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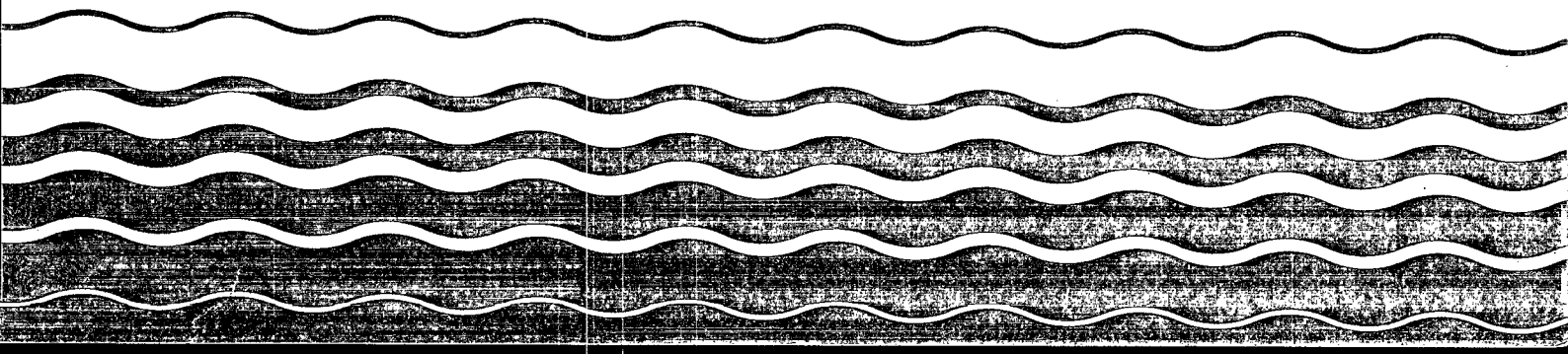
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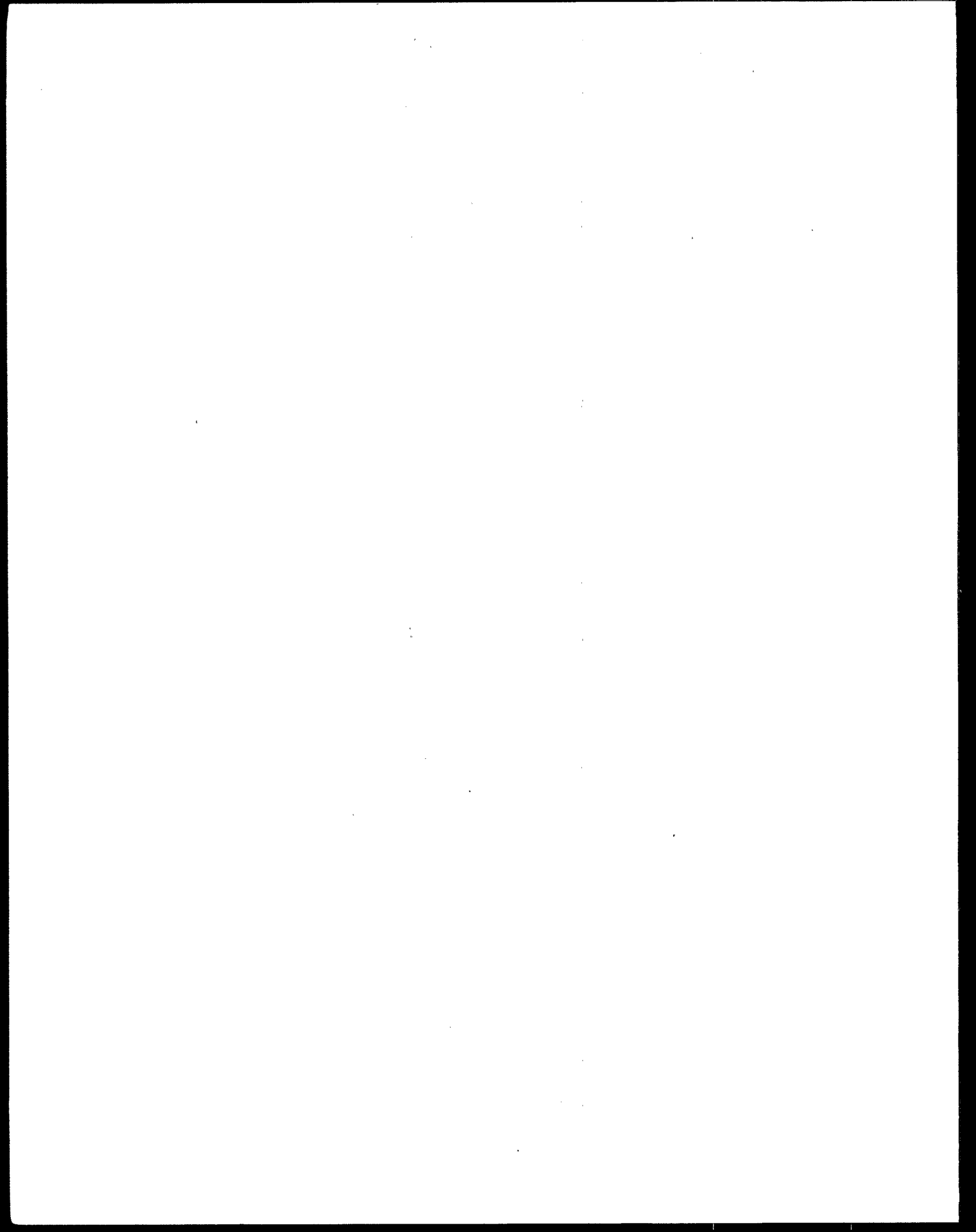
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Water



Guidance Manual for Preparation and Review of Removal Credit Applications





Acknowledgement

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THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
JANUARY 1951

TO THE HONORABLE CHAIRMAN
OF THE BOARD OF TRUSTEES
OF THE UNIVERSITY OF CHICAGO

SIR:

I have the honor to acknowledge the receipt of your letter of the 10th inst. and in reply to inform you that the same has been forwarded to the appropriate authorities for their consideration. I am sure that they will give it the attention it deserves. I am, Sir, very respectfully,
Yours truly,
[Signature]

Very truly,
[Signature]

Very truly,
[Signature]

Very truly,
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Very truly,
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Very truly,
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Guidance Manual for Preparation and Review of Removal Credit Applications

1. Introduction

Regulations providing for the revision of categorical pretreatment standards to reflect POTW removal of pollutants were included in the General Pretreatment Regulations (40 CFR Part 403.7) promulgated in 1978 and 1981. On August 3, 1984, the U.S. Environmental Protection Agency (EPA) revised the removal credit provisions of the pretreatment regulations (49 Fed. Reg. 31212). This rule was finalized after review and consideration of numerous comments in response to the removal credit rule proposed in September 1982. The purpose of changing the rule was to make the removal credits provision of the General Pretreatment Regulations simpler and more workable for those POTWs that are interested in applying for the credits.

