

# SUBSURFACE RESOURCES

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## Goals

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**Mineral and Energy Supplies.** Make metallic and nonmetallic minerals, coal, oil and gas, and geothermal resources available to contribute to national and state energy and mineral supplies and independence.

**Economic Development.** Contribute to Alaska's economy by making subsurface resources available for development, which will provide stable job opportunities and stimulate growth of secondary and other primary industries.

**State Revenues.** Establish a stable source of state revenues.

**Environmental Quality and Cultural Values.** When developing subsurface resources, protect the integrity of the environment and affected cultural resources to the extent feasible and prudent.

**State Support for Mining.** Aid in the development of infrastructure (such as ports, roads, or railroads) and continue to provide geologic mapping and technical support to the mining industry.

## Mineral and Coal Development Guidelines

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**A. Mineral and Coal Exploration.** State land in the Kuskokwim area may be leased or opened for coal prospecting permits if the department determines it is in the best interest of the state as required by AS 38.05.035. Before a permit is issued, DNR will determine if the surface values are significant enough to warrant restricting surface entry. Decisions on surface entry for coal adjacent to streams will be made in consultation with the affected agencies.

**B. Open to Mineral Entry.** All state lands that are open to mineral entry are multiple use

areas where mineral development will be accommodated and encouraged. Recognized exploration methods for locatable minerals will be allowed on all state lands unless specifically closed to mining and will be subject to the conditions of a land use permit. DNR may determine that some traditional forms of access will not be allowed in specific areas to avoid resource damage.

Where an area is open to mineral entry, a miner has the right to stake a claim regardless of the surface use designation or classification. Any adverse effects of mining on surface resources or uses will be managed through compliance with state laws and regulations and the management intent and guidelines of this plan.

**C. Best Management Practices.** ADF&G uses their Best Management Practices for Placer Mining in their review and recommendations for mining plans of operations. Any recommended modifications or rejections of the plans of operations will consider the Best Management Practices. (This document is available from ADF&G or DNR for reference to any miner interested for use in designing the mining plan of operations).

**D. Reclamation of Mineral Land.** Land use permits and approved plans of operations for mineral developments will specify the measures required of the operator to reclaim the land to a useful condition. In the absence of other post-mining land uses identified by this plan, such as settlement, developed recreation, or material sites, the primary purpose of reclamation will be to provide useful fish and wildlife habitat.

The degree of reclamation stipulated shall be determined on an individual basis and reasonably correlate with the habitat suitability categories A-1 to C shown on the maps in Appendix F. Reclamation will among other things be based upon an evaluation of the fish and wildlife resources and habitats

characteristic of the mining area and the mining methods and other appropriate site features that will facilitate reclamation. Reclamation techniques will conform to appropriate Best Management Practices (BMPs) and will occur concurrently with mining, though not necessarily annually. The costs of reclamation relative to the benefits to be gained will be considered when implementing this policy.

General stipulations for A class areas, include: segregation and salvage of the combined soil, vegetation and fine overburden, to the extent feasible and prudent regrading of tailings to eliminate oversteepened slopes; general preservation of water areas produced by mining; and replacement of soil, vegetation, and fine overburden over areas of regraded tailings to promote natural revegetation. Site drainage and stream rehabilitation stipulations will be required as necessary to stabilize water courses and minimize erosion and non-point source pollution. Stipulations will correlate with the anticipated size and scope of the mining operation. Restoration of fish habitat will be done in conformance with ADF&G Fish Habitat permits.

General stipulations for B class areas include regrading of tailings to eliminate oversteepened slopes; replacement of soils (subject to preexisting soil conditions), sustaining revegetation (subject to preexisting vegetation conditions), and revegetation as necessary to stabilize soils and eliminate erosion.

General stipulations for C areas include partial regrading to eliminate oversteeped slopes subject to erosion and if soil types permit, redistribution of fine soil on the regraded areas to promote natural revegetation.

**E. Access for Mineral and Coal Development.** Existing roads and trails should be used to provide access to mine sites wherever feasible. Regulations for miscellaneous land use permits require that access will be managed so that damage is minimal. See guidelines for Trail Management (page 2-60) and Transportation (page 2-63). The fact that an area is closed to new mineral entry will not be cause for denying access across state lands.

