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5.0 MATERIAL SITES

5.1 INTRODUCTION

This section contains criteria for site selection, analysis and design of material sites. Criteria for related activities such as access roads, site clearing, workpad design, earthwork requirements, drainage and erosion control, and restoration are expanded upon in other sections of the Technical Information Supplement.

Additional information related to material sites can be found in “Material Site Evaluations and EMS Information”* ANGTS report, April, 1979 and “Mineral Material Sites Hydraulic Evaluation”, ANGTS report, February, 1983*

5.2 CODES AND CRITERIA

5.2.1 Codes

- United States Code, Title 15 – Commerce and Trade, Chapter 15 C – Alaska Natural Gas Transportation Act
- United States Code, Title 30 – Mineral Lands and Mining
- Clean Water Act, as amended, Title IV – Permits and Licenses, Section 402 – National Pollutant Discharge Elimination System
- Resource Compensation, and Recovery Act (RCRA) – Pollution Prevention, Waste Minimization and PBT Chemical Reduction – P2
- Code of Federal Regulations, Title 18 – Conservation of Power and Water Resources
- Code of Federal Regulations, Title 33 – Navigation and Navigable Waters
- Code of Federal Regulations, Title 36 – Parks, Forests, and Public Property
- Code of Federal Regulations, Title 40 – Protection of the Environment
- Code of Federal Regulations, Title 43 – Public Lands: Interior, Subtitle B – Regulations Pertaining to Public Lands
- Code of Federal Regulations, Title 50 – Wildlife and Fisheries
- Federal Right-of-Way Grant for the Alaska Natural Gas Transportation System Alaska Segment Serial No. F-24538 (December 1, 1980), as such may be updated and/or amended from time to time

*This document is stamped, marked or otherwise identified as confidential and/or proprietary or otherwise protected. The ANNGTC continues to claim confidential treatment for this document, and it should be withheld from disclosure.

- Federal Energy Regulatory Commission conditional certificate of public convenience and necessity, issued on December 16, 1977, as such is finalized
- Alaska Statutes, Title 16 – Fish and Game
- Alaska Statutes, Title 27 – Mining
- Alaska Statutes, Title 38 – Public Land
- Alaska Statutes, Title 46 – Alaska Coastal Management Program
- Alaska Administrative Code, Title 5 – Fish and Game, Chapter 95 – Fish and Game Habitat
- Alaska Administrative Code, Title 11 – Natural Resources, Chapter 71 – Timber and Materials Sales
- Alaska Administrative Code, Title 17 – Transportation and Public Facilities, Chapter 10 – Engineering – Encroachments, Driveways and Road Approaches
- Alaska Administrative Code, Title 18 – Environmental Conservation

5.2.2 Criteria

- Material site design will include measures for erosion and sedimentation control.
- Material site locations will be selected with the intent to:
 - Provide minimum haul distances by selecting sites as near to the construction zone as practical.
 - Minimize the number of material sites, to the extent practicable, on a sectional basis.
 - Avoid designated wildlife habitats; archaeological sites; areas of unique vegetation; avalanche zones; and areas where disturbance will create terrain instability. Areas near the middle to lower reaches of drainage areas which could block or divert drainage channels carrying moderate to large volumes of flow on a periodic basis will also be avoided.
 - Maximize use of the construction zone; existing material sites; and previously disturbed or sparsely vegetated areas.
- Material sites and associated mining activities will be environmentally acceptable to project standards and will:
 - Protect fish and wildlife and their habitats.
 - Protect air and water quality in adjacent areas.
 - Protect archaeological and historical resources.
 - Provide effective utilization of mineral materials and timber resources.
 - Consider existing land uses and land use plans.

- Material sites and associated mining activities will not create hazards to the health and safety of persons affected by material site activities and will:
 - Provide controls for activities in areas of known geologic or natural hazard.
 - Provide and maintain controls for material site traffic in the vicinity of public roads or highways and populated areas.
 - Provide and maintain controls of public access to construction areas.
 - Provide and maintain controls of blasting activities and materials.
- Material sites will not involve activities that adversely affect, damage, or threaten the integrity of TAPS. Development of material sites and related features will:
 - Maintain existing access or provide alternative access to existing facilities.
 - Provide and maintain protection of TAPS and its existing supporting and protective features.
- Economic factors will be considered in the development, operation and restoration of project material sites. Factors to be considered are:
 - Maximize use of existing pits and access roads.
 - Minimize haul distances.
 - Maximize use of thawed, homogeneous, granular materials.
 - Minimize use of areas with excessive overburden.
 - Minimize clearing requirements.
 - Minimize instream work.
 - Minimize use of TAPS workpads for hauling materials.