This manual is intended to explain the final removal credits rule and provide demonstrations, suggestions and guidance for POTWs in the preparation of an acceptable removal credits application. Where possible, examples of information to be included in an application will be provided and potential problems that might be encountered will be pointed out.

The manual also presents guidance for the Approval Authority review of a removal credits application to ensure consistency in review and approval of applications, and the continued oversight of removal credits implementation after approval.

Following this introduction and a background discussion of the removal credits provision, the manual is divided into two major parts. Part I provides guidance to the POTW on obtaining the necessary removal data and preparing a removal credit application. Part I contains three sections:

- A detailed description of application requirements (Section 3)
- Alternative procedures available to the POTW to comply with certain application requirements (Section 4)
- Sampling and analytical requirements for obtaining plant removal data (Section 5).

Part II provides guidance for the Approval Authority. Part II consists of two sections:

- Guidance for reviewing removal credit applications (Section 6) including guidance for evaluating alternative methods of demonstrating consistent removal
- Criteria and procedures for modification or withdrawal of a POTW's removal credits (Section 7).

There are four appendices to the manual. Appendix A contains a copy of the final removal credit provision and the preamble to the rule. Appendix B gives the typical detection limits for the priority pollutants. Appendix C is an example removal credit application which provides a sample format and examples of the calculations and demonstrations required in a removal credit application. Appendix D provides example NPDES permit modification language for the Approval Authority where POTWs have obtained removal credit authority.

The revised removal credits regulation still requires significant demonstrations that will necessitate sampling and analysis to receive and maintain removal credit authority. Since the major benefactor of removal credits will be the affected industrial users, POTWs may solicit, if not require, assistance from these IUs to help provide funding, expertise, equipment and/or manpower necessary for gaining and then maintaining removal credit authority. Several specific suggestions for IU assistance are:

- A special fee system for those IUs that will benefit from removal credits to fund the additional activities that the POTW will need to undertake.
- Certain industries (usually the larger firms) will often have in-house technical expertise that may be loaned to the POTW for initiating such activities as pilot plant or treatability studies, sampling guidance for the more "unusual" organic priority pollutants, evaluation of data, or other technical issues encountered by the POTW.
- Certain industries may be able to provide temporary loans of manpower, equipment, and/or laboratory services to help the POTW.

It is important to emphasize that the removal credits provision should not allow an overall increase of toxic pollutants entering the POTW system. Removal credits will only allow an increase in pollutant loading entering the POTW compared to implementation of "unmodified" Federal categorical standards. In general, there should be a decrease in the toxic pollutant load entering a POTW system, even with removal credits, when compared to the previously unregulated discharges from categorical industrial users.

The majority of experience and concern with toxic pollutants in municipal sewer systems has focused on heavy metals. For this reason, this manual will emphasize, both in discussion and with examples, the application of removal credits to discharges of heavy metals. In most instances concerning removal credits, toxic organic compounds are treated in a similar manner. Where possible, this manual identifies issues that apply only to metals or organic pollutants. Unless noted otherwise, each section applies to both metal and organic pollutants. When pretreatment standards are promulgated for the organic chemicals and plastics and synthetic fibers industry, the Agency will review the standards for individual organic compounds, their rationale and technical basis and determine if changes are needed to this manual.

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2. Background

Section 307(b) of the Clean Water Act (Act) requires the Environmental Protection Agency (EPA) to promulgate Federal categorical pretreatment standards which prevent industrial facilities from discharging into publicly owned treatment works (POTWs) any pollutant which "interferes with, passes through, or otherwise is incompatible with such works." In 1977, Congress amended this section of the Act to permit POTWs to adjust those Federal categorical standards for certain regulated priority pollutants to account for the removal of those pollutants provided by the publicly owned treatment works. This type of adjustment of a categorical pretreatment standard is commonly called a "removal credit."

"Removal," as defined by EPA in its pretreatment rule means:

A reduction in the amount of a pollutant in the POTW's effluent or alteration of the nature of a pollutant during treatment at the POTW. The reduction or alteration can be obtained by physical, chemical or biological means and may be the result of specifically designed POTW capabilities or may be incidental to the operation of the treatment system. Removal as used in this subpart [removal credit provision] shall not mean dilution of a pollutant in the POTW.

The degree of treatment and removal of any particular pollutant may be highly variable, depending upon the particular pollutant, its concentration and form, the characteristics of the wastewater, the POTW design, and manner of operation of the POTW. Since POTWs are generally designed to treat conventional pollutants (e.g., BOD, TSS) in domestic wastewater, many toxic pollutants

either pass through POTWs untreated or are only incidentally treated or removed.

EPA originally implemented the statutory provision for removal credits by including a section in the June 26, 1978 General Pretreatment Regulations establishing the conditions under which POTWs could obtain authorization for removal credits (43 Fed. Reg. 17736). On January 28, 1981, when the General Pretreatment Regulations were amended, the removal credits section was also modified. The modification was intended to streamline certain provisions to facilitate the ability of POTWs to obtain removal credit authority (46 Fed. Reg. 9404).

The 1981 removal credits provision was further modified on August 3, 1984 (Appendix A). This final removal credit provision requires any POTW seeking removal credit authority to demonstrate its removal performance by sampling the plant influent and effluent 12 times throughout one full year at approximately equal intervals and calculating its representative removal rates based on these data. With concurrence of the Approval Authority, an alternative sampling design or alternate data may be used either in lieu of, or as a supplement to, the 12 samples. In any case, the calculated removal credits must be based on all collected samples and be representative of a particular treatment plant's actual removal rate.

