695. HCRA HB 68

HB
68

MINUTES

DATE: Feb. 2, 1979 All members present

HB68 Village Safe Water Act

Sponsor: Chat Chatterton

Testifying:

Rep. Chatterton - Act first administered by HESS then transferred to DEC. Says design expertize exists in Transportation and Public Facilities. Fish hatcheries now done by Public Facilities. Referred to Gov's Report on Efficiency and Management which stated that porgram should be disbanded.

Don Clockson -- Alaska Legal ServicesOppcsed.
DEC is cautious with state funds. DEC outstanding in advance planning. Says three questions should be answered by the Committee:
1. Cost of transfer?
2. Activities of Village Safe Water Program for the last 2 years
3. How would agency work with Bush?

John Scribner-- Dept. of Environmental Conservation-Opposed
9 projects completed--2 in progress
Grants made to villages
DEC contracts for consultant for Village
Consultant designs and constructs
Owned byVillage from beginning and operated by Village.
Public Health Service has water program also so confusion often results.
Costs 25% less than with competitive bidding
Local hire used otherwise union labor.
Local people trained to operate facilities
$5-6 Million put in program not counting recent $7.8 Million bond appropriation

Hearing to be continued.

See Tape 1 Side 1 Sections 1347-1500

Official Business

Alaska State Legislature

House of Representatives

Committee on

Community & Regional Affairs

Pouch V
State Capitol
Juneau, Alaska 99811

Hearing (H) CRA

DATE: Feb. 6, 1979

HB 68 Village Safe Water Act

All members present.

John Scribner, Dept. of Environmental Conservation
Gave cost figures for projects presently in operation and background material on the goals, objectives, and operation of the Village Safe Water Act.

Jerry Sargent, director of Village Safe Water program
Points out that Program is basically a grant program rather than a construction program.

D.E.C. opposes bill.

Richard Holden--Dept. of Transportation and Public Facilities
Dept. is not interested in administering program.

Rep. Chatterton --Sponsor
Suggests that "forced accounting" should be tried in Village Safe Water Program.

Action on HB 68 postponsed till Feb. 19. Rep. Carney and Rep. Chatterton will do some research on the Program and report back to the Committee at that time.

See Tape 1 Side #2 Section 1-638

No. 4

BILL WORK SHEET

(for optional use of committee aides)

COMMITTEE ON CRA

Received from ______________________ DATE 1/25/79

BILL NO. 68 ORIGINAL SPONSOR Chatterton OTHER ______

THIS COMMITTEE RECOMMENDED --

Majority Recommendation: ______

Supported by ______

Minority Recommendation: ______

Supported by ______

Other: ______

Brief/flag title: ______

What bill does:

OUR COMMITTEE AMENDMENTS (what they are and what they do (attach if lengthly))

Fiscal Impact -- Is there a fiscal note for the original bill and one which reflects changes made by the amendments: (attach details).

LAA Legal/Research contact:	Research/supporting information Attached (?) ____

PERSONS/ORGANIZATIONS:

Supporting bill: Richard Holden - Deputy Com. Facilities Planning Research 3900

Opposing bill: John Scribner - DEC - 2640 Dir. of Div. of Water Programs

REMARKS: (use reverse side if necessary)

Alaska State Legislature

House of Representatives

Committee on

Community & Regional Affairs

Official Business

Pouch V
State Capitol
Juneau, Alaska 99811

TO: ALL COMMITTEE MEMBERS

FROM: REP. BILL PARKER, Chairman

RE: HB 68 relating to the Village Safe Water Act

The following recommendations are excerpted from the Governor's Management and Efficiency Review Report

Recommendations

254. **Discontinue construction of village safe water projects.**

The village safe water program is financed completely by the state and there is substantial concern about its effectiveness. The program applies to villages with population ranges of from 25 to 600 persons. Approximately $5-million has been spent to complete eight projects and three more are scheduled.

A fiscal 1977 request of $2-million has been made for the program plus an additional $300,000 for annual maintenance work. The maintenance figure could double as additional projects are completed. The villages are unable to operate and maintain the facilities and a decision must be made on the future of the program.

In view of the inability of the villages to run these facilities successfully, the construction program should be discontinued. As some of the native corporations involved become more experienced, they could contract with the state for such a program, recognizing that rural water and waste disposal systems are almost never financially self-sustaining. Implementation would result in an estimated one-time cost avoidance of $2-million and an annual saving of approximately $300,000.

pp. 135, 137

The final implementation report of the Governor's Management and Efficiency Review states that this particular recommendation has not been implemented. (See p.10)

VILLAGE SAFE WATER PROGRAM
An Update to January 20, 1977

Introduction

The Village Safe Water Act (AS 46.07), passed in 1970, calls for "at least one facility for safe water and hygienic sewage disposal in each village" in Alaska. Little progress was made in the program until December of 1972 due to lack of funds, inability to hire someone to administer the Village Safe Water (VSW) program, and lack of operation and maintenance provisions. Since 1972, six VSW facilities have been constructed, two more are nearly complete, and another is being designed. In addition, an operation and maintenance support program and a comprehensive planning effort have been organized and initiated.

Construction

The six VSW facilities constructed to date are in the villages of Northway, Chevak, Alakanuk, Selawik, Nulato and Pitkas Point. A facility will be completed in Beaver in January, 1977, and in Koyukuk in February of 1977. A facility for Kongiganak is being designed, and construction is scheduled for summer of 1977.

At the nine locations listed above, the VSW projects consist of central sanitation facilities to which village residents can come to obtain water supply, sewage disposal, bathing and laundry services. No piped water distribution or sewage collection systems are involved except for water and sewer service lines to schools.

Construction methods used so far have included: 1) competition bid construction contracts administered by the Alaska Department of Public Works, 2) competitive bid construction contracts administered by the Alaska Department of Environmental Conservation (ADEC), and 3) force account construction by the villages through construction management contracts with engineering consultants. All facilities so far have been designed by engineering consultants.

The force account/construction management method of construction has been the most satisfactory of the three methods used. Facilities constructed that way have been built cheaper and faster than those built under competitive bid construction contracts; the quality of construction has been better; and the villages have been more intimately involved in, and satisfied with, their projects.

VSW facilities have cost from $350,000 at Pitkas Point (begun in FY 76) to almost $1,200,000 at Selawik (begun in FY 74). Villages served have ranged in size from 85 (Pitkas Point) to over 500 (Selawik).

Operation and Maintenance

Experience in the VSW program has confirmed that virtually any utility system installed in remote Alaskan villages is doomed to eventual failure unless the village is given financial, technical, and/or management assistance. Any program for providing utilities in rural Alaska must either adequately provide for long term operation and maintenance, or expect system failures that adequate operation, maintenance and management could have prevented.

Goals and Objectives

"SW Comprehensive Planning

GOAL

To develop a statewide comprehensive program for providing sanitation services in rural Alaska.

PLAN OBJECTIVES

1. Inventory existing water supply and sewage disposal facilities in rural Alaskan villages.

2. Develop criteria for evaluating the adequacy of existing water supply and sewage disposal facilities. identified in # 1 above.

3. Identify existing agency programs providing sanitation facilities to Alaskan villages. Quantify the resources currently available. Identify and describe the technical, management and administrative approaches presently used.

4. Develop criteria to evaluate the effectiveness of thes programs.

5. Evaluate the adequacy of technical, management and administrative approaches identified in #3. above.

6. Identify and evaluate alternative technical, administrative and management methods that might be used to address sanitation needs in rural Alaska.

7. Recommend changes in the activities and resources of existing programs to incorporate the alternatives noted in # 6 above. Recommend new programs and/or authority necessary for implementation.

8. Analyze existing methods of operation, maintenance and management of village sanitation facilities.

In FY 76, the annual operating budgets for VSW facilities ranged from $28,000 at Northway to over $100,000 at Selawik. ADEC provided a total of about $225,000 in VSW operation and maintenance grants in FY 76 to six villages. In addition, ADEC provided technical and management assistance to the six villages. Although expensive, the VSW operation and maintenance support program has made it possible for all completed VSW facilities to serve the public as intended.

Comprehensive Planning

ADEC is developing a comprehensive plan intended to define the roles of State and federal agencies and other groups involved in providing rural sanitation services. An early step in this planning is to inventory all village sanitation facilities. Completing this inventory is viewed as the cornerstore of the VSW planning effort.

The Ninth Alaska Legislature passed a resolution suggesting that a VSW advisory committee be organized consisting of representatives from the 12 Native Regional Service Associations. This committee would assist ADEC with policy and management decisions concerning the VSW program. The Department feels the advisory committee is a good idea and welcomes increased involvement for the Regional Associations.

Several local, State, federal and private organizations participate either directly or indirectly in providing rural sanitation services. A strong working relationship must be developed among the diverse groups if a comprehensive plan for sanitation services throughout rural Alaska is to be successfully developed and implemented.

9. Develop alternative methods for operation, maintenance and management of village sanitation facilities.

10. Recommend changes in the activities and resources of existing programs to incorporate the alternative approaches noted in #9 above.

11. Integrate the findings of the above analysis with the comprehensive plan.

12. With the assistance of the appropriate governmental agencies and Native non profit regional associations, proceed to implement the plan.

PUBLIC INVOLVEMENT & PROGRAM COORDINATION

Because several local, State and federal organizations participate either directly or indirectly in developing rural sanitation facilities, this major planning effort can not be undertaken alone. To insure proper plan development and implementation, a strong working relationship must be developed among the diverse groups currently working on rural sanitation problems.

Public participation and inter-agency coordination must be an integral part of the VSW comprehensive planning process. In this regard, a maximum effort will be made to enlist the active participation of the native regional health organizations, the villages and appropriate federal and state agencies. We hope that by the time a draft of the plan has been formulated, significant public comment and coordination will have been obtained. The results of our collective efforts will be a comprehensive plan for providing rural sanitation services in Alaska.

Principal Contact

For more detailed information on the Village Safe Water comprehensive planning process, please contact:

Greg Capito
Senior Planner
Alaska Department of Environmental Conservation
Pouch O
Juneau, Alaska 99811
Phone: 465-2664

THE STATE OF ALASKA

VILLAGE SAFE WATER PROGRAM

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THE VILLAGE SAFE WATER PROGRAM
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August 29, 1973

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THE VILLAGE SAFE WATER PROGRAM
Projects in Alaska
-Case Studies-

Prepared by Greg Capito
Alaska Department of
Environmental Conservation

ONE

MEMORANDUM State of Alaska

TO: The Honorable Jay S. Hammond
Governor

DATE: September 12, 1975

FILE NO:

TELEPHONE NO:

FROM: Ernst W. Mueller
Commissioner
Dept. of Environmental Conservation

SUBJECT: Village Safe Water Program

Several months ago I requested Dr. Jerry Sargent, who is in charge of our Department's Village Safe Water Program administered under AS 46.07, to prepare a comprehensive briefing paper so that you and your staff can be more informed on that program, its successes and failures, and our plans for the future, of this program. That paper is now completed and is attached.

