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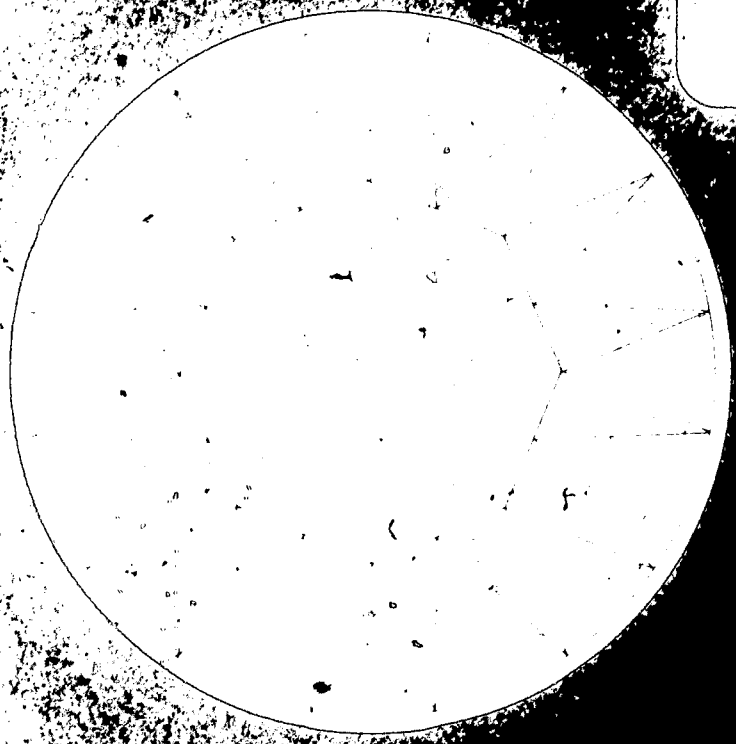
ABSTRACT

In response to the need of many individuals and communities throughout Pennsylvania for an effective network to disseminate information about water resources, a study was conducted to explore possible relationships between the Water Resources Center and the Pennsylvania Cooperative Extension Service. The report focused on a case history review of the information transfer specialist who facilitated exchanges between the two agencies. To assist the specialist, a water resources needs survey was distributed to relevant community members to determine the seriousness of local water problems. He acquired additional information through the use of trade journals, newspaper clippings, and a computer-based water resources information center. The research project has served to reinforce the feeling that the joint Water Center-Extension programs have the potential to greatly enhance the successful transfer of water resources information. (EMH)

A MULTIDISCIPLINARY APPROACH TO SOLVING COMMUNITY WATER PROBLEMS

INSTITUTE FOR RESEARCH ON LAND AND WATER RESOURCES

The Pennsylvania State University • Information Report 76



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A MULTIDISCIPLINARY APPROACH

TO SOLVING COMMUNITY WATER PROBLEMS

Information Report 76

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Institute for Research on Land and Water Resources
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1. There is potential in utilizing local Extension staffs for water resources technology transfer.

2. The well established Extension support services are valuable to any technology transfer system.

3. A competently staffed, readily accessible water resources library is an indispensable part of a water resources technology transfer program.

4. A clipping service information gathering system is a valuable tool in identifying water resources problems and in securing feedback on water resources technology transfer programs.

5. The conduct of water resources technology transfer programs can yield valuable inputs to research needs planning.

6. Technology transfer programs are highly dependent on a complex set of local institutional and attitudinal constraints which are difficult to predict.

7. Technology transfer needs must be recognized at all organizational levels before successful transfer can occur.

SECTION II

Recommendations

1. Information gained from water resources problem identification should be utilized in the planning of Water Center research and the selection of research priorities.

2. Where possible, Water Center technology transfer programs should attempt to make use of existing Extension Service education systems.

3. Water resources education should be broadly designed to take advantage of all available transfer media and reach all potential user groups.

4. To have a broad potential application many Water Center technical reports should be rewritten in simple terms to promote greater and more rapid acceptance by all potential user groups.

5. Where possible, provisions for technology transfer should be included in Water Center proposals and be funded along with the funding of Water Center research projects.

6. Coordination among Water Centers is needed so uniform policies can be developed with regard to the sharing of research reports.

7. Water Center technology transfer programs should not be limited to the transfer of inhouse research.

8. The WRSIC (Water Resources Scientific Information Center) data bank should be enlarged to permit an expansion of subject areas which deal with the most prevalent water resources problems; the precision of searches by WRSIC should be improved; and the service provided by WRSIC should be publicized more vigorously.

9. The Cooperative Extension Service should consider using the clipping service awareness technique in its educational programs.

SECTION III

Introduction

Across the broad range of research conducted at the Water Center in 12 years since its creation, many disciplines in the sciences and humanities have been represented. Perhaps the major strength of the Water Center's program is that it recognizes the complexities of water and related environmental quality problems and that the understanding and solution of these problems require a multidisciplinary approach.

This philosophy of interdisciplinary or multidisciplinary cooperation has been illustrated in many projects conducted by the Center. However, the true value of any multidisciplinary research effort is the eventual implementation of the research results into the mainstream of society where solutions to specific problems are needed.

With the growth of environmental awareness in the past few years, the Water Center has begun to recognize the importance of providing information channels to the public. In the past, the Center's information dissemination activities have been limited to the production of technical completion reports and an occasional press release. More recently, the establishment of a Newsletter has aided in the dissemination of information to research agencies, legislators, and other individuals and institutions interested in the Center's activities. However, there are still many individuals and communities throughout Pennsylvania who would benefit if an effective educational network were established for information dissemination. This network could serve as an outreach of the Water Resources Center, bringing to the people of the state the adaptive research necessary to solve local community problems.

Most recently, P.L. 88-379, "The Water Resources Research Act of 1964," was amended by P.L. 92-175. One of the major changes in the Act was to recognize and provide for ..."scientific information dissemination activities, including identifying, assembling, and interpreting the results of scientific and engineering research deemed potentially significant for solution of water resources problems, providing means for improved communication regarding such research results, including prototype operations, ascertaining the existing and potential effectiveness of such for aiding in the solution of practical problems, and for training qualified persons in the performance of such scientific information dissemination."

The Center does not possess sufficient resources to shape all lines of water resources activity throughout the state or even within the University, nor should it attempt to do so. Nevertheless,

it can aid this effort by endeavoring to develop cooperative projects with other agencies that are actively working with communities and individuals throughout the state. Therefore, the purpose of this study is to determine the program priorities and relationships that can be established in information dissemination between the Water Resources Center and the Pennsylvania Cooperative Extension Service. More explicitly, the project will involve implementation of educational programs in communities where water resource problems exist.

The educational efforts of the Pennsylvania Cooperative Extension Service represent a partnership undertaking between The Pennsylvania State University, the United States Department of Agriculture and local government and citizens. Through this delivery system more than 48,124 educational meetings were held in Pennsylvania during FY75 with a total attendance of 1,582,876 persons. Individual assistance was also provided to 1,011,631 persons throughout the Commonwealth.

The Pennsylvania Cooperative Extension Service is uniquely qualified to undertake this project in conjunction with the Water Resources Center. In striving to attain its educational role as the outreach arm of the College of Agriculture at The Pennsylvania State University, the Extension Service has established a proven and effective delivery system. This system is comprised of more than 400 professional employees, two-thirds of who are located in the 67 counties throughout the Commonwealth and the remaining number are located at the University Park Campus. Extension personnel assigned to the University Park Campus include those which make up the administrative structure of the Extension system, various support services such as publications editors, radio and television programmers, artists, visual aide specialists and various subject matter specialists scattered throughout the many departments of the College of Agriculture.

The role of the subject matter specialist is a key one in the Extension information transfer process. He is the link between the county-based staff and the University research organization. It is his job to interpret, adapt and disseminate technological innovations to the county staffs who then incorporate these advancements into their educational programs. Where necessary, the subject matter specialist participates directly in county educational programs. The specialist is also available to backstop the county staff, when technical requests need to be resolved that are beyond the county staff's capability.

In order to best take advantage of this existing technology transfer system, it was decided to use the bulk of the financial resources of this grant to hire a water resources subject matter

specialist. This specialist is tied administratively to the Extension system, but he is housed at the Water Center and works closely with the Water Center director and his supporting staff. Such an arrangement facilitates interaction between this specialist and the members of the Center's broad based multidisciplinary research teams, yet giving the specialist an Extension identity. This arrangement has thus far proved satisfactory to both the Water Center and the Extension organization.

The basis of this research report is essentially a case history review of the workings of this unique information transfer relationship and the specialist's attempts to build a viable information transfer linkage between the Water Center and the county-based extension staff. The ultimate goal of such a linkage is to facilitate the transfer of pertinent water resources research information to those user groups who are in need of the information.

SECTION IV

Water Resources Needs Survey

To introduce the new water resources specialist to the relatively large and widely dispersed Extension organization, and to gain knowledge of community water resources problems, a questionnaire survey was undertaken. This survey was also designed to introduce the specialist to other potential information transfer vehicles such as environmental regulatory agencies and to evaluate their knowledge and interests in water resources problems.

Over 450 questionnaires were either mailed out or distributed in person to local representatives. (A sample questionnaire and cover letter appear as Appendix A to this report.) Various groups who received questionnaires included County Extension Agents, Pennsylvania Fish Commission Waterways Patrolmen, Pennsylvania Bureau of Forestry Service Foresters, Soil Conservation Service District Conservationists, municipal water authorities, consulting engineers, and the League of Women Voters. In all 255, or 53 percent, of the questionnaires were returned. Table 1 summarizes the response of questionnaire recipients by organization. As Table 1 indicates, the best response was obtained from Pennsylvania Fish Commission personnel. In this case the questionnaires were fully explained at a one-day seminar and their return was required by Fish Commission supervisory personnel. All other questionnaires were mailed. The greatest return was from Soil Conservation Service personnel and Service Foresters. County Extension Agents also responded well to the questionnaire.

The ranking of local water resources problems according to "seriousness" was required of each respondent. In tabulating these responses the number of 1, 2, 3 choices for each problem were included in the tabulation. Table 2 summarizes the results of this tabulation. Table 2 results show that the various aspects of waste disposal and subsequent water pollution were thought to be the most serious problems. The ranking of on-lot disposal in the number two spot may indicate some rural bias in the survey, but it does serve to indicate the relative severity of a problem which is overlooked by most water resources needs surveys. It is also interesting to note that acid mine drainage, which is thought by many water pollution control officials to be Pennsylvania's most serious water quality problem, is ranked fourth on this list.

Also, this survey was conducted during the winter of 1973 less than six months after hurricane Agnes floods had devastated much of Pennsylvania. Despite this, flood damage was ranked fifth on the list. A closer analysis shows that even in the hard hit Susquehanna River Basin the highest ranking for flood damage was third.

Table 1: Summary of Questionnaires Returned

Respondent	Questionnaires Returned	% of Total Sent Out
Area Resource Development Agents	3	43
Service Foresters	30	77
Cooperative Extension Agents	43	64
Consulting Engineers	14	35
League of Women Voters	14	22
Municipal Watershed Managers	28	30
Soil Conservation Service	46	74
*Fish Commission Personnel	77	100

*Questionnaires were distributed at seminar and returned the next day.

Table 2: Ranking of Current Water Resources Problems According to Seriousness, 1973

Problem	Number of 1, 2, 3 Choices
1. Municipal Wastes	153
2. On-Site Disposal	122
3. Industrial Wastes	110
4. Acid Mine Drainage	95
5. Flood Damage	67
6. Water Supply	57
7. Water for Recreation	36
8. Low Stream Flow	16
9. Irrigation	1
TOTAL	720

A 1969 study by Leadley et al.* using a much similar questionnaire ranked flood damage seventh on the statewide list of problems. Leadley's top four problems agree exactly with the top four rankings in this study.

