years, there have been two permitted mineral materials sites at Spencer. The Alaska Railroad currently holds a permit for an area north of the old levee; their permit expires in 2008. Production from the railroad permit area has been intermittent. South of the old levee is the former Spruce Sand and Gravel permit site. Spruce first obtained a permit to extract and sell gravel in 1978.

The stone quarry that served as the major source of material for the old levee was placed under permit to Spruce Sand & Gravel in 1988. No production occurred from Spruce's quarry until 1991. Since that time some 84,100 cubic yards of gravel and 160,664 cubic yards of stone have been produced from the site for use as ballast, riprap, and armor stone. The permit expired September 15, 1997, thereby ending production.

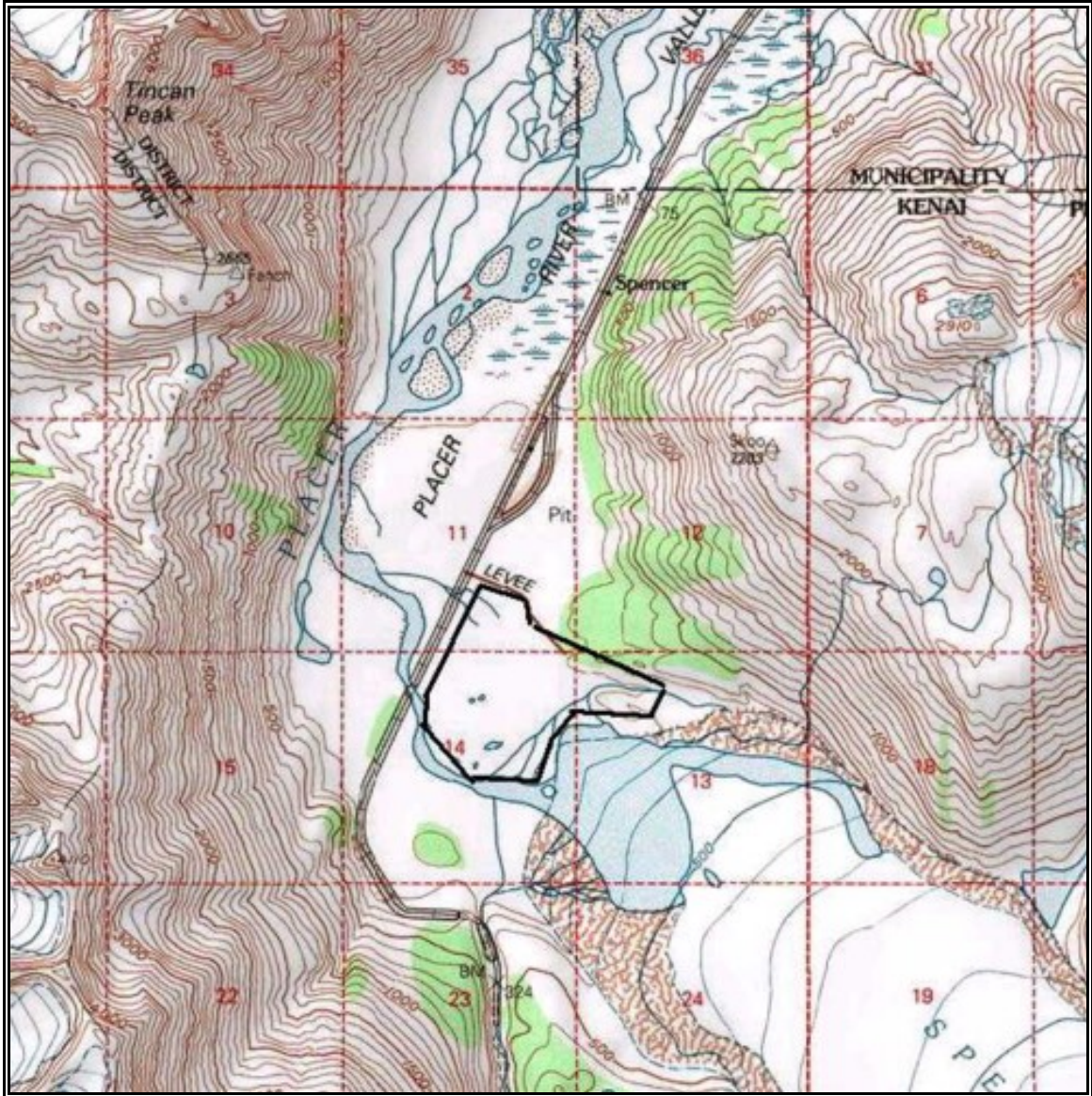
The entire old Spruce permit area is shown as outlined in a bold black line in Figure 15. About half of the area is not being considered for this project.

The stone at Spencer Glacier is a proven, valuable commodity for large-sized armor stone, riprap, ballast, filter stone, and other construction uses. Engineering tests verify the stone as a good source of these construction materials. The Spencer stone has been successfully utilized for marine structures in Homer, Whittier and Seward, and is ideally situated along the rail line between the deep-water ports of Whittier and Seward. The Army Corps of Engineers considers the "Spencer" stone to be a high quality product for marine structures.

The metamorphosed greywacke bedrock, as observed in the quarry face, is the major rock type in the Spencer Glacier area. The greywacke is medium to dark gray, and hard, with little weathering. Glacial striations can be seen in some of the exposed stone, caused by the movement of glacial ice during the advancement phase of the glacier. The quarry face is composed of massive greywacke as well as some highly fractured greywacke. Greywacke has a variety of uses including armor stone, riprap, toe and filter stone, and ballast. There is an estimated 20 million tons of greywacke available at the Spencer site.

In 1996 and 1997, armor stone was produced from the Spencer quarry for the Homer Spit improvement project. Armor stone production consisted of drilling and blasting the quarry face in such a way as to produce the large blocks of stone required for the Army Corps of Engineers (COE) contract. Then the armor stone was sorted from the blasted material, loaded onto trucks, and hauled to the railhead. It was stockpiled at the railhead and later loaded onto railcars.





**Figure 15. Map showing area of former mineral materials permit held by Spruce Sand & Gravel**

Size requirements for armor stone varies with the job, and generally ranges from two- to eight-ton boulders (Barksdale 1991). The (Army COE) 1997 Homer Spit project required boulders 2 to 3.4 tons in size, and to be smoothly graded. Some of the Spencer quarry stone, 75 percent or better, is highly fractured, faulted, or weathered; only a relatively small percent of the stone was suitable as large armor. Approximately 25 percent of the blasted stone is large enough for armor stone in the 2 to 3.4 ton range. The other 75 percent would be suitable for small armor stone, riprap, ballast, and other uses.

Riprap, also produced from the Spencer quarry, is used mainly for erosion control. It is smaller than the armor stone, and is produced by drilling and blasting. There is no individual sorting of stone such as occurs with armor stone. The blasted stone can be pushed into piles by a dozer, and then scooped up and transported to the grizzly by the front-end loader. Riprap has been sized at

the Spencer quarry by screening through several grizzlies, which were fed by the front-end loader. The undersized material may be further graded and/or stockpiled. The undersized material may be crushed for ballast and screened to size.

Toe stone and filter stone are used along with armor stone for constructing breakwaters. Toe stone has a broad range of acceptable sizes. For the 1997 Homer Spit project, the specifications for toe stone were from less than 1 ton to 3.4 tons, and for filter stone, from 4 pounds to 400 pounds. The smaller stone is mined and handled the same as riprap. The larger size stone is handled the same as armor stone.

Ballast has been produced from the Spencer quarry from blasted stone (also called shot rock) and used by the Alaska Railroad. The blasted stone is crushed and screened for size gradations of less than 2½ inches, and greater than 1 inch. Gravels can be crushed for ballast, but this is not as desirable a product. Crushed gravel may not contain as many sharp angular particles as crushed quarry stone.

The Spencer area contains a vast sand and gravel deposit with virtually no overburden (soil) thereby making extraction more desirable than areas where topsoil might have to be excavated and stockpiled for ensuing reclamation. The gravel is generally clean (free from mud) and is suitable for a variety of uses.

Common variety sand and gravel has been mined from a gravel pit (Figure 16) next to the railroad right-of-way, under a 1978 to 1997 mineral materials permit that was amended several times during that period. The gravels contain trace amounts of fine powdery gold.



**Figure 16. Photo of current gravel pit under permit to Alaska Railroad**

The railroad permit area and deposit on the west side of the railroad appear to have similar characteristics, and are a part of the same outwash plain system as the former Spruce permit area. However, these areas have not been formally tested and evaluated.

### **Leasable Minerals**

Leasable minerals generally include oil and gas and may be acquired under a lease system. No leasable minerals are known to occur within the project area.

### **Environmental Consequences**

This area has a long history of mineral materials mining, there are expectations of future mineral materials mining, and mining claims with an approved plan of operations are present. The mining claims and the mineral materials site (up to 530 acres) occupy some of the same ground (see Figure 4).

There are two types of minerals activities within the project area to consider in this analysis. Locatable operations would be authorized under the 1872 Mining Law and their potential impacts would be evaluated under a separate environmental analysis. Locatable operations are currently approved for small-scale hand sampling and it is unknown whether further exploration will be sought.

- 1) Locatable minerals activities - rights to develop and extract the mineral resources are protected by law, and,
- 2) Mineral materials (stone, sand, gravel) – sales of common variety mineral materials from national forest lands are discretionary.

The owners of the mining claims (claimants) in the Spencer Glacier area have a statutory right to develop their mineral resources (placer gold). Additionally, there is a very large, valuable mineral materials deposit at Spencer Glacier, which the Forest Service hopes to make available for production and public uses.

## **Direct and Indirect Effects**

### **Effects of All Action Alternatives**

Under the action alternatives, there would be effects to the minerals and geology resources from the mining operations. Impacts to the mineral materials and any locatable minerals present would consist of their permanent removal from National Forest land. Additionally, the terrain would be lowered about 20 to 30 feet. The natural contours of the kame and kettle topography would be altered, although the reclamation plan would specify that the reclaimed surface be similar to the original surface before mining took place. The elongated rock knob could be partly to entirely removed, depending on the demand. However, a weathered stone cliff would remain once the knob is removed. There would be some fresh stone surface showing where the quarry terminated, but artificial weathering is expected to mitigate that impact. The “fresh” stone face would then be virtually indistinguishable from the older lichen covered stone. Permit renewal could occur if the area is not mined out in 15 years. Due to the tremendous volumes available, it is unlikely that the entire deposit of gravel or stone would be mined out in the 15-year permit period. The permit could be extended if the demand is still strong, and there would be additional NEPA analysis done at that time.

### **Alternative A**

This alternative consists of a medium- to large-scale operation, that would begin on the south end of Area 2 in Figure 5 near the former Spruce gravel pit and work north to move away from Spencer Glacier Whistle Stop. Mining would begin on the PR Association No. 11 mining claim, about 800 feet north of the Whistle Stop platform. Additionally, mining for stone would occur on the elongated greywacke knob, beginning at the west end, where such mining left off in 1997. Trucks could haul gravel and stone on the existing haul road. Gravel could also be moved using a belt system, thus limiting the truck traffic on the haul road. The existing rail spur would be upgraded. Eventually, another rail spur would be built on the west side of the tracks. Blocks of 25 acres would be mined and then reclaimed. Then another 25-acre block would be mined. The second mining block may be started while the first block is being reclaimed.

Total acreage to be mined is 530 acres. An estimated 20 million tons of stone and 27.5 million tons of gravel could potentially be produced from this area. This alternative would provide the largest overall amount of mineral materials of the action alternatives. This alternative anticipates that 250,000 tons would be produced annually over the 15-year term of the permit. Under a mineral materials permit, the permittee would have a minimum production amount specified but not a maximum amount. At 250,000 tons annually, it would take around 110 years to mine out the entire gravel deposit allowed under Alternative A. Thirty acres of stone (20 million tons) would be mined out in 1,000 years. So there is no shortage of reserves for a long-term mineral materials permit.

This alternative allows an operating season from May 1 until October 31 with daily hours of operations from 6 a.m. to 10 p.m. These dates reasonably correspond to the beginning and ending



dates imposed by the weather. Gravel is seldom mined in the winter because it is difficult to mine and handle frozen gravels. Only Alternative D allows longer hours and season. The blasting seasons of May 1 to May 25, and September 15 to October 31 is reasonable, provided that emergency situations are accommodated. An example would be where riprap is needed to repair flood damage. The blasting season in this alternative is more flexible than Alternatives B or C.

This alternative would not materially interfere with approved operations at the placer claims (see Figure 4). Both the mineral materials operations and the placer operations could be using the same roads, same ground, and mining the same material (gravel). Close coordination would be required between mineral materials operators and the placer claimants to ensure smooth operations for both. This could be mitigated by materials operations beginning off the mining claims, thereby allowing the claimants the opportunity to mine the gravel and extract any placer gold prior to the gravel being removed. The locatable miners cannot remove the gravels, since gravel is not a locatable mineral. After placer gold is extracted from the gravel, the gravel could be removed by the mineral materials operator. However, there are no currently approved placer mining operations, other than hand sampling. The claims have been in place since the early 1980s and no placer gold has been produced. Therefore, placer mining operations under this alternative are unlikely to substantially interfere with mineral material operations, or vice versa.

### **Alternative B**

This alternative consists of a large-scale operation that would be mostly conducted on the west side of the tracks (see Figure 7). Gravel mining would not occur on any mining claims, and would generally avoid the recreational facilities. However, mining for stone would still occur on the elongated greywacke knob, beginning at the west end, where such mining left off in 1997. Trucks would haul stone on the existing haul road. The existing rail spur would be upgraded and another rail spur would be built on the west side of the tracks. Blocks of 25 acres would be mined and then reclaimed. Then another 25-acre block would be mined. The second mining block may be started while the first block is being reclaimed.

Total acreage to be mined is 230 acres. An estimated 20 million tons of stone and 12 million tons of gravel could be produced. The stone available is the same for all action alternatives. The total available gravel to mine is less than Alternative A and D, but more than Alternative C. This alternative anticipates a production of 500,000 tons per year, which allows a permittee to take advantage of the economy of scale. In the 15-year permit period, some 7.5 million tons of gravel and 300 thousand tons of stone could be mined. At these rates, the entire gravel deposit would be mined out in 24 years and the stone in 1,000 years. There are adequate reserves for the permit period and beyond.

This alternative allows an operating season from May 1 until October 31, with daily hours of operations from 6 a.m. to 10 p.m., which is the same as Alternative A. Again, these dates reasonably correspond to the beginning and ending dates imposed by the weather. Gravel is

seldom mined in the winter because it is difficult to mine and handle frozen gravels. Only Alternative D allows longer hours and season. The blasting season of September 15 to November 31, is less flexible than Alternative A, which allows blasting in both spring and fall. A two-month period is somewhat restrictive considering that November could be a difficult month in which to operate a blasting project at Spencer Glacier. It may be feasible anyway, provided that emergency situations are accommodated. An example would be where riprap is needed to repair flood damage, therefore blasting may need to be done outside the “allowed blasting season”. By restricting the blasting season, the operator must estimate potential stone sales a year ahead. If they underestimate then they won’t have enough product on-hand and they could lose stone sales to their competitors. If they overestimate, they spend money producing stone that doesn’t sell that season.

The alternative could require some minor coordination with approved placer mining operations. Both the mineral materials operations and the placer operations could use the same haul road. Stone mining would occur at the quarry, which is underlain by mining claim PR Association No. 15. This mining claim is valid for placer gold, which occurs in the gravel, but the gravels within the claim would not be mined by the claimants. Currently there are no actual mining operations and there are not any approved mining operations, other than hand sampling. Since the claims have been in place for over 20 years and no placer gold has been produced. Lack of interest in mining on these claims despite all time high gold prices of around \$900-1000 per ounce suggests that production is unlikely.

### **Alternative C**

This alternative consists of a small-scale operation that would mine in the area of the current railroad gravel permit area (see Figure 9). This alternative would be generally less attractive to large gravel companies like Anchorage Sand and Gravel, Quality Asphalt Paving and other similar companies. Smaller size companies such as those that currently mine in Portage Valley may be interested but the start-up costs at a remote site could be prohibitive for a smaller company. Additionally there is less material available (smallest acreage amount) with this alternative, thereby making it more difficult to recoup capital costs. However, this alternative could allow the railroad to extend their permit and continue to mine gravel for railroad uses in the area. Gravel mining would not occur on any mining claims, and operations would generally avoid the recreational areas. However, mining for stone would occur on the elongated greywacke knob, beginning at the west end, where such mining left off in 1997. Trucks would haul stone on the existing haul road. The existing rail spur would be upgraded and utilized. Blocks of 15 acres would be mined and then reclaimed. Then another 15-acre block would be mined. The second mining block may be started while the first block is being reclaimed.

Total acreage to be mined is 190 acres. An estimated 20 million tons of stone and 7 million tons of gravel could be produced. The stone available is the same for all the action alternatives but the anticipated rate of mining per year is half of the other action alternatives. The available gravel is

the least of all the action alternatives and the rate of mining is least. At a production rate of 100,000 tons annually, within the 15-year permit period, some 1.5 million tons of gravel could be mined. At an annual rate of 10,000 tons, 150 thousand tons of stone could be mined. At these rates, the entire gravel deposit would be mined out in 70 years and the stone in 2,000 years.

This alternative allows an operating season from May 1 until October 31. However, operations would only be allowed on a maximum of four non-peak recreation days and would not be allowed on holidays. During the peak recreation season (May 15 – September 15), the daily hours of gravel operations would be from 8 a.m. to 6 p.m. and from 8 a.m. to 1 p.m. at the rock quarry for sorting and hauling stone. Operating hours for both operations would be 6 a.m. to 10 p.m. outside the peak recreation season. Alternative C would impose the most restrictive hours and days of operations of all the action alternatives. Again, the dates reasonably correspond to the beginning and ending dates imposed by the weather. Gravel is seldom mined in the winter because it is difficult to mine and handle frozen gravels. The blasting season of May 1 to May 25, is probably adequate for the smaller amount being produced, particularly if exceptions are made for emergency situations.

Of the action alternatives, this alternative would require minimal coordination with placer claim operators. This is because the operation would be small-scale and no gravel would be mined off of mining claims. Both the mineral materials operations and the placer operations could be using the haul road. Stone mining would occur at the quarry, which is underlain by mining claim PR Association No. 15. This mining claim is valid for placer gold, which occurs in the gravel, but the gravels within the claim would not be mined by the claimants. Some coordination may be needed due to the proximity of the two operations and common use of the haul road. This need would be less than other action alternatives since the amount of stone mined would be less.

### **Alternative D**

This alternative consists of a large-scale operation, that would mine in the old railroad gravel permit area and the west gravel deposit (see Figure 11). Gravel mining would not occur on any mining claims, and would generally avoid the recreational facilities. However, mining for stone would occur on the elongated greywacke knob, beginning at the west end, where such mining left off in 1997. A rail spur would be constructed to the quarry to minimize the use of haul trucks. This should greatly reduce potential conflict with other users of the road. The railroad has suggested that a rail spur to the quarry could accommodate moving stone out and passengers in to the lake. The existing rail spur would be upgraded and utilized and a rail spur would be constructed on the west side of the tracks. However, only one side would be mined at a time.

A total of 390 acres would be mined. An estimated 20 million tons of stone and 19 million tons of gravel are expected to be produced during the permit term. The stone available is the same for all the action alternatives. The available gravel is the second largest amount of all the action alternatives, after Alternative A. Alternative D, however, has a distinct operational advantage over Alternatives A, B, and C because it is the most flexible and allows for the largest operation.

This allows the permittee to take advantage of the economy of scale, making recovery of capital expenses easier (or just possible), and keeping unit-production costs low. At a production rate of 500,000 tons annually, within the 15-year permit period, some 7.5 million tons of gravel could be mined. At a production rate of 20,000 tons annually, 300 thousand tons of stone could be mined. At these rates, the entire gravel deposit would be mined out in about 38 years and the stone in 1,000 years.

This alternative allows an operating season from May 1 until October 31 with daily hours of operations from 6 a.m. to 10 p.m., except for April 15 - May 15 and September 15 – November 30, where 24-hours-per-day operations are allowed. This is the most flexible hours of operations of all the action alternatives. Again, the dates reasonably correspond to the beginning and ending dates imposed by the weather. Gravel is seldom mined in the winter because it is difficult to mine and handle frozen gravels. The blasting season of April 15 - May 15 and September 15 – November 30 is the longest of all the action alternatives and should be adequate, particularly if exceptions are made for emergency situations. Alternative D may require slightly more coordination with placer claim operators than Alternative C due to the extended season and hours of operations.

### **Alternative E - No Action Alternative**

Under this alternative, mineral material operations would occur only in response to emergency needs; therefore, there would be no detrimental effects from the proposed project on the minerals or geology resources at this time, other than those already resulting from current use of the area.