In particular, this briefing will (1) help provide you with a basis for evaluating VSW capital requests this Department will make over the next several years, and (2) apprise you of the need for defining State policy concerning operation and maintenance of VSW facilities, and perhaps rural utility systems in general. During the current fiscal year, we will be making recommendations to you and the Budget Review Committee concerning these two areas. We hope this information will be helpful to you in evaluating them.

Enclosure

bc: Mr. Scribner/Dr. Sargent

THE VILLAGE SAFE WATER PROGRAM

A Briefing for Governor Hammond

Prepared by

The Department of Environmental Conservation

August, 1975

Juneau, Alaska

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I. THE STATUTE

The Village Safe Water (VSW) Act of 1970 (AS 46.07.010-080) was passed for the purpose of providing "safe water and hygienic sewage disposal facilities in villages in the state," and "to assure that there will be at least one facility for safe water and hygienic sewage disposal in each village." The Act stipulates that each facility will provide at least a safe water supply, means for sewage disposal, and bathing and laundry services. A village is defined as "an unincorporated community which has between 25 and 600 people residing within a two-mile radius, or a second class city." The Department of Environmental Conservation (ADEC) is seeking to have "or a second class city" deleted from that definition because some second class cities in Alaska are big enough that a central facility could not provide adequate sanitation services.

A village receiving a VSW project is not required to contribute toward costs of construction. The State may "provide for construction by contract or through grants to public agencies or private nonprofit organizations, or otherwise."

When a VSW facility is completed the recipient village must be given title to it. The village must agree to accept ownership of the facility and be responsible for its operation and maintenance. The State may assist a village with operation and maintenance expenses when the local governing body lacks sufficient financial rescources.

II. BACKGROUND AND PAST PROJECTS

In April of 1974 the Budget Review Committee requested ADEC to prepare an Issue Analysis on the Village Safe Water Program. The complete text of that analysis appears in Appendix A of this report.

The following excerpts from the VSW Issue Analysis describe activities in the program through June of 1974:

> ...Voters approved a three million dollar bond issue in 1970 to fund the VSW program and another one million dollar bond issue in 1972. Little progress was made in the program, however, until December, 1972 for the following reasons: 1) no money was available to administer the program until October, 1972 and even when the VSW staff position became available, a person suitable to fill it could not be found; and 2) no provision had been made for funds to operate and maintain VSW facilities and ADEC was reluctant to construct facilities without assurance they would operate properly.
>
> In December, 1972, a member of the ADEC staff began a survey of sanitation facilities in small villages throughout Alaska (most of which are native villages) to determine which villages were most in need of VSW projects. Letters were written to government agencies (e.g., the United States Public Health Service and the Bureau of Indian Affairs), native associations (e.g., regional corporations and health corporations) and other organizations with knowledge of village sanitation problems, requesting information and suggestions concerning plans for VSW projects. As a result of this study 32 villages were identified as being most in need of the sanitation services specified by the VSW Act. Meanwhile, in late 1972 and early 1973, the villages of Northway and Chevak requested assistance under the VSW program in finishing central facilities they had begun to construct on their own initiative. Since Northway and Chevak had committed their own resources and thus demonstrated a sincere desire to improve sanitation in the villages they were granted assistance. Then in early 1973, the Department of Education, lacking funds to provide water and waste services for the new schools scheduled for construction in remote villages in 1973-74, asked ADEC to install VSW facilities in Alakanuk, Selawik and Nulato to provide sanitation services for the new schools to be built there in addition to providing sanitation services for the villages. ADEC agreed to do so provided the Department of Education would agree to provide all funds and logistical support necessary for continued operation and maintenance of the VSW facilities...
>
> ...Five villages are receiving major central sanitation facilities construction projects under the VSW program (Northway, Chevak, Alakanuk, Selawik and Nulato). In addition, Arctic Village was granted

a few thousand dollars to buy washing machines and dryers to install in a facility constructed by the U. S. Public Health Service. Total expenditures in the six villages will be approximately three million dollars, leaving about one million dollars for additional projects···

···To date there has been little need for priority criteria for VSW projects. Staff and money have not been available to identify villages qualified for and in need of VSW assistance, so there is little to prioritize. Thirty-two villages were identified as being in critical need of a safe water source, but much more study and coordination is necessary to determine which villages should receive VSW assistance and the extent of each facility.

In general, only villages in most critical need of a safe water supply have been considered for VSW projects. Also important is the village's ability to operate and maintain facilities installed, either unassisted or through arrangements with a school, PHS clinics or other sources of revenue.

Nearly three-fourths of the VSW program's bond money was used for the three joint projects with ASOSS high schools. Those projects were chosen less according to VSW priority criteria than in response to Department of Education pleas and expressed willingness to operate and maintain the finished facilities. Remaining money will be devoted to three or four villages where water supply needs are critical and schools and clinics can provide revenue for operation and maintenance."···

Since June of 1975, the villages of Beaver, Koyukuk and Pitkas Point have been selected to receive VSW projects. They were chosen based on their especially critical need for sanitation services, which need was identified during the ADEC survey of village sanitation facilities begun in December of 1972. The three projects are being funded out of the approximately $800,000 that remain in the VSW bond funds after the projects in Northway, Chevak, Arctic Village, Nulato, Selawik and Alakanuk are completed.

III. EVALUATION OF PROJECTS TO DATE

The VSW program is new to Alaska State government and virtually without precedent. Hence the best methods for achieving the mission of the program are still being worked out as experience is gained.

The Arctic Village project did not involve any construction since VSW funds were provided only for buying washing machines and dryers.

The Northway and Chevak projects consisted of adding to and finishing central sanitation facilities that the villages had started to build on their own initiative. ADEC hired engineering consultants to design and prepare plans and specifications for the improvements made with VSW funds, after which ADEC awarded competitive bid construction contracts to have the work done. These two projects went reasonably well, although at Chevak the termination date of the construction contract had to be extended several months partly due to adverse weather conditions.

At Nulato, Selawik and Alakanuk the VSW facilities are being built in conjunction with new State schools. In each village the school and VSW facility have been designed and are being built under contracts prepared and administered by the Division of Buildings, Department of Public Works. These projects have been most unsatisfactory as is illustrated by the following excerpts from the VSW Issue Analysis:

> ...'One purpose of this issue analysis is to investigate the assumption it is cheaper to construct capital facilities in remote Alaskan villages simultaneously and under the same contract whenever possible. The VSW projects and State high schools in Alakanuk, Selawik and Nulato were expected to cost less by joint construction than if they were built under individual contracts. So far, the VSW facilities are costing more than twice what was originally estimated by the architectural and engineering consultants retained by the Department of Public Works, Division of Buildings; and the facilities themselves have been scaled down...
>
> ...Whether or not it is more efficient to construct two or more State capital projects jointly (one contract) in a remote village than to build them separately is not an easy question. At first

blush, one might think it obvious joint projects would be cheaper since contractor mobilization costs should be less and one large contract should be cheaper to administer than two or more smaller ones. Experience, however, has not given unqualified support to that thesis.

Experience with joint construction in the VSW program is limited to the three projects in Alakanuk, Selawik and Nulato. They have been very unsatisfactory projects from ADEC's point of view in that they have cost double what was anticipated, the facilities had to be scaled down as costs became exorbitant, and monitoring the contract procedure became virtually impossible. The causes of these problems are many and complex. Perhaps among them are: 1) the jobs were big and complex enough that including them in one contract was unwieldy, 2) the consulting engineers and architects did less than satisfactory work, 3) the contract documents were poorly and incompletely done, 4) ADEC did not exert enough control over work done by the consulting engineers and architects, 5) the Division of Buildings did not (perhaps due to lack of time and expertise) critically monitor work prepared by the consulting engineers and architects, and 6) ADOE imposed a severe time limit on time available to prepare the projects for construction.

The major and perhaps root cause of the many problems with the three projects was lack of time for adequate design and contract preparation. The consulting engineers and architects claim they did not have time to do the kind of job they would like to have done. On the other hand, in preliminary negotiations with the consultants about doing the jobs, they indicated the limited time would be "no problem." The Division of Buildings might have been expected to notice the inadequacies in the consultants' work, but they claim not to have had time to review the work properly. Lack of expertise may also have been a factor. Perhaps ADEC should have kept closer track of work done by the consultants; but being insulated from the consultants, contracts and contractors by the Division of Buildings made communication and effective participation difficult.

Joint construction may be just too difficult to organize and administer (at least for certain types of projects) given State construction procedures. On the other hand, ADEC's disappointing experience in joint construction may be due to causes not attributable to joint construction per se. Perhaps some future VSW projects should be built with ADEC managing consultants and contracts directly to see if that method has advantages. Another possibility is force account work, managed either by ADEC or the Division of Buildings"...

The Division of Buildings called a final inspection for the Nulato project on November 13, 1974. ADEC discovered many deficiencies in the VSW facility during the final inspection, and the Department has since then experienced great difficulty in getting the deficiencies resolved. Appendix L consists of copies of

correspondence that illustrate the specific problems with the Nulato project. Final inspection for the Selawik and Alakanuk projects is scheduled for the Fall of 1975.

Design and construction of the VSW facilities for Beaver, Koyukuk and Pitkas Point are being managed directly by ADEC through grants to the villages. For each project ADEC, the village, and a consulting engineering firm enter into three-way contracts; one for design and one for construction management. The design contract specifies the scope of work to be performed by the engineering consultant, sets the compensation rate for design services and prescribes the procedure by which the village pays the consulting engineer with VSW grant money from ADEC. Under the construction management contract the consulting engineer agrees to···"Manage all activities necessary for construction of a VSW facility,··· (be) responsible for the timely ordering, scheduling and expediting of all equipment ··· and material necessary for construction, ··· (and) be responsible for managing all construction activity at the VSW facility site···" In keeping with the intent of VSW authorizing legislation, the village agrees to provide local people to work on the VSW project to the extent they are available. The construction management contract also prescribes procedures by which the village pays construction expenses, the consulting engineer's fee, and labor costs with VSW grant funds from ADEC. To date the three design contracts have been signed and design of two of the projects is nearly complete. The Construction management contracts have also been signed. Construction at Pitkas Point and Koyukuk has begun, and construction at Beaver will start in the Spring of 1976.

The methods by which the Beaver, Koyukuk and Pitkas Point projects are being administered are unique. So far (through design) they have been very satisfactory. It is anticipated that these facilities will cost far less than if they were constructed under typical State competitive bid construction contracts.