Questionnaire recipients were also asked to indicate which water resources problems would be the most serious ten years into the future. Table 3 summarizes their responses to this question. Several shifts in the order of problems are obvious from Table 3. The top three problems remain essentially unchanged. On-lot disposal and industrial wastes were rated about even as problems of the future; however, water supply moved into the top four with no clear separation from the second and third problems. Acid mine drainage became a distant fifth.

In addition to determinations of the seriousness of water resources problems, respondents were asked to evaluate the major obstacles to solving these problems. Of particular interest are those obstacles related to information transfer. A series of questions was asked pertaining to information transfer obstacles. Responses to these questions are summarized in Table 4. Table 4 indicates that the local agency people who are expected to form the information link between the subject matter specialist and the user group perceive that the necessary transfer of information from the researcher to the practitioner is occurring. Hence, they do not view information transfer as an obstacle to problem solution; consequently, little should be gained by attempts to improve the flow of information. On the other hand the respondents indicate that inappropriate public attitudes and lack of public awareness are major obstacles to resolving water resources problems. This seems to indicate that the blockage in information transfer occurs between the local practitioner and the user groups. Apparently the respondents feel that this is the result of an indifferent and unaware general public and the problem becomes one of overcoming this apathy. If one follows this hypothesis, a successful information transfer program must be one that motivates the public to acquire the needed water resources information. However, when viewed in the light of responses to other questions, the reasons for the responses to the questions about obstacles to information transfer are not very clear. For instance, when asked whether prior to receiving this questionnaire they were familiar with the Land and Water Research Institute, 61 percent responded by saying they were either unfamiliar with or never heard of the Institute. A second question asked whether the respondents had ever used research information generated by the Land and Water Research

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*Leadley, S. M., Queeney, D., Dunmore, C. and Baker, K. Water Resources Problems in Pennsylvania. The Pennsylvania State University, Institute for Research on Land and Water Resources, Information Report No. 65, University Park, Pa. 1970.

Table 3: Ranking of Water Resources Problems According to Seriousness, in 1983

Problem	Number of 1, 2, 3 Choices
1. Municipal Wastes	138
2. Industrial Wastes	107
3. On-Lot Disposal	100
4. Water Supply	98
5. Acid Mine Drainage	66
6. Water for Recreation	56
7. Low Stream Flow	38
8. Flood Damage	37
9. Irrigation	6

Table 4: Rating of Obstacles to Problem Solution

	Degree of Hindrance to Solution		
Obstacle	None to Moderate Obstacle % Indicating Nos. 1 & 2*	Moderate Obstacle % Indicating Nos. 4 & 5	Moderate to Great Obstacle % Indicating No. 3
Lack of communication between researchers and field workers	76	—	--
Lack of suitable technology	56	13	31
Unappropriate public attitudes	28	18	54
Lack of public awareness	33	21	46
Lack of cooperation among agencies	48	18	34
Lack of trained personnel at the local level	44	18	38

*For an explanation of these numbers look at item number 7 in the sample questionnaire in Appendix A.

Institute in their work. Only 27 percent of the respondents said yes. A third question asked if research and educational information generated by the Institute had improved their professional skills. Thirty-three percent answered this question affirmatively. It seems unlikely that such a high proportion of respondents (76 percent) would indicate that communication with researchers were not a problem while a similarly significant number (61 percent) would confess to not being familiar with the Institute for Research on Land and Water Resources.

The needs survey questionnaire indicates that waste disposal and related water pollution problems are perceived as the biggest water resources problem facing Pennsylvania. It also indicates that possible obstacles to effective information transfer programs dealing with these problems may involve both uninformed local transfer agents and user groups.

SECTION V

Direct Mail Test of Selected Local Disseminating Agents

Eight individual questionnaire respondents were selected to receive a packet of informational materials via direct mail so their response to this information transfer opportunity could be evaluated. A sample of this information packet appears as Appendix B. Two individuals were selected from the Extension Service, the Fish Commission, the League of Women Voters, and County Conservation District Directors.

Several criteria were used to select the individuals for this test. They had to be located in an area where water shortages had been experienced in the past, and they had to be from geographically dispersed areas across the state. The needs survey questionnaire responses were used to select the participants. One individual was selected from each group who had indicated via the responses on their questionnaire that they were interested in local water resources problems. The second individual selected from each group was one that either made no response to the questionnaire or a response indicative of limited interest in water resources problems.

An educational packet of materials which included several news releases, ten copies of a specially prepared publication and a cover letter were mailed to the selected individuals. The packet publication was specifically designed so the subject matter would have fairly broad application to the water shortage problem. Those who adopted the measures suggested in the packet could actually save money by doing so.

The Extension Service information transfer system has been used as an example by many to illustrate what can be accomplished in technology transfer. Key to the success of this transfer system has been a rather substantial financial incentive to the agricultural community to adopt the information being transferred. It was our intent to duplicate this incentive.

Several months elapsed before follow-up contacts were made with the recipients of the program packets to ascertain their ultimate disposition. A letter was sent to each person on September 26, 1973, asking the following questions.

1) Was this material of value to your conservation program?

2) Did you feel these materials were appropriate for your area of endeavor?

3) Did you disseminate the publications on water conservation to any local organizations? or governments? If so, who were they?

4) Were the news releases used by local news media? If so, what media?

5) Was any action taken to conserve water voluntarily or through governmental regulation in your county as a result of this packet of materials?

6) What did you do with these materials when you received them?

Only one person responded to this communication so an identical one was sent on November 16, 1973. This letter elicited only one more response so subsequent contacts were made by telephone. The written responses are included in Appendix B. Both of the county agents contacted by telephone had only vague recollections of receiving the packet of materials. This indicates their lack of interest in pursuing this subject. Of the two Fish Commission personnel contacted one responded by letter and the other was contacted by phone. The individual in this group that was expected to respond most favorably did so. The other individual said that he had forwarded the information on to a local newspaper. He also said that the information was useful and that he would like to continue receiving water resources information. It was not expected that these Fish Commission personnel would have much use in their work for this information. However, the important thing was that both individuals read and evaluated the information and then disseminated it further.

The individuals from the League of Women Voters were contacted by phone and letter. One responded by letter and again it was the individual which the questionnaire response indicated would respond most favorably. This individual did not incorporate the materials into a meaningful program, but at least the information was disseminated further. The response from the other member of this group indicated that no use had been made of the packet of information.

The Conservation District Directors were contacted by phone. One individual was not reached, but the other was and responded affirmatively. He had used the information in a local radio program and in an article for a local newspaper.

The potential for information dissemination of the groups surveyed should not be overlooked in any water resources technology transfer program. Local contacts in such a program are invaluable and every advantage should be taken of whatever local group seems most responsive. Certainly response among these groups will vary with the type of information disseminated, but some potential exists for dissemination of water resources related information.

Correct audience selection (a long recognized Extension principle) is vital to a successful technological transfer program. Later work with Extension agents reveals a much greater potential for information transfer than was indicated by this small test.

SECTION VI

Local Public Libraries as Information Sources

A limited effort was made to try to assess the potential of small town libraries for water resources information dissemination. Four libraries were contacted and offered free Institute publications if they chose to assist with the study. All of the libraries contacted were most interested in participating in the study. A selection of publications on water resources, one-half of which were technical and the other half of a non-technical nature, were given to each of the four libraries. This information was featured by two of the libraries in special displays. An attempt was made to assess the use of the material after several months had elapsed. Only two librarians kept a record of the material's use in the library on the data sheets that were provided. A sample data sheet appears as Appendix C to this report. The two completed data sheets indicated the non-technical water resources publications were used more frequently than the technical ones, and that the publications in general were used frequently by the library's patrons.

Although no firm conclusions can be drawn from this cursory examination of a small sample of libraries, it at least indicates a potential for water resources information dissemination that should not be overlooked. The local library plays an important role in informing and educating people. New acquisitions for local libraries are severely limited by tight funds and librarians are usually delighted to receive worthy materials at low cost.

There are more than 400 libraries throughout the Commonwealth of Pennsylvania offering a broad base for information transfer activities. Effective liaison with these libraries may pay large dividends.

One small spin-off from this endeavor has been the addition of many of these libraries to the Institute newsletter mailing list. Libraries were originally sent copies of the newsletter without being asked whether or not they desired to receive it, and many objected to its being sent to them. However, the librarians contacted in this study seemed enthusiastic about the newsletter and so a followup attempt to communicate with libraries was begun. This time the libraries were asked whether or not they wished to receive the newsletter and most of them responded affirmatively.

Tying these local libraries into the WRSIC (Water Resources Scientific Information Center) system in some way would give them an important capability which they do not now possess. With improvements in the precision of WRSIC data searches and an expanded information bank, water resources information transfer to the local level would be greatly enhanced.

SECTION VII

Information Materials Evaluation

Many different kinds of materials and approaches are necessary in developing an effective information transfer program. This has long been recognized by the Extension Service. Mass media communications, displays, exhibits, demonstrations, films, slide-sets, correspondence courses and various how-to-do-it and awareness publications have been successfully used by the Extension Service.

As a part of this project an informal evaluation of several communicative methods and materials was attempted. One method of direct mail communication with county staffs was a bi-weekly news release packet sent out by the extension communications section. Individual subject matter specialists within the College of Agriculture prepare news releases for inclusion in this packet. County staffs choose what items within the packet that are of interest and incorporate them into newspaper articles, radio or television shows. This can be a very effective information transfer vehicle.

For a one-year period a news release was prepared every week for direct mail to the county staffs. In all, more than 60 news releases were written and disseminated. Some positive feedback was received from this effort and many of the releases were used in radio programs emanating directly from the College of Agriculture. However, the amount of feedback was small in relation to the total number of county staff reached and little evidence of use of the news releases could be found in newspapers. This effort was subsequently discontinued producing no requests that it be continued. The conclusion was that this effort did not justify the time expenditures that it required.

Mass-media communication via educational television and commercial radio was also attempted. Feedback here is difficult to assess. During some television programming, responses from the viewing audience were solicited by offering a free publication upon request. Response to this approach relative to similar approaches for other topics appeared to be quite good. Even though about 100 requests for the information were received, it is questionable whether elaborately prepared television productions are justified. Many hours of preparation can go into such programming if film footage is to be shot on location or elaborate visual aids are to be prepared. On the other hand little time is consumed if a straight stand up interview is to be done, and the potential exposure may be worth the effort.

Radio programming requires very little preparation and consequently appears to be worth the time invested. Feedback in terms

of informal comments about individuals hearing the show have been greater than those for television shows. Several radio tapes can be made in one-half hour, making this a very effective use of one's time.

Films and special documentaries are another method of communication that were informally evaluated in this study. Two color films and a video tape documentary have been produced to support Water Center information transfer programs. However, only the video tape was developed in direct association with this project. The two color films have been used extensively in information transfer programming and they are extremely effective. They enable the information transfer specialist to supplement an educational presentation with almost no advance preparation. This is a tremendous asset. The films can also be shown alone in a presentation without the information specialist present. However, our experience indicates that films often raise questions or leave something out that really should be addressed during the presentation. Consequently, it is a distinct advantage to have a technical specialist present with the film. Another serious limitation on this medium are production costs involving both time and money. With the current level of support for information transfer at most Water Centers, such endeavors would not justify the necessary effort. They are more attractive when outside resources can be secured for film production. It must be remembered that a rather limited audience will view the film and if per viewer costs are compared with other alternatives, films may not appear quite so attractive. Their real value lies in the preparation time savings accruing to the information transfer specialists.

