

EXPLANATION
This map illustrates potential near-surface sources of various geologic materials that may be useful for construction. Field observations indicate that each geologic unit (for example, stream alluvium) has a definite composition or range of composition wherever that unit is found. Therefore, the presence of materials is interpreted from the distribution of geologic units on the geologic map of this quadrangle. This map is generalized and is not intended to show exact locations of specific materials. The purpose is to indicate general areas that deserve consideration for certain materials and to eliminate other general areas from consideration for these materials. Local variations are common, especially near unit boundaries.

Potential uses of map units are qualitatively summarized in the table below, which shows potential availability of various construction materials in each geologic-materials unit. Precise economic evaluations of specific deposits as sources of construction materials will require detailed examination of each deposit, including areal extent, volume, grain-size variation, thickness of overburden, thermal state of the ground, and depth to water table as well as logistical factors, demand, and land ownership.

DESCRIPTION OF MAP UNITS¹

- BA** WELL-INDURATED SEDIMENTARY ROCK—Conglomerate, sandstone, siltstone, and shale of Arkose Ridge Formation; thin to massively bedded; close to medium jointed
- BF** FOLIATED METAMORPHIC ROCK—Pelite schist; fine to medium crystalline; close to medium jointed; susceptible to splitting by seasonal frost
- BG** GRANITIC ROCK—Quartz diorite and gabbro intrusives; medium to very coarsely crystalline; generally coarsely jointed
- BS** SERPENTINITE ROCK—Massive antigorite-rich serpentinite intrusive; fine grained; close to coarsely jointed; locally intensely sheared; soapstone pods along margins locally mined for ornamental stone
- BU** UNDIFFERENTIATED METAMORPHIC ROCK—Gneiss and amphibolite of basement complex; fine to medium crystalline; generally medium jointed
- BW** WEAKLY INDURATED SEDIMENTARY ROCK—Carbonaceous sandstone, siltstone, shale, and claystone of Tyonek Formation; thin to medium bedded; close to medium jointed
- GS** GRAVEL AND SAND—Alluvium of floodplains and abandoned meltwater channels, and complex deposits of kames, eskers, and crevasse fills; estimated >80 percent clean sand and gravel, except locally may include estimated 15 to 25 percent fine-grained sediments and rare to numerous boulders; well to poorly sorted; estimated thickness 1 m to >6 m; bedding thickness thin to massive, locally crossbedded; thawed, except in active layer of seasonal freezing; generally unconsolidated, except locally well cemented by iron and manganese oxides deposited by groundwater; permeability excellent to moderate; surface drainage excellent to moderate; depth to water table moderate to deep; surface smooth to irregular
- GM** MIXED COARSE AND FINE MATERIALS—Alluvial-fan deposits, colluvium, glacial drift, and artificial fill, estimated 20 to 80 percent coarse, granular deposits with considerable oversized material; sorting good to poor, except locally well sorted where reworked by meltwater streams; estimated thickness 2 m to >6 m; medium to massive bedded; thawed, except in active layer of seasonal freezing; unconsolidated, but lodgement till commonly semiconsolidated by mass of overlying glacier, enabling molds to remain on face when clasts are removed; very low to moderate permeability; surface drainage moderate to poor; depth to water table moderate to deep; surface smooth to irregular
- SM** FINE MATERIALS—Alluvium of small meandering streams; estimated >80 percent sand, silt, and clay; well to moderately sorted; estimated thickness 1 to 3 m; laminated to medium bedded; thawed, except in active layer of seasonal freezing; locally crossbedded; shallow water table; surface drainage poor to moderate; surface smooth, except for local low scarps
- OR** ORGANIC MATERIALS—Undifferentiated swamp deposits; estimated >50 percent peat, organic sand, or organic silt; sorting good to poor; thickness ranges from <1 m to >6 m; thin to thick bedded; commonly frozen at depths >0.7 m with high ice content; permeability good, except poor where frozen; surface drainage poor; shallow water table; surface smooth to hummocky

EXPLANATION OF MAP SYMBOLS²

- Approximate geologic contact
- Test boring
- Core
- ◇ Test probe
- Test pit
- Water well
- △ Surface exposure
- ▲ Minor section
- 7 Uncertain identification

¹Map units and symbols are described for the Anchorage C-7 NE, C-7 NW, C-8 NE, and C-8 NW quadrangles but may not be present on a given map of the group.