Appendix C contains photographs to illustrate physical features of various VSW facilities.

IV. FUTURE PROJECTS

PLANNING

Based on the survey of village sanitation facilities done by ADEC starting in December, 1972, villages tentatively determined to have a high priority to receive VSW projects after FY 76 are Kongiganak, Eek, Anvik, Stevens Village, Chignik Lake, Kasigluk and Nunapitchuk in that order. That priority list was prepared over two years ago with a bare minimum of field effort since staff and funds to do a comprehensive survey have not been available.

ADEC requested additional staff and support funds for FY 76 for planning in the VSW program, and the request was recently approved by the Legislature. If a satisfactory candidate for the new VSW engineering position can be found, a planning effort as described in the following excerpts from the VSW Issue Analysis will be begun:

> "Essential to long range planning for the Village Safe Water program are estimates of how much the program will cost and a description of the schedule according to which expenditures should be made. The cursory inventory of village sanitation needs made by ADEC staff in 1973 served only to identify 32 villages with the most obvious and critical needs. More thorough investigation is necessary to gather field data and coordinate USPHS (United State Public Health Service-Office of Environmental Health, Sanitation Facilities Construction program for Alaska natives) and VSW efforts to determine which villages should have VSW projects. Once the villages are identified, engineering field studies must be made to serve as the basis for preliminary design of facilities and cost estimates. Then, and only then, will the capital spending needs for the VSW program be known with confidence...
>
> ...The three primary planning needs in the Village Safe Water Program are: 1) to identify those villages where VSW facilities should be installed, 2) to determine what services should be provided by each facility to be built, and 3) to establish a schedule according to which the projects are to be constructed...
>
> ...Determining what services should be provided by each VSW facility involves working closely with the village involved. Traditional bathing practices might suggest a type of bathing facility to include in the VSW plant (e.g. traditional fire bath suggests sauna bath). Raw water availability and quality will determine the water source and treatment system. Local environmental conditions greatly influence the choice of a waste treatment

and disposal system. And the size and type of building to erect, foundation requirements, heating needs, and other physical features of the intended facility are also functions of local conditions."...

FUNDING

To date, four million dollars have been available for VSW capital construction. Those funds will be exhausted by the projects in Arctic Village, Northway, Chevak, Selawik, Alakanuk, Nulato, Beaver, Koyukuk and Pitkas Point. It is interesting to note that about three of the four million dollars were consumed by the Selawik, Alakanuk and Nulato projects.

A proposed bond bill for additional VSW capital construction funds was not passed by the 1974 Legislature. In order to make at least token progress in what ADEC considered a very worthwhile program, the Department requested two million dollars from the General Fund for FY 76. Half of that request was granted, making one million dollars available for VSW capital construction in FY 76.

Preliminary intentions based on 1972-73 planning are to offer VSW projects to the villages of Kongiganak and Eek, and perhaps Anvik depending on how much each project will cost. There may, however, be new factors or changed conditions to consider in selecting sites for the FY 76 projects.

V. OPERATION AND MAINTENANCE

SCOPE OF PROBLEM

Village Safe Water facilities must be adequately operated and maintained if they are to serve their intended purpose. Following are excerpts from the VSW Issue Analysis concerning operation and maintenance:

> ..."The legislative assignment of the Village Safe Water program is to provide safe water, sanitary means of waste disposal, bathing and laundry facilities for the inhabitants of small villages in Alaska. Funds were made available for capital construction but no provision was made for meeting long-term operation and maintenance expenses; and virtually none of the villages are capable of sustaining a facility of the type specified by the VSW Act without financial, technical and administrative assistance.
>
> When the Department of Education called on ADEC to build VSW facilities that could provide water and waste service for new high schools, ADEC was reluctant to devote resources intended for village service to school service. But the Department of Education was willing to provide all financial and logistical support necessary for continued operation and maintenance of the VSW facilities, thus dissolving the major obstacle barring progress in the VSW program. So the decision was made to serve the schools with the village VSW facilities in return for the operation and maintenance guarantee from ADOE.
>
> Unfortunately, the basic premise upon which the decision was made to build VSW facilities in conjunction with the high schools in Alakanuk, Selawik and Nulato got lost in the shuffle when ASOSS assumed control of the rural school capital construction program. ASOSS was reluctant to accept the responsibility for operation and maintenance which the Department of Education had previously accepted, which acceptance was the only reason ADEC had agreed to serve the schools with VSW facilities in the first place. By this time, the contracts for the joint VSW-school construction had been awarded and construction was far enough along that the projects could not be cancelled. Fortunately, ASOSS has recently agreed to provide $6,000.00 per month for VSW water and waste service for the schools at Alakanuk and Nulato. ...
>
> ...A facility to provide the services specified by the Village Safe Water Act must contain sophisticated equipment and appliances. Since public health is at stake, water and waste treatment systems must be kept operating properly at all times. Hence, at least one full-time, trained and paid maintenance man must attend every VSW facilities.
>
> Virtually all of the maintenance people will have to come from the villages where VSW plants are installed because "outsiders" are

usually reluctant to take up residence in remote villages. Since people with the training and experience necessary to operate and maintain a VSW facility are usually not available locally, an elaborate, extensive and continuing program for training of VSW plant operators is required.

A continuous and generous flow of revenue will be required to meet the operation and maintenance expenses of VSW facilities. In addition to the plant operator(s) salary, there will be treatment chemicals, electricity, fuel and replacement and repair parts to buy. Operation and maintenance expenses for just a small facility (e.g., 2 washers, 2 dryers, 2 showers, 2 rest rooms, 2 saunas, water supply and waste disposal) could run at least $25,000 per year (1974 prices), excluding amortization of capital costs for replacement purposes. For the larger facilities being built in Alakanuk, Selawik and Nulato, operation and maintance expenses could reach ninety to one hundred thousand dollars per year (excluding amortization).

Sources of revenue in the villages are limited. Individuals who use the VSW facilities will pay fees, but fees cannot be so high people no longer can afford to use the facilities. Two to three thousand dollars per month might be raised through users' fees in larger villages (400 to 500 residents) and proportionately less in smaller towns. Public health clinics, some owned by the U. S. Public Health Service and some owned by the villages, are possible sources of revenue but not more than $500 to $1,000 per month. Whether or not the health clinics can be assessed that much for water and waste service has yet to be determined. Schools are also potential users of VSW water and waste service and sources of revenue. In the past, both BIA and State schools have had their own water supply and waste treatment systems, unless service from other systems was available. Most school systems, however, do not meet water supply criteria and waste disposal requirements of the State. To provide a water and waste system for a school capable of meeting State requirements could cost as much as seventy or eighty thousand dollars per year including capital, operation and maintenance costs. The actual cost at a given school would depend, of course, on such things as availability of water, environmental conditions for waste disposal, size of school, and rate of increase in replacement costs. How much a school is assessed for VSW plant service might reasonably be based on what it would cost the school to provide its own service.

In the final analysis, some minimum amount of money will have to be forthcoming every year to meet operation and maintenance expenses if VSW facilities are to serve their intended purpose. The major sources of those funds are public health clinics, schools and individual facility users. Revenue from individual users and clinics is limited to less than half the VSW facility revenue requirements. Hence, more than half the operation and maintenance costs will have to be picked up by the schools or some other source."...

VSW program involvement was minor enough in Arctic Village that responsibility for continued successful functioning of the sanitation facilities installed rests elsewhere than with ADEC.

The Chevak and Northway facilities were opened for public use early in 1974. Since then there have been damaging freeze-ups in both facilities; the Chevak facility has been periodically closed, or open for only limited use due to lack of money for fuel; and neither facility has served its intended purpose as well as it should because the necessary financial, administrative, and technical assistance has not been provided.

The Nulato facility was first opened for public use in mid-November of 1974. The operational record of this facility has been poor due mostly to the construction problems described earlier in this report. Also the VSW staff engineer has had to spend a great deal of time helping the local plant operators establish administration, management, operation and maintenance systems for the facility. That experience has clearly demonstrated the need for some means by which the villages can have access to continuing assistance in the administration, operation and maintenance of their VSW facilities. The needs for assistance at Nulato, Selawik and Alakanuk are especially critical due to the size and complexity of their facilities.

MEETING OPERATION AND MAINTENANCE NEEDS

The Department of Environmental Conservation requested and received $289,000 in its FY 76 operating budget to assist eight villages with operation and maintenance of VSW facilities. Those funds were requested only as an interim provision until State policy concerning operation and maintenance of VSW facilities can be established. A major purpose of this report is to provide information which can serve as a basis for deciding how operation and maintenance support for VSW facilities might best be provided. Some alternatives listed in the VSW Issue Analysis were:

...1) a grant program to subsidize rural water and waste utility service, 2) a system of State owned and operated facilities to provide water and waste service in remote areas, 3) a utility system owned and operated by native organizations either as a service or a profit making venture (perhaps subsidized by the State), or 4) a public utility managed by a private organization perhaps controlled and subsidized by the State.

A program for operation and maintenance of VSW facilities should perhaps not be considered independent of the need for a system to insure proper operation and maintenance of rural sanitation facilitiies in general. In fact it might be well to consider the possibility of an operation and maintenance system for all rural utilities.

The U. S. Public Health Service (USPHS) and the Alaska Village Demonstration Project (AVDP) sponsored by the Environmental Protection Agency are the agencies other than ADEC with programs for providing rural sanitation facilities. Recognizing the need for agencies with similiar missions to cooperate, ADEC intends to invite USPHS and AVDP to participate in a planning effort to arrive at a comprehensive program for rural sanitation services. [The following preliminary goal and objectives have been drawn up to guide such a planning effort:]

Goal

To devise a comprehensive program for achieving sanitation services in Alaskan villages.

Objectives

1. Inventory current efforts (who involved and description and extent of programs).

2. Identify the people for whom services are being planned (i.e. the recipients).

3. a. Describe sanitation functions that should be provided, if any. Examples are water supply, sewage disposal and bathing facilities.

   b. Identify various feasible methods of achieving the sanitation functions described in (a) above (e.g. central watering point, individual wells, piped water service to houses, vehicle haul system). Estimate the relative costs of these methods, including installation of required physical facilities and operation and maintenance.

4. Determine where resources should come from for installing facilities identified in 3-b above; categorized according to types of recipients (if any such distinctions are made) and methods of achieving sanitation functions (from 2-b above). Examples of resource sources are State government, federal government, Native organizations and local governments.

5. Determine what functional presence should be maintained for how long and by whom for the various physical facilities installed. Examples are training, management and administrative assistance, technical assistance, and operation and maintenance assistance.

6. Determine where resources should come from to achieve the functions identified in (5) above.

7. Devise major features of a comprehensive program to connect resource sources identified in (4) and (6) above with recipients.