Publications written for specific audiences with a need to know a particular bit of information are absolutely essential to a successful information transfer program. One of the biggest shortcomings of existing Water Center transfer programs is the reliance upon technical completion reports and journal articles to accomplish information transfer. Researchers seldom appreciate the need to explain and present things in the simplest way possible to facilitate understanding. Even if the target audience consists of engineering professionals material must be presented in an easily understood form or else little transfer will be gained. The degree of successful transfer is indirectly proportional to the difficulty of the material being transferred regardless of the audience.

There is an inherent tendency in the research community to present research results in a technical and sophisticated manner. Most researchers feel this approach is necessary in order to gain peer respect. In terms of information transfer such behavior is blatantly counterproductive. The attempts of individual researchers to popularize their research findings often fall short of the mark.

What they fail to realize is that most of the local decision makers do not have the knowledge base to interpret the results in a clear and meaningful manner. Sophisticated articles will simply not be read.

Several nontechnical public information reports were developed during the course of this program in an attempt to demonstrate the value of popularizing research reports. The Wastewater Renovation Project has been in existence for 12 years and has received world-wide recognition, and a tremendous amount of mass media coverage. However, demand for the leading popularized version summarizing this work (reprints available since 1970) has been less than 1000 copies, while a popularized article on wastewater renovation printed in April 1974 has had requests for more than 3,750 copies.

In 1974 a public awareness publication entitled "Water Conservation and Wasteflow Reduction in the Home" was prepared in cooperation with the Extension Service. To date this publication has been reprinted twice with more than 22,000 copies distributed. Admittedly, this example is unusual even for most popularized extension publications, but it does illustrate the potential utilization of a professionally done, simplified publication that is used as a part of an overall information transfer program.

Unfortunately, popularized rewriting of research reports is a time consuming, tedious and costly process. At current levels of funding and staff support it is impossible to keep up with the volume of research being completed at the Penn State Water Center.

Displays and exhibits have also been traditionally used to support educational programs within the Extension Service. Using normal extension channels, suitable outlets, in particular county fairs and special agricultural expositions, can be utilized to transfer information. A display was developed depicting the Wastewater Renovation Project for use at such expositions. The display features an animated water cycle that depicts the recycling of water through a land disposal wastewater system. In the year and a half since the display has been built it has been viewed at six county fairs, one state farm show, two Agricultural Field Days, and numerous other events. Unfortunately an accurate estimate of the number of persons reached by this method is impossible.

SECTION VIII

Trade Journal and Popular Publications

Trade journals and popular publications are one of the primary means of transferring technology to many audiences. In many cases these may be the only sources of information available to these audiences.

Articles for such publications should be written in language that the intended audience can understand. If requests for more information are anticipated, appropriate materials must be available to answer these requests.

By their very nature these publications are natural vehicles for the transfer of information to selected audiences.

SECTION IX

Water Resources Scientific Information Center (WRSIC) Evaluation

The Water Resources Scientific Information Center conducts computer based, on-line literature searches for water resources related information. The data base for these searches consists of more than 80,000 abstracts for journal articles, books, technical papers and conference proceedings pertaining to water resources planning and management. Approximately 15,000 new abstracts are added to the information bank annually. The Office of Water Research and Technology, U.S. Department of the Interior is the chief sponsor of the WRSIC system.

Several searches were made through the WRSIC information retrieval system with mixed results. The most obvious problem was the lack of precision of the system. Many irrelevant abstracts were received with each search. Another frequent problem was the rather limited data base in many specific subject areas. We also anticipated that the non-professional user of the system might have difficulty understanding many of the technical terms used in the abstracts.

To try and obtain a reading of the value of WRSIC to Extension personnel, we asked four Extension community resource development agents to initiate a search through WRSIC in any area of interest to them. Three of the four agents did so and their comments are summarized below.

One agent ordered a very specific search for information pertaining to a river basin in his area. In this search the river was one of the key words. He received one abstract from WRSIC for a report which he already had in his possession. Additional information which he was sure was available was not included; consequently, he thought the system was of minimal value to his program.

Another agent sent in a fairly broad request that included the key word septic tanks. His principal interest was information on the efficiency of septic tank drain fields. He received a large number of abstracts only a few of which pertained to his specific interest. The agent thought in general the system was quite useful and that the abstracts provided enough information to the user so he could decide whether to get the full report.

The third agent sought information on water based recreation for the Susquehanna River Basin. He received 42 abstracts, four of which pertained to the subject of his request. Information that he knew existed on this subject was not available; consequently,

he recommended that the system's data base be extended. He also concluded the abstracts were informative enough to base decisions on whether to send for a copy of the entire report.

Again we are dealing with an extremely small sample of users so definite conclusions cannot be drawn. However, based on these experiences it would seem that there are several limitations to WRSIC. The information base is technically oriented which limits its value to the non-research community. The language in the abstracts did not appear to be the problem, but the types of information selected for inclusion in the data base was a constraint on the system's general utility. Consideration should be given to problem oriented data inclusion. Users unfamiliar with the system are in need of a brief instruction sheet to guide them through the computer printout. A pamphlet explaining WRSIC, charges for its use, data bank contents, descriptors etc. should be made available to potential users of the system. The precision of individual searches should be improved. The abstracting of reports for WRSIC appears to be quite good as those surveyed indicated that the abstracts were very informative. The WRSIC system needs to be publicized more vigorously, and local libraries should be considered as possible contact points for WRSIC searches.

SECTION X

Information Feedback to the Research Community

Ideally any information transfer system will make provision for the feedback of water resources research needs to the research community. In this project informal lines of communication were maintained to accomplish this necessary feedback. To date this activity has resulted in one OWRT allotment project (A-038-PA) and three matching grant proposal submissions. More proposals and funded projects will no doubt result from this important activity.

The problems in accomplishing effective water resources needs feedback are immense. Funds for water resources research are severely limited; consequently, many needed areas of research will go begging for lack of available funds. This is a situation where you can easily identify more projects of the highest priority than you have funds to cover. Follow through on identified research needs is also a difficult task. Once an area of demonstrated research need is identified a researcher or researchers must be interested in writing a proposal to answer this need. This is often a difficult task. Many areas of demonstrated need are in areas of applied research, distained by members of the research community. Unfortunately, the biggest immediate payoffs in terms of research utilization and technological acceptance are associated with projects of this type. Research organizations must realize their funding appropriations are becoming increasingly contingent upon the demonstrated value to society of their research efforts. Large research expenditures are increasingly being made only where a relatively immediate payoff is foreseen.

Finally, the non-researcher working in information transfer must be granted credibility by the research-community. His knowledge of the current situation at the local level is a valuable asset in formulating research proposals and in implementing their results. If possible, this individual should be built into the research proposal as a consultant from its inception, and should help formulate a definite plan for the utilization of the research results. It is the information transfer specialist's job to be informed about the water resources problems of his state, and his judgment should not be overlooked in research planning.

SECTION XI

Clipping Service Information Transfer System

In the traditional Extension delivery system the stimulus for information transfer most often originates with the user group. They perceive a need and request the local agent's assistance. If he cannot handle the request with available resources, he passes the request on to the subject matter specialist.

This system works well when the user groups are somewhat familiar with local agents' capabilities and are conditioned to turn to him for help with specific problems judged to be within those capabilities. Unfortunately community water and sewer problems most generally do not fall within most user groups' perceived notions of the local extension agents' capabilities. Consequently, the water resources subject matter specialist received little contact via this mechanism.

The clipping service was subscribed to as a means of breaking this impasse. The clipping service was instructed to clip all items pertaining to water and sewer. The clipping service covers most of the daily newspapers in the state. After subscribing to the service for a short time, it became apparent that some water resources articles were being missed especially those dealing with local flooding problems. Articles about floods and water pollution were added to those to be clipped. The clippings were received every Monday and usually reviewed that same day. If a clipping indicated a community water resource problem for which the Water Center had applicable information, contact was made via the telephone with the appropriate county extension office. If the county extension office concured that action was appropriate and if they agreed to contact the community, the information was forwarded to them. If they were not desirous of making contact then the specialist, with the county's consent, made contact directly with the community.

One of the most important advantages of the clipping service is the continual updating that it provides the subscriber. The clippings can be scanned in a few hours each week and the information they contain used to form a continuous picture of the water resources situation.

A wide variety of information can be obtained from such a service. Water resources problems are clarified and quantified. New research developments are called to the subscriber's attention. Cases of successful technology transfer and research adoption are brought to the subscriber's attention. The clipping service is an important feedback mechanism for both the researcher and the technology transfer specialist.

The clipping service tells the subscriber what the most critical water resources problems are and tells him where his water resources research and technology transfer efforts will have the maximum and most immediate beneficial impact upon society.

The clipping service contact technique allows the information specialist to bring to bear the appropriate information materials at a time of community need. In this way the community should be in the most favorable position for accepting the transferred information.

Table 5 outlines the usefulness of the clipping service to date. The heading "potential contacts" represents those clippings that were received enumerating problems for which information could be transferred to assist in that problem's solution. The heading "usable information" refers to clippings which were received for which no action would be appropriate but which revealed a water resources problem or a new solution to a water resources problem. Clippings in this latter category were valuable because they contributed useful information to the Water Resources Research Institute's efforts.

Table 6 summarizes the data presented in Table 6 for the fiscal year 1975. An average of 39 clippings were reviewed each week of which an average of 13 proved useful. The average cost per useful clipping (sum of total misc., water, sewer and flood useable) was .43 cents. The total cost of the clipping service for the year was $304.80. As we shall see these costs are rather modest when we examine the tremendous potential savings to the recipients of information transferred via this method.

An average of two agents were contacted each week as a result of information provided by the clipping service. In the entire first year of the project fewer than a dozen agent originated contacts were received by the information transfer specialist. This represents a considerable improvement. As might be expected, not all of the agents contacted via this method responded favorably. However, the overall results were encouraging and certainly warrant the continuation of this activity.

A direct mail contact involving information on local flooding received no response from 22 agents contacted. In this case a copy of a clipping from their local newspaper was included with a letter describing a video-cassette tape on flood-control issues. This information was sent out two weeks after major local flooding occurred in each of the agent's counties. No requests for the video-cassette tape or any other follow-up on this mailing was received.

Table 5. Monthly Newspaper Clippings Received by Usage Categories and Resulting Agent Contacts

Date	No. of Clippings	Potential Contacts			Usable Information			Total Misc.	Agents Contacted
		Water	Sewer	Flood	Water	Sewer	Flood		
July 74	291	19	11	--	--	--	--	25	25
Aug 74	210	6	6	--	--	--	--	43	11
Sept 74	143	13	10	--	--	--	--	45	17
Oct 74	89	9	3	--	--	--	--	18	5
Nov 74	115	20	0	--	--	--	--	50	1
Dec 74	95	5	2	--	--	--	--	36	5
Jan 75	128	8	6	1	--	--	11*	47	12
Feb 75	157	10	6	2	--	--	3	52	10
Mar 75	278	11	9	27	--	--	13	33	25
Apr 75	181	7	5	4	35	14	1	50	1**
May 75	175	8	3	0	26	13	3	42	5
June 75	133	4	5	0	21	14	3	38	2
July 75	87	3	5	0	5	4	3	12	3
TOTAL	2,082	120	71	34	87	45	37	491	122

* Added floods to topics for clipping
** Contacts limited to serious water supply problems

Table 6. Average Weekly Summary of Clipping Service Data*

No. of Clippings	Potential Contacts			Usable Information			Agents Contacted
	Water	Sewer	Flood	Water	Sewer	Flood	
39	2	1	1	5	3	1	2

* Weeks where no data were collected are omitted from calculation and figures are averages for 54 weeks.

