

GUIDELINES FOR 1976 UPDATE OF NEEDS
FOR
MUNICIPAL WASTEWATER FACILITIES

FINAL

MARCH 24, 1976



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I. INTRODUCTION

A. BACKGROUND

Sections 205(a) and 516(b) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) require that the Environmental Protection Agency provide Congress, no later than February 10, 1977, with an estimate of needed publicly-owned wastewater treatment works. The provisions of the law have the dual purpose of obtaining a comprehensive estimate of the total cost of meeting the goals of the FWPCA, and of estimating these costs State-by-State as a possible basis for the allocation of construction grant funds.

B. SCOPE OF 1976 UPDATE

The 1976 Update will involve reviewing, validating and revising the estimates of needs reported in the 1974 Survey on a facility by facility basis, so that the degree of confidence in these estimates is enhanced. Two EPA contractors will assist in the conduct of the 1976 effort - one to provide an update of facility-by-facility requirements in Categories I through IV, and another to update estimates in Categories V and VI. Needs reporting categories are as follow:

Category I - Secondary Treatment and Best Practicable Wastewater Treatment Technology

Category II - More Stringent Treatment

Category IIIA - Infiltration/Inflow Correction

Category IIIB - Major Sewer System Rehabilitation

Category IVA - New Collectors and Appurtenances

Category IVB - New Interceptors and Appurtenances

Category V - Correction of Combined Sewer Overflows

Category VI - Treatment and/or Control of Stormwaters

The two main purposes of performing the Update with contractor assistance are to achieve as high a degree of National consistency in the final estimates as possible through uniformly applied guidelines and validation techniques, and to reduce the amount of State and EPA Regional construction grant staff involvement from that which has been diverted in past Needs Surveys.

The 1974 Survey was influenced significantly by Public Law 93-243, which was an Amendment to Public Law 92-500. This Amendment required the reporting of all potential eligible needs to meet the long-range facility requirements of the Act. The 1976 Update will involve a basic change in that reported facility requirements will be based entirely on effluent requirements that are related to Water Quality Standards currently approved by EPA. (See detailed definition in Item 27.)

This survey is restricted to publicly-owned wastewater treatment works, which include treatment plants, sewers, and many other types of related treatment facilities. The term Treatment Facility is used in this survey to mean all such publicly-owned works. Privately-owned facilities, even if they serve the general public, are excluded. Costs for facilities built at publicly-owned water treatment plants for pretreatment, retention or treatment of wastes from water purification processes are ineligible for grants and should not be reported.

II. RESPONSIBILITIES FOR CATEGORIES I-IV ESTIMATES

A. CONTRACTOR

The Contractor will assist EPA in a facility-by-facility Update of the 1974 Needs data of record. This update effort will be done through the cooperation of EPA Regional and State personnel. Individual facility data files will be updated through an evaluation of the most current information. A determination will be made between the Contractor, EPA Regions, and State personnel as to what information sources will most accurately reflect current facility requirements and where they are located. The Contractor will assist in securing and verifying the new information, will prepare initial revised cost estimates when appropriate within the context of 1976 EPA Update guidance, and will coordinate the review of updated facility estimates with Regional and State Needs personnel. Updated information will be entered on the new Form EPA-1.

B. STATES

States will participate with the Contractor and EPA Regions in determining the best available sources of current facility information and the best scheme for assisting the Contractor in securing this information. States may review the contractor estimates and provide further information to the contractor in support of revisions which they feel are necessary. States may submit independent estimates if they disagree with contractor estimates and the difference cannot be resolved. Each State will have to determine the extent of its involvement, as the type of interface with the Contractor and EPA regions may vary considerably.

C. REGIONS

Some of the Regional responsibilities are included in paragraphs II, A and B above. The Regions will be a major source of current facility information, will coordinate Contractor interface with State Agencies, and will provide final acceptance of estimates before final processing.

III. SEQUENCE OF EVENTS AND MAJOR DEADLINES

A. ESTABLISHMENT OF UPDATE PROCEDURES

Immediately upon award of contract, organizational meeting(s) will be held between representatives of the contractor team and EPA staff. These meetings will establish:

1. initial management plan and update procedure concepts
2. necessary communication links
3. a measure of clarity on the contractor's part toward the full objectives of the update as they apply to this program

The contractor's next concern will be to review all "manual" activities with regard to data collection and validation. Where required, instructions will be prepared by the contractor. The review will involve all manual operations performed in Contractor and EPA Headquarters, Contractor and EPA Regional Offices, and State Offices, which are necessary for the gathering and updating of data. Some examples of manual operations for which procedures need to be developed are:

1. Document Control - the accountability of forms through the various procedural steps
2. Data Collection - manner in which EPA files will be used to update and/or verify 1974 Needs data for specific facilities
3. Information Dissemination - reproduction of forms in various stages of completion and the transmittal of data to the functional groups

Another major task concurrent with this review will be the analysis of cost curves and other "rules of thumb" supplied by EPA. Contractor cost analysis engineers will meet with cognizant EPA engineering staff to review and comment on the EPA-developed curves and other cost related tools and methods. Such items as the base from which these estimates were derived, their applicability to the particular situation and available data, and their usefulness throughout the entire geographic area served will be reviewed, and amendments made where necessary. If required, the contractor will develop any new cost-estimating procedures necessary to adequately project facility costs.

The contractor's next major task will be to develop an operations and training manual to be utilized by contractor personnel. Copies will be made available to EPA Headquarters and Regional staff, and State update staff for informational purposes. The manual may contain information of the following nature:

1. Background on the 1976 Update objectives
2. Detailed information on the procedures to be used in update (manual operations, communication lines, etc.)
3. Delineated responsibilities of each labor category involved in the update
4. Full explanation of all cost-estimating procedures
5. Corporate policies that may impact this program (such as travel)

B. PROVISION OF DATA-OF-RECORD

EPA Headquarters will print the data-of-record for each facility in the 1974 Needs Survey onto the new 1976 Update form and provide copies to the Contractor, Regions, and States. The contractor will use this data as the starting point for his updating effort.

C. BRIEFING

After the operations manual has been completed and approved by the Project Officer, the Contractor will commence training and orientation of participants in the program. Training can be divided into separate functions: training and briefing sessions for government personnel, and training for contractor staff.

The training and briefing sessions for government personnel will be conducted in eleven locations; EPA Headquarters and each of the ten EPA Regional Offices. A general overview of the update and a philosophy of the method of approach will be offered. Techniques will be explained at a level of detail appropriate to the audience.

The orientation session at Headquarters will be the first of the eleven briefings. All personnel attending that meeting should be either directly involved with the update, or have input to auxiliary operations. The briefing will be oriented toward the objective of informing personnel fully on all facets of the proposed operation.

Sessions held in each of the ten EPA Regional Offices will be open to both the Regional Update staff and State personnel to be directly involved in the Update activities. Arrangements have been made with the contractor to schedule one meeting per region, with the aid of the EPA Regional NEEDS Coordinator and/or the Project Officer. It will be important to have all of the State representatives at these work sessions.

Concurrent with EPA training, the contractor will commence training of all contractor staff members. The main difference between this training program and those meetings held for the government's benefit will be the level of technical detail covered. Contractor staff will not only receive an overview of the objectives and methods of the Update, but also training in their own special areas of endeavor.

The contractor's operations and training manual will be the primary reference text used for these training sessions and for the duration of the Update.

D. INITIAL CONTACTS WITH STATES AND REGIONS

An initial contact will be made by the contractor with State/Regional personnel concurrent with, or immediately following, the briefing sessions to:

1. Review with each State Update procedures which will be specifically carried out in that State. As a minimum, an understanding should be established in the following areas:
 - (a). Establish a plan for which facilities will receive the major emphasis and/or be reviewed first. This may be decided on the basis of the dollar amount of the facility, expected difficulty of updating needs and obtaining technical data, or any other logical basis. A time schedule should be established from this plan for the entire Update period to identify major completion milestone dates.
 - (b). Establish a basic understanding of coordination procedures and ground rules for necessary contractor visits within the State.
 - (c). The contractor will perform the Update on the basis of information he obtains. If it is jointly determined that the most accurate data sources are elsewhere, then appropriate arrangements may be made for their review within the Contractor's time and resource constraints.
 - (d). Determine if the State will provide additional information to the contractor on new facilities that have been identified since the 1974 Survey. New facility requirements may be the result of the State adopting a 100 percent estimate (following the Update policy on this in paragraph V J), or may have been identified by the State for any other reason. If a State identifies no new facility requirements there will be no direct attempt by the contractor to do so - except that his general review and cross check of existing facility file data may identify a facility requirement missed in previous Needs reporting.

2. Provide a detailed review of the specific adjustments that will be made to the 1974 Survey data in the 1976 Update.
3. Obtain an early indication from the State of the known unique conditions in each State which would cause contractor estimates made through use of National cost estimating procedures to be significantly inaccurate. In this process the States will be asked to identify any factors that will create a major impact on contractor cost estimating. Identification of such factors is essential so that any potential policy disagreements can be resolved as early in the updating as possible. The areas with the highest potential for disagreement relate to flow per capita, population and abnormal construction cost conditions. States will be notified of final or interim decisions on all issues.

E. INITIAL DATA UPDATE

The contractor will perform the first phase of the updating action by modifying the individual facility data to reflect grant awards and new needs.