8. Evaluate existing programs with respect to how well they contribute to achieving the comprehensive program resulting from (7) above.

9. Determine what changes in existing programs and/or new programs are needed to achieve the comprehensive program resulting from (7) above.

VI. CONCLUSION

The Village Safe Water program grew out of recognition of the critical need for adequate sanitation services in rural Alaska. Providing rural sanitation services involves two major efforts: 1) capital construction, and 2) operation and maintenance.

CAPITAL CONSTRUCTION

The major emphasis of the Village Safe Water Act is on construction of central sanitation facilities. Several methods of construction are authorized and ADEC is trying the various options in search of the most productive methods. With the additional staff and funding provided for FY 76, engineering planning can now be done to determine the State-wide need for VSW facilities and estimate total program costs. At least preliminary indications of the total potential scope of VSW capital construction needs should be available by the end of FY 76.

OPERATION AND MAINTENANCE

Construction of any utility system, especially in the relatively harsh environment of rural Alaska, is money wasted unless provisions are made for the system to be properly operated and maintained. Most, if not all villages qualifying for VSW projects lack the necessary resources to administer, manage, operate and maintain even a minimum VSW facility (or any other utility system) without continuing outside assistance.

The Village Safe Water Act contains only brief mention of operation and maintenance assistance for villages which receive VSW facilities. To date the State does not have a firm policy position on how to provide for VSW operation and maintenance. Some of the options to be explored (mentioned earlier in this report) have already become apparent in the few years the VSW

program has been in existence. More such options and a better view of their advantages and disadvantages should result from the planning effort by VSW staff scheduled for FY 76. Perhaps it is reasonable to set the end of FY 76 as the time by which the State can establish policy concerning VSW operation and maintenance. Until then ADEC has funds to help villages manage, operate and maintain their VSW facilities.

Assignment Sheet/Cover Sheet

FY 76 Issue Analysis

(Confidential Internal Working Paper)

Title: Village Safe Water Project

Category: NRMEC

Assigned Issue Description:

Develop a long range plan describing the objectives of the Village Safe Water program and the strategy by which those objectives are to be achieved. Investigate the assumption that construction of VSW facilities in conjunction with other state capital projects in rural Alaska is a more efficient use of State funds than separate construction. A set of criteria for assigning priorities to villages eligible for VSW projects should be developed. Possibilities for agreements with federal and other state agencies concerning joint planning of VSW facilities should be considered.

Lead Agency: Department of Environmental Conservation

Agency Analyst/Respondent: Jerry Sargent

Other Agencies and Representatives Involved

Agency	Representative
State Operated Schools	Homer Marshall
Department of Public Works	Wally DeBoff

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VSW ISSUE ANALYSIS

OBJECTIVES

The specific objectives of this analysis are to:

1) Present a generalized summary of activities in the VSW program from its inception to the present.
2) Describe problems with operation and maintenance of VSW facilities and investigate possible solutions.
3) Analyze experience to date with joint capital construction projects involving VSW facilities and state schools.
4) Describe the planning and budgeting needs of the VSW program and suggest how they might be met.
5) Present criteria used for assigning priorities to villages eligible for VSW projects.
6) Suggest appropriate arrangements with federal and other state agencies to facilitate planning for VSW facilities.

SUMMARY AND CONCLUSIONS

SUMMARY

The Village Safe Water program is intended to provide safe water, waste disposal, bathing and laundry facilities in villages (less than 600 inhabitants) in Alaska. Since its inception in 1970, the program has been involved in five capital construction projects, three of which are joint projects with State-Operated high schools.

The Alaska Department of Environmental Conservation (ADEC) has been reluctant to build VSW facilities in villages where provisions cannot be made for revenue to operate and maintain them. Most villages are not capable of sustaining even a minimal facility without outside assistance, and there is not enough money in the VSW program itself to provide continuing support. The three joint projects with schools were entered into only because the Department of Education (ADOE) agreed to operate and maintain the VSW facilities in return for water and waste service for the schools. Since the Alaska State-Operated School System (ASOSS) gained jurisdiction over the schools, it has been reluctant to honor the Department of Education committment but has recently agreed to do so.

Joint construction means having two or more capital projects (e.g., a VSW facility and a State school) built by one contractor under one contract. The three joint construction projects involving VSW facilities and ASOSS schools have been immensely problematic. This does not mean VSW facilities should not be built to serve State schools, but rather that troublesome construction procedures should be amended. The facilities have cost more than twice what was

anticipated by ADEC and the projects have had to be scaled down due to exhorbitant costs. The consulting engineers and architects did less than satisfactory work on the projects, the contract documents contained costly errors and omissions, and communications among all parties concerned have been muddled at best. One cause of these problems was the time limit imposed by ADOE for preparation of the projects for contracting and construction.

ADEC policy has been not to build VSW projects in villages where U. S. Public Health Service (USPHS) sanitation facilities have been or are to be installed. Hence, VSW program planning is greatly influenced by USPHS planning for construction of water distribution and waste collection and disposal systems. USPHS finds it difficult to project a reliable schedule for construction projects, making it difficult to plan VSW projects accordingly.

Financial requirements of the VSW program cannot be determined until: 1) an extensive survey is made of sanitation services in all villages, 2) USPHS intentions are known with confidence, and 3) villages qualified for VSW program assistance are identified. Once the villages are identified, investigation must be made to determine what facilities should go in each village, engineering data must be gathered, and preliminary design be done in advance of budgeting for capital construction projects, but adequate money and staff have not been available to do those things.

The VSW program can provide badly needed sanitation services to people in rural Alaska, and for the State to have such a constructive program is commendable. Administrative problems analyzed in this report are perhaps no more than might be expected for a new program virtually without precedent. The issue analysis procedure will have served its intended purpose if problems in the VSW program,

openly discussed in this analysis, are recognized by appropriate parties and constructive solutions (some of which are suggested herein) are worked out.

CONCLUSIONS

1) Current policy for the VSW program is to build central sanitation facilities only in villages where dependable provisions can be made for continuing and successful operation and maintenance. Since such provisions are difficult, if not impossible, to make in most Alaskan villages, inter-agency planning is necessary to establish long term policy for providing rural water and waste facilities.

2) Advance planning money and staff are necessary to determine needs to be met by the VSW program and the cost of meeting those needs.

3) The question of whether or not joint capital construction is the best approach for rural State projects has not been resolved. There is evidence in the VSW program that joint construction might not be the best procedure. Alternative means of constructing VSW facilities (and perhaps other State facilities as well) should be tried. Alternatives to having the Division of Buildings administer all rural capital construction projects should also be tried.

4) When a program is transferred from one agency to another (e.g., rural schools from ADOE to ASOSS), provision must be made to insure committments made under the program previous to the transfer will be honored.

5) Village Safe Water facilities can provide sanitation services for village residents and state schools for far less than the cost of serving only the

villagers with VSW facilities and providing separate sanitation systems for the schools.

6) The State can provide essential and laudible services to rural Alaskans through the VSW program. Every effort should be made to solve the procedural problems involved in getting VSW facilities built and to adequately fund the program.

BACKGROUND

The Village Safe Water (VSW) Act of 1970 (AS 46.07.010-.080) calls for the State of Alaska to install "at least one facility for safe water and hygenic sewage disposal in each village". The Department of Health and Social Services (ADHSS) was originally charged with carrying out the program. In 1971, a segment of ADHSS was transferred to the Department of Environmental Conservation (ADEC) which was created by the legislature July 1, 1971. VSW activities were carried on mostly within the new department and in May of 1973, ADHSS and ADEC signed a letter of understanding which essentially turned the VSW program over to ADEC. A copy of the letter of understanding is attached to this analysis.

Voters approved a three million dollar bond issue in 1970 to fund the VSW program and another one million dollar bond issue in 1972. Little progress was made in the program, however, until December, 1972 for the following reasons: 1) no money was available to administer the program until October, 1972 and even when the VSW staff position became available, a person suitable to fill it could not be found; and 2) no provision had been made for funds to operate and maintain VSW facilities and ADEC was reluctant to construct facilities without assurance they would operate properly.

In December, 1972, a member of the ADEC staff began a survey of sanitation facilities in small villages throughout Alaska (most of which are native villages) to determine which villages were most in need of VSW projects. Letters were written to government agencies (e.g., the United States Public Health Service and the Bureau of Indian Affairs), native associations (e.g., regional corporations and health corporations) and other organizations with knowledge of village sanitation problems, requesting information and suggestions concerning plans for VSW projects. As a result of this study, 32 villages were identified as being most in need of the sanitation services specified by the VSW Act. Meanwhile, in late 1972 and early 1973, the villages of Northway and Chevak requested assistance under the VSW program in finishing central facilities they had begun to construct on their own initiative. Since Northway and Chevak had committed their own resources and thus demonstrated a sincere desire to improve sanitation in the villages, they were granted assistance. Then in early 1973, the Department of Education, lacking funds to provide water and waste service for new schools scheduled for construction in remote villages in 1973-74, asked ADEC to install VSW facilities in Alakanuk, Selawik and Nulato to provide sanitation services for the new schools to be built there in addition to providing sanitation services for the villages. ADEC agreed to do so provided the Department of Education would agree to provide all funds and logistical support necessary for continued operation and maintenance of the VSW facilities. Agreements were drawn up and signed by ADEC and the Department of Education specifying the conditions under which the VSW facilities were to be constructed and operated in Nulato and Selawik (see attached copies). Before the Alakanuk agreement got signed, the rural school capital construction program was transferred from ADOE to the Alaska State-Operated School System (ASOSS) and ASOSS assumed responsibility from the Department of Education for the schools to be built in Alakanuk, Selawik and Nulato. In addition, the Selawik school will

be managed as an independent school district starting July 1, 1974. Hence, there has been some confusion and some discord about who should be responsible for operation and maintenance of the VSW facilities being built in conjunction with ASOSS high schools.

Five villages are receiving major central sanitation facilities construction projects under the VSW program (Northway, Chevak, Alakanuk, Selawik and Nulato). In addition, Arctic Village was granted a few thousand dollars to buy washing machines and dryers to install in a facility constructed by the U. S. Public Health Service. Total expenditures in the six villages will be approximately three million dollars, leaving about one million dollars for additional projects.

DEFINITION OF PROBLEMS

OPERATION AND MAINTENANCE

The legislative assignment of the Village Safe Water program is to provide safe water, sanitary means of waste disposal, bathing and laundry facilities for the inhabitants of small villages in Alaska. Funds were made available for capital construction but no provision was made for meeting long-term operation and maintenance expenses; and virtually none of the villages are capable of sustaining a facility of the type specified by the VSW Act without financial, technical and administrative assistance.