The provisions governing removal credits applications are more streamlined than their counterparts in the 1981 amendments and permit POTWs to apply at any time. Under the final regulation, a removal credit application must include:

- A list of the pollutants for which removal credits are sought
- Data demonstrating actual consistent removal
- The proposed new limits
- A certification that the POTW has an approved local pretreatment program or qualifies for the exception to this requirement

- A description of the POTW's current method of managing its sludge
- A certification that granting removal credits will not cause the POTW to violate applicable sludge requirements, NPDES permit limits and conditions, or water quality standards.

1. The first part of the document is a list of the names of the persons who were present at the meeting. The names are listed in alphabetical order.

2. The second part of the document is a list of the topics that were discussed at the meeting. The topics are listed in alphabetical order.

3. The third part of the document is a list of the actions that were taken at the meeting. The actions are listed in alphabetical order.

4. The fourth part of the document is a list of the decisions that were made at the meeting. The decisions are listed in alphabetical order.

5. The fifth part of the document is a list of the recommendations that were made at the meeting. The recommendations are listed in alphabetical order.

6. The sixth part of the document is a list of the conclusions that were reached at the meeting. The conclusions are listed in alphabetical order.

7. The seventh part of the document is a list of the questions that were asked at the meeting. The questions are listed in alphabetical order.

8. The eighth part of the document is a list of the answers that were given at the meeting. The answers are listed in alphabetical order.

Part 1:

Guidance for Developing A Removal Credits Application

The removal credits provision allows a POTW to revise categorical pretreatment standards for particular regulated pollutants to account for the removal of those pollutants provided by the publicly owned treatment works. It is left to the discretion of the POTW to decide whether or not to apply for authorization to grant removal credits. In those cases where the POTW decides it will request removal credit authority, the final removal credit regulation specifies that the POTW must meet five conditions before it can be authorized to grant removal credits to categorical industrial users. These conditions are:

- Demonstrate consistent removal of the pollutant for which a removal credit is being sought
- Have an approved pretreatment program or qualify for the exception to this requirement
- Apply for and receive authorization to grant removal credits from the Approval Authority
- Maintain compliance with Federal, State and local sludge disposal requirements
- Maintain compliance with its NPDES permit limitations and conditions and not otherwise adversely affect water quality in receiving waters.

The following three chapters provide guidance for the POTW to obtain the necessary removal data and prepare a removal credit application.

3. Removal Credit Application Requirements

This chapter describes the requirements of a POTW's application for authorization to grant removal credits. Before discussing the application requirements, however, several points regarding application procedures and the responsibility of the POTW after removal credit authorization has been approved will be highlighted.

When and Where to Apply

A POTW eligible for removal credits may apply to the Approval Authority at any time for authorization to grant or modify such credits. The Approval Authority is the State Agency authorized to approve and oversee POTW pretreatment programs or the EPA Regional office where the State does not have an approved State pretreatment program. The Approval Authority must review the application in accordance with the administrative procedures listed in 40 CFR 403.11, which are the same procedures used to review pretreatment program submissions. After the Approval Authority has completed its review of the application, it can approve or deny the application, or it can authorize a lower removal credit than the POTW sought. Where an application is submitted, the Approval Authority may establish NPDES permit discharge limits for those pollutants which are included in the removal credit authority. The purpose of NPDES limits for the pollutants included in the removal credit is to provide for control of pollutant pass through in the event of a substantive decrease in the treatment plant's removal efficiency or a substantial increase of pollutants entering the system.

Certification Requirements

The application for removal credit authority must contain certifications that granting the removal credit will not cause a violation of sludge disposal requirements or NPDES permit limits and conditions. These certifications must be supported by demonstrated evidence, in the form of a copy of the applicable sludge use or disposal requirements and the calculations showing how the POTW can meet these requirements as well as its NPDES limits and conditions when the removal credit is approved. This should be done by comparing the total influent pollutant load resulting from modified categorical standards to the maximum allowable pollutant influent load (generally used as the basis for the derivation of local limits).

If the maximum allowable load to the POTW treatment plant would be exceeded as a result of the removal credit, the removal credit request cannot be approved. To alleviate this problem a POTW may choose to limit the discharge of a pollutant from one industry in order to qualify for granting a removal credit to other industries. Alternatively, a POTW may grant a lower credit system wide in order to meet the allowable plant influent loading. Working closely with the industries may help facilitate these remedies.

NPDES Permit Modification

After the Approval Authority has approved a POTW's removal credit application, the consistent removal rate documented in the application will be included in the POTW's NPDES permit by reissuance or modification of the permit. Sampling and reporting requirements will also be included. This removal rate then becomes an enforceable requirement of the POTW's permit. The approved removal rate will remain in effect for the term of the POTW's NPDES permit, provided the POTW continues to meet the conditions for removal credit approval including maintaining consistent removal of the pollutants for which the credits were granted.

301(h) Applicants

All 301(h) applicants also applying for removal credits have the responsibility of demonstrating whether implementation of removal credits will still allow its proposed discharge to comply with all 301(h) criteria.

Granting Removal Credits to Industrial Users

Once removal credit authority has been approved for a particular pollutant regulated in a categorical standard, the POTW then determines the removal credit it will grant to the industrial users discharging into its system. The POTW has discretion to extend industrial users any removal credit that does not exceed the approved removal credit. It is also important to note that the POTW is not required to apply the removal credit to all eligible industrial categories or subcategories, nor is it required to apply the credit to all eligible industrial users within an industrial category or subcategory. **Additionally, POTWs should consider requesting a removal credit somewhat less than demonstrated consistent removal.** The impact of a reduced removal credit on an industrial user would be small since the technology required to comply with removal credits in the range of 40 to 60 percent is usually similar. Granting of a large removal credit in the 90 percent range, often requires the industrial user to install little or no treatment to meet the revised effluent limits. The failure of the POTW to consistently demonstrate these high removals will have major impacts on the industrial users which may be required to install additional technology if the removal credit is reduced. Continued demonstration of high removals may be difficult and, in the interest of providing industrial users with long-term and stable effluent limits, the POTW should consider a somewhat lower removal credit. The Approval Authority may modify or withdraw the removal credit contained in the POTW's NPDES permit if consistent removal at the granted rate is not demonstrated.

