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OTHER AGENCY

FROM - USAID/Kathmandu

SUBJECT - Non capital Project Paper

6p

REFERENCE -

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Country Nepal Project No. 367-11-120-207
367-31-120-207

Submission Date: June 7, 1968 Original (PFP) October 17, 1967

US Obligation Span FY 1969 through FY 1971

Physical Implementation Span FY 1969 through FY 1972

Gross life-of-project financial requirements

U. S. dollars	$ 576,850
U.S.-owned local currency	$ 253,960 equivalent
Cooperating country cash contribution	$ 350,000 equivalent

Att to SAT 6-17

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DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY:
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The first phase of the project carried out by W. V. Swarzenski and H. M. Babcock, geologists of the U.S.G.S., has produced refinements in all of the proposed requirements for the project without changing the project's nature, scope, or course of action. Accordingly, Sections A, B, C.1., D and E of the PPP remain valid. Refined statements of requirements and costs are set forth in the two geologists' preliminary report, attached hereto.

The principal refinements are a smaller advisory team that relies on the multiple capabilities of U.S.G.S. professional staff, smaller drill rigs more suitable to the terrain and facilities of the project area, identification of the kinds and amounts of equipment that are available for local currency, and fuller specification of the work program in terms of test holes and wells to be drilled and other results to be realized. Accordingly, figures for all aspects of the project should now be taken from the attached report.

The refined figures in the report should satisfy some of the questions raised earlier by AID/W on the PPP, particularly with regard to equipment. On other questions, the following comments are provided.

Question: "Training element seems less than thought out. The level of staff proposed may be too senior to conduct ing training."

Comments: The report proposes as Technical Assistance a staff of 2 Geologists (USGS) for 3 years, 1 Well Drilling Supervisor for 1 year, and 1 Chemist (USGS) for a short tour of duty to set up the quality-of-water lab. On-job training by this staff will be given Nepalese personnel assigned to the project in all aspects of the investigations project. See training proposed page 20 of report. This type training has been highly successful in the surface water project.

Participant training with the USGS is also proposed for 8 employees during the three year program.

Question: "More important we need more discussion on what follows Ground Water Development Project. What are the next steps? How much further does the U.S. need to be involved?"

Comments: The Irrigation Department, HMG has a budget of Rs. 10,000,000 for Minor Irrigation Development for the current fiscal year (Rs. 40,00,000 ICA; Rs. 20,00,000 HMG) Rs. 60,00,000 have been allocated: Rs. 40,00,000 are committed to development of 40 tubewells in the Terai by contract with Indian well drilling firms. Most of the development is planned for the Eastern Terai however.

The planned budget for FY 69 is Rs. 10,000,000. If the current tubewell development is successful and ground-water study projects indicate the feasibility of this activity, it is planned to expand this phase of water development since surface water resources are limited particularly so far as perennial sources are concerned.

Irrigation Department emphasizes that extensive long range ground-water program is impractical until a study and inventory of the potential are completed or at least initiated.

As this study is completed in each area, it will be appropriate for wells to be developed by the private sector, and/or by HMG. Indian drilling companies can be used and there will be no necessity for direct U.S. involvement in the development stage unless desired for other reasons.

Question: "We have additionally some problems with some of equipment for which dollar funding proposed. We believe several of the items substitutable with equipment from India."

Comments:

Notes on Drilling Equipment

Combination rotary and cable-tool rig

A combination rig of the type proposed for the ground-water investigation in the Terai appears to be best suited for the contemplated use in the area. At some of the sites, drilling through boulder zones of the piedmont will be difficult; at other sites, test holes will be drilled to a depth of about 1,500 feet. Moreover, the rig should be capable of installing gravel-packed tube wells to depths of 400 to 600 feet. A rig equal to Failing FWH 30 would fulfill the drilling requirements and yet would be relatively mobile under existing road conditions; it may be mounted on a truck made in India. The use of two identical combination rigs of U.S. manufacture, as proposed in the project plan, would provide the basis for an efficient test drilling program, assuring rapid progress with a relatively limited amount of interchangeable spare parts. No comparable rig is available in India.

From all reports, including the findings of Mr. Remington (US AID, New Delhi), it appears that rotary rigs of Indian manufacture are not adequate to drill the test holes and tube wells proposed in the project. There is doubt that the equipment would perform well at depths exceeding 800 feet.

"Portadrill"

This rig, a straight rotary manufactured by Winter-Weiss Co., Denver, Colo., has drilled a small number of test holes and water wells in Nepal since 1956. It has just completed a test hole to a depth of 310 feet, 10 to 6 inches diameter, in Koilabas. At that site, a narrow valley in the Sivalik Range, drilling conditions were extremely difficult, with boulders present throughout the valley fill. According to the assistant driller, the rig performed well, nearly all of the drilling was by means of a tricone bedrock bit. It is hoped to convert this test hole into a small public-supply well in June, 1968.