When the Department of Education called on ADEC to build VSW facilities that could provide water and waste service for new high schools, ADEC was reluctant to devote resources intended for village service to school service. But the Department of Education was willing to provide all financial and logistical

support necessary for continued operation and maintenance of the VSW facilities, thus dissolving the major obstacle barring progress in the VSW program. So the decision was made to serve the schools with the village VSW facilities in return for the operation and maintenance guarantee from ADOE.

Unfortunately, the basic premise upon which the decision was made to build VSW facilities in conjunction with the high schools in Alakanuk, Selawik and Nulato got lost in the shuffle when ASOSS assumed control of the rural school capital construction program. ASOSS was reluctant to accept the responsibility for operation and maintenance which the Department of Education had previously accepted, which acceptance was the only reason ADEC had agreed to serve the schools with VSW facilities in the first place. By this time, the contracts for the joint VSW-school construction had been awarded and construction was far enough along that the projects could not be cancelled. Fortunately, ASOSS has recently agreed to provide $6,000.00 per month for VSW water and waste service for the schools at Alakanuk and Nulato.

JOINT CONSTRUCTION

Joint capital construction refers to the construction of two or more separate projects by one contractor under one contract. Joint capital construction should not be confused with the cooperative venture of having other State facilities like schools receive sanitation services from VSW facilities.

One purpose of this issue analysis is to investigate the assumption it is cheaper to construct capital facilities in remote Alaskan villages simultaneously and under the same contract whenever possible. The VSW projects and State high schools in Alakanuk, Selawik and Nulato were expected to cost less by joint con-

struction than if they were built under individual contracts. So far, the VSW facilities are costing more than twice what was originally estimated by the architectural and engineering consultants retained by the Department of Public Works, Division of Buildings; and the facilities themselves have been scaled down.

PLANNING AND BUDGETING

The Village Safe Water Act calls for safe water, sanitary waste disposal, bathing and laundry facilities in every village in Alaska. But VSW facilities need not be installed in all villages because the U. S. Public Health Service (USPHS) is charged with providing sanitation facilities in native villages. Hence, intentions of the federal program are very important in VSW program planning. Unfortunately, the USPHS priority list and plans for sanitation facilities construction projects vary greatly from year to year, making it difficult to plan VSW projects accordingly. To make matters worse, the USPHS has recently been directed to devote most of its sanitation facilities construction effort to serving new housing projects. Virtually the entire program thus becomes subject to the dubiety of rural housing construction programs in Alaska.

Essential to long range planning for the Village Safe Water program are estimates of how much the program will cost and a description of the schedule according to which expenditures should be made. The cursory inventory of village sanitation needs made by the ADEC staff in 1973 served only to identify 32 villages with the most obvious and critical needs. More thorough investigation is necessary to gather field data and coordinate USPHS and VSW efforts to determine which villages should have VSW projects. Once the villages are identified, engineering field studies must be made to serve as the basis for

preliminary design of facilities and cost estimates. Then, and only then, will the capital spending needs of the VSW program be known with confidence.

ANALYSES

OPERATION AND MAINTENANCE

A facility to provide the services specified by the Village Safe Water Act must contain sophisticated equipment and applicances. Since public health is at stake, water and waste treatment systems must be kept operating properly at all times. Hence, at least one full-time, trained and paid maintenance man must attend every VSW facility.

Virtually all of the maintenance people will have to come from the villages where VSW plants are installed because "outsiders" are usually reluctant to take up residence in remote villages. Since people with the training and experience necessary to operate and maintain a VSW facility are usually not available locally, an elaborate, extensive and continuing program for training of VSW plant operators is required.

A continuous and generous flow of revenue will be required to meet the operation and maintenance expenses of VSW facilities. In addition to the plant operator(s) salary, there will be treatment chemicals, electricity, fuel and replacement and repair parts to buy. Operation and maintenance expenses for just a small facility (e.g., 2 washers, 2 dryers, 2 showers, 2 rest rooms, 2 saunas, water supply and waste disposal) could run at least $25,000 per year (1974 prices), excluding amortization of capital costs for replacement purposes. For the larger facilities being built in Alakanuk, Selawik and Nulato, operation

and maintenance expenses could reach ninety to one hundred thousand dollars per year (excluding amortization).

Sources of revenue in the villages are limited. Individuals who use the VSW facilities will pay fees, but fees cannot be so high people no longer can afford to use the facilities. Two to three thousand dollars per month might be raised through users' fees in larger villages (400 to 500 residents) and proportionately less in smaller towns. Public health clinics, some owned by the U. S. Public Health Service and some owned by the villages, are possible sources of revenue but no more than $500 to $1,000 per month. Whether or not the health clinics can be assessed that much for water and waste service has yet to be determined. Schools are also potential users of VSW water and waste service and sources of revenue. In the past, both BIA and State schools have had their own water supply and waste treatment systems, unless service from other systems was available. Most school systems, however, do not meet water supply criteria and waste disposal requirements of the State. To provide a water and waste system for a school capable of meeting State requirements could cost as much as seventy or eighty thousand dollars per year including capital, operation and maintenance costs. The actual cost at a given school would depend, of course, on such things as availability of water, environmental conditions for waste disposal, size of school, and rate of increase in replacement costs. How much a school is assessed for VSW plant service might reasonably be based on what it would cost the school to provide its own services.

In the final analysis, some minimum amount of money will have to be forthcoming every year to meet operation and maintenance expenses if VSW facilities are to serve their intended purpose. The major sources of those funds are public

health clinics, schools and individual facility users. Revenue from individual users and clinics is limited to less than half the VSW facility revenue requirements. Hence, more than half the operation and maintenance costs will have to be picked up by the schools or some other source. The schools are understandably reluctant to commit large amounts of education funds to water and waste service. But such service is as essential t a school as its heating system or roof; and that service must be provided by the school if a VSW facility is not to serve the school. According to estimates done by ADEC, the annual cost (amortization of capital construction plus operation and maintenance) for a school to have its own water and waste system is eighty percent or more of the total annual operation and maintenance costs for a VSW facility serving both the school and the village. Hence, even if the schools agree to pay all operation and maintenance expenses for VSW facilities, the State would be providing adequate water and waste systems for its schools, and sanitation facilities villages for only about twenty percent more than it would cost to provide water and waste service for the school alone. Capital costs of VSW facilities is not included in the above cost comparisons for school water and waste service because the VSW facilities would be built to serve the villages regardless of school participation. Schools would probably not have to meet all operation and maintenance expenses for VSW facilities anyway, because some revenue will be generated by villagers using the facilities and perhaps USPHS clinics and other users.

It is obvious that inter-agency planning needs to be done concerning water and waste utilities in remote villages. Some of the questions that need answers are: How will operation and maintenance of VSW facilities by provided for? Where will operation and maintenance revenue come from? How can rural schools

best be provided water and waste service? What agency should administer State capital and operation and maintenance funds? Should the VSW program provide water and waste service in remote villages on a continuing basis (including periodic replacement of facilities as required); and if so, should the program be given the relative permanence of general fund support as opposed to dependence on bond elections?

Some alternatives to consider are: 1) a grant program to subsidize rural water and waste utility service, 2) a system of State owned and operated facilities to provide water and waste service in remote areas, 3) a utility system owned and operated by native organizations either as a service or a profit making venture (perhaps subsidized by the State), or 4) a public utility managed by a private organization perhaps controlled and subsidized by the State.

JOINT CONSTRUCTION

Whether or not it is more efficient to construct two or more State capital projects jointly (one contract) in a remote village than to build them separately is not an easy question. At first blush, one might think it obvious joint projects would be cheaper since contractor mobilization costs should be less and one large contract should be cheaper to administer than two or more smaller ones. Experience, however, has not given unqualified support to that thesis.

Experience with joint construction in the VSW program is limited to the three projects in Alakanuk, Selawik and Nulato. They have been very unsatisfactory projects from ADEC's point of view in that they have cost double what

was anticipated, the facilities had to be scaled down as costs became exhoritant, and monitoring the contract procedure became virtually impossible. The causes of these problems are many and complex. Perhaps among them are: 1) the jobs were big and complex enough that including them in one contract was unwieldy, 2) the consulting engineers and architects did less than satisfactory work, 3) the contract documents were poorly and incompletely done, 4) ADEC did not exert enough control over work done by the consulting engineers and architects, 5) the Division of Buildings did not (perhaps due to lack of time and expertise) critically monitor work prepared by the consulting engineers and architects, and 6) ADOE imposed a severe time limit on time available to prepare the projects for construction.

The major and perhaps root cause of the many problems with the three projects was lack of time for adequate design and contract preparation. The consulting engineers and architects claim they did not have time to do the kind of job they would like to have done. On the other hand, in preliminary negotiations with the consultants about doing the jobs, they indicated the limited time would be "no problem". The Division of Buildings might have been expected to notice the inadequacies in the consultant's work, but they claim not to have had time to review the work properly. Lack of expertise may also have been a factor. Perhaps ADEC should have kept closer track of work done by the consultants; but being insulated from the consultants, contracts and contractors by the Division of Buildings made communication and effective participation difficult.

Joint construction may be just too difficult to organize and administer (at least for certain types of projects) given State construction procedures. On the other hand, ADEC's disappointing experience in joint construction may

be due to causes not attributable to joint construction per se. Perhaps some future VSW projects should be built with ADEC managing consultants and contracts directly to see if that method has advantages. Another possibility is force account work, managed either by ADEC or the Division of Buildings.

PLANNING AND BUDGETING

Planning

The three primary planning needs in the Village Safe Water Program are: 1) to identify those villages where VSW facilities should be installed, 2) to determine what services should be provided by each facility to be built, and 3) to establish a schedule according to which the projects are to be constructed.

The Village Safe Water Act clearly calls for water supply, waste disposal, laundry and bathing facilities in <u>every</u> village with between 25 and 600 inhabitants in Alaska. Ostensibly, the USPHS has the similar mission of providing water distribution and waste collection and disposal systems in <u>native</u> villages in Alaska. USPHS usually installs relatively elaborate systems to provide running water and sewage disposal service to each house. Since the USPHS systems are usually more desirable than VSW facilities both for public health reasons and from the villages' standpoint, it seems reasonable to plan VSW projects only where USPHS systems have not been and perhaps will not be installed. If the USPHS really does intend to provide water and waste disposal services in all native villages, the VSW program's purpose is only to provide interim sanitation services until the USPHS mission is accomplished. But if some villages are destined never to receive USPHS projects, VSW program planning is greatly influenced by the dependability of USPHS planning.

Determining what services should be provided by each VSW facility involves working closely with the village involved. Traditional bathing practices might suggest a type of bathing facility to include in the VSW plant (e.g., traditional fire bath suggests sauna bath). Raw water availability and quality will determine the water source and treatment system. Local environmental conditions greatly influence the choice of waste treatment and disposal system. And the size and type of building to erect, foundation requirements, heating needs, and other physical features of the intended facility are also functions of local conditions.