**F. Control of Visual Impacts.** Stipulations will be developed as necessary through the land use permit or leasing process to minimize the adverse visual impacts of mining especially in settled areas and recreation areas. In such areas, stipulations should consider, at a minimum, the following items: control of solid wastes; removal of vegetation; siting of mining structures, tailings and overburden; roads; and rehabilitation of mining sites.

**G. Approval of Plans of Operation.** Using procedures established under existing leasing laws and regulations, DNR reviews plans of operation required for locatable mineral leases and will consult with and carefully consider recommendations of ADF&G and the DEC. DNR will approve plans of operation if they adequately address the guidelines of the area plan and applicable laws and regulations and if it can be demonstrated that instream mining will not significantly affect salmon productivity. Violation of the plan of operations is cause for revocation of the approved plan of operation or termination of the lease.

**H. When to Apply for a Mineral Lease.** An application for a mining lease will be required when the owner of the leasehold location is prepared to produce minerals for sale in commercial quantities or to process more than 500 cubic yards of material during bulk sampling or production.

**I. Land Sales in Areas with Subsurface Resources.** See Settlement guideline C-5, page 2-36.

## **Guidelines for the Application of Locatable Mineral Closures and the Locatable Mineral Leasing Program**

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### **A. Background**

Locatable mineral closures are the most restrictive management tool that can be used by DNR to resolve subsurface and other resource conflicts. AS 38.05.185(a) requires that before an area of state land can be closed to mining or mineral location, the commis-

sioner must make a written finding that mining would be incompatible with significant surface uses.

Requiring that locatable mineral developments occur under a lease is a more flexible management tool than mineral closure. Therefore, mineral leasing is preferred over mineral closure as a management option to resolve conflicts between other significant resources and mining and mineral location. AS 38.05.185(a) requires that for mining to be allowed only under written leases issued under AS 38.05.205 the commissioner must determine that either there are potential use conflicts on state land or the land was mineral in character at the time of state selection. Under 11 AAC 86.135(b), if a surface disposal area is not closed entirely to mineral entry, it will be made available only by leasehold location.

After consultation with ADF&G and DEC, and concurrent with the designation of an area being open to locatable mineral entry under lease, DNR will identify potential conflicts between mining and other resources that need protection. DNR will also state the general nature of stipulations to be used in leases to protect those other resources.

## **B. Areas Closed to Mineral Entry**

Using the criteria established in AS 38.05.185(a), DNR generally finds mining to be incompatible with the types of surface uses listed below and closes the area to mining or mineral location at the specified times in the decision making process. However, each situation will be evaluated separately when mineral orders are prepared and a determination made that the requirements of AS 38.05.185(a) have been met.

### **1. Lands Offered for Sale or Transfer to Other Owners.**

**a. Areas Scheduled for Disposal.** Land scheduled for commercial, industrial, agricultural, or subdivision sale will be closed to mining and mineral location at the end of the first year of the Land

Availability Determination System (LADS) process (that is, approximately 2 years before the anticipated land sale).

**b. Homesteading Areas.** Lands available for homesteading (including agriculture homesteading) will be closed to mining and mineral location at the end of the first year of the LADS process (that is, approximately 2 years before the anticipated land sale). These areas will remain closed until the allowed number of homestead entries has occurred. At that time, those portions of the project area with few or no homesteads will be reopened for mineral entry and location unless it is determined that the settlement pattern that has resulted creates significant, irreconcilable land use conflicts.

**c. Land Proposed for Exchange.** Lands proposed for exchange or trade will be closed to mineral entry and location at the time a preliminary agreement to exchange the land is reached.

**d. Land to be Transferred to Another Public Agency.** Lands reserved for transfer to another public agency for development of a public facility or reserved as a future townsite will be closed to mineral entry and location at the time the area is classified "Reserved Use" or an Inter-agency Land Management Agreement is signed.

## **2. Retained Lands.**

Lands and waters that support production or maintenance of fish or wildlife species that have significant economic, recreational, scientific, educational, or cultural values or which have been given special protection through state or federal legislation or international treaty. In the Kuskokwim Area, lands and waters in this category include the portions of streams used for salmon spawning or rearing, or sheefish spawning identified in Appendix H (see also Map 2.4 in this section).

