

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division
Ground Water Branch

DATA ON WELLS AT LADD AIR FORCE BASE, ALASKA

By

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Prepared at the request of the
Alaskan Air Command, U. S. Air Force
Anchorage, Alaska

1961

STATE OF ALASKA
WILLIAM A. EGAN, GOVERNOR
DEPARTMENT OF HEALTH AND WELFARE
PAUL I. WINSOR,
COMMISSIONER

WATER-HYDROLOGICAL DATA SERIES: This is one of a series of hydrologic-
data reports prepared by the Alaska Department of Health and Welfare
from unpublished reports released by the United States Geological
Survey. The basic data included in this series of reports consists
of well and spring records, logs of wells and test holes, and chemical
analyses of water samples collected from wells and springs. Pending
formal publication in Geological Survey reports, much use can be made
of the basic data by the public, water well contractors, and consultants
in planning ground-water supplies.

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DATA ON WELLS AT LADD AIR FORCE BASE, ALASKA, 1960

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ABSTRACT

Ladd Air Force Base, in central Alaska, obtains its water supply from wells. A tabulation of 104 wells gives available data on depth, diameter, yield, and depth of permafrost encountered. Also given are 23 well logs and 21 chemical analyses of well waters and treated waters from Ladd Air Force Base.

INTRODUCTION

This report is part of a study made by the U. S. Geological Survey, at the request of the Alaskan Air Command (U. S. Air Force), for the purpose of furnishing technical advice on developing, improving, and maintaining water-supply facilities at Air Force installations in Alaska. This report represents the compilation of the basic data available pertaining to the water resources at Ladd Air Force Base, Alaska, and supplements an appraisal report that has been prepared for the Air Force. Location of the Ladd Air Force Base area is shown on figure 1.

A compilation of records of 104 wells drilled on Ladd Air Force Base are presented in table 1. A total of 23 well logs are given in table 2, and 21 chemical analyses of well waters and treated waters are given in table 3. The base map of Ladd Air Force Base was prepared by the Alaskan Air Command (U. S. Air Force).

Explanation of data for the wells described in table 1 is given on page 4. Discrepancies in data collected from several sources are listed in the remarks column.

Logs of wells given in table 2 have been placed in order of the present building number. Also given are the old building number (where such a building existed) and the old base well number.

Well waters in the Ladd Air Force Base area generally contain moderate to large amounts of iron. The iron is removed by treating the water with various chemicals. Table 3 lists 19 analyses of untreated water samples from wells and 2 analyses of treated water, one from each of the two treatment plants on the base.

Data presented here were compiled from information in the files of the Ladd Air Force Base, Civil Engineering Section; the Corps of Engineers; personnel of the Preventative Maintenance Section, Alaskan Air Command; the U. S. Geological Survey; and published reports by Péwe, T. L., 1958, Geology of Fairbanks (D-2) quadrangle, Alaska, U. S. Geological Survey GQ 110; and Cederstrom, D. J., in press, Ground-water resources of the Fairbanks area, Alaska: U. S. Geological Survey Water Supply Paper 1590.

The appraisal report by A. J. Peulner, planned for publication by the Geological Survey, is entitled "Geology and water conditions at Ladd Air Force Base, Alaska".

Table 1:----- Description of wells at Ladd Air Force Base

EXPLANATION AND SYMBOLS

- Building number..... The present building number in or near which the well is located. Where building has been destroyed or where a well is not in a building, wells are designated as N, NE, or E for wells north, northeast, or east of the building location.
- Old building number..... A previously used building-numbering system. Some older maps and reports exist which use this outdated numbering system.
- Old well number..... A previously used well-numbering system, now discontinued. Some wells have no well number assigned.
- Well name..... Brief description of well or building as used by current personnel.
- Depth of well..... Reported depth in feet.
- Diameter of well..... Reported diameter in inches.
- Yield..... Reported production rate in gallons per minute.
- Remarks..... C, chemical quality analysis given in table 3; L, log of well given in table 2; WL, water level in feet and tenths reported below land-surface datum. Permafrost occurrence and thickness given where known. Apparent discrepancies in information derived from more than one source are noted.

Table 1

Description of wells at Ladd Air Force Base, Alaska--Continued

Bldg. Number	Old Bldg. Number	Old base well Number	Well name	Depth of well (feet)	Diameter of well (inches)	Yield (gpm)	Remarks
1561-E	105	8	---	47	18	200	---
1561-W	105	1	---	107	24	---	---
1568	117	6	---	112	24	500	0
1577	120	14	---	56	2	---	---
1597	284	62	Heating plant bldg.	180	4	50	L--WL 13.0--Permafrost 4-9 and 19-24 feet
1806	246	53	---	127	4	10	WL 13.5
1808	214	9	---	170	4	5	---
1813	212	38	---	114	4	---	WL 13.6
2001	984	25	---	101	5	50	WL 9.0
2015	984	26	---	71	5	50	WL 10.0
2018	982	51	---	87	4	50	WL 7.0
2030	915	24	---	110	5	50	L--WL 11.5--Permafrost 0-10 feet
2033	919	30	---	76	5	50	WL 7.3
2042	972	49	---	47	4	50	L--WL 10.5
W2045	---	44	---	47	4	50	WL 9.3
W2052	939	42	---	62	4	50	WL 11.3
2053	---	---	Standby well	---	---	500?	---
2061	988	72	---	79	4	5	WL 12.0
22062	---	46	---	56	4	60	WL 10.1
2064	977	75	---	74	4	5	L--WL 11.3--Permafrost 0-45 feet
2071	952	43	---	76	4	50	L--WL 10.3
2084	984	67	---	75	8	500	L--WL 7.0--Permafrost 16-39 feet
2085	943	---	---	44	6	240	Permafrost 0-31 feet
W2085	---	47	---	84	4	50	WL 8.3
2089-N	902	65	---	106	4	5	L--WL 8.3--Permafrost 11-13 feet
2089-S	902	---	---	55	6	220	---

