APPENDIX D

Statement of Findings for Executive Order 11990 Protection of Wetlands

Gravel Acquisition Plan
Denali National Park and Preserve
Alaska

September 2003

Recommended:

Paul R. Anderson — 9/30/03

Superintendent, Denali National Park and Preserve — Date

Certified For Technical Accuracy and Servicewide Consistency:

Mark O'Brien ACTING FOR DAN B. KIMBALL — 10/14/2003

Chief, Water Resources Division, Washington Office — Date

Approved:

Marcia Blaszak — 10/15/03

Acting Regional Director, Alaska Region — Date

INTRODUCTION

The National Park Service (NPS) has prepared and made available for public review, an environmental assessment (EA) to evaluate the impacts of implementing a 10-year gravel acquisition plan (GAP) for Denali National Park and Preserve.

In 1992, a gravel excavation site was established in the Toklat River floodplain, following the approval of a previous Denali Gravel Acquisition Plan. The 1996 Entrance Area and Road Corridor Development Concept Plan and Environmental Impact Statement (DCP/EIS) directed the park to relocate its rock/gravel processing site to the Toklat River floodplain excavation site because the current site, at the Toklat River bridges, created a visual intrusion for visitors. A 1999 EA was developed to complete the process of establishing a gravel-processing site in the Toklat River floodplain that would not affect the existing and proposed visitor rest area. The current Gravel Acquisition Plan proposes five alternatives to acquire sufficient gravel over a 10-year period to maintain and repair the park road. Within the alternatives there are 10 total sites considered. Three of them lie within a floodplain. East Fork River and Downtown Kantishna are new proposed sites and Toklat River is currently operating. The seven upland sites generally have vegetative cover that is a mosaic of upland and wetland tundra, and all of the sites have some area of wetland within or near the proposed mining area.

Executive Order 11990 (Protection of Wetlands) requires the NPS, and other federal agencies, to evaluate the impacts its actions are likely to have on wetlands. This executive order requires that short and long-term adverse impacts associated with occupancy, modification or destruction of wetlands be avoided whenever possible. Development and new construction in such areas should also be avoided wherever there is a practicable alternative.

To comply with these orders, the NPS has developed a set of agency policies and procedures, which can be found in Director's Order 77-1: Wetland Protection and Procedural Manual 77-1: Wetland Protection. These documents provide guidance for managing NPS activities that result in the modification or occupation of wetlands, or that result in impacts to wetland values.

The purpose of this Statement of Findings (SOF) is to present the NPS rationale for its proposed Denali Gravel Acquisition Plan that includes operating material extraction and processing sites in locations with unavoidable impacts to wetland areas and values.

WETLANDS WITHIN THE PROJECT AREA

Technical staff from Hart Crowser, Inc. delineated wetlands at 11 prospective gravel acquisition sites in August and September 2001 using the Routine Onsite Determinations methods described in the *Corps of Engineers Wetlands Delineation Manual* (U.S. Army Corps of Engineers 1987). The types, approximate areas, and functions of wetlands delineated at the sites considered in this EA are summarized from the jurisdictional wetland determination report prepared by Hart Crowser (2002). Wetland delineations have not been conducted at the Downtown Kantishna or East Fork River sites. Descriptions of wetlands at the latter two sites are based on a combination of field observations of nearby sites (Kantishna Airstrip, Camp Ridge, and East Fork Cabin), aerial photo interpretation, and National Wetland Inventory (NWI) maps. Wetland and upland vegetation types described herein follow the *Alaska Vegetation Classification* (Viereck et al. 1992). Wetlands are classified according to the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Plant nomenclature generally follows Hultén (1968), except where there have been recent taxonomic changes. More recent taxonomy follows Kartesz, as found

on the Natural Resources Conservation Service National Plants Database (USDA NRCS 2000) website at http://plants.usda.gov/.

Wetland functions at the delineated sites were assessed using *Wetland Values: Concepts and Methods for Wetland Evaluation* (Reppert et al. 1979), also known as the Reppert Method. Using this method a rating of high, moderate or low is given to major functions of wetlands including: natural biological functions; hydrologic support; storm and floodwater storage and retardation (or attenuation); groundwater recharge; and water quality protection or purification. Because of the relatively simple structure, small size, proximity to human activities, and homogeneous nature of site vegetation, functional values range from low to moderate for all sites and functions. Natural biological functions include general and specific habitat requirements for fish and wildlife. Hydrologic support includes contributions to base flows in streams during low flow periods. Study area, sanctuary, and refuge are an assessment of uniqueness and ability to be used as a scientific study area and sanctuary or refuge for rare or sensitive species. All functions were estimated using best professional judgment evaluation of the physical and biological characteristics of the wetlands and adjacent uplands and their landscape positions.

Table D.1 summarizes the wetland determinations, classifications and estimated acreages at each site. Table D.2 presents the summarized results of the functional assessment of the wetlands at the candidate sites. Wetland boundaries at the respective sites are included on the proposed mining plans in Appendix C of the EA. Existing upland and wetland conditions at each site are summarized below, as are expected wetland impacts based on the mapped wetland locations relative to the mining plans.

No federally designated threatened or endangered species are known to occur within Denali National Park (pers. comm., Ted Swem, USFWS, Fairbanks, Alaska, June 9, 2000). Therefore, no such species are expected to be affected by the proposed gravel acquisition plan, and the topic of potential effects on threatened and endangered species was dismissed from detailed consideration in the EA.

TABLE D.1: SUMMARY OF WETLAND DETERMINATIONS, CLASSIFICATIONS AND ESTIMATED ACREAGES

Site	Jurisdictional Wetland Determination[1]	Wetland Classification[2]	Estimated Wetland Area on the Site
Teklanika Pit	Nonjurisdictional/isolated	PSS1B	1.2
East Fork River	Jurisdictional	R3US/UB	114
Toklat River	Jurisdictional	R3US/UB	185
Beaver Pond	Jurisdictional	PSS/EM1B	0
Boundary	Nonjurisdictional/isolated	PSS1C	0.4
		PEM/SS1C	
Moose Creek Terrace	Nonjurisdictional/isolated	PSS1/4B	4.0
Camp Ridge	Nonjurisdictional/isolated	PSS1/4B	1.5
		PEM1B	
Downtown Kantishna	Jurisdictional	PSS1/4B	13.1
	Jurisdictional	R3USCx	1.6
Kantishna Airstrip	Nonjurisdictional/isolated	PSS1/4B	9.1

1 Preliminary jurisdictional determination. Determinations are subject to verification by the Alaska District, U.S. Army Corps of Engineers.

2 Wetland classification follows Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979).

TABLE D.2: SUMMARY OF RESULTS OF MODIFIED REPPERT FUNCTIONAL ASSESSMENT

Wetland	Wetland Classification[1]	Natural Biological Functions	Study Area, Sanctuary, Refuge	Hydrologic Support	Storm & Floodwater Storage & Retardation	Ground water Recharge	Water Purification
TP	PSS1B	Moderate	Moderate	Relatively low	Relatively low	Low	Relatively low
EFR	R3US/UB	Relatively low	Relatively low	Relatively low	Moderate	Moderate	Relatively low
TR	R3US/UB	Relatively low	Relatively low	Relatively low	Moderate	Moderate	Relatively low
BP	PSS/EM1B	Moderately high	Moderate	Moderate	Relatively low	Low	Relatively low
B	PSS/EM1C	Moderately high	Moderate	Relatively low	Relatively low	Moderate	Relatively low
NFC	PSS1/4B	Moderate	Moderate	Moderate	Relatively low	Low	Relatively low
MCT	PSS1/4B	Moderate	Moderate	Moderate	Relatively low	Low	Relatively low
CR	PSS1/4B and PEM1B	Moderate	Moderate	Moderate	Relatively low	Low	Relatively low
DK	PSS1/4B	Moderate	Moderate	Moderate	Moderate	Low	Low
	R3USCx	Low	Low	Low	Moderate	Low	Low
KA	PSS1/4B	Moderate	Moderate	Moderate	Relatively low	Low	Relatively low

[1] Wetland classification follows Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979).