F. ADJUSTMENTS TO FACILITY DATA

The main concern of EPA, relevant to this program, is to obtain a reasonably accurate picture of the costs necessary to raise the quality of the effluent from municipal wastewater treatment facilities to a level of secondary treatment or EPA approved Water Quality Standards, whichever is more stringent. A secondary concern is to obtain an accurate overview of all facilities within the United States and its Territories. Any approach to the task of data collection for the 1976 NEEDS Update should be designed to ensure the presentation of a "complete" inventory of municipal wastewater treatment facilities. Through this data collection effort the groundwork should be established for estimating the true needs of these same facilities.

The National Commission on Water Quality and its consultants found the following shortcomings of the previous Needs Surveys:

1. population estimates (overestimated by States)
2. level of industrial flows (underestimated)
3. unreported needs for sludge handling and disposal (underestimated)
4. unreliability of discharge requirements that facilities must meet (overestimated)
5. failure of many facilities to update their 1973 NEEDS Survey (underestimated)

The contractor should plan to arrive at cost-estimating procedures which will produce reliable dollar figures and eliminate or reduce the above mentioned areas of error.

Individual facility data will be reviewed by the contractor and adjusted as necessary to achieve consistency with the 1976 Update policy guidance including such items as population, flow, effluent requirements, and cost curves. In performing the update efforts indicated in both this and the preceding paragraphs, the contractor will be using information from Regional data sources such as: the grant files; O&M files; permit files; priority basin files; state effluent guidelines and water quality standards; basin, area and facility plans; any State and local sources agreed on for use as provided above.

EPA will supply the contractor with an Update form for each facility that participated in the 1974 Survey. This form will be pre-printed with data from the NEEDS Survey data bank. This update form will serve as the only vehicle for capturing new or more up-to-date information on the characteristics of the facilities. It will remain in the process until both the State and Region have agreed to the 1976 cost analysis for the facility, or until the contractor submits his estimate without State/Regional acceptance. The contractor will first sort all the forms for a particular State based on the previously established plan (see Section III,D,1,(a)), with others entering the process system as the work flow allows. (approximately 15% of the reports covering the largest facilities accounted for 85% to 90% of the estimated costs in previous surveys.)

Both the NPDES (National Pollution Discharge Elimination System) file and the Construction Grant file will be used for data gathering purposes. All data extracted from these files will be inserted in the appropriate areas of the update form, adjacent to the existing needs data. Where data gathered from previous surveys appears and is in direct conflict with file data, the NPDES and Construction Grant file data will supercede the needs data. The rationale for this is as follows: (1) the permit data has been gathered for public display, and by law must be correct, (2) the permit data is at most 18 months old (about as old as the newest data gathered during the 1974 Needs Survey), and may be much newer, and (3) grants data involve public funds and should therefore be quite accurate.

The Contractor will be facilitated in the above effort by the "Cross-Reference Index." This cross index will indicate the NPDES file number and all grant numbers for each facility covered in the 1974 Needs Survey.

Data will be extracted from the permit application and the permit itself. Among the critical data elements used to verify needs from this data source are:

1. population (1990 and present)
2. total flow (avg. and design)
3. industrial flow (avg. and design)
4. BOD5 (avg. and design)
5. suspended solids (avg. and design)
6. phosphorous (avg. and design)
7. total n (avg. and design)
8. treatment procedures and methods
9. sludge handling procedures and methods
10. level of treatment required to meet existing water quality limitations

The Grant file will be accessed to find out if any grants have been awarded since May 1974. Grants awarded after May 1974 for which needs were reported in the 1974 Survey will be reduced by the amount of the grant award.

After data has been gathered from the files and recorded on the appropriate forms by the contractor's staff, the forms will then be given to the contractor's cost-estimating engineers for cost analysis and technical review. It is expected that the contractor will conduct several "levels" of form processing in this task. Contact with cognizant parties to request additional information on which to base decisions will be made at this time. The latter may involve telephone or letter contact, or personal visits to States or municipalities. The contractor will maintain suspense files on specific problem areas and information needs.

As the required cost estimates are being completed for facilities, the set of forms will be batched and copied. The size of the batches and method of distribution will be determined by the Contractor on the basis of a system that will insure a continuous flow of forms throughout the Update period, and distribution that is expeditious but insures document accountability. (A more complete reference is made to the latter in Section III G.) One complete set will be sent to the State for their review. A second set will be maintained in the Regional Offices for use by both the Contractor's staff and the EPA Regional Needs personnel. The original will be retained by the Contractor in his central processing facility pending review and comment by the State.

When the states receive their batched sets of forms, and have reviewed each facility, they will communicate to the Contractor those facilities which have acceptable costs (so the originals may be released for coding and keypunching). For those facilities whose costs are unacceptable to the States, it will be incumbent upon the State to formally communicate those differences (via the State's copies of the 1976 forms) to the Contractor. Those forms submitted as alternative costs must be signed by the appropriate State Agent. All state comments in the "form-review" stage must be made on a facility-by-facility basis. (For example, the States may not lump individual facilities together when commenting on category costs.)

It is understood that the above task is a continuing one, and that the States will be receiving their copies in batch shipments after they are processed through the Contractor's technical and cost analysis review. This will allow the States more time to review contractor estimates of individual facilities.

In two cases, facility data must be sought out at the State level: (1) facilities that are in the planning stage and that have not been reported in prior NEEDS Surveys, and (2) facilities that are in the planning stage, that have been reported in prior NEEDS Surveys, but that have not yet been issued a permit or grant, i.e., facilities that are known to the system but on which no data is available in the normal sources other than data reported in prior NEEDS Surveys.

The State will be asked to identify all facilities of the type described in (1) above, and will be asked to supply the best data available for all of the data elements listed on the NEEDS form. They will also be asked to carefully review and update the available NEEDS data on facilities of the type described in (2) above. Copies of NEEDS forms will be left with the States for this purpose. Resulting requests for information should be limited, however, as the possible number of any such facilities in a State is actually small and of high current interest in State offices.

If the State does not have the manpower available to meet these requests, the Contractor may arrange to place one (or several) of his staff members in the State offices to assist in preparing the data. It is hoped that the States will cooperate at least to the extent of giving the Contractor access to their files, or nothing valid can be done in the area of new facilities.

When data on a new facility is obtained by the Contractor, it will be reviewed for completeness and checked against the Region permit and grant files. A NEEDS authority/facility number will be assigned and the facility will be added to the wastewater facility cross index. The EPA Regional NEEDS Coordinator will be asked to review the material and add anything he might know about the new facility. The form will then be sent to the Contractor's processing facility and handled in the same manner as all other facilities in the balance of the process.

G. REGIONAL/STATE REVIEW OF UPDATE

The individual facility forms that have been updated by the Contractor will be forwarded for State review. Updated forms will be submitted for review in batches. The contractor will forward such documents to the pertinent States at frequent intervals to insure both continuous flow of documents and accountability. The frequency of distribution should be in accord with the general schedule of facility review that is discussed in paragraph IIID,1,(a) - which affords an even distribution of work over the entire estimating period, prevents a massive last minute resource commitment, and identifies major problems first.

The Contractor will indicate on a cover sheet transmitting each batch, the date by when the State should complete their review and perform one of the following actions:

1. Notify the contractor the facility figures are acceptable, or
2. Notify the contractor where there is disagreement with the data and decide with the contractor on any actions which are necessary to settle the issue.

If disagreements cannot be settled with the Contractor, the State may provide a separate estimate by returning the facility forms, marked-up to reflect what is felt by the State to be the correct data.

This period will provide the State an opportunity to review the Contractor estimates before the facility data is entered for final processing and data summarization. Because of time constraints, the contractor will be able to modify estimates only during the specified "batch-review" period which immediately precedes data automation. Any action to change an estimate beyond this review period will be handled as in the paragraph above - in which situation the State estimate would be treated in the final February, 1977 Report to the Congress as a separate estimate - independent from the EPA estimate.

H. DATA CONVERSION

Conversion of data to machine-readable form will take place continuously from about the eighth week after initiation of data collection until all data has been converted. The Contractor is responsible for designing preliminary specifications for data entry, including all keyboarding tasks. Record format and length will be determined, but will be similar to 1974. Output medium of key-preparation is to be 9 track 800 BPI magnetic tape.

There is provision in the 1976 NEEDS Contract for on-site programming staff to support EPA during the contract period. The NEEDS Project Officer will be the sole director of their activities. EPA will supply all computer time to the project.

IV. MAJOR POLICIES

This section sets forth the major policies of the 1976 Update, and other policies which have general applicability and do not necessarily relate to specific items in the form.

A. DATA-OF-RECORD

The starting point of the 1976 Update is the data-of-record preprinted on Form EPA-1 "Estimate of Municipal Wastewater Treatment Facility Requirements." The data-of-record will differ from cost values submitted in 1974 due to processing actions. See EPA adjustments to 1974 Needs Survey Data Base in Appendix 1 for details. All cost figures will have been automatically updated to reflect 1976 dollars (based on the January 1976 construction cost index.)

This data base may be left the same if the information for a given facility is still accurate; it may be altered to reflect changed cost requirements for any of the reported facilities. Any new facility requirement will be identified by completing a new Form EPA-1. Alterations in the data base are accomplished by filling out all or part of form EPA-1 in the shaded spaces provided in each data item number that is applicable. Data should be corrected or added when missing even if those changes do not result in changed cost estimates.