### **C. Leasehold Location Areas**

Using the criteria established in AS 38.05.185, DNR has determined that on certain lands in the Kuskokwim Area, mining will be allowed only under leases issued under AS 38.05.205. The areas subject to leasehold location requirements are uplands within 200 feet of the ordinary high water mark on either side of the portions of streams used for salmon spawning or king salmon rearing in Appendix H (see also Map 2.4 in this section).

These leasehold location areas will be subject to the following guidelines.

1. Instream mining will not take place unless it can be demonstrated that mining will not significantly affect salmon productivity.
2. An application for a mining lease will be required when the owner of the leasehold location is prepared to produce minerals for sale in commercial quantities or to process more than 500 cubic yards of material during bulk sampling or production.
3. At the time an application for a lease is received, DNR will distribute the application to ADF&G and DEC for comment. Based on comments, appropriate stipulations to protect salmon productivity will be developed and attached to the lease.

### **D. Other Resource Values That May be in Conflict with Coal or Mineral Development**

In some circumstances, the commissioner may find that some resource values may require locatable mineral leasing, closure, or a prohibition of coal leasing and prospecting to protect their continued productivity and availability. In other circumstances, care during mineral development is all that may be necessary to protect these resources. It is impossible to predict the degree of conflict that could occur between mining and any other resource value in all circumstances. Therefore, in the future updates, the following categories of resource values are evaluated to determine if locatable mineral leasing, prohibition of coal leasing or prospecting, or

another management option is needed to protect the continued productivity and availability of the resource in conflict. The sites within the planning area that are judged at this time to need these types of protection are identified in sections B. and C. above.

#### **1. Retained Lands with Significant Commercial, Industrial, or Public Use Values**

-Lands with significant coal, oil and gas, timber or other commercial potential.

-Lands recognized as future transportation corridors where access for pipelines, road, railroads, or other surface transportation infrastructure could be blocked or impeded by mining claims. (After the alignment is established, areas will be reopened if they are surplus land.)

-Lands and waters that provide unique or unusual opportunities for human use and enjoyment, such as fishing, hunting, trapping, photography, and fish and wildlife viewing.

-Lands and waters that provide significant recreation opportunities, such as clear water rivers that are now or are expected to be important for recreation, key public access sites, and recreation facilities.

-Lands and waters that are the watershed of a community water supply.

-Sand and gravel pits, stone quarries, or other significant known material sites where development might be impeded if mineral claims were staked.

#### **2. Retained Lands with Significant Fish or Wildlife Resources**

-Lands and waters that support protected species of plants, fish or wildlife (bald and golden eagles), threatened species (arctic peregrine falcon), or endangered species (American peregrine falcon).

-Lands and waters that support production or maintenance of fish or wildlife species that have significant economic, recreational, scientific, educational, or cultural values or which have been given special protection through state or federal legislation or international treaty.

-State game refuges, critical habitat areas, and sanctuaries. In decision Memorandum 44, signed by the commissioner in January 1984, DNR set the statewide policy that in legislatively established Critical Habitat Areas and Wildlife Refuges mining will occur under lease,

though the policy has not been implemented yet. Also, individual legislatively designated areas may be recommended for mineral closure, but such a closure would be decided on a case by case basis using the criteria found in AS 38.05.185(a).

