*Chapter 2.0*

# The Proposed Project

# 2.0 THE PROPOSED PROJECT

## 2.1 INTRODUCTION

This chapter describes the Diamond Chuitna coal project -- what the various parts (components) of the project are, where they would be located, and how they would function. The applicant's plans for construction and operation of each component (e.g., power source, worker housing, etc.) are described. For some components (e.g., location of the transportation corridor), the EIS scoping process, the third party EIS team, a federal or state agency or the applicant itself have identified more than one option. In these cases, each of the other options is described in addition to the applicant's proposed option.

The mitigation plan included in the project proposal, including mitigation measures committed to by the project applicant for all project components, is described in this chapter. The discussion of environmental consequences (Chapter 5.0) assumes these mitigation measures will be in place if the project is constructed. Chapter 6.0 summarizes the mitigation, reclamation and monitoring requirements imposed by the state of Alaska through the Alaska Surface Coal Mining Program and other state permitting programs; requirements imposed through federal and local permitting programs; and other measures which could be considered by the permitting agencies.

The Alaska Surface Coal Mining Control and Reclamation Act (AS 27.21) and pertinent regulations (11 AAC Chapter 90) require very detailed information about all aspects of the applicant's proposed plan of operation (e.g., water drainage control and treatment, reclamation). The large volume of this information makes it impractical to incorporate it into this EIS. Therefore, this chapter only summarizes the major aspects of the proposed project. However, references to the location of this detailed information in Diamond Alaska Coal Company's 27-volume Permit Application to Conduct Surface Coal Mining (1985) are given for readers who wish to pursue more specific details (see Section 7.7 for locations of the permit application).

## 2.2 PROJECT OVERVIEW AND COMPONENTS

### 2.2.1 Introduction

Since the applicant has not yet concluded a final contract for sale of coal, the length of time it would take to develop the project to its full production capacity of 10.9 million Mt (12 million short tons) is unknown, but would occur in stages depending upon economics. As coal production increased, staged development of the mine, housing site, overland coal transportation system, port site, and loading trestle would occur commensurate with production requirements. Under optimal conditions, full production capacity could be reached after four years of operation. However, it is likely that full production would take longer than four years to reach and, thus, the full impacts of the completed project would not occur until some undetermined time in the future.

The project overview below generally describes the project at full production. Most mine development impacts would be of lower magnitude before full production is reached. The exceptions would be short-term activities such as hauling coal by truck. This would occur only during the early years of the project and may cause greater impacts than transporting coal by conveyor.

### 2.2.2 Project Overview

Development of the Diamond Chuitna project would involve a surface coal mine located approximately 72 km (45 mi) west of Anchorage (Fig. 1-1). The coal would be surface mined by large shovels and draglines and hauled by trucks to a nearby mine area conveyor for transport to a mine service area for crushing. The crushed coal initially would be hauled in trucks from the mine service area to a port on Cook Inlet. After two years of mine operation, coal would be moved from the mine service area to the port on a conveyor. At lower production levels, the coal would be loaded from a short trestle at the port onto barges for transport to market. At higher production levels, coal would be loaded from a long trestle onto ocean-going ships.

Under the optimal, four-year full production development schedule, production in the first year of mine operation would be approximately 1.8 million Mt (2 million short tons). Production would increase to about 3.6 Mt (4 million short tons) in the second year. In the third year, production would increase to approximately 5.4 million Mt (6 million short tons), reaching 10.9 million Mt (12 million short tons) per year by the fourth year of mine operation.

Figure 2-1 shows the locations of the project component options used to formulate the action alternatives. The mine, overburden stockpile, and mine service area all would be located on land owned by the State of Alaska (Fig. 4-1).

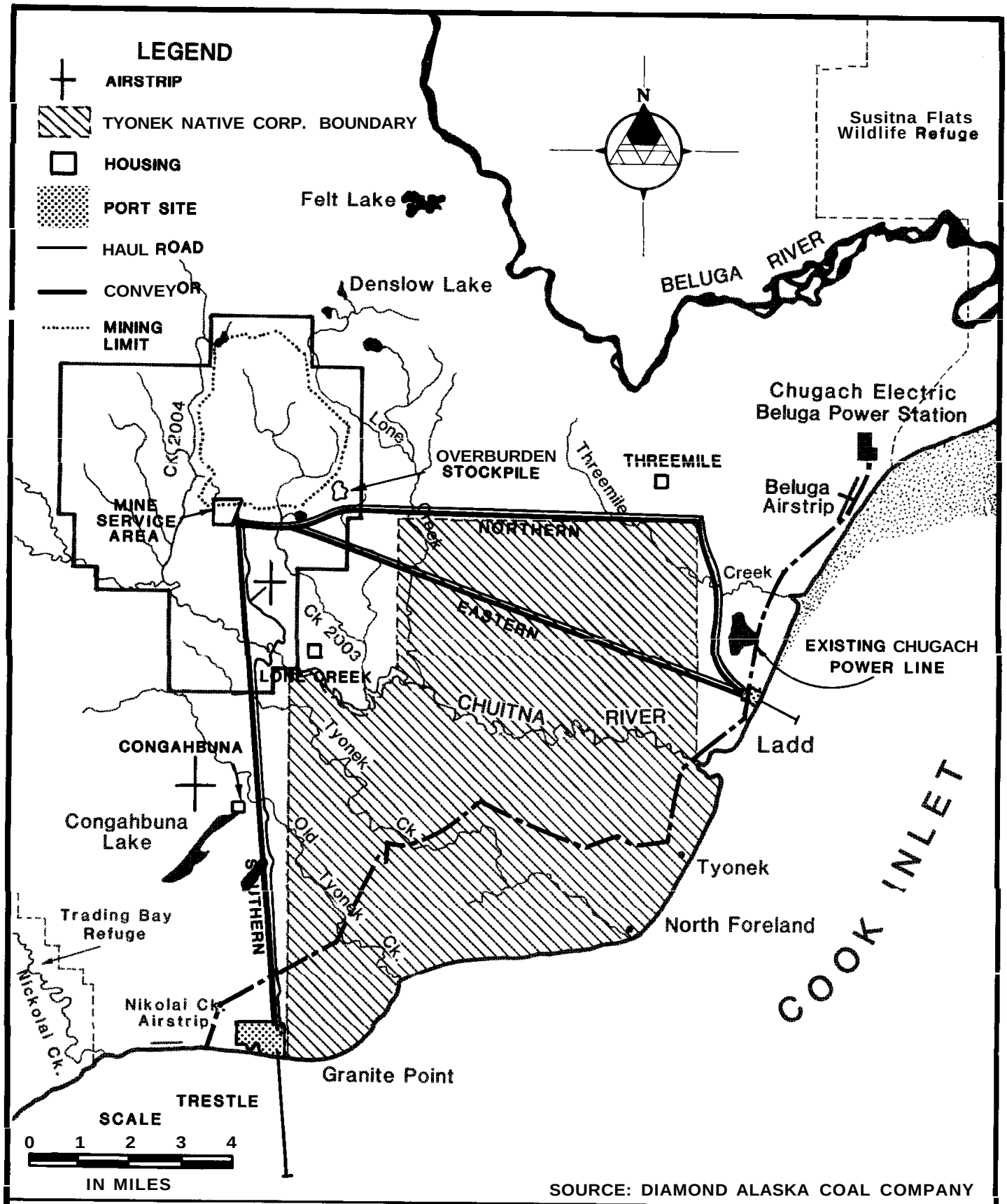
Three transportation corridor options are incorporated into the action alternatives evaluated in this EIS: northern/Ladd, eastern/Ladd, and southern/Granite Point (Fig. 2-1). The northern corridor would run east from the mine service area across state land toward the Beluga airstrip, then turn south southeast across land owned by Cook Inlet Region Native Corporation to a port site at Ladd on land owned by the Kenai Peninsula Borough (KPB). The eastern corridor would run in a straight line southeast from the mine service area across state land and land owned by the Tyonek Native Corporation (TNC) to the same port site at Ladd. The southern corridor would run in a straight line south from the mine service area across state and KPB land to a port site on state land at Granite Point.

The applicant wishes to retain two of the transportation corridor/port site options (southern/Granite Point and northern/Ladd). Two alternatives incorporating these options are therefore identified in this EIS as the applicant's Proposed Project. The applicant's proposal entails development of only one of these transportation corridors. The haul road and conveyor would both be constructed within the same corridor leading to the associated port site (either Ladd or Granite Point). Regardless of which transportation corridor and port site would be ultimately developed, the applicant plans to initially utilize the existing Ladd barge landing and the existing road between Ladd and the mine site for the staging of equipment and construction access.

Three housing site options are evaluated in the EIS. The Lone Creek and Threemile housing sites are located on state land, while the Congahbuna housing site and airstrip are located on KPB land.

### 2.2.3 Project Comwonents and Owtions

In reviewing this document, it is important that the reader understand the relationship among the terms "component", "option", and "alternative." The project has several comwonents, each one a necessary part of an entire viable mining project (e.g., the mine, transportation system, port site, housing site, etc.). For each component there may be one or more options (e.g., a southern or a southeastern transportation corridor location option). An alternative is a combination of options (one for each component) that constitutes an entire functioning project.




SOURCE: DIAMOND ALASKA COAL COMPANY

FINAL PROJECT OPTIONS LOCATIONS

Diamond Chuitna Environmental Impact Statement | FIGURE 2-1

For most components the EIS scoping process initially identified at least two options. The process by which this large number of options was screened to reduce the number to a manageable level and how the ultimate project alternatives were selected is described in detail in Chapter 3.0. The descriptions below for each project component, therefore, address only those component options which were ultimately retained and which are specifically addressed in at least one of the action alternatives for each scenario. For each component where more than one option remains, the applicant's preferred option is described first.

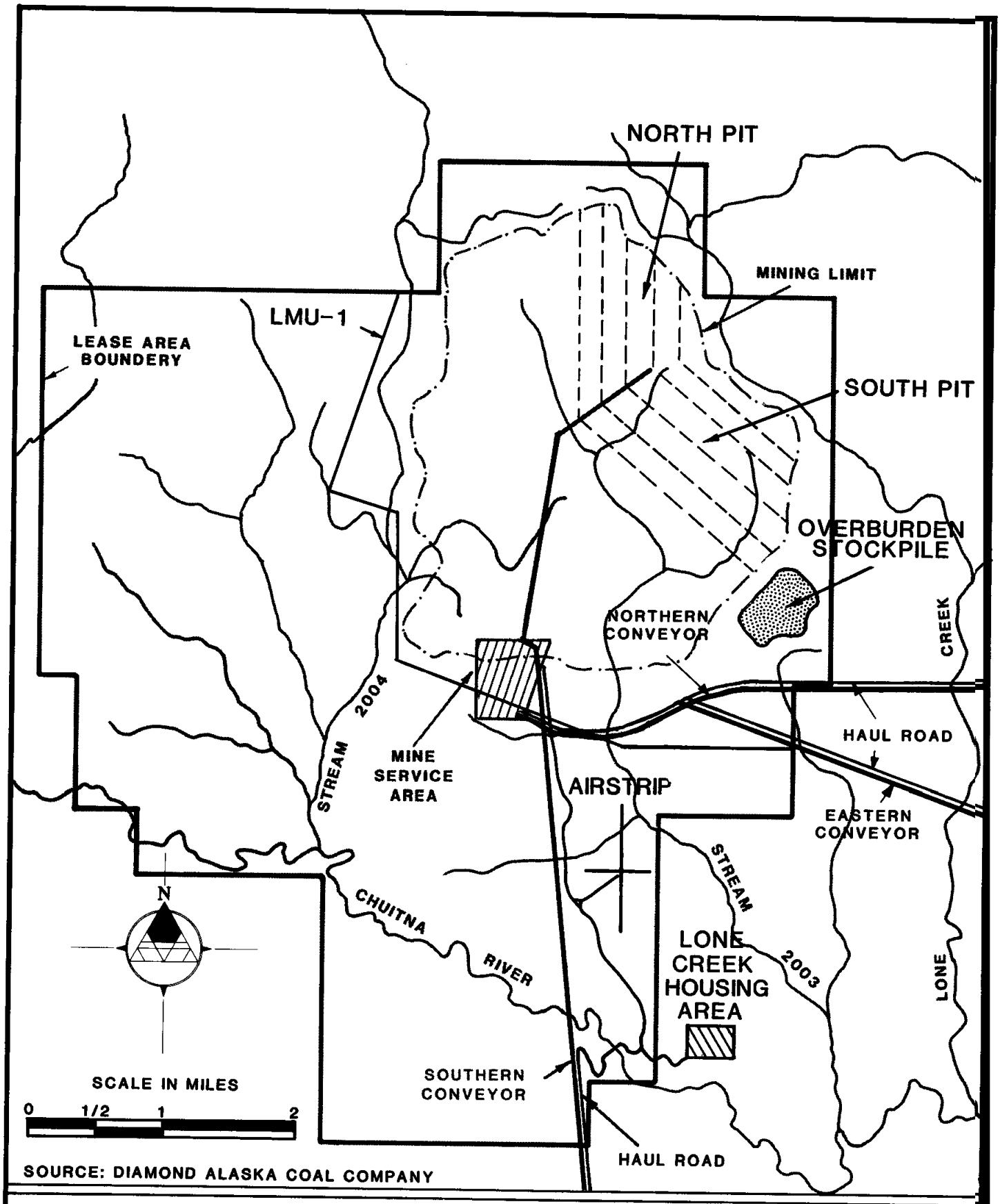
## 2.3 MINE AREA FACILITIES

### 2.3.1 Location and Size

The mine would be located entirely within logical mining unit no. 1 (LMU-1), one of three units within the lease area and the only one involved in the proposed 34-year project (Fig. 2-2). LMU-1 covers approximately 4,047 ha (10,000 ac) and contains a minimum of 299 million Mt (330 million short tons) of coal (recoverable).

The sizes and locations of the coal seams, the nature of the overburden* and interburden*, and the economics involved in mining the coal are such that only surface mining would be feasible. The coal is contained in five major seams, each varying in thickness between 1.8 and 6.1 m (6-20 ft), with a cumulative stripping ratio of 3.9:1 (i.e., 3.9 $m^3$ of overburden to 1 Mt of recoverable coal [4.6:1, or 4.6 $yd^3$ per short ton]). The actual area to be mined (mining limit) would be approximately 2,029 ha (5,014 ac) in size and would be divided into north and south pits (Fig. 2-2) which would be mined simultaneously but in separate operations during the life of the project. These pits would begin on the northeast edge of the mining limit and proceed generally west and southwest, respectively, during the life of the project.

A maximum of 182 ha (450 ac) of pit would be open at any one time. An additional maximum of 61 ha (150 ac) around the pit would be disturbed at any one time in clearing and grubbing vegetation in preparation for stripping overburden, or recontouring in preparation for revegetation. A total of approximately 63 ha (155 ac) per year would be cleared for mining in two periods - most likely spring and fall. Maximum depth of the pit would range from 6.1 m (20 ft) during the first year of production to approximately 122 m (400 ft) in the final years of the project. Average pit depth would be about 61 m (200 ft).