A critical factor in deciding what services to provide is the village's ability to operate and maintain the facility. More services require more extensive facilities which are more difficult and expensive to operate and maintain. Most villages are currently unable to support even a minimal water supply and bathing center without participation by schools or outside assistance. State schools and village residents can both be provided sanitation services from VSW facilities cheaper than if the villagers have VSW facilities and the schools have separate sanitation systems. Hence, financial participation by State schools in operation and maintenance of VSW facilities is desirable unless some other form of assistance is made available. <u>In no case should a VSW facility be built unless and until dependable provisions have been made to operate and maintain it</u>.

Scheduling the construction of VSW projects involves prioritizing the projects according to some set of criteria. The system used so far by ADEC is described later in this report.

Budgeting

Funding decisions concerning the VSW program must be based on knowledge

of the program's mission. If one-time capital construction facilities for an identified number of villages is the intent, the VSW program is finite. After the qualified villages have been identified, preliminary engineering investigations and design could be done to serve as the basis for cost estimates, and total cost of the program would be known. If continuing provision of sanitation services in some number of qualified villages is the intent, the VSW program is continuous and includes involvement in operation, maintenance and replacement of facilities.

A great deal of time and money is required to make the preliminary engineering field investigations and designs essential for accurate cost estimations, and dependable cost estimates for the VSW and every other State program are absolutely essential in planning State services and making state budget decisions. All too often ADEC and most other State agencies are asked for spur-of-the-moment cost estimates for capital construction projects. Such estimates can be correct only by coincidence, and they do more harm than good when appropriations based on them prove inadequate. Advance planning money must be provided so preliminary engineering and cost estimates can be done before budgeting. ASOSS was recently authorized a $400,000.00 advance planning revolving fund for planning capital projects. The VSW program would benefit greatly from a similar fund.

PRIORITY CRITERIA

To date there has been little need for priority criteria for VSW projects. Staff and money have not been available to identify villages qualified for and in need of VSW assistance, so there is little to prioritize. Thirty-two villages were identified as being in critical need of a safe water source, but much

more study and coordination is necessary to determine which villages should receive VSW assistance and the extent of each facility.

In general, only villages in most critical need of a safe water supply have been considered for VSW projects. Also important is the village's ability to operate and maintain facilities installed, either unassisted or through arrangements with a school, PHS clinics or other sources of revenue.

Nearly three-fourths of the VSW program's bond money was used for the three joint projects with ASOSS high schools. Those projects were chosen less according to VSW priority criteria than in response to Department of Education pleas and expressed willingness to operate and maintain the finished facilities. Remaining money will be devoted to three or four villages where water supply needs are critical and schools and clinics can provide revenue for operation and maintenance.

INTER-AGENCY COORDINATION

Coordination of VSW program planning with planning for USPHS sanitation facilities projects is vital. The relationship between the two programs was described earlier. ADEC has recently taken the initiative in establishing a routine by which USPHS and ADEC can communicate more openly and coordinate planning for village sanitation projects more fully. Copies of correspondence concerning this initiative are attached to this report.

Coordination of VSW program capital construction with other State capital construction projects may or may not be imperative depending on whether or not joint construction is judged desirable for rural capital projects. The assump-

tion that joint construction is desirable is made questionable by experience in the VSW program. If the problems with joint construction can be overcome, the obvious center for coordination of projects should be the agency administering the joint ventures--probably the Division of Buildings. Coordinating and programming all State rural capital construction projects would be a massive task, however, to say nothing of managing the joint projects themselves.

Further direction for inter-agency coordination will be pointed out if and when the questions posed earlier in this report and requiring the attention of inter-agency planning are answered. Coordination with AVEC might allow VSW facilities to make use of waste heat from power generators. Other State installations (e.g., road maintenance shops, airfield maintenance shops and Fish and Game projects) might be coordinated with the VSW program to receive water and waste services.

THE BRIGHT SIDE

The purpose of an issue analysis is to focus on the problems in a program. But many things are right about the VSW program. There is a desperate need for sanitation services in Alaskan villages; and VSW facilities, despite past problems with getting them built, can help satisfy that need. Village schools face critical water supply and waste disposal problems which VSW facilities could help solve. The relatively unspoiled and often fragile natural environment of rural Alaska must be protected from the insults of improper disposal methods for human wastes. VSW facilities offer that protection.

The VSW program is new and virtually without precedent. The growing pains described in this analysis are perhaps part of the experience out of which can grow an efficient and popular service by the State.

LETTER OF UNDERSTANDING

This letter of understanding is entered into this _____ day of May 1973 between the Department of Health and Social Services and the Department of Environmental Conservation. The terms of this letter of understanding are as follows:

1. The Department of Environmental Conservation agrees to do all planning and engineering with regard to Village Safe Water Act facilities.

2. The Department of Health and Social Services agrees to approve all planning and engineering by the Department of Environmental Conservation and the expenditures of all funds made by the Department of Environmental Conservation for Village Safe Water Act facilities.

3. The Department of Environmental Conservation agrees to accept all responsibility for Village Safe Water Act facilities.-

Frederick P. McGinnis Commissioner Department of Health and Social Services	Max C. Brewer Commissioner Department of Environmental Conservation

AGREEMENT CONCERNING VILLAGE SAFEWATER

ACT FACILITY AT SELAWIK, ALASKA

This agreement is made and entered into this 29 day of June, 1973 between the Department of Environmental Conservation, State of Alaska, the Department of Health and Social Services, State of Alaska, the Department of Education, State of Alaska, and the City of Selawik, Selawik, Alaska, for the purpose of providing for the construction and the continued operation and maintenance of a Village Safewater Act (AS 46.07.010 - .080) facility at Selawik, Alaska. The terms of the agreement are as follows:

1. The Department of Environmental Conservation and the Department of Health and Social Services agree to provide the capital funds necessary to construct a Village Safewater Act facility at Selawik, Alaska, in conjunction with the construction of the high school facility of the Department of Education at Selawik, Alaska.

2. The City of Selawik agrees to be responsible for the operation and maintenance of the Selawik Village Safewater Act facility constructed in accordance with this agreement.

3. The Department of Environmental Conservation, the Department of Health and Social Services and the Department of Education agree to encourage the City of Selawik to develop, adopt and enforce an ordinance requiring the members of the community to take their garbage to the incinerator and their chemical toilet wastes and honey bucket wastes to the sewage treatment plant located in the Selawik Village Safewater Act facility.

4. The Department of Environmental Conservation, the Department of Health and Social Services and the Department of Education agree to

encourage the City of Selawik to adopt a fee schedule for the use of the Selawik Village Safewater Act facility, the revenues of which will be used to replace such items as washing machines and dryers as necessary.

Agreed to this 21 day of June, 1973.

Max C. Brewer, Commissioner
Department of Environmental Conservation
State of Alaska

James F. McClain
Acting Deputy Commissioner
Frederick P. McGinnis, Commissioner
Department of Health and SOcial Services
State of Alaska

Asst to Comm.
Marshall L. Lind, Commissioner
Department of Education
State of Alaska

Oran Walton, Mayor
City of Selawik

AGREEMENT CONCERNING THE OPERATION AND MAINTENANCE OF THE VILLAGE SAFEWATER ACT FACILITY AT SELAWIK, ALASKA

This agreement is made and entered into this 29 day of June, 1973 between the City of Selawik and the Department of Education, State of Alaska. The terms of the agreement are as follows:

1. The City of Selawik agrees to permit use of the Village Safewater Act facility to be located at Selawik, Alaska, by the schools of the Department of Education at Selawik, Alaska.

2. The Department of Education agrees to provide to the City of Selawik all funds and logistical support necessary for the continued operation and maintenance of the Village Safewater Act facility at Selawik. Operation and maintenance includes all repairs whether minor or major in nature. However, repair does not include re-construction of the Selawik Village Safewater Act facility if such facility is substantially or entirely destroyed.

Agreed to this 29 day of June, 1973.

for Dr. Marshall L. Lind, Commissioner
Department of Education
State of Alaska

Oran Walton, Mayor
City of Selawik

Approved to this 12th day of July, 1973.

Dr. Max C. Brewer, Commissioner
Department of Environmental Conservation
State of Alaska

James F. McClain
Acting Deputy Commissioner
For Frederick P. McGinnis, Commissioner
Department of Health and Social Services
State of Alaska

Jónas Ramoth, President
Selawik Advisory School Board

AGREEMENT CONCERNING VILLAGE SAFEWATER
ACT FACILITY AT NULATO, ALASKA

This agreement is made and entered into this 17th day of May, 1973 between the Department of Environmental Conservation, State of Alaska, the Department of Health and Social Services, State of Alaska, the Department of Education, State of Alaska, and the City of Nulato, Nulato, Alaska, for the purpose of providing for the construction and the continued operation and maintenance of a Village Safewater Act (AS 46.07.010 - .080) facility at Nulato, Alaska. The terms of the agreement are as follows:

1. The Department of Environmental Conservation and the Department of Health and Social Services agree to provide the capital funds necessary to construct a Village Safewater Act facility at Nulato, Alaska, in conjunction with the construction of the high school facility of the Department of Education at Nulato, Alaska.

2. The City of Nulato agrees to be responsible for the operation and maintenance of the Nulato Village Safewater Act facility constructed in accordance with this agreement.

3. The Department of Environmental Conservation, the Department of Health and Social Services and the Department of Education agree to encourage the City of Nulato to develop, adopt and enforce an ordinance requiring the members of the community to take their garbage to the incinerator and their chemical toilet wastes and honey bucket wastes to the sewage treatment plant located in the Nulato Village Safewater Act facility.

4. The Department of Environmental Conservation, the Department of Health and Social Services and the Department of Education agree to encourage the City of Nulato to adopt a fee schedule for the use of the Nulato Village Safewater Act

ATTORNEY GENERAL, STATE OF ALASKA
STATE CAPITOL
POUCH K, JUNEAU, ALASKA
PHONE 586-5391

facility, the revenues of which will be used to replace such items as washing machines and dryers as necessary.

Agreed to this 11th day of July, 1973.

Dr. Max C. Brewer, Commissioner
Department of Environmental Conservation
State of Alaska

James F. McClain
Acting Deputy Commissioner
Frederick P. McGinnis, Commissioner
Department of Health and Social Services
State of Alaska

Dr. Marshall L. Lind, Commissioner
Department of Education
State of Alaska

Ivan Sipary, Mayor
City of Nulato

April 23, 1974

Mr. Edmund S. Jacobsen
Sanitary Engineering Director
U.S. Public Health Service
P.O. Box 7-741
Anchorage, Alaska 99510

Dear Mr. Jacobsen:

Long range planning for the Village Safe Water Program is currently being done in the Alaska Department of Environmental Conservation. The purposes of the planning are to identify communities where Village Safe Water facilities should be built, determine what services should be included in those facilities, and estimate their costs.