In other cases contacts were made, but little action was taken by the agent. In many cases follow-up contacts were necessary to move the information transfer process forward. In cases where agents did not indicate interest the contact was either dropped or the agent bypassed with his permission. In some cases regional community resource development agents seemed more receptive to this method of contact, but they frequently failed to follow through with the information transfer.

Many times the agent made contact and little action was taken by the user group. Usually various institutional, political, or financial constraints prevented the implementation of the information.

Better insight into these problems can be gained by reviewing the selected case histories presented in Section XII. These case histories are representative of the more than 100 agent contacts made during fiscal 1975. In many cases adequate feedback on the various contacts was not obtained. This is a serious problem with any information transfer program. In some cases the clipping service itself provides feedback via news articles about technology implementation. However, to date examples of this have been relatively few.

SECTION XII

Selected Case Histories of Clipping Service Contacts

During fiscal 1975 more than 100 clipping service originated contacts were made with local Extension Service offices. Most of these contacts were made by telephone and in most cases the county agent was the person contacted. A detailed record of each of these phone conversations was kept and all subsequent correspondence resulting from each contact was retained. Notes made immediately following each phone conversation form the basis for the information contained in the following case histories.

Eight case histories have been arbitrarily selected for inclusion in this report. These case histories represent the most successful and some of the least successful examples of clipping service contacts. They also illustrate most of the problems encountered in using this approach to transfer water resources information through the Extension Service. Correspondence associated with these case histories appears by case in Appendix E.

Case 1

This county agent was first contacted about a water quality problem that I found in a clipping from his hometown newspaper. In this contact I explained an Extension water testing service to the agent who was unfamiliar with it. Nothing further developed.

On 26 July 1974 I contacted this agent again about a sewer ban that was to go into effect in a community within the county. The agent was aware of the problem and he knew about Special Circular 184 "Water Conservation and Wasteflow Reduction in the Home." He said that he sent a copy of this publication along with a letter to the chairman of the borough's sewer committee, but as of 8 October 1974 he had not received a reply. This was frustrating especially since the borough official had asked borough residents to reduce water use by bending the float arm down and placing a brick in their toilet. It would have seemed that Sp. C. 184 would have been very appropriate in this case.

On August 12, 1974 I again contacted this agent concerning a community within the county that had been turned down for sewer funding and was in need of help. On 23 August 1974 I sent information on sewer funding to this agent.

I called this agent on 8 October 1974 to elicit some feedback from earlier conversations. We talked about the relatively widespread problems in the county associated with sewer bans. The agent

said that he would be setting up a meeting for local government officials cometime during the winter and he wanted to know what my qualifications were to speak to this group. I subsequently was invited to speak at a meeting on water resources for local government officials.

The clippings reviewed on 11 November 1974 revealed a serious water shortage in a community located within this county. The situation was so desperate that water was being trucked into the community by volunteer fire companies. I contacted the county extension office on 12 November and talked to one of the county agent's assistants as the county agent was not in the office at the time. The assistant was aware of the problem. He agreed to make contact with local officials in the community and give them copies of our water conservation publications. I sent the necessary information that day. On 4 December 1974 I checked back with the assistant agent concerning a clipping that stated that copies of the publication were to be distributed by a local 4-H club in a door to door canvass of the community. The assistant agent was not aware of this plan. On 5 December the assistant agent called me and said that his secretary had not told him that the community's request for the publication had come in, and requested that I arrange for several hundred of the publications to be sent to him. On 10 December I checked with the assistant agent to make sure that the publications were received and was assured that they had been and that they would be distributed by the end of the week.

Later in December contact was made with the community's council president concerning his reaction to the information dissemination program. He said that the community appreciated the help very much and that the publications were very helpful. He said that there was a lot of information in the publication with which most people were not aware.

On 25 March 1975 I spoke to a group of local government officials in this county about water conservation and wasteflow reduction and a new method of water well location developed by Water Center researchers.

Case 2

I received a clipping on 27 January 1975 that told of a waste treatment problem with a pharmacy in a rural area. I called the county agent in whose county the problem was located and discussed the problem with him. In this case the pharmacy was unable to put in a septic tank system because of poor drainage conditions; consequently, a holding tank was installed. The county agent was aware of this problem, but he was not aware of the most recent extension publication applicable to this problem even though new publications are routinely sent to each agent when delivered. He

requested a copy of the publication as soon as possible and indicated that he would pass it on to the owner of the pharmacy. On 20 March 1975 I checked back with the agent. He said that he had sent the publication, but he had not received any feedback from the pharmacy owner.

On 14 July 1975 I again contacted this agent about a potential application of wasteflow reduction information to a resort wasteflow problem. He knew about the pertinent Extension publication, but he was unfamiliar with its contents so I briefly covered this for him. He knew the manager of the resort personally and he said that he would relay the information to him.

This particular agent had not returned a questionnaire in the needs survey and consequently I would have concluded that he would not be very receptive to a clipping service contact. However, exactly the reverse was true. He was appreciative of my interest in the county's water problems and he moved quickly to transfer information at my suggestion.

Case 3

Several clippings were received on 8 July 1974 that related problems of water shortages and sewer overloads in several communities in this county. I called the county agent that same day to find out if he was aware of these problems and the information that was available to help solve them. He was informed of both and he was distributing the information to all municipalities in the county. He requested that I come to his county to meet with him and local officials on these problems. On 30 July 1974 I met with him and the county's water resources planning director. Both were interested in Special Circular 184 "Water Conservation and Wasteflow Reduction in the Home." The agent had previously ordered 300 copies to be used in a Boy Scout project and the county official wanted more information on the concept.

On 25 September I received more clippings about problems of a similar nature in this county. I followed up by calling the local official whom I had met in July. He reiterated his interest in the information in Sp.C. 184 and stated a desire to obtain 100 copies of the report. He further stated that he liked the ideas in Sp.C. 184 and that he was going to get some publicity out on it. I checked with the county agent and he said that he would send the 100 copies to the water resources planner.

On 13 November 1974 I contacted this agent again with reference to a polluted water well problem in his county. He was unaware of Extension's water testing program so I sent him information about that. He requested 100 more copies of Sp.C. 184.

I called this agent on 21 March 1975 to obtain some feedback on the outcome of our earlier discussions. He was not in at the time and he returned my call on 27 March 1975. He said that he had used Sp.C. 184 and that it had been received favorably. He said that the county water planner had also used it. He thought that more detailed information about its use and impact on the communities in the county would be difficult to obtain. He said that he would do a radio program featuring the information in Sp.C. 184 the next day.

Case 4

On 27 September 1974 I contacted a county agent with regard to a water shortage in one of his county's communities. I told him about our water conservation information and suggested that the people in this community might benefit from this information. He was reluctant to contact officials in this town without their requesting him to do so. After talking with him for awhile he decided that it would be permissible for me to contact the community directly but he did not have the borough office telephone number. He said that he would call me back with this information. On 21 October I entered a note that I had not received this information from the agent nor was a call I had placed the previous week returned.

I contacted this agent again on 31 January 1975 about a water quality-quantity problem in his county. He did not know any of the officials in the affected township, but he said he'd check for possible inputs. He mentioned that he was sponsoring a series of meetings for local government officials and that this information might be appropriate for such a meeting. To date I have had no further contact with this county agent.

Case 5

On 29 July 1975 I contacted a county agent who I had worked with before about a sewage treatment plant problem in his county. The agent was not aware of the problem. The plant was hydraulically overloaded with an accompanying severe odor problem. The agent said he would check on the problem. He called me the next day and told me to talk directly to one of the town council members who was expecting my call. In the course of this discussion he mentioned that the community also had quality problems with its water supply. After a lengthy conversation, in which many other problems were discussed, I agreed to do some searching for solutions to these problems and get back to the councilman. Subsequently, I compiled some information and responded by letter. On 14 March 1975 I received a request for assistance from this agent which I answered by letter.

Case 6

In response to a clipping received on 7 July 1974, contact was made with this county agent on 8 July 1974 concerning a severe water shortage problem in a small community within his county. The agent was familiar with Sp.C. 184 and wished to obtain a copy of Sp.C. 199 "23 Ways to Save Water in an Emergency."

On 25 September 1974 this agent was again contacted about a water shortage problem in another area of the county. He again expressed desire for a copy of Sp.C. 199 and stated that he had Sp.C. 184 on hand. I suggested that I meet with officials in the troubled area, and he agreed. However, I had another commitment for the only suitable meeting date. The agent wanted a brief description of my capabilities. The agent remarked that he knew one of the officials in the affected area quite well and that he would pass along copies of Sp.C. 184 and 199 to him. He also stated that he had sent information associated with the 8 July 1974 contact to officials in that community.

On 17 December 1974 this agent was again contacted concerning a water metering controversy in a large metropolitan area within his county and another water shortage situation in a small community within the county. He said that the former problem was too hot politically for him to become involved and that he would check into the latter problem. He also asked that I plan a visit to his office in the near future.

On 4 March 1975 I met with two members of the agent's staff (the agent could not be present) to discuss the county's water supply problems and the information that we had available to help solve these problems. The staff seemed very interested in the information that I presented to them.

On 25 July 1975 contact was made with one of the assistant agents that I had met with on 4 March 1975 with reference to a water shortage problem in yet another community within the county. The assistant agent after consulting with the agent decided that no action would be appropriate at this time because the issue was politically sensitive and local citizens did not appreciate the need for the information contained in Sp.C. 184 and 199. He said that if the problem got worse then they would consider transferring the necessary information.

Case 7

On 8 July 1974 I contacted this agent about the installation of holding tanks in a residential development in his county. I explained that Sp.C. 184 would be valuable to homeowners on

sewage holding tanks in reducing wasteflows and thus reducing their service costs. He was noncommittal with regard to making the necessary contacts to use the information.

On 30 September 1974 I again contacted this agent about a serious water shortage problem in one of the county's communities. The agent was aware of the problem and recalled our earlier discussion about Sp.C. 184. I suggested that we get together if possible on 22 October as I would be in the county. He said that he would try to set up a meeting between myself and officials in the affected community. He did not contact me as of 22 October and I later learned from him that the community officials were not interested in the meeting.

On 6 December 1974 I again contacted this agent with reference to another serious water shortage problem in his county. He was not aware of this problem but said that he would check on it. With reference to the 30 September contact he stated that a consulting firm had been retained to develop a new source of water for that community. I had previously been alerted to this by the clipping service. There was no further contact with the agent on this problem.

On 17 December 1974 I mailed this agent a clipping describing still another water shortage problem in a community within his county.

In an attempt to gain some feedback from the numerous contacts that I had with this agent I called him again on 21 March 1975. I also wanted to alert him to a new film which had been produced explaining the fracture-trace method of water well location. He had taken no action on any of my previous contacts. However, he indicated that the fracture-trace method had been employed by two of the municipalities with water shortage problems and by several farmers to locate new wells. I was aware of the communities' actions via the clipping service. He said that there was a considerable amount of interest in this well location technique, especially among farmers, in the area. I suggested that we have a meeting on the subject, and he expressed dissatisfaction with this idea, because no one in the Extention Service possessed sufficient expertise in this technique. I suggested that he defer such requests to a consultant.