TP –Teklanika Pit; EFR – East Fork River; TR – Toklat River; BP – Beaver Pond; B –Boundary; NFC – North Face Corner; MCT – Moose Creek Terrace; CR – Camp Ridge; DK – Downtown Kantishna; KA – Kantishna Airstrip.

Teklanika Pit

Palustrine scrub-scrub broad-leaved deciduous wetlands (PSS1B) associated with lower-lying areas and small water track features cover about 1.2 acres of the site. Scrub-shrub vegetation consists of a dwarf scrub community that varies in species composition across the site. Dominant plants include dwarf birch (*Betula nana*), willows (*Salix* sp.) that are generally less than 2 feet tall, sedges (*Carex* sp.), and polar grass (*Arctagrostis latifolia*). Cloudberry (*Rubus chamaemorus*), Arctic sweet coltsfoot (*Petasites frigidus*), cottongrass (*Eriophorum* sp.), sphagnum moss (*Sphagnum* sp.), and leatherleaf (*Chamaedaphne calyculata*) are associated species. Cloudberry, Arctic sweet coltsfoot, sphagnum and are most abundant in and immediately adjacent to the small water tracks that generally run from ESE to NNW from near the SE corner towards the north end of the site. The water tracks terminate south of the north boundary in a variation of the dwarf scrub community characterized by taller dwarf birch and willows, up to about 3 feet tall. Small tussocks are scattered throughout the area. Shallow, organic (peat) soils that support this wetland vegetation are seasonally or permanently saturated. Dwarf deciduous scrub-shrub wetland types are widespread in the park. Wetland functions at this site were rated as moderate for biological functions and sanctuary/refuge, and low or relatively low for the four water resource functions.

East Fork River

The entire site (up to 114 acres) consists of unvegetated gravel bars within the active channel of the East Fork Toklat River. Although it is unclear why, some of these gravel deposits are identified as upland on the National Wetlands Inventory map for this area. Most gravel bars and braided channels are classified as riverine upper perennial unconsolidated shore/unconsolidated bottom (R3US/UB) wetlands. These wetlands are widespread in the park and are associated with all of the larger rivers, including the Toklat River, Teklanika River, Sanctuary River, and Savage River. These riverine upper perennial wetlands appear to provide moderate to low levels of most wetland functions. The ratings are moderate for storm and floodwater storage and retardation (or attenuation) and groundwater recharge, given their large size and connectivity with other wetlands and adjacent uplands. The water quality protection or purification function appears to be relatively low because the only source of pollutants is atmospheric deposition.

Toklat River

The entire site (185 acres) consists of unvegetated gravel bars within the active channel of the Toklat River. The gravel bars and braided channels are classified as riverine upper perennial unconsolidated shore/unconsolidated bottom (R3US/UB) wetlands. These wetlands are widespread in the park and are associated with all of the larger rivers, including the Toklat River, Teklanika River, Sanctuary River, and Savage River. These upper perennial wetlands appear to provide moderate to low levels of most functions, similar to the East Fork River site.

Beaver Pond

There is a mosaic of palustrine scrub-shrub broad-leaved deciduous and emergent wetlands (PSS/EM1B) that cover an area of approximately 0.4 acre east of the proposed mine site. Wetlands are composed of a mixture of dwarf scrub, tall scrub and mixed graminoid-forb herbaceous vegetation associated with a drainage and beaded stream downslope of the Denali Park Road. Dominant plants include willows, dwarf birch, bog blueberry (*Vaccinium uliginosum*), lowbush cranberry (*Vaccinium vitis-idaea*), sedges, and crowberry. Common but not dominant associates included rough fescue, Arctic sweet coltsfoot, mosses, shrubby cinquefoil,

and a horsetail species (*Equisetum* sp.). Flow from a network of drainage channels and wetlands north of the park road appear to be concentrated and conveyed to this wetland through the culvert in the road. Surface water enters the wetland and spreads out in the tall scrub community at the south edge of the park road. Downslope surface water flow becomes more concentrated in a drainage channel and beaded stream that flows into the larger perennial stream on the valley floor to the south. Permanently saturated mineral soils around shallowly inundated areas and beads (ponds) of the stream are covered by the mixed graminoid-forb vegetation and scrub vegetation is in between the nodes of the stream and higher gradient areas. These palustrine scrub-shrub and emergent wetland types are common throughout the park.

Natural biological functions, including food chain production and general and specialized habitat are moderately high because of surface water connections to aquatic environments (the beaded stream) as well as the larger size of these wetlands. Hydrologic support functions are higher because of the presence of the beaded stream. Groundwater recharge appears low, because the wetland is such a small proportion of the total subbasin area. Although vegetation density is high, water purification or protection appears to be only moderate because the only source of pollutants to this area, other than road dust, is from atmospheric deposition.

Boundary

Wetlands cover an area of about 0.4 acre and consist of an isolated, seasonally saturated, palustrine broad-leaved deciduous scrub-shrub and emergent system (PSS/EM1C) located in a closed depression. The dwarf-low shrub vegetation is dominated by dwarf willows, bog blueberry, lowbush cranberry, dwarf birch, crowberry, mosses and lichens. Crowberry is abundant and forms dense, continuous patches on the tops and sides of small hummocks. A sedge species is also present but not dominant. The emergent vegetation class is a mixed graminoid and forb community type. Dominant plants included sedges, violet (*Viola* sp.), rough fescue, an oxytrope species (*Oxytropis sp.*), bog blueberry, dwarf birch, moss, and scattered lichens. Mineral soils with an appreciable amount of fines are likely seasonally saturated. Natural biological support functions, storm and floodwater storage, and water purification or protection are rated moderate given the relatively simple vegetation structure, relatively small size, and isolated nature of the wetland. Hydrologic support and groundwater recharge appears low because of the wetlands small size and moderately poorly drained soils.

North Face Corner

The entire top of the terrace on the site (about 5.7 acres) is an isolated, saturated palustrine scrub-shrub broad-leaved deciduous and broad-leaved evergreen (PSS1/4B) wetland. Dwarf scrub vegetation is dominated by dwarf birch and several ericaceous shrubs, including bog blueberry, Labrador tea, lowbush cranberry, and crowberry. A sedge species, cloudberry, polar grass, and Arctic sweet coltsfoot were among the associated species. Silt loam mineral soils appear to be permanently saturated because of a combination of shallow permafrost and subsurface drainage from the mountain slopes to the southwest. Apparent wetland functions are similar to those provided by other previously described scrub-shrub wetlands. Natural biological support functions, hydrologic support, storm and floodwater storage, groundwater recharge and water quality protection range from low to moderate because of the wetland's landscape position, isolated nature, and relatively simple vegetation structure.

Moose Creek Terrace

There are two wetlands at the Moose Creek Terrace site. These cover a total area of about 4.0 acres. Both are a mixture of palustrine scrub-shrub broad-leaved evergreen and broad-leaved deciduous (PSS1/4B) wetlands characterized by dwarf scrub vegetation types dominated by species similar to those described on other sites. Soils are apparently permanently-saturated mineral soils. Shallow subsurface drainage from the slopes to the south appears to be the primary source of wetland hydrology to both wetlands. Because there is no direct surface water connection to Moose Creek, it appears that these are isolated and nonjurisdictional wetlands. Functions for the PSS1/4B wetlands are similar to those previously discussed. Natural biological support functions may be somewhat higher than most other wetlands, given the moderate structural complexity and proximity to the Moose Creek riparian corridor that provide habitat and travel corridor opportunities to fish and wildlife. Hydrologic support, storm and floodwater storage, groundwater recharge, and water purification or protection range from low to moderate.