B. LEVEL OF EFFORT

The contractor will spend more time on the analysis of estimates relating to the large and/or significant facilities - possibly visiting these treatment authorities if data from other sources is inadequate. The requirement for a plan for how this is to be accomplished was identified in paragraph 111D,1,(a).

C. DOLLARS

All costs are to be reported in thousands of dollars. Hundreds should be rounded to the nearest thousand. Cost figures should be entered as indicated in the following example:

If the figure is: \$1,283,652,522
It should be reported as 1,283,653.

All costs are to be in current (January, 1976) dollars. Unchanged needs from 1974 which were reported in 1973 dollars will be automatically adjusted by inflation multipliers to 1976 dollars (as indicated above) in the Data-of-Record printed on the individual facility forms.

D. SECONDARY TREATMENT

Wherever reference is made to terms relating to "secondary treatment" it shall be considered for the 1976 Update to be synonymous with the term "Best Practicable Waste Treatment Technology (BPWTT)." Also for the purposes of this Update, BPWTT will mean secondary treatment under the treatment and discharge alternative, unless higher levels of treatment are required by water quality standards or other requirements. Nothing in these definitions affects the July 1, 1977 secondary treatment requirements of the Act.

E. DESIGN YEAR

Costs are to be based on the design of facilities which will serve the projected 1990 resident population. The composite State-wide 1990 population figures are those used in the 1974 Survey. If a firm design has been based on a year beyond 1990, the facility costs should be adjusted to reflect the 1990 population figures. Adjustments in the cost of facilities to serve the 1990 population should be made through the use of appropriate cost curves.

F. UNITS OF MEASUREMENT

Most data will be collected in English units (feet, gallons, etc.) of measurement, but may be converted through a computer program so the Final Report can reflect either metric or English units, or both.

G. COST ESTIMATING

Cost factors have been brought up to date by analysis of a large number of recent actual bids for grant projects throughout the country. A series of simplified cost curves derived from this analysis are attached in Appendix 2 and may be used in the absence of more detailed engineering estimates.

Appendix 2 also contains policies that will govern the cost estimating effort in the 1976 Update. The policies will cover such areas as allowances for existing plants, where plant expansion costs are being estimated.

H. ALLOWABLE BASIS FOR PLANT ESTIMATES

As indicated in Section I,B the 1976 Update will be limited to facility requirements that are based on effluent criteria included in State Water Quality Standards approved by EPA as of February 1, 1976. (See detailed definition in Item 27.)

Estimates for the Update must also be in accord with current municipal construction grant eligibility guidelines as specified in the February 11, 1974 Construction Grant Regulations and supplemental Program Guidance Memoranda.

I. SAMPLE

The contractor will report needs using the same sample groups as used by the States in the 1974 Survey. The States will have the option to go to a 100 percent report basis, provided that additional requirements have previously been identified and there is sufficient information to complete a Form EPA-1 for each facility. States must provide the contractor with a completed Form EPA-1 for each additional facility by July 1, 1976. A decision must be made by the State to go to a 100 percent basis of estimating by March 15, 1976; and written notification of such decision must be officially sent to the EPA Regional Needs Coordinator. The contractor will discuss this option with each State in his initial contacts.

For all States using a sample, the contractor will validate the 1974 data. Included in such validation will be a comparison of the sampled communities used by the State in the 1974 Survey with the communities that should have been selected in accordance with the sampling procedure contained in the 1974 Survey Program Guidance.

J. BASIS OF ESTIMATE

The 1976 Update retains the concept that the costs reported for all needs must indicate the basis on which the cost estimate was developed, and where available, provide data to support the reported needs. Cost estimating procedures are contained in Appendix 2. Use of these procedures is no longer optional as it was in the 1974 Survey. The basis of cost estimates are explained below. If more than one is applicable, use the code which represents the highest level of accuracy.

1 - State certification

This relates to certifications by a State where excessive infiltration/inflow does not exist. These certifications must be based on studies or other information available on the sewer system before facility planning begins, or gathered in the course of the facility planning process and must be acceptable to the Regional Office. Code '1' should not be used when a 'Code 2 Analysis', or a 'Code 3 Survey' has been completed.

2 - Analysis completed

The estimate is based on documented cost analysis, per 40 CFR, Part 35, February 11, 1974. This applies only to Category IIIA.

3 - Evaluation survey completed

This estimate of cost is based on the findings of a Sewer System Evaluation Survey, completed pursuant to 40 CFR, Part 35. It refers only to Category IIIA.

4 - Engineer/Consultant firm estimate

The estimate is based on detailed engineering work including detailed Step II plans and specifications for construction grant assistance.

5 - Cost of previous comparable construction

This estimate is based on the cost of a project which is similar in size and scope and for which detailed construction cost data is available.

6 - Engineer/Consultant preliminary estimate

The estimate of cost is based on a completed Step I Facilities Plan, including a cost effective analysis, or for IIIA and IIIB based on a completed technical study which provides sufficient information to estimate cost eligibility and validity.

7 - EPA - supplied cost estimating procedures

The cost is estimated through the use of EPA cost estimating procedures.

8 - Cost effective analysis

The estimate of cost is derived from comparative economic evaluation of various alternatives, per 40 CFR, Part 35, but full facilities plans are not completed.

9 - Rough estimate

The estimate of cost is derived from the application of crude and "rule of thumb" procedures, e.g., the cost of a secondary treatment plant estimated at one dollar for every gallon treated.

K. DESIGN FLOWS

A flow per capita per day of up to 125 gallons will be allowed in the Update as an acceptable value for validation purposes. Flow values that exceed 125 gallons per capita per day must be justified on an individual case basis. This flow value relates to domestic flow and includes an allowable factor for commercial flows and for infiltration/inflow that is not considered excessive (e.g., that amount of I/I which cannot be economically eliminated). The flow figures used in the Update should relate to design flow. Per capita domestic/commercial flow does not include industrial flow, excessive I/I, or the wet weather component of flow in a combined sewer system. Design population should be used in calculating per capita figures.

Industrial flows for existing facilities will be evaluated on the basis of the following criteria:

1. Existing flows will be allowed
2. Future flows will be allowed to the extent that their need can be verified through letters of intent or other documentation that is considered acceptable to the EPA Regional office under its grant approval policies.
3. Flows in excess of those validated in 1 and 2 above will be allowed up to 20% of the 1 and 2 flow.

Industrial flows for new facilities (not yet built) will be the greater of the following:

1. 10% of the design capacity or design pollutant loading of the new plant, or
2. Actual flow to the extent that the need can be verified through letters of intent or other documentation that is considered acceptable to the EPA Regional Office under its grant approval policies.

If reported industrial flows do not meet the above criteria, they will be flagged for further evaluations on an individual case basis.

L. INFILTRATION/INFLOW

Costs for nonexcessive I/I (I/I which is more cost effective to convey and treat than to eliminate) should be reported in Category I, II, IVA and IVB as appropriate. Only costs for correcting excessive I/I should be reported in Category IIIA.

M. CATEGORY V - CORRECTION OF COMBINED SEWER OVERFLOWS AND CATEGORY VI - TREATMENT AND/OR CONTROL OF STORMWATERS

Categories V and VI facility requirements will be estimated through a separate Update contract. For this reason there should not be any needs reported in this Category I-IV Update for facility costs that are allocable to the control and abatement of pollution attributable to the wet weather component of waste water in combined sewer systems, or costs for facilities needed to control pollution discharges from separate storm sewers.

V. SPECIFIC GUIDELINES FOR COMPLETING FORMS

This section provides the specific policies which relate to each item number in Form EPA-1. These individual item descriptions may include an expansion of the "major Policies" discussed in Section IV.

The form for the collection of data for the 1976 Needs Update is substantially different in format from the 1974 Survey form, although the information gathered is essentially identical. The form itself will be printed for each facility included in the 1974 Survey, and will show for these facilities the data-of-record from 1974. Space is provided by each item for updated, new, or changed information. Much of the form is to be filled out using the coded numbers listed on the Code Reference Chart printed on the reverse side of the form. The instructions that follow relate to each Item Number in Form EPA-1.

ITEM NUMBER 1 Authority-Facility Numbers

In this update, every existing and proposed facility is uniquely identified by a combined authority and facility number. The first two digits of the authority number are the Federal Information Processing Standard (FIPS-5) codes for States and territories of the United States. The next four numbers uniquely identify each authority within the State. The last three numbers identify facilities within the authority.

In past Needs Surveys, authority numbers were assigned sequentially by each State agency, using whatever consistent system was most convenient (i.e., alphabetically, geographically, at random). For example, the first authority number in Alabama was designated 01-0001. Facility numbers were ordinarily assigned by each authority unless the State agency had a complete inventory of all facilities operated by each authority and decided to pre-number all questionnaires.

The 1976 Update will provide forms with data-of-record information for all facilities reported in 1974. These Needs numbers cannot be changed. The Contractor will be responsible for assigning new authority and facility numbers for those new authorities, new facilities, or facilities not reported in 1974. The contractor will work with the State agency in assigning new authority numbers to insure no numbers are duplicated and that the numbering system remains consistent with the State's.

Under each new authority, or for new facilities under an authority already defined in the 1974 Survey, numbers should be assigned to each existing and proposed facility. Do not change existing numbers.

For all new facilities, the authority-facility number should be written clearly in the space provided in item 1 and also in the lower right hand corner of the form.