Critical factors in deciding where Village Safe Water projects will be located are past activities and future plans of your Sanitation Facilities Construction program. We feel the water distribution and waste collection and treatment systems installed by your agency are highly desirable in any community for which they are feasible. Hence those villages intended to receive a Public Health Service project are not likely to be considered for the centralized facilities authorized by the Village Safe Water Act.

In short, our planning is greatly dependent on your planning. I suggest our agencies get together soon to discuss and work out a cooperative and continuing planning procedure whereby our individual efforts to provide remote sanitation facilities can be clearly defined and programmed. Please let me know your reaction to this proposal and feel free to suggest a time, place, and format.

Sincerely yours,

Max C. Brewer
Commissioner

cc: Brewer
Cherry
[illegible]
[illegible]
[illegible]

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION

File - PHS

ALASKA AREA NATIVE HEALTH SERVICE
BOX 7-741
ANCHORAGE, ALASKA 99510

May 1, 1974

Refer to: A-OEH

Dr. Max C. Brewer, Commissioner
Dept. of Environmental Conservation
Pouch "O"
Juneau, Alaska 99801

Dear Max:

I was glad to receive your letter of April 23, suggesting a planning meeting to coordinate our efforts in the various villages in Alaska.

I would like to suggest a meeting in Anchorage. The time could be arranged to coincide with some trip you have to make to Anchorage. Just let us know about a week in advance and we'll arrange to be available.

I would suggest that the meeting be quite informal. First you or your staff could present your program and explain the limitations or constraints of the operation; then someone from our office could explain our program and the limitations imposed by our operating policies. A discussion of possible joint effort and each agency's construction schedule would follow from this.

Let us know when you will be able to meet or if you have any other suggestions.

Sincerely,

Edmund S. Jacobsen, P.E.
Sanitary Engineer Director
Chief, Office of Environmental
Health

vz

May 22, 1974

Edmond S. Jacobsen
Chief, Office of Environmental Health
Alaska Area Native Health Service
P.O. Box 7-741
Anchorage, Alaska 99510

Dear Mr. Jacobsen:

Your recent encouragement of a meeting to discuss coordination of our rural sanitation facilities programs is gratifying. As was pointed out in my last letter, we would like to avoid spending Village Safe Water Act funds in villages where water distribution and waste disposal systems have been or soon will be built by your agency. Hence the coordination I speak of is less in the form of joint projects and more in terms of establishing a procedure to insure mutual understanding of the year by year intentions of our two agencies.

I suggest we schedule semi-annual meetings to be held alternately in Juneau and Anchorage. At these meetings you or members of your staff could describe your most current plans for sanitation facilities projects, and I or members of my staff could do the same for Village Safe Water projects. These meetings would at least improve communications between our agencies and help avoid conflict in our rural activities.

Let me know what you think of my suggestions. If you agree with the intent, perhaps we can schedule a meeting to discuss details in the near future.

Sincerely,

Max C. Brewer
Commissioner

MCB:JWS:lt
bc: Cherry
Lowery
Scribner

of ALASKA MEMORANDUM

RECEIVED
JUN 26 1974
BUDGET & MANAGEMENT

TO: M.R. Charney, Director
Division of Budget & Management
Department of Administration

DATE : June 25, 1974

FROM: Buel A Taggart
Commissioner
Department of Public Works

SUBJECT: FY 76 Issue Analysis Village Safe Water Projections
131-1-03 P

We are submitting the following analysis on the issue of Village Safe Water Projection, prepared by the Division of Buildings, Department of Public Works.

Summary and Conslusions

The Village Safe Water Act of 1970 (as 46.07) provides that safe water and sewage disposal shall be provided to villages in the State.

Program costs could be reduced by developing a more efficient design utilizing prefab construction methods, or purchasing prefab modules or trailers.

The Department of Public Works suggests that the program be implemented similarly to the matter it has in the past. Cooperating with other State agencies. The buildings and their contents would be designed in Alaska by Alaskan engineers and architects.

Problem Definition

The basic problem in implementing this program is developing a satisfactory design that will satisfy the Department of Environmental Conservation's requirements, and be economical to operate.

Objectives

The objectives of this issue analysis are (1) to establish criteria for a basic or standard Safe Water Facility design satisfying the requirements of the Department of Environmental Conservation, fill the requirements of the villages where the facility will be used, be economical to construct, and will adequately function with only minimum maintenance; (2) to develop guidelines for implementing a training program of adequate scope to successfully educate one or two persons in each village to perform maintenance on the structure and its associated equipment and (3) to establish a source of revenue adequate to carry out all the required activity.

Alternatives

Criteria for developing a basic or standard design for a Safe Water Project may be determined from the following information.

- Results of a subsurface site investigation & permafrost
- Availability of water on site
- The quality of the water on the site
- The types of sewage disposal already in use by local residents
- The methods used by residents to transport garbage and refuse
- The population to be served by the facility
- The projected increase or decrease in population to be served
- The ability of the community served to own and operate the facility
- Funds available for the project

Developing guidelines for a training program may be obtained by the following methods:

- Research other training programs used by other Departments, such as the Department of Labor or the Department of Education
- Make inquiries into training programs that other States have developed
- Investigate the possibility of the contractor training two or more people to operate and maintain the facility

Major Constraints

The major constraints involving the Village Safe Water Projects are:

a) The climatalogical extremes that are found in the State with the usual underground conditions, such as seasonal frost and permafrost, make designing a low-cost structure very improbable.

b) Most villages where a Safe Water Facility will be located are in areas where subsurface soil conditions will be a problem, and construction costs will be high.

c) The majority of the future Safe Water Facilities will be located in villages having very little, if any, source of revenue.

TWO

REPORT OF THE TASK FORCE ON REMOTE VILLAGE WATER FOR THE ALASKA WATER ASSESSMENT

TASK FORCE MEMBERS:

Jerry Sargent (Chairman)	-	Alaska Department of Environmental Conservation
Bill Ryan	-	Alaska Native Health Service
Dave Gray	-	Representing the Alaska Federation of Natives
Larry Kimball	-	Alaska Department of Community and Regional Affairs

Juneau, Alaska

June 25, 1976

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REMOTE VILLAGE WATER

INTRODUCTION

In late April of 1976 the chairman of the Alaska Water Study Committee (AWSC) called a meeting at which the chairman of the problem information task force on remote village water was identified, and the general objectives of the task force were given. Time budgeted for the task force to make its study and submit its report was about two months.

A great deal of information on conditions in Alaska villages has been gathered in the past for various purposes. Unfortunately, most of the data are scattered among government agencies in formats tailored to serve the specific purpose(s) for which the data were gathered in the first place. In two months, it was possible only to barely begin defining and documenting water related problems in the far flung and diverse villages of Alaska.

Members of the remote village water task force were:

Jerry Sargent (chairman)	-	Alaska Department of Environmental Conservation
Bill Ryan	-	Alaska Native Health Service
Dave Gray	-	Representing the Alaska Federation of Natives
Larry Kimball	-	Alaska Department of Community and Regional Affairs

TASK FORCE ASSIGNMENT

The overall mission of the task force on remote village water as assigned by the AWSC was "development of additional information on those (remote village water related) problems considered to be serious and of immediate concern". Specific activities assigned to the task force were:

1. Review the technical memoranda for Activities 1 and 2 of the Alaska Water Assessment, and suggest appropriate changes.
2. Develop documentation for remote village water problems.

3. Describe the effects (adverse and beneficial) of not solving each problem.

4. Consider alternatives for solving the problems, and assess impacts of solutions.

5. Make any recommendations to the AWSC which the task force considers appropriate.

TASK FORCE ACTIVITIES

In order to schedule task force efforts such that as much as possible of the information requested by the AWSC could be provided, the following outline of activities for task force members was prepared:

1. Review technical memoranda for Activities 1 and 2 of the Alaska Water Assessment.

2. Develop a list of suspected water related problems in Alaska villages. Also, list all "places" considered villages for the purposes of this task force study.

3. Inventory the current status of Alaska villages with respect to the water related problems listed in 2 above.

4. From the inventory in 3 above, confirm or discount problems listed in 2 above. The inventory is documentation of confirmed problems.

5. Evaluate problems confirmed in 4 above in view of the State Regional Futures in the technical memorandum for Activity 2 of the Alaska Water Assessment.

6. Speculate about what new water related problems might arise in Alaska villages in view of the State Regional Futures.

7. Describe consequences of not solving problems identified in 4 and 6 above.

8. Discuss alternatives for solving problems listed in 4 and 6 above, and estimate consequences and impacts of solving them.

With time to complete all eight of the activities listed above, the task force might have arrived at a clear definition of water related problems in remote Alaska villages, along with alternatives for solutions. But in the two months available to the task force and with the efforts of the task force members being an addition to their full time jobs, only a beginning could be made.

Review of Technical Memoranda

The short section on remote village water in the technical memoranda for Activities 1 and 2 are very general, and none of the broad generalities seemed to be greatly in error. The few comments by task force members on the technical memoranda are:

1. For the purposes of the Water Assessment, the number of villages, or "small communities that are remote geographically, and in many cases culturally, from the state's population centers" (quoted from the Activity 2 technical memorandum) was determined by the task force to be 201.
2. The technical memoranda were correct in stating "The greatest difficulty with water systems may not be in getting them installed, but keeping them running." The task force would change the word "may" to "is".
3. The state's Village Safe Water (VSW) program is currently structured and funded adequately to maintain VSW systems after installation, a statement to the contrary in the Activity 2 technical memorandum notwithstanding.
4. Questions raised about the appropriateness of water quality standards in the Activity 1 technical memorandum also apply to waste treatment and disposal standards.
5. In the Activity 1 technical memorandum, complicated and difficult logistics should be added to "cold climate and permafrost" as factors complicating solutions to remote village water problems.

Water Related Problems in Remote Villages

Members of the task force were asked to reach a concensus on a list of the general categories of remote village water problems. The list of problems is:

1. Domestic Use
2. Industrial and Institutional Use
3. Contamination by Waste Disposal
4. Flooding
5. Erosion

After lengthy discussion, water based transportation was eliminated from the list of problems since that problem might be more legitimately included in a transportation study. Also, human use or consumption of water resources has not yet resulted in water transportation problems that did not exist independent of human activity.

Current Status of Remote Villages

Need For Inventory

The task force as a group confirmed what the individual task force members had previously suspected independently, to wit there is no comprehensive compilation of data by which the severity and extent of the water related problems listed in the previous section of this report could be assessed. Hence it became necessary to gather and compile the appropriate data from various files and references.