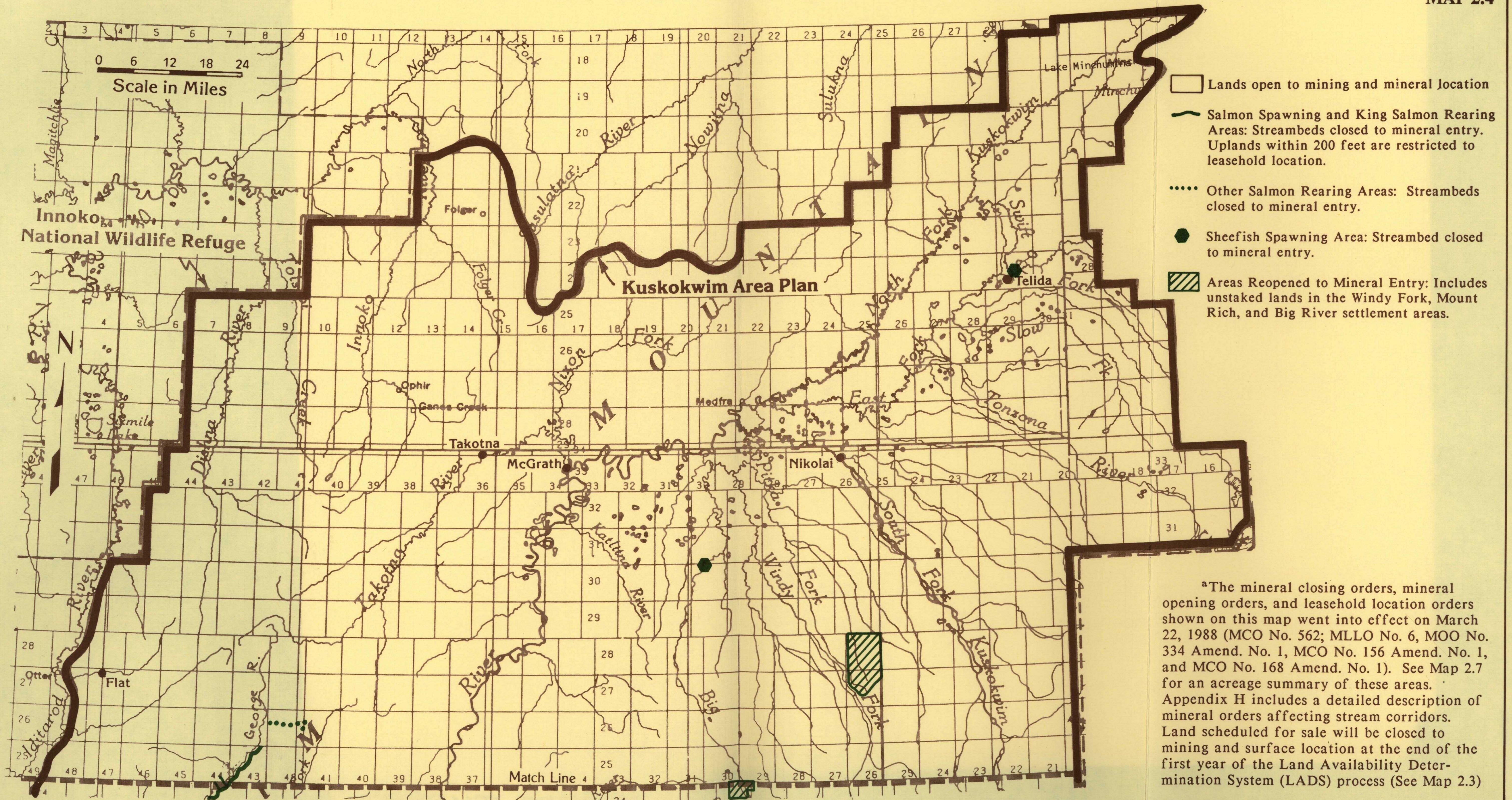
-Other lands and waters not included above that are known to support unique or unusually large assemblages of fish or wildlife.



# SUBSURFACE DESIGNATIONS

MAP 2.4

MAP 2.4 SUBSURFACE DESIGNATIONS -- LEASEHOLD LOCATION AREAS, AREAS CLOSED TO NEW MINERAL ENTRY, AND AREAS REOPENED TO MINERAL ENTRY<sup>a</sup>




<sup>a</sup>The mineral closing orders, mineral opening orders, and leasehold location orders shown on this map went into effect on March 22, 1988 (MCO No. 562; MLLO No. 6, MOO No. 334 Amend. No. 1, MCO No. 156 Amend. No. 1, and MCO No. 168 Amend. No. 1). See Map 2.7 for an acreage summary of these areas. Appendix H includes a detailed description of mineral orders affecting stream corridors. Land scheduled for sale will be closed to mining and surface location at the end of the first year of the Land Availability Determination System (LADS) process (See Map 2.3)