After the POTW calculates the extent of credit it will allow a particular industrial user or group of industries, each industrial user will typically be required to calculate its revised discharge limit and present the data and calculations to the POTW for review and approval. If the industrial user employs integrated treatment of several wastestreams, it will be necessary for the industry to calculate a revised end-of-pipe standard using the combined wastestream formula [see 40 CFR 403.6(e)] and include this information when submitting the revised limit calculation to the POTW.

A POTW that has already received removal credit authority for a particular pollutant may automatically extend that removal credit to other

categorical standards where the same pollutant is regulated. In this situation, however, the POTW must notify the Approval Authority whenever removal credits are extended to industrial users (either additional facilities or additional categories) that were not identified during the original removal credit application phase. Application of the removal credit to other categories is conditioned upon continued achievement of the approved consistent removal rate and compliance with sludge requirements and NPDES permit limits and conditions. The POTW should demonstrate in its notification that extension of the removal credits will not increase the pollutant load in the plant influent beyond the maximum allowable as calculated to prevent plant interference, pass through, and sludge contamination.

Monitoring Requirements

A. POTW that receives removal credit authority must continue to monitor its removal rate. A minimum of one representative influent and effluent sample per month (typically collected to account for hydraulic detention time within the treatment plant) for the reporting period is required for those pollutants for which removal credits were granted. All sampling data must be presented (even if more than one sample per month is collected). Also, the monthly sampling schedule should be varied so that the influent/effluent samples are representative of different week days. Samples which are always collected on the same day, even if at different times during the year, probably are not representative of the routine variation in a treatment system. Analytical methods must conform to the requirements specified in the final removal credit rule (see Section 5). **The results of this monitoring are reported to the Approval Authority at least once per year and are necessary for both the POTW and Approval Authority to verify maintenance of the approved consistent removal rate.** At the discretion of the Approval Authority, more frequent monitoring and/or reporting of information to support consistent removal may be required. For situations where influent concentrations are below detectable levels, working closely with industrial users and the Approval Authority may help to quantify their actual contributions.

Application Requirements

Specific application requirements are discussed in the following sections in the order specified in the removal credit section of the Pretreatment

Regulations. An example removal credit application is included as guidance in Appendix C. The reader should refer to the example when reviewing the following sections. For further information, the reader may want to consult one or more of the references listed in the bibliography in Table 3.3 at the end of this chapter.

3.1 List of Pollutants

The POTW's application must list the pollutant(s) for which removal credits are proposed. These pollutants may include any toxic pollutant for which discharge limits are specified in a categorical pretreatment standard. Three pollutant parameters warrant specific attention. These are total metals, total toxic organics, and surrogate or indicator pollutants. The following sections address the application of removal credits for these parameters.

3.1.1 Total Metals

The total metals parameter is defined in the electroplating categorical standard as the sum total concentration of specified individual metals [which are chromium (T), copper, nickel, and zinc]. In addition to the total metals limit, the categorical standard establishes limits on each individual metal comprising the total metals parameter. Removal credit can be sought for the total metals parameter. The procedure is consistent with that for a specific toxic pollutant with the exception that influent and effluent data are required for all four metals comprising the total metals parameter. Consistent removal is based on the summation of the influent and effluent data for the four individual metals using the methodology outlined in Section 3.2 of this manual.

The effect of a removal credit for total metals only may be limited by the unadjusted limits for the individual metals comprising the total metals parameter. Full benefit is gained by granting removal credit for the individual metals of concern and the total metals parameter.

3.1.2 Total Toxic Organics (TTO)

The total toxic organic (TTO) parameter is defined as the sum total of all regulated toxic organics (specified in the categorical standard) with a concentration greater than 0.01 mg/l. TTO categorical limits are based on best management practices and are intended to promote good housekeeping practices, solvent recovery efforts and similar activities to reduce toxic organics discharge. Compliance with categorical TTO limits includes analysis for only those toxic organics reasonably expected to be present is required. In lieu of monitoring, certification is available to satisfy compliance. A periodic statement to the effect that there continue to be no sources of toxic organic discharges satisfies compliance requirements. The TTO parameter is comprised of different constituents for each categorical industry. Although overlap occurs among different categories' TTO constituents, no single definition for the TTO parameter is applicable to all categories with TTO limits.

Because TTO limits are based on good management practices and because many TTO parameters are stripped, not treated, by conventional POTW treatment (which may be hazardous to POTW workers and the environment), removal credit should be very carefully evaluated for the TTO parameter. A POTW applying for a TTO removal credit (or a specific organic compound) should ensure that the removal credit will neither create nor exacerbate a violation of air quality standards. A summary of the problems related to a TTO removal credit is presented below:

- Easing of TTO limits contradicts the policy promoting best management practices by the IU and negates the inherent benefits of such practices
- TTO compliance may be a certification procedure where monitoring is not required to show compliance, and therefore quantifiable discharge data are not readily available
- TTO constituents vary among categories, therefore providing no specific, uniform TTO parameter which a POTW could sample and apply to all categorical industries with TTO limits
- TTO removal is incidental to conventional POTW treatment (e.g., solvents are stripped into the air, not treated by the POTW).

The preceding discussion applies only to the TTO parameter. (Removal credit for specific regulated toxic organics should be considered separately from the TTO parameter.)

3.1.3 Surrogate or Indicator Pollutants

Some categorical pretreatment standards use conventional or nonconventional pollutants as indicators or surrogates for toxic pollutants (e.g., oil and grease analysis instead of TTO monitoring). Removal credits for indicator or surrogate pollutants regulated in a categorical standard may be granted only if the standard specifically permits removal credits for those indicator and/or surrogate pollutants. In all other situations, only those toxic pollutants specifically regulated by a standard, and not the corresponding indicator pollutant, may receive a removal credit. Presently, only the iron and steel categorical standards (for coke plants) permit a removal credit for the indicator pollutant total phenols.