ITEM NUMBER 2 Facility Name

In this Update, a "Treatment Facility" will usually consist of a wastewater treatment plant, plus all collector and interceptor sewers, pumping stations, or other auxiliary facilities which feed into the plant and are under the control of the same Treatment Authority that operates the treatment plant. In most cases, therefore, a treatment facility will consist of an entire wastewater treatment system, and only one Update form should be completed, no matter how elaborate the system. Separate forms on each collector sewer, pumping station, etc., whether existing or proposed, are not required, except as specified below.

Occasionally, a Treatment Authority operates only a sewage plant; another authority is responsible for collection. In this case, a form should be completed for the plant only; a second form should be completed for the collection system only. If a single authority has control over more than one facility, a form should be completed for each facility.

The "Facility name" for a new facility should be the name most frequently used by the Authority to identify this facility. The name on the printout of record for facilities reported in 1974 should not be changed unless considered completely inappropriate.

ITEM NUMBER 3 Authority Name

The official name of the Authority is the name which is used to legally identify it. If several such names exist, use the name contained in the most recent Federal construction grant, if still appropriate. If the Authority is a unit of a city or county, please identify the unit. (For example, "Auckland, City of, San. Dept," rather than merely "AUCKLAND" or "LANCASTER COUNTY.")

For purposes of this Update, a treatment authority means any unit of a State, county, or city government, or any other non-Federal unit of government, which is responsible for the collection and/or treatment of municipal wastewater. A Treatment Authority may be a unit of a local government, such as the Board of Public Works of a particular City, or it may be a special-purpose agency established to provide services to a particular area, such as a metropolitan sewer and water authority. The area served by an authority may be limited to a town or part of a single city or county; or it may include all or part of a number of cities, towns, counties or other places.

In some areas, there may be one Authority responsible for collection of wastewaters and another Authority responsible for treating them. In such cases, a form should be submitted describing the respective functions and eligible needs within the scope of this Update. Only those sections relevant to collection need be filled out for an Authority which is only responsible for collection services, etc.

In some areas, no unit of government may have been designated as responsible for either the collection or the treatment of sewage. (Not all areas of the country require such services.) If the State agency has determined that the concentrations of population and other sources of pollution in a particular county do not require local sewage services, no forms need to be completed for such counties. However, it is considered necessary that all populated places above 500 persons should be represented in this survey, either directly or indirectly through the sampling process.

In areas where there appears to be a need for collection and/or treatment services, but no unit of government has been designated as responsible for providing them, the following guidelines apply:

1. If the area is an incorporated place, then the government of the place should be considered to be the Treatment Authority.
2. If the area is not incorporated, then the county government, such as the Board of County Supervisors, is presumed to be the Treatment Authority.

State Water Pollution Control Agencies may have modified the above guidelines for determining Treatment Authorities, if State law provides for a different residual responsibility, or, in New England, where the township constitutes the unit of local government closest to "county."

ITEM NUMBER 4 NPDES Number

Enter the National Pollutant Discharge Elimination System (NPDES) permit/application number.

ITEM NUMBER 5 Basin Code

These codes were developed by EPA to show the major/minor basins where plant effluents are discharged. This information is part of the data-of-record and will appear on most of the 1976 Update forms.

The contractor will be provided with a list of these basin codes and will enter the codes for all facilities which were missed during the 1974 Survey and for all new facilities.

ITEM NUMBER 6 245 Number

The Municipal Waste Facility Inventory (245 File) is an automated data file which reflects the status, characteristics, and types of disposal and treatment facilities in place on January 1, 1968. Every facility included in the 245 data file has an assigned number. Where this number is part of the 1974 Needs Survey data-of-record it will be preprinted on the 1976 Update form. When missing, the contractor will fill in this number by accessing the cross-reference index.

ITEM NUMBER 7 Sample

If the facility is part of the sample group to be used in the 1976 Update, check this box.

ITEM NUMBER 8 Facility Location

State:

This two digit number indicates the name of the State. These numbers are based on the Federal Information Processing Standard for designating States and outlying areas of the United States (FIPS-5). The same numbers are used in the Authority number assigned to each treatment authority.

County:

This is the FIPS-6 code, which indicates the name of the county.

Place:

This number is derived from the "Geographic Identification Place Scheme" developed by the Census Bureau for use in the 1970 Census. The place code numbers will be used to identify (on the questionnaire) each place in which an authority or a facility is located. The scheme uses the FIPS-5 and FIPS-6 codes for State and counties. The place code itself is a 4-digit number assigned to each place within a State which was identified in the Census. Numbers are assigned in alphabetical order. The combination of the 2-digit State code and the 4-digit place code uniquely identifies each place in the United States.

ITEM NUMBER 9 Congressional District

Record the number of the Congressional District(s) to which this facility provides service. (For example, for a plant which services the third and seventh districts, enter "03" and "07.")

ITEM NUMBER 10 Submission Code

Indicate the proper code, as follows:

1. No change from data-of-record from 1974 Survey.
2. Facility not reported in 1974. This may include any newly identified facility requirement, e.g., a regional treatment plant proposed since the 1974 Survey.
3. Change from 1974

Changes in the 1974 cost data, occurring from such causes as imposition of additional effluent limitations, designation of water quality limited segments, or receipt of a grant award for a previously-reported need should be reported. NOTE: These causes may result in an increase, decrease, or deletion of a 1974 need "of record" identified on the form.

ITEM NUMBER 11 City

The name of the city or town in which the facility is located.

ITEM NUMBER 12 County

The name of the county or county-equivalent in which the facility is located.

ITEM NUMBER 13 Zip Code

The official Post Office zip code of the facility.

ITEM NUMBER 14a Facility Status

Indicate the proper code, as follows, for present operational status of the facility.

- 1 - in operation
- 2 - not in operation

ITEM NUMBER 14b Nature of Facility

Indicate the proper code showing the existing (or, if new, the proposed) type of facility, as follows:

1 - A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with combined sewers.

2 - A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with separate sewers.

3 - A separate treatment plant. (The sewers which discharge to this plant are under the control of one or more different authorities.)

4 - A separate municipal wastewater collection system. (Includes one or more connected collector and/or interceptor sewers, force mains, pumping stations, etc., which either discharge without treatment or discharge to a facility controlled by a different authority. Do not include combined sewers or storm sewers.)

5 - A separate combined sewer system. (Includes one or more interconnected sewers which carry both sanitary wastewaters and stormwaters, and which either discharge without treatment or to a facility operated by another authority. If facility includes both separate sanitary sewers and combined sewers, report as combined.)

6 - Other

ITEM NUMBER 14c Construction Grant Status

Grants made on needs reported in the 1974 Survey will be automatically flagged before the start of the 1976 Update. If there were construction grant funds approved or pending in 1974, the preprinted data-of-record will show the appropriate code. The contractor will be provided with a supplemental grant listing which shows all grants awarded under PL 92-500 up to December 31, 1975 and will update each from to show the current grant status. The codes are as follow:

- 1 - construction grant funds approved or pending in 1974
- 2 - no applicable grants

Construction grants are constantly in the process of being approved by EPA. For purposes of the 1976 Update, all applications and pending grants should be reported as needs. Grants made before January 1, 1976 should be subtracted from the needs of record. All grants awarded after January 1, 1976 should be reported as needs and should not be subtracted from reported needs.

Cost overruns or other increases in the cost of construction of facilities which are a part of an approved grant are excluded from the scope of this Update and should not be reported as needs. However, costs to upgrade treatment (e.g., to EPA-defined secondary treatment level) above the level specified in an approved grant should be included in this Update.

Facilities which are under construction, or that have received a grant from EPA but are not under construction, should be reviewed to determine if their design meets the new requirements of the law and if the costs are expressed in 1976 dollars. If they do not meet these requirements, a need exists to the extent that the design must be upgraded to meet new requirements.

ITEM NUMBER 14d Projected Change

If there is a projected change for the facility, indicate the proper code, as follows:

- 1 - Enlarge
- 2 - Upgrade
- 3 - Enlarge and upgrade
- 4 - Install in new plant (i.e. construct new plant and/or
install in new plant)
- 5 - Replace
- 6 - Abandon
- 7 - No change
- 8 - Other

ITEM NUMBER 14e Date

If code 6 is used in 14d, indicate the month and year the facility will be abandoned.

ITEM NUMBER 15 Summary of Category Needs

This section shows the costs for Categories I-IVB. The Cost of Record (column a), New and/or Revised cost (column b), and Portion Required to Satisfy Backlog (column c) for each category will be shown in unshaded and shaded areas as described below. Columns (a) and (c) are to be used by EPA/contractor while the unshaded portion of column (b) is to be used by the States to report New and/or revised costs. Only the contractor will write in the shaded areas of Item 15.

Column (a) Unshaded area -- shows preprinted cost from 1974 Survey automatically adjusted for such factors as inflation and change in population, etc. If the contractor revises this estimate, he will cross out the preprinted number and enter the revised figure above it. This space is also to be used to report the estimate of needs for facilities not included in the 1974 Survey.

Column (a) Shaded Area -- Will show the final cost estimate after State review, reflecting either contractor/State agreed estimate or contractor estimate if agreement with State can not be reached.

Column (b) Unshaded Area -- State will review column (a) data-of-record cost, and/or revisions to it by the contractor, and will use this unshaded area of Column (b) to enter revised cost, if it is felt that the data-of-record or contractor's revision is inaccurate.

Column (b) Shaded Area -- If the contractor and the State cannot agree to a revised cost estimate after State review, the State figure will be entered here. The contractor will enter the State estimate on the original copy of the form.