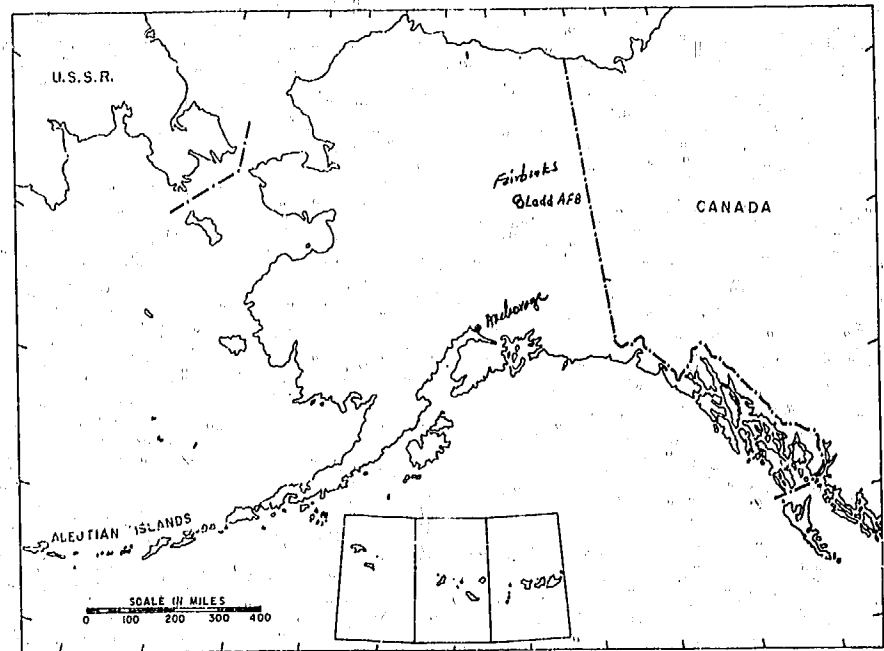


Figure 1. Sketch map of Alaska showing location of Ladd Air Force Base

Table 1

Description of wells at Ladd Air Force Base, Alaska--Continued

Bldg. Number	Old Bldg. Number	Old base well Number	Well name	Depth of well (feet)	Diameter of well (inches)	Yield (gpm)	Remarks
2096	920	80	NGO Club	---	4	---	0
3002-W	381	48	Hanger heating bldg.	82	4	50	G--WL 8.6
3002-E	381	81	" " "	---	8	50	---
3003	384	71	Fire well, south system	160	8	500	L--WL 10.8--Permafrost 17-59 feet
E3003	---	---	Obs. well U.S.G.S.	148	4	---	L--Permafrost 24-40 feet
W3014	350	---	---	30	7	780	Large dug well
3020	380	33	---	63	4	5	WL 8.5
3024	351	15	---	30	2	5	---
3026	357	52	---	88	4	50	WL 6.6
3029	354	23	---	110	4	5	WL 12.0
3031	355	22	---	106	4	50	L--WL 7.0--Permafrost 13-35, 45-47, and 65-73 feet
3042	388	7	---	66	4	50	0
3081	394	40	---	157	4	50	WL 10.0
3090	380	41	---	97	4	---	WL 9.3
3111	305	---	---	100	6	120	0
3113	306	2	---	97	4	10	WL 11.5
3137	374	39	---	149	4	10	L--WL 9.0--Permafrost 20-96 feet
3193-W	427	56	Civilian bakery	92	4	50	WL 11.0
3193-N	437	29	Civilian mess bldg.	126	4	50	L--WL 8.5--Permafrost 1-16 and 35-37 feet
3221	214A	38	---	83	4	50	WL 10.6
W3225	216A	37	---	99	4	50	L--WL 14.0
3542	337	21	---	118	4	---	WL 7.5
3508	244	03	HNO plant	99	8	300	WL 12.7
W3504	---	31	---	84	4	6	L--WL 7.7--Permafrost 2-23 feet
3806	356	34	---	67	4	50	L--WL 6.0