POTENTIAL AVAILABILITY OF VARIOUS GEOLOGIC MATERIALS

Map unit	Composition	Probability of locating sources of — ^a						
		Gravel and sand	Sand	Mixed coarse- and fine-grained material	Clay	Crushed aggregate	Riprap armor rock	Building stone
BA	Well-indurated sedimentary rocks	Nil	Poor	Poor	Poor	Moderate to good	Poor to moderate	Nil
BF	Foliated metamorphic rocks	Nil	Nil	Nil	Nil	Nil	Poor	Nil
BG	Granitic rocks	Nil	Nil	Nil	Nil	Moderate	Moderate	Moderate
BS	Serpentinite rocks	Nil	Nil	Nil	Nil	Moderate	Moderate	Moderate
BU	Undifferentiated metamorphic rocks	Nil	Nil	Nil	Nil	Moderate	Moderate	Poor
BW	Weakly indurated sedimentary rocks	Nil	Poor to moderate	Poor	Poor	Poor	Nil	Nil
GS	Gravel and sand	Good	Good	Poor	Nil	Good	Nil	Nil
GM	Mixed coarse and fine materials	Moderate	Moderate	Good	Poor	Poor	Nil	Nil
SM	Fine materials	Nil	Poor	Nil	Poor to moderate	Nil	Nil	Nil
OR	Organic materials	Nil	Nil	Nil	Moderate	Nil	Nil	Nil

^aThe imprecise terms "good," "moderate," "poor," and "nil" are purposely used to indicate the relative probability of locating good deposits of each construction material in the various map units. No definite values are assigned to each term, but they may indicate a probability of 80 percent or more for "good," 30 to 80 percent for "moderate," less than 30 percent for "poor," and essentially zero chance for "nil."

REFERENCE CITED

R & M Consultants, 1978, Geologic materials and hazards analysis of the proposed new state capital site at Willow, Alaska; Anchorage, Capital Site Planning Commission Source Document 3, 93 p.

SUBSURFACE DATA

The following brief descriptions summarize the sediments and bedrock observed in soil borings, probes, test pits, water wells, and surface exposures in this quadrangle. Each description is keyed by number to location symbols on the geologic-materials map. Known observation dates are shown in brackets for each description and data sources are provided in parentheses. Depth ranges have been converted to metric units from English units in the original references.