Column (c) Unshaded Area -- Shows estimated cost of new or of modifications to existing facilities to satisfy backlog needs of July 1, 1975 population.

Column (c) Shaded Area -- Shows above cost after validation and adjustment. The following guidelines will be used to calculate backlog needs under the various cost categories:

1. Categories I, II, and IVB -- incrementally interpolated (through the use of appropriate cost curves) estimated costs to satisfy July 1, 1975 population and currently approved treatment levels.
2. Category IIIA -- All estimated costs for I/I correction.
3. Category IIIB -- All major rehabilitation costs plus that portion of replacement cost which is apportioned to serve July 1, 1975 population. Incremental replacement costs of sewers larger in size than those needed to serve the 1975 population will not be reported as backlog.
4. Category IVA -- Cost of collectors and appurtenant facilities. Backlog cost for this Category will be the same as in the shaded area of column (a).

Column (d) -- Refers to Columns (a) and (b) only. It does not relate to the backlog costs. If the preprinted code is different from the basis of estimate for the contractor's revised estimate, the contractor will cross out the preprinted code and enter the revised one above it. If the State wishes to indicate a different code for data it may enter in Column (b), it may do so by crossing out the contractor's code and entering the new code, making sure the new code is also in the unshaded area. The contractor will enter the basis of estimate code for the final cost estimate in the shaded area.

1. Categories I and II

A plant construction cost must be reported as either a Category I or a Category II plant. All plant costs must be reported in only one category. The criteria for selection of the proper category is as follows:

- (a) If the required level of treatment is restricted to the parameters of Five-Day BOD, suspended solids, fecal coliform bacteria and pH, and conforms to the following definition, then all plant costs should be reported for a Category I plant.

Biochemical oxygen demand (five-day).

- The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 30 milligrams per liter.
- The arithmetic mean of the values for effluent samples collected in a period of seven consecutive days shall not exceed 45 milligrams per liter.
- The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

Suspended Solids.

- The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 30 milligrams per liter.
- The arithmetic mean of the values for effluent samples collected in a period of seven consecutive days shall not exceed 45 milligrams per liter.
- The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

pH

- The effluent values for pH shall remain within the limits of 6.0 to 9.0.

Fecal Coliform

- The geometric mean of the value for effluent samples collected in a period of 30 consecutive days shall not exceed 200 per 100 milliliters.
- The geometric mean of the values for effluent samples collected in a period of seven consecutive days shall not exceed 400 per 100 milliliters.

(b) If the required level of treatment is more stringent than defined above, and/or includes additional limiting parameters for phosphorous, ammonia, nitrogen, etc., then all plant costs should be reported for a Category II plant. This should be true even if secondary type unit process elements (augmented) are to be utilized in accomplishing the treatment level.

(c) If land treatment is utilized, it should be so indicated in Item 29 as code 15, and all costs, including land purchase, reported as Category II or Category I depending upon effluent limitations required to be met by the Permit requirements.

In a combined sewer system any costs allocable to the treatment plant capacity utilized to correct periodic bypasses or overflows should be excluded from Category I or II cost and should be reported as a Category V cost (in a separate effort). Cost of constructing storage/retention basins or lagoons or other facilities to control discharge of pollutants from combined sewer overflows or bypasses should also be reported in Category V. (See paragraph V M.)

The Eligible Construction Costs should include all grant eligible costs, i.e. construction contract costs, design costs, contingencies, legal-administrative costs, effect of OSHA requirements, etc. Total plant costs include facilities such as administration buildings, shops, laboratories, landscaping, outside piping, and utilities. Land costs should not be included except when land is used as an integral part of the treatment process or for ultimate disposal of wastes.

2. Category IIIA Infiltration/Inflow Correction and Category IIIB Major Sewer System Rehabilitation

Category III deals with sanitary sewer systems and has been split so that needs can be reported in 2 sections. The "A" Section deals with "Infiltration/Inflow Correction"; necessitated by the provisions of Section 201 of PL 92-500. The "B" Section deals with "Major Sewer System Rehabilitation," as defined in Section 211 of PL 92-500, which provides for grants for replacement or major rehabilitation of an existing sewage collection system if it is necessary to the total integrity and performance of the waste treatment works. The costs of correction of Infiltration/Inflow in combined sewer systems and the cost of correction and/or treatment of overflows and bypass flows from such sewers is not to be reported. (See Paragraph V. M.) Major rehabilitation or replacement of separate or combined collection systems may be reported in Category IIIB when necessary for the overall integrity and performance of the sewer system.

Cost estimates should be reported in Category IIIA or IIIB only if the basis of estimate code is 2, 3 or 6.

The following costs should be reported in Category IIIA: (a) Infiltration/Inflow Analysis (b) sewer System Evaluation Survey, and (c) Corrective action to reduce I/I if cost effective.

For the 1974 Needs Survey, if costs were reported in Category IIIA for correction of excessive I/I without changing Category I or Category II costs, a duplication of costs may have occurred. Therefore, the following guidance is provided to avoid duplication and allow eligible costs to be reported correctly:

- (a) If overflows in the sanitary sewer system or bypasses do not occur, and treatment costs were included in Categories I and II for excessive I/I, report a cost for I/I correction in IIIA, but also make an appropriate reduction of Category I or II costs to account for I/I that is to be removed from the system.
- (b) If overflows occur in the sanitary sewer system due to I/I, and costs for treatment were not included in Categories I and/or II in previous Surveys, such costs for I/I correction, satellite overflow treatment facilities, or storage and pump back facilities should be reported in Category IIIA.

All needs reported in Category IIIB must reflect replacement or major rehabilitation costs necessary to insure total integrity and performance of the waste treatment works. Normal system operation and maintenance costs may not be included as a need. Costs should be reported in category IIIB only if the sewers do not have excessive infiltration/inflow. All costs for improving sewers with excessive infiltration/inflow should be reported in category IIIa in accordance with the guidance for that category.

For the purpose of this Update, replacement is defined as construction of parallel sewers or sewers to perform the function of existing sewers where existing sewers are to be abandoned. Major rehabilitation is defined as extensive repair of existing sewers beyond the scope of normal maintenance programs (e.g. cement mortar lining of deteriorated brick sewers). The cost of rehabilitation should not exceed replacement costs.

If the "Basis of Estimate" code for an identified requirement is 2, 3 or 6, it may be reported in the Update. However, if other codes are marked as the basis for the estimate, the cost will not be allowed.

The contractor should review with each State, in their initial discussions, any 1974 needs in these categories that were reported as other than 2, 3 or 6 costs; and if no analytical work has been done in the State to further define the requirement, the needs should be eliminated from the 1976 Update.

3. Category IVA New Collectors and
Category IVB New Interceptors

Category IV has been separated so that requirements can be reported in either Section "A" for "New Collectors" or Section "B" for "New Interceptors."

Force mains and pumping stations will be reported under either A or B - depending on whether their primary mechanical function relates to the Collectors or the Interceptors.

Engineering details relating to collectors, interceptors, and their related force mains and pumping stations - as well as cost information - will be identified in Item Number 17. The cost information will therefore appear in both Item Numbers 15 and 17. Individual costs will be reflected in Item Number 17 and will be summarized as one total cost in Item Number 15.

Costs may be included where there is a need caused by raw discharges, seepage to waters from septic tanks, cesspools, etc., and/or to comply with applicable court orders, permit stipulations, or administrative actions. Section 211 of the Act provides that new collectors can be funded in communities existing prior to the enactment of the Act, (October 18, 1972), and then only if the community has sufficient existing or planned capacity to adequately treat the collected sewage. Sewage collection systems for new communities, new subdivisions, and newly developed urban areas are not covered under the construction grant program. Provisions for sewers for such areas are to be included as part of the development costs of the new construction. In accord with "eligibility" policy - collector needs must comply with the 2/3 existing population rule. The 2/3 rule means no award may be made for a new sewer system in a community in existence on October 18, 1972 unless two-thirds of the flow design capacity through the sewer system will be for waste waters originating from the community (Habitation) in existence on October 18, 1972.

ITEM NUMBER 16 Facility Population

This section shows the population which receives treatment and/or collection from the facility. It is broken down by present resident population, present non-resident population, projected resident population, and projected non-resident population. Data-of-record for each of these categories will be listed for those receiving treatment, not receiving treatment, receiving collection and not receiving collection. There is additional space for any changes.

The term non-resident applies to transient, seasonal, and daytime (working) populations which do not reside in the service area of the facility, but whose wastes must be taken into consideration in designing facilities. (Non-resident population does not include any form of "population-equivalent" based on industrial or commercial flows.) A hypothetical example would be a downtown business area with a resident population of ten thousand but a daytime, working population of twenty-five thousand. The non-resident population would thus be fifteen thousand.

The "area served by this facility" includes not only the boundaries of the areas actually served, but also any enclaves whose residents are served by septic tanks, outhouses, etc. An overall restriction is that the total resident population projected for 1990 for an entire State cannot exceed the overall population as reported in the 1974 Needs Survey.

The data-of-record on the preprinted forms shows the July 1, 1975 population as well as the projected (1990) population, as adjusted. See appendix 1 for adjustment details.

ITEM NUMBER 17 Need for New Collectors, New Interceptors, Force Mains and Pumping Stations

As mentioned previously (Item 15 instructions), this section is used to report the engineering and cost details relating to segments of collection systems and appurtenances. Separate lines are provided so that collection system segments that have similar cost functions can be listed together. For example, if two to six inch pipe has the same cost factor in the cost estimating guidelines, the data for all pipe falling into this size category should be consolidated as one line entry.