Table 1

Description of wells at Ladd Air Force Base, Alaska

Bldg. Number	Old Bldg. Number	Old base well Number	Well name	Depth of well (feet)	Diameter of well (inches)	Yield (gpm)	Remarks
1011	142	957	Supply for north water plant	1057	24	780	Rept. with 12" casing
E1023	---	60	---	115	4	10	---
SE1023	---	57	---	160	4	50	WL 14.0
31024	138A	68	---	155	4	50	L--WL 10.5--Permafrost 8-47 feet
1024	116	4	Management school	45	4	5	0
1032	156	94	Supply for north water plant	56	12	750	Rept. depth probably length of pump column--0
1036	164	---	---	40	2	---	0
1044	137A	73	---	79	4	50	WL 13.6
1080	205	3	---	87	4	---	---
1083	223	13	---	104	2	6	---
1087	281	63	---	78	8	---	L--WL 10.1
E1107	285	---	---	172	---	160	Permafrost 0-52 feet
E1107	282	---	---	88	6	230	Permafrost 10-52 feet
W1115	271	28	---	57	4	6	WL 6.0 feet
1115	242?	---	Gold storage bldg.	47	4	6	0
1125	276	38	---	42	4	---	WL 13.0
1132	238	10	---	41	4	5	---
1135	237	59	---	45	4	50	L--WL 8.4--Permafrost? 3-7 feet
1147	702	79	---	48	4	0	WL 11.0
1148	703	5	---	43	2	5	---
1149	704	12	---	38	2	---	0 also rept. 30 feet deep.
1168	---	---	POL fuel dump	---	---	---	0
1173	---	---	Army POL fuel dump	---	---	---	0
1213	102A	90	Mess hall bldg.	110	6	50	0
1236	140A	74	---	315	4	---	L--Permafrost 0-26 feet
E1244	---	78	---	73	4	---	WL 13.0--Permafrost 0-47 feet
1545	141A	69	Individual well	56	4	50	WL 11.3

Table 1
Description of wells at Ladd Air Force Base, Alaska--Continued

Rdg. Number	Old Bldg. Number	Old base well Number	Well name	Depth of well (feet)	Diameter of well (inches)	Yield (gpm)	Remarks
3595	---	---	Fire standby well	67	6	2507	WL 13
3627	425A	60	---	98	4	50	WL 13.5
3650	349	58	Power plant annex well	167	4	50	L--WL 13.0--Permafrost 14-26 feet
33686	---	---	Standby well Army area	204	18	1,300	C
3698	---	---	NGO Club annex	110	12	7507	L--WL 12.0--Permafrost 6-21, 23, 26 and 37-51 feet
3760	429	18	E. M. Mess	95	4	50	C
4001	---	---	---	---	---	---	---
4005	612	92	---	118	24	---	---
4021	646	---	Standby well, south system	118	12	7507	WL 17
4023	---	---	---	127	12	---	C--I--Permafrost 5-21 feet
4024	606	84	Main gate	130	6	---	---
4031	---	---	---	326	2	---	---
4035	627	87	E. M. Mess Hall	40	2	---	---
4038	516	88	---	40	2	---	---
4044	503	16	---	32	6	30	WL 9.0--Yield also reported 50 gpm.
4046	435	17	---	106	4	5	L--WL 11--Permafrost 44-50 feet--Yield also reported 50 gpm.
4049	470A	82	---	75	6	50	WL 13
4055	---	20	Old NCO club	86	4	50	WL 12
W4064	610	27	---	165	4	5	WL 9.5
SR4064	609	82	Supply for south water plant	95	2	---	---
N4070	427	85	Salvage yard	95	4	750	C
4074	---	---	---	118	8	---	---
4227	603Z	19	---	178	4	50	C--WL 10.0--Permafrost 67-153 feet
5001	1001	---	---	176	8	---	---
5027	1038	70	---	---	---	---	WL 7.5
5036	1032	86	---	---	---	---	---

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 1536, old bldg. 140A, old well 74		
Frozen		
Muck.....	5	5
Sand, gravel.....	31	36
Thawed		
Sand, gravel.....	58	89
Sand.....	65	154
Sand, gravel.....	2	156
Sand, gravel (10%).....	10	166
Sand, medium gravel (10%).....	2	168
Sand.....	1	169
Sand, medium gravel.....	8	177
Sand (95%), fine-medium gravel.....	8	185
Sand.....	6	191
Sand, muck.....	4	195
Sand.....	5	200
Sand, muck.....	10	210
Sand.....	8	218
Sand, some fine gravel.....	3	221
Sand, muck.....	7	228

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well south of bldg. 1087, old bldg. 281, old well 63		
Thawed		
Gravel.....	2	2
Sand.....	8	10
Gravel.....	11	21
Sand, gravel.....	19	40
Sand.....	8	48
Sand, medium gravel.....	2	50
Sand, coarse-medium gravel.....	1	51
Sand, gravel.....	12	63
Sand, coarse gravel.....	9"	72
Gravel, some clay.....	1	73
Sand.....	2	75
Clean sand, coarse-medium gravel.....	3	78

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 1133, old bldg. 237, old well 59		
Thawed		
Gravel.....	3	3
Frozen		
Sand.....	4	7
Thawed		
Sand.....	9	16
Sand, fine gravel.....	4	20
Sand, some gravel.....	4	24
Sand.....	11	35
Sand, fine gravel.....	2	37
Fine-medium gravel.....	2	39
Sand, medium gravel.....	2	41
Fine-medium gravel.....	4	45