Camp Ridge

Much of the site is wetland (1.5 acres) consisting of a mosaic of PSS1/4B and PEM1B wetlands. Wetlands consist of an open needleleaf forest type, dwarf scrub, and tussock tundra community types. Tree cover is generally less than 30 percent in the open needleleaf forest, so it is not considered a forested wetland according to the USFWS wetland classification system (Cowardin et. al. 1979). In addition, a portion of the site is characterized by a tussock tundra vegetation type that is classified as PEM1B wetland. White spruce and ericaceous shrubs similar to previously described scrub-shrub wetlands are dominant. Tussock tundra vegetation includes dwarf ericaceous shrub species similar to other wetlands as well as scattered black spruce (*Picea mariana*) and tussocks formed by cottongrass and sedges. Soils appear to be permanently saturated as a result of shallow permafrost and subsurface drainage patterns, and range from mineral to organic (sphagnum peat). These palustrine scrub-shrub and emergent wetlands appear to provide low to moderate levels of all functions similar to previously described isolated wetlands.

Downtown Kantishna

The NWI map shows relatively extensive PSS1/4B wetland along the southwest boundary of the site, south of Eldorado Creek. In addition, there are three riverine wetlands including Moose Creek (R3UBH) Eldorado Creek (R3UBHx) and a seasonally flooded, excavated unsolidated shore (R3USCx) wetland in the northeast corner. Palustrine scrub-shrub wetlands appear to be upslope of historically disturbed areas. Dominant plants in this wetland include willows and dwarf evergreen shrubs similar to those for other wetlands with this classification. Soils are likely relatively shallow and permanently saturated. Riverine wetlands have been disturbed by historic placer mining activities. These wetlands are generally unvegetated braided channels or sparsely vegetated gravel bars. Where vegetation exists, it consists primarily of pioneer species, including willows, alder and cottonwood. Palustrine scrub-shrub wetlands appear to provide low to moderate levels of functions. Because of historical disturbance, riverine wetland functions appear to be relatively low for all categories except flood storage and attenuation. Because the site is in the floodplain, this function appears to be moderate.

Kantishna Airstrip

The entire top of the terrace (about 9.1 acres) at this site is a mixed PSS1/4B wetland. The dwarf scrub vegetation is dominated by plants similar to those at wetlands described previously. Other plants that were common but not dominant included woodland horsetail (*Equisetum sylvaticum*), black spruce, sedges, and lichens. This wetland appears to provide similar functions as the other PSS1/4B wetlands. Functions range from low to moderate.

THE PROPOSAL IN RELATION TO WETLANDS

The proposed action, three alternative actions and a no-action alternative are described in detail in the Environmental Assessment for the Denali National Park Gravel Acquisition Plan. All five of the alternatives would directly impact wetlands in the park. Alternative 1: No-Action and Alternative 3: Minimum Visual Intrusion/Long Hauls would continue to extract and process borrow material from the Teklanika and Toklat River sites, while Alternative 3 would also include new development at the Moose Creek Terrace site. Alternative 2: Maximum Flexibility/Short Hauls would use material from the existing Teklanika and Toklat River sites, plus the East Fork River, Beaver Pond, Boundary, Camp Ridge, Downtown Kantishna and Kantishna Airstrip sites. Alternative 4: Phased Development with a Moderate Number of Sites and Alternative 5: Economic Alternative with Moderate Hauls also call for material extraction from the Teklanika, Toklat River, East Fork River and Downtown Kantishna sites, plus the Moose Creek Terrace site (Alternative 4) or the North Face Corner site (Alternative 5). Based on the similarity of their components and impacts, the NPS identified Alternatives 4 and 5 as the NPS-preferred alternatives. Based on public comment on the draft EA, the NPS is dropping phase 2 of alternatives 4 and 5, so the Moose Creek Terrace and North Face Corner sites are no longer included in the NPS preferred alternative.

Plans for gravel extraction at the respective sites have been developed in a manner to avoid direct or indirect wetland impacts to the greatest extent possible. Nevertheless, given the extent of wetland area within the road corridor and elsewhere in the park landscape, some inclusion of wetland area within the proposed mining area boundaries is unavoidable. Table D.3 (presented in the EA as Table 4.5) identifies the areas of wetland impacts by site and alternative. Maps D.1 through D.5 show the locations of wetlands relative to the mining plans for the source sites included in Alternative 4 or 5 (the preferred alternatives).

TABLE D.3: SUMMARY OF WETLAND IMPACTS (ACRES) BY ALTERNATIVE

Site	Wetland Classification[1]	Alternative1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
TP	PSS1B[2]		1.2	1.2	1.2	1.2
EFR	R3US/UB		2.3[3]		2.3[3]	2.3[3]
TR	R3US/UB		3.3[3]	3.3[3]	3.3[3]	3.3[3]
BP	PSS/EM1B					
B	PSS/EM1C[2]		0.4			3.1
NFC	PSS1/4B[2]			4.0	4.0	
MCT	PSS1/4B[2]		0.7			
CR	PSS1/4B[2] and PEM1B[2]		0.8			
DK[4]	PSS1/4B					
	R3USCx		1.6		1.6	1.6
KA	PSS1/4B[2]		9.1			
	Total Impact (acres)	None	19.4	8.5	12.4	11.5

1 Wetland classification follows Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979)

2 Appear to be isolated, nonjurisdictional wetlands. The Alaska District, U.S. Army Corps of Engineers will make the final jurisdictional determination.

3 Including up to an acre of impacts from the temporary (seasonal) access road.

4 It is assumed that potential impacts to riverine wetlands (Moose Creek and Eldorado Creek) would be avoided or negligible. Gravel removal, processing and storage would be limited to previously disturbed areas.

TP – Teklanika Pit; EFR – East Fork River; TR – Toklat River; BP – Beaver Pond; B –Boundary; NFC – North Face Corner; MCT – Moose Creek Terrace; CR – Camp Ridge; DK – Downtown Kantishna; KA – Kantishna Airstrip.