# FINAL MINE AREA OPTIONS LOCATIONS

Diamond Chuitna Environmental Impact Statement | FIGURE 2-2

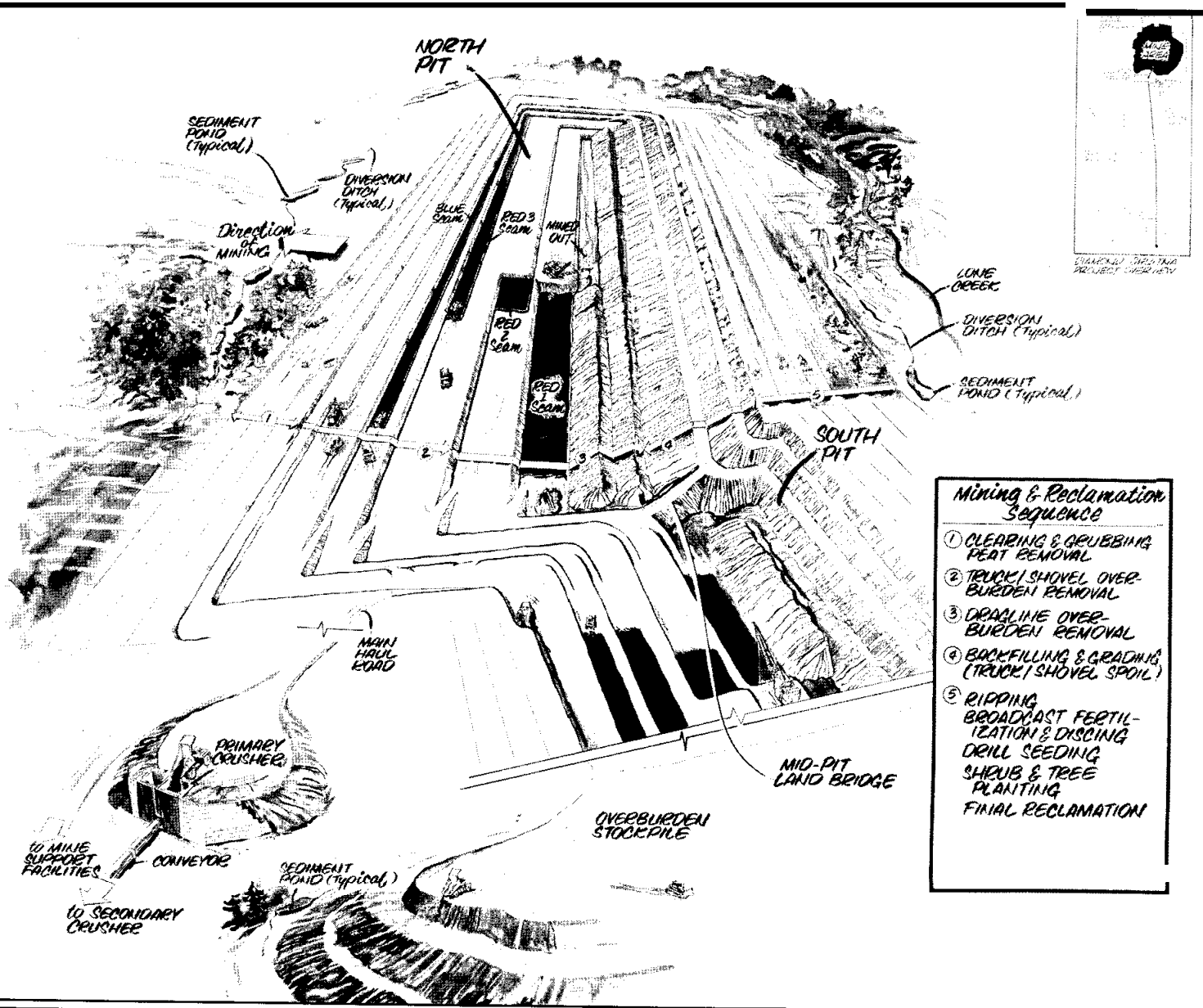
### 2.3.2 Minins Seauence and Methods

Mining activities would begin with the clearing and grubbing of all trees, brush, stumps, and other vegetation. This slash material would be burned, if conditions allowed, or buried under adequate spoil in the mine pit if burning were not possible. Topsoil will be removed and stored in a separate pile for use during revegetation. Then, approximately 16.8 million $m^3$ (22 million $yd^3$) of overburden, excluding topsoil, initially would be excavated (the "box cut"*) and permanently placed in an overburden stockpile (Fig. 2-2). After completion of the box cut, as new topsoil and overburden are excavated from the pit's advancing face to expose the coal, the overburden would be put onto the trailing edge of the pit from which the coal would have already been removed (Fig. 2-3). This area would then be reclaimed by regrading it to its approximate premining contours, including stream locations and drainages, covering it with topsoil, and then revegetating it. Because of an approximate 18 percent swell factor associated with the reclaimed overburden, the original surface contours could be approximated without use of the material in the permanent overburden stockpile.

During the first year of production, mining methods would employ shovels (15-19 $m^3$ [20-25 $yd^3$] capacity), overburden haul trucks (136-154 Mt [150-170 short ton] payloads), and coal haul trucks (91-136 Mt [100-150 short ton]) for stripping and coal recovery. A 44 $m^3$ (57 $yd^3$) dragline would be added later with a smaller 27 $m^3$ (35 $yd^3$) dragline added when full production was resumed. At full production capacity, the draglines would be used for overburden and interburden removal while the shovels and haul trucks would be used for prestripping of overburden.

Coal would be loaded onto trucks directly from the seams by hydraulic backhoes, shovels, or front end loaders. Because of the unconsolidated nature of both the overburden and interburden and the tendency of the coal to crumble, no major blasting is anticipated. Some infrequent secondary blasting would be required, primarily to move large glacial erratic boulders which are scattered throughout the overburden. Such blasting would occur an average of once per week.

Run-of-the-mine coal would be hauled by truck to a primary crusher located in front of the advancing mine face between the north and south pits (Fig. 2-3). The primary crusher would be moved every three to five years. The coal would be crushed to a maximum size of 15 cm (6 in) and carried about 3,962 m (13,000 ft) by a 1.4 m (54 in), two-span partially enclosed mine area conveyor system to a secondary crusher (located in the mine service area outside the mining




# ARTIST'S ILLUSTRATION – MINING AND RECLAMATION SEQUENCE

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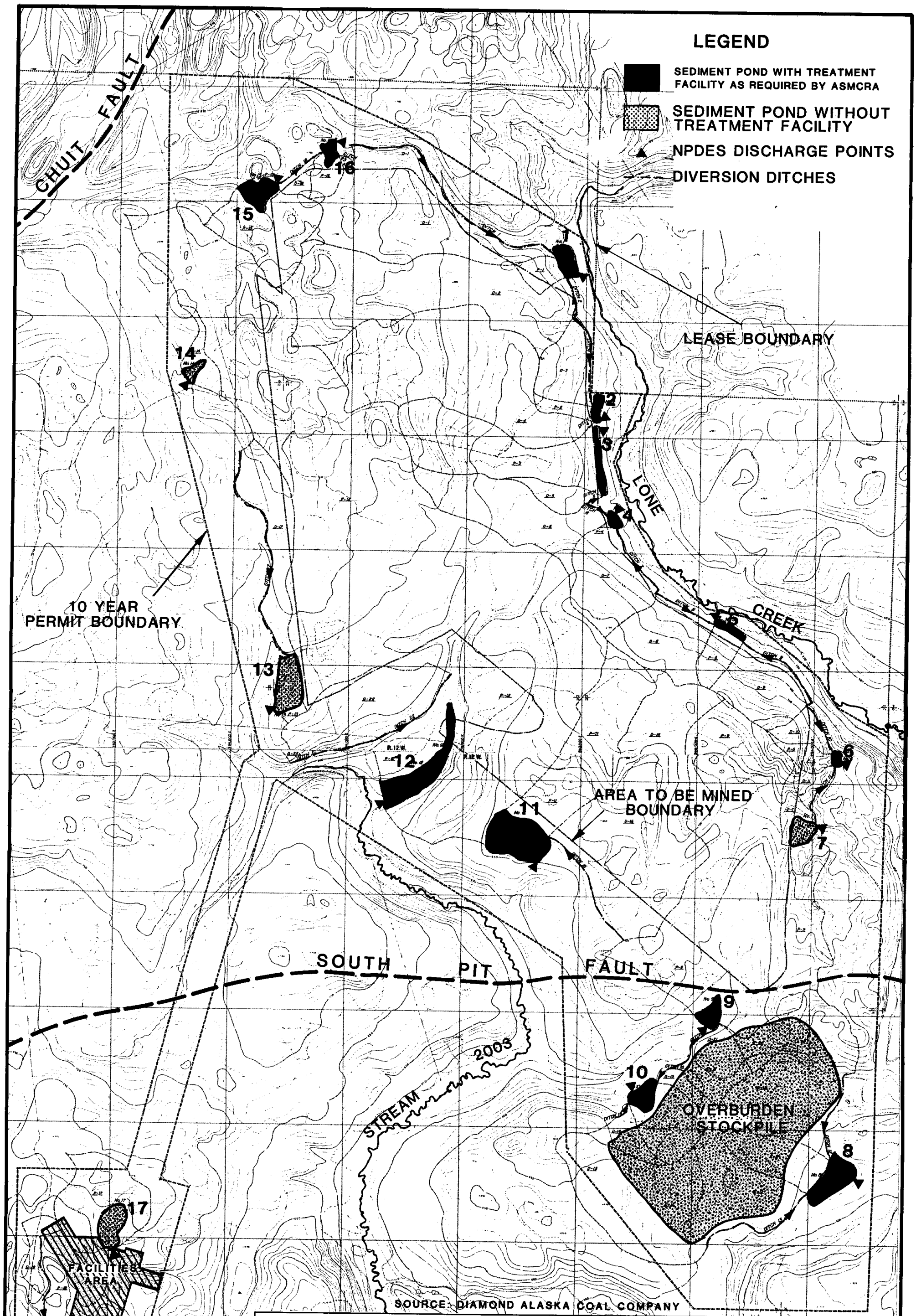
FIGURE 2-3




SOURCE: DIAMOND ALASKA COAL COMPANY

**MINE AREA DRAINAGE CONTROL AND TREATMENT FACILITIES (FIRST TEN YEARS)**

Diamond Chuitna Environmental Impact Statement

**FIGURE 2-4**

limit) where it would be crushed to a maximum size of 5 cm (2 in) and then weighed. The mine area conveyor will be elevated in at least four locations so that the bottom of the horizontal steel support pipe will be a minimum of 2.4 m (8 ft) above ground level to permit crossing by moose and bears.

### 2.3.3 Water Control and Treatment

The discussion below summarizes the major aspects of the proposed water drainage control and treatment system. More detailed information may be found in Vol. XVII, Sec. 4.12, of the state surface mine permit application (Diamond Alaska Coal Company 1985). The two water control processes needed in the mine area to handle surface and ground-water flows both within and around the active mine pit are described below. During the initial 10 years of operation, portions of streams 200304 and 200305 would be mined and a sediment pond would be located in Stream 200305. A major portion of Stream 2003 (Fig. 2-2) would be displaced during the later years of the project.

#### 2.3.3.1 Runoff from Areas Outside the Active Mine Pit

The area to be mined during initial 10 years of operation is topographically situated such that it would receive little natural runoff from surrounding undisturbed areas. Thus, little runoff would have to be diverted around the mining area for discharge into existing drainages.

The primary collection ditch and sediment pond system for runoff from within the area to be mined will be constructed prior to mining and will be maintained until completion of reclamation (Fig. 2-4). Note that this system covers only the first 10 years of operation (7 years of mining). The collection ditches will carry runoff from disturbed and undisturbed areas within the area to be mined, the overburden stockpile, and mine service area to sediment ponds. These ponds will function by retaining the water to allow suspended solids to settle out prior to discharge to existing drainages. Depending upon the location, amount and quality of the collected water, it might also be handled or controlled by various other methods including sediment treatment structures, dugout pond/filter dams, sediment filter fabrics, gravel pads, and vegetation barriers.

All discharges will meet applicable water quality standards by: (1) being discharged as planned; (2) the use of mixing zones; or, (3) additional treatment processes. A mixing zone is a limited area or volume of water where dilution and mixing of wastewater from a point source of

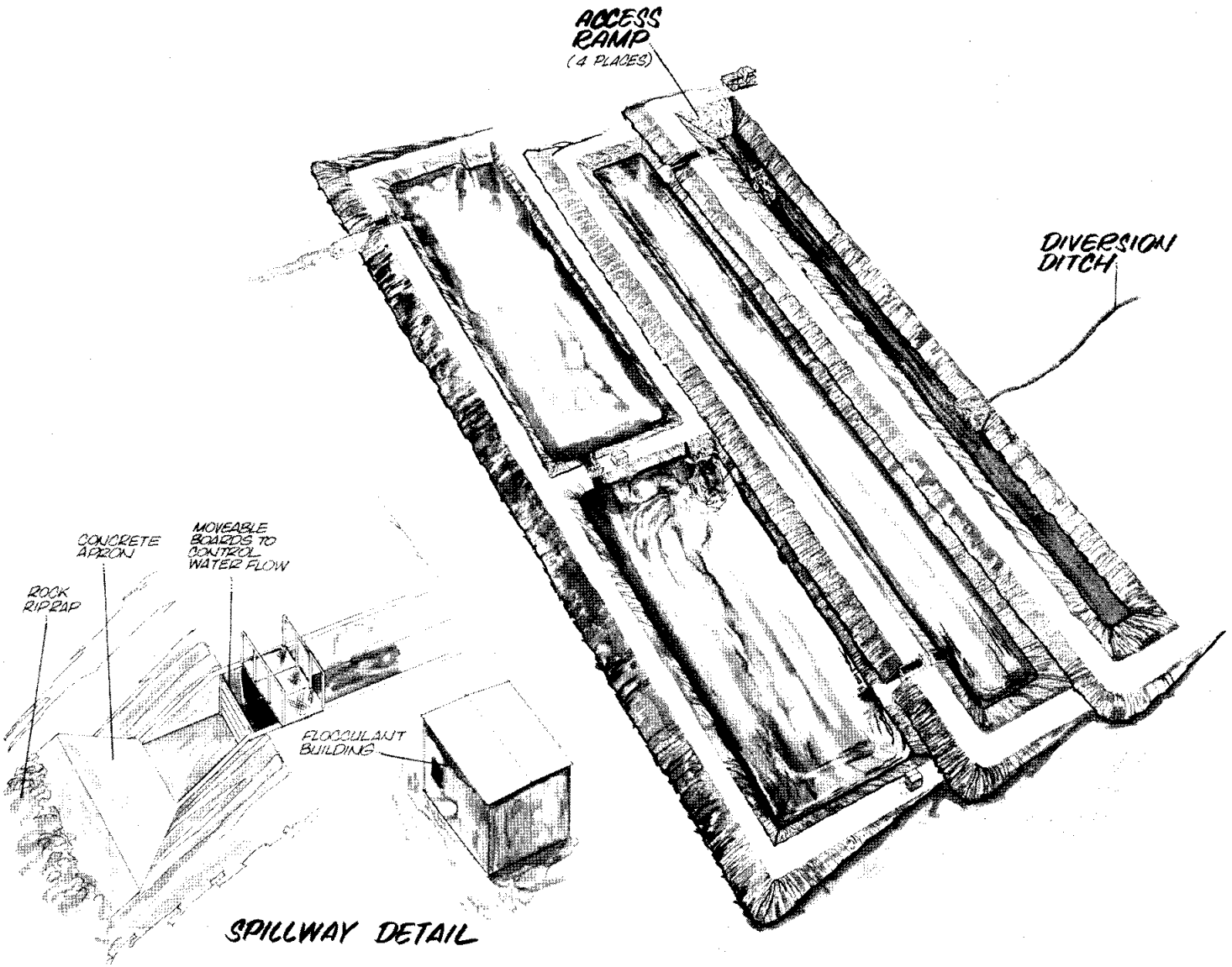
pollution is allowed to occur. Numeric water quality criteria can be exceeded in the mixing zone as long as acutely toxic conditions are prevented (EPA 1983). The rationale is that a small area of degradation can exist without causing adverse effects to the overall water body. EPA (1983), however, states that careful consideration must be given to the appropriateness of a mixing zone where a substance discharged is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic. Federal guidance (EPA 1983) considers location, size, shape, outfall design, and in-zone quality to determine the appropriateness of a mixing zone. Alaska's mixing zone provision is presently set out in 18 AAC 70.032 of the water quality standards. This regulation adheres to federal guidance for mixing zones. The permittee has requested and received approval from ADEC for a mixing zone to meet the state's turbidity water quality standard. The proposed final mine NPDES permit (AK-004357-5, part I, B.6 included in Appendix D) includes a reference to the applicable mixing zone.