3.2 Consistent Removal Data

The POTW's application must demonstrate consistent removal for each pollutant for which a removal credit is being sought. In most cases, this demonstration must include analytical data (conforming to Part 136 test methods) from influent and effluent samples and a calculation of consistent removal based on the data obtained. Analytical data are required from at least 12 representative samples of POTW influent and effluent taken at approximately equal intervals throughout one full year. The Approval Authority has the discretion to require more frequent sampling and to establish specific requirements to ensure that samples are representative. Particular exceptions concerning the methodology used for demonstration of consistent removal are mentioned later in this section and are more fully discussed in Chapter 4.

Consistent removal is defined and calculated by using the following formula (as presented in the Regulations):

$$r = \frac{I - E}{I}$$

where: r = consistent removal rate for a pollutant
 I = average concentration of the pollutant in the influent
 E = average concentration of the pollutant in the effluent.

I and E are calculated by taking the arithmetic average of all influent and effluent data, respectively. All sampling data sets for which influent pollutant concentrations were quantifiable must be used in the arithmetic calculation.

If a POTW has collected influent and effluent samples at different frequencies during the preceding year (e.g., many samples collected during one month and only 1 sample in other months), then the POTW and Approval Authority must ensure that the resulting removal rate is representative of the plant's actual performance. If these differences in monthly sampling frequencies result in an unrepresentative consistent removal rate, then monthly rates should be calculated by taking the arithmetic average of all influent and effluent data for each month and then calculating the consistent removal rate. In such cases, the POTW should review the sampling frequency and removal rates and, with the Approval Authority's concurrence, determine the most representative method for calculating consistent removal.

3.2.1 Limits of Detection

Sometimes a laboratory analysis is unable to quantify a pollutant because its concentration in the sample is too small. A numerical value for that pollutant is needed in order to calculate the average effluent concentration. **The value that should be used when actual pollutant concentration values cannot be measured is the "limit of detectability" of the analytical procedure used to measure the pollutant.**

Substituting the limit of detectability value for the nonquantifiable concentration of a pollutant enables a POTW to use the removal credit formula for any of the following situations:

- The pollutant is measurable in some but not all of the influent and effluent samples

- The pollutant is not measurable in any of the effluent samples.

(If the pollutant is not measurable in any of the influent samples, the removal credit formula cannot be used.)

However, substitution of the detection limit for an actual effluent level may result in an artificially low removal rate. This problem is magnified by low influent pollutant concentrations.

Two types of limits of detection exist: a method detection limit and a quantitative detection limit. The method detection limit refers to the limit of detectability for a particular substance using a specified method under ideal conditions. The quantitative detection limit refers to the limit of detectability for a particular substance using a specified method under actual operating conditions. The quantitative detection limit is dependent on the particular wastewater characteristics and the unique interferences associated with the wastewater. The quantitative detection limit should always be used when it is necessary to substitute a limit of detection in a removal credit application.

Typical method detection limits are given in Appendix B. In most cases, POTWs should be able to obtain limits of detection for metals near the values contained in Appendix B. However, POTWs may be confronted with the situation in which their in-house lab or contract laboratories will quote quantitative detection limits higher than those found in Appendix B. This situation will occur most frequently with regard to analysis of toxic organic pollutants. The POTW should exercise its judgment when selecting a laboratory for organic pollutant analysis to ensure that the quantitative detection limits used are of sufficient sensitivity to demonstrate the POTW's removal capabilities. In this regard, the limits of detectability listed in Appendix B should serve as a guide as to what is ideally attainable. When using limits of detectability to determine consistent removal in those situations where the pollutant is not measurable, the quantitative detection limit employed by the laboratory must be used. Also, in all cases the data used to support the determination of consistent removal should use the same quantitative detection limits for both influent and effluent analyses.

The organic priority pollutants should be identified and quantified by gas chromatography/mass spectrophotometry (GC/MS). The GC/MS method is able to resolve many of the compound interferences that may occur when two or more compounds are poorly separated by the gas chromatograph. GC/MS can distinguish among such compounds and quantify the one for which analysis is required. Most of the method detection limits for organic priority pollutants contained in Appendix B are possible based on GC methods. Contract labs generally quote quantitative detection limits for organic priority pollutants at 10 ug/l based on GC/MS analysis.

Where a POTW anticipates applying for removal credit authority for organic priority pollutants, it should contact several laboratories in an effort to find one that can provide the lowest limits of detectability possible. If a laboratory can be found that can provide low limits of detection, the chances that the POTW can demonstrate consistent removal are improved.

3.2.2 Alternatives to Pollutant Concentrations Below Detectable Limits

If some or all of the analytical results obtained for determining consistent removal are below the limit of detection, or if a pollutant cannot be measured in any of the influent samples, an alternative method for demonstrating a consistent removal may be presented. However, the POTW should realize that approval of any alternate methodology will require concurrence by the Approval Authority and be subject to review by EPA Regional staff and EPA Headquarters Office of Water Enforcement and Permits staff.

The POTW must consult with the Approval Authority prior to embarking on an alternative demonstration, thereby preventing an expenditure of time and resources only to learn that the method used is not satisfactory. Each proposal to use an alternate methodology will be judged on a case-by-case basis. A thorough demonstration of the validity and applicability of any alternate method will be required of the POTW. At a minimum, any option used must provide data which are representative of the POTW's normal operating condition and of the yearly and seasonal variations in influent quantity and quality to which the treatment system is subjected. Specific guidance on the

use of alternative methods for demonstrating consistent removal is provided in Chapter 4.

3.2.3 Lowering of the Consistent Removal Rate After Approval

If periodic monitoring indicates that the approved removal rate for a pollutant has dropped substantially and consistently, the approved removal credit will be reduced or withdrawn by the Approval Authority according to the procedures and criteria described in Chapter 7 of this document. The effect of the revised, reduced, or withdrawn rate(s) is generally that discharge limits for IUs will be made more stringent, potentially requiring installation (within a reasonable time period not to exceed that prescribed in the General Pretreatment Regulations) of additional treatment by affected industrial users. Where the POTW was initially granted a large removal credit, the effect of a reduced removal credit upon industrial users could be substantial.

It will probably be the exception that a POTW's removal rate becomes substantially higher after the initial documentation and approval of the consistent removal rate. This is due to the fact that as the modified categorical standards are implemented and enforced, the total influent concentration for the affected pollutant(s) will typically drop. A lower treatment plant influent concentration for any pollutant may result in a lower removal rate for the pollutant.