A comprehensive and accurate inventory of the status of remote villages with respect to water related problems will take many months to prepare. Incidentally, such an inventory will be done as part of a joint program planning effort between the Alaska Department of Environmental Conservation's Village Safe Water Program and the USPHS Alaska Native Health Service. For the purpose of the task force study, however, only a barely cursory inventory could be done. Hence conclusions drawn from the inventory done by the

task force, and presented in this report, must be considered only a gross first estimate of village conditions, subject to many omissions and errors in data for individual villages.

The Inventory

Choices of data to include in the inventory were based on what information was needed to judge the extent and severity of the 5 remote village water problems listed earlier in this report. Categories of data sought for each village included in the study (a total of 201 villages) were: a) population, b) number of homes, c) present domestic water supply, d) adequacy of present domestic water supply, e) planned or ongoing improvements in present domestic water supply, f) housing projects planned, g) name and description of institutions and/or industrial establishments, h) present water supply for institutions and industrial establishments, i) adequacy of present water supply for institutions and industrial establishments, j) planned capital projects, k) garbage disposal method, l) domestic sewage disposal method(s), m) industrial and institutional sewage disposal method(s), n) other man-made contamination of natural surface or subsurface waters, o) frequency of flooding, p) severity of flooding (percent of village), q) type of flooding, and r) whether or not there is an erosion problem. All catagories of information were not, of course, available for all 201 villages.

Domestic Use- The severity of the village domestic water use problem was judged based on data from 190 villages. The villages were categorized as: 1) hauling water from undeveloped and unimproved sources, 2) hauling water from a developed source(s), and 3) having water service to each home (including individual wells, piped service, and vehicle delivery). If the service from a water supply system in category (2) or (3) appeared reasonably dependable (in quality and quantity) and convenient to consumers, the village with that system was considered not in need of immediate domestic water use improvements. On the other hand, all villages in category (1), and any villages in categories (2) and (3) with undependable or unreasonably inconvenient systems were considered in need of immediate domestic water use improvements.

Table I is a summary of the domestic water use data.

TABLE I. Domestic Water Use Summary

	Category	Number of Villages	% of 190
1.	Haul water from undeveloped source(s)	48	25
2.	Haul water from developed source(s)	63	33
	a. Portion of 2 adequate	34	18
	b. Portion of 2 inadequate	29	15
3.	Have water service to homes	79	42
	a. Portion of 3 adequate	54	28
	b. Portion of 3 inadequate	25	13
4.	Require immediate improvements in domestic water use (1 + 2b + 3b)	102[a]	54
5.	Do not require immediate improvements in domestic water use (2a + 3a)	88[b]	46

a. Represents a total population of 24,105 or 49% of the villages' population.

b. Represents a total population of 24,957 or 51% of the villages' population.

Industrial and Institutional Use- The severity of industrial and institutional water use problems was evaluated based on data from 141 villages containing a total of 358 institutions and industrial establishments. Data were not readily available on industrial and institutional water use in the other villages.

The water supplies of the 358 institutions and industrial establishments were categorized (see Table II) as adequate, moderately inadequate, and severly inadequate.

TABLE II. Industrial and Institutional Water Use

Category	Number of Institutions and Industrial Establishments	% of 358
Have an adequate water supply[a]	170	48
Have a moderately inadequate water supply	127	35
Have a severely inadequate[b] water supply	61	17

a. Adequate means piped service to a building plumbing system, with water of reasonably acceptable quality and quantity.

b. Severely inadequate means water is unreasonably difficult to obtain and/or quality is poor enough to discourage consumption.

Contamination by Waste Disposal- In evaluating the extent of man-made contamination of natural surface and subsurface waters around remote villages, the task force examined garbage disposal methods, sewage disposal methods and any other evidence of contamination (e.g. fuel spills) in sources from which the inventory was drawn. The severity of village water contamination was judged based on data from 146 villages. Those villages were categorized as having no evidence of contamination of natural waters, having severe and hazardous water contamination problems, and having conditions such that contamination of natural waters is very likely (even though no immediate or severe consequences of such contamination are evident). A severe and hazardous contamination problem is defined as a situation where direct contact between people and untreated sewage is possible (e.g. honey buckets dumped on a river bank, cess pool contents flooding to the ground surface).

A summary of the data on contamination of natural waters around remote villages is shown in Table III.

TABLE III. Contamination of Natural Waters

Category	Number of Villages	% of 146
No evidence of Contamination	45	31
Severe and hazardous contamination exists	70	48
Potential for contamination exists, but no immediately hazardous situation exists	31	21

Flooding- The flood data used in this study were taken from the Flood Hazard Information summary prepared by the Alaska District of the Corps of Engineers. Of the 201 remote villages (as defined for the purposes of this study) the Corps of Engineers Flood Hazard report contained sufficient information on 174. Those 174 villages were categorized as having a severe flooding problem (at least 20% of the village flooded at least once every 5 years), a minimal flooding problem (any portion of the village flooded no more frequently than once every 100 years) and a moderate flooding problem (any village not in the severe or minimal categories). Table IV is a summary of the flood data.

TABLE IV. Flood Hazard

Category	Number of Villages	% of 174
Severe flood problem	10	6
Moderate flood problem	96	55
Minimal flood problem	68	39

Erosion- The erosion data used in this study came from the same source as the flood data. The Corps of Engineers report only indicates whether there is or is not erosion at a given village site. Apparently the Corps indicates an erosion problem if they have ever received reports revealing such a problem. Lacking such a report, no erosion problem is indicated. In other words the erosion data are not the result of systematic evaluation of the erosion situation at all villages. The Corps Flood Hazard report has erosion data on 192 of the 201 villages in this study. Of those 192 villages, 86 are reported as having an erosion problem (45%), while 106 are listed as not having erosion problems (55%).

Evaluation of Problem List After Inventory

In general, the inventory data confirm that domestic use, industrial and institutional use, contamination by waste disposal, flooding and erosion are indeed significant problems for remote Alaska villages. Extrapolating the data to all 201 villages included in the study, which represents a total population of 50,345, the following conclusions are drawn:

1. Domestic water service to about 24,000 people in rural Alaska is in need of immediate improvement.

2. Water service to about 106 institutions and industrial establishments in rural Alaska is severly inadequate, while service to about 219 institutions and industrial establishments is moderately inadequate.

3. In 96 Alaska villages there is severe and hazardous contamination of natural surface and/or subsurface waters due to disposal of man-made wastes. In another 42 villages the potential for such contamination exists.

4. The task force was surprised to learn that only about a dozen villages have a severe flooding problem by the definition of severe used in this report and according to data from the Corps of Engineers. It must be pointed out, however, that "severe" means different things to different people, and less than half of the villages can be considered as not having flooding problems.

The task force is convinced that flooding is a major problem in Alaska that cannot be overlooked. It is also important to recognize that "flooding" can refer to a threat from both high water and moving ice.

5. The erosion data gathered for this study do little to confirm, discount or quantify the extent of erosion problems in Alaska villages. It is probably safe to speculate, however, that at least half (and perhaps far more) of the 200 plus villages in Alaska face erosion problems.

Remarks

Gathering the inventory data and evaluating the current status of remote village water problems consumed nearly all the time available to the task force for this study. Hence little time was spent analyzing the State Regional Futures, predicting consequences of not solving water related problems, and describing alternatives for solving problems. Those issues were discussed, however, in a lengthy and wide-ranging meeting of the task force. Following is a summary of the major points made during that meeting.

1. Inadequate water supply and waste disposal systems in villages cause health problems and make life unnecessarily uncomfortable and inconvenient. A measurable portion of village disease and death rates can be attributed to substandard water supply and waste disposal methods. When village residents must devote a significant portion of their individual energies to satisfying basic sanitation needs (the same needs satisfied as an assumed matter of course for most Alaskans), less time, energy and other resources are available for more productive enterprise.

2. Water supply and waste disposal problems in Alaska villages can be solved given enough money and committment by government. The technology exists to make adequate water supply and waste disposal services available in virtually all villages. But the technology can be applied only if money is available for capital construction. And capital construction is only a beginning. Successful operation,

maintenance and management of village sanitation facilities is far more difficult to contend with than construction. Unless operation, maintenance and management problems are solved, much capital construction effort is wasted.

Satisfactory service from even the simplest water supply and waste disposal facility is doubtful unless technical, management and, frequently, financial assistance is made available to villages from outside sources. The need for assistance increases as the complexity of sanitation facilities increases. The relatively recent standards of performance imposed by government on water supply and waste disposal systems have made and will make mandatory ever more complex systems.

3. Whatever programs and funds are made available to villages for solving sanitation problems could eventually be administered through the native regional service organizations, which are primarily the non-profit counterparts of the land claim corporations and the regional health corporations. Although not currently in a position to take on complete responsibility for multi-million dollar sanitation facility programs, the regional organizations are much closer to the village people and their environment than are most government agencies. Hence if the regional organizations are willing, every effort should be made to build their ability to administer programs providing village sanitation services.

4. When a more abundant, more convenient and better quality water supply is made available in a village, the waste (especially sewage) disposal needs of that village will increase correspondingly.

5. The availability and cost of energy relate to several aspects of village water. Most of the village energy needs are met by petroleum fuels. Because of transportation problems, large storage capacities are required to sustain heat and electrical energy production throughout the winter. In addition the cost of fuel in villages ranges from two to five times the cost in major Alaskan urban centers. A majority of the villages currently

have inadequate or no bulk fuel storage capacity. The energy requirements, then, for the operation of domestic water and sewage treatment facilities are critical factors in establishing these services. Another aspect of the increased use and need for fuel in the villages is the increased threat that large scale fuel storage and delivery poses for water pollution. Alternate sources of energy have been proposed for some areas such as wind generated, hydroelectric, and geothermal power. However, these sources are only in the development stage.

6. Solutions to flooding and erosion problems are less technological than institutional and social. If founded in good comprehensive planning, possible solutions to flooding and erosion problems include relocating villages, protecting villages from damage with physical facilities (e.g. breakwaters, retaining walls), planning to accept some expected amount of damage, and lessening flood and erosion damage by modifying natural water flows. Of overriding importance, however, is the need to consider the lives, values and aspirations of the village residents.

7. Most of the villages depend on water transportation for a large portion of their bulk supplies. A large percentage of these communities are accessible by water for only a few months of the year when the rivers and the coasts are free from ice. The resultant high transportation costs and limited delivery adversely affect village development and the provision of basic goods and services. Although harbor and docking facilities, navigation aids, and flood and erosion control perscriptions can improve water transportation, the development of land and air transportation systems offers alternative and complementary solutions to transportation problems.