Table 2.--Logs of wells at Ladd Air Force Base, Alaska

Material	Thickness (feet)	Depth (feet)
Well south of bldg. 1024, old bldg. 138A, old well 68		
Thawed		
Gravel, fill	4	4
Sand.....	4	8
Frozen		
Sand.....	2	10
Sand and fine gravel.....	1	11
Medium gravel.....	24	35
Sand, medium gravel.....	13	47
Thawed		
Sand.....	13	60
Sand, medium gravel.....	8	68
Medium-coarse gravel.....	3	71
Sand.....	5	76
Sand, pea gravel.....	4	80
Sand, fine gravel.....	4	84
Sand, muck.....	4	88
Sand.....	2	90
Sand, muck.....	5	95
Sand, pea gravel.....	2	97

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well south of bldg. 1024, old bldg. 138A, old well 68--Continued		
Thawed--Continued		
Sand.....	7	104
Sand, medium gravel.....	5	109
Sand, fine gravel.....	1	110
Sand, gravel.....	3	113
Sand.....	2	115
Sand, fine-coarse gravel.....	2	117
Sand, coarse-medium gravel.....	1	118
Medium gravel, sand.....	3	121
Sand.....	18	139
Sand (80%), coarse-medium gravel (40%).....	3	142
Sand.....	1	143
Sand, pea gravel.....	1	144
Sand, coarse gravel.....	1	145
Sand.....	2	147
Sand, pea gravel.....	2	149
Sand, medium-coarse gravel.....	4	153
Medium-coarse gravel.....	1	154
Medium-coarse gravel, some sand.....	1	155

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 1536, old bldg. 140A, old well 74--Continued		
Sand, some medium gravel.....	6	234
Sand, muck.....	5	239
Sand, muck, some fine gravel.....	3	242
Sand, muck.....	4	246
Sand, some medium gravel.....	1	247
Sand, muck.....	10	257
Muck, some sand.....	17	274
Muck, sand.....	9	283
Sand, some muck and gravel.....	5	288
Sand, muck.....	5	293
Sand, some fine gravel.....	1	294
Sand, muck.....	18	312
Muck.....	3	315

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 1597, old bldg. 264, old well 62--Continued		
Thawed--Continued		
Sand.....	16	106
Sand, medium-coarse gravel.....	2	108
Clean pea gravel.....	6	114
Sand, fine gravel.....	3	117
Sand.....	36	153
Sand, medium-coarse gravel.....	1	154
Sand.....	1	155
Sand, medium-coarse gravel.....	2	157
Medium gravel.....	2	159
Sand, fine gravel.....	1	160
Sand.....	7	167
Sand, coarse gravel.....	3	170
Sand, fine-coarse gravel.....	1	171
Sand, coarse gravel.....	1	172
Sand.....	4	176
Pea gravel, sand.....	4	180

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 1597, old bldg. 264, old well 62		
Thawed		
Sand.....	4	4
Frozen		
Sand, gravel.....	5	9
Thawed		
Sand, gravel.....	10	19
Frozen		
Sand, gravel.....	5	24
Thawed		
Sand.....	9	33
Sand, fine gravel.....	3	36
Sand.....	7	43
Sand, some gravel.....	4	47
Sand, medium-fine gravel.....	2	49
Sand, medium gravel.....	5	54
Sand.....	26	80
Sand, medium-fine gravel.....	3	83
Sand, medium gravel.....	3	86
Sand, fine gravel.....	1	87
Clean pea gravel.....	3	90

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2030, old bldg. 915, old well 24		
Frozen		
Muck.....	3	3
Gravel.....	5	8
Sand, some gravel.....	2	10
Thawed		
Sand, some gravel.....	2	12
Sand, fine gravel.....	7	19
Sand, some gravel.....	6	25
Gravel, some sand.....	5	30
Sand, muck.....	2	32
Sand, medium gravel.....	4	36
Sand, some gravel.....	5	41
Sand, medium gravel.....	17	56
Sand, fine gravel.....	4	62
Sand, some gravel.....	6	68
Sand, medium gravel.....	11	79
Sand.....	4	83
Sand, gravel.....	4	87
Sand.....	5	92

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2030, old bldg. 915, old well 24--Continued		
Thawed--Continued		
Sand, some gravel.....	2	94
Sand, medium gravel.....	4	98
Fine gravel, some sand.....	4	102
Sand, some gravel.....	2	104
Gravel.....	6	110

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2064, old bldg. 977, old well 75--Continued		
Thawed--Continued		
Sand, medium gravel.....	10	66
Some sand, medium gravel.....	2	68
Some sand, medium and coarse gravel.....	3	71
Sand, some fine gravel.....	2	73
Some sand, medium and coarse gravel.....	1	74

Well in bldg. 2071, old bldg. 952, old well 43

Thawed		
Sand, gravel.....	58	58
Sand.....	8	66
Sand, gravel.....	5	71
Sand, coarse gravel.....	1	72
Sand, medium-coarse gravel.....	1	73
Sand, fine gravel.....	1	74
Fine gravel.....	1	75
Sand, coarse gravel.....	1	76