Column "a" is to be used to identify the "type" of item being listed and the code identifiers are to be obtained from the Code Reference Chart - Item 17.

The diameter (column b) and length (column c) of the pipe are to be reported in inches and feet respectively. The capacity (column c) is used when reporting pumping stations, and is reported in MGD.

ITEM NUMBER 18 Disposal of Liquid Effluents

More than one entry may be used in this section. For each entry fill out a, b, and c.

1. Disposal

Indicate by using the appropriate code the type of disposal now used or required, as follows:

- 1 - Outfall to surface waters
- 2 - Ocean outfall
- 3 - Holding pond
- 4 - Deep well
- 5 - Ground water recharge
- 6 - Other land disposal
- 7 - Recycling and reuse
- 8 - Septic tank field
- 9 - Other

2. Use

Indicate by using the appropriate code the status of this disposal, as follows:

- 1 - Now in use
- 2 - Under construction or provided for in an approved EPA grant.
- 3 - Required, but not yet approved or funded
- 4 - Not applicable

3. Change

Indicate by using appropriate code the projected change for this disposal. The codes are as follows:

- 1 - Enlarge
- 2 - Upgrade
- 3 - Enlarge and upgrade
- 4 - Install in new plant
- 5 - Replace
- 6 - Abandon
- 7 - No change
- 8 - Other

ITEM NUMBER 19 Required Infiltration/Inflow Correction Action

The basic ground rules for reporting needs in this Category are covered in Paragraph Section V, Item 15, 2.

Indicate under "code" by using the appropriate code below what action is necessary to correct infiltration/inflow conditions to meet the requirements of Section 201 and/or 211 of the FWPCA.

- 1 - Not known at this time
- 2 - None
- 3 - Seal off sewer lines
- 4 - Replace/reline sewer sections
- 5 - Change/create flow routing system
- 6 - Provide flow equalization
- 7 - Other corrective actions

If codes 3 through 7 are used, indicate the proper code below for the basis of estimate:

- 1 - State certification
- 2 - Analysis completed
- 3 - Evaluation survey completed
- 4 - Engineer/Consultant firm estimate
- 5 - Cost of previous comparable construction
- 6 - Engineer/Consultant preliminary estimate
- 7 - EPA - supplied cost estimating procedures
- 8 - Cost effective analysis
- 9 - Rough estimate

Costs are reported under Item 15, Category IIIA.

ITEM NUMBER 20 Estimated I/I Flow Component

If Item 19 is marked using codes 3 through 7, indicate how much of the flow of the facility is due to infiltration/inflow. Report in millions of gallons per day.

ITEM NUMBER 21 Major Rehabilitation/Replacement Required

To complete this item, refer to the policy set forth in Section V, Item 15, 2.

Using the same codes listed in number 19, indicate if and why major rehabilitation or replacement of the existing sewer collection system is necessary. If codes 3 through 7 are used, indicate the proper code for basis of estimate. Report the cost under Item 15, Category IIIB.

ITEM NUMBER 22 Do Wastewaters Originate in Communities Existing before October 18, 1972?

Indicate by "yes" or "no" the answer to the above question.

ITEM NUMBER 23 1972 Collection Population

Enter the resident population which existed on October 18, 1972, for which new collector sewers are required, as of January 1, 1976.

ITEM NUMBER 24 Flows/Concentrations, Monthly Average

Current flow and concentration levels, and present and projected design specifications will be used to validate Category I or II costs. Any items which influence facility design/cost should be entered.

Existing means the actual average concentration, based on 30 day observations made during 1975, of influent only for flows and both influent and effluent concentration levels for 5-day BOD and suspended solids. Present design is the influent and effluent levels which the plant is presently intended to handle.

Projected design is the influent and effluent levels which the plant will be designed to handle for the year 1990.

1. Flow

Total flow means all the wastewaters moving through the plant; including domestic, commercial, industrial, and infiltration/inflow. This figure should be reported in million gallons per day. Industrial flow is that amount of flow, moving through the plant, that originates from industrial sources. This figure should be reported in million gallons per day.

2. Composition of Influent and Effluent

Concentrations of the following constituents are to be designated to provide characterization of plant influent and effluent - and the basis for plant design. Only those constituents significant to the plant unit process scheme should be listed.

- (a) For BOD (Biological Oxygen Demand), use the conventional definition. This figure should be reported in milligrams per liter (mg/l).
- (b) For suspended solids, use the conventional definition. This figure should be reported in milligrams per liter (mg/l).
- (c) For phosphorous, use the conventional definition. This figure should be reported in milligrams per liter (mg/l).
- (d) For ammonia NH_3 , use the conventional definition. This figure should be reported in milligrams per liter (mg/l).
- (e) TKN is Total Kjeldahl Nitrogen and should be expressed in milligrams per liter.
- (f) Other should be used for other major constituents that have a significant influence on the facility design. (A supplemental Code Chart may be developed for additional constituents.)
- (g) Total Nitrogen should be expressed in milligrams per liter.

ITEM NUMBER 25 Does Discharge Meet Secondary?

Answer "yes" or "no" if the discharge meets secondary treatment standards.

ITEM NUMBER 26 Will Discharge Meet Secondary By July 1, 1977?

Answer "yes" or "no" if the discharge will meet secondary treatment by July 1, 1977.

ITEM NUMBER 27. Is Required Treatment Level More Stringent Than Secondary?

An effluent limitation "more stringent" than secondary means a requirement for treatment processes, in addition to secondary treatment processes, necessary to meet an effluent limitation specified in an EPA-approved water quality plan, an administrative or court order, a license, etc., an EPA approved water quality standard which is binding on the treatment facility, or a legally binding State established effluent limitation. Examples include requirements to remove phosphorous, ammonia, or organic substances. All limitations more stringent than secondary must be based on requirements in effect as of February 1, 1976.

Approved water quality plans are: basin, metropolitan or regional plans approved by EPA pursuant to Section 303(e) or 201 for the FWPCA.

A body of water is water quality dependent if some or all of the discharges to it will need treatment "more stringent" than secondary treatment levels to meet a water quality level specified by the State. The basis for this classification is that a State, after careful analysis of the extent and sources of pollution affecting a particular stream segment, has determined that the level of secondary treatment defined by EPA or an applicable State law will not be sufficient to achieve or maintain the water quality standards applicable to this body of water. Required discharge levels are designated by each State as part of its "continuing planning process." A "yes" or "no" answer must be entered in the box.

ITEM NUMBER 28 Reasons

If item 27 is "yes", indicate which reason imposes the most stringent requirement by using the codes below:

- 0 - A water quality plan which has been approved by EPA
- 1 - Order of State Court
- 2 - Order of Federal Court
- 3 - State permit and license
- 4 - NPDES permit and license
- 5 - State enforcement order and proceeding
- 6 - Federal enforcement order and proceeding
- 7 - Voluntary agreement which includes a schedule of compliance or improvements
- 8 - Other
- 9 - A certification by the State that the body of water receiving this discharge is water quality dependent, and that more stringent treatment is needed to meet Federally-approved water quality standards for dissolved oxygen or nutrients

ITEM NUMBER 29 Treatment and Sludge Handling

There are three columns in this section. The first column is for type of treatment and sludge handling; the second column is for the current use; and the third column shows projected change. All codes are referred to on the Code Reference Chart.

APPENDIX 1

EPA ADJUSTMENTS TO THE 1974 NEEDS SURVEY DATA BASE

1. INTRODUCTION

From the time of its receipt in 1974, and up until the printing of the 1976 NEEDS Update Data of Record, adjustments have been made to the 1974 Needs data base, as reflected in magnetic records on tape. These adjustments have been made for one or a combination of the following reasons:

1. Data was incorrectly reported
2. Key punching errors were found
3. EPA edit programs adjusted all costs
4. EPA edit programs adjusted some populations

When comparing the current questionnaire forms with the data as submitted by the States in 1974, therefore, differences will exist in all cost figures, and supportive data may be changed.

The chronology of changes made to the data is as follows:

1. Data received from the States via 1974 Needs questionnaires was coded and key-prepared into machinable form.
2. A 1974 Needs Survey master file was created using the 1973 data (for facilities reported as unchanged from 1973) and the key-prepared 1974 data.
3. The 1974 Needs master file was edited for errors, and corrected where applicable.
4. The 1974 Needs master file was edited for excessive or unsupported costs and changed appropriately on a facility-by-facility basis.
5. The 1974 Needs master file was edited for excessive reported resident populations and reduced on a facility-by-facility basis, as appropriate.
6. 1974 Survey costs (expressed in June 1973 dollars) were upgraded to January 1, 1976 dollars.

II. DETAILED EDITS

The following specific data edits were performed on the 1974 Needs Survey master data file:

A. Identification Data

Changes to existing identification data were as follows:

1. A determination of which facilities were incorrectly reported as "sample" facilities (and visa-versa) was made, and the facilities were reported correctly.
2. Authority/Facility numbers were checked to determine accuracy, and changed appropriately.

B. Categories I and II Costs

Plant volume and effluent specifications as reported by the facility were accepted without question. Categories I and II reported costs were then fitted to EPA supplied cost curves, as presented in the Survey Guidance package. Costs exceeding 110% of the cost curves were reduced to 110% of the cost curves.