# SUBSURFACE DESIGNATIONS


MAP 2.4

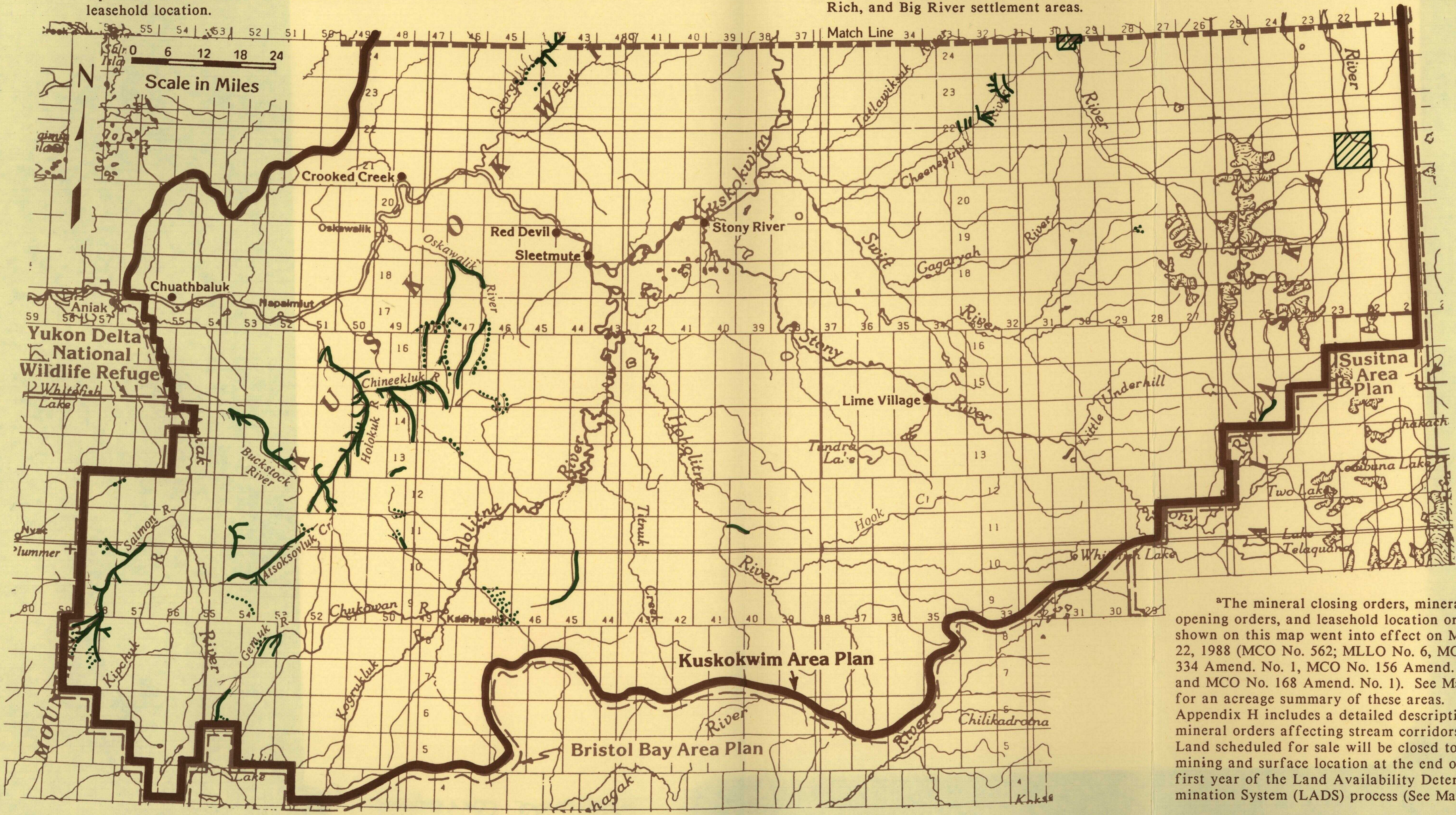
MAP 2.4 SUBSURFACE DESIGNATIONS -- LEASEHOLD LOCATION AREAS, AREAS CLOSED TO NEW MINERAL ENTRY, AND AREAS REOPENED TO MINERAL ENTRY<sup>a</sup>

 Lands open to mining and mineral location

Salmon Spawning and King Salmon Rearing Areas: Streambeds closed to mineral entry. Uplands within 200 feet are restricted to leasehold location.