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2042, old bldg. 972, old well 49		
Thawed		
Sand, gravel.....	38	38
Sand.....	2	40
Sand, gravel.....	4	44
Gravel.....	3	47

Well in bldg. 2064, old bldg. 977, old well 75

Frozen		
Gravel fill.....	4	4
Sand, muck.....	6	10
Sand, fine gravel.....	17	27
Sand, medium gravel.....	2	29
Sand, fine gravel.....	16	45
Thawed		
Sand.....	1	46
Sand, some fine gravel.....	5	51
Sand.....	5	56

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2084, old bldg. 984, old well 67		
Thawed		
Sand, gravel fill.....	9	9
Sand.....	7	16
Frozen		
Sand.....	7	23
Sand, pea gravel.....	1	24
Sand, gravel.....	15	39
Thawed		
Sand, gravel.....	11	50
Sand, coarse gravel.....	9	59
Sand, gravel.....	2	61
Sand, coarse gravel.....	4	65
Sand, pea gravel.....	5	70
Sand, coarse gravel.....	5	75

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2089, old bldg. 902, old well 65		
Thawed		
Gravel fill.....	2	2
Muck, moss.....	1	3
Sand, gravel.....	8	11
Frozen		
Sand, gravel.....	2	13
Thawed		
Sand.....	1	14
Sand, medium gravel.....	8	22
Sand, fine gravel.....	4	26
Sand, muck, some fine gravel.....	7	33
Sand, large gravel.....	7	40
Sand, fine gravel.....	13	53
Fine gravel.....	1	54
Sand, fine gravel.....	3	57
Sand, fine and some medium gravel.....	2	59
Sand, some coarse gravel.....	4	63
Sand, some fine and medium gravel.....	2	65
Sand, fine gravel.....	12	77

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 3003, old bldg. 384, old well 71--Continued		
Frozen--Continued		
Gravel.....	7	46
Sand.....	5	51
Sand, fine gravel.....	4	55
Sand, gravel.....	4	59
(---)?		
Sand, gravel.....	2	61
Thawed		
Sand, gravel.....	6	67
Sand.....	2	69
Sand, fine gravel.....	4	73
Sand, pea gravel.....	6	79
Sand, fine gravel.....	16	95
Sand.....	2	97
Sand, fine gravel.....	20	117
Sand, some coarse gravel.....	4	121
Sand.....	16	137
Sand, fine gravel.....	2	139
Sand, medium gravel.....	4	143
Sand, coarse gravel.....	5	148
Sand, medium gravel.....	9	157
Sand, coarse gravel.....	3	160

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 2089, old bldg. 902, old well 65 --Continued		
Thawed--Continued		
Sand, medium and coarse gravel.....	5	82
Sand.....	9	91
Sand, some pea gravel.....	4	95
Sand, some fine gravel.....	3	98
Sand, coarse gravel.....	2	100
Medium and coarse gravel.....	2	102
Pea gravel, clean.....	3	105
Pea, medium, and coarse gravel.....	1	106

Well in bldg. 3003, old bldg. 384, old well 71

(Not given).....	15	15
Thawed		
Sand, medium gravel.....	2	17
Frozen		
Sand, medium-coarse gravel.....	10	27
Sand.....	7	34
Sand, medium gravel.....	5	39

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well near bldg. 3003, near old bldg. 384		
Thawed		
Muck, sand.....	7	7
Gravel, some sand.....	5	12
Sand, gravel.....	10	22
Sand.....	2	24
Frozen		
Sand.....	3	27
Gravel.....	5	32
Coarse gravel.....	5	37
Gravel.....	3	40
Partially thawed		
Gravel.....	2	42
Thawed		
Sand.....	5	47
Sand, fine gravel.....	6	52
Gravel.....	21	73
Coarse gravel.....	5	78
Gravel, sand.....	19	97
Gravel.....	10	107

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well near bldg. 3003, near old bldg. 384--Continued		
Thawed--Continued		
Gravel, sand.....	9	116
Gravel.....	8	124
Sand.....	1	125
Gravel.....	8	133
Sand, gravel.....	2	135
Sand.....	9	144
Sand, gravel.....	3	147
Gravel.....	1	148

Well in bldg. 3031, old bldg. 356, old well 22

Thawed		
Sand, fine gravel.....	13	13
Frozen		
Sand, some fine gravel.....	22	35
Thawed		
Sand, some fine gravel.....	8	43
Frozen		
Sand, some fine gravel.....	4	47

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Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 3137, old bldg. 374, old well 39		
Thawed		
Muck, sand.....	14	14
Sand, some gravel.....	6	20
Frozen		
Sand, fine gravel.....	9	29
Sand, gravel.....	19	48
Sand, fine gravel.....	7	55
Sand, gravel.....	22	77
Sand, fine gravel.....	11	88
Sand, gravel.....	8	96
Thawed		
Sand.....	4	100
Sand, gravel.....	4	104
Medium gravel.....	1	105
Medium gravel, some sand.....	12	117
Sand.....	12	129
Fine gravel.....	2	131
Sand, gravel.....	2	133
Sand, some fine gravel.....	6	139
Sand.....	2	141
Sand, gravel.....	6	147
Coarse gravel.....	2	149

