Stephenson Report

DP

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TO: Mr. Vincent W. Brown, Director, USAID/Kabul

FROM: James E. Stephenson, A.I.D. Consultant

SUBJECT: Central Helmand Drainage Project - Observations and Recommendations

Introduction

In accordance with instructions from AID/W, in particular NESA/CD, I arrived in Kabul August 31 to undertake an assessment of progress and prospects for subject project. The purpose was early-on identification of problem areas in carrying out Phase I activities and their effect on upcoming actions related to the proposed loan for Phase II. From such an assessment, it was expected that remedial, or ameliorative, courses of action might be perceived that would enable a fair test of the Phase I exercise. Further, in the initial meeting after my arrival, you asked that I concern myself with Phase II prospects and what might promote timely preparation of the Phase II project paper.

Contacts and Travel

While in Kabul September 1-6, I had discussions with the various Mission personnel concerned with the project; these included, besides yourself, Messrs. Barbour, Denton, Standish, Reilly and Gatch. In your company I met briefly with Mr. Ferogh, Deputy Minister for Planning, and Mr. Mohammadi, Director, Water and Power Authority. I spent most of September 6 in discussion with Mr. Vittetoe, SCS, who had recently completed a TDY in the Valley. On September 7, I proceeded in company with Mr. Tayeb, a USAID engineer, to Lashkar Gah, where I remained until September 12. During this period I talked extensively with Mr. Tyson, Project Liaison Officer, and Mr. Formali, Director, Land Development Planning Division, HAVA, during the course of meetings and inspection of the Kad-i-Ali, Marja, Shamalan and Darweshan areas. (Note: Unfortunately, neither Mr. Aman nor Mr. Sham of HAVA were in the Valley during my time there. I did not meet with Governor Sherzai as scheduled on my last day, as he was called away to Kandahar.) I returned to Kabul September 12 to organize my report and for further discussions with Mission personnel. My planned departure date is the evening of September 16.

PHASE I

1. Main Drains

a. Surveying is well along with two crews in the field.

--Nad-i-Ali: Surveying is virtually complete for the Wasteway and Deep Drains 2 and 3--approximately 21 km.

--Marja: Of about 20 km. required on Outlet Drain "C" and Wasteway Extension "A", 2 km. has been surveyed.

--Shamalan: A survey crew is just beginning work on the Zarist Drain and Spur--about 12 km. required.

--Darweshan: No start has yet been made in this area; about 20 km. required on Outlet Drain "C" and a portion of Outlet Drain "A".

Pits to determine the character of the soil and depth to the hard conglomerate layer are dug by hand. There is nothing technically wrong with this, but it is slow and difficult when working below the water table. Given the work effort and time required to put down such test pits, I asked Mr. Formali how he proposed to proceed when a great number of exploratory holes would be needed to obtain basic data for designing farm drain depth and spacing. His response was that he would put such holes down with a hand auger such as HAVA used in soil sampling. I expressed my doubt as to the efficacy of this procedure in stiff soils or where deep holes were required. I suggested that serious consideration be given to use of a power auger or a coring bit when the tempo of work picks up, and that it certainly would be required for Phase II work.

b. Design

--HAVA has completed profile/gradient/cross sections for the 6.43 km. Drain 2 Extension in Nad-i-Ali. The design and drawings were done by Mr. Wardak of HAVA with a strong input from Mr. Vittetoe (SCS).

--Mr. Formali's design/drawing staff currently consists of Mr. Wardak, plus five newly assigned college graduate trainees, two of which are engineers.

--Only three drafting tables were in evidence, two in use.

--Of the five trainees, the two engineers are expected to go into design/drafting, the other three (science graduates) are slated for soils lab work (1), economic work (1), and drainage classification (1).

Mr. Formali said he expected "some drafting" out of the last named three above and that three new engineers were to be added. It was unclear where these individuals would come from, but Mr. Formali was confident that with the support of the Governor they could be secured. He also stated that four drainage engineers would be added for Phase II. He stated that equipment and working space would be no problem.