 Other Salmon Rearing Areas: Streambeds closed to mineral entry.

 Areas Reopened to Mineral Entry: Includes unstaked lands in the Windy Fork, Mount Rich, and Big River settlement areas.



<sup>a</sup>The mineral closing orders, mineral opening orders, and leasehold location orders shown on this map went into effect on March 22, 1988 (MCO No. 562; MLLO No. 6, MOO No. 334 Amend. No. 1, MCO No. 156 Amend. No. 1, and MCO No. 168 Amend. No. 1). See Map 2.7 for an acreage summary of these areas. Appendix H includes a detailed description of mineral orders affecting stream corridors. Land scheduled for sale will be closed to mining and surface location at the end of the first year of the Land Availability Determination System (LADS) process (See Map 2.3)



## **Oil and Gas Guidelines**

The Kuskokwim area's potential for oil and gas is poorly understood. Based on preliminary exploratory work, the Holitna and Minchumina sedimentary basins are thought to have low potential for oil and gas. In the past, lease sales have been proposed for both basins, but neither is on the current (January 1988) DNR 5-year leasing program. If and when any areas in the Kuskokwim area are added to the 5-year schedule, measures will be designed to protect current uses of the land, such as traplines, and fish and wildlife resources. DNR will consider methods to protect particularly important areas such as river corridors. To assure that the public is informed and has the opportunity to comment, the Division of Oil and Gas, through its public outreach program, will request comments several times in the sale planning process, and will conduct public meetings or hold teleconferences in the area. In recognition of the fact that the Kuskokwim area has many dispersed communities that do not have easy access to information on oil and gas leasing issues, DNR also encourages local groups interested in these issues to form an organization for the purpose of commenting and exchanging information on any proposed oil and gas lease sales.

**A. Exploration Techniques that Minimize Clearing.** Techniques that minimize the clearing of trees will be used wherever feasible in order to avoid alteration of valuable fish and wildlife habitats, avoid increasing access to sensitive areas, and avoid increasing the chance of bark beetle infestation. Clearing of forested areas through bulldozing, or other means, for the sole purpose of seismic exploration will not be approved by the Director of the Division of Oil and Gas unless there is no feasible alternative and only after consultation with the Division of Forestry and the Department of Fish and Game.

To prevent bark beetle populations from building up beneath the bark of felled trees and infesting nearby living trees, white spruce that is felled must be hydro-axed, burned, buried or similarly disposed of, as required by the Division of Forestry.

**B. Removal of Abandoned Facilities.** Upon abandonment of sites used under lease or permit, roads, buildings, and other facilities, will be removed and the site rehabilitated, unless it is shown to the satisfaction of the Director, Division of Oil and Gas, after consultation with the Department of Fish and Game, that such removal and restoration is not in the state's best interest.

**C. Pipeline Design.** Pipelines should be buried. Where conditions prevent burial, pipelines will be sited and elevated, ramped, or otherwise designed to allow free passage of big game animals.

**D. Worker Education.** Many people working on oil and gas exploration and development will not be aware of the environmental and social considerations essential to proper development of the sale area. Therefore, lessees shall include in any exploration and/or development plans a proposed environmental training program for all personnel involved in exploration or development activities (including personnel of the lessees' contractors or subcontractors) for review and approval by the Director of the Division of Oil and Gas.

The program should be designed to inform each person working on the project of specific types of environmental, social, and cultural concerns that relate to the individual's job. The program shall also be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which these personnel will be operating. When ADF&G reviews the oil and gas worker education program it will give operators information the operators can use to make their employees aware of harvest regulations.

The program should be formulated and implemented by qualified instructors experienced in each pertinent field of study, and should employ effective methods to ensure personnel understand and use techniques necessary to preserve archaeological, geological, and biological resources. The program should be developed in consultation with local people (such as fish and game advisory committees)



who have the expertise and willingness to participate.