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Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 3031, old bldg. 356, old well 22--Continued		
Thawed		
Clay, sand, muck.....	6	53
Sand, some fine gravel.....	11	64
Sand, muck.....	1	65
Frozen		
Sand, muck.....	8	73
Thawed		
Sand.....	16	83
Sand, coarse gravel.....	3	86
Sand, medium gravel.....	1	87
Sand, fine gravel.....	7	94
Sand, medium gravel.....	12	106

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Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 3193, old bldg. 437, old well 29		
Thawed		
Muck.....	1	1
Frozen		
Muck.....	2	3
Sand.....	12	15
Thawed		
Sand.....	14	29
Sand, some gravel.....	6	35
Frozen		
Sand, gravel.....	2	37
Thawed		
Sand, gravel.....	8	42
Sand, some fine gravel.....	7	49
Sand, some gravel.....	21	70
Sand, fine gravel.....	9	79
Sand, some coarse gravel.....	5	84
Sand.....	11	95
Sand, some gravel.....	7	102
Sand.....	7	109

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Table A.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 3153, old bldg. 437, old well 29--Continued		
Thawed--Continued		
Medium-coarse gravel.....	3	112
Sand, some coarse gravel.....	8	117
Sand.....	4	121
Sand, medium gravel.....	4	125
Medium-coarse gravel.....	1	126

Well west of bldg. 3225, old bldg. 316A, old well 37

Thawed		
Sand.....	36	36
Sand, some gravel.....	5	41
Sand.....	12	53
Sand, fine gravel.....	4	57
Sand.....	9	66
Sand, medium gravel.....	5	71
Sand, coarse gravel.....	3	74
Sand, some coarse gravel.....	2	76
Sand, some gravel.....	5	81

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Table B.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well northwest of bldg. 3584, old well 31--Continued		
Thawed--Continued		
Medium gravel.....	2	67
Sand, coarse gravel.....	2	69
Sand, some medium gravel.....	4	73
Sand, fine gravel.....	4	77
Sand.....	4	81
Coarse gravel.....	3	84

Well in bldg. 3586, old bldg. 166, old well 34

Thawed		
Medium gravel.....	7	7
Sand.....	29	36
Sand, medium gravel.....	9	47
Sand.....	4	51
Sand, some gravel.....	1	52
Sand, medium gravel.....	5	57
Sand, some gravel.....	5	62
Sand, fine gravel.....	5	67

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Table B.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well west of bldg. 3225, old bldg. 316A, old well 27--Continued		
Thawed--Continued		
Sand, fine gravel.....	9	90
Sand.....	2	92
Sand, coarse gravel.....	2	94
Sand, some gravel.....	1	95
Gravel.....	2	97
Sand, gravel.....	2	99

Well northwest of bldg. 3584, old well 31

Thawed		
Muck.....	2	2
Frozen		
Gravel.....	7	9
Sand, gravel.....	14	23
Thawed		
Sand, medium gravel.....	4	27
Sand, fine gravel.....	19	46
Sand, some gravel.....	6	52
Sand.....	4	56
Sand, some coarse gravel.....	9	65

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Table B.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well south of bldg. 3666 (test well at new power plant--unused)		
Thawed		
Fill.....	5	5
Sand, gravel.....	9	14
Frozen		
Sand, gravel.....	1	15
Gravel.....	47	62
Gravel, wood fragments.....	10	72
Gravel.....	10	82
Thawed		
Gravel.....	36	118
Sand, coal fragments.....	2	120
Sand.....	9	129
Gravel, sand, silty.....	58	183
Gravel, sandy.....	21	204

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Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 4001, old bldg. 429, old well 18		
Thawed		
Muck.....	6	6
Frozen		
Muck.....	5	11
Sand, gravel.....	10	21
Thawed		
Sand, fine gravel.....	2	23
Frozen		
Sand, gravel.....	5	28
Thawed		
Sand, fine gravel.....	6	34
Sand.....	3	37
Frozen		
Sand, muck.....	7	44
Sand, gravel.....	7	51
Thawed		
Sand, muck, fine gravel.....	6	57
Sand, fine gravel.....	11	68

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 4031, old well 91--Continued		
Thawed--Continued		
Sand, fine gravel.....	20	135
Sand, medium gravel.....	4	139
Sand, fine.....	4	143
Sand, coarse, medium gravel.....	34	177
Sand, fine.....	11	188
Sand, fine to coarse, medium gravel.....	2	190
Sand, fine to silty.....	31	221
Clay, blue, fine sand.....	19	240
Sand, fine to coarse, gravel.....	18	258
Sand, fine, clay.....	3	261
Sand, fine to silty.....	61	312
Sand, coarse to fine.....	9	317
Sand, coarse, medium to coarse gravel.....	4	321
Sand, fine to coarse, coarse gravel.....	5	326