At this stage, engineering/design resources look grim for the job at hand. There is only one qualified draftsman aboard and in light of the heavy input of Mr. Vittetoe to the one production exercise to date, Nad-i-Ali Drain 2 Extension, his design qualifications have not yet been truly put to the test. Assuming that the trainees will come along, but slowly it is highly doubtful that such a thin staff can come close to keeping up with the necessary level of work when the tempo increases and includes farm drain design. Obviously, it will be woefully short for Phase II. HAVA is counting heavily on the arrival of the new SCS people. However, it will be well into November earliest before they are effectively in place; further, there is little HAVA staff to work with. The worst thing that could happen for the purposes of the project as conceived is that the SCS drainage engineers take on production work themselves. (Note: the Project Paper foresaw 46 HAVA professional and technical staff for design, drafting and drainage engineering; the discrepancy between actual and projected is obvious.)

c. Field Construction Engineering

There has been no requirement for such engineering to date. It will be needed when Drain No. 2 Extension construction starts; hopefully in the next few days. With only two survey crews in being and much design work ahead, additional field crews will be needed for staking and inspection when the work, including farm drains, picks up. I asked about the availability of additional survey crews and supporting transportation. Mr. Formali responded that the Governor would see that he got additional survey crews and vehicles when required. (Comment: My concern is that with the best of will additional survey crews, equipment and vehicles may just not be available upon consideration of competing demands in the Valley.)

d. Construction

No work yet started in any area. Construction work should begin shortly as the AID-HAVA Memo of Understanding No. 2 for Nad-i-Ali Drain No. 2 Extension is ready for the Governor's signature. Work can then proceed when an Agreement is signed between HAVA and HACU. Memo of Understanding No. 2 covers 6.43 km. of new drain with 44,743 cubic meters of excavation in the dry, at a unit cost of 27 Afs. per

cubic meter, totalling $21,194.00. AID will reimburse 70% of the cost, which works out to $2,307 per km. (Note: In discussions with Mr. Formali, he indicated that the price negotiated with HACU was 38 Afs. per cubic meter for dry excavation and 48-50 Afs. for wet excavation, including spreading and shaping. I have no basis for reconciling the difference in the AID and HAVA/HACU figures; I point it out as a possible area of controversy in reimbursement agreements.)

--Neither Mr. Aman nor Mr. Sham of HACU was in the Lashkar Gah area during my visit, so I could get no information from HACU management on the equipment outlook for the Phase I work. Mr. Formali had assumed that the Drain 2 Extension would be excavated with a dragline; Mr. Tyson and I pointed out that the work would go much faster if the Loan -012 scrapers were used as all excavation would be in the dry.

--With the momentum which has built up, I have little doubt that the Drain 2 Extension work will begin without too much delay.

--The larger question is whether HACU can provide equipment for work simultaneously in say, three areas. I came away with the strong impression that HAVA was counting heavily on the seven exprop engines needed for currently-owned HACU drag lines. This is a very weak reed to lean upon, as even if the order were placed today, the first operable crane with an exprop engine installed is at least 6 to 8 months away.

--In discussing the availability of HACU equipment generally for this project, Mr. Formali was confident that with the support of the Governor the necessary HACU equipment would be allotted to the job.

2. Farm Drains

Design:

Although general locations were marked for me on the area maps during our meetings (except for Nad-i-Ali), specific locations have not been selected nor is there a program as yet for starting farm drain activity in any area. I pushed very hard on this, stressing its importance to a happy conclusion of the Phase I testing exercise. The general plan clearly is to start farm drain work where the people have evidenced the strongest desire for it. This, of course, would ameliorate the problem of access and perhaps willingness by the farmers to do the work; in the larger view, it might well not provide the test of farmer willingness to go along with the program. Mr. Formali stated that initial farm drain work would begin in the Nad-i-Ali and Marja areas in 9-10 weeks. Much engineering needs to be done before actual farm drain excavation begins:

--selection of location (with assurance of access)

--surveying

--soil samples and determination of depth to hard conglomerate layer--required to determine hydraulic conductivity through the soil and depth and spacing of drains

--design

--staking for construction

Construction:

The estimate of cost for digging farm drains is based on one man digging a cubic meter per day; he would be paid about 40 Afs. per day, and in Nad-i-Ali and Marja the excavation required would run about 1½ cubic meters per running meter of ditch.