Case 8

On 4 June 1974 I reviewed a clipping that related a community's problems with nitrate levels in the public water supply that exceeded drinking water standards. The article indicated a general lack of knowledge on the part of public officials in the affected community concerning the public health implications and methods of

treatment involved in this problem. I contacted the appropriate county agent, and he said he wanted any information on the problem that I had and that he would forward it to the appropriate officials, several of whom he knew personally. Later follow-up on this with the agent revealed that he had taken no action because he did not want to get involved.

On 26 July 1974 I contacted this agent about several problems--one involving a potential application of land disposal to correct a tertiary treatment problem and the other concerning a community's need for water conservation and wasteflow reduction. The agent was unfamiliar with both of the Extension publications covering these subjects (Special Circulars 184 and 185) and requested copies of them.

On 23 August 1974 I contacted this agent about several sewer ban problems in the county. He demonstrated a good knowledge of these and other sewage problems in the county, but he indicated a reluctance to get involved.

On 17 December 1974 I again contacted this extension office with reference to a potentially serious water shortage in the county. The agent did not return my telephone call.

Summary of Case Histories

The case histories presented reveal a great many of the problems with water resources information transfer through the Extension system. The county agent is an individual in a system which traditionally has granted considerable autonomy to the local extension office. County agents are free to determine their own program priorities and working relationships, which leaves the subject matter specialist somewhat at their mercy. The subject matter specialist characteristically views his subject area with more interest than does the county agent, who is a generalist torn in many different directions. These differing views on subject matter areas are even more divergent when the subject matter specialist is working in an area, like water resources, that is far removed from the backgrounds and traditional programs of the majority of county agents. In light of this, the reactions of the agents illustrated in the foregoing case histories are understandable.

It is apparent that there may be a large potential for successful information transfer using the clipping service problem identification technique. If the county agent perceives community development as a part of his responsibility and if he perceives water resources as a part of community development, progress in water resources information using this technique appears to have potential. The numerous successful contacts illustrated by the case histories serve to illustrate this point.

SECTION XIII

Support Services

Various support services are extremely valuable in information transfer programs. This has long been recognized by the Extension Service and over the years Extension has developed a full complement of these services. These support services were available to the Water Center in conjunction with this project and their assistance proved quite valuable. These services include a competent staff of professionals in the areas of editing, illustration, design and layout, radio and television, exhibit preparation, and photographic services. In addition facilities and staff are available for duplication, warehousing, and dissemination of publications. A wide variety of projection and sound equipment and an extensive visuals library were also available.

Library services are another key item in any successful information transfer program. The Water Center is fortunate to have in house an excellent water resources library staffed by a professional librarian. Such a facility is valuable in quickly and efficiently dealing with the many requests generated by information transfer programs.

SECTION XIV

Summary

Many methods were tried and evaluated to transfer water resources information from the research community to appropriate user groups utilizing for the most part the established Extension transfer system. Many of these methods were either borrowed from or part of Extension's patently successful educational process. Some methods seemed to work better and more efficiently than others but the largely informal evaluation procedures utilized in this work make definite conclusions difficult. It was implicit from the beginning of this project that in addition to the project's research function a definite service in information transfer was to be performed for the Water Center and the Extension Service. This served to limit the resources available for detailed evaluation of the many projects undertaken in the research program.

There is no question that this research project has served to reinforce the feeling that joint Water Center—Extension programs have the potential to greatly enhance the successful transfer of water resources information. Problems within this delivery system have been recognized and where possible solutions to these problems have been presented. This project gives ample evidence that the task of making today's research a part of tomorrow's way of doing things is not easy. It will require the efforts of many individuals and the dedication of the research community as well as information transfer specialists.

SECTION XV

Technology Transfer Activities

A wide variety of activities must be conducted in support of technology transfer programs. Numerous presentations must be made before various groups, mass media programming must be accomplished, and advisory services must be offered to key groups of decision makers. It is often difficult to see an immediate payoff for these activities. However, in the long run the relationships that are developed and the information that is transferred will be of benefit to overall technology transfer efforts. The following is an example of the activities with which a transfer specialist may become involved. The activities presented represent a one-year period (FY75).

Continuing Education Activities

Water Conservation Conference for 100 individuals in the water industry and allied fields (A038PA).

Workshop on Biological Indicators of Water Quality for 45 school teachers.

Waterways Patrolman Seminar on Limestone Barriers to Neutralize Acid Mine Drainage for 12 new waterways patrolmen (A030PA).

Boys Forestry Camp for 40 camp attendees.

BEA Teacher's Workshop on Water Quality for 30 school teachers.

Franklin County Conservation Workshop for 200 elementary school children.

Research Activities in Progress

An Interdisciplinary Approach to the Development of an Information Dissemination System.

An Investigation of Alternatives to Conventional On-Site Sewage Disposal Methods.

Proposals Prepared and Submitted

Evaluation of Pennsylvania Water Research Center Technological Transfer Programs.

A Cooperative Interagency Demonstration Project in Water Research Technology Transfer.

An Educational Medium for Instruction in the Proper Handling, Storage, and Applications of Highway Deicing Salt.

Publications

"Timber Management Influences on Aquatic Ecosystems and Recommendations for Future Research." Sharpe, W. E. Water Resources Bulletin, Vol. II, No. 3, June 1975.

"23 Ways to Save Water in an Emergency." Sharpe, W. E. Special Circular No. 199, Cooperative Extension Service, October 1974.

Submissions for Publication

"Observations of Aquatic Insect Larvae Populations on the Leading Ridge Experimental Watersheds." Sharpe, W. E. Submitted to Pennsylvania Forests.

"How to Treat Acid Streams with Limestone Barriers." (based on A030PA) Sharpe, W. E. Submitted to Cooperative Extension Service.

Talks

Issues in Man-Environment Relations Class (discussed research in A038PA) - September 15, 1975.

Water Conservation to Ferguson Township Water Authority (discussed research in A038PA) - November 20, 1974.

Erosion and Sediment Control Workshop for Loggers - November 26, 1975.

Nittany Mountain Sportsman Club (discussed research in (A-030-PA) - January 13, 1975

Public Meeting on Issues in Flood Control - February 19, 1975.

Lecture on "Living Filter" to C.E. class - February 24, 1975.

Local Government Officials - Water Conservation and Water Well Location (discussed research in A-030-PA and A-005-PA) - March 25, 1975.

Life Science class (discussed research in AO-38PA) - May 1, 1975.

Wastewater Reduction (discussed research in A-038-PA) - Agronomy Faculty - May 5, 1975.

Public meeting on the Impact of Energy Parks on Water - May 21, 1975.

Papers Presented

"Residential and Commercial Water Conservation and Waste-flow Reduction with Water-Saving Devices - A State of the Art Review with Recommendations for Research." Sharpe, W. E. Delivered to Water Conservation Conference, April 8-10, 1975, P.S.U.

Mass Media Programming

T.V. Appearances on: "Farm, Home & Garden" - Sept. 16, 1975. (discussed research on A-038-PA)
"Weather World" - April 7, 1975. (discussed research on A-038-PA)

Radio Programs on: "Home and Garden" March 11 & 18, 1975. (discussed research on A-038-PA)
"Sounds of Progress" (4 programs) (discussed research on A-038-PA)

Advisory Work

Pennsylvania Association of Conservation District Directors, Inc.

Universities Council on Water Resources - Technology Transfer Committee

Other

Prepared unpublished fact sheets "Nitrates in Water" and "Home Water Disinfection Methods."

Prepared booklet for Bald Eagle Area High School on "Water Quality."

Prepared booklet for Allentown teachers on "Biological Indicators of Water Quality."

Gave personal consultation to five farms on farm water pollution control and water supply treatment.

APPENDIX A

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

January, 1973

Dear Sir:

You have been selected to participate in a survey of the water resources problems facing Pennsylvanians. The Land and Water Research Institute and the Cooperative Extension Service are sponsoring the survey.

Enclosed is a questionnaire for use in expressing your opinions as to the nature of water resource problems with which you are familiar. Your responses will be held in the strictest confidence. A self-addressed stamped envelope is included for return of the questionnaire.

The questionnaire itself is fairly self-explanatory. Please ignore the boxes and numbers in the left hand margin. They are for our use in tabulating results. Answer each question as fully and completely as possible. You are encouraged to add to the lists of problems and obstacles to problem solution in the space provided.

A program is being developed to increase the level of communication between Institute researchers and problem-solvers in the field. The information that you provide will be used to determine points of emphasis in this program. Your positive response to the questionnaire will be an important first step in opening this information pipeline.

I am looking forward to continued contact with you as this new extension effort in water resources begins to take shape. If you have any questions about the survey, a need for water resources information, or if you just want to share your ideas call me at (814) 863-0070 or drop me a line.

Thank you.

Sincerely yours,

Bill Sharpe
Water Resources Extension Specialist

No. A240
1 2 3 4

Basin ☐
5

NAME: _____ OCCUPATION: _____

1. For what area or areas of the state do you feel most knowledgeable about water problems?

   Statewide (check) _____
   Region (specify) _____
   County (specify) _____
   Borough or Township (specify) _____

   Answer the remaining questions as they pertain to the area of the state that you have just identified.

☐ 6 2. Is up to date water resources information essential to the performance of your professional duties?

   ☐ Yes ☐ No ☐ Not Applicable

3. Using the list of problems that is presented below pick what you feel are currently the three most important problems and rank them according to seriousness under Column A.

   a. Put the number "1" after the most serious problem
   b. Put the number "2" after the second most serious problem
   c. Put the number "3" after the third most serious problem

   Feel free to add problems to the list in the spaces provided and rank them according to seriousness. Now do the same for problems that you feel will be most serious 10 years from now under Column B.

	Problem	Column A (Current Problems)	Column B (Problems in 10 years)
A. ☐☐ 7 8	a. industrial wastes	___	___
	b. municipal waste system	___	___
☐☐ 9 10	c. on-site disposal (septic tanks)	___	___
	d. acid mine drainage	___	___
	e. water supply	___	___
☐☐ 11 12	f. flood damage	___	___
	g. low stream flow	___	___
	h. water for recreation	___	___
B. ☐☐ 13 14	i. irrigation	___	___
	j. other: (specify)_____		
☐☐ 15 16	_____	___	___
	k. other: (specify)_____		
☐☐ 17 18	_____	___	___

19

4. Describe the nature of the current problem that you rated most serious.

20

5. Describe the nature of the current problem that you rated second most serious.

21

6. Describe the nature of the current problem that you rated third most serious.

7. Below is a list of obstacles to solving current water problems. In this question and the succeeding two questions evaluate the degree of hindrance each obstacle is to solving the current water problems that you identified in question 2 by circling the appropriate scale value. Feel free to add obstacles to the list where you deem necessary.