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 4001, old bldg. 429, old well 18--Continued		
Thawed--Continued		
Sand, muck, fine gravel.....	3	71
Sand, fine gravel.....	10	86
Coarse sand-gravel.....	2	88
Medium sand, fine gravel.....	2	90
Coarse sand-gravel.....	5	95
Well in bldg. 4031, old well 91		
Thawed		
Muck and fine silt.....	5	5
Frozen		
Silt, fine.....	16	21
Thawed		
Sand, coarse.....	22	43
Clay, hard, sandy.....	24	67
Sand, gray.....	8	75
Pea gravel.....	2	77
Sand, small gravel.....	30	107

Table 2.--Logs of wells at Ladd Air Force Base, Alaska--Continued

Material	Thickness (feet)	Depth (feet)
Well in bldg. 4046, old bldg. 435, old well 77		
Thawed		
Gravel.....	5	5
Muck, sand.....	19	24
Sand.....	4	28
Sand, muck.....	4	32
Sand.....	3	35
Fine sand, some gravel.....	9	44
Frozen		
Sand, fine gravel.....	6	50
Thawed		
Fine sand.....	6	56
Sand, muck, fine gravel.....	4	59
Sand, fine gravel.....	9	65
Sand, medium gravel.....	3	71
Sand.....	33	94
Sand, fine gravel.....	10	104
Fine sand, some medium gravel.....	2	106

Analyses by Geological Survey, United States Department of the Interior
(parts per million)

9-268 q

Laboratory Number	6004	6006	6003	6010	6009
Date of collection.....	7/1/60	6/28/60	7/1/60	6/28/60	7/1/60
Silica (SiO ₂).....	22	23	20	36	36
Iron (Fe).....	8.4	10.10	0.26	2.4	0.11
Manganese (Mn).....	0.21	0.05	0.01	0.26	0.01
Calcium (Ca).....	58	51	32	40	26
Magnesium (Mg).....	12	11	9.5	10	10
Sodium (Na).....	5.4	5.1	5.4	5.8	6.3
Potassium (K).....	3.5	3.3	3.3	3.8	3.7
Bicarbonate (HCO ₃).....	234	196	123	167	107
Carbonate (CO ₃).....			5		
Sulfate (SO ₄).....	18	17	18	20	23
Chloride (Cl).....	3.0	5.0	4.0	3.5	8.0
Fluoride (F).....	0.2	0.2	0.9	0.3	1.2
Nitrate (NO ₃).....	0.3	0.1	0.3	0.1	0.3
Carbon Dioxide (CO ₂).....	19	25	0	13	2
Dissolved solids					
Calculated.....	238	212	158	204	168
Residue on evaporation at 180 °C.					
Hardness as CaCO ₃	195	172	119	142	106
Noncarbonate hardness as CaCO ₃ ...	3	12	10	5	18
Alkalinity as CaCO ₃	192	161	109	137	88
Specific conductance (micromhos at 25 °C).....	378	350	242	290	236
pH.....	7.3	7.1	8.7	7.3	8.0
Color.....	0	0	0	0	0

- 6004 - Ladd Field, Fairbanks, Alaska, well in bldg. 1011, supplies old water plant
- 6006 - Ladd Field, Fairbanks, Alaska, well in bldg. 1032, supplies old water plant
- 6003 - Ladd Field, Fairbanks, Alaska, treated water from old water plant
- 6010 - Ladd Field, Fairbanks, Alaska, well in bldg. 4074, supplies new water plant
- 6009 - Ladd Field, Fairbanks, Alaska, treated water from new water plant

Table 3: Chemical analyses of water from wells at Ladd Air Force Base, Alaska

Analyses by Geological Survey, United States Department of the Interior
 9-268 q (parts per million) 16828

Laboratory Number	5996	5992	5993	5998	5997
Date of collection.....	6/27/60	6/22/60	6/22/60	6/27/60	6/27/60
Silica (SiO ₂).....	23	30	20	24	19
Iron (Fe).....	12	2.5	6.3	0.87	17
Manganese (Mn).....	2.1	0.62	1.0	0.60	0.82
Calcium (Ca).....	77	48	47	46	59
Magnesium (Mg).....	28	13	15	16	53
Sodium (Na).....	14	5.5	7.2	5.7	11
Potassium (K).....	6.7	3.2	3.5	3.1	3.4
Bicarbonate (HCO ₃).....	372	197	209	206	468
Carbonate (CO ₃).....					
Sulfate (SO ₄).....	36	18	22	15	3.0
Chloride (Cl).....	8.0	3.5	10	5.0	10
Fluoride (F).....	0.2	0.2	0.2	0.2	0.5
Nitrate (NO ₃).....	0.1	0.1	0.0	0.1	0.2
Carbon Dioxide (CO ₂).....	30	6	10	10	19
Dissolved solids					
Calculated.....	390	222	235	218	407
Residue on evaporation at 180°C					
Hardness as CaCO ₃	314	176	182	183	368
Noncarbonate hardness as CaCO ₃ ..	10	14	11	14	0
Alkalinity as CaCO ₃	305	162	171	169	384
Specific conductance (micromhos at 25°C).....	595	331	358	329	658
pH.....	7.3	7.7	7.5	7.5	7.6
Color.....	5	40	5	10	40