### **Cumulative Effects**

The area analyzed for cumulative effects to minerals and geology resources is the proposed Spencer Glacier Mineral Materials site and the existing mining claims as displayed in Figure 4. The timeframe considered for cumulative effects was from the previous 10 years through the next 15 years. Past, present and future projects and activities within this area that can impact mineral and geology resources include the following:

- *Whistle Stop Project:* This project will provide numerous recreational developments in the Spencer area. The Whistle Stop project is using local gravels and other mineral materials for trail construction and facilities. Gravel deposits beneath recreational developments are generally irretrievable for the life of the development but these areas are very small.
- *Placer mining claims:* The Forest has approved a (locatable minerals) mining plan of operations for sampling placer gravel, and operations under that approval are expected to begin in 2007. So there may be placer sampling occurring in 2007 and after, which may possibly result in additional exploration, development, and production. However, sustained placer operations are unlikely, given the low grade of the deposit and the exceedingly fine (dust-sized particles) gold present that are difficult to recover. Placer

operations could result in ground disturbance in the Spencer area whether sand, gravel, and stone mining occurs or not. If emergency needs arose for mineral materials, some coordination with any ongoing approved placer operations would be needed.

- *Rafting Operations on the Placer River:* Commercial rafting operations will continue to occur between Spencer Lake and Luebner Lake, utilizing the Alaska Railroad to transport equipment and clients. Rafting put-in and takeout sites would not be available for mineral materials extraction. Rafting activity would tend to restrict mining in the immediate area. Again these areas are quite small.
- *Alaska Railroad operations:* Passenger and freight train traffic through the Placer Valley will continue. Periodic track maintenance will occur, along with structures to control erosion from shifting stream channels. The presence of the train is beneficial because it allows for easier extraction of mineral materials but also places some constraints on the location of areas to be mined. Again, this limitation is small with regard to the size of the deposit.
- *Motorized recreation:* Motorized recreational activities will continue to take place in the Spencer area, including snow machine use when snow conditions permit, airboat and jet boat use, and helicopter skiing. In general, the more motorized activity in the immediate mining areas, the more safety concerns. Snow machine use in the winter may contribute to vandalism of material operators and/or mining claim operator's personal property. This use is not new; it has been ongoing for many years. The most efficient mitigation would be the removal of equipment, supplies, and facilities when the site is not occupied. But, in practice, there would be some facilities that would remain over the winter. There may need to be warning signs posted for snow machine users. Airboat, jet boat, and helicopter skiing should have virtually no direct impact on the minerals and geology resources. Airboats and jet boats may bring additional people into the area, which would cause further safety concerns during active mining operations.

The Spencer Mineral Materials project, in conjunction with the activities listed above, will have large-scale irreversible effects on the mineral materials resources of the area. However, effects to the overall geology of the area are expected to be small with respect to the scale of the surrounding landscape. Numerous activities in addition to the mineral extraction are proposed in the Spencer area, including use from trail users, camping use with considerable ground disturbance, structures, rafting operations, and motorized use. By concentrating a number of uses within the Spencer area, the total cumulative footprint from the various activities is kept smaller. Mineral materials mining operations would be reevaluated after 15 years. The deposit may not be mined out and there may still be strong demand. Presumably, recreational uses would continue. Placer operations may occur in the future as a result of improved recovery technology. Recreation developments and placer mining could result in a minimal reduction in the availability of mineral materials from the Spencer area. Areas committed to recreational developments would be

unavailable for mineral extraction. The Spencer Mineral Materials project would have the greatest impact on minerals and geology of the area by removing large amounts of gravel and rock and by lowering the landscape by up to 30 feet. Overall, the cumulative effects of all of these actions could eventually be a full commitment of the mineral resource in the project area, either through sale or through preclusion by other uses.

### **Summary of Effects**

Commenters were concerned about the possibility of conflict with valid existing rights associated with placer claims (Issue 1), as well as, the feasibility of operations (Issue 7). None of the alternatives would materially interfere with placer mining operations conducted under an approved plan of operations. All action alternatives would require coordination between the two mining operations due to operations occurring at the same time in close proximity and requiring use of the same haul road by both operations. In general, larger materials operations would require more coordination than smaller operations. Alternative E has the least need to coordinate with placer mining operators. However, some coordination would still be required if emergency needs for mineral materials arose.

Feasibility of operations depends on a number of factors, some of which are outside the scope of this analysis. Examples of factors that would be within the scope of this analysis would be size of area, mining life of deposit, scale of operations allowed (annual production), products offered, mining season, blasting season, operating hours, onsite processing, materials storage, facilities allowed, placement and length of rail spur, reclamation requirements, and similar items.

**Table 2. Likelihood of Spencer Minerals project alternatives to conflict with valid existing rights**

	<b>Stone sales on claims</b>	<b>Gravel mining on claims</b>	<b>Share haul road use</b>	<b>Scale of operation</b>
Alternative A	Yes	Yes	Yes	Med - large
Alternative B	Yes	No	Yes	Large
Alternative D	Yes	No	Yes, but reduced due to quarry rail spur	Large
Alternative C	Yes	No	Yes	Small
Alternative E	No	No	No	none

Alternative D has the longest, most flexible hours of operations and blasting season of all the action alternatives and has the second largest amount of ground available. Alternative D avoids mining gravel from the placer mining claims. There are 38 years of gravel when mined at a rate of 500,000 tons per year. This is a long operating life. The permit would be for 15 years, but if demand is strong, it could be extended. The rock would last for 1,000 years at the projected rate of mining, which is a virtually unlimited supply. The amount of rock available could accommodate a very large-scale project, such as the relocation of the city of Kivalina, Alaska or the Anchorage Harbor expansion, either of which will take a significant amount of gravel and stone. The Army Corps of Engineers contacted the Forest Service several years ago to inquire

into the availability and to express their interest in the mineral materials at Spencer Glacier. These projects are in the planning phase.

Based on feasibility from the best to the least, the Alternatives are ranked:

- 1) Alternative D (large acreage and large scale operations, most flexible hours and season),
- 2) Alternative A (largest available acreage, flexible hours and season),
- 3) Alternative B (large scale operations, smaller available acreage),
- 4) Alternative C (small scale operations, least available acreage, most restrictions on operations of action alternatives), and
- 5) Alternative E (no mining allowed).

The proposed Spencer Mineral Materials project would remove mineral materials (also referred to as common variety minerals) and any other minerals that are contained within the sand and gravel. This is an irreversible commitment of resources. There are abundant supplies of mineral materials within the National Forest; in other words, such resources are not rare or unique.

The surficial geology would be altered by the removal of some 20 to 30 feet of sand and gravel, and the removal of stone from a rounded, elongated rock knob in mined areas. While the surface of the ground will be lowered, the original appearance of the kame and kettle topography can be emulated during reclamation. Although the rock knob would be removed, the area can still attain a natural appearance after reclamation.

There would be no impacts to minerals or geology from the no action alternative (Alternative E). There would be no impacts to leasable minerals from any alternative.

Overall, the cumulative effects of all of these actions could eventually be a full commitment of the mineral resource in the project area, either through sale or through preclusion by other uses (e.g., recreation).

## Noise

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### Affected Environment

In many parts of the Chugach National Forest, noise levels are quite low. This has historically been the case at Spencer Lake with the exception of passing trains and previous mining activities. However, the recent Whistle Stop FEIS acknowledged that the new recreational developments were likely to change the recreation experience, presumably the noise levels, at Spencer. The FEIS (USDA Forest Service 2006b, pg 3-11) described the expected effects:

*“In all alternatives, Spencer Glacier is expected to be the major attraction. Facilities proposed will accommodate large numbers of people and will be designed to accommodate all abilities. In the immediate area of Spencer Glacier users should expect to consistently encounter a number of other visitors (more than 15 parties/day), both at recreation sites and on trails. There will be a highly reduced feeling of solitude within the vicinity of Spencer*

*Lake. With more highly developed trails, a greater diversity of recreation facilities and a readily available opportunity to engage in outfitted and guided trips, there is a likelihood of encountering both a higher number of users and larger size groups. This level of social encounters will be a significant change from the current social setting. However, this change is consistent with the long-term management direction for this local area.”*

The ROD for Whistle Stop project (USDA Forest Service 2006a, pg. 10) also acknowledged that:

*“Due to the nature of designated Whistle Stops, there will be small, essential nodes of development and high levels of encounters at these locations as visitors utilize these facilities to safely exit the train and disperse use accordingly.... It is only at Spencer Lake, which is classified as a Developed Recreation Complex, where facilities will be designed to accommodate a large number of people, and hence, encounters.”*

Ambient noise levels were used as a comparison for the analysis of the noise of the proposed project activities. Because no primary noise data exists (i.e., no actual sound measurement has occurred to date), current noise levels were estimated using either general references or data collected at similar sites. Backcountry areas such as the Spencer Glacier have an ambient (or environmental background) noise level that likely varies somewhat throughout the day and year given the vegetative cover, glacier calving, river noise, insects and wildlife, and other normal climatic conditions (wind, rain and occasional thunder). From reference sources, forests and “wilderness” (not necessarily related to congressionally designated wilderness) are estimated to have noise levels in the range of 35 to 45 decibels (dB). In addition, other human-caused noise includes the Alaska Railroad, aircraft overflights, and recreational user-generated activity noise (ranging from snow machines in the winter to simple group conversation).

Actual studies conducted by the National Park Service (NPS) in Denali National Park between 2001 and 2003 measured ambient noise throughout the year in several locations. They found that “natural ambient sound levels” varied by habitat type, ranging from a mean of 20.0 (and range of 18.6 to 21.7) dBA in areas of low shrub to a mean of 32.9 (and range of 30.5 to 36.3) dBA in open needle leaf vegetation types.

In addition to the ambient environmental noise, there are other noise sources currently present at Spencer. Table 3 shows the decibel levels of noise sources already occurring within the Spencer Glacier area, including ambient environment noise and river noise, and periodic nonmotorized recreation activity, snow machine use in the winter, current sporadic placer mining activity (occasional truck and powered testing activity), and Alaska Railroad freight and passenger trains.



**Table 3. Existing sources and levels of noise currently estimated to be occurring at Spencer Mineral Materials project area**

Existing Noise Source	Expected Noise Level (dB)	Decibel Reference Distance	Standardized Noise Comparison (dB at 1000 ft)
Ambient environment	35	---	35
Placer River	40	550	23
Nonmotorized recreation activities	60	5	14
Snowmachining (winter only)	78	50	52
Occasional placer mining activity	88	50	62
Train (freight locomotive and cars)	97	50	71

## Environmental Consequences

The analysis of the estimated noise impacts of the proposed gravel mining and rock quarrying activities at the Spencer Glacier site focuses on the expected or likely noise outputs of the activities in comparison to ambient environment and existing activity noise levels. The five project alternatives are compared in terms of (1) magnitude, (2) duration, and (3) frequency of noise level changes. Effects of the alternatives were analyzed for two timeframes: 1) the peak recreation season (May 15-September 15) and the non-peak recreation season (September 16 to May 14). Noise levels were estimated at eight specific recreation sites at Spencer. The noise analysis was based on the information regarding season and duration of activities as displayed in Table 4 and the expected noise outputs of those project activities as displayed in Table 5. The full noise analysis is available in the project record and is summarized below.

Table 5 lists the major expected noise sources associated with common gravel and rock activity as proposed in this project, as well as an estimated decibel noise output associated with each (assuming a single source for each).

Analysis results are limited by the following:

- No actual onsite measurements of noise resulting from activities can be made because no activities are present to measure (therefore, noise effects can only be estimated using comparable activities elsewhere and through a review of available literature).
- A number of variables affecting noise transmission (e.g., atmospheric conditions, vegetation, and topography) cannot be easily modeled without actual noise level production. (Accordingly, all noise change measures assume an open plain rate of dissipation.)

**Table 4. Summary of season, days, and hours of operations under the various alternatives for the Spencer Mineral Materials project**

	Alternative A	Alternative B	Alternative C <sup>1</sup>	Alternative D	Alternative E
Gravel Mining Season	5/1-10/31	5/1-10/31	5/1-10/31	4/15-10/31	n/a
Total days of operation	184	184	131	200	0
Days during peak recreation season (5/15-9/15)	124	124	71	124	0
Hours per day during peak recreation season	16	16	10	16	0
Days during non-peak recreation season (9/16-5/14)	60	60	60	76	0
Hours per day during non-peak recreation season	16	16	16	24	0
Drilling and Blasting Season	5/1-5/25 and 9/15/-10/31	9/15-11/30	5/1-5/25	4/15-5/15 and 9/15-11/30	n/a
Total days of operation	71	76	25	106	0
During peak recreation season(5/15-9/15)	10	0	10	0	0
Hours per day during peak recreation season	16	0	5	0	0
During non-peak recreation season(9/16-5/14)	61	76	15	106	0
Hours per day during non-peak recreation season	16	16	16	24	0

1 - Alternative C restricts gravel-mining operations to a maximum of 4 days per week during the 124-day peak recreation season (5/15-9/15). Gravel mining activities are allowed 7 days per week during the 241-day non-peak recreation season (9/16-5/14).

**Table 5. Major noise sources and estimated noise output (dB) associated with proposed mineral operations at Spencer**

Expected Noise Source	Expected Noise Level (dB)	Decibel Reference Distance	Standardized Noise Comparison (dB at 1000 feet)
Camp activities	75	3	25
Drilling	96	50	64
Blasting	129	300	119
Loaders and trucks	88	50	62
Generators	82	50	56
Conveyor belts	68	100	48
Sorting and crushing	87	100	67
Loading in rail cars	75	100	55
Train (freight locomotive and cars)	97	50	71

- The exact nature of the gravel mining and rock extraction activities cannot fully be articulated (including equipment, operating schedules, and spatial locations), making precise calculations even less likely. All estimates are based upon parameters described previously in Chapter 2.
- In addition to the above uncertainties, many noise producing activities will likely shift across the project landscape making exact noise measurement calculations only generally representative of all possibilities over the life of the project.
- No onsite information on recreational user tolerance of noise has been conducted.
- Existing studies on comparable situations are found to be very limited, providing little other source to evaluate estimated noise levels.

The key findings of this analysis for all time periods are as follows:

- Considerable difficulty exists in trying to develop a simple comparative measures of the estimated noise outputs associated with this project due to (1) uncertainties in project features, (2) project operational schedules being more windows of opportunity than fixed, (3) exact distances from project features to public use areas, (4) variable landscapes affecting noise transmission, and (5) recreational user sensitivity to estimated project noise outputs.
- The noise effects of gravel mining, and to a lesser extent rock quarrying, could be mitigated to some degree by the construction of a berm(s), which could serve as physical barriers to noise transmission across the area. Other known reliable means of reducing noise impact could include (1) use of modern, quiet equipment and generators during the evening hours, and (2) the maintenance and/or planting of screening trees. The topography surrounding the site area (somewhat enclosed) could make these potential mitigation measures less effective than if applied on a theoretically flat plane.
- Total noise impact is a combination of (1) peak noise output at any one time and (2) the frequency and duration of the noise output.
- As best may be estimated, mining and associated activities identified in all four action alternatives—A, B, C, and D—for the proposed project will subject recreational users in the Spencer Glacier area, including users of the Spencer Glacier Whistle Stop Developed Recreation Area, to elevated levels of non-ambient noise. Gravel operations under Alternative A would be most likely to mask ambient sounds at developed recreation sites at Spencer. Under this alternative, noise of operations would also be audible above the sounds of normal recreational activities expected at Spencer Whistle Stop and other developed recreation sites at Spencer. Operations under Alternative C would be least likely to be audible at these same sites, and noise from gravel operations is not expected to dominate normal recreational sounds at these same sites. Alternatives B and D would

be similar to Alternative C but are more likely to be audible above normal recreational sounds at the Whistle Stop and along the Placer River.

- The maximum numbers of days per year that recreation visitors would be subjected to project noise are: Alternative D, 200 days; Alternatives A and B, 184 days; Alternative C, 131 days; and Alternative E, 0 days.

### ***Direct and Indirect Effects for 124-Day Peak Recreation Season (May 15 to September 15)***

For purposes of this analysis the “peak recreation season” is defined as that portion of a typical year when the weather permits recreational activities not dependent upon snow cover and which is warm enough to entice a wider range of outdoor recreation visitors (this is the period when the U.S. Forest Service regularly plans to manage the setting for summer recreation activities). The peak recreation season occurs approximately 124 days per year between May 15 and September 15.

The key findings of this analysis for the peak recreation season are:

- All four action alternatives (A, B, C, and D) would expose visitors to noise levels in excess of estimated ambient environmental noise level during the 124-day peak recreation season..
- Any-one-time noise levels at the Spencer site are estimated to vary from 35 dB (mean ambient environment) to approaching 120 dB (during drilling and blasting) for Alternatives A and C, and to approximately 70 dB (during gravel mining activities) for Alternatives B and D.
- During the peak 124-day recreation season, recreation visitors would be subjected to the following number of days of gravel mining noise per alternative: Alternatives A, B, and D, 124 days; Alternative C, 71 days; and Alternative E, 0 days. Drilling and blasting could occur for 10 days under Alternatives A and C, and 0 days in Alternatives B, D, and E.
- Alternative A would expose visitors to noise levels in excess of ambient environmental noise levels approximately 74 percent of the 124-day peak recreation use season. By comparison, Alternatives B and D would expose visitors to noise levels in excess of ambient levels approximately 69 percent of the time; Alternative C would expose visitors to excess noise approximately 18 percent of the time; and Alternative E would not expose visitors to excess noise.
- Alternatives A, B and D would expose visitors to some project noise levels in excess of ambient environmental noise levels approximately 75 percent of the time during any 24-hour period. Alternative C would expose visitors to some project noise levels approximately 42 percent of the time.

- Alternative C would subject recreational visitors to the least duration of noise on a weekly basis during the 124-day peak recreation season—approximately a 55 percent reduction compared to Alternative A. During those 4 days the reduction in hours occurs both at the beginning and end of the day.
- For all four action alternatives the noise sources producing the highest noise levels, both blasting and the Alaska Railroad (ARRC), would occur the least often in terms of total hours of exposure.

Tables 6-9 display the estimated noise levels due to various activities at eight specific recreation sites at Spencer under Alternative A, B, C, and D, respectively.

### **Implications for Recreation**

The following suggests what a representative day during the summer peak recreation season (as far as may be determined given project details) would be like at eight possible sites for a recreational visitor under each of the five alternatives based on the information in Tables 6-9.

#### **Alternative A**

At 6 a.m., gravel mining and rock quarrying activities may begin. Sources of that noise could include trucks and loading equipment, conveyor belts, generators, and loading railroad cars. The noise levels may shortly reach up to 67 dB (equivalent to a noisy office or street traffic ) intermittently at the Spencer Lake rafting put-in location, meaning that ambient noises as well as the sound of the river may not be heard. Several miles away at Center Creek Pass, the noise may reach 49 dB, again louder than average ambient noise (assumed to be an average of 35 dB, discounting a high wind) but somewhat less than the noise of normal nonmotorized recreational activities (62 dB). A rafter on the Placer River may also notice the same noise. On any given day, a train may stop to load rocks and gravel into metal hopper cars along a siding. Throughout the day, a visitor may experience other peak noise events, including the Alaska Railroad, rock drilling, and blasting. The railroad noise not associated with the project would vary from an estimated 97 dB (equivalent to, well, a locomotive) at the two sites along the track to around 54 dB (equivalent to a quiet residential street) at Center Creek Pass, but be of relatively short duration for the several times it passes through the area.

**Table 6. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative A**

Existing and Potential Noise Source	Recreation Site							
	Spencer Whistle Stop Station	Spencer Lake Rafting Put-In Location	Spencer Lake Viewing Platform	Center Creek Pass	Spencer Flats Public Use Cabin Location	Spencer Lake Group Campsite	Placer River (West of AKRR tracks)	Alaska RR View Stop
Ambient environment	35	35	35	35	35	35	35	35
Placer River	39	40+	37	23	36	33	33	30
Nonmotorized recreation	62	62	62	62	62	62	62	62
Snow machine use (winter only)	85	85	85	85	85	85	85	85
Proposed gravel mining activity <sup>1</sup>	53-74	51-73	50-65	48-56	49-59	51-69	52-74	49-58
Proposed rock quarrying activity <sup>2</sup>	57-61	63-69	59-63	48-50	54-57	60-64	52-54	53-55
Proposed drilling/blasting	105-110	111-117	108-111	97-99	103-106	108-113	100-103	101-103
Train (nearest freight locomotive and cars) <sup>3</sup>	97+	60	60	54	69	61	61	97+

1 Because no on-site processing of gravel would be permitted in this alternative, the worst-case noise producer is trucks and loading equipment but other noise producing activities include conveyor belts, generators, and loading rail cars (reference noise is 95 dB at 50 feet).

2 Worst-case noise producer is blasting but other—and more continuous—noise producing activity is drilling (shown in parentheses).