Current most serious problem: _____

	Degree of hindrance to solution				
	Presents no obstacle		Moderate		Very great obstacle
22 23 a. opposition from special interest groups; specify whom	1	2	3	4	5
7 8 9 24 25 26					
27 28 b. lack of understanding of the problem of higher levels of government	1	2	3	4	5
7 8 9 29 30 31					

		Degree of hindrance to solution				
		Presents no obstacle		Moderate		Very great obstacle
32 33	c. presence of more pressing community problems	1	2	3	4	5
7 8 9 / 34 35 36						
37 38	d. lack of financial support	1	2	3	4	5
7 8 9 / 39 40 41						
42 43	e. lack of trained personnel at the local level	1	2	3	4	5
7 8 9 / 44 45 46						
47 48	f. lack of cooperation among agencies	1	2	3	4	5
7 8 9 / 49 50 51						
52 53	g. lack of public awareness of the problem	1	2	3	4	5
7 8 9 / 54 55 56						
57 58	h. inappropriate public attitudes	1	2	3	4	5
7 8 9 / 59 60 61						
62 63	i. lack of suitable technology to solve the problem	1	2	3	4	5
7 8 9 / 64 65 66						
67 68	j. multiple political jurisdictions	1	2	3	4	5
7 8 9 / 69 70 71						

		Degree of hindrance to solution				
		Presents no obstacle		Moderate		Very great obstacle
72 73	k. lack of appropriate legislation	1	2	3	4	5
74 75 76						
80						
1 2 3 4						
5 6	l. lack of communication between researchers and field workers	1	2	3	4	5
7 8 9						
10 11	m. other; (specify) _____	1	2	3	4	5
12 13 14						
15 16	n. other; (specify) _____	1	2	3	4	5
17 18 19						

8. Current second most serious problem: _____

	Degree of hindrance to solution				
	Presents no obstacle		Moderate		Very great obstacle
a. opposition from special interest groups; specify whom _____	1	2	3	4	5
b. lack of understanding of the problem by higher levels of government	1	2	3	4	5
c. multiple political jurisdictions	1	2	3	4	5

	Degree of hindrance to solution				
	Presents no obstacle		Moderate		Very great obstacle
d. lack of suitable technology to solve the problem	1	2	3	4	5
e. inappropriate public attitudes	1	2	3	4	5
f. lack of public awareness of the problem	1	2	3	4	5
g. lack of cooperation among agencies	1	2	3	4	5
h. lack of trained personnel at the local level	1	2	3	4	5
i. lack of financial support	1	2	3	4	5
j. presence of more pressing state or community problems	1	2	3	4	5
k. lack of appropriate legislation	1	2	3	4	5
l. lack of communication between researchers and field workers	1	2	3	4	5
m. other; (specify) _____ _____	1	2	3	4	5
n. other; (specify) _____ _____	1	2	3	4	5

9. Current third most serious problem: _____

a. opposition from special interest groups; specify whom _____ _____	1	2	3	4	5
b. lack of understanding of the problem by higher levels of government	1	2	3	4	5
c. multiple political jurisdictions	1	2	3	4	5

	Degree of hindrance to solution				
	Presents no obstacle		Moderate		Very great obstacle
d. lack of suitable technology to solve the problem	1	2	3	4	5
e. inappropriate public attitudes	1	2	3	4	5
f. lack of public awareness of the problem	1	2	3	4	5
g. lack of cooperation among agencies	1	2	3	4	5
h. lack of trained personnel at the local level	1	2	3	4	5
i. lack of financial support	1	2	3	4	5
j. presence of more pressing state or community problems	1	2	3	4	5
k. lack of appropriate legislation	1	2	3	4	5
l. lack of communication between researchers and field workers	1	2	3	4	5
m. other: (specify) _____	1	2	3	4	5
n. other; (specify) _____	1	2	3	4	5

[ ] 20 10. Prior to receiving this questionnaire I was [ ] very familiar with, [ ] familiar with, [ ] unfamiliar with, [ ] never heard of the Land and Water Research Institute at Penn State.

[ ] 21 11. Have you ever used research information generated by the Land and Water Research Institute at Penn State in your work?

[ ] Yes [ ] No [ ] Not Applicable

[ ] 22 12. Has research or educational information generated by the Land and Water Research Institute at Penn State improved your professional skills?

[ ] Yes [ ] No [ ] Not Applicable

23 13. Given the most serious water resource problems in your area, and keeping in mind the obstacles to solving these problems, what research efforts by the Land and Water Research Institute do you think are necessary?

24 25

26 14. What can I do personally to help you in your work as it relates to water resource problems?

27 28

29 15. Would you be interested in attending a seminar or conference on one or more of the subjects listed below? ☐ Yes ☐ No. If your answer is yes, check the subject or subjects of interest to you.

30

- ☐ ground-water resource development
- ☐ acid mine drainage control
- ☐ wastewater renovation by spray irrigation
- ☐ floods and flood damage control
- ☐ community water supply development
- ☐ liquid agricultural wastes
- ☐ effects of forest management practices on water quality and quantity
- ☐ basic water resources orientation
- ☐ other; (specify) _____

APPENDIX B

Water Use Conservation

Publication Available

A new publication describing ways to reduce water use and wasteflow from individual homes is available from _____. The material presented in the publication is in two parts. The first part explains the procedures involved in treating water before it is used in the home and after it leaves as wastewater. The second part of the report explains how water and money can be saved by the use of certain appliances and plumping devices.

Many plumbing devices are mentioned that are inexpensive, easy to install, and of no bother to the housewife. Such things as aerator faucets, flow regulation valves, and water saving toilets are discussed. All of these devices more than pay for their cost over the long run.

The advantages of saving water and reducing wasteflow are pointed out, and the amount of savings to be expected for each of the devices is shown. An abundant supply of good pure water and a cleaner environment are just two of the many benefits to be obtained by conserving water.

Remember, to get a copy of the publication, Water Conservation and Wasteflow Reduction in the Home, contact _____.

4 May 1973 William E. Sharpe

A Brick in Your Tank?

Ever since Tilly Spetgang plunked a couple of bricks down on the meeting table of the Cherry Hill, New Jersey town council, people have been talking about a brick in your tank. The idea is so simple that it sounds ridiculous but when you stop and think about it, you realize that it's really not all that funny.

We use water very wastefully because of its abundance and low cost without giving much thought to where it comes from or where it's going. Unfortunately, pure water is getting scarcer, and we can no longer ignore where water goes after it leaves our homes. As our demand for water increases and the supply of pure water decreases, we must begin to use water more efficiently and with less waste.

A big water-waster is the ordinary flush toilet. It uses twice as much water as necessary. A brick placed in the toilet reservoir saves a quart of water everytime the toilet is flushed. A simple idea for today's complex world.

Alot of people don't realize that there are many other water saving devices available for not only toilets, but sinks and showers as well. There are even new kinds of toilets available that use a lot less water. A publication titled "Water Conservation and Wasteflow Reduction in the Home," is now available from _____ explaining what you can do to save water in your home.

A brick in your tank is a good place to start saving water, but why settle for half a pie when you can have the whole thing?

4 May 1973

William E. Sharpe

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

Dear

Enclosed are ten copies of a recently developed publication on water conservation and wasteflow reduction in the home. This topic should be of particular interest to you, since water shortages occur from time to time in your county. The publication lists the water saving devices that are currently available and gives cost estimates on the savings that can be obtained through their use.

Water, sewage and energy costs can be reduced resulting in considerable savings to the household. A simple beginning such as merely placing a brick in the reservoir of a bathroom toilet can lead to a movement to save water in whole communities. Collective action such as this can accomplish the saving of millions of gallons of water. Ultimately, plumbing codes will be changed to specify water saving devices. This has already happened in the Washington D.C. area.

It makes sense to use only the necessary amount of water, and that is what water saving devices are designed to do. There is no inconvenience to the homemaker and money is saved in the long run. If you are looking for an environmental project that makes sense and saves dollars, this publication should be of value to you. Water Conservation and Wasteflow Reduction in the Home has been printed in limited supply on a trial basis; consequently, your response to this publication is important. I would be most grateful if you would indicate to me what use you made of the publication. I would like to know who you distributed it to, whether or not any action was stimulated by it, and what the reaction of the public was to the idea of water conservation and wasteflow reduction. Additional copies of this report will not be printed unless the feedback from you is favorable.

Sincerely yours,

William E. Sharpe
Water Resources Extension Specialist

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

November 16, 1973

Ms. Ethel E. Bishop
3280 Burd Ave.
Allentown, PA 18103

Dear Ms. Bishop:

A few months ago you received from me a packet of materials on home water conservation for your evaluation and use. At this time I would like you to send me your evaluation of these materials along with a brief description of what use if any you made of this material. I would be most grateful if you would apswer the following questions in your response to me.

1) Was this material of value to your conservation program?

2) Did you feel that these materials were appropriate for your area of endeavor?

3) Did you disseminate the publications on water conservation to any local organizations? or governments? If so, who were they?

4) Were the new releases used by local news media? If so, what media?

5) Was any action taken to conserve water voluntarily or through governmental regulation in your county as a result of this packet of materials?

6) What did you do with these materials when you received them?

I would appreciate very much hearing your frank appraisal of the publication itself and its value or lack of it to you. I am also anxious to have your recommendations for improving the publication and the water conservation program. If you feel that such a program is unnecessary, please so state.

I would appreciate a prompt response to this inquiry as we must soon make a decision on whether or not to continue this program.

Thank you.

Sincerely,

William E. Sharpe
Water Resources Extension Specialist

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH COMMISSION
214 Hickory St.
Hollidaysburg, Pa. 16648
November 26, 1973

Mr. William E. Sharpe
Water Resources Extension Specialist
Penn State University
Land and Water Research Building
University Park, Pennsylvania 16802

Dear Mr. Sharpe:

In response to your letter dated November 20, 1973, following is my evaluation of the materials which you mailed to me. I think the best approach would be to answer your questions directly.

1. Was the material of value to your conservation program. Little if any. This doesn't mean that the material was not any good or that it would not be useful to someone else. What I mean is that for my particular program it really is of very little use.

2. Did you feel that these materials were appropriate for your area of endeavor? I think my answer for number 1 pretty well takes care of this question.

3. Did you disseminate the publications on water conservation to any local organizations? or governments? If so, who were they. The answer to this question would have to be yes and no. I gave my deputies copies of the material. Since my one deputy is a member of the local Audobon Chapter, and another is president of a local sportsmens club and vice president of the Blair Co. Federation of Sportsmens Clubs, you could say they were distributed but not directly. Some of my other deputies have similar connections with local organizations and government.

4. Were the news releases used by the local news media? If so, what media. The answer to this is a simple "no".

5. Was any action taken to conserve water voluntarily or through governmental regulation in your county as a result of this packet of materials? None that I know of on any kind of widespread basis. There may have been some individual actions, but this is more than I know for sure.

6. What did you do with these materials when you received them? I read them over to determine their value to me in my program. I then gave them to my deputies. I felt that since they weren't really of tremendous value to me in my program, possibly my deputies could use them or knew of someone who could.

I realize that my answers probably are not what you were looking for. I'm sure that my method of dispersal leaves something to be desired. I come to the conclusion that I have to deal with water conservation purely from the stand point

of how something affects the fish in our streams. While I realize that water quantity certainly has an effect on the fish, my biggest effort has to be toward improving quality. This keeps me plenty busy. Really what I'm am trying to say is that I certainly feel that the material would be of great use to someone else, its use to me is limited. I really don't have the time available to me to push water quantity as much as water quality.

Yours truly,

Walter A. Rosser

Waterways Patrolman

3280 Byrd Avenue
Allentown, Pa. 18103
October 16, 1973

Mr. William E. Sharpe
Water Resources Extension Specialist
Land and Water Research Building
University Park Pa. 16802

Dear Mr. Sharpe:

Please accept my apology for the delay in replying to the survey questions which you sent me on September 26 concerning the usefulness of the Home water conservation materials which you had sent early in the summer. Answers attached.

You request a frank appraisal. My own opinion is that all means of publicizing practical methods, which these are, for conservation of our resources is helpful. However, I feel that efforts of this sort can only be stop-gap unless we control population growth, and this is the work to which I give highest priority in my time. (This is why you have not heard from me sooner!) But, attention to population problems and abortion rights (to which I give Much time) cannot operate in a vacuum, I therefore regard your work as highly important. Since one cannot follow the game without a program, your facts and figures must be set down for others to see.