Lessees shall submit for review and approval a continuing technical environmental briefing program for supervisory and managerial personnel of the lessee and its agents, contractors, and subcontractors.

## **Other Guidelines Affecting Subsurface Resources**

Several other guidelines may affect subsurface resources. See the following sections of this chapter:

- Fish and wildlife habitat
- Public access
- Settlement
- Stream corridors and instream flow
- Transportation
- Trail management
- Wetlands management

## **Land Allocation Summary**

**Background.** This plan determines whether lands are open or closed to mineral entry and where minerals are designated. Primary surface use designations for primary use minerals are made in certain cases where there is currently intensive subsurface resource exploration or development of statewide significance or where major subsurface development is likely to occur within the 20 year planning period. Primary use designations are established to recognize that mineral development is one of the major surface and subsurface activities in these areas.

**Resource Potential and Use.** The Minerals Element published by DNR in October, 1986 describes the mineral resources, their uses, and management in the planning area. The following background information summarizes some of the key information in this report. The Kuskokwim Area Plan includes nine mining districts that have produced 2.5 million ounces of gold, several hundred

thousand ounces of by-product silver, over 40,000 flasks of mercury, and minor amounts of tungsten, lead, zinc, copper, and bismuth. Between 1898 and 1985, gold worth approximately \$826 million (1985 prices) was produced in the area and \$26 million in silver, mercury, copper, lead, and zinc.

Extraction of locatable minerals is still an important locally operated industry in the upper Kuskokwim region. Between 1981 and 1985 alone, approximately \$15 million was spent on mineral exploration and development in the area. Thirty-three gold and mercury mines employing at least 125 people were active in 1985. Seventy-one percent of all mine employees in 1985 were residents of the Kuskokwim Area. Labor costs accounted for 35 percent of the total expenses for the average placer mine. Placer mining is the largest private sector employer in the region.

Today placer gold mining, mineral exploration, and minor mercury (hardrock) mining are the principle mining industry activities. The mineral deposits currently being evaluated by the mining industry can be grouped into five major categories: 1) gold-silver-copper-tin deposits related to volcanic and granitic rocks of the Kuskokwim Mountain province; 2) lead-zinc-silver-cobalt-skarn deposits in the southern Alaska Range; 3) mercury deposits in both areas; and 4) lead-zinc deposits in limestone north of Medfra.

Based on analysis conducted by the Minerals Section of the Alaska Division of Geological and Geophysical Surveys, of the 1,089 township that were analyzed, about 2.4 percent or 28 townships have extremely high mineral potential; 5.3 percent or 57 townships have high mineral potential; 31 percent or 350 townships have fair mineral potential; 43 percent or 460 townships have relatively low mineral potential region wide.

**Management.** DNR has accommodated and encouraged mineral prospecting, location, and development throughout most of the planning area. When subsurface resources are developed, the plan includes guidelines that protect the integrity of the environment



and affected cultures. Currently exploration and development of locatable minerals is allowed on all state lands within the planning area except in a few small areas specifically closed to mineral entry.

The Department's policy for mineral entry for each subunit is shown by the land use designation summary charts in Chapter 3 which indicate whether the subunit is open to mineral entry or surface location, requires that locatable mineral development occur under lease, or are closed to mineral entry (Map 2.4). Under this plan, approximately 15.5 million acres (97 percent) of the state land in the planning area remain open to mineral entry. These include lands in the following mining districts: McGrath, Innoko-Tolstoi, Innoko-Ophir, Innoko-Candle, Iditarod-Moore, Iditarod-Flat, Iditarod-George, Iditarod-Donlin, and Aniak. Virtually all land with high to very high mineral potential will continue to be open to new mineral entry. Approximately 46,000 acres of unstaked lands within in the past Windy Fork, Big River, and

Mount Rich disposals will be reopened to mineral entry (see Map 2.4).