3 Does not include loading gravel or rock in rail cars.

**Table 7. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative B**

Existing and Potential Noise Source	Evaluation Site							
	Spencer Whistle Stop Station	Spencer Lake Rafting Put-In Location	Spencer Lake Viewing Platform	Center Creek Pass	Spencer Flats Public Use Cabin Location	Spencer Lake Group Campsite	Placer River (West of AKRR tracks)	Alaska RR View Stop
Ambient environment	35	35	35	35	35	35	35	35
Placer River	39	40+	37	23	36	33	33	30
Nonmotorized recreation	62	62	62	62	62	62	62	62
Snow machine use (winter only)	85	85	85	85	85	85	85	85
Proposed gravel mining activity	55-66	51-56	50-55	51-56	48-54	51-56	57-74	49-54
Proposed rock quarrying activity	57-61	63-69	59-63	48-50	54-57	60-64	52-54	53-55
Proposed drilling/blasting	105-110	111-117	108-111	97-99	103-106	108-113	100-103	101-103
Train (nearest freight locomotive and cars)	97+	60	60	54	69	61	61	97+

**Table 8. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative C**

Existing and Potential Noise Source	Evaluation Site							
	Spencer Whistle Stop Station	Spencer Lake Rafting Put-In Location	Spencer Lake Viewing Platform	Center Creek Pass	Spencer Flats Public Use Cabin Location	Spencer Lake Group Campsite	Placer River (West of AKRR tracks)	Alaska RR View Stop
Ambient environment	35	35	35	35	35	35	35	35
Placer River	39	40+	37	23	36	33	33	30
Nonmotorized recreation	62	62	62	62	62	62	62	62
Snow machine use (winter only)	85	85	85	85	85	85	85	85
Proposed gravel mining activity	53-56	51-62	50-58	49-52	49-54	51-59	54-58	49-53
Proposed rock quarrying activity	57-61	63-69	59-63	48-50	54-57	60-64	52-54	53-55
Proposed drilling/blasting	105-110	111-117	108-111	97-99	103-106	108-113	100-103	101-103
Train (nearest freight locomotive and cars)	97+	60	60	54	69	61	61	97+

**Table 9. Estimated noise levels in decibels at eight recreation sites at Spencer under Alternative D**

Existing and Potential Noise Source	Evaluation Site							
	Spencer Whistle Stop Station	Spencer Lake Rafting Put-In Location	Spencer Lake Viewing Platform	Center Creek Pass	Spencer Flats Public Use Cabin Location	Spencer Lake Group Campsite	Placer River (West of AKRR tracks)	Alaska RR View Stop
Ambient environment	35	35	35	35	35	35	35	35
Placer River	39	40+	37	23	36	33	33	30
Nonmotorized recreation	62	62	62	62	62	62	62	62
Snow machine use (winter only)	85	85	85	85	85	85	85	85
Proposed gravel mining activity	51-64	49-59	48-56	47-54	47-52	49-58	52-72	47-51
Proposed rock quarrying activity	57-61	63-69	59-63	48-50	54-57	60-64	52-54	53-55
Proposed drilling/blasting	105-110	111-117	108-111	97-99	103-106	108-113	100-103	101-103
Train (nearest freight locomotive and cars)	97+	60	60	54	69	61	61	97+

On rare occasions (a window of less than a 6 percent of all total hours during the 124-day peak recreation season) during May and mid-September through October a siren will announce a dynamite blast(s) that may exceed 100 dB (equivalent to a jackhammer seven feet away) for a second. Rock drilling could occur throughout the day, creating up to 69 dB (equivalent to a noisy office or street traffic) at the Spencer Lake rafting put-in location and even 50 dB (equivalent to a quiet restaurant) at Center Creek Pass. This level of noise may continue more or less at a constant level, swapping in one peak noise source for another given operational needs in gravel mining activity or rock quarrying, throughout the day until 10 p.m. at night. Only when all activities cease is a visitor likely to hear ambient environmental noise sources and levels.

The exact levels of noise produced by the different gravel mining activities will likely vary at many of the evaluation sites over the years as those activities “wander” across the full extent of the project site as necessary. It is expected that the noise levels would be lowest when activities are located farthest away from the evaluation site. There would be less variation across the years associated with rock quarrying since the quarry site is much more limited in area than available gravel.

### **Alternative B**

A visitor would have a similar experience as with Alternative A, except that the expected noise levels at Spencer Lake rafting put-in, viewing platform, and group campsite would be about 55-56 dB (less than any on-going non-motorized recreation). Noise levels at the Spencer Whistle Stop and along the Placer River are expected to be about 66-74 dB and could be audible above normal recreational sounds. Also a very important difference under Alternative B is that there would be no exposure to blasting since it would (these would occur in the five hours in the mid-morning from mid-September to the end of November, past the peak recreation season). The number of trains stopping for loading may rise to three per week from two thus increasing the frequency of this noise source.

### **Alternative C**

By comparison, Alternative C would limit noise from mineral activity in two ways: (1) by reducing the days of activity per week, and (2) by reducing the hours of daily operations. Gravel mining and rock quarry operations would only occur on a maximum of four non-peak recreation days of the week and would not occur on holidays. There would be a 3-4 day continuous period each week with no noise from mineral activities. Gravel mining operations and quarry operations would not begin until 8 a.m. Gravel operations would end at 6 p.m. while quarry operations would end at 1 p.m. Taken together, these changes represent about a 55 percent reduction in noise exposure time compared with Alternative A. Also noise due to gravel operations at all of the developed recreation sites at Spencer are expected to be less than any on-going recreational activities. Only when recreationists were completely quiet would the noise of the gravel operations be expected to be heard over ambient noise levels.



### **Alternative D**

A visitor would have nearly the same experience as with Alternative B. The number of trains stopping for loading may rise to three per week from two. Gravel mining activities may actually be a little noisier due to the use of onsite rock crushing in addition to the normal conveyor belts, sorting and loading activities.

### **Alternative E**

Because there are no anticipated scheduled gravel mining or rock quarrying activity, the predominant noise to be heard are daily the Alaska Railroad trains, whose noise levels will rise to mask the ambient environmental noise at any of the eight evaluation sites with levels ranging from 54 to 97+ dB. Outside of these windows a visitor would have the option to remain quiet to hear the ambient environmental noise and sound of the river or engage in group activities, which would also mask ambient environment and river sounds.

### ***Direct and Indirect Effects for 241-Day Non Peak Recreation Season (September 16 to May 14)***

For purposes of this analysis the “non-peak recreation season” is defined as that portion of a typical year outside of the peak recreation season when few recreationists use the area due to snow cover, cold temperatures and lack of train access. The non-peak recreation season occurs approximately 241 days per year between September 16 and May 14.

Key findings of this analysis for the 241-day non-peak recreation season (September 16 to May 14) are:

- Peak noise levels associated with the project would not vary from those of the 124-day peak recreation season, except that peak noise levels of blasting would occur in all four action alternatives. Any-one-time noise levels at the Spencer site are estimated to vary from 35 dB (mean ambient environment) to approaching 120 dB (during drilling and blasting), and to approximately 70 dB during gravel mining activities.
- Drilling and blasting activities would be the dominant project related noise source during the non-peak recreation season. These activities could occur on 106 days under Alternative D, 76 days under Alternative B, 61 days under Alternative A, and 15 days under Alternative C.
- Noises associated with gravel mining could occur on 60 days of the non-peak season under Alternatives A, B, and C. Under Alternative D gravel mining would be allowed for 76 days.
- Alternatives A, B, and C would expose visitors to noise levels in excess of ambient environmental noise levels approximately 10 percent of the 241-day non-peak recreation use season. By comparison, Alternative D would expose visitors to noise levels in excess

of ambient levels approximately 28 percent of the time; and Alternative E would not expose visitors to excess noise.

- Discounting the unpredictable occurrence of snowmachining, ambient environment noise would occur more than 50 percent of the time in all four action alternatives. Given historical use patterns, snowmachines could however represent the loudest source of noise other than blasting during the 241-day Non-peak recreation season.
- In all four action alternatives the noise sources producing the highest noise levels, both blasting and the Alaska Railroad (ARRC), occur the least often in terms of total hours of exposure.

### **Implications for Recreation**

The following suggests what a representative (as far as may be determined given project details) day during the fall through spring recreation season would be like at the eight evaluation sites for a recreational visitor under each of the five alternatives based on the information in Tables 6-9.

#### **Alternative A**

For 52 days prior and after the peak recreation season, gravel mining and rock quarrying activities may begin at 6 a.m. Sources of that noise could include trucks and loading equipment, conveyor belts, generators, and loading railroad cars. The noise levels may shortly reach up to 67 dB (equivalent to a noisy office or street traffic ) intermittently at the Spencer Lake rafting put-in location, meaning that ambient noises as well as the sound of the river may not be heard. Several miles away at Center Creek Pass, the noise may reach 49 dB (equivalent to a quiet restaurant), again louder than average ambient noise (assumed to be an average of 35 dB, discounting a high wind). The noise of any on-going snowmachining is likely to be louder than gravel mining and rock quarrying. On any given day, a train may stop to load rocks and gravel into metal hopper cars along a siding. Throughout the day, a visitor may experience other peak noise events, including the Alaska Railroad, rock drilling, and blasting. The railroad noise not associated with the project would vary from an estimated 97 dB (equivalent to, well, a locomotive) at the two sites along the track to around 54 dB (equivalent to a quiet residential street) at Center Creek Pass, but be of relatively short duration for the several times it passes through the area.

On rare occasions a siren will announce a dynamite blast(s) that may exceed 100 dB (equivalent to a jackhammer 7 feet away) for a second. Rock drilling can occur throughout the day, creating up to 69 dB (equivalent to a noisy office or street traffic) at the Spencer Lake rafting put-in location and even 50 dB (equivalent to a quiet restaurant) at Center Creek Pass. This level of noise may continue more or less at a constant level, swapping in one peak noise source for another given operational needs in gravel mining activity or rock quarrying, throughout the day until 10 p.m. at night. Only when all activities cease is a visitor likely to hear ambient environmental noise sources and levels assuming there is no snow machine activity.

The exact levels of noise produced by the different gravel mining activities will likely vary at many of the evaluation sites over the years as those activities “wander” across the full extent of the project site as necessary. It is understood that the noise levels would be lowest when activities are located farthest away from the evaluation site. There would be less variation across the years associated with rock quarrying since the quarry site is much more limited in area than available gravel.

For the remaining 189 days (or 78 percent of the 241-day non-peak recreation season) the loudest noises will be associated with snow machine use and the Alaska Railroad.

### **Alternative B**

A visitor would have nearly the same experience as with Alternative A. The number of trains stopping for loading may rise to three per week from two.

### **Alternative C**

A visitor would have nearly the same experience as with Alternative A, except their exposure to blasting would be 10 percent less of what would be experienced in Alternatives A and B.

### **Alternative D**

A visitor would have nearly the same experience as with Alternative A, except their exposure to blasting could be more than twice as long as in Alternative A. The number of trains stopping for loading may rise to three per week from two. Gravel mining activities may actually be a little noisier due to the use of onsite rock crushing in addition to the normal conveyor belts, sorting and loading activities.

### **Alternative E**

Because there are no anticipated scheduled gravel mining or rock quarrying activity, the predominant noise to be heard are snow machine use and the Alaska Railroad trains; the noise levels of both of these will rise to mask the ambient environmental noise at any of the eight evaluation sites with levels ranging from 54 to 85 dB. Outside of these windows, a visitor would have the option to remain quiet to hear the ambient environmental noise and sound of the river or engage in group activities, which would also mask ambient environment and river sounds.

### **Cumulative Effects**

This analysis attempts to address the cumulative impact of the estimated noise generated by the project features on other noise levels estimated at the site. The cumulative effects boundary includes the planned recreation sites at Spencer Glacier as displayed in Figure 3. As described in subsequent sections the principal other sources of noise at the site include the Alaska Railroad all year, the random noise of snow machine activity that may take place in winter and the few vehicles and human activities associated with rafting in the summer. It is the nature of noise and noise measurement that cumulative impacts of these other activities, with the possible exception

of the Alaska Railroad, probably do not constitute a significant cumulative effect above that generated by the project activities. That is, project noise will likely simply mask other noises rather than detectably add to those noise levels.

### **Summary of Effects**

The following summarizes the five alternatives based on the measures developed for Issue 2, the effects of mining operation noise on recreationists; including (1) mean any-one-time decibel level during the 124-day peak and 241-day non peak recreation season and (2) percent of total peak recreation and non peak recreations seasons that any of several noise sources is dominant.

- During the 124-day peak recreation season Alternatives A and C equally have the greatest potential to expose recreation visitors to the highest any-one-time noise event because of the possibility of blasting—although that is for a relatively very small proportion of the time. Excluding blasting, the four action alternatives appear more or less equal in terms of how a recreational visitor likely perceives the noise level from other gravel mining activities given the uncertainty in what project features, and how many, would be operating at any one time.
- Alternative C, with its fewer hours of daily activity and fewer operating days, would reduce the total time in hours that visitors would be subjected to gravel mining and rock quarrying noise by approximately 55 percent during the 124-day peak recreation season.
- All alternatives except Alternatives C and E would more or less equally represent a significant increase in the time that ambient environmental noise levels would be masked.
- Based on a combination of the above, a rank ordering of the potentials of the five alternatives to impact the ambient environmental noise during the 124-day peak recreation season would be Alternative A having the most impact, B, D or C having less but equal impact, and E having the least impact.
- During the 241-day non-peak recreation season, Alternative D would have the greatest potential to expose recreation visitors to the highest any-one-time noise event because of the amount of potential blasting. Excluding blasting, the four action alternatives appear more or less equal in terms of how a recreational visitor likely perceives the noise level from other gravel mining activities given the uncertainty in what project features, and how many, would be operating at any one time.

## **Scenic Quality**

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### **Affected Environment**

The Spencer Glacier area is located near the head of the Placer River Valley. The landscape is typical of the Turnagain Arm area with a broad flat glacial valley and very steep side slopes, a filled in fjord. Placer River meanders from side to side in the valley bottom. The valley bottom is mostly lush wetlands with grasses and sedges covering much of the area. On higher ground,

pockets of alder, cottonwood, and an occasional spruce tree break up the flatness of the valley bottom. The steep side slopes are covered in dense forest of spruce and hemlock, giving way to a band of alder, then alpine at about 1,500 feet elevation. Surrounding peaks are a mix of alpine-covered slopes, exposed rock, permanent snow fields and small glaciers. At the head of the valley is the Spencer Glacier and Lake. In winter, it is a landscape of white: snow covered from valley bottom to surrounding peaks. While still spectacular, the variety of colors and textures visible in summer are coated in snow and ice, presenting a landscape that excels in shades of grey, shadow patterns, and a crispness that only happens on cold clear days.

The major impact over the years is from railroad development. From the air or surrounding mountain tops, the line created by the railroad dominates the landscape, but when traveling along it, like a road, the impact is much less and provides the primary access route and viewing platform to the area (Figure 17). The Spencer area has been used for gravel and rock supply since the early 1900s. Except in areas mined in the last 10 years, the remaining disturbed areas are covered in alders with scattered cottonwood and young spruce established underneath. Unless walking through previously disturbed areas, there is little evidence of the amount of disturbance that has occurred over time. Even the old rock quarry face is not obvious until one gets within about 1000 feet. This is due to very broken face of the old quarry, the invasion of alders breaking up the face, and the natural weathering of the rock, reducing the contrast. The current area under a permit for gravel extraction, at the north end of the area being evaluated, has an open, disturbed area adjacent to the railroad tracks and is visible for a short time as the train passes. To the casual observer, most of the area appears natural.



**Figure 17. Spencer area as seen from the Alaska Railroad**

Over the broader Placer River Valley landscape, the area is inventoried as having high scenic integrity and the long-term scenery management objective is to retain the high scenic integrity of the Backcountry Management Area. In the immediate Spencer Glacier Area, the area identified for the Whistle Stop project has a Developed Recreation Complex management prescription, allowing for more intense development in foreground use areas, but the overall emphasis is to maintain the natural appearing landscape.

Slightly complicating scenery management in the area is the presence of several mining claims. These claims, when a plan of operations is approved, are guided by the Minerals Management prescription. This allows for significant change in the current landscape integrity. To date, the plan

of operations allows only minimal exploration and has resulted in little change in the scenery. If mining operations evolve into a production mode, there could be a significant change in the appearance of the landscape.

## **Environmental Consequences**

### ***Direct and Indirect Effects***

The primary difference among the alternatives with regard to scenery is the amount of area to be mined. However, overall disturbance at one time is limited with rehabilitation occurring continuously. As a result, unless noted, anticipated impacts are expected to be pretty much the same for all alternatives.

With all alternatives, except the No Action Alternative, there are 3 major potential effects on the scenery of the area:

- Impacts from the equipment, especially loading equipment
- Impacts to the scenery from removing vegetation and mining gravel
- Impacts from the quarry operations and creating a large, rock face

### **Impacts from Equipment**

In all action alternatives, the moving of gravel or rock to a common loading area is expected to be the same. The only difference will be the size of equipment needed for loading. Stockpiling and loading of gravel have the potential to create the greatest intrusion on the landscape.

The largest or tallest loading equipment anticipated is 110 feet tall and the stockpile associated would be approximately 100 feet high (Alternative D). All other alternatives propose lower loading or stockpile heights. To determine if proposed loading equipment would be visible from key viewing areas, bright red balloons were located at the approximate place where loading equipment would be set up (see Figure 18). These balloons were placed at 100 feet and 60 feet into the air. To also provide some scale, balloons were also placed at 400 feet in the air. It was a cloudy day but there was minimal wind, so the balloons did not drift.

Photos were then taken from 4 key view points within the Spencer Glacier Whistle Stop area (see Figure 19). These points were the Whistle Stop Station, the rock viewing area adjacent to Spencer



**Figure 18. Three-foot diameter red balloon used to evaluate visibility of gravel extraction equipment from key viewpoints at Spencer**

Lake, the raft/canoe put-in used by the outfitter guide and from a raft floating the Placer River. In all cases, the 60-foot and 100-foot balloons were not visible. The balloon located at 400' was visible from all sites.



**Figure 19. Aerial photograph displaying balloon location in relation to key viewpoints at Spencer**

A combination of circumstances contributed to the balloons not being visible. The most important factor is that the site is essentially flat. Combined with the height of the vegetation and the distance between viewing points and the proposed loading areas, the largest stockpile and loading conveyor will not be visible from the key viewing points at the Spencer Glacier Whistle Stop. However, as people pass the loading area on the train, the loading conveyor and stockpiles will be visible for a brief time and the site will have an industrial look.

### **Impacts from Gravel Extraction**

Removal of the vegetation and extracting gravel would create a noticeable change in the large-scale landscape. There are no large, naturally occurring exposed gravel areas in the landscape of

Placer Valley. From higher elevation viewpoints, the gravel operations would be very noticeable. From the train, the openings created would potentially be visible as the train passes. From the Spencer Glacier Whistle Stop, planned developments are located away from the southern edge of proposed extraction areas of all alternatives, providing adequate screening. The openings created would not be visible unless one wanders into the gravel extraction area. The flat nature of the landscape and the thick underbrush and cottonwood, provide good screening. All the alternatives require rehabilitation after each 25 acres of extraction. While the impact would move about on the site as gravel extraction progresses, the overall impact would be limited to the current extraction area and areas newly rehabilitated, reducing the overall footprint and impact. The way vegetation grows in the area, after 5 years, areas rehabilitated would still be noticeable from the air or higher elevation viewpoints but starting to blend back into the landscape when viewed from the train.

### **Impacts of Rock Quarry**

The rock quarry is the one element that has the potential to dominate the viewed landscape. The rock outcrop that is proposed for quarrying is close to the developments in the Spencer Glacier Whistle Stop. It does not currently dominate the immediate viewshed. Currently, the face is not very large, has adjacent natural exposed rock outcroppings, has weathered (reducing the bright contrast typical of newly exposed rock), and is broken by invading alder.

In all action alternatives, the removal of the rock as proposed would increase the exposed rock and be noticeable from the viewing and raft put-in areas at the Spencer Glacier Whistle Stop. However, under the reclamation plan, the rock quarry face will be artificially weathered to blend with the surrounding rock.

The proposed rehabilitation plan incorporates many elements that will reduce the impact on scenery over time. Design elements such as shaping, slope flattening, rock weathering, and revegetation are all critical elements in reducing the change in the scenery, returning it to a more natural appearance. The addition of ponds into the landscape is generally a positive feature. From a scenery perspective, rehabilitation, with or without ponds is most important.

### **Cumulative Effects**

Cumulative effects were assessed on the same area as displayed in Figure 19 because this is the only area with any past, present, or planned activities that could affect the viewed landscape. There has been gravel and rock extraction for about 100 years. None of this area was reclaimed and, as a result, there are still impacts on the scenic integrity from these prior activities. With a planned duration of 15 years, and potentially longer, the impacts on scenery from the proposed gravel extraction would be a continuous presence in the Spencer Lake area. There would be a continuous snaking of extraction areas, newly rehabilitated areas, and recovering areas within the project area. Adjacent recreation developments associated with the Spencer Glacier Whistle Stop and other whistle stops are anticipated to continue with additional trails and recreation facilities



being constructed. Aside from a long, continuous presence, the cumulative impact to scenery is expected to be relatively low due to the limitations on openings and the requirement for rehabilitation.