I expressed concern over the specifics of how the farm labor would be recruited, organized, supervised and paid for digging the drains. Mr. Formali was confident that this would be no problem; however, until proven by doing, I see this as a real problem.

In addition to the question of availability of labor to do the excavation, there remains the question of engineering design staff which, as presently organized, must come from that currently fully occupied with the main drains. With the farm drains added, it is obvious that the survey and design staff will be spread impossibly thin if significant work is to be accomplished in the first quarter of 1976.

3. Recommendations

a. That steps be taken to tie down the availability of additional survey crews with appropriate equipment plus field engineering/inspector personnel as the pace of work increases (perhaps HAVA Engineering Division).

b. That steps be taken toward securing additional designers/draftsmen as the pace of work increases (perhaps HAVA Engineering Division).

c. That serious consideration be given to power tools for putting down the necessary test holes for both main drain and farm drain design. (I would suggest that this be placed on the agenda of the new SOS people, i.e., to determine the need, present availability with HAVA, and the kind of equipment--slot auger, Dennison bit, etc.--most suitable to the work.)

d. That Mr. Tyson immediately prepare simple CPM diagrams, i.e., a display of time-phased events and resources required for their accomplishment, covering engineering and construction for each of the two Phase I activity streams--main and farm drains--in each area (Nad-i-Ali, Marja, etc.). These CPM diagrams would then become a primary tool in monitoring the program. As the level of work increases, such CPM's would enable early-on identification of soft spots where remedial steps must be considered. A significant product of this exercise would be recognition of when the level of work would justify scheduling the Interim Evaluation of Phase I. (Note: In subsequent discussion in Kabul, Mr. Denton suggested that such CPM work be done by HAVA; I have no quarrel with that if it can be accommodated on their plate. The important thing is that it be done--in the first instance for AID's own programming requirements; I would defer to Mr. Tyson on the most effective way to carry it out.)

e. That the Phase I Interim Evaluation be tentatively rescheduled for March 1976, a firm timing to be set on the basis of performance monitored as above. (Note: March 1976 is, of course, speculative at this juncture; it is based on my best judgment of the earliest date when enough Phase I work will be in progress to make the Evaluation meaningful, i.e., construction work--main and farm drains--going on in three areas with appropriate engineering back-up.)

Phase II

1. Prospects

The foregoing section on Phase I inevitably focuses on negative aspects perceived by me as affecting Phase I performance. On the positive side, there is tremendous commitment and confidence by the two principals with whom I worked closely in the Valley--Messrs. Formali and Tyson. Further, Mr. Formali has a strongly motivated staff as evidenced by working after hours and on off-days. Even so, there is a limit to what can be accomplished by the extra effort of a few individuals. Inevitably, there must be a reasonable match-up between manpower and equipment resources with the job at hand. There is no question that I am somewhat bearish on a successful Phase I in terms of meeting the test as a prelude to Phase II, whereas Messrs. Formali and Tyson are bullish--very properly so in their positions. If the Phase I Interim Evaluation were made in January 1976, I see the prospect of a go-ahead for Phase II as virtually zero. If such an evaluation is deferred two or three months, the odds become more like 50-50. Further deferral of the evaluation if accompanied by the input of further resources--qualified HAVA manpower and HACU equipment--will increase the chances of a go-ahead for Phase II.

