UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

# IRRIGATION WATER SUPPLY FOR THE COAST INDIAN COMMUNITY, RESIGHINI RANCHERIA, KLAMATH, CALIFORNIA

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Open-File Report 80-404

Prepared in cooperation with the
Bureau of Indian Affairs



Menlo Park, California
May 1980

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## ILLUSTRATION



## CONVERSION FACTORS

For readers who may prefer to use metric units (International System of Units) rather than inch-pound units, the conversion factors for the terms used in this report are listed below.

| Inch-pound unit | Multiply by | Metric (SI) unit |
|---|---|---|
| acre | 4047 | square meter |
| acre-foot | 1233 | cubic meter |
| foot | 0.3048 | meter |
| gallon | 0.003785 | cubic meter |
| gallon per minute | 0.06309 | liter per second |
| mile | 1.609 | kilometer |

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a datum plane derived from a general adjustment of the first order level nets of both the United States and Canada, formerly called "mean sea level."

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## ABSTRACT

A required 1,100 gallons of water per minute for irrigating agricultural lands used by the Coast Indian Community on the Resighini Rancheria near Klamath, California, cannot be developed from wells. However, the required quantity of water might be developed from a trench installed in sand and gravel deposits that are hydraulically connected with the Klamath River.

## INTRODUCTION

The Resighini Rancheria, held in trust by the U.S. Government for the Coast Indian Community, is largely on the flood plain south of the Klamath River about 1 mi southeast of Klamath, Calif. The area is on Waukell Flat inside a curve of the Klamath River (fig. 1). An abandoned channel (indicated by the dotted 20-foot contour on map) carved by past floods on the Klamath cuts northwestward across the Rancheria from the southeast corner to the north-central boundary. The base of this channel is slightly above, but virtually at, the low-water river stage.

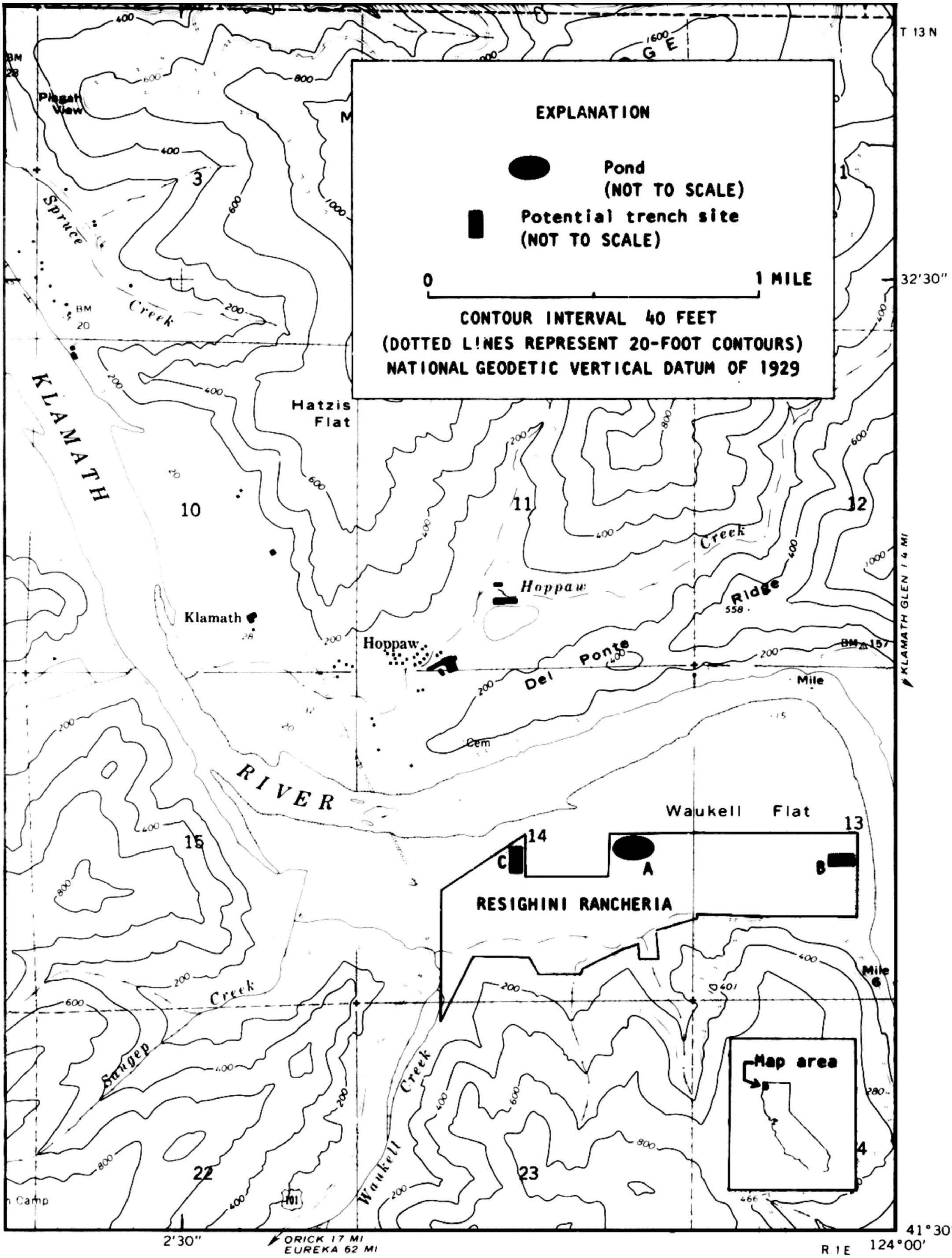
The Rancheria covers about 230 acres of land, none of which is permanently occupied. Permanent residence is precluded by flooding of the river; the most recent large flood, in 1964, destroyed five temporary homes on the Rancheria. At present the area serves as the summer residence for several families who have small vegetable gardens watered from a small stream diversion.