5.3 DESIGN AND SITE SELECTION PROCEDURES

5.3.1 Project Material Requirements

The initial and ongoing phase of the project is the assessment of mineral materials required for construction of the project. Material requirements are determined with respect to quantities, qualities, locations, and schedules. Estimates of the material site target quantities are based on the design of the project. Accuracy of estimates will increase as design progresses. See Section 4, Earthwork Estimates and Haul Analysis, for more information.

5.3.2 Determination of Estimated Target Quantities

Estimated target quantities are established from the plans and specifications with consideration of contingencies for rejections, geological uncertainties or contingencies for adjustments in construction planning. As the design progresses, adjustments are made in assigning contingencies to reflect the increased level of confidence in estimates.

5.3.3 Determination of Scheduling Requirements

Scheduling requirements will include zones of restricted activities. Each construction activity which requires borrow material is examined to determine scheduling priorities.

5.3.4 Identification of Prospective Material Sources

Identifying prospective material sources is accomplished through office evaluation of existing data and field reconnaissance of sources appearing to have the most potential for project use. Geologists, engineers, construction and environmental personnel skilled in evaluation of arctic and subarctic conditions, utilize available data to identify and screen prospective sources for compliance with the criteria for project materials. Aerial photography, satellite imagery, engineering terrain analysis, geologic maps, topographic maps, and any other maps or materials which document geologic or environmental features in the pipeline corridor are used to identify prospective material sources and potential access routes to the sources.

5.3.5 Identification and Screening of Prospects

Geologic and geomorphic interpretations are used to identify preliminary prospects from landforms and terrain units that have the following characteristics:

- A size that is sufficient to support development of a material source to fulfill a major portion of the target quantity determined for a material haul segment.
- Corridors to provide feasible access to project work areas.

Preference is given to prospects within or adjacent to areas with previous material site development or disturbance. Prospects are screened to minimize the probability of encountering unresolvable conflicts with the criteria. Each prospect and its potential access corridors are reexamined as additional data are obtained to select the best prospects for continued consideration. The screening process includes the following:

- Consideration of environmental factors to minimize selections which involve:
 - Undisturbed areas.
 - Archaeological or historic sites.
 - Restricted fish and wildlife habitats.
 - Wetlands.
 - Locations highly visible from highways or public use areas.
 - Encroachments on buffer strips.
 - Locations with historic icing, drainage, erosion or stability problems.
- Consideration of impacts on health and safety and third party facilities by minimizing selections which will require:

- Activities near TAPS.
- Activities near third-party facilities.
- Materials hauling across the TAPS oil pipeline or along its workpad.
- Excavations or materials hauling near public campgrounds or picnic areas.
- Consideration of construction difficulties by minimizing selections which will require:
 - Excavations in permafrost soils.
 - Removal of large amounts of overburden.
 - Clearing heavy timber.
 - Construction of long or elaborate access roads.
 - Materials hauling across bridges or low water crossings.
 - Materials hauling along steep adverse grades.
 - Extensive hauls of common borrow.
 - Extensive hauls of select materials.

5.3.6 Preparation of Reconnaissance and Exploration Plans

Reconnaissance and exploration plans are prepared for prospective material sources that have been identified and screened by the preliminary activities. Each prospective material site is assigned a number for identification purposes and designated as a prospective site for either field reconnaissance or field exploration. Plan view drawings on photomosaics (or topographic maps where no photography is available) and narratives are prepared to delineate the prospect area and describe the where, what, why, when, and how aspects of the proposed field activities. Land ownership and jurisdiction determinations are made for each prospect and access route and affected third parties are contacted. The reconnaissance and exploration plans, along with the other required documents, are submitted in support of field program permit applications.

5.3.7 Field Reconnaissance

Each prospective site is visited by teams of engineers/geologists and environmental personnel after the snow cover have melted and prior to freeze-up in the fall. The purpose of the visits is to supplement basic data on each site and verify that the actual field conditions agree with those interpreted during the preliminary identification and screening process. Data confirmation and gathering is conducted in accordance with the approved reconnaissance plans.

5.3.8 Exploration

Subsurface exploration is conducted at each site in accordance with the approved exploration plans to confirm geologic conditions and obtain material samples for determination of index properties.

5.4 MINING PLAN DEVELOPMENT

Mining plan development is initiated for each available material source, as determined by the investigative programs, and is continued to the extent necessary to determine if the site should be recommended as a “prime site”, “alternative site”, or rejected for project use. This is accomplished by a process of successive steps of plan development and adjustment based upon evaluations of anticipated effects and reviews for criteria compliance. To the extent possible, existing material sites will be utilized.