It is expected that this project, along with the current and planned recreation developments, would gradually change the scenic integrity of the foreground at Spencer to a more developed nature in the short term. This change is consistent with the scenic integrity objectives for the Minerals Management prescription and the Developed Recreation Complex management prescription. However, there may be some deterioration of the scenic integrity objectives for the Back country Management Area from points where the “seen area” would include views of the Spencer Mineral Materials project area during the next 15 years.

### ***Summary of Effects***

Overall, the effects of the proposed gravel extraction would be most visible from locations above the valley floor. The gravel operations would be hidden from most recreationists using the developed facilities at the Spencer Glacier Whistle Stop. Visitors riding the Alaska Railroad may be able to see the gravel operations from the train briefly. Limitations on the size of disturbance areas and specific elements of the reclamation plan would limit the impacts of the gravel operations on scenery. However, the rock extraction area would be very visible from several key recreation sites at Spencer until such time that the rock face is reclaimed. Cumulative effects from the gravel and rock extraction along with other on-going activities are expected to be minimal in the long term due to rehabilitation of disturbed areas. As a comparison, the current disturbed area at the site of the previous mineral materials site is about 10 acres and the disturbed area at the current ARRC siding is about 25 acres.

## **Recreation**

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### **Affected Environment**

#### ***Summer Use***

Spencer Lake and Glacier are considered outstanding recreation sites. Due to the lack of public roads and trails, the Placer River Valley has historically been relatively inaccessible to the majority of Chugach National Forest visitors. Access was either strenuous or costly. Visitors to Spencer were limited to those viewing from the Alaska Railroad trains or those using the services of outfitters and guides. A few hunters and fishermen came up the Placer River in motor boats. There were no recreational facilities and the Spencer area provided a backcountry recreational experience with few encounters with other visitors. However, through the public involvement process during Forest Plan revision this site was recognized as a valuable recreation site and was identified as a future Developed Recreation Complex.

The main avenue for transportation through this corridor is the Alaska Railroad (ARRC). The ARRC conducts daily passenger trips throughout the area during summer months only. Currently

the Alaska Railroad conducts daily business, carrying both freight and passengers, throughout the project area multiple times per day. In terms of passenger business, up to three trains per day visit the project area during the summer months: The Coastal Classic and Glacier Discovery both operate daily from mid-May to mid-September and a train chartered by cruise ship companies periodically traverses the project area. The only train that currently stops at Spencer and drops off visitors is the Glacier Discovery Train. As of 2007, the total number of train riders was 28,138 or about 228 people a day. The Railroad only allows the public to disembark the train at Spencer to access the Chugach National Forest backcountry due to safety concerns associated with people walking along the tracks.

Independent of railroad access, during the summer recreationists have the ability to access the Placer River area by boat, by airplane or helicopter, and by foot through cross-country travel. Non-guided boat use on the Placer River has never been quantified, but anecdotal information indicates that use is low (less than five boats per day). Use is even rarer until mid-August when fishing opportunities increase and in September when duck hunting begins (personal communication, S. Stash, 2005). Outfitter/guide boat use on the Placer River, while occurring, is infrequent. Fewer boats travel up the Placer towards Spencer Lake, possibly because fish populations are higher on the lower Placer River. Access by air and by foot does occur, however, these modes of access have not been quantified in this area. Due to a lack of developed infrastructure (e.g., trails), and the remote nature of the area, foot traffic is believed to be extremely low (with encounters less than 1-2 parties per day) throughout the area, consisting of hunters, anglers, and rugged backcountry adventurers.

With the approval and construction of the Spencer Glacier Whistle Stop (see Figure 3), the Spencer area will be accessible to many more visitors. The Alaska Railroad now drops recreationists at the Spencer Whistle Stop for visits from a few hours to several days. Recreational developments will include trails, campsites, a viewing platform, public use cabins, restrooms, and educational kiosks. The facilities will accommodate large numbers of people and visitors of all abilities. An estimated 244 visitors exited the train at Spencer for the Spencer Glacier hike in 2007<sup>5</sup>. Use is expected to increase in future years as the Spencer Whistle Stop becomes better known. The recreational experience is expected to be more of a developed recreation experience with greater comforts and less solitude. This change is consistent with the long-term management direction for this local area.

Five outfitters and guides currently operate in the project area during the summer providing services including rafting, canoeing, hiking, fishing, flightseeing, and motorized boat-tours. In 2007, outfitter/guide use was reported to be about 2,986 user days, up from 2,595 user days in 2006. Visitors may now enjoy a wider range of recreational activities including hiking, kayaking, camping, fishing, and wildlife viewing without employing the services of outfitters or guide if they so choose.

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<sup>5</sup> Note: Unguided hikers were not able to exit the train at Spencer until August of 2007.

## **Winter Use**

While the ARRC will only be providing summer access to the Spencer Glacier Whistle Stop and greater Whistle Stop project area, there is the possibility for winter recreation use to increase due to potential future recreation infrastructure (e.g., public-use cabins), which in turn may ultimately result in transportation of passengers during the winter months. Therefore, it is important to assess the status of winter use in the project area.

As with many areas of Alaska, recreation use in the Spencer area increases in the winter due to a firm snowpack and frozen waterways. There is evidence of snow machine and backcountry ski use throughout the entire Placer River drainage from November – April (except for the Skookum Glacier Drainage, which closes to motorized use April 1) as well as the Trail Creek drainage. Both independent and guided snow machine use has been documented not only in the Placer Valley, but also throughout the numerous drainages and glaciers (such as Spencer Glacier) in the valley). Motorized snow machine use is dictated by snowpack. If the snow depth is not sufficient to protect area resources, the entire Placer River Valley is closed to snow machine use until there is adequate snow cover.

Helicopter-assisted skiing also takes place in various locations throughout the Placer River Valley, generally from January to April. There is potential for the Alaska Railroad to run winter trips to the Spencer area for nonmotorized users such as skiers. Six outfitters and guides operate in the project area during the winter, providing services including snowmobile tours, skiing, heli-skiing, and flightseeing.

## **Environmental Consequences**

### ***Direct and Indirect Effects***

The Spencer Mineral Materials proposed action and alternatives have the potential to affect recreationists primarily during the peak summer recreation season (May 15 to September 15). There is less potential for effects to recreationists during the non-peak recreation season due to the low number of visitors present. Increased noise, traffic, dust, presence of industrial equipment, and signage may adversely impact the quality of the recreational experience depending on the sensitivity and expectations of the visitor. Gravel mining operations have been permitted in Portage Valley for several years in close proximity to developed recreation facilities. The Glacier Ranger District has reported no complaints from campers or other recreationists regarding the mineral materials operations. These facilities are located in a roaded natural setting along a paved highway. Similar to the Portage Valley setting, the Spencer area has the same Developed Recreation Complex management prescription. Thus, the recreational experience is expected to be more of a developed recreation experience with greater comforts and less solitude. This change is consistent with the long-term management direction for this local area.

This report analyzes the following factors that have the highest potential to effect visitors recreating in the greater Spencer area:

- The type of mining activity (removal of gravel or rock)
- Location of mining activity and progression of operations (proximity to recreation facilities and areas of visitor use)
- Season and hours of gravel operations
- Season and hours of rock quarry operations (drilling, blasting, and removal/transport of resources)

The location and spatial extent of the activities were displayed previously in Figures 5, 7, 9 and 11. The timing and duration of the various minerals activities are displayed in Table 10 below.

**Table 10. Timing and duration of various minerals operations for the Spencer mineral materials project under each alternatives**

<b>Mineral Activity</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>	<b>Alternative E</b>
Gravel Operating Season	5/1 – 10/31	5/1 – 10/31	5/1 – 10/31	4/15 – 10/31	N/A
Total days of gravel operations	184	184	131	184	0
Days during peak recreation season	124	124	71	124	0
Hours per day during peak recreation season	16	16	10	16	0
Days during non-peak recreation season	60	60	60	76	0
Hours per day during non-peak recreation season	16	16	16	16	24
Blasting Season	5/1-5/25 & 9/15-10/31	9/15-10/31	5/1-5/25	4/15-5/15 & 9/15-11/30	N/A
Total days of blasting operations	71	76	25	106	
Days during peak recreation season	10	0	10	0	0
Hours per day during peak recreation season	16	0	5	0	0
Days during non-peak recreation season	61	76	15	106	0
Hours per day during non-peak recreation season	16	16	16	24	0

**Alternative A**

Alternative A would have the greatest initial impact to the recreation experience due to the planned commencement of gravel removal immediately adjacent to the Spencer Glacier Whistle Stop and the Spencer Glacier Developed Recreation Complex area and related facilities. As gravel removal proceeds in a northerly direction, the overlap and encroachment with developed recreation facilities would diminish and the impact to the recreation experience would lessen.

Additionally, with gravel operations initially situated adjacent to recreation facilities and areas of visitor concentration, risk of visitors accidentally wandering into the mineral operation area is highest under this alternative. It may be difficult and expensive to ensure visitor safety.

Under Alternative A, the length of the gravel operating season includes the entire 124-day peak recreation. Operations would be allowed for up to 16 hours per day. Thus, there is the potential on any given day for recreationists to be impacted by operations. The greatest impact is expected to be noise as discussed previously in this document. However, no nighttime operations would be allowed and there would be quiet for 8 hours each night.

Operations could also occur on a total of 60 days during the spring and fall non-peak seasons. Fewer recreationists are expected to be affected at this time, primarily hunters or fishermen. Mineral operations may preclude use of the area by some hunters.

Operations at the rock quarry have the potential to generate the greatest effects on recreationists and the recreation experience throughout the greater Spencer area. This is due to the relative proximity of the rock quarry operations and the developed facilities found throughout the Spencer Developed Recreation Complex area. Alternative A includes two blasting periods: May 1 – May 25 and September 15 – October 31. Blasting at this time would have limited effect on Whistle Stop visitors as train service begins in mid-May and is generally complete by mid-September. However, the fall blasting season has the potential to impact recreationists engaging in activities such as fishing and hunting.

Alternative A would permit operations at the rock quarry from May 1 – October 31 for rock sorting and hauling. As noted above in earlier discussion, this season overlaps entirely with the peak recreation season (mid-May to mid-September). Alternative A also specifies that work at the rock quarry may take place between the hours of 6:00 a.m.-10:00 p.m. (Rock quarry work consists of sorting and transporting of quarry rock.) This schedule of operations would likely create a noticeable impact to the visitor experience in the general Spencer area as the rock quarry is situated in relative proximity to the majority of the existing and planned recreation facilities. Recreationists hiking the Spencer Glacier Trail and spending time at the Spencer Lake viewing platform would be able to both see and very possibly hear operations occurring at the rock quarry.

### **Alternative B**

Alternative B would have a moderate impact to the recreation experience because gravel removal would occur only on the west side of the Alaska Railroad tracks. While removal of gravel would not directly impact the developed recreation facilities in the Spencer area, there is the potential that the operation would impact recreationists traveling or recreating along the Placer River. Due to the planned removal of gravel from the west side of the tracks, this alternative would have the lowest risk of visitors accidentally wandering into areas with active mining operations. This alternative would be the least difficult and costly to ensure public safety.

While the planned removal of gravel would be on the east side of the Alaska Railroad tracks, gravel operations would begin on the north end furthest from developed recreation facilities. In future years, with the continued progression of gravel removal to the south, there may be an increasing impact to area recreationists as operations encroach upon the developed recreation facilities adjacent to the Spencer Glacier Whistle Stop.

The length of the gravel-operating season and the hours of operations are the same as under Alternative A and effects are expected to be the same as discussed above.

The rock-blasting season for Alternative B is from September 15 – November 30, therefore it could potentially impact the fall recreation outlined above as well as early season winter recreation such as snow machine use and backcountry skiing. However, there would be no impacts from blasting during the peak recreation season. Alternative B would allow the same operating season and hours for rock sorting and hauling at the quarry as Alternative A. Effects would be the same as described above.

### **Alternative C**

Alternative C is also expected to have a moderate effect on the recreation experience. Although the minerals extraction would occur only on the same side of the railroad tracks as the Spencer Whistle Stop and Developed Recreation Complex, the two areas are well separated. An old levee would provide a visual and sound barrier. Alternative C would have a low risk of a visitor accessing the gravel operations area and would be less costly and easier to provide for public safety. Public safety has the potential to be more easily compromised as gravel removal moves south and closer to developed recreation facilities in the Spencer area. However, gravel extraction under Alternative C never reaches the Developed Recreation Complex and utilizes the old levee as a physical barrier between recreation sites and minerals operations.

Under Alternative C, the length of the gravel-operating season includes the entire 124-day peak recreation. However, operations would be restricted to a maximum of four days per week. Operations would occur on non-peak recreation days and would not be allowed on holidays. Operations would be allowed for only 10 hours per day. Thus, there would be a minimum of three days per week that recreationists would not be affected by many sights and sounds of active mineral operations. During holiday weeks, four or more days may be restricted from operations. Again, no nighttime operations would be allowed and there would be quiet for 14 hours each night.

Operations could also occur for a total of 60 days during the spring and fall non-peak seasons. Fewer recreationists are expected to be affected at this time, primarily hunters or fishermen. Mineral operations may preclude use of the area by some hunters.

Alternative C, with a 25-day blasting season, creates the least overall impact to recreationists from this activity. However the May 1 – May 25 blasting season would overlap with the peak recreation season for 10 days and could impact National Forest visitors engaging in activities

such as spring hunting, backcountry skiing and snow machine use (if the area is still open to winter motorized use past the normal closure date of May 1). Additionally, the opening of Whistle Stop service via the Glacier Discovery Train is typically the second half of May. Therefore, a blasting season that includes dates within the second half of May does have the potential to disturb visitors utilizing early season Whistle Stop services.

In Alternative C, operations at the rock quarry may take place between 8:00 a.m. and 1:00 p.m., during the time period of May 1- October 31. The reduced hours of operation would lessen the impact to area recreationists with effects mainly felt by overnight visitors since the train doesn't drop off passengers until early afternoon. Initially, the number of overnight visitors is expected to be small, yet the operation of mechanized equipment has a high potential for negatively impacting the recreation experience expected at Spencer Lake in particular. If, in the future, the train schedule is modified to include multiple daily drop-offs at the Spencer Glacier Whistle Stop, there is the greater potential for effects to both day and overnight users in the greater Spencer Lake area. Additionally, as described above, there will be impacts to visitors recreating in the area during the spring and fall seasons.

### **Alternative D**

Alternative D also has a moderate potential to affect recreationists as it would allow extraction of gravel from the same areas as Alternatives B and C combined. While the location for commencement of gravel removal in Alternative D has yet to be established, the possibilities are similar to Alternatives B and C, resulting in a moderate impact to area recreationists as described above. Effects to public safety are also similar.

Under Alternative D, the length of the gravel operating season includes the entire 124-day peak recreation. Operations would be allowed for up to 16 hours per day during the peak recreation season. Effects are the same as discussed above for Alternative A.

However, during the non-peak recreation season, operations would be allowed for a total of 76 days. There would be no nighttime quiet hours and operations would be allowed up to 24 hours per day. During the non-peak recreation season, there would be no quiet hours each night. The recreationists who would be most impacted by the expanded hours of operation in this alternative are those who enter the area via boat, helicopter, or means other than the railroad, both early and late season and would be engaging in activities such as fishing, hunting, snowmachining and skiing.

Alternative D, with a blasting season of 106 days, would likely have the greatest effect on area recreationists. The spring (April 15 – May 15) and fall/winter (September 15 – November 30) blasting seasons would have impacts to visitors similar to those described for Alternative B and C above.

Alternative D identifies an expanded season of operations at the rock quarry, encompassing the spring and fall/early winter seasons. This would create additional potential impacts to recreationists as noted above in previous discussions.

In addition, Alternative D includes 24-hour-a-day operations at the rock quarry from April 15 – May 15 and September 15 – November 30. Therefore, with implementation of Alternative D, Spencer area recreationists would be impacted during the spring, fall, and early winter as described in discussions above.

### **Alternative E**

Alternative E would have no effects on recreation at this time.

### **Effects from Reclamation Plan**

The reclamation plan for this project has the potential to enhance recreation opportunities in the future, specifically with the development of ponds (see Figure 22 in Appendix A). These ponds are included to reestablish the kame and kettle topography characteristic of the site. The ponds would be connected to the Placer River and would provide clear water habitat for fish rearing and other wildlife use. At this point, there are no plans to construct trails to any of the pond locations. Nonetheless, absence of trails does not mean that ponds would not be utilized by both adventurous travelers as well as those accessing the area via the Placer River. Therefore, the pond development may benefit various users such as fishermen, hunters, and wildlife viewers. Ponds developed on the west side of the tracks (Alternatives A, B and D) could benefit those people accessing the area by water (Placer River). Ponds developed on the east side of the tracks (Alternatives A, C and D) could benefit those accessing the area via the Alaska Railroad. Alternatives A and D, which identify pond development on both the west and east sides of the track, have the greatest potential benefit to recreationists due to multiple pond locations.

### **Effects Common to All Action Alternatives**

Each of the action alternatives has the potential to produce the effects described above on the recreation experience in the greater Spencer area for up to 15 years. The permitted operations could be renewed for subsequent 15-year periods based on successful performance and demand for materials.

Additionally, development of rail spurs at various locations in the Spencer area has the potential to provide increased and enhanced access to key area recreation sites, including Spencer Lake and trails leading to Spencer Glacier both during and after project implementation.

### **Cumulative Effects**

Other existing or potential future projects could affect the recreation and special uses resources in the greater Spencer area over the next 15 years. Several recent and reasonably foreseeable projects are expected to increase recreational use in the Spencer area including the Whistle Stop project, outfitter/guide permits, possible recreational development on State lands at Grandview,



and dispersed winter recreation. Placer mining operations on the existing placer claims within and immediately adjacent to the Spencer Developed Recreation Complex have potential for additional impacts in terms of increased noise and visual impacts that are not as aesthetically pleasing or in character with a backcountry experience. These types of disturbances could add to any impacts from the Spencer Mineral Materials project resulting in a less enjoyable experience for recreationists. An increase in recreationists combined with an increase in placer mining activity has the potential for increased conflict between these two uses. While an expansion of placer mining activity will have limited impact on recreation activity (i.e., the areas of mining activity will not greatly diminish opportunities for recreational pursuits), there will be some degree of impact to visitor safety. Visitor safety may be compromised in a number of ways, including the potential for visitors accessing improperly signed areas of reclamation, the possibility of visitors accessing operating areas, and the chance that visitors are not made aware of blasting operations.

### ***Summary of Effects***

The primary effects to recreation from the proposed action or alternatives would result from increased noise related to the gravel and rock quarry operations with blasting and drilling having the greatest overall impact (refer to the Noise section of this document for a summary of those effects).

Overall, Alternatives A and D have the greatest potential to effect area recreationists. Alternative A would have the greatest effects during the peak recreation season due to the proximity to the Spencer Glacier Developed Recreation Complex and long operating hours for all types of operations. Alternative D would have the greatest impacts during the non-peak recreation season due to the extended operating seasons for both gravel operations and rock blasting, as well as the extended hours of operation for gravel and blasting during the off-season. Alternative B would have less effect on recreationists due to the more advantageous location of gravel operations and the reduced blasting season. Alternative C would have the least effects to recreationists of all the action alternatives. This is due to the more beneficial location of gravel operations, progression of gravel operations, the condensed season for rock blasting, and the reduced operating hours for gravel and rock quarry operations during the peak recreation season.

Providing for public safety would be simplest and least costly under Alternative C since recreational use would have the least overlap with the minerals operations. Under Alternative A, provisions for public safety would be most challenging due to the length of the operating season, the long hours of operation, and the spatial extent and proximity of the operations.

Upon completion of the quarry operations, some benefits for recreationists are expected from the development of ponds for fishing, fish viewing, and wildlife viewing. The construction of rail spurs may provide improved access to recreational developments for a wide range of users and abilities.

## **Heritage Resources**

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### **Affected Environment**

Surveys identified known heritage sites within the area of potential effect (APE), including historical remains associated with the Alaska Railroad. Evidence of prehistoric remains is not expected within the project area, primarily due to recent deglaciation of the terrain. Evidence of historic use of the area is confined to the twentieth century.

The area is attributed ethnographically to the Athabaskan speaking Tanaina. While resources harvested by the Tanaina are located within the project area, including moose and bear, as well as the cambium (gum) of spruce and the bark of birch and cottonwood (Mattson et al. 1979), no evidence of prehistoric sites was discovered.

The Tanaina utilized areas such as this one temporarily to hunt, building small brush/branch structures (Mattson et al. 1979). Today, there may only be subsurface evidence of any hunting forays they may have undertaken in the area. Due to recent deglaciation, evidence of their use of the area would likely be limited to the mountain slopes that form the east boundary of the project area.

Placer mining became a significant enterprise in the Kenai Peninsula in the late 1800s. However, counter to what its name might suggest, little mining took place along the Placer River (Sleem 1910). Mining was limited to prospecting of fine-grained gold above Spencer Glacier and, more recently, suction dredging (Jansons et al. 1984). Historically, there were no “diggings” or lode mines. Today, the P.R. Mine operates within the project area, as evidenced by their large rock quarry. Other evidence of modern mining activity was noted (ref. 9. b.). Historic placer prospects would likely be located within the floodplain of the Placer River or other stream courses draining from the mountain.