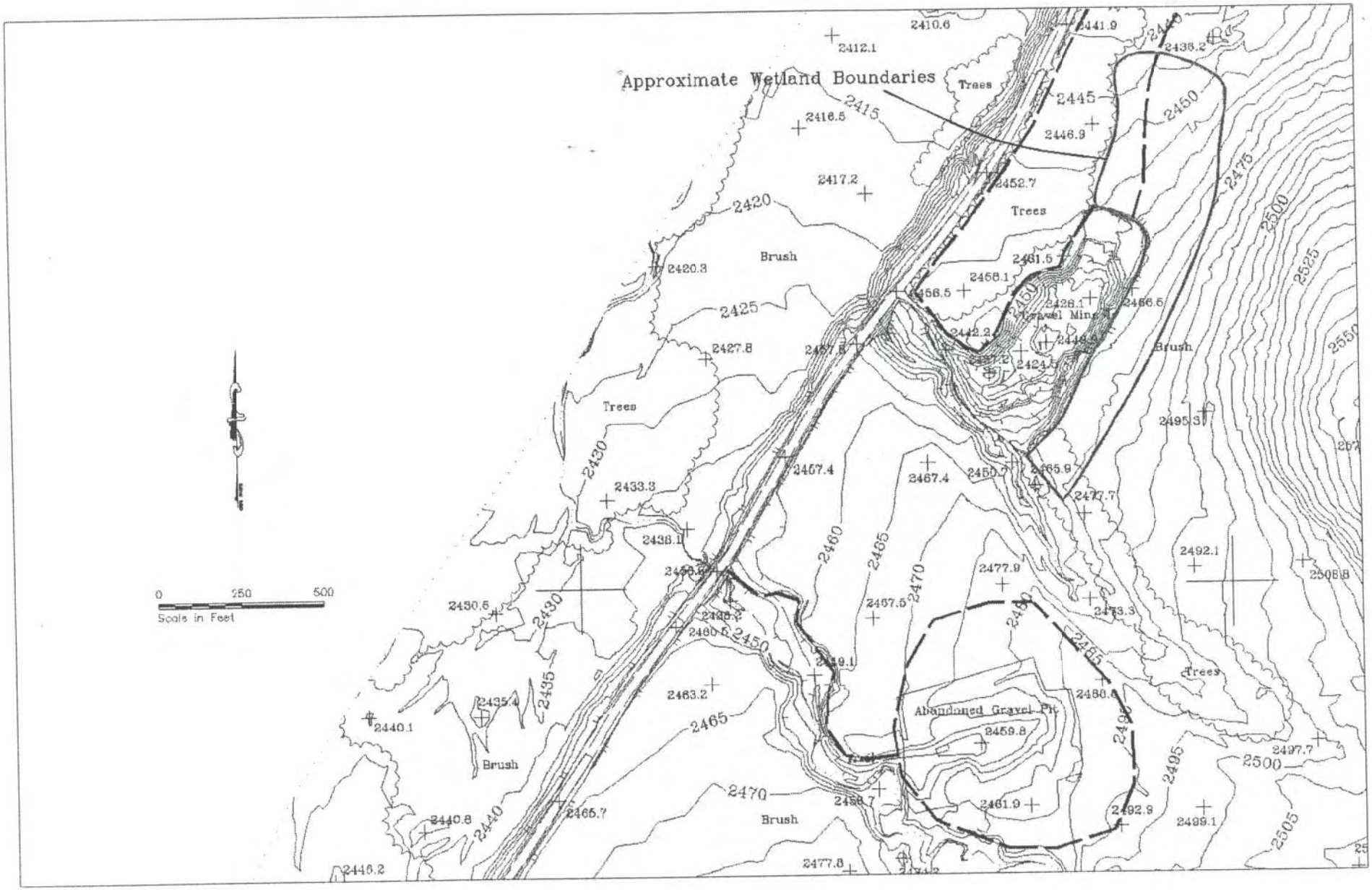


FIGURE D.1–TEKLANIKA PIT MINING AREA AND WETLANDS

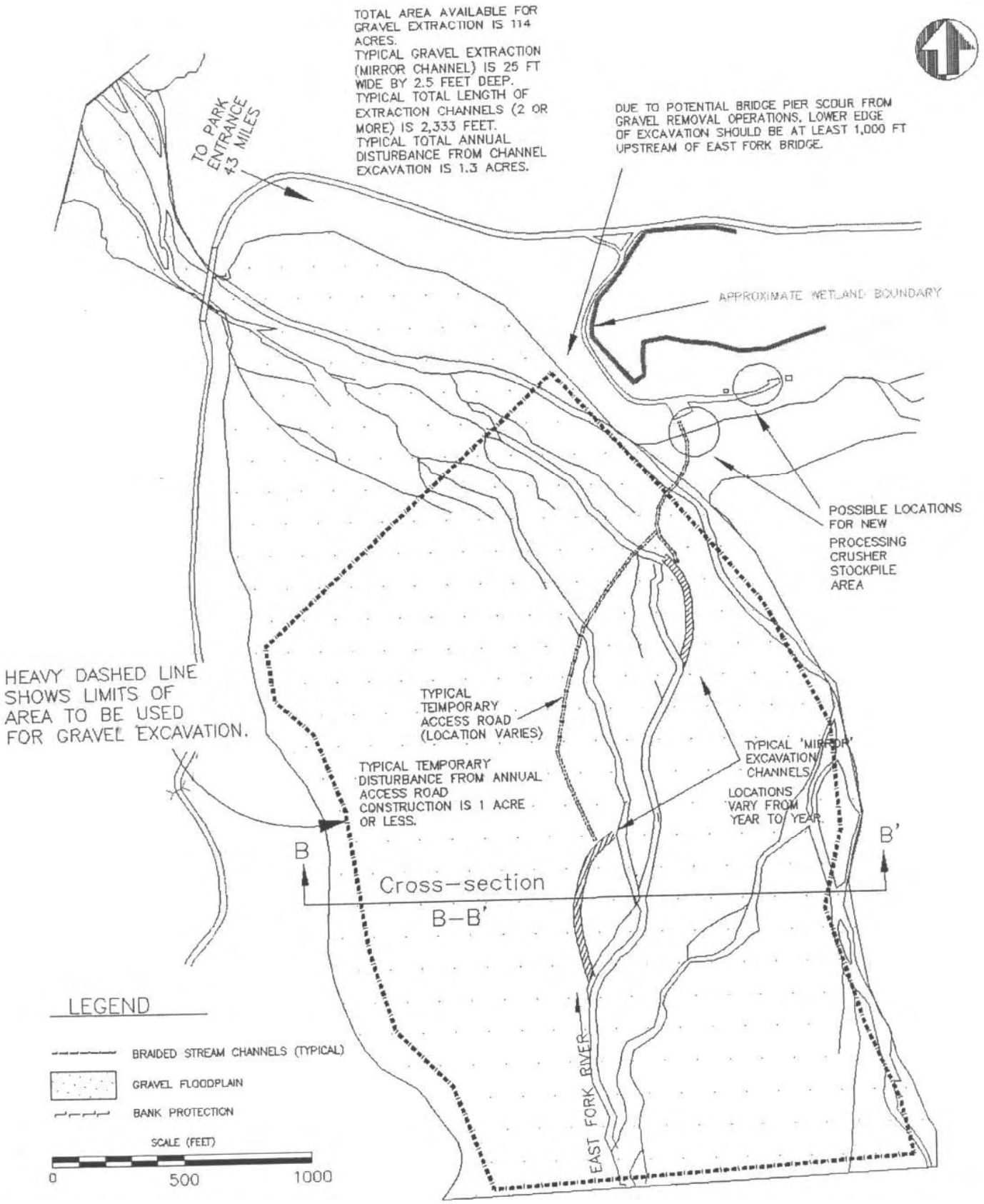


FIGURE D.2-EAST FORK RIVER MINING AREA AND WETLANDS

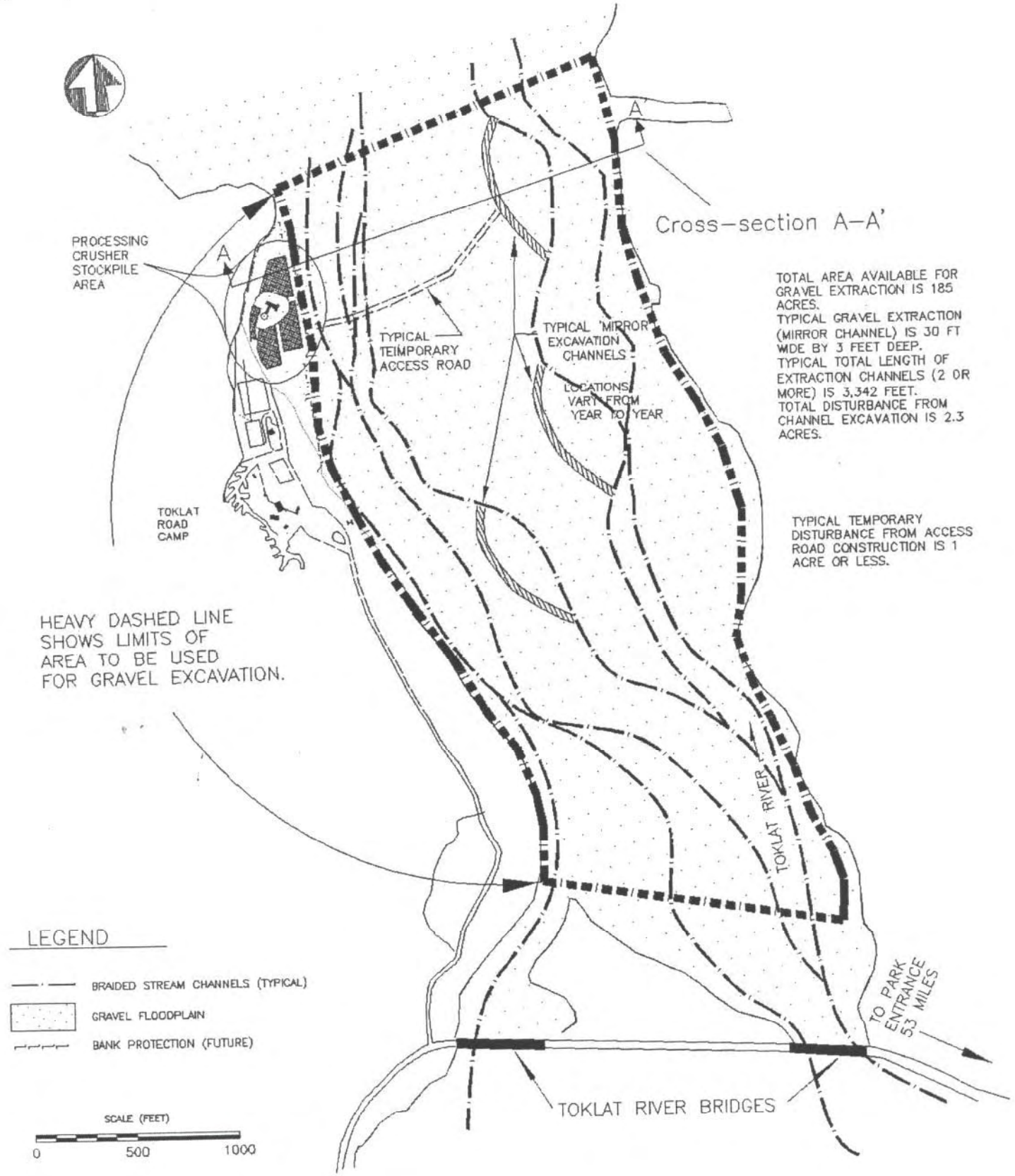
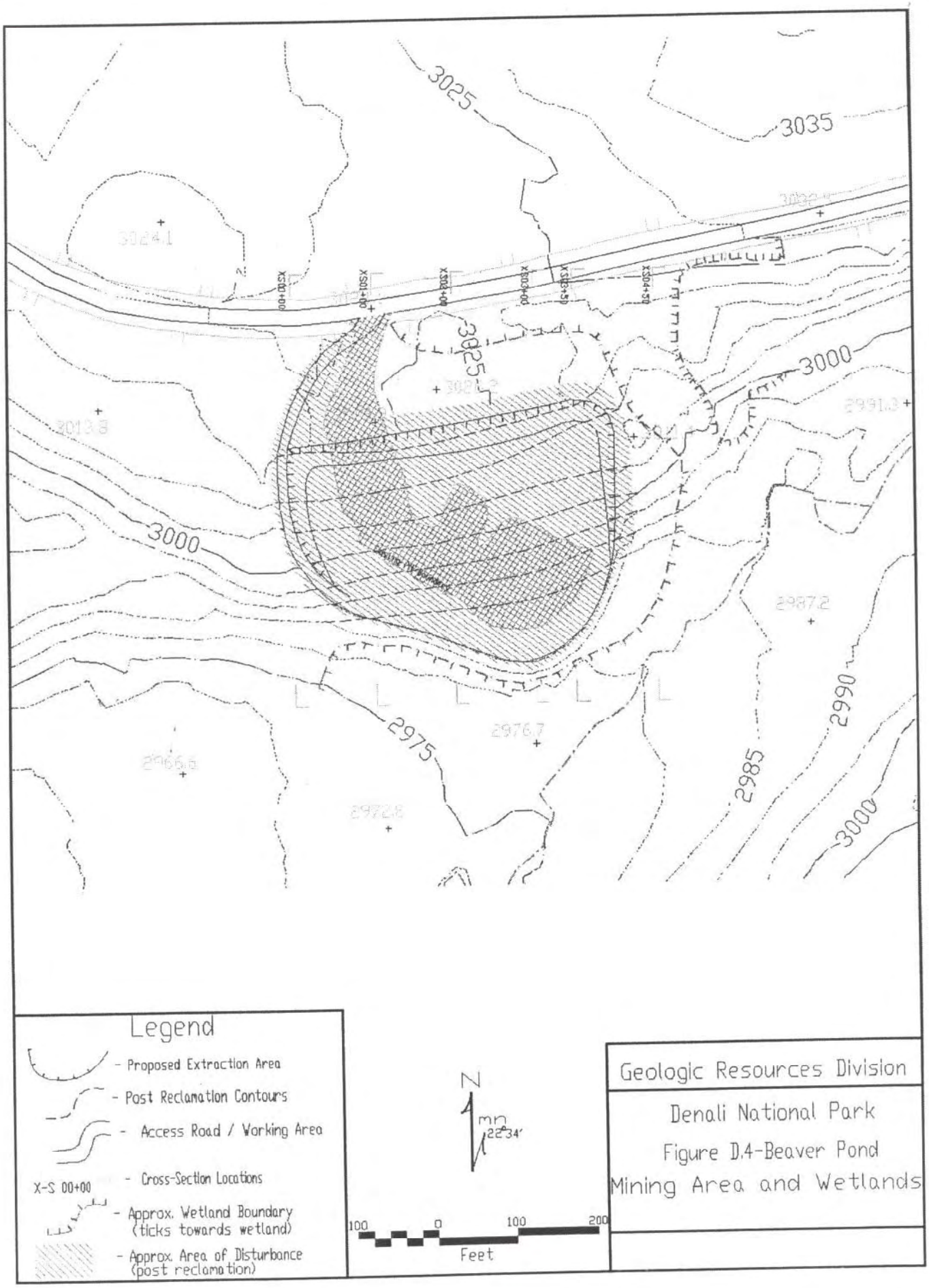


FIGURE D.3-TOKLAT RIVER MINING AREA AND WETLANDS


3025
3035
3000
3025
3000
2975
2985
2990
3000
Legend
- Proposed Extraction Area
- Post Reclamation Contours
- Access Road / Working Area
X-S 00+00 - Cross-Section Locations
- Approx. Wetland Boundary (ticks towards wetland)
- Approx. Area of Disturbance (post reclamation)
N
mn
22°34'
100 0 100 200
Feet
Geologic Resources Division
Denali National Park
Figure D.4-Beaver Pond
Mining Area and Wetlands