Where other treatment is necessary before discharge, e.g., flocculation, additional treatment facilities will be built in conjunction with the sediment ponds. Figure 2-5 shows a typical two-structure sediment pond system with flocculent building. The collection ditch/sediment pond system will be redesigned and rebuilt at intervals to accommodate drainage needs using the experience gained during the first 10 years of operation.

On the northwestern and western sides of the mine area, space is available for location of adequately sized sediment ponds to handle sediment loads with little or no additional treatment. However, on the northeastern and eastern sides of the mine area, space would be limited between the mine pit and Lone Creek. In these areas, sediment ponds with additional sediment treatment structures will be necessary during periods of high runoff. Then treatment structures will consist of a series of excavations and embankments using baffles and selective routing to control, treat, and allow monitoring of runoff prior to discharge into Lone Creek.

Once the water is treated, it will be released from the ponds into natural drainages at the 18 points shown in Figure 2-4. Outflow from sediment pond concrete spillways will be controlled by a riprap* energy dissipator to minimize potential erosion.

The sediment ponds will be dredged periodically with the dredged material put into the mine pit and covered by at least 1.2 m (4 ft) of spoil material.




**ARTIST'S ILLUSTRATION – TYPICAL SEDIMENT POND**

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**FIGURE 2–5**

#### 2.3.3.2 Active Mine Pit Water

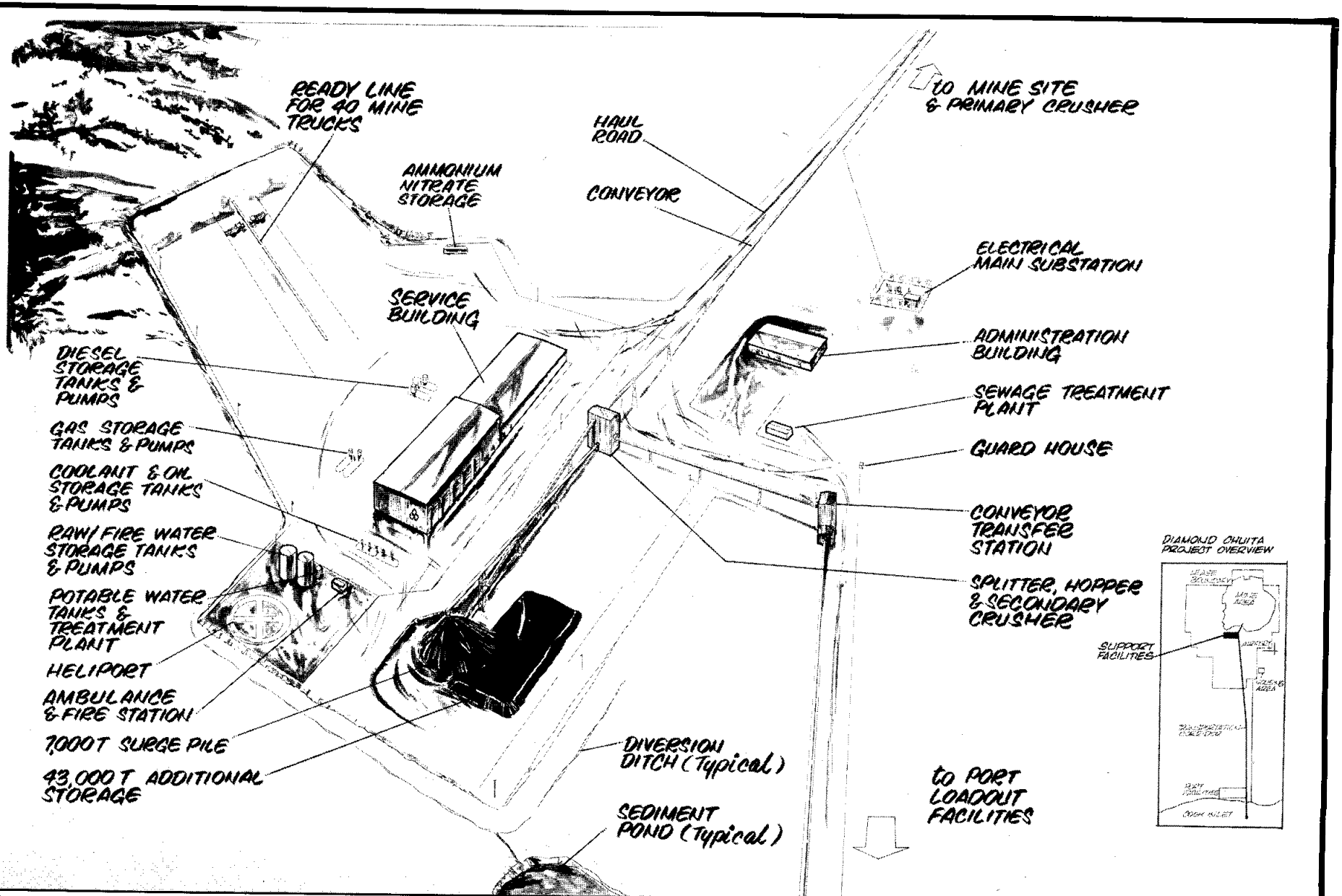
Control of surface runoff from rainfall and snowmelt within the active mine pit and ground water that would drain into the pit during the mining process will be handled in the same manner. Water will be collected in sumps* with a reserve storage capacity to allow initial settling of suspended solids and any additional treatment which might be necessary (e.g., buffering, flocculation). The water will then be pumped from the active mining areas to the adjacent larger sediment control ponds for treatment, monitoring, and discharge into drainages of Lone Creek and Stream 2003. During a given year (within the first 10 years), approximately 50 percent of the water pumped from the active mine pit ultimately will be discharged into the Lone Creek drainage. At any time, however, discharges into either creek, or both simultaneously, could occur depending upon the active mining pit location.

### 2.3.4 Overburden Stockpile

At the start of operations, approximately 16.8 million $m^3$ (22 million $yd^3$) of overburden from the box cut (excluding topsoil) would be excavated and permanently placed in an overburden stockpile (Fig. 2-2). Because of an approximate 18 percent swell factor associated with the reclaimed overburden, the original surface contours could be duplicated without use of the material in the permanent overburden stockpile. This stockpile would be approximately 61 m (200 ft) high, 1,280 m (4,200 ft) long and 670 m (2,200 ft) wide and would cover about 81 ha (200 ac). No further material would be added. The stockpile will be stabilized, graded and then revegetated to prevent erosion. Runoff from the stockpile will be handled in the same manner as described above for the mine area using a treatment system consisting of collection ditches and three sediment ponds (Fig. 2-4). Topsoil from the box cut will be stockpiled in a separate area.

### 2.3.5 Mine Service Area

The permanent mine service area would be located on the southern edge of the mining limit (Fig. 2-2). The approximately 22 ha (55 ac) area would include the main administration building, a service building housing the principal maintenance, warehouse and service facilities; equipment ready lines; water, diesel fuel, gasoline and lubricant storage; electrical substation; ambulance and fire station; water and sewage treatment plants; emergency power system; explosives magazine; heliport; and emergency and safety facilities (Fig. 2-6). The area will not be fenced. No one will be housed at the mine service area.




**ARTIST'S ILLUSTRATION – MINE SERVICE AREA**

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**FIGURE 2–6**

Coal from the primary crusher at the mine would enter the mine service area by conveyor and pass through a splitter-hopper* which would feed coal to either the secondary crusher (and thence by conveyor to the port) or to a surge pile or an emergency storage pile in the service area. The coal would not be washed or otherwise processed. The two coal piles would have a combined capacity of approximately 45,360 Mt (50,000 short tons) and would serve to offset differences in conveyor capacities and compensate for downtime in mining operations.

Runoff from the mine facilities area itself, including any water used for dust control spraying, will be collected by a ditch system and sent to two sediment ponds (11 and 12) (Fig. 2-4) for settling and treatment to meet water quality standards before being released into the Stream 2003 drainage. Flocculent equipment will be installed in ponds 1-6, 8-12, 15 and 16 prior to the ponds becoming operational.

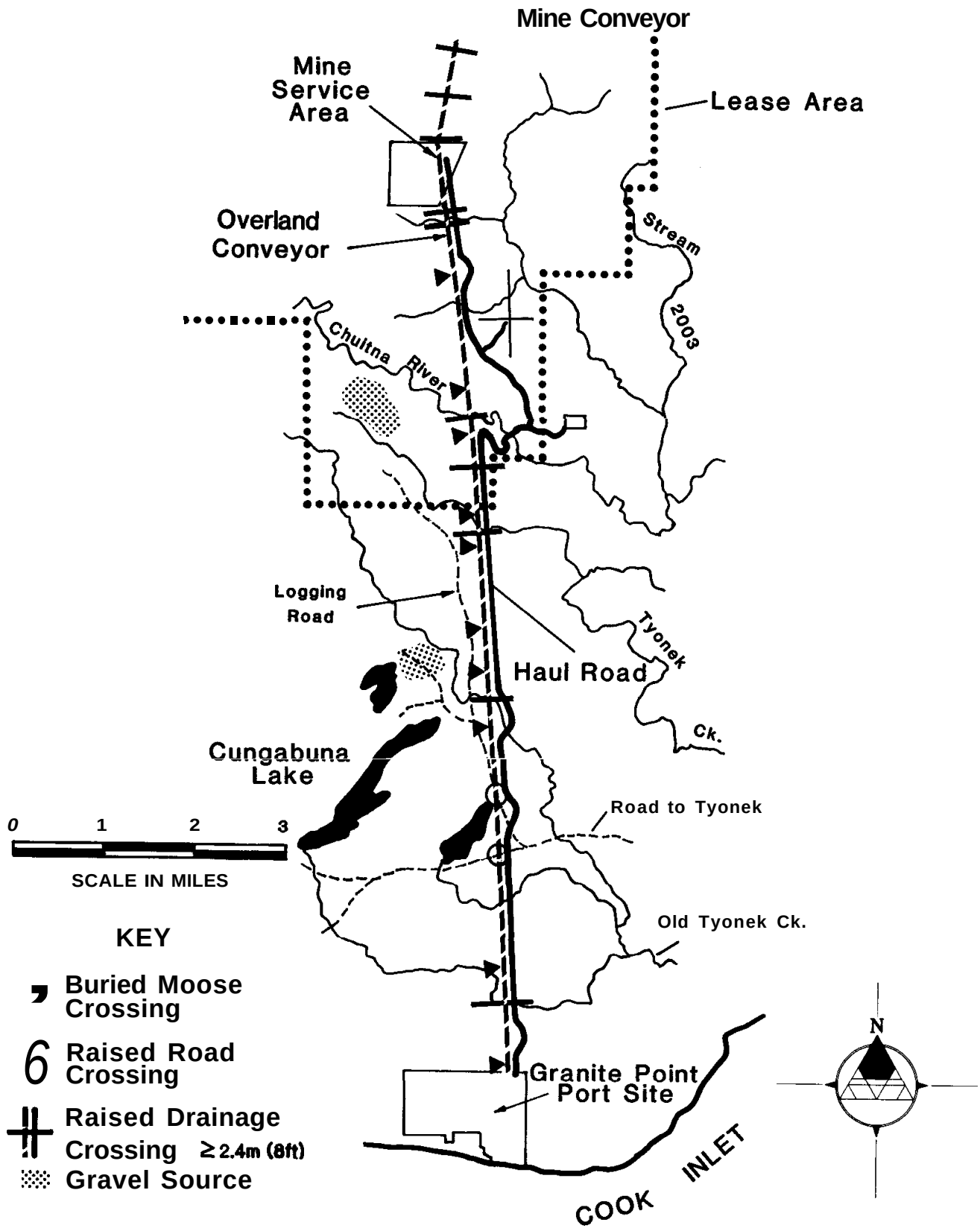
Sanitary waste water generated at the facility will be treated in a packaged treatment plant at primary and secondary levels. Effluent will be carried in a pipeline buried next to the road to the housing area where it will join the treated effluent pipeline from the housing site and be discharged into the Chuitna River directly south of the housing site.

Nonorganic solid wastes will be deposited in fenced and enclosed dumpsters located throughout the service area and collected on a regular basis. A temporary fenced landfill near the mine site will be used for solid waste disposal only during construction, and will then be closed. After that, these wastes will be trucked to a large, permanent, fenced disposal site in the vicinity of the mine. Solid wastes will not be put into the mine pit itself. Organic wastes will be deposited in separate fenced and enclosed dumpsters within the service area and hauled to the housing area organic waste incinerator. Hazardous wastes will be handled completely separately and will be removed from the project area entirely for disposal at an authorized hazardous waste site.

## 2.4 TRANSPORTATION SYSTEM

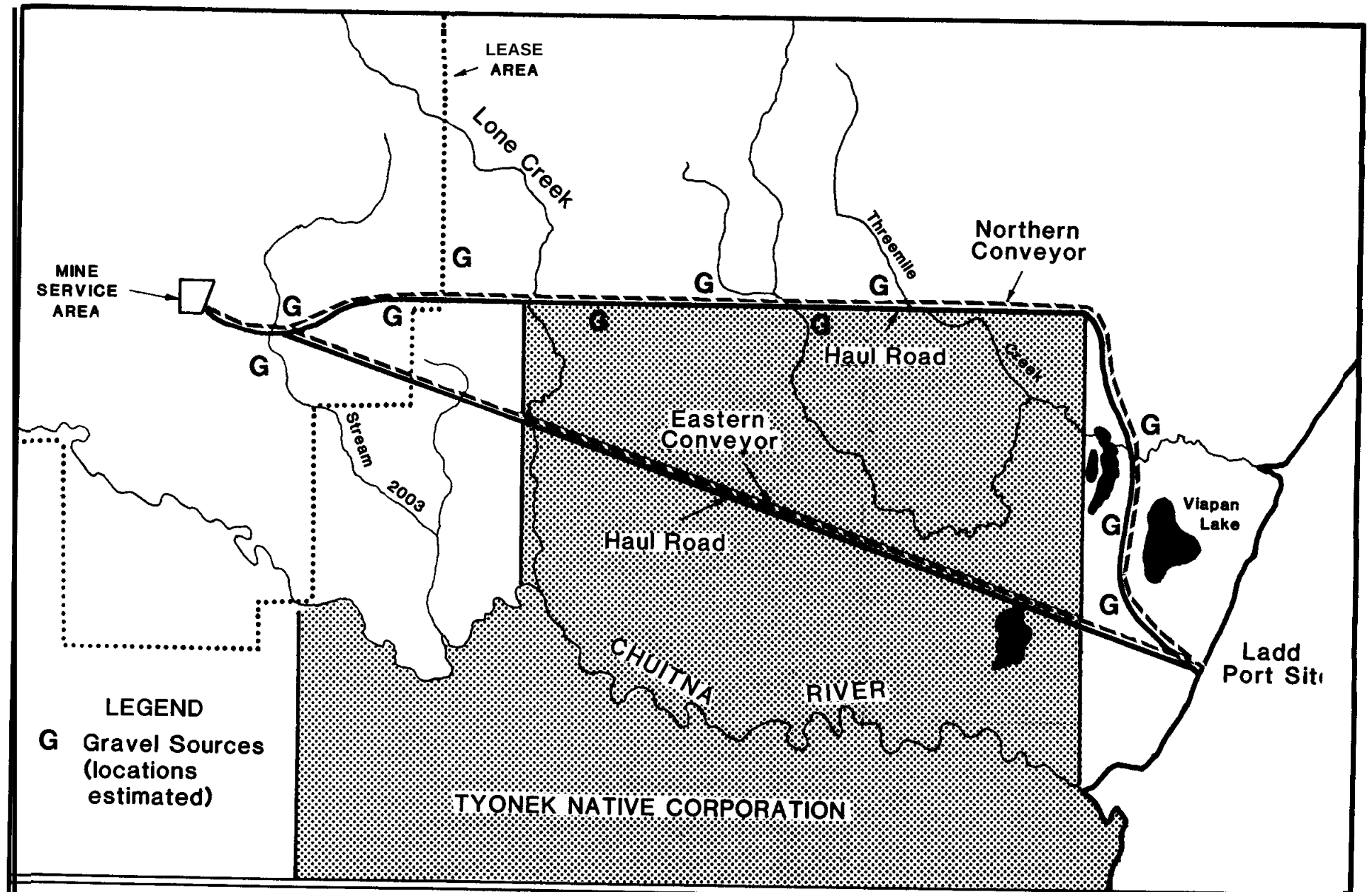
### 2.4.1 Convevor

If either the southern or eastern transportation corridor is selected, an approximately 15.9 km (10 mi) single-span conventional continuous belt conveyor would transport coal from the mine service area to a port on Cook Inlet (Figs. 2-7 and 2-8). The northern corridor, if selected, would require an approximately 22 km (13.8 mi) two-span conveyor (Fig. 2-9). The southern corridor would have six minor stream crossings (two unnamed tributaries to Stream 2003 north of the Chuitna River, Tyonek Creek, Old Tyonek Creek, and two unnamed