Due to the importance of maintaining the approved consistent removal rate, it is strongly recommended that the POTW and Approval Authority routinely (at least monthly) evaluate the treatment plant's removal capabilities for the pollutants affected. Such an evaluation should not wait until a full twelve months of data is available. A routine evaluation of removal capability will enable the POTW to immediately identify a significant variation from the approved removal rate and take action as early as possible to determine the cause and make appropriate changes. The POTW should also remember that the demonstrated, approved removal rate becomes an enforceable part of the POTW's NPDES permit. Therefore, to ensure its ability to comply with this part of its permit, the POTW may wish to consider applying for authority to grant a consistent removal rate somewhat less than the full amount initially demonstrated.

3.3 Calculation of Revised Discharge Limits

The removal credit application must contain the revised discharge limit for each pollutant and for each industry or industrial category (and sub-category where appropriate) for which removal credits are proposed. The revised limits are derived by using the following formula:

$$y = \frac{x}{1-r_m}$$

where: y = revised discharge limit for the pollutant

x = pollutant discharge limit specified in the applicable categorical pretreatment standard

r_m = POTW's consistent removal rate for the pollutant (expressed as a decimal fraction).

As an example, the calculation for the revised maximum daily discharge limit for chromium in the Electroplating Standards is presented below. In this example, a removal rate of 40.5 percent (0.405) is used with a maximum daily categorical standard for chromium of 7.0 mg/l.

$$y = \frac{7.0}{1-0.405} = 11.8 \text{ mg/l}$$

Based on this formula, the revised maximum daily limit for chromium is 11.8 mg/l when the POTW consistent removal rate is 40.5 percent.

A complete example of the use of these and other calculations is provided in Appendix C.

3.3.1 Evaluation of Removal Credit Effects on the Treatment Plant Influent Pollutant Load (i.e., Local Limits)

A fundamental issue affecting the granting of removal credits is the comparison of the influent pollutant load resulting from modified categorical

standards to the calculated maximum allowable treatment plant influent load. The maximum allowable treatment plant influent load is usually determined during the development of local limits as required by 40 CFR 403.5. The actual local (numerical) limits with which IU's must comply are derived by implementing an acceptable allocation of the maximum allowable loading (see Guidance Manual for POTW Pretreatment Program Development for more detail on local limits development). It is also important to remember that categorical standards apply to the end-of-the-regulated-process, not to the end-of-pipe discharge from the IU to the POTW system as is the case with most local limits. Therefore, where the POTW is going to compare the modified categorical standard (based on a removal credit) with the local limit for the IU discharge, the point of application of the standards must be considered. In many cases, the IU will combine other regulated, unregulated or dilute wastestream with the regulated wastestream in question prior to the point where samples are collected for a compliance determination. This will require the use of the combined wastestream formula to adjust the categorical standards before a comparison with local limits can be performed. In all cases, the POTW cannot grant a removal credit where the categorical standard(s) will be revised upward to the established maximum allowable loading thus causing the plant influent load to exceed the level required to prevent plant interference, pass through and sludge contamination.

3.3.1.1 Calculation of Maximum Allowable Plant Influent Load

The development of technically based IU discharge limitations (i.e., local limits) for incompatible pollutants requires a POTW to determine maximum allowable plant influent loads for these pollutants. Unlike Federal categorical standards, which are technology based, local limits are established for each individual POTW treatment plant to prevent the introduction of pollutants from industrial users of the system in amounts or concentrations that might:

- Interfere with or upset the efficient operation of the POTW treatment plant
- Contaminate the POTW sludge to a degree that it cannot be disposed of using the preferred or most cost effective disposal option

- Pass through the POTW treatment plant causing violation of the NPDES permit and/or water quality standards
- Injure POTW workers.

The methodology recommended by EPA to determine a maximum allowable plant influent load is presented in the EPA document entitled Guidance Manual for POTW Pretreatment Program Development. The data requirements, formulas, evaluation criteria and other information necessary for making this determination is presented in the Manual and its appendices. For this reason, a detailed discussion of the methodology is not presented here. The U.S. EPA has made available a computer program for developing local limits that identifies the maximum allowable plant influent load and is based on the same methodology presented in the Guidance Manual. The primary advantage of the computerized software (PRELIM) is the speed with which calculations are performed, the flexibility of the program to evaluate various industrial discharge and plant influent data, and the ability to store and manipulate large volumes of data.

3.3.1.2 Comparison of Maximum Allowable Loading to Projected Loading with Removal Credits

As mentioned, local limits are POTW-specific pollutant limitations for industrial users. In no case should the pollutant concentration (or mass) in the influent to the POTW treatment plant exceed the maximum allowable influent concentration (or mass) calculated as part of local limits development. Depending on many variables (e.g., size and type of POTW treatment plant, number and type of industrial users, NPDES limits, sludge disposal limits, pollutant allocation method, etc.), the local limits applied to industrial users for a particular pollutant may be more stringent than a revised categorical standard for the same pollutant. Unless the POTW chooses to reestablish its pollutant allocation method so that the POTW treatment plant influent loading is met even when the revised categorical standard(s) is applied, the more stringent local limit must be enforced.

Using the example from page 3-12, assume a POTW treatment plant has determined that the maximum allowable plant influent loading for chromium is

8.3 lb/day, which, when the controllable fraction is allocated to industrial user's as a concentration limit, is 9.0 mg/l for all industrial users. The POTW is seeking a removal credit for chromium to benefit the electroplaters in the community. The plant demonstrates a consistent removal rate of 40.5 percent for chromium. The modified categorical standard, based on the equation shown on page 3-11, is 11.8 mg/l. This is higher than the local limit and when the revised standard is applied to all electroplaters in the community, the projected chromium loading in the treatment plant influent is 9.1 lb/day. This exceeds the maximum allowable loading of 8.3 lb/day. Therefore, the application of the full 40.5 percent removal rate for the electroplaters cannot be granted without some lowering of the local limit for other IUs to offset the increased pollutant load from electroplaters. Alternatively, the categorical standard for electroplaters (assuming removal credit authority were granted to the POTW) could be relaxed only up to the previously established local limit of 9.0 mg/l so as not to increase the pollutant load beyond the maximum allowable in the treatment plant influent and to maintain the same chromium limit for all IUs.