- 5996 - Ladd Field, Fairbanks, Alaska, well in bldg. 1024
- 5992 - Ladd Field, Fairbanks, Alaska, well in bldg. 1115
- 5993 - Ladd Field, Fairbanks, Alaska, well in bldg. 1149
- 5998 - Ladd Field, Fairbanks, Alaska, well in bldg. 1168
- 5997 - Ladd Field, Fairbanks, Alaska, well in bldg. 1173

Table 3. Chemical analyses of water from wells at Ladd Air Force Base, Alaska--
Continued

Analyses by Geological Survey, United States Department of the Interior
 9-268 a (parts per million) 16828

Laboratory Number	5995	6007	6008	5994	6011
Date of collection.....	6/27/60	6/29/60	6/29/60	6/27/60	6/28/60
Silica (SiO ₂)	31	37	33	35	32
Iron (Fe)	5.8	2.7	5.1	7.5	0.60
Manganese (Mn).....	0.82	0.50	0.50	0.37	0.97
Calcium (Ca).....	39	39	36	37	40
Magnesium (Mg).....	13	9.6	8.8	14	11
Sodium (Na).....	5.2	4.0	3.8	5.3	4.3
Potassium (K).....	3.6	3.0	3.0	3.0	3.2
Bicarbonate (HCO ₃).....	184	158	152	172	162
Carbonate (CO ₃).....					
Sulfate (SO ₄).....	13	12	14	16	18
Chloride (Cl).....	3.5	6.0	2.0	5.5	10
Fluoride (F).....	0.4	0.2	0.3	0.4	0.2
Nitrate (NO ₃).....	0.2	0.5	0.2	0.6	0.3
Carbon Dioxide (CO ₂).....	7	10	15	6	13
Dissolved solids					
Calculated.....	206	190	176	210	200
Residue on evaporation at 180°C				181	
Hardness as CaCO ₃).....	154	139	126	152	148
Noncarbonate hardness as CaCO ₃ ..	3	10	2	10	16
Alkalinity as CaCO ₃	151	130	125	141	133
Specific conductance (micromhos at 25°C).....	287	287	262	276	301
pH.....	7.6	7.4	7.2	7.7	7.3
Color.....	10	0	30	100	0

- 5995 - Ladd Field, Fairbanks, Alaska, well in bldg. 2095
- 6007 - Ladd Field, Fairbanks, Alaska, well in bldg. 3760
- 6008 - Ladd Field, Fairbanks, Alaska, well in bldg. 4005
- 5994 - Ladd Field, Fairbanks, Alaska, well in bldg. 4031
- 6011 - Ladd Field, Fairbanks, Alaska, well in bldg. 5001

Table 3. Chemical analyses of water from wells at Ladd Air Force Base, Alaska--
Continued

Analyses by Geological Survey, United States Department of the Interior
(parts per million) 16823

Laboratory Number	740	747	222	750	743	742
Date of collection	4/13/51	4/13/51	8/6/47	4/23/51	4/20/51	4/11/51
Silica (SiO ₂).....	19	28	27	36	30	36
Iron (Fe).....	25.02	2.46	5.23	0.44	2.42	4.04
Manganese (Mn).....	4.0	0.09	0.57	0.13	0.50	0.70
Calcium (Ca).....	68	52	55	40	58	53
Magnesium (Mg).....	12	9.2	12	11	14	13
Sodium (Na) & Potassium (K).....	157	6.8	6.2	4.3	6.1	6.1
Bicarbonate (HCO ₃).....	360	190	216	160	228	217
Carbonate (CO ₃).....						
Sulfate (SO ₄).....	193	11	17	17	22	16
Chloride (Cl).....	44	9.0	3.0	1.5	3.2	4.4
Fluoride (F).....	0.3	0.2	0.3	0.3	0.2	0.2
Nitrate (NO ₃).....	2.1	2.5	0.3	3.5	0.8	0.4
Dissolved solids						
Calculated.....	677	213	238	193	247	238
Residue on evaporation at 180°C						
Hardness as CaCO ₃	219	168	187	145	202	188
Noncarbonate hardness as CaCO ₃ ..	0	12	10	14	15	10
Alkalinity as CaCO ₃						
Specific conductance (micromhos at 25°C).....	985	335	364	284	403	379
pH.....	7.9	7.8	8.0	7.5	7.9	7.8
Color.....						

- 740 - Ladd AFB, Fairbanks, Alaska, well in bldg. 1036
- 747 - Ladd AFB, Fairbanks, Alaska, well in bldg. 1513
- 222 - Ladd AFB, Fairbanks, Alaska, well in bldg. 1568
- 750 - Ladd AFB, Fairbanks, Alaska, well in bldg. 3002
- 743 - Ladd AFB, Fairbanks, Alaska, well in bldg. 3042
- 742 - Ladd AFB, Fairbanks, Alaska, well in bldg. 4233

Table 3. Chemical analyses of water from wells at Ladd Air Force Base, Alaska--
Continued