SOUTHERN CORRIDOR CONVEYOR AND HAUL ROAD LOCATIONS

Diamond Chuitna Environmental Impact Statement | FIGURE 2-7




EASTERN AND NORTHERN CONVEYOR AND ACCESS/HAUL ROAD LOCATIONS

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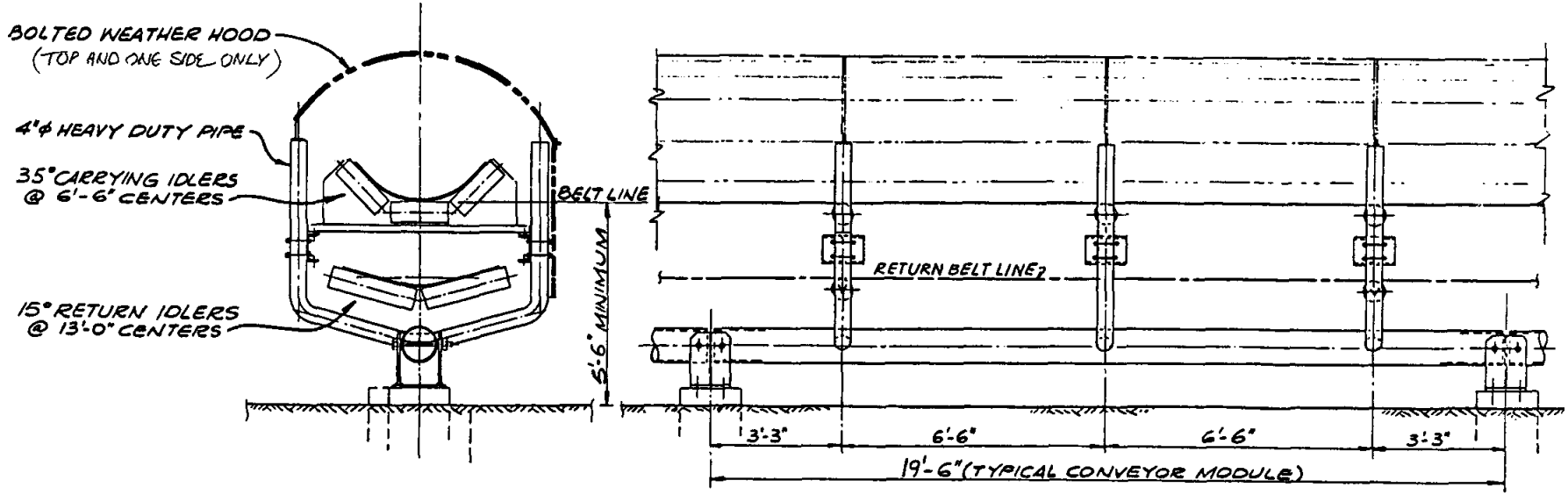
FIGURE 2-8




SOURCE: Diamond Alaska Coal Company

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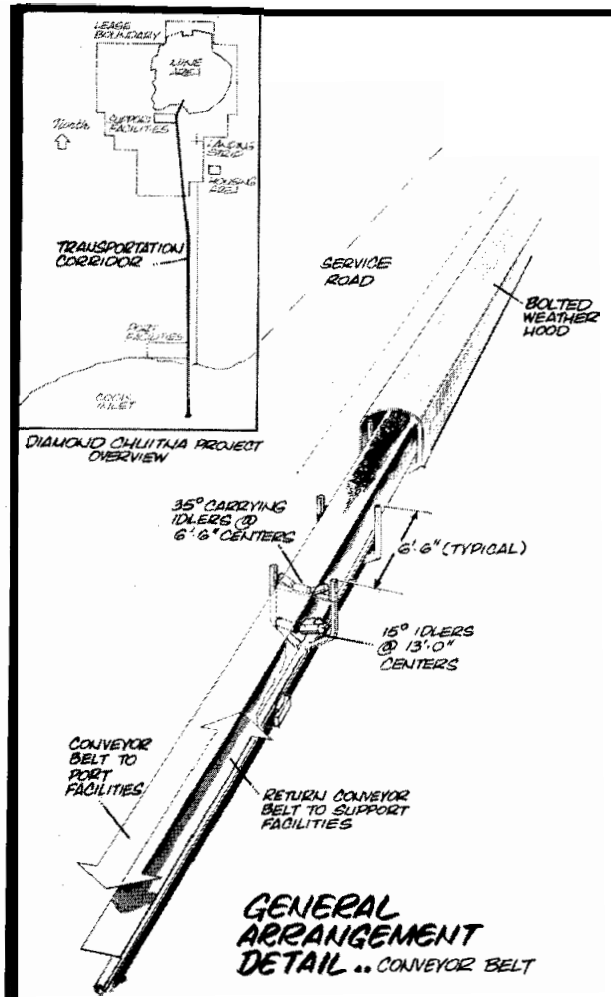
|---|---|
| **TYPICAL CONVEYOR MODULE AND CROSS SECTION** | **Diamond Chuitna Environmental Impact Statement** |
| | **FIGURE 2-9** |

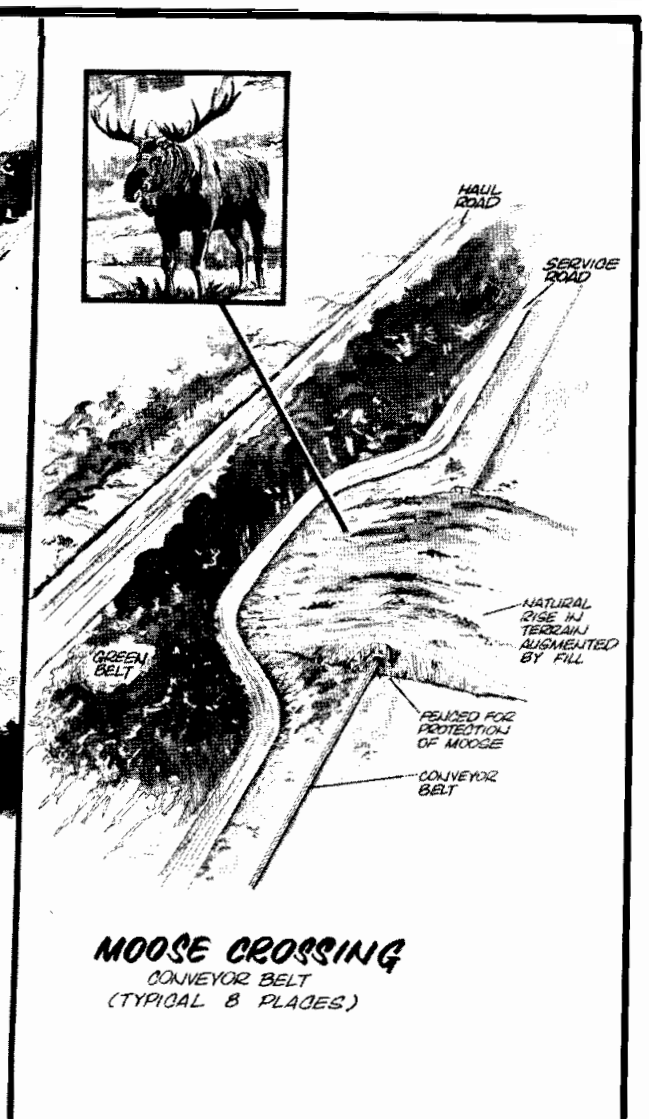
tributaries to Old Tyonek Creek) and one major stream crossing (Chuitna River). The northern corridor would also cross six small streams including two tributaries to Stream 2003, Lone Creek, two tributaries to Threemile Creek, and the Threemile Creek mainstream. The eastern corridor would cross 3-4 streams including two tributaries to Stream 2003 and Lone Creek. Neither the eastern nor the northern corridors would have major stream crossings comparable to the southern corridor's Chuitna River crossing.

The entire conveyor structure would be supported by a horizontal steel pipe typically elevated about 0.6 m (2 ft) above the ground surface on pedestal support piers spaced approximately 6.1 m (20 ft) apart (Figs. 2-9 and 2-10). The entire structure typically would be 2.9 m (9.6 ft) tall and 2.2 m (7.3 ft) wide. The coal-carrying belt would be a minimum of 1.7 m (5.5 ft) above the ground and would be supported by heavy duty pipe yokes attached to the horizontal steel pipe at 2 m (6.5 ft) intervals. The conveyor belt would be 1.2 m (48 in) wide and capable of moving about 1,633 Mt (1,800 short tons) of coal per hour. The conveyor belt will be enclosed on top and one side with a weatherhood to protect the coal from moisture and wind. The open side would permit visual inspection of and access to the rollers for maintenance. Wherever the conveyor crosses streams, it will be partially enclosed on the underside (underpanning) to prevent coal or dust from entering the stream. If a conveyor is built across the Chuitna River (southern corridor), it will be totally enclosed and suspended about 52 m (170 ft) above the river by cables (Fig. 2-9).

To permit moose, bears, and people to cross the conveyor, at appropriate locations it would be buried for a minimum of 61 m (200 ft) in large diameter culverts or arch spans (Fig. 2-10). At other locations, e.g., stream crossings, the conveyor will be elevated a minimum of 2.4 m (8 ft) above ground level. There will also be places where the conveyor will be raised to permit existing roads to pass underneath (Fig. 2-7). The conveyor will be gradually elevated to a clearance of 9.4 m (30 ft) at these road crossings, taking about 61 m (200 ft) on each side of the road to rise to that height from its normal elevation. In combination along any corridor, the maximum distance between crossings (underpass or overpass) will be approximately 2,000 m (2,187 yd), with an average center-to-center distance between crossings of approximately 880 m (962 yd).

Although locations for conveyor crossings have been identified for the southern corridor (Fig. 2-7), final locations will be determined by field inspection of the final alignment. Crossings on the northern and eastern corridors






**ARTIST'S ILLUSTRATION – CONVEYOR SYSTEM DESIGN**

**Diamond Chuitna Environmental Impact Statement**

**FIGURE 2–10**

will also be determined through on-site inspections; the same criteria described above will be used. Crossings will be located where moose are most likely to cross the conveyor, i.e., riparian areas and ridgetops.

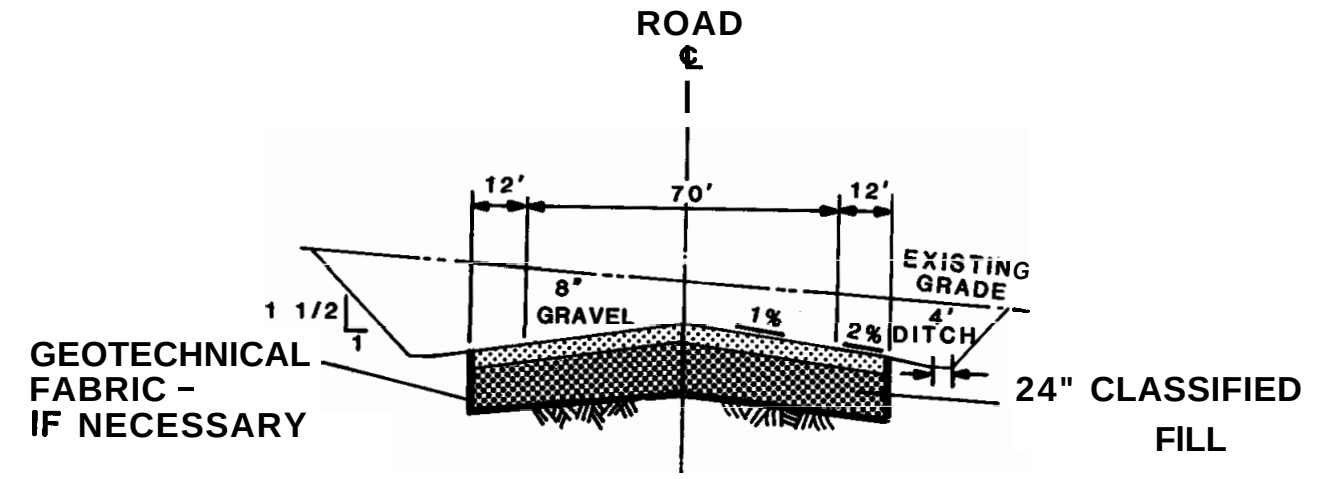
A light duty, minimally improved 4.6 m (15 ft) service/access road suitable for four-wheel drive vehicles would be built immediately adjacent to the conveyor for maintenance purposes. It would be separated from the substantially improved access haul road primarily for safety reasons (to reduce risk of vehicle/conveyor collisions). The separation will also provide a greenbelt between the more heavily traveled access/haul road and the conveyor to increase ease of big game movements across the corridor. Drainage and sediment control measures for the conveyor will be the same as those described below for the main access/haul road. Brush within the conveyor right-of-way will be mechanically controlled; no herbicides will be used.

### 2.4.2 Access/Haul Road

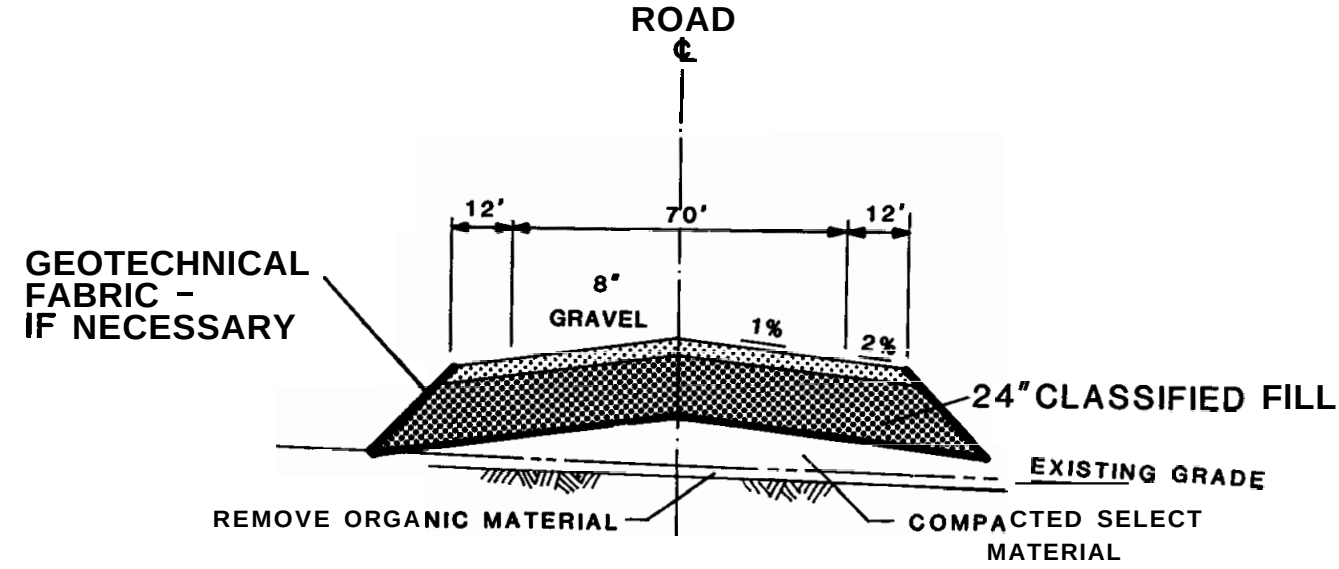
Regardless of which transportation corridor is selected, a private, all-weather access haul road would be constructed that would generally parallel the conveyor along that route (Figs. 2-7 and 2-8). The road would be gravel-surfaced, crowned to promote drainage, and would have two traffic lanes and wide gravel shoulders on each side (Fig. 2-11). The proposed southern route would have a 29 m (96 ft) wide road while the proposed eastern and northern routes would have 9.2 m (30 ft) wide roads. In clearing the corridor for the roads, an average prism of 35 m (116 ft) for the southern route and 12 m (40 ft) for either the eastern or northern routes would be cleared. Grades would be maintained at a maximum of 6 percent.