Technical data demonstrating the maximum allowable treatment plant influent load should be available at the POTW for each pollutant and each treatment plant that will be affected by an application for removal credit authority. The Approval Authority may request copies of the local limits development material so that it may be included in the review of the removal credits application.

3.3.2 Multiple Treatment Plants

Many POTW authorities operate more than one treatment plant, each of which may be receiving wastewater from industrial users regulated by categorical pretreatment standards. The preparation of removal credit applications for POTWs with multiple treatment plants should follow the guidance presented in this section. Due to the wide variety of situations concerning multiple treatment plants, the POTW is encouraged to consult with the Approval Authority for guidance concerning the preparation of applications for removal credits in the multiplant system.

Three basic options are available for determining the removal credits to be requested. Each of them requires the determination of actual pollutant removal rates at each treatment plant. These three options are briefly explained as follows.

Option I: Separate Removal Credits for Each Treatment Plant

In this alternative, each treatment plant is considered separately. A consistent removal rate is calculated and requested for each individual treatment plant. Assuming the plants have significantly different removal rates (which would be typical), industries discharging to the different plants, but subject to the same categorical standards, will have different removal credits applied to the standards based on the different removal rate at the treatment plant which receives their wastestream. For example, consider a situation in which a POTW authority has two treatment plants. Each plant receives discharges from electroplaters and the POTW requests authority to provide a removal credit for chromium. If the chromium removal rate is 46 percent for Plant A and 28 percent for Plant B, then industrial users discharging to Plant A could revise their chromium standard by 46 percent while the users of Plant B could revise the standard by only 28 percent. Also, individual treatment plants might obtain removal credit authority for different pollutants, depending on the nature of the industries discharging to each plant.

The obvious benefit of option I is that it enables a POTW to provide the maximum removal credit to industries located in an area serviced by a particular plant. However, it can create economic inequalities, since industries in one portion of the POTW's total service area may be granted a more lenient standard than other industries discharging to a treatment plant with a lower removal efficiency.

Option II: Uniform Removal Credits Based on Lowest Removal Rate of All Treatment Plants

This option is for multiplant POTW systems that desire community-wide removal credits but do not qualify for mass based multiplant averaging. In using this option, a POTW must determine the removal rates for applicable

pollutants in all the treatment plants, compare the loadings using the modified categorical standards with the maximum allowable treatment plant influent load, then apply for authority to grant the lowest (i.e., most stringent) removal rate demonstrated to meet the appropriate criteria for the entire system. This option ensures that all plants can individually demonstrate their achievement of the uniform removal rate. As an example, if the POTW has three treatment plants, all of which receive discharges from electroplaters and which have chromium removal rates of 46 percent, 35 percent, and 28 percent, respectively, then the POTW authority would request a removal credit of 28 percent for all plants. This option is available for POTWs that have more than one treatment plant receiving industrial waste, where the plants are not hydraulically interconnected, and the POTW wants all industrial users subject to a given categorical standard to meet the same pollutant limitation.

Option III: Mass Based Multiplant Averaging

Many POTW systems include more than one treatment plant and frequently encompass more than one political jurisdiction. Industrial users (IUs) in these systems frequently discharge into different treatment plants. These situations can create difficulties for POTWs in administering and implementing the removal credits provisions of the Regulations. The most notable difficulty is enforcing "different" modified categorical standards for industrial users in the same community due to the differences in removal rates of the various treatment plants. Also, the existence of hydraulic interconnections and the transfer of sewage and/or sludge from one plant to another causes complications in the determination of precise removal credits. This results in uncertainty as to which treatment plant an IU discharges into and what removal rate is appropriate for the IU. In response to this problem, the Agency will consider this mass based multiplant averaging option as a method for calculating a uniform, system-wide removal credit in appropriate circumstances. However, each removal credits application using mass based multiplant averaging will be reviewed on a case-by-case basis by the Approval Authority (State and Regional staffs) in consultation with EPA Headquarters, Office of Water Enforcement and Permits, prior to approval or denial.

Listed below are a number of factors which will be considered before approving this option:

- The existence of hydraulic interconnections that would allow the diversion of sewage and/or sludge from one treatment plant to another
- A history of trucking sewage and/or sludge between the treatment plants
- Integrated management among the treatment plants in the POTW system
- The degree of treatment (e.g., secondary) performed by each treatment plant for which multiplant averaging is being considered, and
- The mass of industrial waste introduced to each treatment plant.

These factors are important in assessing whether mass based multiplant averaging is appropriate for an individual POTW system. However, any other appropriate additional factor will also be considered before permitting this option. For most POTW systems, either Option I (Separate Removal Credits for Each Treatment Plant) or Option II (Uniform Removal Credits Based on Lowest Removal Rate of All Treatment Plants) is the appropriate method for developing removal credits for multiplant POTWs. The Option III procedure will be assessed on a case-by-case basis considering the factors identified above. POTWs are encouraged to consult with their Approval Authority concerning preparation of their removal credits application. If the POTW application requests mass based multiplant averaging, then the POTW should address the concerns described above.

The calculation to determine the mass based average removal rate is derived from the formula found in the Removal Credit regulations:

$$r = \frac{I - E}{I}$$

where: r = the consistent removal rate
 I = the POTW treatment plant influent concentration of the pollutant in question
 E = the effluent concentration of the same pollutant.

In the mass based multiplant situation, however, (I) and (E) also equal the sum of the influent and effluent mass, respectively, divided by the sum of individual flows (f_i) for all treatment plants in the system. Numerically, the formula is:

$$I = \frac{\sum (f_i \times I_i)}{f_i} \quad \text{and,}$$

$$E = \frac{\sum (f_i \times E_i)}{f_i}$$

This can be viewed as taking all of the wastewater treatment plant influents and mixing them together as one influent and doing the same to the effluent, or

$$r = \frac{(\text{pollutant mass in}) - (\text{pollutant mass out})}{(\text{pollutant mass in})}$$

Because the above equation uses the mass-based sums of all influents and effluents, this methodology represents a release to the environment of a pollutant mass equivalent to that resulting from the implementation of removal credits for each individual treatment plant. In accordance with the 1984 Removal Credit regulations (49 FR 31212) the average influent and effluent pollutant concentrations (I&E) must be calculated by averaging all influent and effluent data.