There is no acceptable domestic water supply on the Rancheria. An existing well, just outside the southern boundary, reportedly has the potential to supply 15 gallons per minute, enough water to meet the small domestic needs on the Rancheria at present. The well is not equipped with a pump, and no power supply is available at the site. If the water from this well is potable, a hand pump or engine-driven jack-type pump could be installed for immediate use.

## PURPOSE AND SCOPE OF STUDY

This study was undertaken at the request of the U.S. Bureau of Indian Affairs to provide guidance in obtaining a water supply for proposed irrigation on the Rancheria. The quantity of water needed was not specified by the Bureau. However, assuming that 150 acres will ultimately be irrigated and that 2 feet of water would be applied during four dry summer months, about 300 acre-feet (about 1,100 gallons per minute 12 hours per day for 120 days) of water would be required.

The work was done during a 2-day field visit to the Rancheria; the conclusions are based largely on a brief geological reconnaisance and on oral information on three wells drilled on or near the Rancheria.




Base from U.S. Geological Survey
Requa 1:24,000, 1966

FIGURE 1.--Location of Resighini Rancheria and potential sites for development of water for irrigation.

## HYDROGEOLOGY

The Rancheria, except for a small area of bedrock along the southern boundary, is underlain by a thin veneer of alluvium deposited over a shallow-buried bedrock bench which is at about present river level. Logs of wells indicate that the alluvium ranges from about 10 to 50 feet in thickness. The thicker sections of alluvium are near the mouths of streams emanating from the mountains on the south. The alluvium consists largely of silt and silty sand containing a few lenses of coarse sand and gravel. Other than the one well that is outside the Rancheria boundary, there are no existing wells in the alluvium. Of two older wells, destroyed by floods, one did not yield enough water to warrant development; the other yielded less than 2 gallons per minute. The low yield results from the fact that the saturated thickness of the alluvium is less than 2 feet in most of the area. Water occurs at the base of the alluvium in a thin layer on top of the bedrock bench.

The bedrock on which the buried bench was carved is virtually non-water-bearing. Perhaps in places it could supply enough water for a one-family well. Commonly, water from bedrock in this area contains a high concentration of iron and is hard, but it may be sufficient for drinking water where water of better quality cannot be found.

## POTENTIAL SOURCES OF IRRIGATION WATER

There is virtually no potential for developing a conventional drilled well on the Rancheria that would yield 1,100 gallons per minute for 4 months. However, this quantity might be developed from (1) an existing pond (site A, fig. 1) in the abandoned channel described above (henceforth referred to as the flood channel), (2) an open excavation (sites B and C, fig. 1) adjacent to the river, or (3) a large-diameter dug well adjacent to the river.

## SUGGESTED DEVELOPMENT PRIORITY

It is suggested that potential sources of irrigation water be explored in the priority order as enumerated and discussed below.

Priority 1.--To test the potential of the pond, it is suggested that a sump be dug (by dragline or backhoe) at the south end of the pond and pumped at a rate of 1,100 gallons per minute for 72 hours. Changes in the water level of the pond would be monitored during pumping, and the quantity of water pumped would be measured. Rough estimates of the quantity of water that seeped into the pond during pumping and of the recovery rate after pumping could be made.

The pond is in the bottom of the flood channel, and the source of water probably is seepage from the alluvium. The pond is perennial, which indicates a ground-water source; the water level in the pond represents the water table in the alluvium. This pond may furnish the required quantity of water for irrigation.

Priority 2.--If the pond does not provide the required water, a second approach would be to dig a trench of largest practical size to a depth a few feet below river level and as near to the river as possible. The best location might be at the east end of the Rancheria (site B, fig. 1) or at the north end of the triangular jog near the center of section 14 (site C, fig. 1). The trench could be dug a few yards from the river to receive water through present river-channel deposits. Such a trench would be destroyed by floods on the river but could easily be reconstructed at the beginning of each irrigating season.

Priority 3.--A third alternative would be to construct a large-diameter dug well, at the same sites suggested above for the trench, by excavating into the river-channel deposits with a backhoe, vertically inserting a large-diameter, perforated section of culvert in the excavation, and backfilling around the culvert with gravel. This would be, in effect, a large-diameter well in the channel deposits and would be hydraulically connected to the river.

This system would be more difficult to replace than that suggested in priority 2.

Water could be pumped from any of the systems suggested and distributed by quick-couple aluminum pipe to sprinklers at the irrigation site. A pump, powered by gasoline engine or electricity, could be mounted on a portable platform so that it could be moved, along with the sprinkler system, to safe storage during the flood season.