Over most of its length, the road would be separated from the conveyor by approximately 61 m (200 ft). At river crossings or other natural features, the road would have an independent alignment to maintain grade.

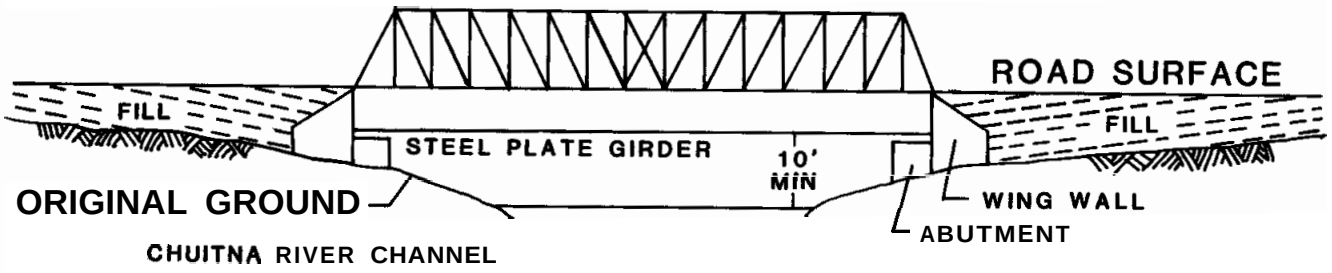
Drainage and sediment control measures will include: (1) construction of ditches to divert runoff from undisturbed areas around operational areas; (2) construction of collection ditches; (3) installation of culverts under roads to collect and control runoff from road surfaces, embankments, and adjacent areas; (4) surfacing of main roads and facility areas with gravel material; (5) revegetation of road cuts, embankments and other disturbed areas as soon as possible after construction; and (6) use of specific localized sediment control measures in sensitive areas. In sensitive areas such




CUT SECTION




FILL SECTION




SOURCE: DIAMOND ALASKA COAL CO.

# TYPICAL HAUL ROAD AND BRIDGE DESIGN

Diamond Chuitna Environmental Impact Statement

FIGURE 2–11

as those adjacent to stream channels, localized sediment control measures will include ditches with rock filter dams, gradient terraces with dugout filter ponds, rock drainage-ways, placement of sediment filter fabric, and use of straw or vegetative sediment filters as appropriate.

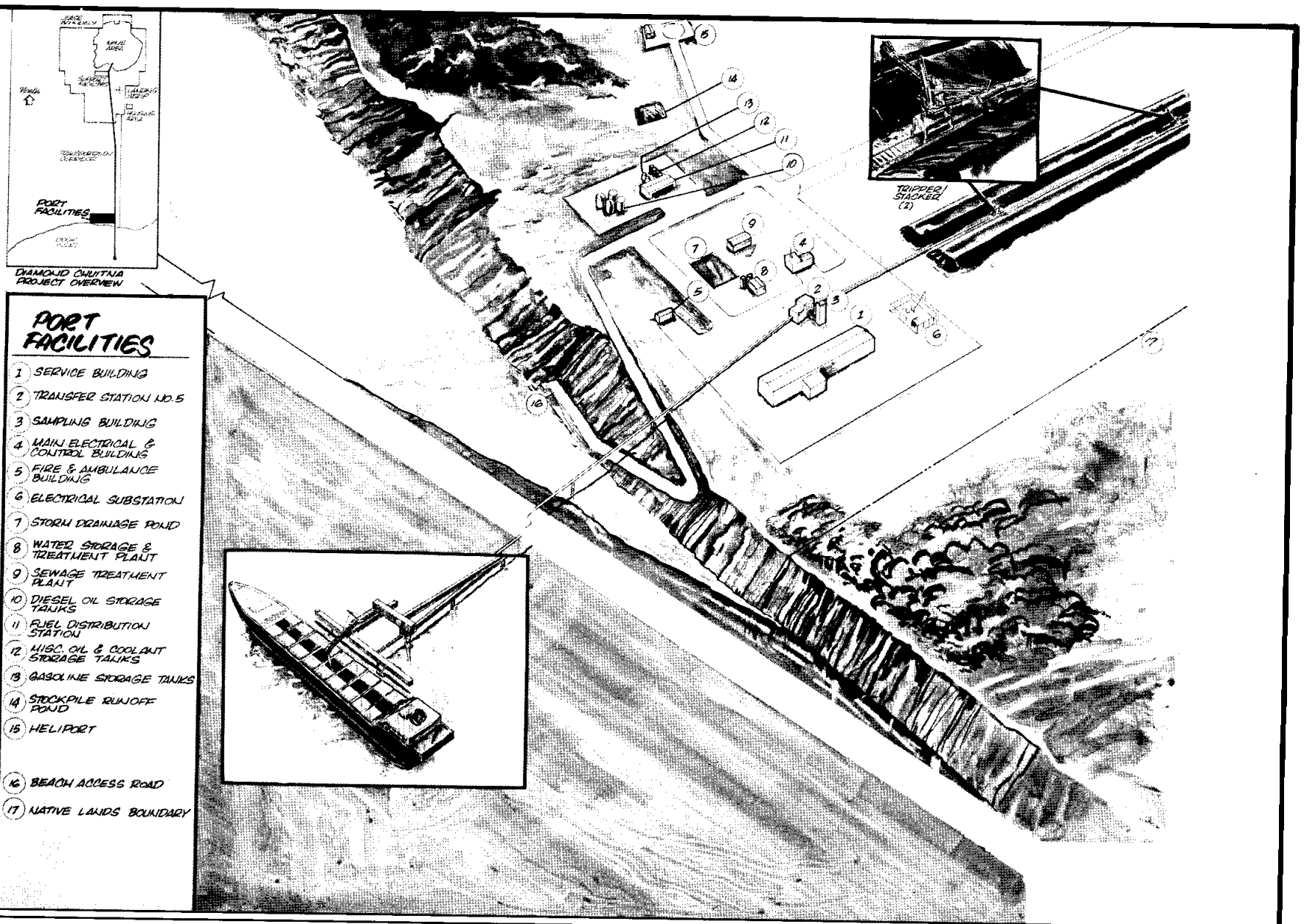
## 2.5 PORT FACILITIES

### 2.5.1 Onshore Port Facilities

The onshore port facilities which would be developed at either Ladd or Granite Point would ultimately be capable of accommodating an annual capacity of 10.9 million Mt (12 million short tons) of coal (Fig. 2-1). Either onshore site would occupy approximately 121 ha (300 ac) on the bluff above Cook Inlet. The site would be connected to a supply barge staging area at tidewater about 30 m (100 ft) below the bluff by a 7.3 m (24 ft) wide beach access road. Figure 2-12 is an artist's illustration of the port facilities if built at Granite Point. A facility at Ladd would be similar.

Major facilities at the onshore site would include a large service building, coal transfer station, sampling building (to sample coal heating value, moisture, ash and sulfur content), main electrical and control building, fire and ambulance building, electrical substation, water storage and treatment plant, sewage treatment plant, diesel fuel and gasoline storage and distribution area, and a heliport. The site will be fenced to minimize human/wildlife encounters. No one will be housed at the port site during project operations.

Coal would enter the onshore port facility on the overland conveyor and be transferred to one of the two 1.8 m (72 in) yard conveyors. It would then be sent directly to the shiploader on the approach trestle if a barge or ship were being loaded. If loading were not in progress, coal would be stored in two large parallel stockpiles on either side of the conveyor (Fig. 2-12). The amount of coal stored at the port site would vary depending upon shipping schedules, marine weather conditions, and downtime in mining operations. At full production, up to 1.1 million Mt (1.2 million short tons) of coal could be stored, but a minimum of 90,720 Mt (100,000 short tons) always would be stockpiled. A 30 to 45 day turn-over of coal in the stockpiles would be anticipated. Tests on the self-heating potential of the coal indicated no susceptibility to fire hazard while exposed to the atmosphere. The coal piles will be unlined and will sit upon a gravel fill pad. Alignment of the piles will be approximately north-south at Granite Point to minimize contact with the prevailing winds. Alignment at Ladd has not yet been determined, but




# ARTIST'S ILLUSTRATION – PORT SITE FACILITIES

Diamond Chuitna Environmental Impact Statement

FIGURE 2-12

stockpiles will also be aligned to minimize wind contact. The maximum dimensions of these stockpiles would be approximately 945 m (3,100 ft) by 61 m (200 ft) by 15 m (50 ft) high. During barge- or shiploading, coal would be taken from these stockpiles and placed on the conveyors to the approach trestle.

Coal would be transferred from the conveyor to the stockpiles, or taken from the stockpiles and placed onto the conveyor, by two large railmounted stacker-reclaimer units which would move parallel to the conveyor. These machines would have a bucketwheel at the end of their booms which would be able to break through a frozen crust of coal up to 0.6 m (2 ft) thick when reclaiming coal for shiploading.

A packaged commercial sewage treatment plant will be used to treat all sewage generated at the port facility. Following treatment to meet applicable standards, the effluent will be carried by pipeline along the elevated trestle and discharged into Cook Inlet at Granite Point or discharged into an onsite leach field at Ladd.

Nonorganic solid wastes will be deposited in fenced and enclosed dumpsters located throughout the port facility and collected on a regular basis. Initially, these wastes will be hauled to a temporary fenced landfill near the mine site which will be closed following completion of construction. For the first five to ten years of project operation, these wastes will be buried in a fenced landfill near the port facility. After that, the wastes will be hauled to the large permanent landfill in the vicinity of the mine. Solid wastes will not be put into the mine pit itself. Organic wastes will be deposited in separate fenced and enclosed dumpsters within the port facility and hauled to the housing area organic waste incinerator. Hazardous wastes will be handled completely separately and will be removed from the project area entirely for disposal at an authorized hazardous waste site.

Drainage and sediment control will be accomplished by drainage ditches which will collect all surface runoff from the disturbed area of the port site and divert it into sediment ponds. This will include storm runoff and water sprayed on coal stockpiles for dust control. Treatment methods will vary depending upon the water quality of the runoff. Following treatment, the water will be carried by pipeline on the approach trestle for discharge directly into Cook Inlet. All discharges will meet state and federal water quality standards (see the proposed final NPDES permit - Appendix D). The drainage and treatment system will be designed to accommodate volumes from the 10-year, 24-hour precipitation event. Likewise, all culverts and diversion ditches will be designed to contain the peak flow from a 10-year, 24-hour event.

### 2.5.2 Offshore Port Facilities

If full production is anticipated, a port could be developed at either Granite Point or Ladd. At either location, a trestle could be built to the deep water needed for accommodation of large coal ships. For less than full production, coal would be loaded onto ocean-going barges. Barges can operate in shallower waters than can the coal ships. Appropriate depths can be reached substantially closer to shore at Ladd than at Granite Point; therefore, if bargeloading only is required, a port would be developed at Ladd.

Offshore facilities for either port location would consist of an approach trestle with ship breasting and mooring dolphins (Fig. 2-12). The trestle length at Granite Point would be either 2,277 m (7,470 ft) or 3,810 m (12,500 ft) depending on the size of the ships which would be used.

Approximately 287 m (940 ft) of either trestle would be upland of the mean high tide line, thus reducing the length of the trestle extending into the inlet. The trestle would be 7.9 m (26 ft) wide, 9.1 m (30 ft) high and supported by single piles up to 3.7 m (12 ft) in diameter. The piles would be approximately 122 m (400 ft) apart and the trestle would be a minimum of 6.1 m (20 ft) vertically above the water at mean higher high water (MHHW). The structure would be designed to withstand the greater than 9.1 m (30 ft) tides, 3.6 m/s (7 knot) currents and 1.1 m (42 in) thick ice floes of upper Cook Inlet. One of the mooring dolphins would support a helipad.

At Granite Point, smaller "Panamax class" vessels (54,432 to 72,576 Mt [60,000 to 80,000 dwt]) with drafts of 11.9 m (39 ft) capable of passing through the Panama Canal could be loaded at the shorter trestle with a berthing depth of 14 m (45 ft) at mean lower low water (MLLW). Larger vessels up to 108,864 Mt (120,000 dwt) would require the longer trestle with a berthing depth of between 15.2 and 18.2 m (50 and 60 ft).

At Ladd, to accommodate lower production levels, the 9,072 to 13,609 Mt (10,000 to 15,000 dwt) barges would require a trestle of approximately 168 m (550 ft) in length to reach a berthing depth of 1.2 m (4 ft) at MLLW. This would require tidally controlled berthing where barges would be moved into the dock, loaded and then moved away to take advantage of water depths at higher tide levels. At full production, the trestle would be approximately 3,505 m (11,500 ft) long to load large ships at a berthing depth up to 18.2 m (60 ft). The trestle specifications would be the same as described above for Granite Point.

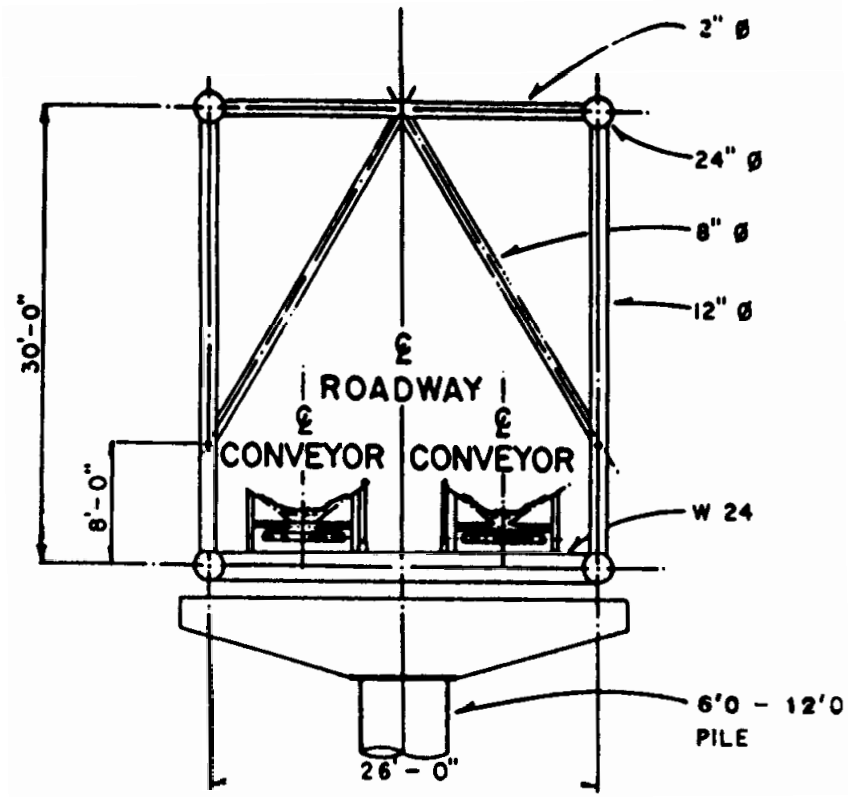
Coal would be transported from the onshore port to a linear shiploader facility at the end of the approach trestle on two covered conveyors each 1.8 m (72 in) wide (Fig. 2-13). At full production, the shiploader would have an effective loading rate of 3,629 to 4,536 Mt (4,000 to 5,000 short tons) per hour. It would have a boom capable of swinging to reach all compartments of a coal barge or ship, with the spout being lowered into the hold to reduce dust generation. The trestle conveyors would be paralleled by a 1.5 m (5 ft) wide walkway that would be used to transport operating and maintenance personnel and equipment. Coal could be loaded 24 hours per day throughout the year, affected only by weather and ice conditions in Cook Inlet.