Mining is primary use in seven subunits in the planning area which encompasses approximately 936,000 acres of state land near Medfra, Nixon Fork River, Ganes Creek, Madison Creek, Moore Creek, Ophir, Folger, Flat, Beaver Mountains., Taylor Mountains, Fortyseven Creek, and the George River (see Table 2.6). These areas were designated because of their high mineral values and because these are actively mined or are likely to have subsurface resource development in the near term. However, mineral potential ratings were based on whole townships. Portions of the designated lands have low or moderate mineral values. Lands in the Horn Mountains, Upper George River, and Flat areas proposed for state selection also have moderate to high mineral potential. If conveyed to state ownership, they will be open to mineral entry and minerals will be designated as primary use.

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**Table 2.6 Minerals Designations**

<u>Subunit</u>	<u>Approximate Area</u>
Nixon Fork subunit 6b	23,000 acres
Innoko River subunit 7a	169,000 acres
Dishna - Iditarod subunit 8c & 8f	290,000 acres
Takotna River subunit 9c	46,000 acres
George River subunit 10b	368,000 acres
Holitna River subunit 15g	40,000 acres
<b>TOTAL</b>	<b>936,000 acres</b>

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Approximately 18,000 acres or .11 percent of state land will be available for locatable mineral development under a lease. These are uplands within 200 feet of the ordinary high water mark on both sides of 356 miles of streams which contain king salmon rearing habitat and moderate to very high mineral potential.

Table 2.7 is a summary of the areas open to mineral location, reopen for mineral location, open to leasehold location, or closed to mineral location. Uplands which are private, Native, or federally owned are not affected.

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**Table 2.7 Lands Currently Open to Mineral Location, Reopened to Mineral Location, Open to Leasehold Location, or Closed to Mineral Location.**

<u>Mineral Order</u>	<u>Acreage</u>	<u>Miles of Streams</u>	<u>Percent of State Land in Planning Area</u>
Lands Opened to Mineral Location	15,559,000 ac.	----	97.2 percent
Lands Reopened to Mineral Entry after Staking for Settlement	46,380 ac. <sup>a</sup>	----	0.3 percent
Uplands Open to Mineral Entry Under Lease Because of Salmon Spawning and King Salmon Rearing	17,568 ac.	356	<0.1 percent
Streambeds Closed to New Mineral Entry Because of Salmon Spawning and Rearing or Sheefish Spawning	3,917 ac.	499	0.1 percent
Lands Closed to Mineral Entry Prior to Land Sales	372,000 ac.		2.3 percent

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<sup>a</sup> Note: A small amount of state land adjacent to unsurveyed private parcels within past disposal areas remains closed to new mineral entry. These lands will be reopened when surveys are completed.



Approximately 372,000 acres (2.3 percent) of state lands proposed for disposal will be closed to new mineral entry prior to offering the areas for sale (Table 1.2 and Map 2.3). In general, subunits where settlement is the primary use have low mineral potential with the exception of subunit 16c. Land offered in this subunit will be configured to minimize conflicts with mining claims and areas with high mineral potential. Similarly, remote cabin areas are configured to avoid areas with large numbers of mining claims.

Another 3,900 acres along 500 miles of stream bottoms (.02 percent of state lands in planning area) will be closed to new mineral entry to protect salmon and sheefish spawning or king salmon rearing streams where mineral potential is moderate to very high (see Map 2.4). Existing claims in these areas are not affected.

Mineral closures and other policies resulting from this plan do not alter or replace existing regulations, nor do they affect existing mineral closures (with the exception of the three settlement areas that will be reopened to mineral entry). The areas that are closed by the plan apply only to new exploration and development activities. Any existing leases, prospecting permits, or mining claims will not be affected.

**Lands Available for Oil and Gas Exploration and Leasing.** Both the Holitna and the Minchumina sedimentary basins are located within the planning area. All state lands are available for oil and gas exploration and leasing. Lands in the larger South Fork drainage proposed for state selection also have long-term potential for gas development.

**Lands Available for Exploration and Development of Other Leasable Minerals.** (Coal, sedimentary uranium, potassium, sodium, oil shale, geothermal). Approximately 470,000 acres of state-owned or state-selected land in the planning area show high or moderate coal potential. All state lands will remain available to coal leasing and prospecting. Any leases for coal or other leasable minerals will be dealt with case by case consistent with the management intent for the unit, plan guidelines, and existing laws and regulations.