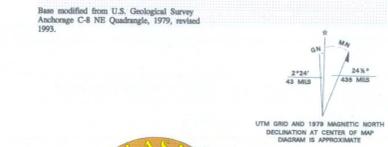
1. 0-0.9 m sandy silt; 0.9-1.4 m sand with trace silt; 1.4-4.8 m silty sand with trace gravel grading to silty sand with some gravel; 4.8-6 m sandy silt with trace gravel; 8.6-11.8 m silt with some sand and gravel. Water table at 3.9 m [10-28-77] (R & M Consultants, 1978, test boring 1).
2. 0-0.5 m organic silt; 0.5-1.1 m sandy silt with trace gravel; 1.1-2.4 m silty sand with some gravel; 2.4-3.6 m sand with some gravel; 3.6-7.5 m silty sand with some gravel, rare cobbles and boulders. Water table at 2.6 m [10-28-77] (R & M Consultants, 1978, test boring 2).
3. 0-1.2 m sand with some silt, trace gravel; 1.2-7.6 m gravelly sand with some silt grading to sandy gravel with some silt; 7.6-11.8 m silty sand with trace gravel. Water table at 7.9 m [10-28-77] (R & M Consultants, 1978, test boring 7).
4. 0-3.5 m organic material; 3.5-10.6 m silty sand with some gravel. Water table at 0 m [10-28-77] (R & M Consultants, 1978, test boring 4).
5. 0-0.5 m organic silt; 0.5-1.7 m sand with trace silt; 1.7-5.5 m sandy gravel with trace silt grading to gravelly sand with some sand, trace silt [10-28-77] (R & M Consultants, 1978, test boring 6).
6. 0-0.2 m organic material; 0.2-1.7 m sandy gravel with some silt; 1.7-3.9 m sand with some silt and gravel; 3.9-10.0 m silty sand with some gravel [10-28-77] (R & M Consultants, 1978, test boring 5).
7. 0-0.9 m organic material; 0.9-1.2 m silt and gravel. Water table at 0.2 m [11-7-78] (R & M Consultants, 1978, test probe 151).
8. 0-0.3 m organic material; 0.3-0.6 m sand; 0.6-0.8 m silty sand; 0.8-1.2 m gravelly sand [11-7-78] (R & M Consultants, 1978, test probe 150).
9. 0-0.3 m organic material; 0.3-0.9 m silt with some gravel, trace sand. Water table at 0.3 m [11-6-78] (R & M Consultants, 1978, test probe 154).
10. 0-0.3 m organic material; 0.3-1.2 m silt with trace sand and gravel [11-7-78] (R & M Consultants, 1978, test probe 153).
11. 0-0.2 m organic material; 0.2-1.2 m sand with trace to some silt and gravel [11-7-78] (R & M Consultants, 1978, test probe 152).
12. 0-0.5 m silty sand, numerous cobbles. Water table at 0.3 m [11-7-78] (R & M Consultants, 1978, test probe 155).
13. 0-0.1 m organic material; 0.1-0.6 m sandy gravel [11-7-78] (R & M Consultants, 1978, test probe 156).
14. 0-0.1 m organic material; 0.1-0.6 m silty silt with trace gravel; 0.6-0.8 m gravelly silt with some sand [11-7-78] (R & M Consultants, 1978, test probe 158).
15. 0-0.1 m organic material; 0.1-0.6 m sandy silt with trace gravel; 0.6-0.8 m gravelly silt with some sand [11-7-78] (R & M Consultants, 1978, test probe 157).
16. 0-0.5 m silt; 0.5-1.1 m sand with some silt, trace gravel [10-7-78] (R & M Consultants, 1978, test probe 85).
17. 0-0.2 m organic material; 0.2-0.8 m sandy gravel with trace to some silt [10-7-78] (R & M Consultants, 1978, test probe 84).
18. 0-1.7 m organic material; 1.7-1.8 m sand. Water table at 0 m [10-7-78] (R & M Consultants, 1978, test probe 83).
19. 0-0.3 m organic material [10-7-78] (R & M Consultants, 1978, minor section 83).
20. 0-1.7 m clayey silt with trace sand and gravel [10-7-78] (R & M Consultants, 1978, test probe 82).
21. 0-0.2 m sandy silt; 0.2-0.8 m sandy gravel [10-7-78] (R & M Consultants, 1978, surface exposure 81).
22. 0-0.2 m organic material; 0.2-1.2 m sandy gravel [10-7-78] (R & M Consultants, 1978, test probe 80).
23. 0-0.1 m organic material; 0.1-0.2 m sandy silt with trace gravel; 0.2-0.8 m mudstone [10-4-78] (R & M Consultants, 1978, test probe 68).
24. 0-0.2 m organic material; 0.2-0.5 m sand with trace gravel; 0.5-1.1 m sand [10-3-78] (R & M Consultants, 1978, test probe 69).
25. 0-0.2 m organic material; 0.2-0.3 m clay (weathered mudstone); 0.3-7.4 m mudstone [10-3-78] (R & M Consultants, 1978, surface exposure 70).
26. 0-0.2 m organic material; 0.2-0.3 m sandy silt; 0.3-0.5 m sandy gravel, numerous cobbles; 0.5-1.1 m sandy gravel and gravelly sand [10-5-78] (R & M Consultants, 1978, surface exposure 71).
27. 0-0.2 m organic material; 0.2-0.6 m sandy silt; 0.6-0.9 m gravel with some sand, numerous cobbles; 0.9-3.0 m covered interval; 3.0-4.4 m mudstone [10-5-78] (R & M Consultants, 1978, surface exposure 76).
28. 0-0.2 m organic material; 0.2-0.5 m sandy gravel with trace silt; 0.5-0.6 m sandy gravel, scattered cobbles; 0.6-0.8 m sand and gravel; 0.8-3.0 m sand with trace gravel, rare boulders [10-4-78] (R & M Consultants, 1978, surface exposure 75).
29. 0-0.1 m organic material; 0.1-0.2 m sandy gravel; 0.2-0.3 m sandy silt with gravel, some clay; 0.3-0.6 m sandy gravel; 0.6-2.6 m conglomerate [10-4-78] (R & M Consultants, 1978, surface exposure 74).
30. 0-3.3 m conglomerate; 3.3-4.2 m sandstone; 4.2-5.5 m conglomerate [10-4-78] (R & M Consultants, 1978, surface exposure 74).
31. 0-0.2 m organic material; 0.2-0.3 m sand with some gravel; 0.3-0.6 m sandy gravel with trace silt; 0.6-0.9 m sand; 0.9-1.1 m silt with trace clay and coal fragments [10-5-78] (R & M Consultants, 1978, test probe 78).
32. 0-0.2 m organic material; 0.2-0.6 m sand with some silt, trace gravel (numerous cobbles at 0.2 m); 0.6-0.9 m sandy gravel with some silt [10-4-78] (R & M Consultants, 1978, test probe 71).
33. 0-0.1 m organic material; 0.1-0.3 m sandy silt; 0.3-0.5 m cobbles; 0.5-0.6 m gravelly sand with trace silt; 0.6-1.2 m sand with trace silt [10-4-78] (R & M Consultants, 1978, test probe 72).

^bBased on field observations, estimated percentages of gravel, sand, silt, and clay are indicated by the terms "some" and "trace." "Some" implies a general composition of 12 to 30 percent and "trace" implies a general composition of 4 to 12 percent. Estimated percentages less than 4 percent were not recorded in the field. Terms used to describe the estimated percentages of cobbles and boulders are "numerous," "scattered," and "rare." "Numerous" implies that drilling through the layer would encounter two cobbles or boulders in an interval of 0.6 m; "scattered" implies that drilling would encounter two cobbles or boulders in an interval of 3 to 4.5 m; and "rare" implies that drilling would encounter two cobbles or boulders in an interval of more than 4.5 m.

This DGGS Report of Investigations is a final report of scientific research. It has received technical review and may be cited as an agency publication.

DERIVATIVE GEOLOGIC-MATERIALS MAP OF THE ANCHORAGE C-8 NE QUADRANGLE, ALASKA

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Based on field investigations in 1980, 1981, 1988, 1993, and 1994 supplemented by interpretation of 1:12,000-, 1:18,000-, and 1:24,000-scale color aerial photographs taken in 1973, 1981, 1982, and 1986 and 1:63,360-scale black-and-white aerial photographs taken in 1964 and 1993. Field assistance provided by Cheri Daniels, Kristi Klein, and Gina Crane. Jim Rooney, R & M Consultants, kindly granted permission to publish these geotechnical data. Reviewed by Jim Clough and Jeff Klein.



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