The trestle will not be used for receiving supplies for the project. Freight, bulk materials, small quantities of certain fuels and other supplies will be brought in by barge, unloaded at the barge staging area on the beach, and trucked up the beach access road (Fig. 2-12) to the onshore port facility, housing site or the mine area as required. Major quantities of diesel fuel and gasoline will arrive by tanker and be pumped through a pipeline supported by the elevated trestle to the onshore port facility. Fuel will be stored in tanks at the onshore port site (which will hold a four-month supply) and be trucked by tractor/trailer units to the housing site or mine area as required (see Sect. 2.10.3). When ice conditions prohibit use of barges, food and miscellaneous supplies will be transported to the project area by aircraft.

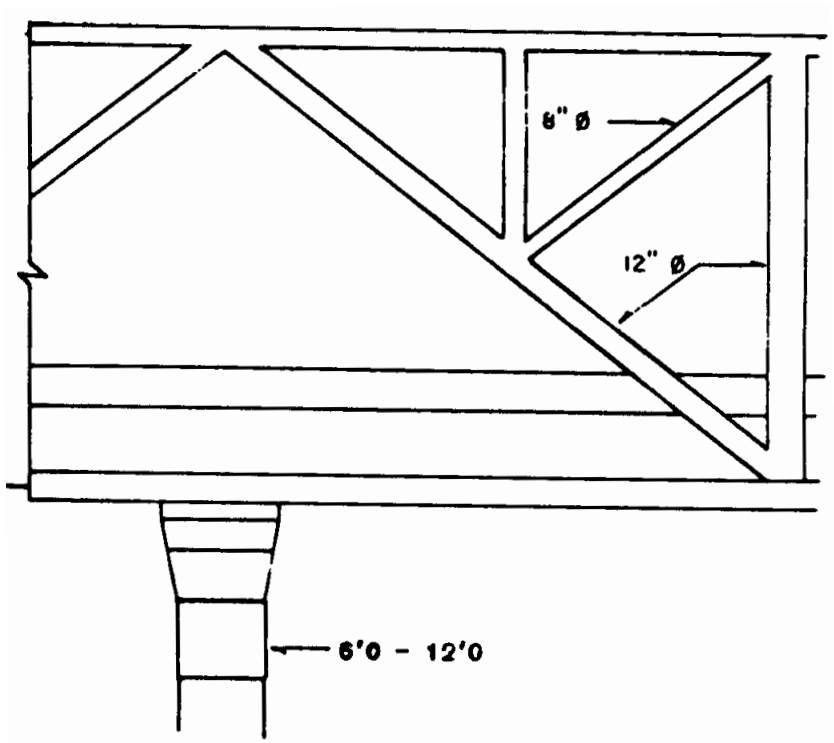
## 2.6 HOUSING AND AIRPORT FACILITIES

### 2.6.1 Housing

The workforce would be housed in permanent single-status housing and community facilities on an 8 ha (20 ac) site. The entire housing area will be fenced to minimize human/animal contacts. Full production facilities would consist of four buildings with 102 units and two buildings with 66 units connected by all-weather corridors. Other facilities would include a dining hall/administration building, recreation center, laundry, medical facilities, security and fire services, and a maintenance building (Fig. 2-14). The facilities would be operated on the "motel" concept with employees checking into available rooms for their four-day stay at the project site. There would be no town at the housing site. The facilities would be designed for the actual number of employees on site (424) with a 27 percent contingency for weather conditions for a total of 540 beds. No employee-owned firearms or alcohol will be allowed at the housing facilities.




*FRONT VIEW*



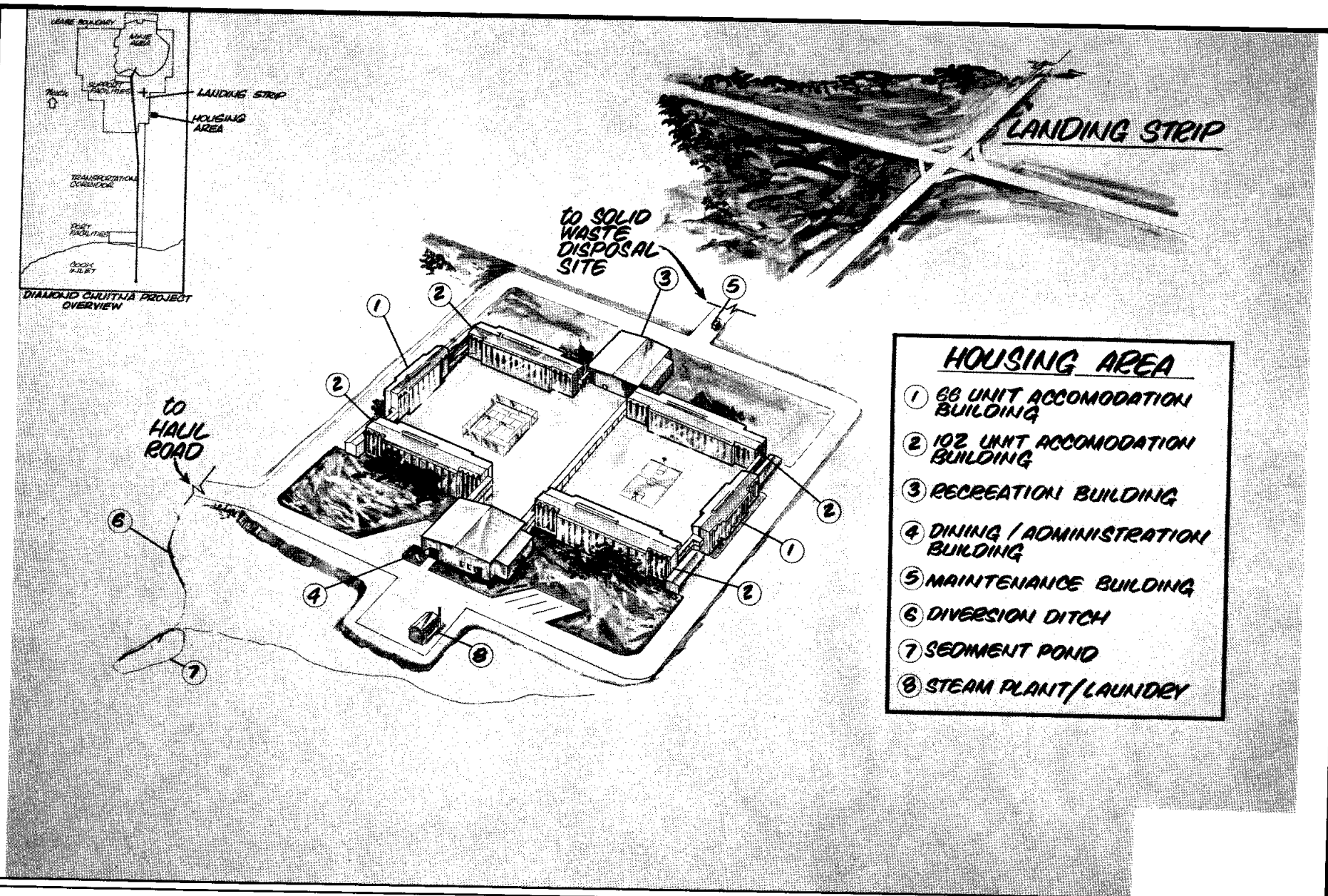

*RIGHT VIEW*

SOURCE: Diamond Alaska Coal Company

# TRESTLE AND PIER DESIGN

Diamond Chuitna Environmental Impact Statement

FIGURE 2–13




ARTIST'S ILLUSTRATION – HOUSING AND AIRSTRIP FACILITIES

Diamond Chuitna Environmental Impact Statement

FIGURE 2-14

Water will be obtained from a series of ground-water wells with a storage capacity of approximately 302,800 l (80,000 gal) at the site. A packaged commercial sewage treatment plant with a capacity of approximately 136,800 l (30,000 gal) per day will handle sanitary and other drainage from the housing complex. Treatment will be at primary and secondary levels. Effluent from the Lone Creek housing area will be carried in a pipeline and discharged into the Chuitna River directly south of the housing site. Effluent discharge from the Threemile and Congahbuna housing sites has not been designed but will conform to state and federal regulations. The sludge effluent generated from treatment plants at any housing site will be hauled to the mine pit for burial.

Disposal of all wastes will be in approved sites. Nonorganic solid wastes will be deposited in fenced and enclosed dumpsters located throughout the housing area and collected on a regular basis. Initially, these wastes will be hauled to a temporary fenced landfill near the mine site which will be closed following completion of construction. For the first five to ten years of project operation, these wastes will be buried in a fenced landfill near the housing area. After that, the wastes will be hauled to the large permanent landfill in the vicinity of the mine. Solid wastes will not be put into the mine pit itself. Organic wastes will be deposited in separate fenced and enclosed dumpsters within the housing area and burned in a nearby incinerator. Hazardous wastes will be handled completely separately and will be removed from the project area entirely for disposal at an authorized hazardous waste site.

Drainage and sediment control will be handled by a ditch collecting system which will surround the facility and collect surface runoff and carry it to two sediment ponds for treatment and release to existing drainages. Treatment methods will be the same as for the mine service area and port site facilities, and water quality standards will be met before discharge.

### 2.6.2 Airstrip

A private gravel landing strip would be located close to the housing facility (Fig. 2-2). The main runway, 1,524 m (5,000 ft) long and 30 m (100 ft) wide, would be oriented in a north-south direction with a smaller 914 m (3,000 ft) east-west runway. The airstrip would have navigation lights, but would not be capable of handling instrument approaches in bad weather. A small terminal building and a maintenance building would be located at the site. Water requirements will be small and water will be hauled to the terminal building by truck. Chemical toilets will be used with sewage being hauled and dumped into the housing facilities' treatment plant. Gray water from the terminal will be treated to meet water quality standards and then released into the airstrip's drainage

system which will discharge to existing drainages. There will be no sediment ponds. Solid wastes will be kept in an enclosed, fenced dumpster which will be regularly emptied and disposed of in the same manner as that for the housing area.

## 2.7 POWER GENERATION

Estimated average-load electrical power demands for the project at full operation would be approximately 35 Mw, with a maximum demand of 50 Mw. Power would be purchased from the existing Chugach Electric Association natural gas power station at Beluga (Fig. 2-1) and transported to the project site by a 69 kv line on wooden poles. If the Granite Point port site were selected, the powerline would follow the existing powerline right-of-way running from the power plant to the oil tank farm about 2.4 km (1.5 mi) west of the proposed Granite Point port site (Fig. 2-1). This existing right-of-way would not have to be widened and would connect with a wooden pole transmission line within the transportation corridor between the port site and the mine.

If the Ladd port site were selected, the powerline would follow the existing right-of-way until it intersected the transportation corridor where it would split to provide power to both the port site and the mine.

## 2.8 RECLAMATION PLAN

The discussion below summarizes the major aspects of the proposed reclamation plan. References are given to the location of more detailed information in the state surface mine permit application (Diamond Alaska Coal Company 1985).

### 2.8.1 Mine Pit

The reclamation plan for the mine area will have short-term as well as long-term goals. The short-term goal will be the immediate stabilization of the disturbed site through control of erosion and sedimentation. The long-term goals will be to: 1) establish wildlife habitat that will be at least as useful and productive as the premining environment; and 2) create an aesthetically acceptable site that blends with the surrounding terrain and vegetation. These goals will be met using the methods described below.

During the initial 10 years of operation, a total area of approximately 583 ha (1,440 ac) would be mined. Reclamation of disturbed sites will begin during the second year of mining (year five of the permit) and will follow, but not interrupt, mining annually until all acreage disturbed by mining and associated activities is reclaimed. No disturbed acreage will be unclaimed.

During the first year of reclamation, 1 ha (3 ac) will be reclaimed. During the next five years, 51 ha (125 ac), 56 ha (139 ac), 143 ha (354 ac), 61 ha (151 ac) and 75 ha (186 ac) will be recla med, respectively, for a total of 387 ha (958 ac) reclaimed after six years of mining. More detailed information may be found in Vol. XVI, Sec. 4.08, of the permit application.

#### 2.8.1.1 Backfilling and Grading

After the initial box cuts have opened the pits for mining operations, the overburden and interburden material from the active mine areas will be backfilled by draglines and truck and shovel operations into the mined out areas (Fig. 2-3). Grading and stabilization then will be done by bulldozers and graders. The final topography will match the premining contours as closely as possible and will not exceed original slope grades. Slopes will be designed to minimize erosion and maintain adequate water retention for vegetative growth. Gradient terraces will be used to control sheet runoff.

Postmining surface drainage channels will be located to minimize erosion and slumping. Major reconstructed surface drainage channels will be lined with riprap material as necessary to limit bank erosion and scour. The drainages will be reconstructed with gradients, meanders, and habitats similar to premining drainages to provide habitat for anadromous fish species.

No exposed coal seams will be left on the reclaimed surfaces. A minimum of 1.2 m (4 ft) of nontoxic and noncombustible spoil material will be used to cover any exposed seams that remained after mining. Spoil materials at the mine site contain no known acid-forming or toxic substances; therefore, no special handling techniques for these types of materials are anticipated.

#### 2.8.1.2 Topsoil Handling Plan

Suitable topsoil material will be recovered from areas to be affected by mining and related operations prior to disturbance. The recovered topsoil will be either stock-piled for later use or redistributed directly on backfilled and graded areas. When possible, the topsoil will be immediately redistributed in preference to stockpiling. Topsoil removal, stockpiling, and replacement will be scheduled to coincide with the overall mining sequence.

Stockpiles will be designed to minimize wind and water erosion, and topsoil will not be disturbed or rehandled after stabilization unless the soil were to be redistributed on a graded surface. Unnecessary compaction and contamination of stockpiles will be eliminated and they will be protected from

waste disposal, construction, and other such disturbances to maintain integrity. All stockpiles will be located within the mining limit and will be as small as possible.

Planting specifications to control stockpile erosion will differ depending on the life of the stockpile. Stockpiles remaining in place less than 30 days during the growing season will not be revegetated but will be left in roughened condition to retard erosion. Stockpiles remaining in place longer than 30 days during the growing season, but less than one calendar year, will be seeded with an annual seed mixture. Stockpiles to remain in place over one growing season and into or through additional growing seasons will be seeded with a permanent grass mixture and mulched.

Topsoil will be redistributed in a manner and at such time that: (1) achieves an average soil thickness of 15.2 cm (6 in) consistent with the revegetation goals, contours, and surface drainage systems; (2) minimizes compaction, contamination, and erosion; (3) conserves soil moisture and promotes revegetation; and (4) minimizes deterioration of the biological, chemical, and physical properties of the soil.

Following replacement and final grading of topsoil, but before seeding, a sampling plan will be implemented to evaluate the preparation of backfill and seedbed materials. This plan will include analysis of samples by a designated analytical laboratory.

Peat will be salvaged in advance of mining operations for recreating peat-filled wetland habitats on regraded soils. To the extent possible, stockpiling of peat will be avoided and no long-term (greater than 30 days) stockpiles will be established. Temporary peat stockpiles will remain isolated from topsoil stockpiles and will not be sited in drainage ways. More detailed information may be found on Vol. XVI, Sec. 4.10, of the permit application.

#### 2.8.1.3 Revegetation

To determine which plant species will be used for revegetation, certain criteria were established:

Native species will be used wherever possible.

Seed mixtures and planting rates will reflect consideration of the relationship between herbaceous species and woody species in terms of competition for soil moisture, nutrients, and sunlight. For example, heavy seeding rates of vigorous, introduced grass species were considered inadvisable because of undesirable competition with wood species.