5.4.1 Mining Plan Design and Procedures

Using the data and recommendations resulting from the investigative programs and subsequent evaluations or reviews, mining plan design will be developed according to the following procedures:

5.4.1.1 Preliminary Layout

Establish preliminary material site layout by considering the following:

- Field recommendations, environmental data, (including site restoration potential), test logs, and laboratory data.
- Locations of facilities, work areas, or permit areas of others.
- Drainage and erosion control.
- Terrain stability.
- Any limitations on stockpile location and orientation as determined by hydraulic analysis.

5.4.1.2 Upland Sites

- The major environmental concerns of upland site development are proximity to critical wildlife habitat, exposure to erosion and visual impact. Bedrock sites are similar, although geologically unique, and will be considered.
- Knob or knoll type developments should progress in a tabletop fashion with a perimeter of existing vegetation remaining. Removing a course of material conforming to natural contours on upland sites may increase visual impact, while decreasing resistance to erosion and reclamation by natural invasion.

- Working face extractions may be used in certain hard rock quarry sites. Consideration should be given to locate quarry sites in unexposed areas to reduce potential visual impacts.
- Upland material sites, consisting of a shallow unconsolidated material over hard unrippable bedrock are difficult to confine to small areas. Where expansive sites are necessary because of shallow material, a special configuration of visual buffers will be developed jointly by the geotechnical and visual resource designers.
- A bowl-like configuration may be used to minimize visual impact and erosion. It may be possible to use such sites for spoil and solid waste disposal. A natural seed and debris source should be preserved in each area for restoration by natural re-invasion.
- Glacial outwash plains represent the least environmentally sensitive areas encountered on the project. Sites will have little visual impact because of the gentle and uniform gradient of the areas. Surrounding terrestrial habitats affected are uniform and expansive. Consideration will be given to areas providing fishery habitat.

5.4.1.3 Other Sites

- Areas to receive first consideration for use will be available abandoned stockpiles from previous mining operations, then, areas of large unvegetated gravel bars.
- Areas to receive consideration for development after other sites have been exhausted will include:
 - First level terrace remnants within active floodplains.
 - Side sloughs of active floodplains that have established marsh habitat.
 - Areas where it may be desirable to leave some silty spoil materials as future plant and wildlife habitat.
- The following alternate methods of development will be considered for active floodplain sites:
 - Shallow scraping should be considered for the majority of floodplain sites. Shallow mining of these sites should be limited to unvegetated gravel bars lying above the mean low summer flow lines indicated in the hydraulic analysis. The mining area should be graded to prevent ponding or entrapment of fish. Full width buffer strips may not be applicable on these types of sites and variances should be requested where justified.
 - Constrained deeper excavations may be considered on gravel bars in areas where large amounts of material are required and no other sources are readily available. Hydraulic and fisheries analyses will be used to determine requirements for these sites.
- Design and development of terrace sites will include:
 - Consideration of sensitive habitats.
 - Use of adequate setbacks from highways (minimum of 500 feet).

- Use of existing access roads where possible.
- Consideration of shrub riparian habitat.
- Consideration of potential impact on adjacent facilities.
- Alluvial fan sites are best environmentally designed as a function of steepness and vegetative cover. Due to the nature of geological deposition, stream buffer design is a major consideration. The site should be selected with sufficient buffers (Federal ROW Stipulation 2.3.2 requires a minimum of 500 feet) to be completely independent of the alluvial water source or designed to accommodate the water entirely after operations. Environmentally, stream non-disturbance is the preferred method. Unforested sites and sites that contain creeks should be mined to accent the natural alluvial geometry. In cases where active channels threaten the mining work area, appropriate diversion structures will be placed.
 - Planning pit development to emphasize a natural shape will allow removal of large amounts of material with minimal visual impact on unforested fans, and also facilitate stream control.
 - Well-forested alluvial fans with substantial visual and watercourse buffers have the potential to be used as major corridor pits. This type of development is considered first. Steepness becomes a limiting factor on the size of such pits when visual impact downslope is a consideration because the back of the pit becomes exposed more quickly as steepness increases.
 - The effects of channel switching and headward erosion are of special interest in alluvial fan sites near third party facilities.

5.4.1.4 Adjusted Layout

Perform design evaluations and reviews of preliminary designs. Adjust preliminary designs on a site by site basis. Reject sites where designs cannot be developed to comply with specific criteria.