As I have answered in the questionnaire, I have distributed your booklet to six members of the Water Quality Committee of the Allentown League of Women Voters, and to the Chr. of the Land-Use Study Comm.

If you have copies available, I would appreciate you sending me several copies of your July Newsletter, Vol. 4, No. 1 for me to distribute to the Land-Use Comm. Also, I am sure, that Mrs. Louise Northup, Chr. of the Land-Use Comm. would appreciate being placed on your mailing list. I presume that you will continue me on the list.

I am sorry that it may appear to you that we have not done much with your booklet suggestions in a practical sense. Even before receiving it, someone on the "Water" Comm. had suggested that we undertake the "brick in the tank" project, but I have to confess the project has not gotten off the ground yet.

I hope that this arrives soon enough to be of some use to you.

Sincerely yours,

Ethel E. Bishop

Ethel E. Bishop

1) Was this material of value to your conservation program?

Yes.

2) Did you feel that these materials were appropriate for your area of endeavor?

Yes.

3) Did you disseminate the publications on water conservation to any local organizations? or governments? If so, who were they?

Yes, to the Water Quality Committee of the Allentown League of Women Voters. (One of the members is the wife of a man who is on the staff of Rodale Press.) Not to anyone in gavernment, but we may; that is a good idea, there is a candidate who, if elected, would probably be interested in it. I still have two extra copies which I am saving for such a person.

4) Were news releases used by local news media?

The Allentown MORNING CALL has one reproter who is very much interested in water supply and quality, - also solid waste management; his name is Al Hasbrouck. Material which you wuld send him would stand a good chance of getting his attention. (101 No. 6th St., 18105) I will try to get one of the booklets to him.

5) Was any action taken to conserve water voluntarily or through governmental regulation in your county as a result of this packet of materials?

No.

6) What did you do with these materials when you received them?

First, I read them. See above answers.

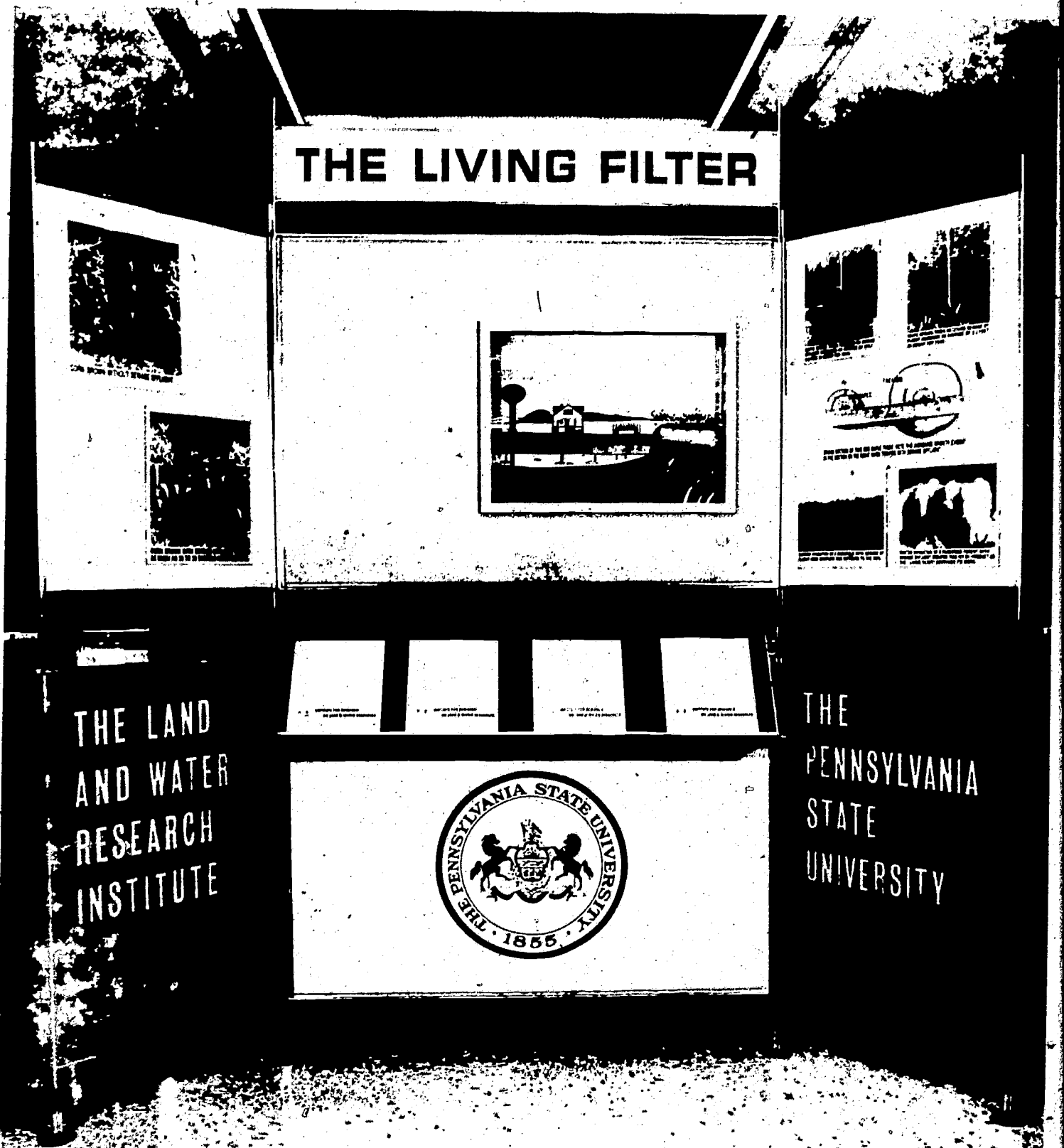
Ethel E. Bishop
Environmental Quality Chr.
Allentown LWV

APPENDIX C

Publication	Times Used	Remarks
Nontechnical		
Clean Water		
Water Resources Notes		
Don't Leave it all to the Experts		
A Primer on Ground Water		
A Primer on Waste Water Treatment		
The Age and Growth of the Fishes in Pennsylvania		
Private Water Systems		
Water Pollution Causes and Cures		
Recycling Sewage Effluent Through the Soil and its Associated Biosystems		
Technical		
Behavior of Annual Floods in Limestone Basins in Pennsylvania		
Deer Movements and Behavior along an Interstate Highway		
Collision of Vehicles with Deer Studied on Pennsylvania Interstate Road Section		
Changes in Streamflow Following Partial Clearcutting on a Forested Watershed		
Efflects of Municipal Wastewater Disposal on the Forest Ecosystem		
Effects of Trees and Forests in Neutralizing Waste		
Pan and Lake Evaporation in Pennsylvania		

Publication	Times Used	Remarks
Technical (cont.)		
Water Resources Research in Pennsylvania		
Active Research Project Listing		
Tornadoes in Pennsylvania		
Flood Series for Gaged Pennsylvania Streams		
Hydrologic Behavior of Selected Watersheds in the Northern Appalachian Region		

APPENDIX D


THE LIVING FILTER
THE LAND AND WATER RESEARCH INSTITUTE
THE PENNSYLVANIA STATE UNIVERSITY
THE PENNSYLVANIA STATE UNIVERSITY · 1855 ·

APPENDIX E

CASE 1

THE PENNSYLVANIA STATE UNIVERSITY

LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

Dear:

I thought I'd send you a note on sewage facilities funding through the Environmental Protection Agency for your future reference, and in case anyone in Bonneauville requested such information from you. At any rate the first step for a community to take is to write to: Mr. Warren Carter, Director, Office of Grants Coordination, U.S. EPA, Curtis Building, 6th and Walnut Street, Philadelphia, Pennsylvania 19106. Attn: Charles Sapp.

The community should give some general information about the proposed project in the letter. EPA will then do a preliminary eligibility check. If the community is eligible for an EPA grant, they should upon notification of this write to: C. Trent Perry, Chief, Grants Unit, Bureau of Water Quality Mgt., Department of environmental Resources, P.O. Box 2063, Harrisburg, Pennsylvania 17120. Mr. Perry will furnish the community with an application kit for sewage facility grant. The rest is up to the community and their consulting engineer.

Give me a call if you have any questions.

Sincerely yours,

William E. Sharpe
Water Resources Specialist

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

Dear:

Enclosed please find a summary of my 1974 tasks.

This task summary should indicate to you that my major areas of work are for this year. I have the additional capability of securing information on most any water resources related problem that you might encounter. I am able to do this because of my location at the Land and Water Research Building where we have a very good water resources library and access to a national computer search service.

I have program responsibility for the entire water resources area to include water quality, water supply, water conservation, water pollution control, flood control, municipal waste treatment, municipal water treatment and aquatic ecology. This admittedly is a pretty tall order but the water resources staff in the Institute for Research on Land and Water Resources is available to assist me.

During our recent phone conversation, we discussed Special Circular 184 "Water Conservation and Wasteflow Reduction in the Home." I feel that the material presented in this publication affords municipal officials with another management alternative in dealing with problems of water shortage and sewer plant overloading. If the devices recommended in S.C.-184 are utilized on a community-wide basis, significant, long term reductions in water use and wasteflow volumes can be achieved. In addition significant savings on water, sewer and electric or fuel bills can accrue to the individual home owner. In these times of skyrocketing utility rates such savings cannot be ignored.

If you have any questions about what I have sent you, do not hesitate to give me a call.

Sincerely,

William E. Sharpe
Water Resources Specialist

Town Without Water; Three Reservoirs Dry

Fire trucks haul water to Abbottstown in massive relief effort.

An estimated 1,000 persons went without water Sunday in Abbottstown after the borough's three reservoirs went dry over the weekend, causing a massive relief effort and an urgent appeal by borough officials for residents to conserve water during what is called "an extremely critical situation."

By 5:30 last evening, a caravan of volunteer truckers had pumped a quarter million gallons of purchased water into a borough reservoir. Town council president John Ebaugh said he thought the emergency water-lift would see residents through this week if they conserved carefully.

Civil Defense would only supply 400-gallon tankers, and then only after approval by the state Department of Environmental Resources. Ebaugh said the bureaucracy involved in obtaining Civil Defense aid seemed too lengthy and the borough decided to try its own relief measures.

East Berlin Water Co. agreed to sell Abbottstown water at an as yet undetermined price, and borough officials and the area's state representative lined up volunteer firefighters and tank-truck drivers to begin the emergency water-lift Sunday morning.

With Hamilton Township policemen water into a temporary pool while Pumper "122" shoved it up and into the reservoir.

The borough has two reservoirs in the Pigeon Hills southwest of the Lincoln Speedway with a dual capacity of a million gallons. A third reservoir completed this week, with a three-million-gallon capacity could not be tapped because the little water in it is still muddy and undrinkable, the borough council president said.

Borough residents in the east end of town, because they live at the lowest level of the borough, received the most water from their spigots through the gravity

Water Crisis Continues

By KATHLEEN STERNER
Sun Correspondent

ABBOTTSTOWN—Abbottstown Borough still has water supply problems, according to a report given by George Wildasin, water authority engineer, at Thursday night's meeting of the Borough Council in the town hall.

"Although the ban has been lifted against drinking the water," Wildasin said, "we are still requiring conservation of water. "We are urging residents to continue conservation measures, and request that laundry not be done in the home. Automatic washers are also terrific drain on our supply."