The Alaska Railroad has left an indelible mark on the landscape within the project area. The railroad bisects the project area, and both the associated Spencer Siding (ca. 1915) and levee are within the project area. Gilliam (1998) noted that the levee was constructed in 1917 to prevent inundation of the railroad. Railroad-associated remains are expected to be located along the rail corridor, and within and in the vicinity of the siding and levee. Specifically, a 1919 water supply station once stood at milepost 56. In addition, the Iditarod National Historic Trail generally follows the route of the railroad.

Eighteen cultural features are located within the project APE especially in close proximity to the railroad. Features found further west towards Placer River are flotsam in nature and reflect the past condition of the project area. Much of this project area has been subject to numerous flood events.

Both previously recorded and newly recorded archaeological sites will be identified to the project administrator for avoidance by project activities using the standard resource protection measures. Any proposed project boundary changes will be subject to a case-by-case review for Section 106

compliance needs and documentation. There is also a possibility that cultural resources may be present and were not located during survey due to dense vegetation, deadfall, and/or topographic constraints. In the event that cultural remains are discovered during the course of the project, they would remain undisturbed and must be reported immediately to the District and/or Forest Archaeologist.

## **Environmental Consequences**

### ***Direct and Indirect Effects Common to all Alternatives***

The CNF Heritage Staff has reached a finding of “no historic properties affected” for the Spencer Mineral Materials Project with the stipulation that documented cultural resources would be avoided during the proposed minerals extraction and related activities. If the cultural resources cannot be avoided, then a determination of eligibility must be completed for each site and the effects assessed.

### ***Cumulative Effects***

Because there are no direct or indirect effects, there would be no cumulative effects to cultural resources from implementation of any of the alternatives.

## **Watershed**

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### **Affected Environment**

The Spencer mineral materials project area lies within the Placer River watershed (approximately 80,700 acres). The lower Placer River watershed receives about 60 inches of annual precipitation, with up to 140 inches falling annually in the high-elevation glaciated areas. The average March 1 snowpack in the valley floor is about 40 to 75 inches. About 37 percent of this glacially sculpted watershed is currently covered by glaciers, including the Spencer, Bartlett, and Skookum Glaciers. These glaciers are receding, and Spencer Lake has formed at the terminus of Spencer Glacier within the last 55 years.

The Placer River is a large glacial river draining the Spencer Glacier and Spencer Lake. This glacial system is dynamic, with high sediment loads and braided channels. Glacial outwash deposits exist to the west and northwest of Spencer Lake and in the lower Placer Valley floor. Over time, the Placer River channel downstream of the railroad bridge has shifted from a braided system to a single, meandering channel. The outlet of Spencer Lake has remained relatively static, as the channel is incised into an old terminal moraine.

Numerous high gradient contained streams exist in the headwaters and sideslopes of the watershed, and numerous low gradient palustrine channels exist in the flats of the lower Placer Valley. Palustrine wetlands are also widespread throughout the valley floor of the Placer Valley. Small palustrine wetlands are found scattered in the area around Spencer Lake.

Stream flows in the Placer River are controlled by glacial melting, with peak flows occurring between late June and early August and a potential for high-magnitude floods. Non-glacial streams, draining smaller basins and hillslopes in the Spencer area, generally peak in June, with less severe floods. All streams in the area can experience high-magnitude, short-duration floods during fall rains. The Placer River is highly turbid from glacial sources, with high sediment loads that increase during times of high flows. Human uses have had little effect on water quality in this watershed, although the motorized railroad corridor presents a risk of water quality impairment.

## **Environmental Consequences**

### ***Direct and Indirect Effects***

The proposed Spencer Mineral Materials project would have limited effects on water resources and hydrologic processes in the Placer River Watershed. The outwash plain of the Placer River in the proposed mineral extraction area is a naturally dynamic area, with natural changes occurring as the Placer River adjusts and glacial recession continues.

Potential water quality effects of the gravel extraction operations under all action alternatives include possible increases in turbidity of surface water. Surface water runoff is limited by the porous nature of the glacial outwash gravels covering this area, although large storm events can produce runoff from the small drainages on the eastern valley side. With the application of mitigation measures and applicable best management practices (BMPs), groundwater outflow will be filtered by the ground substrate, and any surface water outflow that does occur from the gravel extraction ponds will carry little sediment. Any impacts of these effects on the Placer River would be low because of the naturally high glacial turbidity present in the river. The potential risk of water quality impacts by alternative increases with the size of the gravel extraction operation and the proximity of the operations to the Placer River or other streams. Any increases in turbidity are not likely to violate Alaska State water quality standards (Alaska Department of Environmental Conservation 2006).

The quantity of surface water runoff could increase as a result of decreased uptake of water from vegetation in the mineral extraction area and increased groundwater flow rates from groundwater ponds. These effects could cause a very small increase in water quantity in the Placer River, and a moderate increase in the water quantity in the small stream flowing north out of the eastern gravel extraction area. Flow regime changes in this stream could have short-term effects in terms of channel stability.

Channel morphology would not be directly impacted by the gravel extraction operations. Gravel extraction west of the railroad would lower the terrace to floodplain level, increasing the available meander belt width of the Placer River. This could present a possible risk of channel capture of any areas excavated to a lower elevation by gravel extraction. Gravel extraction east of the railroad would have no effect on channel morphology of the Placer River.

The proposed gravel extraction operations are likely to have little impact on existing wetlands and floodplains. Much of the area proposed for gravel extraction consists of well-drained alluvial outwash gravels on abandoned glacial channels and river terraces. No mapped wetlands exist within the eastern gravel extraction area, and gravel mining in this area would not impact wetlands. Mapped palustrine wetlands exist along the northern portion of the western gravel extraction area. Under Alternatives A, B, and D, palustrine wetlands would be impacted by gravel mining operations. However, the proposed reclamation plan would create ponds and channels, ultimately increasing the amount of wetlands in both of the gravel extraction areas.

Floodplains exist along the existing channel of the Placer River, but no gravel extraction is proposed in these floodplains. The proposed gravel extraction areas are all located on higher glacial outwash surfaces or alluvial terraces. These are essentially old floodplains that were abandoned as the Placer River incised into the glacial outwash. Gravel extraction on the west side of the railroad under Alternatives A, B, and D could potentially lower the ground surface to the level of the existing floodplain, increasing the amount of floodplain available to the Placer River.

### ***Cumulative Effects***

Cumulative effects for this analysis were assessed on the Placer River watershed. Cumulative effects of this project over the next 15 years along with other past, present, and foreseeable projects and activities in the Placer River watershed are expected to be limited. The Spencer Mineral Materials project in conjunction with the activities listed previously on page 33 would have limited cumulative effects on the Placer River watershed. These activities will not affect the quantity or timing of surface waters. Water quality is a potential concern in the Spencer Lake area, where the heaviest use will occur. Numerous uses in addition to the mineral extraction are proposed in the Spencer area, including use from trail users, large camping areas with considerable ground disturbance, structures, rafting operations, and motorized use. Although these uses have the potential to degrade water quality in nearby streams and lakes from sedimentation caused by ground disturbance, the Placer River and Spencer Lake are not sensitive to these effects because of the coarse gravel substrate and the high sediment loads naturally present from glaciers. Potential effects to channel morphology include bank erosion from trampling and loss of riparian vegetation. By following BMPs, these cumulative effects are likely to be minor, with the potential for isolated areas of eroding banks and other localized impacts.

### ***Summary of Effects***

Direct, indirect, and cumulative effects to water resources from this project are expected to be negligible.

## Fisheries

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### Affected Environment

The proposed Spencer Mineral Materials Project would exist entirely within the Placer River watershed. The watershed contains 69 miles of Class I streams (streams containing anadromous fish), 11 miles of Class 2 streams (streams containing only resident, non-anadromous fish), and 51 miles of Class III streams (streams with no fish) (Figure 20). The primary water bodies in this watershed include Placer River, Skookum Creek, Spencer Lake, and Luebner Lake. Spencer Lake, Placer River and Skookum Creek are highly glacial, whereas Luebner Lake is much less turbid. Additionally, many smaller streams and sloughs fed primarily by groundwater, springs, and snow melt provide valuable clearwater spawning and rearing habitat in the drainage.

Indigenous fish species important to recreational and commercial fishing in the watershed include sockeye salmon (*Oncorhynchus nerka*), chum salmon (*Oncorhynchus keta*), pink salmon (*Oncorhynchus gorbuscha*), coho salmon (*Oncorhynchus kisutch*), and Dolly Varden char (*Salvelinus malma*) (Browning 1976; Krueger 1977; Johnson et al. 2004).

### ***Sensitive, Threatened, and Endangered Species***

Several of the fish species present in this watershed are threatened or endangered in parts of their historical range – primarily the Pacific Northwest. However, none are federally listed as threatened, endangered, or sensitive in the Placer River watershed or Southcentral Alaska. Nonnative fish species have not been introduced or located in the watershed or surrounding areas.

### ***Aquatic Habitat***

Aquatic habitat in the watershed ranges from productive groundwater-fed sloughs and channels located along the lower Placer River to less productive high gradient upper valley channels characteristic of the smaller tributaries. The Placer River is the largest stream in the watershed but probably serves primarily as a migration corridor to more productive clear tributaries, ponds, lakes, and sloughs.

Aquatic habitat surveys conducted by Browning (1976), Krueger (1977), and Nelson (1985) found that the larger primary channels of streams in the area provide little spawning habitat for anadromous fish due to large amounts of glacial fines, large cobble, and boulder substrates. However, these areas provide juvenile fish with excellent rearing and overwinter habitat during low flow periods (late fall through spring) when suspended sediment loads are low. Further, the authors reported that quality spawning habitat and spawning fish were more common in the less turbid secondary and tertiary streams. Based on their minnow trapping results, these smaller streams also provided excellent rearing habitat for juvenile fish.

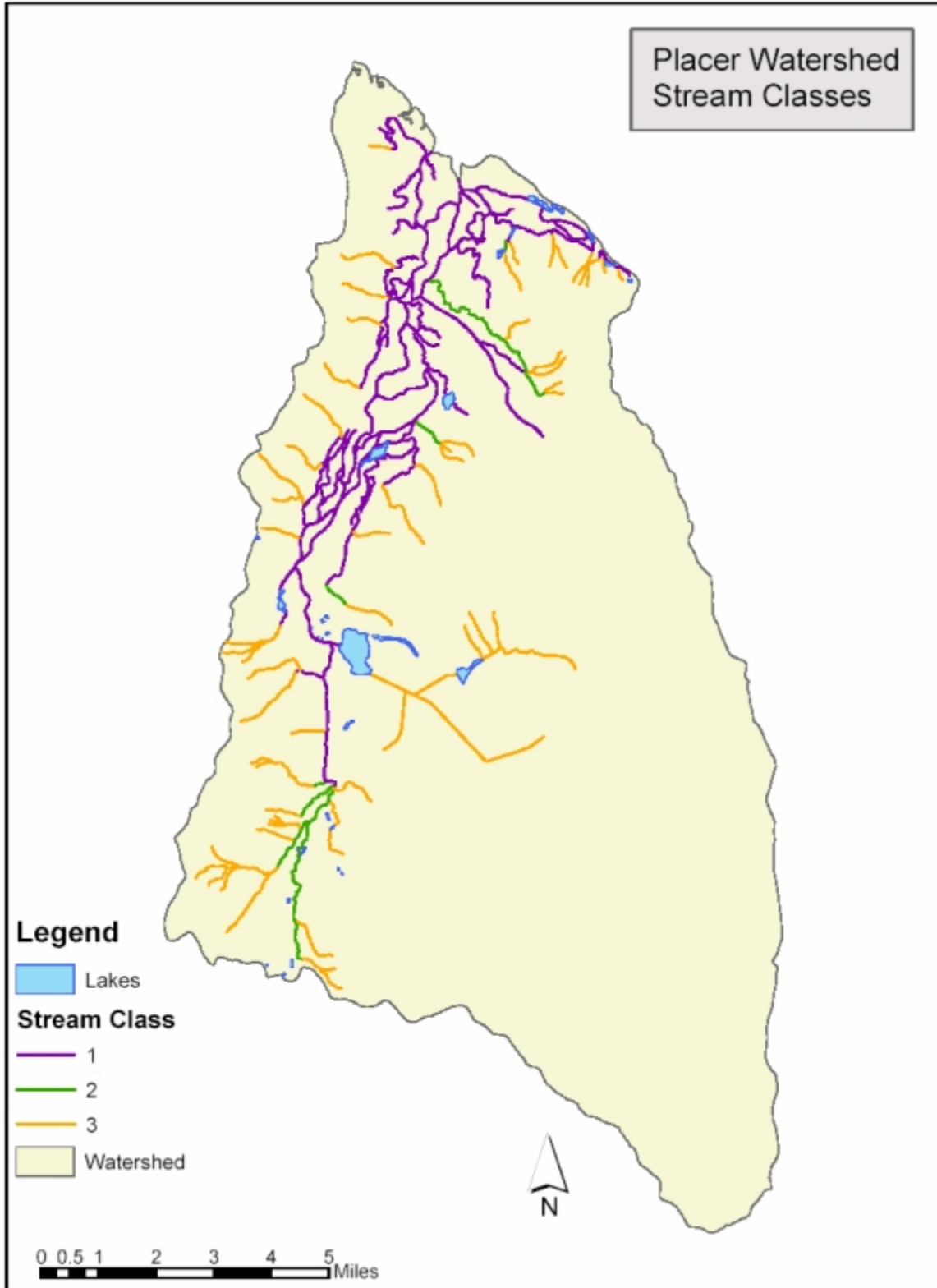


Figure 20. Stream Class designation and location in the Placer River watershed. Class 1 contains resident and anadromous fish species, Class 2 contains only resident fish species, and Class 3 has no fish species.

## ***Fisheries Management***

The Placer River watershed is located within the Chugach National Forest and is managed primarily under the Backcountry Area prescription, except for an approximately one-half-mile section of the lower Placer River and a small quantity of land adjacent to Spencer Lake. The lower Placer River is part of the Fish, Wildlife, and Recreation prescription of the Forest Plan and does not overlap with the Spencer Mineral Materials Project. Additionally, a section of land adjacent to Spencer Lake has been defined as a Developed Recreational Complex but does not overlap with the Spencer Mineral Material Project. Under the Backcountry Area prescription, fish and wildlife habitat improvements may be present but accomplished in a manner that blends into the area's natural features. Currently, because the Placer River watershed is relatively unimpacted by anthropogenic activities, the Chugach National Forest is not engaged in any active management of riparian and aquatic habitat for fisheries purposes. However, monitoring use and potential impacts remain a priority.

Fish populations in the drainage are managed and protected under Alaska Department of Fish and Game (ADF&G) sport-fishing regulations and daily harvest limits. For most of the Placer River drainage, sport fishing is open year-round for all species except Chinook salmon. However, Skookum Creek upstream of the Alaska Railroad bridge is closed to fishing from July 14 through December 31 of each year. This restriction is in place to protect adult salmon once they have reached the primary spawning areas.

The Glacier Ranger District conducts foot surveys to monitor adult chum and coho salmon returning to an unnamed clear tributary of Skookum Creek. These surveys can provide information on run-timing, peak escapements, and a relative index of annual variability. Salmon runs in this clear tributary tend to coincide with the salmon runs elsewhere in the watershed. Chum salmon start arriving in early August and coho salmon arrive in mid September. Chum salmon escapement peaks around late August and coho salmon peak in mid-October. This particular tributary is not located in an area expected to be impacted by the Spencer Mineral Materials project.

Luebner Lake and its inlet stream support both coho and sockeye salmon. The lake, though relatively small (26 acres), is the largest clearwater lake in the watershed and probably provides the best aquatic habitat in the watershed to support populations of sockeye salmon. Formal and consistent escapement surveys have not occurred here but sporadic surveys over the past three years support the concept that this is a very important spawning and rearing area for this species. Activities associated with the Spencer Mineral Materials Project should not impact this water body.

The proposed Spencer Mineral Materials project generally does not create any significant concerns for fish and aquatic habitat in the Placer River drainage. However, this is based on the assumption that mineral extraction will be carried out in a manner that minimizes impacts to



aquatic habitat. In the event ecological processes are being compromised by the project and associated activities, mitigation efforts to correct the impacts should be a priority.

## **Environmental Consequences**

Direct and indirect effects on the fisheries resource from the proposed action and all alternatives are described in the following section. Additionally, cumulative effects for all past, proposed, current, and reasonably foreseeable activities in the project area will also be addressed. Based on the scope, designs, and locations of the five possible alternatives, this project would likely have very limited negative impacts to the fisheries resource in the Placer River watershed. This analysis will specify and address potential areas of concern. Effects to the fisheries resource will be similar for each of the alternatives except Alternative E – No Action.

### ***Direct, Indirect and Cumulative Effects of the No Action Alternative***

Under Alternative E - the No Action Alternative, there would be no implementation of the proposed activities. Therefore, there would be no significant effects to fish habitat or populations.

### ***Direct and Indirect Effects Common to All Action Alternatives***

#### **Fish Passage**

All action alternatives would occur in areas where no streams currently exist. Therefore, the use of bridges or culverts would not need to occur and fish passage issues should not exist. As part of the reclamation plan, ponds and spawning channels would eventually be created in the project area to benefit anadromous fish in the Placer River watershed. However, access for fish from the Placer River to these waterbodies would not occur until gravel extraction is near completion and roads over the spawning channels would not be needed.

#### **Direct Fish Mortality**

Because no fish or streams currently exist in the proposed project area, direct fish mortality cannot occur.

#### **Erosion and Water Quality**

Because the process in which a contractor would gain access to subsurface materials would require scraping all surface vegetation and soil from the site, accompanying changes in surface hydrology can be anticipated. This, in turn, can lead to increased flows, erosion, and turbidity into nearby waterways (Collier et al. 1970; Touyinthiphonexay and Gardner 1984).

Generally, runoff generated by storms may be greater in a given area because reduced or eliminated vegetative cover, loss of organic topsoil and peat, and compaction of mined soil will reduce the ability of the area to absorb water (Nelson et al. 1991). When surface areas lose the ability to absorb water (rainfall), increased overland and channel flows result. These increased flows can place hydrological stresses on a stream's ability to transport the additional water and

dissipate flow energy leading to channel scouring, bank erosion, and increased turbidity – all of which can compromise essential fish habitat.

However, the majority of surface runoff would enter the Placer River without impacting any nearby smaller streams. The Placer River is a large braided river that is already highly turbid and capable of handling large flood-stage flows. Because the river is already naturally turbid (glacial) and probably does not provide quality fish habitat, concerns about increased runoff as a result of the mineral extraction are minimal.

To further protect against large-scale erosion in the project area, each alternative requires reclamation to begin on an existing parcel before the next parcel can be cleared for gravel extraction. Alternatives A and B have a 25-acre limitation and Alternative C has a 15-acre limitation. This would result in the contractor having to start the reclamation process on the first 25-acre parcel (or 15-acre parcel for Alternative C) before the next 25-acre parcel can be disturbed. In the case of Alternative D, the requirement would be the same as Alternatives A and B (every 25 acres) or at the end of every season – which ever comes first.

### ***Comparison of Alternatives***

Whereas the proposed action and each of the other action alternatives are not expected to have significant impacts on the fisheries resource, the alternatives with the greatest amount of development and ground disturbance would tend to present a higher risk. Overall, the proposed action (Alternative A) would have the greatest potential for impacts because it would alter the largest area of land. Each of the other alternatives would have a lesser degree of development and therefore would assumedly present less risk to fish species and aquatic habitat in the proposed project area.

However, reclamation plans have been developed to help reduce or mitigate potential risks. Additionally, these plans require the development of more wetland ponds as the amount of land available for gravel extraction increases. Under these proposals, Alternatives A and D would carry the greatest potential risks because they include the largest area for extraction; but they would also better benefit the fisheries resource because more ponds would be required in the reclamation process.

### ***Cumulative Effects***

Several other past, present, and future projects could affect the fisheries resource in the Placer River watershed over the next 15 years when considered in conjunction with the proposed gravel extraction. These projects are listed below with a brief summary of potential impacts.

### ***Whistle Stop Project***

The recently approved Whistle Stop project includes a number of recreational developments near Spencer including trails, campgrounds, cabins, a viewing platform, and a whistle stop. The Alaska Railroad will stop at Spencer to unload visitors. Recreationists are expected to use the

Spencer Glacier Whistle Stop as an access point to the backcountry for multi-day trips, as well as a destination for day trips to Spencer Glacier, Spencer Lake, and for raft trips on the Placer River.

Potential effects to the fisheries resource associated with this project include impeded fish passage, direct and indirect fish mortality, and increased sport fishing. Based on the assumption that associated trails and facilities will be constructed using best management practices described in the Soil and Water Conservation Handbook - FSH 2509.22 (USDA Forest Service 1996) and the Aquatic Habitat Management Handbook - FSH 2090.21 (USDA Forest Service 2001), very few actual impacts to the fisheries resource are expected to occur. Implementation of these conservation measures would minimize any adverse effects, thus protecting and conserving a sustainable fisheries resource and its ability to contribute to healthy ecosystems.