Category IIIB costs were accepted. Category IIIB costs were reduced to \$35.00 per foot of pipe in the entire sewer system when costs exceeded \$35.00 per foot.

D. Category IVA Costs

Collector costs were reduced in all States on a facility-by-facility basis in three general areas:

1. When the ratio of 1972 resident population to proposed population sewered by new sewers was less than $2/3$, then Category IVA needs were reduced proportionately to meet the " $2/3$ rule."
2. When population to be sewered by new collectors was zero, Category IVA needs were reduced to zero.
3. When the facility classified itself as a treatment plant with no collectors or interceptors, Category IVA needs were reduced to zero.

Category IVA needs in West Virginia were examined manually, and were reduced to \$120.00 per capita.

E. Category IVB Costs

Category IVB costs were adjusted downward on a facility-by-facility basis using the following criteria:

1. Where costs exceeded the EPA cost curves by more than 10%, costs were reduced to 110% of the curves.
2. Where Category IVB needs were given, but no pipe lengths or diameter were shown, needs were deleted from Category IVB.
3. Where obvious errors were made in filling out questionnaires, costs were reduced in est Virginia, Oklahoma, and Arkansas.
4. Where State reported population was exceeded, Category IVB costs were reduced proportionally (Alaska, Florida, Idaho, Kansas, Nebraska, Nevada, New Hampshire, North Dakota, South Carolina, and Wyoming).

F. Population

EPA edit programs adjusted some populations for both 1972/73 and 1990 in the 1974 Needs data of record base. These adjustments were made to resident 1974 and 1990 populations on a facility-by-facility basis for both treatment and collection. Non-resident populations were accepted for the 1974 needs survey.

Bureau of Census Series P-25 (1975 current population) and P-26 (1990 projected population) were used as a basis for determining populations for each of the States. When treatment and/or collection population totals exceeded the Census population totals for States, facility totals were reduced proportionally. This was done for both the 1972/73 and the 1990 resident populations. Stated as a formula, it would be the following:

$$\begin{array}{ccc} & \text{Facility Population} & \\ & \text{designated} & = \\ & \text{for 1974 Survey} & \\ \\ \text{Facility Population} & & \text{Census Pop. for State} \\ \text{reported} & \text{X} & \text{(divided by)} \\ \text{in 1974 Survey} & & \text{Pop. for State reported} \\ & & \text{in 1974} \end{array}$$

Adjustments downward were made for the following States:

California	Michigan
Colorado	Nevada
Delaware	New York
Georgia	Pennsylvania
Illinois	Wisconsin
Massachusetts	

APPENDIX 2

COST ESTIMATING PROCEDURES

I. INTRODUCTION

Construction cost estimation procedures have been developed for use in the NEEDS Update for Categories I, II and IV. For Categories I and II, cost curves are provided, and are to be used in the absence of or as supplement to other information developed by and for the contractor. For Category IV, an estimation scheme is provided which involves factoring a basic unit cost by multipliers for population density and location. All costs calculated using these techniques are estimated as of January 1976.

II. TREATMENT COSTS

For Categories I and II, treatment plant construction cost curves are provided as Figure 1 and Figure 2. Figure 1 is scaled for plants from .01 to 3.0 MGD while Figure 2 is scaled for larger plants.

Both Figure 1 and Figure 2 show seven cost curves. Curves 1-6 are estimates of the total grant eligible cost for construction of sewage treatment works, at increasing levels of required treatment. Curve one is the estimate of grant eligible cost for secondary treatment, and curve six estimates costs at an effluent treatment level of less than 5 for five day BOD and suspended solids, with P, NH₃, and NO₃ removal. Curves two through five are appropriate estimates for effluent specifications between the extremes as indicated on the graph.

Curve Seven is a subtractive curve, to be used to estimate the salvage value of a treatment plant as may be realized in the case of upgrading and/or expansion.

Table A provides a list of multipliers to be applied to costs determined from the treatment cost curves, depending on the proximity of the plant to one of those cities. These multipliers result from different construction costs in various localities.

To determine treatment costs using the curves, the reviewer should select the cost from the point defined by the design average plant flow and the required treatment level. The salvage value of any existing primary plant should be determined by its flow from curve seven, and subtracted from the cost. The resultant cost should then be multiplied by the city multiplier for the city closest to the proposed treatment plant.

Costs calculated using curve one should be reported as category I plants. Plant costs estimated using curves two through six should be reported as category II plants only if the required level of treatment is higher than secondary treatment as defined by EPA.

Table A

City Multipliers for Treatment Plant Construction

Location	Treatment Plant City Multiplier
ATLANTA, GEORGIA	.8347
BALTIMORE, MARYLAND	1.0083
BIRMINGHAM, ALABAMA	.8264
BOSTON, MASSACHUSETTS	1.1132
CHARLOTTE, NORTH CAROLINA	.6281
CHICAGO, ILLINOIS	1.1570
CINCINNATI, OHIO	1.0331
CLEVELAND, OHIO	1.0744
DALLAS, TEXAS	.7934
DENVER, COLORADO	.8843
DETROIT, MICHIGAN	1.0083
HOUSTON, TEXAS	.8678
KANSAS CITY, MISSOURI	1.0000
LOS ANGELES, CALIFORNIA	1.0578
MIAMI, FLORIDA	.8843
MILWAUKEE, WISCONSIN	1.0331
MINNEAPOLIS, MINNESOTA	.9091
NEW ORLEANS, LOUISIANA	.9256
NEW YORK, NEW YORK	1.3223
PHILADELPHIA, PENNSYLVANIA	1.1818
PITTSBURGH, PENNSYLVANIA	1.0413
ST. LOUIS, MISSOURI	1.1570
SAN FRANCISCO, CALIFORNIA	1.1157
SEATTLE, WASHINGTON	1.0330
TRENTON, NEW JERSEY	1.0826

III. Interceptor and Collector Sewer Costs

Interceptor and collector sewer costs will be estimated using four elements: 1) the diameter of the pipe; 2) the length of the pipe; 3) the culture of the place of installation; 4) the location of the project.

These variables are shown in Tables I-III. Table I shows the gross cost per linear foot of pipe laid in place by diameter. All appurtenances are included in this cost. The appropriate unit cost from Table I should be multiplied by the appropriate factor from Table II - Cultural Modifiers, to aid in reflecting the cost of different types of cultural areas. That product must then be multiplied by the appropriate city factor selected from Table III - City Multipliers. The city selected should be the city nearest the proposed construction site. Finally, the resultant unit cost should be multiplied by the feet of pipe required.

Table IV provides the list of the average interceptor sewer size for a given design discharge.

Table I

Gross Per LF Cost of Sewers
By
Diameter including all Appurtenances

Diameter (inches)	Average Cost (dollars)
4	11
6	14
8	16
10	19
12	22
15	26
18	30
21	34
24	37
27	40
30	44
36	50
42	57
48	65
54	74
60	84
66	94
72	104

Table II

Culture Modifiers
for
Sewer Construction

Culture	Modifier
Open Country	.8131
Residential, new, no houses	.6033
Residential, established, sparse	.6985
Residential, established, dense	.7169
Commercial Area, through street	.9911
Central City	1.3127

Table III
City Multipliers
for
Sewer Construction

City	Multiplier
Atlanta, Georgia	1.4901
Baltimore, Maryland	1.1006
Birmingham, Alabama	1.2638
Boston, Massachusetts	1.3877
Charlotte, North Carolina	.6604
Chicago, Illinois	1.4026
Cincinnati, Ohio	1.2331
Cleveland, Ohio	2.1335
Dallas, Texas	1.0598
Denver, Colorado	.6971
Detroit, Michigan	1.7952
Houston, Texas	.8996
Kansas City, Missouri	1.2250
Los Angeles, California	1.3922
Miami, Florida	.9762
Milwaukee, Wisconsin	1.2155
Minneapolis, Minnesota	1.0241
New Orleans, Louisiana	.9833
New York, New York	2.3467
Philadelphia, Pennsylvania	1.4165
Pittsburgh, Pennsylvania	1.5353
St. Louis, Missouri	1.8105
San Francisco, California	1.3380
Seattle, Washington	1.8472
Trenton, New Jersey	1.2920

Table IV
Sizing of Interceptor Sewers

Pipe Size (Inches)	Pipe Size (Feet)	Design Discharge Range (MGD)
6	---	0.08 or less
8	---	0.08 - 0.17
10	---	0.17 - 0.29
12	1	0.29 - 0.47
15	---	0.47 - 0.82
18	---	0.82 - 1.3
21	---	1.3 - 1.9
24	2	1.9 - 2.7
27	---	2.7 - 3.8
30	---	3.8 - 4.9
36	3	4.9 - 8.0
42	---	8.0 - 11.8
48	4	11.8 - 17.0
54	---	17.0 - 22.5
60	5	22.5 - 29.5
66	---	29.5 - 37.5
72	6	37.5 - 48.0
84	7	48.0 - 72.0
96	8	72.0 - 100
108	9	100 - 140
120	10	140 - 180
132	11	180 - 240
144	12	240 - 300
156	13	300 - 365
168	14	365 - 440
180	15	440 - 540
192	16	540 - 640