In general, the rig seems to be in good condition and does not present special problems of maintenance. It is equipped with about 860 feet of 2 ½ - inch drill pipe and is capable of drilling a 6-inch hole to that depth. Bit sizes range from 6 to 10 inches, both drag bits and bedrock bits are available. New bits have been bought from time to time by Dept. of Irrigation, H.M.G.

The "Portadrill" would be well suited to drill small-diameter exploratory holes in the Terai. As its capacity to drill production wells is rather limited, the transfer of the rig from the Dept. of Irrigation to the Ground-Water Investigation Project would permit test drilling in the Bhairahawa area prior to the arrival of any drilling equipment from the U.S. without handicapping the Department of Irrigation's plans to install production wells.

Reverse Rotary R

This method permits the drilling of large-diameter holes and is preferred in water wells up to a depth of about 450 feet. The drilling of a 22-inch

hole allows for proper gravel packing of the well and assures maximum yield. A rig of Indian manufacture (Pioneer Tube Well Industries, Private, Ltd., Calcutta) has drilled 4 holes and installed 2 tube wells to depth of 360 to 420 feet between May 19 and 30, 1968, in the area of Parvanipur, Kaliya, and Jitpur. The operations of drilling, installing casing, and gravel packing were well coordinated by the Indian contractor. The drilling equipment appeared to be adequate for the job, and, in general, the operations proceeded smoothly and as rapidly as in the U.S. - The aquifer test wells to be installed under the project by contractors should be drilled by the reverse rotary method, and production wells can be drilled by the same kind of rigs.

Tentative Time Schedule

Ground-water Investigation Project

First Year

1. month — Place orders for procurement of 1st year equipment list

3. month — Arrival of senior U.S.G.S. adviser.

4. month — Begin test drilling with "Portadrill" in southern part of Khairahawa area.
Arrival of scientific equipment from U.S.
Arrival of equipment and vehicles ordered in India.

5. month — Arrival of U.S.G.S. chemist on TDY, to set up water-quality laboratory and train personnel.

6. month — Arrival of drilling equipment from U.S.
Arrival of U.S. drilling supervisor.
Arrival of second U.S.G.S. adviser.

7. month — Start of test drilling in Khairahawa area with U.S. equipment
Contract for drilling of 6 tube wells by reverse rotary method in Khairahawa area (pumping-test wells).

9. month — Drilling of 3 tube wells in Khairahawa area by U.S. rig (pumping-test wells).

Summary, First Year

About 50 to 60 test holes and 9 tube wells should be completed in the Bhairahawa area during the first year of the project. Also about 15 of 21 pumping tests scheduled in the area should be completed. During the monsoon season, emphasis will be on office work: basic record files, logs, geologic sections, sketches, other illustrations.
Place order for procurement of 2nd year equipment list.

Summary, Second Year

Complete test drilling in Bhairahawa area. Complete remaining pumping tests scheduled for area. Move to Nepalganj area, drill about 55 test holes. Contract for drilling of 8 tube wells by the reverse rotary method. Perform about 15 pumping test in the Nepalganj area.
Place order for procurement of 3rd year equipment list.

Summary, Third Year

Drill about 55 test holes and 9 tube wells in the Dhangarhi area. Contract for the drilling of 6 tube wells by the reverse rotary method. Perform about 15 pumping tests in the Dhangarhi area.

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While the time schedule above is optimistic with respect to procurement of equipment, the U.S.G.S. team feels that it is attainable, and the timing of the monsoon makes this schedule essential to avoid losing a full year. U.S.G.S. staff in the U.S. is understood to be collecting appropriate specifications so that procurement papers can be issued promptly. As a contribution to maintaining the schedule, HMG Secretary of Water and Power has agreed to make available either one of the Indian drills his Ministry is now purchasing or the "Portadrill" described above. Neither is capable of carrying the project's drilling requirements, but either rig can give a focus to mobilization as soon as the first geologist arrives and can perform work useful to the project for a reasonable period if arrival of project equipment from the U.S. should be delayed.

Not reflected in the cost figures are possibilities of paying for a well driller and for some participant training with U.S. owned Pakistani rupees. Mr. Swarzenski will confirm these possibilities by consulting in Pakistan at the beginning of his return trip to the U.S.

Attachment: Ground-Water Resources Investigations Program for The Western Terai, Nepal
By
W.V. Swarzenski and H.M. Babcock, U.S. Geological Survey - 5 copies.

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