### **Outfitter/Guide Use**

Currently, several types of outfitter/guides are permitted to operate with clients in the analysis area. Guided activities include snow machine tours, rafting, canoeing, fishing, hiking, skiing, and flight seeing. With the development of the Whistle Stop project and associated facilities, opportunities for additional guided adventures would probably occur. Snowmachine tours and skiing do not present a significant risk to the fisheries resource because these activities occur in the winter when most streams and lakes are frozen and a buffer of snow protects riparian areas and instream degradation. Flight seeing would not disturb the resource, as well. However, increased boating, guided fishing, and hiking all have the potential to cumulatively impact the fisheries resource and associated aquatic habitat. Each of these activities could contribute to streambank degradation that might potentially impact aquatic habitat and may increase harvest of adult fish returning to spawn.

### **Dispersed Winter Recreation**

As with many areas of Alaska, recreation use in the Spencer Project area increases in the winter due to a firm snowpack and frozen waterways. Heavy snow machine and moderate backcountry ski use occurs throughout the entire Placer River drainage from November – April. Helicopter-assisted skiing also takes place in various locations throughout the Placer River valley. Additionally, the Alaska Railroad generally runs one winter trip into the Grandview area each season. The “Ski Train” takes place in the early spring and transports nonmotorized backcountry travelers to the area for a one-day trip. Due to avalanche concerns in the general Grandview area, the Alaska Railroad has concerns with making this trip multiple times in the winter season.

These types of activities do not present a significant risk to the fisheries resource because they occur in the winter when most streams and lakes are frozen and a buffer of snow protects riparian areas and instream degradation.

### **Commercial Recreation Leasing on State Land at Grandview**

In their Kenai Area Plan, the State of Alaska Department of Natural Resources (DNR) identifies the potential for commercial recreation leasing on some amount of the 320 acres of State lands in

the Grandview area. It is mentioned in the plan that the “*DNR is not proposing to develop the unit at this time, nor has it received an application for this type of use* (State of Alaska DNR Kenai Area Plan, 3-37)”, and “*at Grandview, state lands will be managed to provide opportunities for train passengers both in summer and winter* (Kenai Area Plan, 3-30).” It is possible that with development of Whistle Stop service at Grandview, there could be increased interest in commercial recreation development in the area, thereby bringing more visitors to Spencer as well.

Resident fish populations do exist in the Grandview area and depending on the degree of additional development, increased human use and associated facilities could cause additional impacts to these resident fish populations.

### **Summary and Determination of Effects**

Overall, direct, indirect, and cumulative effects associated with the proposed Spencer Mineral Materials project will be limited in scope and will have no significant effect to fish habitat and populations in the Placer River drainage. Additionally, there are no listed or sensitive fish species that are known to exist in the project area. This determination of effects is based on the assumption that associated equipment and facilities would be temporary and constructed only in Forest Service permitted areas. Further, any roads or trails developed for the project should follow best management practices described in the Soil and Water Conservation Handbook - FSH 2509.22 (1996) and the Aquatic Habitat Management Handbook - FSH 2090.21 (2001). Implementation of these conservation measures would minimize any adverse effects, thus protecting and conserving a sustainable fisheries resource and its ability to contribute to healthy ecosystems.

Because the reclamation for this project includes development of wetland areas (ponds), this project would actually benefit fish populations by providing valuable clear-water spawning and rearing habitat and provide additional recreational opportunities (fish viewing and angling) for Spencer Glacier Whistle Stop visitors.

## **Wildlife**

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### **Affected Environment**

The Chugach National Forest provides habitat for an estimated 232 vertebrate species including 51 mammals, 179 birds, and 2 amphibians. These species contribute to the health of the Forest and provide Forest users with a full range of opportunities that include consumptive and nonconsumptive activities (USDA Forest Service 2002a). This analysis discusses 1) federally listed threatened and endangered species (TES) (see Table 11), 2) Forest Service Region 10 sensitive species, 3) Forest Service management indicator species (MIS), 4) migratory birds, and 5) species of special interest (SSI) that may be affected by the proposed action. No threatened or endangered species are known from or expected to occur within or adjacent to the in the project area.

**Table 11. Threatened and endangered species considered for the Spencer Mineral Materials project**

<b>Species</b>	<b>Status</b>
Humpback Whale	Endangered
Steller Sea Lion	Threatened
Steller's Eider	Threatened

### **Sensitive Species**

#### *Trumpeter Swan*

An aerial survey for trumpeter swans was conducted by Forest Service personnel on June 1, 2005 and August 8, 2005, as well as during spring and fall of 2004. No swans or swan nests were found in the project area though nesting habitat was identified at the mouth of Placer River approximately 10 miles from the project site.

#### *Osprey*

Ospreys are uncommon to rare throughout Alaska, localized near lakes, large rivers, and coastal bays. Osprey have been observed feeding on spring season Eulachon run in the Twentymile river approximately 10 miles from the project area but it is very unlikely they would occupy the project area. No sightings have been reported in the vicinity of Spencer Lake or the Placer River.

### **Management Indicator Species (MIS)**

Management indicator species that may be present during project construction and future use include brown bears, moose, and mountain goats.

#### *Brown Bear*

The Kenai brown bear has been the subject of continuing study for over 20 years (Interagency Brown Bear Study Team 2001). Brown bears move throughout the Kenai Peninsula using the resources of the ecosystem (mountainside den sites, alpine foraging areas in the spring, riparian areas and fish streams in the summer, and upland berry patches in the fall). In spring, female brown bears with cubs are associated with upland habitats, in close proximity to cover. They are not closely associated with riparian areas, and avoid salmon streams until later in summer. They tend to stay near the den after emergence. Primary forage includes horsetail, skunk cabbage, grasses, and sedges associated with riparian areas, wet meadows, and forested areas (Suring et al. in press).

A recent genetic study found that brown bears are not genetically isolated from the mainland, and appear genetically stable (Jackson et al. in prep.). The total number of brown bears on the Kenai Peninsula is uncertain. Habitat modification and human activities such as road construction, residential and commercial developments, mining, timber harvest, and outdoor recreation has reduced the habitat of the brown bear on the Kenai Peninsula (Suring et al. 1998). Habitat modification and human activities have increased the number of brown bear killed in defense of life and property (DLP) (Suring and Del Frate 2002).

To help mitigate potential negative impacts, the Chugach National Forest created brown bear core areas. These areas are designed to manage selected landscapes and their associated habitats to meet population objectives for brown bears and to reduce dangerous encounters (especially DLP) between humans and brown bears. This project area does not occur within the brown bear core area. However, primary habitat for brown bears is identified as fishable reaches of salmon streams by both movement-based analyses and habitat-based analyses (Suring et al. in press). Salmon are a dominant food source for bears, used to increase bears fat stores for hibernation (Hilderbrand et al. 1999). For brown bears on the Kenai Peninsula, the Forest Plan contains a standard stating:

*On the Kenai Peninsula geographic area, manage areas of forest cover approximately 750-feet from both sides of important bear feeding areas in specific areas of a stream where salmon are concentrated in pools, below falls, or where broad spawning flats result in localized feeding concentrations of bears to provide cover for brown bears while feeding, or between brown bears and humans. Important brown bear feeding areas will be located with the advice of the Alaska Department of Fish and Game (ADF&G). Within the 750-foot brown bear management zone the following activities will not be allowed:*

- a. new road construction;*
- b. any vegetation management not intended to maintain or improve ecological conditions for brown bear (USDA Forest Service 2002a, pg. 3-30)*

The plan also has a guideline suggesting that managers:

*Locate long-term concentrated human activities away from important seasonal brown bear concentrations. A minimum one-mile avoidance distance is recommended but could vary depending on site-specific circumstances that will also maintain adequate bear protection. This guideline is not intended to preclude the construction of facilities and trails that would reduce bear-human conflict. (USDA Forest Service 2002a, pg. 3-29)*

The Placer River is an anadromous stream, containing spawning salmon from August through October. Salmon from the river are a source of protein for brown bears living in the Placer River area but concentrated feeding areas have never been identified in the Placer River vicinity. Consultation with ADF&G Biologist, Thomas McDonough, identified no specific concerns relative to known bear feeding concentration areas in the Placer Drainage. The Placer is very turbid where it borders the western and southern edges of the project area up through its outlet on Spencer Lake. Typically, such waters are not conducive to spawning unless they lead to clear water tributaries. One such tributary exists along the northeast boundary of Gravel Deposit #2 (160 acres). This clear water channel has reportedly supported spawning salmon (pers. comm. S. Stash, CNF Fisheries Biologist) in the past and thus may be an important bear feeding area. It has never been formally surveyed.

Areas of bear concentration are not specifically known from within or adjacent to the project area. However, human and brown bear encounters will likely increase by some unknown amount in the Placer Area due to the semi permanent presence of a mining camp associated with the project. This concern was stated during public scoping for the project and has been echoed during scoping for facility development under the adjacent Whistle Stop project.

### *Moose*

Moose are associated primarily with early to mid-succession habitat and riparian areas (USDA Forest Service 2002a). On the Kenai Peninsula, limitations on population growth include winter habitat, predation, hunting, and mortality from vehicular collisions (Lottsfeld-Frost 2000). Moose habitat exists throughout the proposed project. Moose sign was noted in almost all areas during ground surveys. A habitat capability model was initiated in the fall of 2006 with the Forest Service, Pacific Northwest Research Station, Alaska Department of Fish and Game and University of Alaska-Anchorage. This project includes classifying community types and determining available biomass of forage for moose in Placer Valley, including the Spencer Lake area. Additionally, an analysis of movements and biology of 6 collared moose in the Placer Valley will be conducted. The results of this study will help determine the importance of this upper valley area to moose. Unfortunately, the results were not available during the time of this analysis, though there is notable use of the project area by moose during the proposed operating season based on incidental observation and the predominant vegetative community type.

Public scoping returned a concern that increased train traffic may result in increased collisions with moose in the Placer River area. This is not a concern shared by ADF&G, according to Assistant Area Biologist Thomas McDonough. Additionally, given the relatively minor increase in total train traffic (estimated to be only an additional 2.6 trains a week during the operating season) associated with this project, any resulting increase in collisions is likely to be insignificant to the population level.

### *Mountain goats*

Mountain goats use cliffs, alpine, and subalpine habitats. They are generally found near steep cliffs with slopes over 50 degrees. Goats are most abundant in the highly glaciated coastal mountains and least abundant along the relative dry west slopes of the Kenai Mountain range where they coexist with Dall's sheep (Del Frate 1994). Cliffs and steep broken ground are used as habitat to escape from predators. Mountain goat habitat typically lies in the alpine and on steep-rugged slopes. Goats have been sighted or sign has been noted at lower elevations. These locations are used by goats for travel between primary habitat areas or for winter foraging in old growth hemlock stands. There is potential for goats to use the project area during winter season but during the proposed operating season the presence of predators (e.g., wolves and bears) in lowland areas of the Placer drainage likely prevent any regular use of the project area. The Forest Service and AK Department of Fish and Game initiated a movement and habitat utilization

project in 2006, which included collaring goats in the Placer/Skookum area. Results of this work may allow us to evaluate wintertime use in the vicinity of the project area.

### **Neotropical (Migrant) Birds**

On January 10, 2001, President Clinton signed an Executive Order for the “Responsibilities of Federal Agencies to Protect Migratory Birds” which directed the federal agencies to develop an MOU with the U.S. Fish and Wildlife Service (USFWS) to promote conservation of migratory birds. Agencies shall identify potential impacts to migratory birds and their habitats, avoid or minimize adverse impacts, restore and enhance habitats, and evaluate the effects of actions on migratory birds. In March of 2005, the Alaska Regional Director for the USFWS issued guidance to land management agencies in Alaska regarding temporal restrictions on land clearing activity designed to mitigate take on migratory bird species. The USFWS recommends that land clearing activities in south central Alaska not occur between May 1 and July 15 to avoid direct take of migratory birds during the breeding season (USDI FWS 2005). A variety of migratory species (primarily passerines or songbirds) likely breed within the project area though no formal surveys have ever been completed.

### **Species of Special Interest**

#### *Bald Eagle*

Bald eagles in Southcentral Alaska generally nest in old cottonwood trees near water and use the same nest each year (Daum 1994). The nesting season on the Chugach National Forest is generally from March 1 to August 31 (USDA Forest Service 2002a). An aerial survey for bald eagle nests was completed by Forest Service personnel on May 4, 2005. No bald eagle nests were found in the project area; the nearest detected was several miles away near the mouth of Placer River.

#### *Northern Goshawk*

Northern goshawks are year-round residents of the Chugach National Forest. Forests where nests occur are characterized by large-diameter trees having a closed canopy, with exposed gaps and an open understory (USDA Forest Service, Seward District goshawk files). The amount and location of feeding and nesting habitat appears to limit population viability in Southeast Alaska (Iverson et al. 1996). A ground survey completed by Forest Service personnel on May 4, 2005 found no primary goshawk nesting habitat (spruce/hemlock forest) in or adjacent to the project area.

#### *Marbled Murrelet*

Marbled murrelets are medium-sized seabirds that inhabit costal waters, inland freshwater lakes, and nest in inland areas of old-growth conifer forest on the ground (Carter and Sealy 1988). Their presence has not been documented within the project area but surveys have never been conducted. There is limited potential that habitat may exist in spruce/hemlock forests adjacent to the project area.



### *Townsend's Warbler*

The Townsend's warbler is a neo-tropical migrant that breeds in Alaska. They are largely restricted to mature forest with tall coniferous trees, and are abundant in large undisturbed tracts of continuous forest, but will also use forest in late successional stages (Matsuoka et al. 1997). Their presence has not been documented within the project area but surveys have never been conducted. Based on surveys of similar habitat in adjoining valleys it is likely that this species uses the spruce/hemlock habitat adjacent to the project area.

### *Canadian Lynx, Gray Wolves and Wolverine*

Canadian lynx are most likely found within the Placer Valley area in relatively low numbers. Lynx use a variety of habitat, including spruce and hardwood forest. They require a mosaic of conditions, including early successional forests for hunting and mature forests for denning (Koehler and Brittell 1990). Recent research suggests that lynx utilize large blocks of connected forest habitat with a mosaic of age classes (Seidel et al. 1998).

Gray wolves are habitat generalists, with main prey consisting of ungulates (Mech 1970). Wolves usually live in packs that include parents and pups of the year. Pack size ranges from 2 to 12 animals. Wolves normally breed in February and March and the pups are born in May or early June (Stephenson 1994).

Wolves have been documented as sometimes abandoning a den and moving pups to an alternative den if disturbed by humans (Mech et al. 1991). There are approximately 2-3 packs that range across the upper Turnagain Arm, including Placer, Portage and Twentymile valleys (Cliff Fox, pers. comm. 2003). Biologists from the Forest Service and ADF&G are attempting collaring efforts in the vicinity at the time of writing but unfortunately, data from those efforts is not available to support this analysis. Results from this study could improve our understanding of this species' use of the Placer/Spencer Lake area.

Wolverines have been characterized as one of North America's most rare mammals and least known large carnivores. Wolverines seem to be most associated with the hills and mountains of the Kenai Peninsula (Magoun 1996). Denning and rendezvous sites are critical stages in wolverine natural history. They are places to house kits (wolverine young), for when nursing, and when kits are too young to travel (Pulliainen 1968). They are primarily scavengers but also hunt birds and rodents, and will eat fruits, berries, and insects when other prey is unavailable (Hash 1987). Sample unit probability estimation (SUPE) winter surveys conducted in 2004 found no tracks in the Placer/Spencer Lake area (Golden 2004). Biologists from the Forest Service and ADF&G are attempting collaring efforts in the vicinity at the time of writing but unfortunately data from those efforts is not available to support this analysis. Results from this study could improve our understanding of this species' use of the Placer/Spencer Lake area.

## **Environmental Consequences**

This analysis incorporated natural history, habitat requirements, GIS analyses, consultation with State and Federal biologists, Forest Plan direction, and review of pertinent literature to investigate the significance of potential disturbance for the species described in the Affected Environment section. Potential impacts to species of interest were assessed using the following ranked approach to address disturbance impacts on wildlife species (USDI NPS 1994).

### *Negligible Effects*

- No species of concern are present, no or minor impacts expected
- Minor impacts that do occur have no secondary (long-term or population) effects

### *Low Impacts*

- Non-breeding animals of concern present in low numbers
- Habitat is not critical for survival; not limited to the area targeted for use, etc.
- No serious concerns expressed by State or Federal fish and wildlife officials

### *Moderate Impacts*

- Breeding animals of concern are present and/or present for critical life stages
- Mortality/interference with activities necessary for survival are likely to occur occasionally
- Mortality/interference are not expected to threaten the continued existence of species in the area
- State and Federal officials express some concern

### *High Impacts*

- Breeding animals present in high numbers and/or during critical life stages
- Areas have history of use during critical life stages during critical periods. Habitat is limited and animals cannot relocate to avoid impacts
- Mortality or other effects (injury, physiological stress, effects on reproduction and young raising) are expected on a regular basis; these effects threaten the continued survival of the species
- State or Federal officials express serious concern

## **Direct and Indirect Effects**

### **Threatened and Endangered Species**

#### *Humpback Whale, Steller Sea Lion and Steller's Eider*

Based on expected absence from the project area the proposed action will have *negligible* direct, indirect, or cumulative effect on these species.

### **Sensitive Species**

#### *Osprey*

Based on expected absence from the project area the proposed action would have *negligible* direct, indirect or cumulative effects on this species.

### **Management Indicator Species**

Management indicator species (MIS) that may be present during project construction and future use include brown bears, moose, and mountain goats.

#### *Brown Bear*

Appropriate mitigations were developed for Whistle Stop facilities in the same area to minimize negative interactions between humans and bears and these should also be applied to any facilities associated with this project. Assuming these mitigations are followed, the project is expected to have *low* impacts on brown bears on the Kenai.

An unnamed stream exists outside of the northeastern tip of gravel deposit #2, which has the potential to support spawning salmon and thus could be an important resource to brown bears adjacent to the project area. According to the 2002 Forest Plan, such streams on the Kenai should be protected from ground clearing occurring within 750 feet of the stream channel. A stream survey completed by Chugach National Forest fisheries biologists found some evidence of past spawning use (e.g., the presence of old redds indicating use in prior years) of this stream but determined that the course of the stream channel is greater than 750 feet from the areas proposed for land clearing; thus no stream buffer is necessary to protect potential brown bear habitat.

#### *Moose*

The proposed activity would certainly displace individual moose from operation areas temporarily but given the quarry site is limited to a 30-acre maximum and gravel extraction to a maximum of 25 acres annually, habitat modification impacts are not extensive relative to what is present within and adjacent to the project area. Furthermore, the proposed habitat reclamation plan to “emulate an undulating kame and kettle topography typical of glacial outwash areas” will return valuable forage habitat for moose in the Placer River area. Given the success of similar reclamation efforts in Portage Valley it is reasonable to assume that in the long term there would be little to no net loss of habitat for this species. Renewed gravel extraction at former pits within

the project area, which were not reclaimed in the past, may eventually increase the total amount of habitat available within the Spencer Lake area.

Though individual moose are likely to be temporarily displaced from portions of the project area due to disturbance from mining activity, the actual habitat modification required for gravel extraction and quarry activity is relatively minor in scale. As such, in the short term, the project may have *low* impacts to this species but given the proposed reclamation, long-term effects are likely to be *negligible*.

#### *Mountain goats*

Based on expected absence from the project area the proposed action would have *negligible* direct, indirect or cumulative effect on this species.

### **Neotropical (Migrant) Birds**

Providing that the majority of land clearing activities associated with the proposed project can occur outside the breeding season (May 1 through July 15 in Southcentral Alaska) the proposed action would have *low* impacts to migratory birds. As mitigation, the majority of land clearing activities could be annually restricted to July 15 through April annually. If significant land clearing is completed during the breeding season then the proposed action would likely have *moderate* impacts to migratory birds relative to direct take during the breeding season.

### **Species of Special Interest**

#### *Bald Eagle*

Based on expected absence from the project area the proposed action would have *negligible* direct, indirect or cumulative effect on this species.

#### *Northern Goshawk*

Based on expected absence from the project area the proposed action would have *negligible* direct, indirect or cumulative effect on this species.

#### *Marbled Murrelet*

Based on expected absence from the project area the proposed action would have *negligible* direct, indirect or cumulative effect on this species.

#### *Townsend's Warbler*

Though Townsend's Warblers likely exist in spruce/hemlock habitats surrounding the project area it is unlikely that the proposed activity would have significant compounding effects on those habitats. As such, the proposed action would have *negligible* direct, indirect or cumulative effect on this species.

### *Canadian Lynx, Gray Wolves and Wolverine*

The project only directly modifies 600 acres of habitat and thus is unlikely to have direct impacts on features of importance to these carnivore species, which are known for their mobility at the landscape level. However, the proposed action is likely to result in some level of displacement from the project area and the vicinity of Spencer Lake during the season of operation based on the documented sensitivity of these species to consistent human presence (Claar et al. 1999). Given the lack of information describing the specific importance of the project area to any of these species it is difficult to characterize the potential for the indirect effects resulting from such displacement. In the absence of concern expressed by ADF&G or the public at large relative to this species, as well as the lack of known or suspected important habitat unique to the project area, these species are likely to have low impacts resulting from the proposed action.

