

FEDERAL RECONSTRUCTION AND DEVELOPMENT PLANNING COMMISSION
FOR ALASKA
SCIENTIFIC AND ENGINEERING
(TASK FORCE NO. 9)

4 June 1964

MEMORANDUM

TO: Chairman, Federal Reconstruction and Development Planning Commission
for Alaska

FROM: Chairman, Scientific and Engineering Task Force

On 17 May 1964, members of the Field Team accompanied by Colonel Harry Tufts of the Commission staff made an inspection of Valdez, Alaska. In addition to discussions with the Mayor and with the Resident Engineer, Corps of Engineers, U. S. Army, the group inspected most of the existing town, the new temporary barge dock, and the proposed site for relocation of Valdez. Reports prepared by the U. S. Geological Survey and the Alaska State Highway Department were also available to the Field Team.

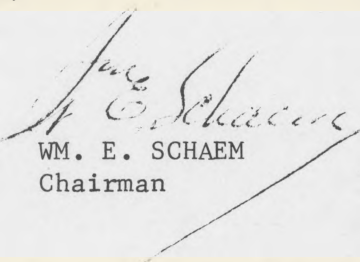
The present condition of nearly all Valdez buildings and facilities, the long history of flood troubles from Valdez Glacier Stream, and the instability of both on and offshore sediments all argue strongly for abandonment of the present town.

The Task Force endorses the announced plan to abandon the present town of Valdez and to rebuild both the town and dock facilities at the "Old Townsite", 4 miles northwest of Valdez, just east of the mouth of Mineral Creek. The Task Force recommends Commission approval of the plan.

This endorsement is based on the facts related in the inclosed memorandum and is subject to the requirement that all design and construction be in strict accordance with the provisions of the Uniform Building Code for Seismic Zone 3.

1 Incl

Memo from C/S&E Field
Team, 3 Jun 64


WM. E. SCHAEM
Chairman

cy Schussler 6/15 (3 rgs)

FEDERAL RECONSTRUCTION AND DEVELOPMENT

PLANNING COMMISSION FOR ALASKA

TASK FORCE 9

3 June 1964

SUBJECT: Comparative Geologic Evaluation of the Present Townsite and the "Old Townsite" at Valdez, Alaska

FROM: E. B. Eckel, Chairman Task Force 9 Field Team

TO: W. E. Schaem, Chairman, Task Force 9

The present townsite is situated at the head of a steep-walled fiord, at tidewater, on a glacial outwash delta immediately west of the confluence of Valdez Glacier Stream and Lowe River. The slope of the delta is southwest from approximately 50 feet at the northeast end of town to sea level at the harbor. New borings to 130 feet show that the delta is composed of saturated, loose to medium dense, silty sand with scattered pebbles and stringers of gravel. During drilling it was necessary to use a thick bentonite mix and drive casing ahead of the bit to prevent sand from flowing into the holes, indicating poor consolidation and low shear strength of the subsoils. The configuration of the bedrock valley and the depth of water in Port Valdez suggest that the thickness of this deltaic section may be as much as 600 feet, however the deepest well, which did not reach bedrock, is only 250 feet. The seaward face of the delta is steep and exposed to wave, current, and tidal action.

The March 27 earthquake triggered a massive submarine slide, involving an estimated 20 million cubic yards of material along the seaward face of the Valdez delta. The slide completely destroyed the harbor facilities and nearshore installations. Waves generated by the slide and subsequent tsunami did additional damage in the downtown area. Stresses generated by the slide and the tremors developed an extensive system of fissures throughout the finegrained, saturated, unconsolidated deposits at the head of the fiord. These fissures, plus the tremors, caused structural damage to most of the buildings in Valdez and destroyed the sewer and water systems. Removal of support from the face of the delta has resulted in seaward movement and depression below high tide level of portions of the shore area.

The present townsite has always been subject to intermittent flooding from Valdez Glacier Stream. At present the channel of this stream is artificially controlled by a levee and the town itself is protected by a dike. An unusual advance of Valdez Glacier or sudden release of water from one or more of the ice-dammed lakes along the flanks of Valdez Glacier could change the present stream regimen sufficiently to by-pass the levee with resulting damage to the highway and town.

3 June 1964

The "Old Townsite"

The "Old Townsite" lies approximately 4 miles northwest of Valdez on the north side of the bay immediately east of the mouth of Mineral Creek. It is situated on an alluvial fan confined on the south side by an almost continuous bedrock boss. The south flank of this bedrock boss is steep with deep water flanking it throughout most of its length. The elevation of the alluvial fan is higher than and the slope of the fan is steeper than the Valdez delta at the present townsite.

Subsurface investigations indicate that the alluvial fan at the "Old Townsite" is composed of coarse, tabular, cobble gravel, with an interlocking bedded structure, which will provide excellent foundation conditions. The ground water table ranges from approximately 20 feet in the upper portions of the fan to approximately 7 feet in the lower portions of the fan. No cracks or fissures comparable to those in the Valdez delta could be found at the "Old Townsite" nor was there any evidence of structural damage to the single dwelling there.

The bedrock configuration at the mouth of Mineral Creek effectively prevents the stream from swinging east into or near the townsite.

In summary the "Old Townsite" provides the following advantages over the present townsite.

1. A bedrock boss providing a resistant buttress retaining and protecting the toe of the alluvial fan from danger of sliding or slumping. This boss also protected the "Old Townsite" from the slide generated waves and tsunami related to the March 27 quake.
2. A stable foundation anchor on the bedrock boss for a major dock facility, with favorable offshore conditions, and a protected locality for a small boat harbor.
3. Judging from the negligible evidence of fissures and cracks, the coarse alluvium of the "Old Townsite" fan appears to be more stable under seismic conditions than the saturated, finegrained material of the Valdez delta.
4. The "Old Townsite" has better natural protection from floods than the present townsite.
5. Drainage, water table conditions and potential water supply from Mineral Creek appear to be favorable at the "Old Townsite".

E. B. Eckel

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