2. Planning

Obviously, planning for Phase II should not be set aside until there is a definitive Phase I answer. Management judgment would dictate the level of effort and timing for various inputs into Phase II planning. I recommend that the following items be addressed as crucial to the preparation of a Phase II project paper:

a. The Equipment Plan scheduled for November 1975 in the current Project Paper should not be attempted until after completion of the Interim Drain Review and Preliminary 24-month Construction Plan (scheduled for February 1976 in the Project Paper--probably too early given the delayed arrival of SCS personnel).

b. For loan presentation purposes, and more importantly as a working tool, HAVA should prepare a base (or project) map for each of the four areas--Nad-i-Ali, Marja, Shamalan, and Darweshan--updated to show readily current installations such as irrigation works, drainage, roads, significant topographic details, etc. New work can be clearly projected on overlays and "as-built" work added as completed. (Note: I believe a project map along these lines was prepared for Shamalan some years ago.) I suggest the SCS drainage engineers address the project map matter for each area with HAVA and the AID Project Liaison Officer in consultation with the USAID/CDE office.

c. Techniques and an action plan should be devised without delay for making cost-benefit and beneficiaries analysis and for setting of priorities (by location) for Phase II development in the four areas.

d. The Master Drainage Plan for each area should be developed with least delay. This will form the basis for the Phase II engineering and construction plan which, together with the cost-benefit and beneficiaries analysis, will form the "guts" of the Project Paper.

e. The question of labor intensive versus machine construction for farm drains is integrally related to d. above. First is the matter of economics and the availability of labor; then, the question of what kind of equipment would be best suited to the Helmand scene. (Note: At first blush, I would suspect Nad-i-Ali and Marja would be suitable for hand excavation--relatively shallow, stiff soil--while Shamalan and Darweshan might be better tackled with machines--deeper ditches, flatter side slopes, much more excavation for each running meter of ditch.) Two methods of machine excavation come to mind: a small back hoe operated off a farm-type tractor for open or buried drains and a plastic pipe-laying machine for excavating and installing buried field drains. (Mr. Wittatoe, SCS, dwelt at some length on the latter in his memorandum of September 12, 1975.) Such modern pipe laying machines require a train of materials to feed them--polyethylene plastic tubing, fiber glass or sand-gravel filter material;

further, the operation of the machine calls for skilled handling to maintain proper grade and assure integrity of the tubing and filter envelope installation. Therefore, I recommend that a study by highly knowledgeable people be instituted to explore (a) the economics of labor intensive vs. machine construction in the four project areas; and (b) the efficacy of modern pipe laying machines for placing underdrains under the conditions--physical, human and logistic--appertaining to operation in the Helmand Valley. NESA/CD and SER/ENGR could be called on for assistance in finding suitably qualified people for the study.

f. One should not overlook the necessity for adequate HACU equipment maintenance and repair facilities concommitant to a Phase II operation. Mr. Watson's (AID/W) report of June 26, 1975 stressed this point (summary paragraph I.4.). In my discussions with him, I was particularly struck by the absence of suitably enclosed spaces at HACU's Chah-I-Anjir shops for repair of hydraulic equipment and for engine overhaul. I recommend that steps for upgrading maintenance and repair capability be high on Mr. Anderson's agenda when he takes up his assignment with HACU.

g. Thought needs to be given as to how payment from the loan for work performed in Phase II is to be related to loan-financed equipment.

h. Thought needs to be given as to how the project and its implementation may be structured so that one does not end up with a HACU equipment loan rather than a Helmand Valley drainage loan. In my view, no one in AID would be enthusiastic about the former.

i. There is the matter of organization both in USAID/Kabul and HAVA for carrying out the Phase II work in the field. On the AID side, there is a crying need now for a full-time Phase I project manager, technically knowledgeable of the business. Once he is aboard and operating, he will have a good notion of the "what and how" of the support needed by other skills in the Mission. (Note: My impression is that the Mission engineers should be more directly involved in the project management than they seem to be currently.) Whether the Project Manager should be posted to Kabul or Lashkar Gah is an open question; there are factors that argue each way. I understand that present thinking in the Mission tends to the Kabul location. I lean toward an on-site manager normally but, under the circumstances, frequent and extended visits to the Valley might give the best of both worlds. The experience with Phase I, assuming early arrival of the project manager, should go a long way toward resolving the location question.

On the HAVA side, the Land Development Planning Division as presently constituted, and I believe planned, is just too thin to