### ***Direct and Indirect Effects by Alternative***

#### **No Action**

No direct, indirect or cumulative effects would result from implementing the no action alternative.

#### **Effects Common to all Action Alternatives**

The final determination of effects for all species analyzed is that the proposed activities may impact individuals or habitat but are not likely to contribute to a trend toward federal listing or cause a loss of viability to the population or species. All species evaluated were determined to experience *negligible to low* impacts assuming mitigations proposed are implemented along with the proposed action. If the proposed mitigation measures are not carried forward during implementation then there may be *moderate* effects to both brown bears and migratory birds.

#### ***Cumulative Effects***

Cumulative effects were assessed on the Placer River watershed over the next 15 years. This area encompasses about 80,700 acres (326 km<sup>2</sup>).

The proposed habitat modification and semi-permanent occupation of the project area may have compounding effects with facilities and activities associated with the Whistle Stop project. The cumulative effects of the two projects are difficult to define given the lack of specific information describing how the species considered herein use the Placer drainage.

There is some cause for concern for wolves, wolverines, and lynx that are known to be sensitive to the consistent presence of humans (Claar et al. 1999). The proposed semi-permanent occupation of the project area may have compounding effects with facilities and activities associated with the Whistle Stop project (a recreation facility development project associated with the railroad line through the placer drainage). Generally home ranges of wolves range from 57-86 km<sup>2</sup> (Lindstedt et al. 1986); home ranges of wolverines range from 105-535 km<sup>2</sup> (Whitman et al. 1986); and home ranges of lynx range from 50-783 km<sup>2</sup> (Bailey et al. 1986). Cumulative

effects were considered at the watershed scale (the Placer drainage is an area of about 326 km<sup>2</sup>) and assumed these general home range values were representative of these species on the Kenai. Considering the size of the combined projects in relation to the size of home ranges available in this watershed, the activity is likely only to affect one to a few individuals from each species. While those individuals may come to avoid the Spencer Lake area during spring and summer months, as a result of the combination of mining and recreation activities in the drainage, it is unlikely to have significant cumulative effects on populations in the region.

These same two projects may also interact to increase the number of human-bear encounters, which may increase the number of brown bears killed in Defense of Life and Property (DLP) by increasing the number of humans in the area. The Forest Service partners with the U.S. Fish and Wildlife Service, National Park Service and ADF&G to promote a healthy population of brown bears on the Kenai Peninsula. Important objectives of this cooperation are (1) to provide bears with refuge from human-generated displacement and (2) to decrease DLPs. Mitigation measures have been included in both projects to minimize any increase in DLPs. Cumulative effects to brown bears are expected to be low.

Cumulative effects to moose and migratory birds are not anticipated because the Spencer Glacier Whistle Stop project did not remove a measurable amount of vegetation.

No cumulative effects are expected to any other species because no direct or indirect effects are expected from this project.

### ***Summary of Effects***

Overall, direct effects to habitat and wildlife populations are likely to be *negligible to low*. Some migratory birds may be impacted if land-clearing activity is permitted during the breeding season. Indirect effects to species resulting from disturbance occurring as a result of mining activity and its associated land-clearing activities are also likely to be *low to negligible*. The reclamation proposed following gravel extraction (especially on former gravel sites that were not reclaimed originally) within the project area has some potential to improve moose forage. Cumulative effects are expected to be negligible as well.

## **Botany**

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### **Affected Environment**

#### ***Ecological Classification***

The ecological setting of the project area is described by ecological subsections as part of a National Hierarchical Framework (Davidson 1997), which stratifies and delineates landscapes based on biotic and environmental factors. The most general level that describes the overall processes affecting the landscape on the Kenai Peninsula is the ecological subsection level. The majority of the project area lies within the Turnagain Arm subsections.

The Turnagain Arm subsection includes all the lowlands and sideslopes adjacent to Turnagain Arm. The topography of the area consists of broad outwash plains bounded by steep, rocky, glaciated sideslopes. A major portion of the outwash plains consists of wetlands. The annual precipitation at sea level is about twice that of the other subsections on the Kenai Peninsula. Precipitation ranges from 20 inches in the valley to 80 inches in the alpine. The characteristic vegetation in the alpine and some of the mountain sideslopes is dominated by dwarf scrublands and herbaceous vegetation types. The remainder of the sideslopes and the valley bottoms are covered with mixed needleleaf/broadleaf forest. Wetlands and shrublands also cover much of the valley bottoms and floodplains.

### **Vegetation**

Vegetation types based on the “ecological mapping units” (EMU) GIS coverage has been summarized for the project area. This coverage is an air photo-based map developed from interpretation of aerial photography from 1993. Minimum map unit size is 2.5 acres. Community type descriptions are primarily from “Portage, Placer, and Twentymile Valley Bottoms” completed by Connie Hubbard in 1993. Cottonwood types cover 90 percent of the area. The remaining area is covered by mountain hemlock (4 percent), barren (6 percent), and water (less than 1 percent).

### **Non-Native Plants**

Information on non-native plants has been summarized from previous surveys and reports (Duffy 2003 and DeVelice 2003) and from surveys conducted for the Whistle Stop project (September 2004 and August 2005).

To date, large populations of non-native plants have not been observed outside of areas directly affected by human-caused disturbance within the Kenai Mountains. Important factors potentially affecting non-native plant populations in the area are increasing. Human use and the diversity of human use are increasing (including use of pack animals, mountain biking, and mining activities).

Within the project area, non-native plants are concentrated along the railroad corridor, the railroad siding area at Spencer, and some around the mine site at Spencer Lake. Common weed species found here include: *Linaria vulgaris*, *Matricaria discoidea*, *Plantago major var. major*, *Poa annua*, *Poa pratensis*, *Taraxacum officinale*, *Trifolium hybridum*, and *Melilotus alba*. Table 12 lists weed species found in the Spencer area.

Table 13 lists approximate population sizes of non-native plants found in the Spencer area (Alaska Exotic Plant Information Clearinghouse (AKEPIC) database). The table also lists an invasiveness ranking value (0-100) for each species, which was developed by experts at the Natural Heritage Program. Species with a higher ranking value are considered more invasive and pose a greater threat to natural ecosystems. Figure 21 displays the locations of these infestations.

Table 12. Weed species found in the Spencer area

Scientific Name	Common Name	Reproduction	Characteristics
<i>Linaria vulgaris</i>	Yellow toadflax	Seeds and rhizomes	Perennial, plants can establish from root fragments as short as ½ inch.
<i>Matricaria discoidea</i>	Pineapple weed	Seeds	Annual
<i>Plantago major</i> var. <i>major</i>	Common plantain	Seeds and root fragments	Annual, biennial, or perennial
<i>Poa annua</i>	Annual bluegrass	Seeds	Annual, short-lived perennial
<i>Poa pratensis</i>	Kentucky bluegrass	Seeds and rhizomes	Rhizomatous, mat-forming perennial
<i>Taraxacum officinale</i>	Dandelion	Seeds and roots	Perennial
<i>Trifolium hybridum</i>	Alsike clover	Seeds only	Perennial
<i>Trifolium repens</i>	White clover	Seeds and creeping stems	Perennial
<i>Melilotus alba</i>	White sweetclover	Seeds	Biennial, each plant can produce up to 350,000 seeds

Table 13. Location and population size of weed species found in the Spencer area

Scientific Name	Infested Area (acres)	Canopy Cover (percent)	Stem Count	Invasiveness Ranking
<i>Trifolium repens</i> L. and <i>Trifolium hybridum</i> L.	10	5	500+	59 57
<i>Plantago major</i> L. var. <i>major</i>	10	1	500+	44
<i>Taraxacum officinale</i> Weber	1	1	51-150	58
<i>Matricaria discoidea</i> DC	10	1	500+	32
<i>Poa pratensis</i> L.	2	1	51-150	52
<i>Linaria vulgaris</i> P. Mill.	2	10	151-500	69
<i>Taraxacum officinale</i> Weber	0.001	20	6-25	58
<i>Poa annua</i> L.	0.001	60	26-50	46
<i>Taraxacum officinale</i> Weber	0.01	1	6-25	58
<i>Poa annua</i> L.	1	10	51-150	46
<i>Capsella bursa-pastoris</i> (L.) Medik.	0.001	50	1-5	40
<i>Taraxacum officinale</i> Weber	5	1	51-150	58
<i>Poa pratensis</i> L.	10	1	51-150	52
<i>Poa pratensis</i> L.	2	1	151-500	52

*Melilotus alba* has not been included in Table 13 since the data for this species has not been entered into the AKEPIC database. In 2006, two small patches of this species were located and pulled in the railroad siding area. Total area of infestation was approximately 0.1 acre with a stem count of 51-150. *Melilotus alba* is a species of concern with an invasiveness ranking of 80. Other species of concern due to the relatively high invasiveness ranking include *Linaria vulgaris*, *Taraxacum officinale*, *Trifolium hybridum*, and *Trifolium repens*. Manual control (hand pulling) of *Linaria vulgaris* and *Taraxacum officinale* occurred in 2006. However, the soil was too compacted to remove any of the root system and hand pulling simply reduced the number of seeds produced but did not reduce the existing populations since these species can reproduce from root fragments. Hand pulling will occur again in 2007 and there are plans for an integrated weed management project with estimated implementation in 2008. A single plant of *Capsella bursa-pastoris* was found and pulled in 2005. It has not been observed at the site since that time.



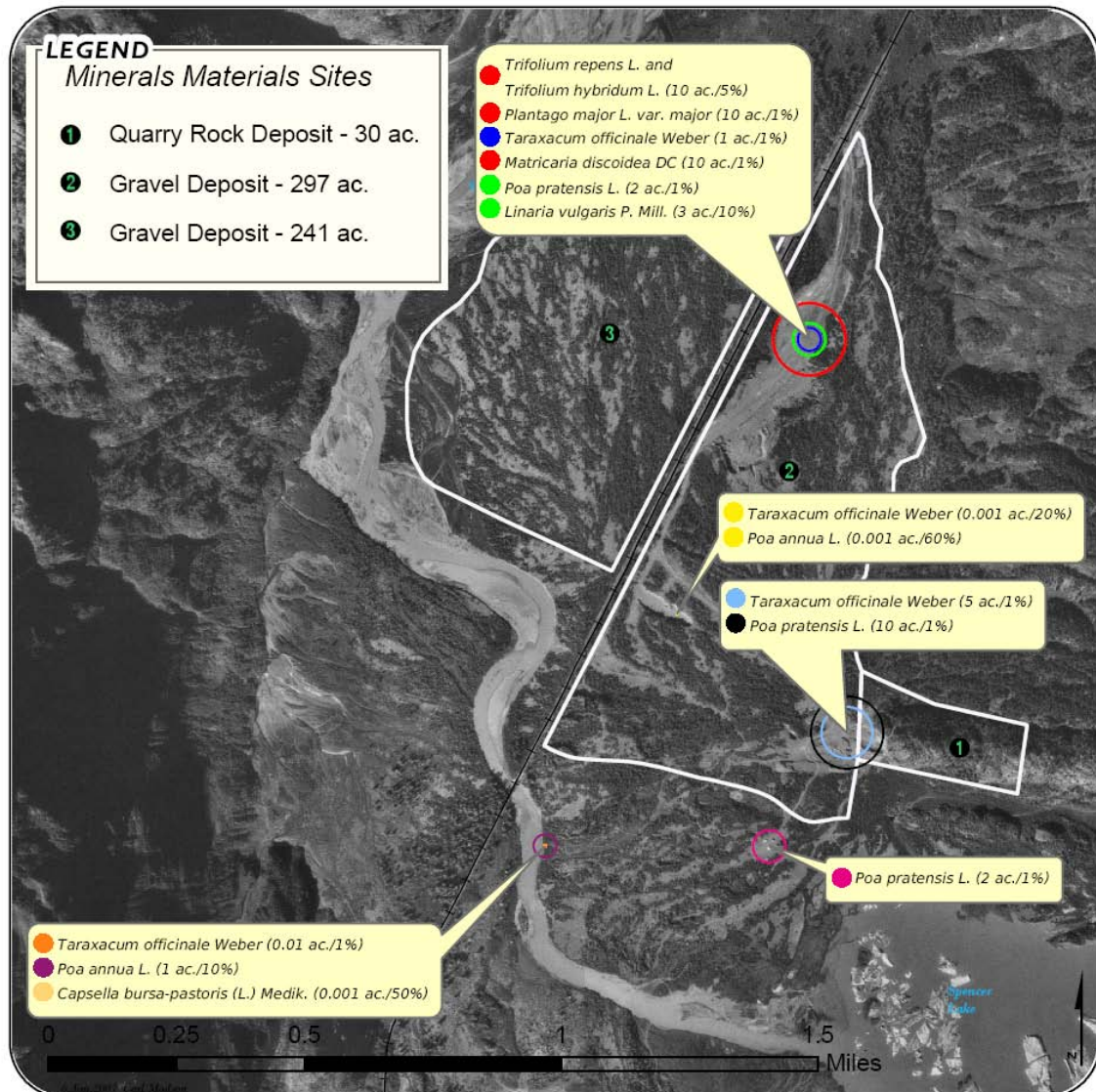


Figure 21. Invasive plant locations in the Spencer area

### Threatened and Endangered Species

No threatened or endangered species are known from or expected to occur within or adjacent to the project area.

### Sensitive Species

A pre-field review of existing information concerning the plants listed above was conducted for the project area. This review included the Regional Forester's Sensitive Species List, Alaska Natural Heritage Program (AKNHP) data base records, past surveys (Duffy 1994), botanical literature (some titles are listed in the references section of this report), consultation with the Alaska Region Botanist and Chugach National Forest Ecologist, review of proposal details, maps, air photos, and GIS information.

There are no known populations of sensitive plants in the project area. The closest sensitive plant population occurs on an alpine bench overlooking Spencer Lake, east of the project area. *Carex lenticularis var. dolia* was located at that site during field surveys for the Whistle Stop project in 2005.

The following general habitats (or plant communities) occur in the project area: coniferous forest, deciduous forest, mixed-conifer/deciduous forest, forest edge, tall shrublands, low shrublands, rocky areas, rock outcrops, ridgetops, cliffs, gravel, scree, talus, boulder fields, wet areas, riparian areas, streambanks, subalpine meadows, area dominated by moss or lichen, and dry meadows. The sensitive plants listed below are suspected to occur in the project area since the area contains appropriate habitat and is within the known or suspected range of the plants.

*Aphragmus escholtzianus*: Generally occurs in heath, alpine, and subalpine habitats.

*Arnica lessingii spp. norbergii*: Generally occurs in open forests, heath, wet meadows, alpine, and subalpine meadows.

*Carex lenticularis var. dolia*: Generally occurs along lake edges, marshy areas and in alpine and subalpine habitats.

*Draba kananaskis*: Generally occurs in alpine and subalpine habitats.

*Ligusticum calderi*: Generally occurs in forest edges and wet meadows.

*Papaver alboroseum*: Generally occurs in gravelly, well-drained open areas.

*Romanzoffia unalascensis*: Generally grows on moist to wet riverbanks, beach terraces, and rock crevices.

*Stellaria ruscifolia ssp. aleutica*: Generally occurs along lake margins, marshy areas, alpine and subalpine areas, and rocky outcrops. In Alaska, this species prefers moist gravelly habitats.

Rare plant surveys of intensity levels 2-4 have been conducted in the project area in late September 2004, August 2005, August 2006, and September 2006. No sensitive plant species were found in the project area. However, populations of the sensitive *Carex lenticularis var. dolia* were located in the vicinity in an alpine bench above the project area.

## **Environmental Consequences**

This section discusses the effects to vegetation from the proposed action and all alternatives. Overall, the effects analysis will focus on impacts to Region 10 sensitive plants and from non-native plants. Although some of these activities would directly alter the general vegetation composition, the total acres of impact in comparison to the vast undeveloped areas of the Glacier Ranger District is not expected to be large enough to make a noticeable change in general vegetation conditions.

**Threatened and Endangered Species**

Based on expected absence from the project area, the proposed action would have no direct, indirect, or cumulative effect on any threatened or endangered plant species.

**Non-Native Plants**

**Direct and Indirect Effects**

*Alternatives A, B, C, and D*

The alternatives would have varying levels of ground disturbance (Table 14). In addition, impacts are potentially increased when activities occur in areas with known infestations. For this project, the siding area has, by far, the greatest concentration of non-native plants and Table 14 also lists whether or not the Alternative proposes activities in the siding area.

**Table 14. Approximate acres of disturbed ground disturbance by alternative**

<b>Alternative</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Total acres of disturbed ground	560	260	190	390
Activity in heavily infested area	Yes	No	Yes	Yes

Of the action alternatives, Alternative A has the greatest amount of ground disturbance and Alternative C has the least. All of the alternatives include the siding area except for Alternative B. Overall, Alternative A would have the greatest potential to introduce and spread non-native plant species in the project area. Alternatives B and C would likely have the least potential to introduce and spread non-native plants because of the lowest acres (Alternative C) or no activity in the siding area (Alternative B).

Unless invasive species are eradicated from the site prior to excavation, there is some risk of spread to remote locations. Seeds of invasives may be present in mineral materials that are transported off-site to other locations in Alaska.

*Alternative E – No Action*

Existing populations of non-native plants would likely continue to persist and spread into surrounding areas. Of particular concern are sites with existing and future human use such as the railroad corridor and Spencer Lake area, which also contain numerous populations of non-native plants. The railroad line will continue to be a vector for the introduction and spread of non-native plants, especially in the absence of an aggressive eradication program. The railroad siding area is heavily infested with many non-natives and provides a tremendous seed source for surrounding areas. Any equipment or materials stored or brought through the siding area will collect weed seeds and disperse them to new areas.

Planned Whistle Stop developments may introduce new non-native species from seeds attached to machinery brought into the area. Continued human traffic associated with existing and planned uses could also introduce and spread non-native plants by importing seeds on equipment or shoes. Species such as *Melilotus alba* are easily spread along waterways and if introduced into Placer Valley, could spread along the river corridor.

Generally, non-native plants are not present in natural habitats and the spread of non-native plants into undisturbed areas would likely remain at the current slow pace. Although rare, non-native plants are slowly spreading into undisturbed habitats as documented in the vegetation analysis for the Whistle Stop project. They are likely spreading from known sources and vectors of spread. Without actively treating known weed infestations, natural habitats will be vulnerable to future introductions of non-native plants. In order to address this concern, the Spencer Weeds Project has been initiated. This project would propose to treat non-native plants with integrated weed management techniques. The NEPA analysis is expected to be completed in FY2008.

### **Cumulative Effects**

Cumulatively, with increasing levels of activity and development in the area due to this project, Whistle Stop project, and increasing outfitter/guide requests there is a greater chance that non-native plants would become established and spread to surrounding areas. In order to start addressing these concerns, a Spencer Weeds Project has been initiated, which would propose to conduct integrated weed management techniques throughout the Spencer area. However, this project is still in the planning stages with NEPA projected to be completed in 2008. If the Spencer Weeds project is implemented, impacts from non-native plants would be greatly reduced at the Spencer area.

### **Sensitive Species**

As stated earlier, surveys for sensitive plants have been conducted for this project and no new sensitive plant populations have been found in the project area. In compliance with policies and standards set forth in the Forest Service Manual (FSM 2670) a biological evaluation for sensitive plants has been completed and contains more details on the analysis and determination of effects.

### **Direct and Indirect Effects**

#### *No Action Alternative*

Since the no action alternative would not further disturb vegetation in the project area, no direct or indirect effects are expected.

#### *Action Alternatives*

Direct effects would result from mineral material extraction that would modify or destroy potential habitat or any known or unknown populations of sensitive species. Although proposed activities may impact potential habitat, direct impacts to sensitive plant populations would be highly unlikely since no sensitive species were found in the surveys.

Indirect effects would come from non-native plants that compete with sensitive plants for available habitat. General impacts associated with non-native plants have already been discussed above. Potential infestations of non-native plants can have devastating impacts on rare plants and habitats. An example from Glacier National Park has shown that the non-native spotted knapweed (*Centaurea maculosa*) eliminated seven rare and uncommon species within three years (Montana Weed Control Association and Montana State University). Since many of the natural habitats in this area are still generally free of non-native species, threats of that magnitude are not likely to occur in the near future. However, as presence and spread of non-native plants increase as a result of the Spencer Minerals project, so does the risk of negative impacts to R10 sensitive species and their habitats.

For sensitive plants, the alternative with the greatest amount of ground disturbance would likely result in the greatest degree of direct and indirect impacts to R10 sensitive plant species. For example, Alternative A has the potential to impact approximately 530 acres whereas Alternative C would only impact 190 acres. The section above discusses that the Alternative A would also have the greatest potential to introduce and spread non-native plants, which compete with sensitive plants for available habitat. Overall, the comparison of impacts by Alternative to sensitive plants would be similar to that for non-native plants.