5.4.1.5 Final Layout

Perform design evaluations and reviews on a regional basis. Adjust site designs for estimated material site target quantities and subdivide excavation into aliquots for staged development. Sequence of development of aliquots should be established to minimize environmental impacts. Recommend sites best fitting criteria as “prime sites” and remainder of sites fitting criteria as “alternate sites”.

5.5 MINING PLAN IMPLEMENTATION

The mining plans are working documents which will be used in conjunction with the construction specifications to guide the development, operation, and restoration of project construction material sites. The mining plans and any material sales contract stipulations permit provisions or joint-use agreements which relate to construction requirements will be

incorporated into the construction contract documents for implementation by the construction contractors. In addition, ANNGTC or the Agent of ANNGTC will provide the necessary construction management and support staff to interface with the involved agencies; administer the provisions of the materials sales and construction contracts, permits, authorizations, and joint-use agreements; and oversee construction contractor activities related to material sites.

5.5.1 Initial Activities

Subsequent to approval of mining plans and prior to the beginning of construction work, certain initial activities are required to begin implementation of mining plans. These activities include the following:

- Establishment of work area field reference points (WAFRP) for semi-permanent control of material site working limits. Excavation depths and buffer locations are used to determine the location of WAFRPs.
- On-site inspection of areas requiring removal of merchantable timber.
- Fuel handling and servicing of equipment will be specified for each location.
- Field marking of clearing and work limits for initial stages (aliquots) of development for excavations, overburden stockpiles, and access roads.
- Establishment of survey base lines for cross section surveys and performance of cross section surveys of original ground surfaces in initial work areas.
- For sites selected for material processing, the analysis and approvals of the construction contractor's work plans, including obtaining any additional permits and land use authorizations which may be required.

5.5.2 Material Site Development and Operation Activities

The development and operation activities will vary from site to site, but they will be conducted in accordance with the mining plans and the specifications. Typically, development and operation of a new site could consist of the following activities:

- Clearing
 - An initial pioneer trail will be cleared along the approved access road alignment from an existing road or the pipeline right-of-way to the work limits of the material site. Existing facilities will be considered and appropriate prior measures taken.
 - All sites will be surveyed for merchantable timber within the initial clearing limits and the access road right-of-way. Merchantable timber will be cut, topped, limbed, and disposed of in an approved manner (See Section 10).
 - Remaining trees and brush will be cleared from the site clearing limits and the construction zone of the access road.

- Resulting slash and debris will be burned or otherwise removed from the site excavation limits. Large stumps and roots within the excavation limits will be grubbed and burned or removed. Slash and debris will be removed from the vicinity of drainage courses.
- Slash and debris, which is not burned, will be placed for burial under fills or overburden disposal areas (See Section 9).
- Any snow cover will be removed and piled within the clearing limits but away from drainage courses.
- Overburden Removal
 - Layers of organics and organic topsoil (e.g., in areas of shrub tundra and tall and low shrub uplands) will be stripped and stockpiled separately in accordance with the mining plan for use in site restoration.
 - Layers of mineral overburden materials unusable for construction purposes will be stripped and stockpiled in accordance with the mining plan.
 - Thin layers of overburden materials, which can be reasonably blended with better material, will be hauled to work sites.
- Construction Material Extraction
 - Excavation of construction materials will be in accordance with the lines shown on the site plan and typical sections in the mining plan. Removal will be staged and progress to maintain pit drainage.
 - Depending on topography of the site and the condition of the materials, suitable construction procedures and equipment will be used to loosen and load the material into haul vehicles or move it to stockpile areas.
- Access Road Construction
 - Road construction will begin with any required cutting within the right-of-way and any resulting useable materials will be placed in fill areas. Borrow material from the material site will be used to complete the grading according to the plans. Compaction will be obtained by routing construction equipment evenly over the entire roadway.
 - Depending upon the season or environmental sensitivity of the drainage courses, culverts may be installed either before fill construction or in open cuts during or after fill construction.
 - At intersections with existing roads and highways, safety control measures will be implemented.
- Drainage and Erosion Control
 - Application of drainage and erosion control measures will be in accordance with the mining plan, specifications and Section 11 of the Technical Information Supplement.

- Processing and Stockpiling
 - Processing and stockpiling at material sites will be in accordance with the mining plans, permits and the work plan.
- Restoration
 - Restoration of disturbed areas will be in accordance with approved mining plans, specifications, and Section 12 of the Technical Information Supplement.
 - Final restoration plans will be formulated during material site operations during construction and will include consideration of scheduled completion of construction activities; continuing needs for maintenance materials; and site specific conditions resulting from construction operations.