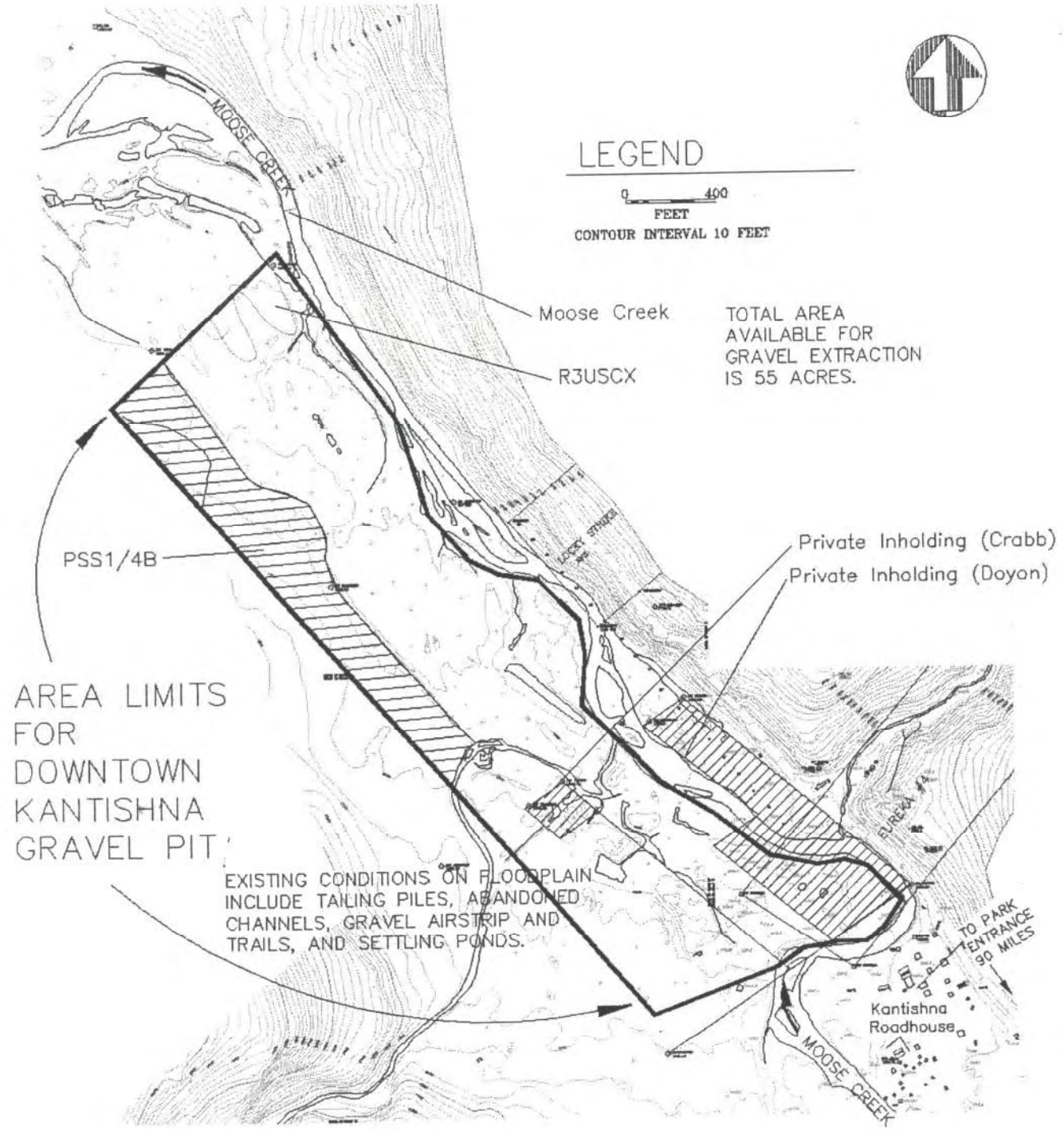


FIGURE D.5—DOWNTOWN KANTISHNA MINING AREA AND WETLANDS

SITE SELECTION CRITERIA

In accordance with NPS Special Directive 91-6, Field Guide to Implementing the NPS Management Policies Re: Administrative Use of In-Park Borrow Material, park management determined it economically infeasible to obtain gravel for road maintenance entirely from external sources. Most gravel, therefore, is obtained from sources within the park. The Denali Park Road corridor was deemed to be the best general location within the park for gravel sources. The NPS used nine specific criteria for identifying preliminary gravel source sites within the park road corridor; criteria that are relevant to considerations of potential wetland impacts include the following:

- Development of the source will minimize wetlands and floodplains disturbance, as directed by pertinent NPS policies.
- Access to the source will not involve multiple crossings of rivers or perennial streams (Toklat River excepted), particularly streams in the Kantishna area where anadromous fisheries could be adversely impacted.
- Sites must be situated such that full restoration is possible after extraction is completed.
- The source contains good quality material in sufficient quantity.

Based on these criteria, the NPS developed a preliminary site index of 19 possible gravel sources within the park road corridor. Eight of those sites were subsequently eliminated from the list based on deficiency with one or more of the site selection criteria, including three sites considered deficient with respect to the wetland and floodplain criterion. The 10 source sites evaluated in the EA, and one site reserved for future testing, were considered to be consistent with the site selection criteria. Evaluation of the 10 sites indicated that wetland impacts could be avoided to a considerable extent or minimized through site-specific planning, and that the NPS would be able to compensate for unavoidable wetland impacts through restoration of degraded wetlands.

MITIGATION PROPOSED

The proposed action includes a variety of measures in all alternatives to mitigate and monitor impacts of the actions on wetlands and other environmental resources. Measures used to mitigate impacts include avoidance, minimization through modification of proposed mining plans and, lastly, compensation for unavoidable impacts. The process to be followed for development and operation of upland and floodplain extraction and processing sites (described in detail in Chapter 2 of the EA) include specific prescriptions for identifying the area to be included in the active operations and installing erosion and sedimentation control measures. Sites would be designed so that restoration of the extraction area could occur quickly and return natural functions and processes to the sites. Operational monitoring, sediment monitoring and project documentation common to all sites and alternatives would include monitoring and records pertinent to wetland conditions before and after extraction activities. Restoration of the gravel source sites operated through this plan will, in general, not be considered to provide the compensation necessary for new wetland impacts.

The Downtown Kantishna site represents an exception to this condition. Wetland and floodplain resources at the Downtown Kantishna site have been considerably disturbed by past placer mining activity at the site, and the NPS has identified this site as a high priority for reclamation. While this site would be used for gravel extraction, the gravel removal would occur as an integral and necessary component of site reclamation. Because of the current degraded status of the Downtown Kantishna site, the serious need for reclamation of a functional

stream/wetland/riparian system, and the need to recontour the floodplain to accomplish the reclamation, the Downtown Kantishna site would serve both purposes of gravel supply and compensation for wetland impacts. Approximately 4 acres along the floodplain of the 2000 feet of the lowest reach of Eldorado Creek would be restored during the site recontouring. Restoration at this linear site would not include gravel extraction, but would attempt to bring Eldorado Creek into a channel configuration similar to that shown on pre-mining air photos. Bank stabilization and floodplain recontouring would extend at least 40 feet on either side of the stream OHW. An additional 3 acres of riparian environment adjacent to the western shore of Moose Creek would be recontoured and stabilized. A small amount of gravel extraction may accompany this work. There would also be stream habitat improvements to at least 3 acres of Moose Creek itself due to the streambank work. The stabilization would reduce the amount of very mobile placer gravel and finer particles that would be eroded into the streambed. **Additional (but unquantified) riverine wetland habitat will be improved downstream due to the reduction of excessive sedimentation from these restored areas.** Map D.6 shows the conceptual reclamation plan for the Downtown Kantishna site.

Compensation, by restoration of previously degraded wetlands, is required under the NPS no-net-loss policy for projects involving disturbance or loss of wetlands. Gravel extraction and processing operations are not exempt from this requirement. Compensation will occur for the unavoidable loss or disturbance of wetland area at gravel source sites over the next 10 years. Restoration plans beyond a conceptual approach have not yet been developed,

ALTERNATIVES CONSIDERED

The five alternatives are described in detail in the Environmental Assessment for the Denali Gravel Acquisition Plan. They are summarized as follows:

Alternative 1 - No-Action: This alternative would result in no new gravel source developments within Denali National Park and Preserve. The existing authorized source sites at Teklanika Pit and Toklat River would continue at extraction rates approved in the 1992 Gravel Acquisition Plan (NPS 1992). The remaining 5,000 to 10,000 cubic yards (cy) of material authorized in the 1999 North Face Corner EA would also be authorized, but this source would be exhausted in summer 2003 and prepared for restoration.

Alternative 2 – Maximum Flexibility/Short Hauls: This alternative would authorize the extraction of mineral materials from up to 9 sites within the park boundaries. These sites would be the Teklanika Pit at milepost (MP) 27 of the park road, East Fork River at MP 43, Toklat River at MP 53, Beaver Pond at MP 70, Boundary at MP 88, North Face Corner at MP 89, Camp Ridge at MP 90, Downtown Kantishna at MP 91 and Kantishna Airstrip at MP 93. Material from the East Fork River would be used for emergency road repair of slope failures along Sable or Polychrome passes. Allowable extraction at Toklat River would be increased from 7,500 cy a year to an average of 11,100 cy a year. Material from Downtown Kantishna and Kantishna Airstrip would be used for road repair projects and rehabilitation of the Kantishna Airstrip at the western end of the Denali Park Road.