Wildlife value will be a prime consideration in the selection of plant species and development of seeding and planting rates.

With the above goals in mind, preliminary seed mixtures and stocking selections were developed based on species characteristics, potential success, commercial availability, and availability of seed or cuttings stock on or near the permit area.

As soon as practicable after a disturbed area is returned to the proper contour and grade, topsoil will be spread and the site will be stabilized. Erosion and sedimentation will be minimized by construction of sediment control and retention structures, proper seedbed preparation, fertilization, and planting of rapidly establishing species. The longer-term goals of establishing productive wildlife habitat will be accomplished through additional planting of seedlings and cuttings of woody species.

Sediment ponds and associated diversion ditches will be removed at the completion of mining when the upstream drainage areas are stabilized, revegetation standards met, and acceptable water quality attained. Prior to regrading, ponds will be dewatered and the sediment material tested for toxicity. If unsuitable for use in the revegetation program, the material will be removed and buried under 1.2 m (4 ft) of nontoxic fill. Sediments should be stable in the landfill. No additional undue leaching should occur. Remaining ponds and associated drainage ditches will then be backfilled, graded, and revegetated. More detailed information may be found in Vol. XVI, Sec. 4.11 of the permit application.

### 2.8.2 Overburden Stockpile

The size, shape, and slope of the overburden stockpile will be such that stability will be assured once vegetation is established. Though the topography of the stockpile will differ from the surface of the mined areas, slope angles will permit the use of agricultural equipment. Thus, the techniques described above for the mine area will also be used on the stockpile. Once a portion of the surface is no longer disturbed by stockpiling activities, revegetation will be completed during the next planting season using the same procedures described in Section 2.8.1.3.

### 2.8.3 Mine Service Area

All steel and fabricated buildings will be dismantled and removed for salvage. Structures and equipment of no salvage value will be buried in the mine pit. Other

components, including concrete footings, slabs, and foundations will be removed at ground level before being buried in the pit. Gravel pad and road surfacing materials and all coal debris will also be disposed of in the mine pit. Sedimentation ponds and associated drainage ditches will be reclaimed as described for the mine pit area.

Once cleared, all excavations at the site will be filled and the site graded to the approved postmining topography. Areas exhibiting compaction detrimental to plant establishment will be ripped. Revegetation will be done in the same manner as described for the mine pit area.

### 2.8.4 Transportation Corridor

Any transportation facilities which cannot be beneficially used for other purposes will be dismantled and salvaged. Any facilities not salvaged will be removed, foundation structures broken up, and the resulting rubble buried in an approved landfill. Disturbance to the land under the conveyor will be limited to a denuding of the ground surface where poles and conveyor braces had been located. These disturbed areas will be revegetated where more than 50 percent of the predisturbance vegetative cover has been eliminated.

If the main haul road is not left intact for other users, road surfacing and culvert materials will be removed and buried in an approved landfill. The road bed will be ripped to relieve compaction and the roadbed and embankments will be graded to blend with adjacent undisturbed terrain. Temporary drainage features will be built to control runoff and erosion until revegetation of regraded areas occurs.

### 2.8.5 Port Site

Structures which would serve a useful purpose for continued activities will be left in place. The trestle might serve future coal mining or other mineral or natural resource development operations in the region. The facilities might also provide a source of revenue for other future businesses. In any event, all facilities which will not be retained for other beneficial uses will be appropriately reclaimed and the disturbed areas revegetated in the same manner as described above for the mine service area facilities. Instead of using the mine pit, any burial would take place in approved landfills.

### 2.8.6 Housing Area and Airstrip

All improvements will be dismantled and removed for salvage value. Foundations, roads, gravel pads, etc., will be appropriately reclaimed and the disturbed area revegetated as described above for the mine service area facilities. If the State does not want the airstrip to remain usable, it will be reclaimed and revegetated also.

### 2.8.7 Fish Resources

Several types of mitigation will be accomplished to protect fish resources during the development and operation of the mine. Measures include construction and operation procedures, monitoring studies, and a restoration plan. Table 2-1 outlines the major proposed fish mitigation measures and associated monitoring programs. More detailed information may be found in Vol. XV, Sec. 4.07.1 of the ASMCRA permit application; ASMCRA requirements are summarized in Chapter 6.0 of this document.

## 2.9 CONSTRUCTION

### 2.9.1 Schedule and Sequence

Once project construction is begun, it would take approximately three years to complete. Most construction would take place each year during the May through October period.

#### 2.9.1.1 First Year

The first step would be establishment of a barge staging area at the base of the bluff below the port site (Fig. 2-12) and construction of a road up the bluff to the onshore port facilities site. The onshore port site would serve as the main construction camp and would have housing and dining facilities, construction offices, fueltanks, sewage treatment plant, and temporary equipment service, repair and warehousing facilities. Vegetation clearing and grubbing would begin at the port site in preparation for the major civil work to be completed in the second year.

Because of its importance in development of the project, construction of the mine access/haul road would begin as soon as the initial facilities were established at the port site. Regardless of which port site were chosen, road construction equipment would be landed at the existing Ladd beach barge site and transported over the existing Ladd road to the mine area so road construction could be simultaneously carried out from both ends. Completion of the road would take about 18 months.

TABLE 2-1

MAJOR PROPOSED FISH MITIGATION MEASURES AND MONITORING PROGRAMS DURING FIRST TEN YEARS OF PROJECT

| IMPACT | MITIGATION | MONITORING |
|---|---|---|
| 1) Increased sedimentation due to mining | A - Construct settling ponds designed to catch mine dewatering until sediment settles out. | NPDES permit compliance. |
| | B - Whenever possible, minimize use of construction and mining in streams other than those designated for mining. | Environmental coordinator would periodically check construction and mining areas for compliance. |
| | C - Prior to the construction of settling ponds, m mining in streams would occur during spawning periods of salmon species potentially using the mainstem section of watershed 2003. | Environmental coordinator would monitor construction activities to ensure compliance. |
| 2) Habitat loss due to mining in stream | A - Rebuild sections of tributaries 200304 and 200305 to approximate premining conditions as much as possible. | Conduct fish habitat characterization studies once after restoration in order to determine value of stream in terms of potential fish use. |
| | B - Revegetate mined areas to minimize increased erosion rates and loss of overhanging vegetation in vicinity of streams. | Environmental coordinator would monitor revegetation efforts to determine program effectiveness. |
| 3) Habitat loss due to altered flows in streams | A - Return water form sediment ponds into lower sections of tributary 200305 and 200304 and mainstem portions of watersheds 2003 and 2002. | Conduct an instream flow survey at stream location(s) exhibiting potential significant losses of salmon habitat. Survey would be conducted once after mined stream segments were restored. |
| 4) Increased sedimentation and habitat alteration due to conveyor system and road crossing watershed 2003 | A - Staging areas for stream crossings would be located outside of riparian zone to minimize amount of sediment entering stream and reduce disturbance to riparian vegetation and aquatic habitats. | Environmental coordinator would inspect stream crossing activity for compliance. |
| | B - A maximum ROW of 30 m (100 ft) would be used at the stream crossing to reduce disturbance. | Environmental coordinator would inspect design plans and construction activities. |

TABLE 2-1
MAJOR PROPOSED FISH MITIGATION MEASURES AND MONITORING PROGRAMS DURING FIRST TEN YEARS OF PROJECT
(continued)

| IMPACT | MITIGATION | MONITORING |
|---|---|---|
| | C - Construction methods would employ latest state-of-the-art techniques. (Examples of bank and stream bottom protection measures would include riprapping, upland storage of excavated riverbed materials, importing clean backfill, backfilling with previously excavated riverbed materials, and revegetation. | Environmental coordinator would review proposed construction methods and make suggestions on bank and stream bottom protection measures at each crossing. After construction, the coordinator would inspect condition of stream bank and bottom substrate and other fish habitat characteristics at an immediately downstream of the proposed crossing. |
| | D - Road crossing would be constructed and maintained to prevent obstructions to movements of adult and juvenile salmon. | Environmental coordinator would inspect construction activities and make observations during different flow regimes. |
| | E - Construction activities would be scheduled to avoid spawning periods of salmon if possible. | Environmental coordinator would review construction timing plans and inspect construction activities. |
| 5) Alter water quality due to mine dewatering and relase of rater from settling ponds. | A - NPDES permit compliance. | NPDES permit compliance. |
| 6) Fuel or lubricant spills | A - Fueling and lubrication of equipment would not occur within approximately 201 m (660 ft) of streams. Equipment would be properly maintained and checked for leaks periodically. Spills would be reported immediately to the environmental coordinator. | Environmental coordinator would approve fueling locations and routinely check for compliance. Affected streams would be immediately surveyed for fish kills following a spill. |

Clearing, grubbing, site grading, and electrical distribution networking would be completed at the housing facilities site, and the dining hall, recreation center and about one-fourth of the housing units would be constructed. The airstrip would also be constructed and made operational.

#### 2.9.1.2 Second Year

The major civil and building construction work would be completed at the onshore port site. Pilings for the offshore elevated trestle would be driven and the conveyors at the onshore port site would be built. The mine access haul road would be completed and additional housing units, the boiler plant and communication facilities would be constructed at the housing area.

At the mine service area, most civil work would be done and the electrical system completed. Limited building construction would be initiated. Construction of the water control and treatment facilities for the whole mine area would also begin.

#### 2.9.1.3 Third Year

The offshore trestle would be assembled on the pilings and the shiploader erected. The stacker-reclaimer would be erected at the onshore port site and the remainder of the housing units would be completed.

At the mine service area, facilities construction would be completed. Clearing and grubbing would begin at the mine site with initial stripping of overburden beginning late in the third year or early in the fourth.

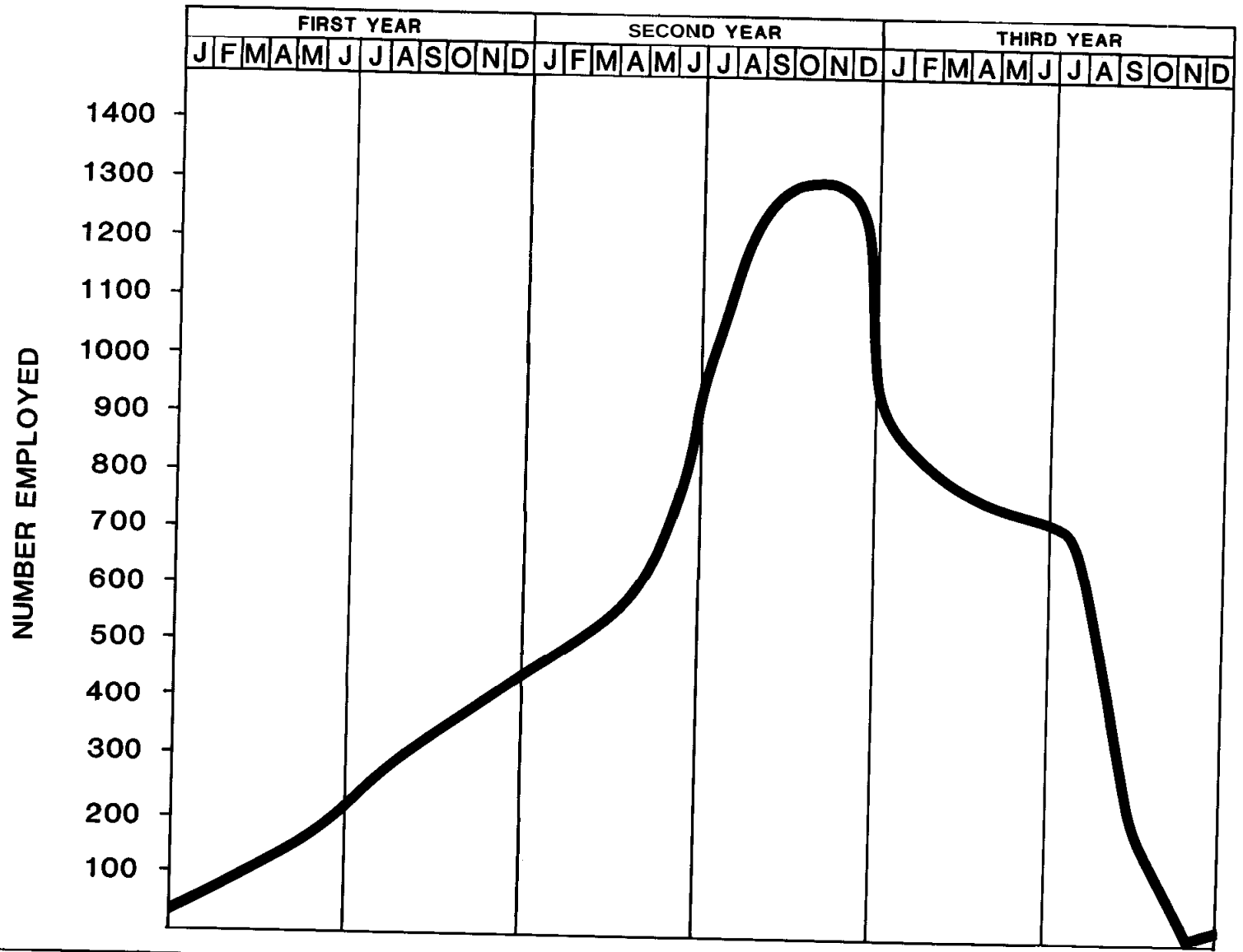
### 2.9.2 Construction Employment

The estimated number of workers to be employed during construction is shown in Figure 2-15. Construction employment would gradually increase to approximately 430 at the end of the first year, then rise quickly to a peak of about 1,300 workers in October and November of the second year. Employment would then decrease quickly to approximately 750 between March and July of the third year. By the end of the third year, construction employment would drop to well below 100 when production would begin.

### 2.9.3 Construction Methods

#### 2.9.3.1 Facilities Sites

Construction methods for the three major facilities sites (the mine service area, onshore port site, and the housing area and airstrip) would be similar. Prior to actual construction, access roads to each facility would be




NUMBER OF WORKERS EMPLOYED, BY MONTH, DURING PROJECT CONSTRUCTION

Diamond Chuitna Environmental Impact Statement

FIGURE 2-15

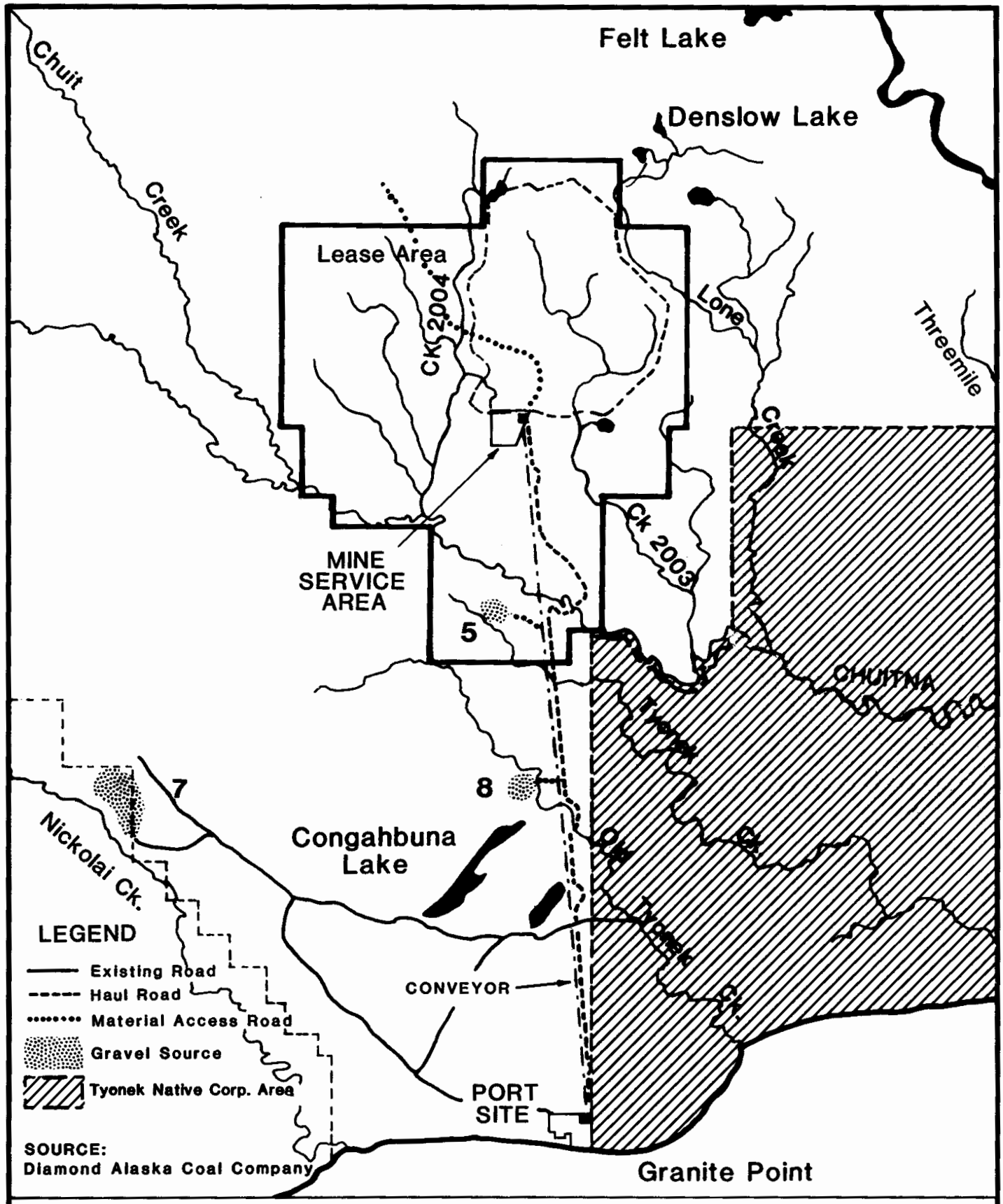
installed. In general, fabrication of most facilities would be completed at factory locations with the modules being shipped by barge to the port for offloading, transportation to the site, assembling, and erection.