Wildasin pointed out that many people were under the assumption that because of the recent heavy rains that the situation had improved. "Usage is up, and we still have a probable six weeks of limited supply," he said. At the peak of the crisis, three weeks ago, consumption was estimated at 145,000 gallons per week from the reservoir. This week, usage jumped to 174,000 gallons per week, although the inflow of water from wells and springs has remained the same. The extra 30,000 gallons per week has to be shipped in through sanitized tankers from surrounding sources.

Shipping will have to continue until the normal winter flow from springs begins. Under normal conditions the flow begins in early January. Runoff from surface water has not increased supply since reservoir banks are still not saturated enough to slough off an appreciable quantity of runoff into the reservoirs.

The shortage has cost the borough roughly $1,000, for water purchased so far, and labor and gas. This figure includes a donation of $50 to each of the nine fire companies who helped transport water and volunteered equipment and manpower during the initial emergency, and a reimbursement to the Auxiliary of the Abbottstown Fire Co. for monies spent to purchase food to feed the volunteers that Sunday. Both measures were approved for payment by council.

Until the water supply is returned to normal, the borough will have to continue to ship water to the reservoir, at the rate of five or six loads per week. Wildasin estimated the cost per load to run $5.50 for water, plus labor and gas for equipment used.

As a reminder to residents

See WATER—Page 6

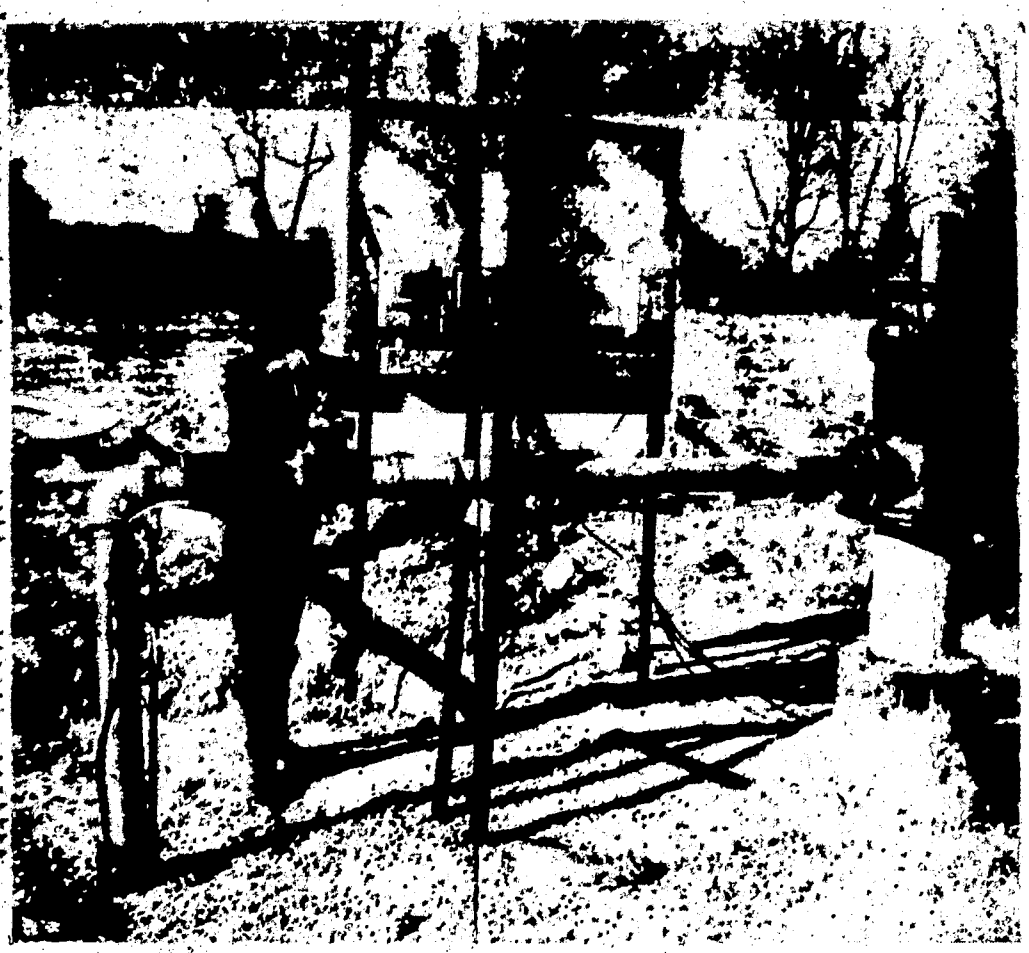
Continued From Page 1

hat the crisis is not yet over, Council moved to supply pamphlets prepared by Pennsylvania State University containing water conservation methods. The pamplets will be distributed by a local 4-H club door to door, and will include a letter from council requesting cooperation.

Wildasin noted that it was not his opinion that borough residents were being wasteful since "too many remember the early days of the water system, when water was dear." But, he pointed out that many may not be aware that the shortage will be with them for some weeks yet.

During discussion of the water report, council expressed their gratitude to all those who helped during the emergency. President John Ebaugh noted that the Borough owed a debt of gratitude to Congressman George Goodling who responded immediately to the cry for help and supplied use of a federal tanker to transport water, and to Assemblyman Clark Smith who requisitioned two tankers from military sources for borough use.

THE APPLICATION OF RESEARCH INFORMATION FOR A LONG TERM SOLUTION TO THE PROBLEM:



WILL SOLVE PROBLEM — Ross Kershner, Greencastle R. D. 4, an employe of the Borough of Greencastle, places the deep well pump into operation Friday. The variable-flow pump will add 300 gallons of water a minute to the reservoir. Now at a dangerously low level, the reservoir is expected to be filled to capacity in about three weeks with the additional flow. The pump and its operating equipment will be enclosed in a building in the near future. (RH photo by Ken Peiffer)

*NOTE: This well site was located by Dr. Richard R. Parizek of The Pennsylvania State University using a technique that was developed with funds provided by the Office of Water Research and Technology, U.S. Department of the Interior through the Institute for Research on Land and Water Resources.

H2O Usable
Mid-Atlantic Newspaper Services, Inc.
2717 N. Front St.,
Harrisburg, Pa. 17110

HANOVER, PA.
MAR 18 1975

Evening Sun (e)
Circ. 27,494

'Water' Is Subject Of Hearings

"Water—Our Neglected Resource" will be the topic of two public meetings scheduled by the Adams County Extension Service. In view of the severe water shortage problems experienced by many communities last year, the first meeting on Tuesday, March 25, will cover new methods of locating underground water and methods by which people and communities may conserve water. William Sharpe, Penn State extension specialist in water resources, will attend.

Henry Wooding, Penn State extension agricultural engineer, will discuss various methods of solving water quality problems Tuesday, April 1. Both meetings are to be held in Room 147 in the Gettysburg Senior High School Annex starting at 7:30 p.m.

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

Dear:

Enclosed are the copies of "23 Ways to Save Water in an Emergency" that you requested. I hope that they are of value to the communities suffering from crisis water shortages in your county.

As I mentioned in our phone conversation Special Circular 184 "Water Conservation and Wasteflow Reduction in the Home" has application in cases where communities need to expand their water resources supply. By reducing consumption with these devices as much as 25% more water can be made available for the community's use.

We also have information on new groundwater exploration techniques for those communities that are contemplating expansion of their current water supply systems. This information enables the user to accurately and economically locate the best well drilling sites in a given area.

If you need more copies of the information that I have sent you or anything else, do not hesitate to call.

Sincerely,

William E. Sharpe
Water Resources Specialist

CASE 2

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

Dear: 7

Enclosed are several copies of Special Circular's 184 and 199.

I would suggest that the occupant of the pharmacy take the following steps to minimize wasteflow from the building.

1. Install one of the several toilet volume reducers mentioned in S.C.-184.

2. Minimize toilet flushing as recommended in S.C.-199.

3. Consider installation of flow control valves on faucets and showers (if any). These are available from Noland Company, 2700 Warwick Blvd., Newport News, Va. 23607 (see S.C.-184).

4. Minimize the running of water at sinks in the pharmacy in accordance with suggestions in S.C.-199.

These simple steps can greatly reduce holding tank pumpout costs. The devices mentioned should more than pay for themselves in a month.

Sincerely yours,

William E. Sharpe
Water Resources Specialist

CASE 5

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

Dear:

I have done some checking with the staff, and I have the following recommendations.

1. For odor problems in sewage treatment plants, I recommend that:

   a) You have your consulting engineer check the BOD (biochemical oxygen demand) loadings to see how much oxygen is required to maintain aerobic conditions in the aeration tanks.

   b) Check blower capacities to see how much oxygen is being delivered to aeration tanks and step up blower output or add additional blower capacity if necessary to maintain aerobic conditions.

   c) Eliminate as many stormwater connections to the sanitary sewer systems as possible.

   d) Have your operator obtain certification as quickly as possible. To aid in this contact John Rosso, Dept. of Community Affairs, State Street Building, 500 North Third St., Harrisburg, Pa., 17101

2. For the disposable diapers clogging pumps problem, I recommend that:

   a) You install a comminutor or bar screens (cheaper) at the inflow end of your treatment plant. The comminutor will grind up the diapers and the screens will physically remove them.

   b) If money is a problem, it might be cheaper to launch a concerted education effort to keep people from flushing disposable diapers down the commode--I don't know how effective this would be. Ray Reitz and I may be able to help on this if you are interested.

3. For corrosive water problem, I recommend that:

a) A reputable laboratory be engaged to determine the corrosive index of the water.

b) Calgon (Sodium hexametaphosphate) be added to the water during the fall season when Ph control is necessary. Enough calgon should be added to produce a phosphate concentration of 5-10 mg/1 initially, tapering off to 1-2 mg/1 for the remainder of the season.

c) An attempt to control leaf litter in the reservoir may also prove worthwhile although it probable would be more costly.

I hope that these suggestions are of value to you and your community. I may be able to provide more specific information on your sewage odor problem with more knowledge of your treatment plant design. However, I must point out that we are in the education and information business only so I cannot make design recommendations for you--your consulting engineer will have to do that.

I am sending you a copy of Special Circular 184 "Water Conservation and Wasteflow Reduction in the Home." This information will be especially valuable to you when you get your infiltration problems squared away; however, you could start applying it now--every little bit helps.

If I can be of further assistance, do not hesitate to call on me.

Sincerely yours,

William E. Sharpe
Water Resources Specialist

CASE 8

THE PENNSYLVANIA STATE UNIVERSITY
LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Institute for Research on
Land and Water Resources
--Land Resources Center
--Water Resources Center
--Regional Analysis Center

Area Code 814
863-0291

June 10, 1974

Dear

Enclosed are materials explaining the nature of the methemoglobinemia problem and how it affects humans. I have also enclosed a paper on nitrate removal from water supplies. I apologize for the way the material is presented, but it is all that we have. I feel that the urgency of the situation demands a prompt response.

Nitrate removal techniques are expensive and generally unproven. Of the methods presented, I would suggest trying breakpoint chlorination first. If the water company is already chlorinating the supply this would simply mean that they would have to add more chlorine and give it a longer time to react with the water.

Other alternatives for the water company are to locate and control the source of the nitrate pollution, relocate their water supply wells, or use one of the alternative treatment methods presented in the papers.

Water consumers should use another approved and safe source for their drinking water. Domestic uses of water other than drinking should be little affected by the nitrates.

I would also like to call your attention to Special Circular 184 "Water Conservation and Wasteflow Reduction in the Home." In communities where water supplies are short, water saving can be a valuable tool in husbanding this vital resource.

If you have any further questions, give me a call.

Sincerely yours,

William E. Sharpe
Water Resources Specialist

WES/mbm

Enclosures