Figure 1

TREATMENT PLANT CONSTRUCTION COST CURVES - DESIGN FLOW RATE 0.01 to 3.0 MGD

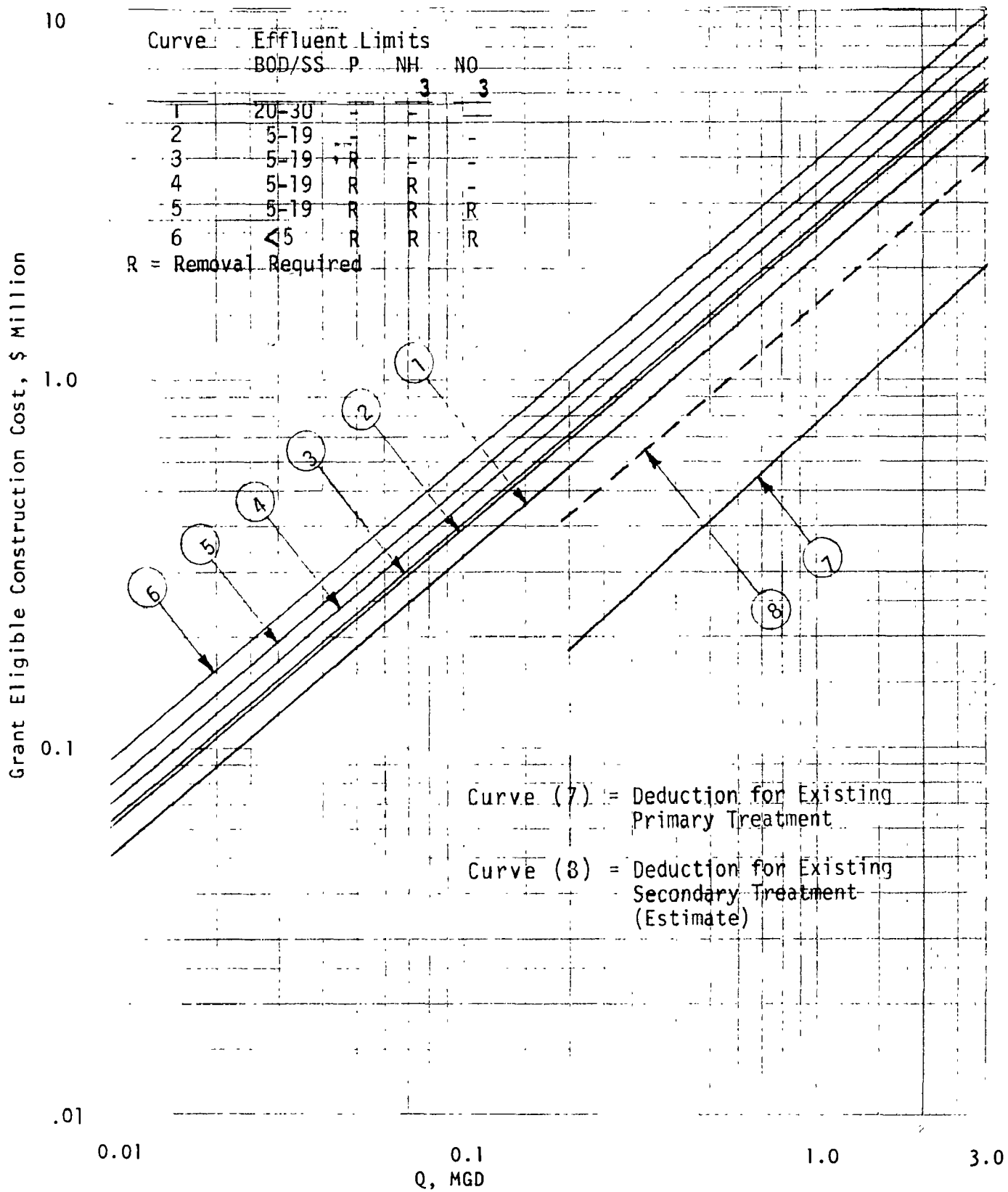
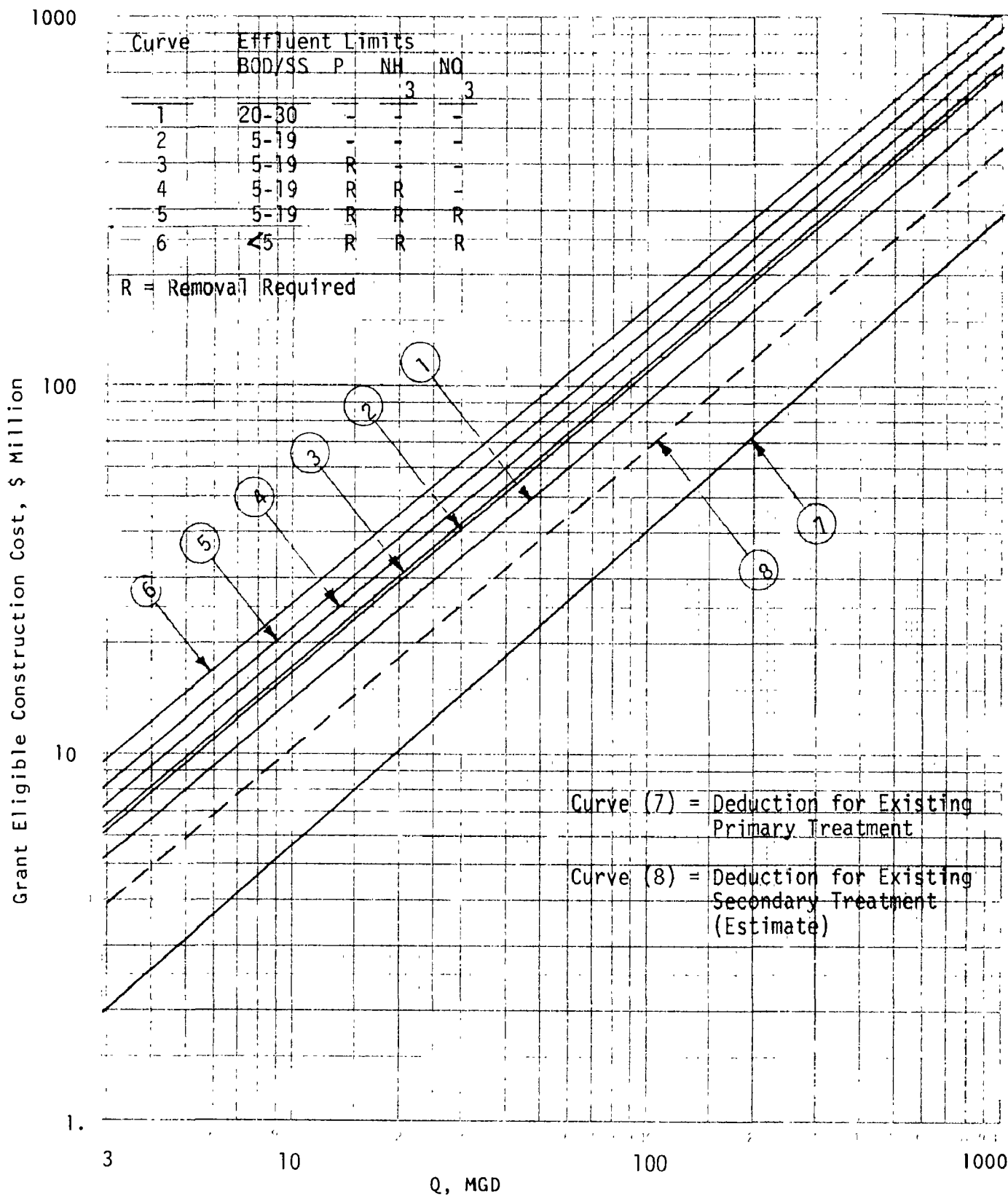


Figure 2

TREATMENT PLANT CONSTRUCTION COST CURVES - DESIGN FLOW RATE 3 TO 1000 MGD



APPENDIX 3

EXPLANATIONS OF QUESTIONS RAISED DURING REGIONAL BRIEFING SESSIONS, MARCH 1-12, 1976

1. Q. Can the cost of purchasing an already operating privately owned wastewater treatment plant by a municipality be reported as a need?
 - A. The Title II regulations require that all such acquisitions have the prior approval of the EPA Regional Administrator in order to be eligible for grant funds. Since a decision on the eligibility of those acquisitions should be based on facility planning, such costs may be reported only if a facility plan has justified the purchase.
2. Q. On what date should a facility need be considered satisfied for not reporting it in the Needs Update?
 - A. For purposes of the Needs Update, if a grant offer has been made before January 1, 1976, its need will be considered to have been fulfilled whether or not such grant has been formally accepted by the municipality.
3. Q. Do the "Treatment Plant Construction Cost Curves" provided in Figures 1 and 2 of Appendix 2 of the Guidelines include the cost of disinfecting the effluent?
 - A. Costs derived from these curves are national average grant eligible costs, and therefore include disinfection.
4. Q. Which curve should be used to estimate treatment plant costs when only five-day BOD, suspended solids and ammonia removals are required without concurrent removal of phosphorus?
 - A. Since the incremental cost to remove phosphorus is a small fraction of the cost of removing ammonia, it is recommended that curve 4 be used to estimate the cost of plants expected to provide the above mentioned level of treatment.

- Q. In a State which has decided to report needs on a 100 percent basis in places of less than 10,000 population and is outside Standard Metropolitan Statistical Areas (SMSA's), what is the minimum population of a place that should be included in the Update?
- A. In order for a place outside an SMSA to be included in the Update on a 100 percent basis, it should have a minimum population of 500. Exceptions are possible, and a completed EPA-1 will be accepted for smaller places.