Site work would begin at each facility with clearing and grubbing of all trees and brush. This material will be put into windrows for burning, if conditions allowed, or buried under an adequate depth of spoil in the mine pit if burning is not possible. Precautions will be taken to prevent beetle infestation of white spruce. Areas with peat or muskeg deposits will be drained by ditches to facilitate removal. The peat will be hauled to a nearby disposal site which will be revegetated after it has served its purpose. Diversion ditches and sediment ponds will be constructed around the perimeter of the facilities to control and treat water runoff. Ditch sizes and sedimentation control methods will be similar to those described below for the haul road. After the facility sites are **"final"** graded, the modules will be trucked to the sites and actual construction of the buildings and other facilities will begin.

All **subgrade** and final grade gravel material, including that used for construction of the conveyor and haul road, would come from the areas shown in Figure 2-16, if the southern corridor is utilized. Gravel sites along the northern corridor are indicated in Figure 2-8. Gravel sites for use along the eastern corridor have not been investigated. Approximately 3.82 million $m^3$ (5 million $yd^3$) of borrow* material would be used for all project facilities. Of this total, approximately 458,760 $m^3$ (600,000 $yd^3$) would be gravel and 3,058 $m^3$ (4,000 yd) would be **riprap** or armor rock. The remainder would be any suitable fill material.

The material sources will be accessed by two-lane gravel roads suitable for heavy equipment. They will be located to maximize use of the existing logging and oil exploration road systems in the project area. Prior to any activity at the material sites, small diversion ditches, and berms will be constructed around the perimeter to divert surface runoff away from the area. Vegetation within the material pit boundaries will be cleared and disposed of in the same manner as described above for the facility sites. All surface material will then be removed and stockpiled in a suitable nearby location. Erosion control measures, including temporary seeding, will be used as appropriate to stabilize the stockpiles.

In wet areas, sumps will be constructed at a low point on the pit bottom to collect water. Some small-scale blasting may be required to establish these drainage sumps. Small submersible pumps will be used to remove the water for discharge to the surface drainage system. sediment fences,




**GRAVEL SOURCE LOCATIONS, SOUTHERN CORRIDOR**

| Diamond Chuitna Environmental Impact Statement | FIGURE 2–16 |
|---|---|

fabric filters, and straw bale dikes will be used as needed to remove sediment from the pumped water as well as to control sediment in and around the pit.

A tracked-dozer will be used to rip material and a front-end loader will feed it into a crusher hopper. The crushed material will be screened and stockpiled by size in the pit area prior to being hauled by scrapers or rear-dump trucks to use areas. During construction of the project facilities, the crushing and screening operation will be continuous. Following construction, the operation will occur on an intermittent basis.

When a material source is exhausted or when operation is impractical due to low demand or haulage distance, an area will be reclaimed to a condition compatible with, and similar to, the surrounding terrain. The pit will be backsloped either through placement of the stockpiled overburden material or through ripping and dozing to provide a stable slope to minimize erosion and blend with surrounding terrain. Suitable surface material will be replaced in a uniform thickness over the disturbed area and erosion control measures will be taken including contour furrowing, terracing, and construction of rock drains. The entire area will then be revegetated using a suitable seed mix of indigenous and introduced species.

No dredging or filling will be necessary for either the trestle or berthing offshore port facilities. Each monopile will be driven with hammers to a predetermined depth in the inlet floor for support of the approach trestle, shiploader and berthing dolphins. Structural steel trusses will then be placed on top of the monopiles with barge-mounted cranes to serve as the platform to support the conveyors and shiploading equipment.

#### 2.9.3.2 Conveyor and Access/Haul Road

Conveyor construction would occur in two phases. In the first phase, vegetation will be cleared from the right-of-way only to the extent necessary for construction access. Vegetation will be windrowed and burned under permits from DNR and DEC. Ground cover will be left intact where feasible to provide erosion protection. Runoff will be collected by diversion channels and routed to sediment control structures prior to discharge. Then, only limited cut and fill operations will be necessary since generally both the conveyor and its adjacent service road will follow the natural terrain. The rigidity of the conveyor structure and the inherent design flexibility will allow localized topographic features such as small drainage channels to be effectively bridged. Upon completion of site preparation work, the conveyor support

piers will be placed. In phase two, mobile cranes will lift prefabricated conveyor framework sections into place for attachment to the support piers.

Construction of the access/haul road will require some cut and fill operations which will occur simultaneously with placement of culverts. Where the road crosses a surface drainage channel, culverts designed to pass the peak discharge from a 10-year, 24-hour precipitation event, with no ponding on the upstream end, will be used. All culverts will be placed on suitable bedding material and appropriate riprap material will be incorporated at the inlet and outlet to minimize erosion. "Trash rack" structures will be installed at culvert inlets to prevent clogging due to debris.

In areas where adverse surface conditions exist for building roads (e.g., muskegs), a special construction technique will be used which will effectively "float" the road on the less competent underlying material. In this method, a flotation material, typically wood chips or logs, is placed directly on top of the undisturbed surface vegetative mat. A layer of minimally compacted fill material is then laid down followed by a geotechnical fabric which would provide lateral stability, distribute bearing loads over a large area, and allow drainage through the road base. Normal construction methods will then follow until the designed grade was achieved.

Permanent bridges will be of truss and girder construction supported by concrete piers (Fig. 2-11). Construction will be timed to minimize impacts upon spawning salmon or other fish movements and temporary pontoon bridges or stream fords will be used to provide equipment access.

During construction of the facility sites, conveyor and road, both temporary and permanent diversion ditches will be constructed to divert runoff from undisturbed areas either around the construction sites or through culverts installed under the road. These will be maintained until disturbed areas are effectively controlled. Additional drainage and sediment control measures will include surfacing of main roads and facility areas with gravel, and revegetation of road cuts, embankments and other disturbed areas as soon as possible after construction to minimize erosion. In sensitive areas, e.g., adjacent to stream channels, localized sediment control measures will be used, including rock filter dams, gradient terraces with filter ponds, rock drainageways, placement of sediment filter ponds and use of straw or vegetation sediment filters. All disturbed areas will be revegetated and mulched, if necessary, as soon as possible after completion of construction activities.

The access/haul road will be maintained on a regular basis. Maintenance will include grading, bridge, culvert and

drainage ditch inspection, repair of any localized erosion on embankments, wetting of the road surface by water trucks to control dust during dry periods, and snow removal by snowblower to prevent buildup of high snow berms which would impede animal movements across the right-of-way.

## 2.10 OPERATION

### 2.10.1 Coal Production and Shipping Schedules

Under the optimal four-year full production development schedule, initial production would begin at a low level and build to full production. During the initial year of operation, approximately 1.8 million Mt (2 million short tons) of coal would be produced using two shifts of mine workers per day and truck/shovel operations in the pit. The coal would be transported to the port site on the access/haul road using truck tractors, each hauling two, 45.4 Mt (50 ton) uncovered trailers. The tractors would make approximately 55 round trips per day.

During the second year of operation, production would be increased to about 3.6 million Mt (4 million short tons) per year by adding a second work shift at the mine. The coal would still be hauled by trucks to the port site in approximately 99 round trips per day. Early in the second year, the first dragline would begin working. Later in the second year, the main overland conveyor would commence operation. This would eliminate the need to haul coal by truck to the port site. Production would increase in the third year to approximately 5.4 million Mt (6 million short tons) per year. In the fourth year, full production of 10.9 million Mt (12 million short tons) per year would be reached. In the fifth year, the second dragline would begin operation.

Shipping schedules and frequency would depend upon the size of the ships to be loaded. Table 2-2 shows approximate shipping characteristics for two sizes of ships at full production. At lower production levels not requiring ships, barges would be berthed at the Ladd trestle for up to approximately 200 days per year.

Table 2-2

APPROXIMATE SHIPPING CHARACTERISTICS AT FULL PRODUCTION FOR TWO SIZES OF COAL SHIPS

| Characteristics | 100.000 dwt | 60.000 dwt |
|---|---|---|
| Ship arrivals/yr | 150 | 250 |
| Interval between arrivals (days) | 2.3 | 1.4 |
| Berth loading time (hours) | 25 | 15 |
| Approximate berth occupancy | 52% | 57% |

Source: Diamond Alaska Coal Company

### 2.10.2 Job Skills and Shift Schedules

An estimated total of 848 permanent employees would be employed by the project at full production, with half that total (424) being at the project site at any one time. There would be two 11-hour shifts each day. Thus, half the employees on site (212) would be working and half eating or sleeping at any given time. Employees would work a four-day-on, four-day-off schedule and would be flown back to their homes in Anchorage or on the Kenai Peninsula during their off-work periods. All operations except ship loading would be scheduled for 362 days per year (three-day holiday allowance). Shiploading would be scheduled for 350 days per year to allow 12 days for down time due to weather and ice conditions.

Table 2-3 shows the estimated buildup of new permanent project employees (excluding construction personnel) under the optimal, four-year full production development schedule.

Table 2-3

NEW PERMANENT PROJECT EMPLOYEES
(EXCLUDING CONSTRUCTION PERSONNEL)
UNDER THE OPTIMAL, FOUR-YEAR FULL PRODUCTION
DEVELOPMENT SCHEDULE

| | proiect Year | New Employees |
|---|---|---|
| | 1 | -- |
| | 2 | 98 |
| Construction | 3 | 276 |
| Mining Begins | 4 | 140 |
| | 5 | 96 |
| | 6 | 86 |
| | 7 | 122 |
| | 8 | 30 |
| Total | | 848 |

Source: Diamond Alaska Coal Company

of these 848 employees, approximately 218 would be heavy equipment operators; 125 operators fortrucks, light equipment and other machinery; 289 mechanics, shop hands, electricians, plumbers and other maintenance personnel; 110 miscellaneous personnel including cooks, bakers, house-keepers, dishwashers, and other life support functions; and 106 administrative personnel.

### 2.10.3 Fuel Handling

Because the project would receive, store, and use sizable quantities of diesel fuel, lubricating oils, and other liquids at various facilities, a Spill Prevention, Control and Countermeasure (SPCC) Plan consistent with federal and state fuel handling standards will be prepared for each facility. Copies of that plan will be kept on file at each facility. Each plan will specify the methods which will be used to prevent and control spills which might occur during transportation, unloading, storage, or use of petroleum products. All personnel at each facility will be trained in spill prevention and appropriate personnel will be trained in the execution of the SPCC plan in case of a spill. Each facility will have adequate equipment available to complete

cleanup operations. During construction each contractor will also be instructed in SPCC plan compliance and cleanup methods.

Runoff water from the equipment washdown areas would contain oils, grease, solvents, and other hydrocarbon materials. Traps will be installed to collect these materials before discharge to the pond. In addition, the runoff pond receiving this water will be equipped with a skimming device to separate these materials if the traps fail and route them to storage areas.

Waste oil and other used hydrocarbon materials will be collected, stored, and removed from the project area for recycling or for disposal in approved waste disposal sites. Other hazardous waste materials (e.g., paint, solvents) will be handled and stored separately and shipped from the project area for disposal in approved waste disposal sites.

### 2.10.4 Air Quality Considerations

Burning of slash material from clearing and grubbing operations will occur only under favorable weather conditions and when permitted by DEC. Otherwise, slash will be buried under an adequate depth of spoil in the mine pit.

At all facilities, operations will be conducted to minimize coal dust, fugitive dust, and other emissions which might affect air quality. At the mine service area and the onshore port site, the coal stockpiles will be oriented to minimize contact with the prevailing north-south winds. Usually, no water will be sprayed onto the stockpiles because of the normal water content of the coal and because the coal will be regularly stacked and recovered and will not remain in the stockpile for long periods. If coal does remain in a stockpile for an extended length of time, periodic applications of water or water with a chemical dust retardant will be used. Tests on the self-heating potential of the coal indicated no susceptibility to fire hazard while exposed to the atmosphere.

The coal stacking and recovery units will use water sprays to control dust during those operations. All conveyor systems will be designed to minimize wind effects. Both the mine conveyors and the main overland conveyor will be partially enclosed. The transfer points, including the second crusher in the mine service area, will use negative pressure systems, water sprays and/or other technology to capture as much coal dust as possible. Coal dust collected from the negative pressure systems will be put back onto the coal conveyors. The first crusher, in the mine area, will not have a negative pressure system since it will be open at the top to permit the trucks to dump coal into it.

Once the coal reaches the shiploader, it will be discharged into the barge or ship holds through a fixed downspout. Coal will not be subjected to wind since the downspout will extend into the ship's hold, keeping most of the dust within the hold.

Fugitive dust will be minimized in several ways. Ground disturbance will be kept to a minimum with disturbed areas being revegetated as soon as possible. Exposed areas which will be continuously used, e.g., roads, pads, laydown areas, would be surfaced with aggregate material. When dry or windy conditions occur, these surfaces will be watered to control dust or truck speeds will be reduced to lower fugitive dust emissions. During the early years of operations when coal is hauled to the port site by trucks, road watering and use of a chemical dust suppressant, if required, will keep fugitive dust emissions to a minimum. Trucks will be properly loaded to prevent spillage when turning or braking. Spillage which does occur will be cleaned up to minimize coal fines on the road surface.

### 2.10.5 Environmental Trainina Proaram

An environmental training program designed to promote environmental awareness andhighlight environmental protection and mitigation measures will be developed for contractors and employees. The program will include a description of existing environmental resources, identification of potential environmental impacts related to project operations, and a discussion of environmental protection and mitigation measures with emphasis on employee involvement.

### 2.10.6 Environmental Coordinator

An environmental coordinator will be located in Anchorage during the construction phase. Through onsite monitoring, the coordinator will assure adherence to project stipulations. During the operational phase, the coordinator will continue to ensure that environmental permit stipulations are met, direct the worker environmental training program, investigate human/wildlife contacts (including road collisions), oversee the various environmental mitigation and monitoring programs, and serve as agency contact for project status reports and site inspections. The environmental coordinator will be represented in the field by a full-time, on-site environmental supervisor with a support team made up of personnel from the revegetation and reclamation staff.