Alternative 3 – Minimum Visual Intrusion/Long Hauls: This alternative would authorize extraction of mineral materials from 3 sites within park boundaries. These sites would be the existing Teklanika Pit and Toklat River sites, and the Moose Creek Terrace site at MP 89. All three sites would support stockpiling and processing activities.

Alternative 4 – Phased Development with Moderate Number of Sites: This alternative would

Alternative 4 – Phased Development with Moderate Number of Sites: This alternative would authorize the extraction of mineral materials from 5 sites at any one time. These sites would be Teklanika Pit, East Fork River, Toklat River, Beaver Pond, and Downtown Kantishna in phase 1 and Moose Creek Terrace in phase 2. The North Face Corner site would be cleaned out and restored as soon as possible. Downtown Kantishna and Beaver Pond might satisfy park needs for gravel at the western end of the park road over the next 10 years, but if they did not the Moose Creek Terrace site would be opened near the end of the planning period.

Alternative 5 – Economic Alternative with Moderate Hauls: This alternative would be essentially the same as Alternative 4, except phase 2 at the western end of the park road would involve the North Face Corner instead of Moose Creek Terrace.

The new NPS preferred alternative would be Alternative 4 or 5 without phase 2 gravel extraction and processing at either the North Face Corner or Moose Creek Terrace.

SUMMARY OF ENVIRONMENTAL IMPACTS

The potential environmental consequences of the alternatives are described in the Environmental Assessment for the Denali Gravel Acquisition Plan. The impact conclusions with respect to wetlands are summarized below and in Table D.3 for each alternative.

Alternative 1: No Action

The no-action alternative would have a negligible potential impact on wetlands, and the lowest impact of any alternative. Only those wetlands at the Teklanika Pit (PSS1B), Toklat River (R3US/UB), and North Face Corner (PSS1/4B) would be affected. It is assumed that these impacts have been mitigated as part of the previous NEPA process and gravel acquisition planning, and there would be no new impacts from continuing these existing operations.

Alternative 2: Maximum Flexibility/Short Hauls

This alternative would affect the largest amount of wetland area (19.4 acres), the most types of wetlands, and the least common wetland type observed at all of the sites (palustrine emergent wetlands at Boundary and Camp Ridge). Both jurisdictional and apparently nonjurisdictional wetlands would be affected by this alternative, including 7.2 acres of jurisdictional riverine wetlands, 9.8 acres of isolated PSS1/4B wetlands, 0.4 acres of isolated PSS/EM1C wetlands, 1.2 acres of isolated PSS1B wetlands and 0.8 acres of isolated PEM1B (Table D.3). Because loss of wetland functions would be proportional to loss of wetland area, this alternative also would contribute to a major loss of functions compared to other alternatives and require the most compensatory mitigation. Even if tundra type (PEM1B) plants, topsoil and overburden are stockpiled, wetlands with peat (organic) soils are unlikely to be successfully restored or recreated. Organic soils, tussocks, and processes in these systems are not replicable at this time. There might be some risk of subsidence and thermokarst from thawing of permafrost that might also affect the ability to restore or recreate wetlands at the North Face Corner and Camp Ridge sites. This alternative would have the greatest potential losses of wetland acreages and functions of all the action alternatives. Overall wetland impacts would be major compared to the other action alternatives. In addition, this alternative would have the greatest cumulative effects.

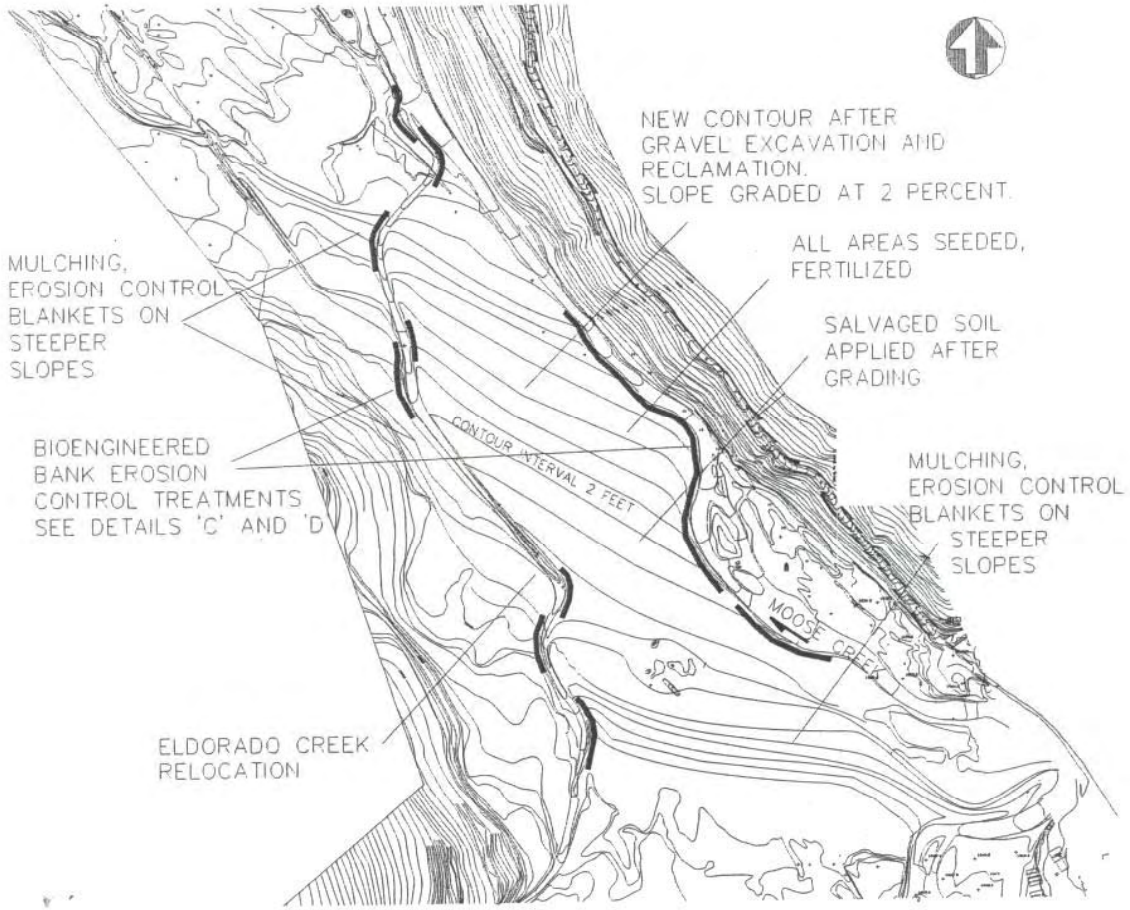


Figure D.6 - Downtown Kantishna Restoration Plan

Alternative 3: Minimum Visual Intrusion/Long Hauls

Potential wetland impacts that would occur from this alternative are estimated at 8.5 acres. Only those wetlands most commonly found at potential extraction sites would be affected and most of these would be jurisdictional riverine wetlands (3.3 acres of R3US/UB) that would result in temporary impacts on wetland functions. In addition, approximately 1.2 acres of isolated and nonjurisdictional PSS1B wetlands and 1.4 acres of isolated and nonjurisdictional PSS1/4B wetlands would be affected. Potential losses of wetland acreages and functions would be the lowest among the action alternatives, but somewhat greater than for Alternative 1. Overall wetland impacts would be minor. This alternative would have the least potential cumulative effects of all the action alternatives.

Alternative 4: Phased Development of Moderate Number of Sites

This alternative would affect a combined total of 12.4 acres of both jurisdictional and nonjurisdictional wetlands. Alternative 4 would affect the same amount of jurisdictional riverine wetlands (5.6 acres of R3US/UB) as Alternative 2 or Alternative 5. Approximately 1.2 acres of isolated and nonjurisdictional PSS1B and 4.0 acres of isolated and nonjurisdictional PSS1/4B wetlands also would be affected. This alternative would have greater potential impacts on wetland acreages and functions than Alternative 3, but lower potential impacts of both wetland acreage and functions compared to Alternative 2. All of the wetlands impacted by this alternative are common throughout the park and the surrounding region. Overall wetland impacts would be moderate compared to Alternative 2. Potential impacts are higher than Alternative 3 and slightly higher than Alternative 5. Potential cumulative effects on wetlands from this alternative would be about the same as Alternative 5, higher than Alternative 1 or 3, and considerably lower than Alternative 2.