### **Cumulative Effects**

Other existing or reasonably foreseeable future projects in vicinity of the Spencer Minerals Project include the Alaska Railroad, the Whistle Stop project, Outfitter/Guide special uses, the Johnson Pass Trail, the Iditarod National Historic Trail, and Spencer Weeds project. The Spencer Minerals project could add up to approximately 560 acres of additional ground disturbance. Proposed activities may impact potential habitat, but are unlikely to impact actual sensitive plant populations since none were found during surveys. Across the Kenai Peninsula portion of the Chugach National Forest, there are vast areas of potential habitat (over one million acres) as shown by the bioenvironmental analysis completed for the Forest Plan. Cumulatively, the loss of another 560 acres would not make a measurable effect to sensitive plants when over one million acres of potential habitat still exist on the Kenai Peninsula.

### **Summary of Effects**

There is some potential for invasive plant populations to establish or expand to adjacent areas. Unless invasives are eradicated from the site prior to excavation, there is some risk of spread to remote locations. Seeds of invasives may be present in mineral materials that are transported off-site to other locations in Alaska. Adverse effects may be reduced in the future with integrated weed management under the proposed Spencer Weeds project.

The final determination of effects for all nine sensitive species is that the proposed activities may impact individuals or habitat but are not likely to contribute to a trend toward federal listing or cause a loss of viability to the population or species.

## Economics

During the public scoping process for this project, some concern was expressed about the economic feasibility of the project (Issue 7). According to FSM 1970.62, the analysis should implement “techniques to develop the most efficient combination of activities for each decision unit within each alternative.” Given the information provided, financial efficiency measures are calculated in this analysis to provide a means of comparing the economic feasibility across alternatives.

### **Direct and Indirect Effects**

The alternatives are analyzed and compared using the Quicksilver program to estimate the benefit-cost ratios and the net present values (NPVs) of project alternatives for both the operator and the Forest Service. Quicksilver is a financial analysis tool developed by the Forest Service to generate measures of financial efficiency. This analysis is based on the assumptions of the likely development scenarios displayed in Table 1. The costs and benefits associated with the development of the Spencer Mineral Materials site are displayed in Table 15. Both the quantities used in likely development scenarios and the values used for the benefits and costs were obtained from local sources, in part, from information provided by potential operators (actual sources are included in the project record). The data utilized in this analysis represents the best available estimate of the quantities, costs, and benefits associated with each development scenario.

**Table 15. Table of values used for costs and benefits associated with the Spencer Mineral Materials project.**

<b>Benefit/Cost</b>	<b>Forest Service</b>	<b>Operator</b>
Value of aggregate	\$0.321 per ton (sale price)	\$9.20 per ton (sale price)
Value of quarry rock	\$0.512 per ton (sale price)	\$83.30 per ton (sale price)
Permit administration	-\$22,000 per year	N/A
Clearing of 25-acre site	N/A	-\$1,600
Construction of rail spur	N/A	-\$200 per linear foot
Mining and loading of aggregate	N/A	-\$1.00 per ton
Mining and loading of quarry rock	N/A	-\$1.53 per ton
Rail transport of materials	N/A	-\$3.75 per ton
Truck transport of materials	N/A	-\$2.00 per ton
Unloading of trains	N/A	-\$0.60 per ton
Stockpiling and storage	N/A	-\$0.50 per ton
Loading and scaling	N/A	-\$0.80
Reclamation of 25-acre site	N/A	-\$3,400

The single largest cost affecting the economic feasibility of the project is the cost of constructing one or more rail spurs. If the rail spurs could be used for other purposes, then some of this cost might be further offset. However, for this analysis, development costs are assumed to be incurred solely by the operator and do not account for potential offsets occurring from multiple-use scenarios. The single largest component affecting the economic feasibility of the project is the

sale price of the materials. Fluctuations in market conditions could affect the economic feasibility of mine operations by changing the expected returns to the operator and Forest Service. Values of materials reported by local sources are assumed to accurately represent current market conditions.

Table 16 reports NPVs and benefit-cost ratios across alternatives for both the Forest Service and the operator. According to OMB Circular A-94, NPV is the standard criterion for deciding whether a project is economically justifiable. NPV is a way of comparing all monetarily valued costs and benefits, and is calculated by subtracting the discounted sum of total costs from the discounted sum of total benefits. Economic principles associated with the time value of money suggest that money now is worth more than money in the future. Thus, benefits and costs occurring in the future must be discounted back to represent their current value. A federally prescribed discount rate of 4 percent is used in this analysis (FSM 1971.21). A positive NPV means that the discounted sum of benefits is greater than the discounted sum of costs. Inflation is also a variable that can affect the NPVs associated with each alternative. However, due to the uncertainty of future inflation, OMB Circular A-94 recommends the avoidance of making assumptions about the inflation rate whenever possible. Thus, for the purposes of this project, inflation will be left at zero.

**Table 16. Table of comparative economic measures for various alternatives for the Spencer Mineral Materials project**

<b>Economic Measure</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>	<b>Alternative E</b>
Benefit-Cost ratio – Forest Service	3.95	7.46	1.63	7.46	N/A
Benefit-Cost ratio – Operator	2.03	1.76	2.24	1.74	N/A
Net Present Value – Forest Service	\$751,714	\$1,643,964	\$159,437	\$1,643,964	N/A
Net Present Value - Operator	\$22,380,670	\$30,128,721	\$10,808,758	\$29,737,966	N/A
Benefit-Cost Ratio – Both Parties	2.05	1.80	2.23	1.78	N/A
Net Present Value – Both Parties	\$23,132,384	\$31,772,686	\$10,968,196	\$31,381,930	N/A

The relationship between benefits and costs is further assessed with the computation of benefit-cost ratios for the Forest Service and the Operator (Table 16). The benefit-cost ratio is simply the discounted sum of benefits divided by the discounted sum of costs. A ratio greater than one suggests that the benefits associated with a project are greater than the costs. One caveat of benefit-cost ratios is that they do not allow the analyst to assess the aggregate value of benefits

associated with an alternative. The alternative with the highest benefit-cost ratio has the highest value of benefits compared to the associated costs, but does not necessarily have the greatest value of benefits at the aggregate level. Benefit-cost ratios are often utilized as a decision criterion in situations when a budget constraint is present (i.e., choose the alternative with the highest ratio up to a certain level of total costs). NPV provides a better measure of the overall level of benefits and costs as it reports the difference between benefits and costs at the aggregate level, rather than being a ratio of the two.

The figures provided in Table 16 serve as measures of the financial efficiency of the proposed alternatives. Specific welfare criteria may affect the determination of the preferred alternative. The decisionmaker should assess the results of each alternative separately and take into account any secondary biological and social impacts associated with the alternatives. The benefit-cost ratios and NPVs presented above are based solely on the financial information provided by local sources. The data provided does not allow for the quantitative valuing of secondary impacts. Thus, the financial measures provided here should be balanced with a qualitative assessment of any expected biological and social impacts associated with the alternatives.

### ***Cumulative Effects***

This project is expected to contribute to the economy of Southcentral Alaska along with other enterprises occurring on Forest Service lands in the Placer River drainage including the Whistle Stop project, helicopter skiing on the Kenai Peninsula, and various outfitter/guide operations. The mineral materials provided through this project are expected to generate further economic benefits as the materials are processed into value-added materials, transported to local job sites, and installed as part of larger construction projects.

### ***Summary of Effects***

All action alternatives are expected to be economically feasible as all have positive NPVs and benefit-cost ratios greater than one for both the Forest Service and the operator. In terms of the effects on both parties combined, Alternative C has the highest benefit-cost ratio, while alternative B yields the highest NPV. Alternative C reports the highest benefit-cost ratio for the operator because the costs of facilities and infrastructure are the lowest; but also yields the lowest benefit-cost ratio for the Forest Service due to the low level of extraction associated with this alternative. Because of the low level of mineral extraction, Alternative C also has the lowest NPV for both parties. Since the costs incurred by the Forest Service are constant across all alternatives, their benefit-cost ratios and NPVs are directly correlated with the amount and value of materials extracted. Alternatives B and D provide for high NPVs to both parties, but the benefit-cost ratios for the operator are lower due to the higher cost of infrastructure. Alternative A is intermediate in terms of both benefit-cost ratios and NPVs. Under this alternative, only about half as much gravel would be available, and the rail spur on the west side of the tracks would be constructed only after the east side was mined out, thus deferring that cost several years. All alternatives are assessed with a 15-year time horizon. If the permit is renewed for an



additional 15-year period, benefit-cost ratios and NPVs will change because much of the infrastructure will have been established. Further NEPA analysis would be conducted at that time.

## **Short-term Uses and Long-term Productivity** \_\_\_\_\_

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

## **Unavoidable Adverse Effects** \_\_\_\_\_

There would be no unavoidable adverse impacts in any of the action alternatives. All of the adverse impacts associated with this project as discussed in previous sections of this document could be avoided by selection of Alternative E, no action.

## **Irreversible and Irretrievable Commitments of Resources** \_\_\_\_\_

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

Under any action alternative, there would be an irreversible commitment of the mineral resource including rock, gravel, sand, and any placer gold or other locatable mineral that might be present in the materials that are sold. Under all alternatives, there is an irretrievable commitment of the mineral resource underlying the current recreational developments. As long as these developments are in place, the mineral materials beneath these areas are not available for disposal.

## **Legal and Regulatory Compliance** \_\_\_\_\_

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with ...other environmental review laws and executive orders.” The proposed action and alternatives must comply with following:

### **Principle Environmental Laws**

The following laws contain requirements for protection of the environment that apply to the proposed action and alternatives:

### ***ANILCA Section 810, Subsistence Evaluation and Finding***

The effects of this project have been evaluated to determine potential effects on subsistence opportunities and resources. There is no documented or reported subsistence use that would be restricted as a result of implementation of any alternative.

### ***Bald Eagle Protection Act***

Management activities within bald eagle habitat would be in accordance to a Memorandum of Understanding (2/26/02) between the Forest Service and the U.S. Fish and Wildlife Service. There are no known nest locations in the project area.

### ***Endangered Species Act***

No species listed as endangered, threatened or proposed for listing are present in the project area. There is no designated critical habitat present in the project area. There would be no effects to any endangered or threatened species.

### ***Clean Water Act***

The Placer River is a glacier-fed stream with naturally high turbidity. The project design is in accordance with Forest Plan standards and guidelines, best management practices, and applicable Forest Service manual and handbook direction. The project activities are expected to meet all applicable State of Alaska water quality standards.

### ***Clean Air Act***

Emissions anticipated from the implementation of any alternative would not be expected to exceed State of Alaska ambient air quality standards (18 AAC 50).

### ***Coastal Zone Management Act of 1972, as amended***

The Coastal Zone Management Act requires the Forest Service, when conducting or authoring activities or undertaking development directly affecting the coastal zone, to ensure that the activities or development be consistent with the approved Alaska Coastal Management program to the maximum extent practicable. In State of Alaska and the USDA Forest Service, Alaska Region, on Coastal Zone Management Act/Alaska Coastal Management Program Consistency Reviews (FS Agreement No. 00MOU-111001-026, effective March 2, 2000), this decision requires a consistency determination with the Coastal Zone Management Act, which will be completed prior to project implementation.

### ***Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended***

The Magnuson-Stevens Fishery Conservation Act (the Act) requires that all federal agencies consult with the National Marine Fisheries Service (NMFS) when any project “may adversely affect” essential fish habitat (EFH). The Act also requires that agencies with existing consultation

processes contact NMFS to discuss how the existing processes can be used to satisfy the EFH consultation requirements (50 CFR 600.920(e) (3)). None of the activities would cause any action that may adversely affect EFH as defined by this Act.

### ***Migratory Bird Treaty Act***

Mitigation measures have been added to this project to minimize effects to migratory birds. There would be no impacts to migratory bird populations.

### ***National Historic Preservation Act of 1966***

Section 106 of the National Historic Preservation Act requires that all federal undertakings follow the regulations found at 36 CFR 800 to identify and protect cultural resources that are within project areas and which may be affected by projects. The Chugach National Forest will follow the procedures in the Programmatic Agreement among the Chugach National Forest, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Office. A complete project-specific inventory of the area has been conducted. The project is not expected to impact cultural resources; however, if upon completion of the inventory, cultural resources are discovered, development of recreation sites will avoid culturally important areas.

### **Executive Orders**

The following executive orders provide direction to federal agencies that apply to the proposed action and alternatives:

#### ***Invasive Species, Executive Order 13112 of February 3, 1999***

Invasive species populations have the potential to spread in the project area. Implementation of mitigation measures and design features outlined earlier in this document would minimize the spread of invasive species in accordance with E.O. 13112.

#### ***Recreational Fisheries, Executive Order 12962 of June 6, 1995***

No major adverse effects to freshwater or marine resources would occur with implementation of this project, due to proper location and design features of mining operations and facilities. The reclamation plan would enhance recreational fishing opportunities.

#### ***Floodplain Management, Executive Order 11988 of May 24, 1977***

This activity would not impact the functional value of any floodplain as defined by Executive Order 11988 and would not have negative impacts on wetlands as defined by Executive Order 11990.

#### ***Protection of Wetlands, Executive Order 11990 of May 24, 1977***

Wetlands occur in the project area. However, both location and design features of mining operations and facilities will minimize the impact to wetlands in accordance with E.O. 11988.

***Environmental Justice, Executive Order 12898 of February 11, 1994***

Implementation of this project is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations.

**Special Area Designations**

There are no special area designations in the project area such as wilderness, inventoried roadless areas, wild and scenic rivers, research natural areas, or municipal watersheds.

## Chapter 4. Consultation and Coordination

### Preparers and Contributors

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The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

#### ***ID Team Members:***

Aaron Poe, Wildlife Biologist  
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Steve Hennig, Landscape Architect

#### ***Federal, State, and Local Agencies:***

Environmental Protection Agency  
Kenai National Wildlife Refuge  
National Marine Fisheries Services  
USDA Natural Resources Conservation Service  
U.S. Geologic Service  
USDI Bureau of Land Management  
USDI National Park Service  
USDI Fish and Wildlife Service  
US Army Corps of Engineers  
Alaska Department of Fish and Game  
Alaska Department of Natural Resources

Alaska Department of Transportation

Kenai Peninsula Borough

Municipality of Anchorage

City of Whittier

***Tribes:***

Bristol Bay Native Corporation

Sealaska Corporation

Nana Regional Corporation

Kenaitze Indian Tribe

***Others:***

Over 400 individuals and groups were contacted during the initial scoping process.

**Distribution of the Environmental Impact Statement** \_\_\_\_\_

This environmental impact statement has been distributed to individuals who specifically requested a copy of the document. Copies have been sent to the Federal agencies, federally recognized tribes, State and local governments, and organizations listed above.

## References

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# Appendices

## **Appendix A – Reclamation Plan**

### **Objectives**

The reclamation objectives for the Spencer Mineral Materials site are:

- Restore a more natural landscape through reclamation of mining areas. Restored areas will emulate kame and kettle topography typical of glacial outwash areas.
- Provide high quality recreational opportunities in conjunction with the Spencer Glacier Whistle Stop where feasible.

### **Design features**

- The perimeter of the extraction area will be sinuous with no straight lines (including along the railroad). The side slopes will be no steeper than 4 to 1 slope with a slope of from 6:1 to 8:1 along at least 50% of the boundary.
- Excavation areas will generally retain about 5 feet of material above the ground water level to prevent areas of standing water except around fish ponds.
- The surface of the reclaimed area will be undulating with variations of up to 3 feet in height.
- Vegetation and organic material removed during operations will be spread over the excavated area with emphasis on areas near ponds.
- Excess vegetation may be deposited in the ponds to improve fish habitat or it may be burned.
- The rock quarry face will be artificially weathered to blend with the surrounding rock.
- All equipment and supplies will be removed.
- The rail spur will be removed if not needed for other purposes.
- Temporary access routes will be reclaimed if not needed for other purposes.
- All camp and other facilities will be removed.
- Any remaining invasive plants will be treated using any method approved for use at the time of reclamation.

Depending on the chosen alternative, the Glacier Ranger District will have two to four ponds created as part of the site reclamation plan. These ponds will create excellent off-channel spawning and rearing habitat for coho, sockeye, and chum salmon as well as Dolly Varden char. These ponds are also expected to provide increased fish viewing and recreational angling opportunities near the Spencer Glacier Whistle Stop.

An aerial photo with superimposed ponds and connecting channels is provided to illustrate the approximate locations, shapes, and sizes of the ponds (see Figure 22). Variation in the overall

shape and size variations are possible with prior agreement with the District planning staff. Pond and channel characteristics and parameters include:

- Ponds may range from approximately 7 to 15 surface acres in size.
- Pond shapes will be moderately complex providing watered coves, peninsulas of land, and possibly islands.
- Approximately 30% of each pond will be 8 to 10 feet deep based on the mean summer water table level. Can be deeper if a benefit to contractor.
- Approximately 30% of each pond will be 5 to 7 feet deep.
- Approximately 40% of each pond will be 2 to 4 feet deep.
- Above water level shorelines will be no steeper than a 4 to 1 slope angle.
- Approximately 40% of the shoreline will be 8 to 1 slope angle.
- Pond connecting channels will be moderately meandering.
- Channel depths can vary from 1 to 4 feet deep and 6 to 10 feet wide.

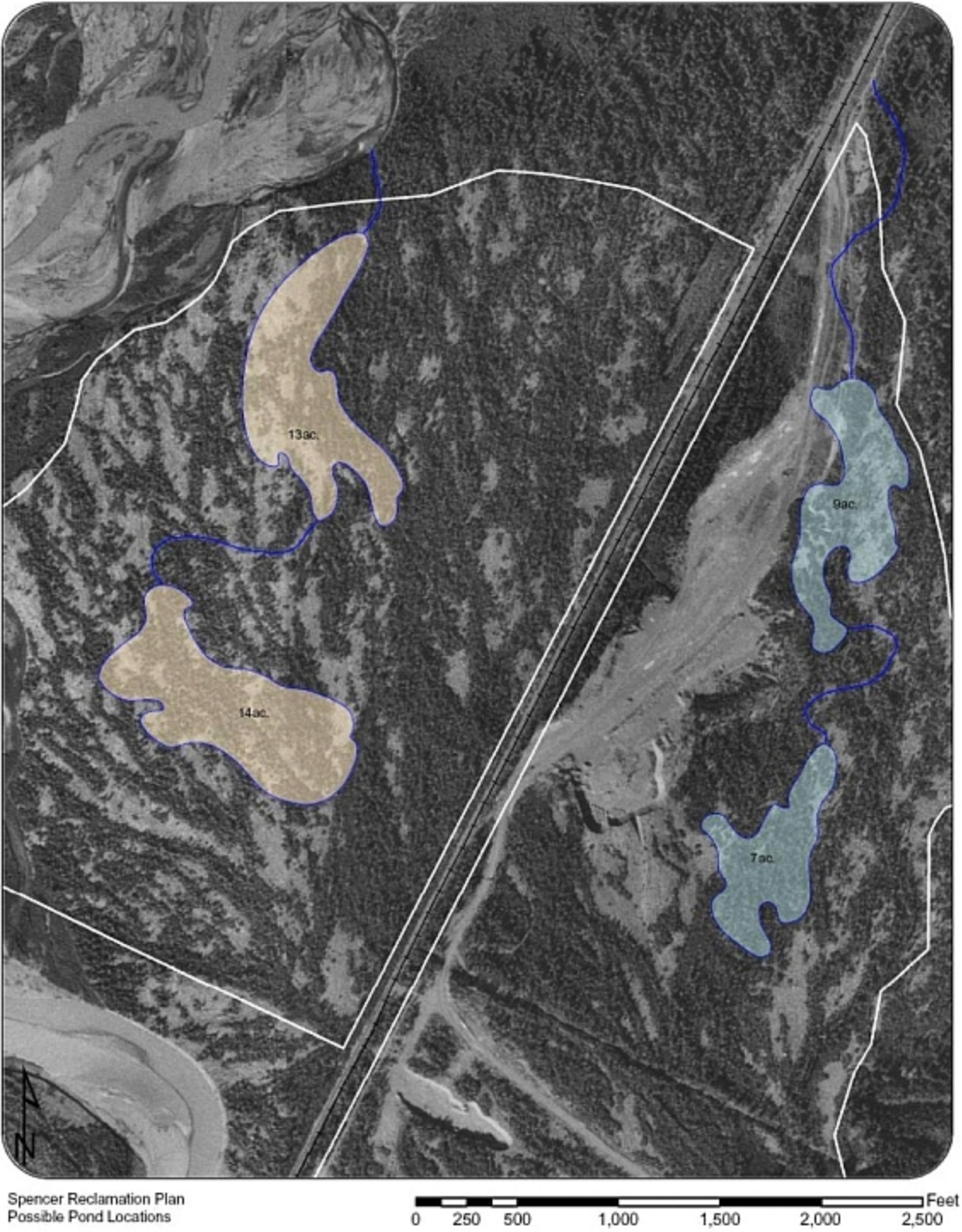


Figure 22. Aerial photograph showing a likely development scenario for ponds at Spencer mineral materials site following reclamation