Alternative 5: Economic Alternative with Moderate Hauls

The total affected wetland area for this alternative is estimated at 11.5 acres. Alternative 5 would result in similar impacts to jurisdictional riverine and jurisdictional PSS1/4B wetlands compared to Alternative 2 and Alternative 4, and slightly lower impacts on jurisdictional riverine wetlands compared to Alternative 3. Compared to Alternative 4, total impacts to isolated and nonjurisdictional PSS1/4B wetlands would be approximately 0.9 acres less. Alternative 5 would involve the same amount of impacts (about 1.2 acres) to isolated and nonjurisdictional PSS1B wetlands as all other action alternatives. Overall, potential for wetland losses and associated functions for Alternative 5 are higher than for Alternative 3, but lower than for Alternative 2 or (by a small margin) Alternative 4. Potential cumulative effects are slightly lower than Alternative 4, higher than Alternative 1 or 3 and much lower than Alternative 2.

The new NPS preferred alternative, which involves only phase 1 of alternatives 4 or 5, would affect 8.4 acres of wetlands. This alternative would result in the same impacts to jurisdictional riverine wetlands as in alternatives 2, 4, or 5 (up to 5.6 acres R3US/UB). Up to 1.2 acres of isolated shrub-scrub wetlands (PSS1B) would be impacted at Teklanika Pit, and 1.6 acres of seasonally flooded, excavated unconsolidated shore wetlands (R3USCx) would be impacted at Downtown Kantishna.

CONCLUSION

There is no practicable alternative that would meet the needs for gravel acquisition and that would completely avoid loss or disturbance of wetlands. Site selection and development of site-specific mining plans have been done to avoid or minimize wetland impacts to the extent practical. Mitigation and monitoring actions included in the project plans include measures intended to protect wetlands within or adjacent to the sites. As required by NPS wetland protection procedures, unavoidable impacts to wetland areas resulting from implementation of the plan will be compensated for, on a minimum 1:1 acreage basis, by restoring previously disturbed riverine and palustrine wetland habitat and associated riparian habitat in appropriate regions of the park. Specifically, the NPS has identified previously disturbed mining claim areas along Eldorado Creek (4 acres) and Moose Creek (6 acres) within the Downtown Kantishna extraction site as proposed areas for wetland and riparian restoration that would provide compensation greater than the 8.4 acres of unavoidable wetland impacts under the preferred alternative for the gravel acquisition plan. Additional (but unquantified) riverine wetland habitat will be improved downstream of these sites due to the reduction of excessive sedimentation from these restored areas.

Gravel acquisition is proposed for the Downtown Kantishna site under Alternatives 2, 4, and 5. For all three alternatives the overall objective is to recover mineral materials as a by-product of reclaiming this disturbed site during the life of the plan. This area has been substantially disturbed by placer mining activities in the past 50 years, and the NPS considers reclamation of the site to be a priority need for the Kantishna area. Gravel extraction and reclamation activities at this site would disturb 1.6 acres of existing wetland, which appears to be a feature of historic placer mining. The conceptual reclamation plan for the site (Karle 2003) addresses the restoration of natural floodplain structure and functions; site reclamation would logically include restoration of wetlands associated with the stream. Therefore, it is expected that the wetland impacts would be temporary and would be mitigated on-site upon successful restoration of the site.

The NPS has identified Alternatives 4 and 5 in the EA as the environmentally preferred alternative, but after public comment, the NPS will eliminate phase 2 of those alternatives. The NPS believes the new preferred alternative would provide adequate mineral materials needed to maintain the park road and facilities in a safe and esthetic condition, while minimizing adverse impacts to park natural and cultural resources. Either alternative would preserve non-renewable resources to the extent feasible and minimize, on balance, the direct and indirect impacts to park surface area, vegetation, wetlands, wildlife, air quality, water resources and park visitors.

The new preferred alternative (alternative 4 or 5 without phase 2) would have unavoidable impacts to wetlands, and would adversely affect the least amount of wetland area than any other action alternative. The no-action alternative does not meet the stated needs for park management without resulting in exorbitant costs and excessive damage to the Denali Park Road from trucking gravel from external sources to project sites in the park. The reasons for the NPS preferred action over the no-action alternative are summarized as follows:

1. The NPS preferred alternative is consistent with the planning direction provided by the 1997 Entrance Area and Road Corridor Development Concept Plan. This plan directs the NPS to obtain mineral materials needed for the western end of the park from, in order of priority: (a) private lands, (b) previously disturbed lands in the Kantishna area and, lastly, (c) Moose Creek Terrace, but only after other viable sources are exhausted.
2. Truck traffic with Alternative 1 (No-Action) would be substantially greater than with the NPS preferred alternative. Thus, Alternative 1 would result in greater impacts to air

resources from fugitive dust, greater damage to the road surface and structure, and greater disturbance to park visitors and wildlife. These impact relationships must be balanced against the relative wetland impacts of the alternatives.

3. The NPS Preferred Alternative would extract gravel from sites where wetland impacts would be minimal (1.2 acres at Teklanika Pit and 1.6 acres at Downtown Kantishna). Activity at the Downtown Kantishna site would occur only on previously disturbed areas, including some areas now wet, but these are disturbed wetlands and riverine systems whose functions would be improved through gravel extraction and restoration. Disturbance at unvegetated wetlands within the active gravel floodplain of the East Fork River or Toklat River sites would be restored by natural gravel migration and floods within 5 years of extraction. Alternative 1 would also result in impacts to Teklanika Pit and the Toklat River to lesser extents, but trucking of large volumes of gravel across the park road would result in greater impacts to park resources and visitor services as noted above under reason 2.
4. The cost analysis of the alternatives indicates that the NPS Preferred Alternative would be considerably less costly than Alternative 1. Alternative 1 would have a greater reliance on purchases of gravel from external sources and greater average haul distances, which would increase the cost of supplying the same volume of gravel relative to the NPS Preferred Alternative.

Based on the lack of a practicable alternative with less impact on wetlands and the inclusion of measures to avoid, minimize or compensate for wetland impacts, the NPS finds the proposal to be consistent with Executive Order 11990 and NPS Director's Order 77-1: Wetland Protection.

REFERENCES

Cowardin, L. M., V. Carter, F. C. Golet and E. T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Office of Biological Services, Publication FWS/OBS-79/31. Washington, DC.

Hart Crowser. 2002. Denali National Park Gravel Acquisition Plan Wetland Delineation. Prepared for Denali National Park by Hart Crowser, Inc. Anchorage, Alaska.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press. Stanford, CA.

Karle, K.F. 2003. Reclamation and Mitigation Measures for Downtown Kantishna Gravel Pit. Unpublished report prepared for Denali National Park, Alaska.

Reppert, R.T., W. Sigleo, E. Stakhiv, L. Messman and C. Beyers. 1979. Wetland Values: Concepts and Methods for Wetland Evaluation. U.S. Army Corps of Engineers, Institute for Water Resources. Fort Belvoir, Virginia.

U.S. Army Corps of Engineers (Corps). 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers, Environmental Laboratory, Technical Report Y-87-1, Waterways Experiment Station. Vicksburg, Mississippi.

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (**http://plants.usda.gov**). National Plant Data Center. Baton Rouge, LA 70874-4490 USA.

Viereck L.A., C.T. Dyrness, A.R. Batten and K.J. Wenzlick. 1992. The Alaska Vegetation Classification. General Technical Report PNW-GTR-286. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, OR.