We examine below a number of concerns with this method, and it is important for the Approval Authorities to be aware that these concerns can be resolved through NPDES permit limits and POTW local limits. While the total mass of pollutants discharged from a POTW using a mass based multiplant removal credit is essentially equivalent to that discharged from treatment plants using individual removal credits, individual treatment plants may experience pass through and interference problems. Therefore, it must be ensured that the modified pollutant standard derived from the mass based multiplant removal credit meets the intent of the pretreatment program for

each individual treatment plant (i.e., the modified standard must still protect each individual treatment plant from pass through, process interference and sludge contamination). In order to achieve this objective, the POTW must demonstrate that implementation of the modified categorical standard(s) based on the multiplant removal rate does not result in a pollutant mass that exceeds the maximum allowable plant influent load calculated for each individual treatment plant. Additionally, for plants discharging to different receiving waters, the Approval Authority must ensure that each plant's water quality concerns are met.

To illustrate Option III, consider a POTW with three plants (A, B and C) all meeting the secondary equivalency criteria, seeking a removal credit for chromium. Flow rates and chromium concentrations in the influent and effluent of each plant are as follows:

<u>Treatment Plant</u>	<u>Flow (mgd)</u>	<u>(I_i) Cr Inf Conc (mg/l)</u>	<u>(E_i) Cr Eff Conc (mg/l)</u>
A	8.0	7.5	3.0
B	2.0	6.0	1.2
C	2.5	7.0	3.0

The data are substituted into the appropriate equations as follows:

$$I = \frac{(8.0 \times 7.5) + (2.0 \times 6.0) + (2.5 \times 7.0)}{(8.0 + 2.0 + 2.5)} = 7.2 \text{ mg/l}$$

$$E = \frac{(8.0 \times 3.0) + (2.0 \times 1.2) + (2.5 \times 3.0)}{(8.0 + 2.0 + 2.5)} = 2.7 \text{ mg/l}$$

$$r_m = \frac{7.2 - 2.7}{7.2} = 0.63 \text{ (63\% removal)}$$

Thus, the system-wide average removal rate (r_m) is determined to be 63 percent for chromium. To provide the margin of safety, as recommended on page 3-3, the POTW desires to apply for a removal credit of 60 percent of its consistent removal rate. Therefore, its removal rate for revising the chromium categorical standard becomes 37.8 percent ($63\% \times 0.60 = 37.8\%$) or $r_m = 0.378$. It should be noted that the influent/effluent data sets for each of the three treatment plants were derived from the average of all sampling data for which the influent concentration of chromium was detectable at each plant. The individual removal rates for treatment plants A, B, and C are 60 percent, 80 percent, and 57 percent, respectively, when calculated on an individual basis.

The categorical standard for chromium discharged from existing electroplaters is 7.0 mg/l daily maximum. The revised discharge standard based on the multiplant average consistent removal rate should be calculated by the following equation:

$$y = \frac{x}{1 - r_m}$$

where:

$$y = \frac{7.0 \text{ mg/l}}{1 - 0.378} = 11.3 \text{ mg/l}$$

Assume that the POTW has calculated what technically derived local limits for chromium would be necessary to prevent process interference, pass through and sludge contamination at each of the treatment plants and are as follows:

<u>Plant</u>	<u>Calculated Local Limit for Cr (mg/l)</u>
A	15.0
B	8.0
C	12.5

Since local limits provide the upper limit for a removal credit, comparison of the local limit and adjusted categorical standard is necessary. Several considerations must be taken into account in order to facilitate this comparison. The following assumptions for this example address these considerations:

- IU flow remains at current level - no dilution to meet concentration based limits
- Alteration of local limits not possible - no reallocation of maximum allowable plant influent loading.

Because of the above assumptions, the local limits for each plant in this example provide a true representation of the maximum allowable plant influent loading at each facility. However, the adjusted categorical standard applies at end-of-process and the local limits apply at end-of-pipe. Following the procedure outlined in Section 3.3.1 of this manual, the adjusted categorical standard is corrected to its end-of-pipe equivalent for each IU. For illustration purposes it is further assumed that none of the affected IUs in the example have any dilution, unregulated, or other regulated flows. Therefore, the local limits for chromium and the adjusted categorical standard for chromium are directly comparable.

The adjusted chromium standard (11.3 mg/l) exceeds the calculated local limit necessary to protect plant B from interference, pass through, or sludge contamination (8.0 mg/l) and, therefore, cannot be permitted with the stipulated conditions and assumptions of the example. If the POTW wants to enforce a single chromium standard for all IUs, an adjusted standard of no higher than 8.0 mg/l would have to be implemented in order to ensure the protection of plant B. If the POTW wished to benefit from the multiplant average, it could apply the 8.0 mg/l chromium limit to only those industrial users tributary to plant B and apply the adjusted standard of 11.3 mg/l to all other applicable users; or apply the 8.0 mg/l chromium limit to plant B users and

recalculate the adjusted limit based on the multiplant average for plants A and C. If the local limit (i.e., maximum allowable plant influent loading) for any treatment plant for any pollutant for which a removal credit is being sought is determined to be more stringent than the unmodified categorical standard (or the loading using the unmodified standard), no removal credit can be granted and the local limit must be implemented and enforced.

3.4 Local Pretreatment Program Certification

The removal credit application submitted to the Approval Authority must include a certification from the POTW stating that it has an approved pretreatment program or qualifies for the exception to this requirement as discussed below. The certification must be signed by an authorized POTW representative. A POTW that qualifies for a pretreatment program approval exception may conditionally receive removal credit authority until its pretreatment program is approved. The exception applies only if both of the following conditions are met:

- Each industrial user currently subject to a categorical pretreatment standard who may receive a conditional removal credit has submitted to the POTW the information required in a Baseline Monitoring Report (BMR) as specified in 40 CFR 403.12 (b)(1)-(7). In order to be complete, the information submitted by the user should reflect the revised discharge limit as modified by the removal credit
- The POTW has submitted to the Approval Authority an application for pretreatment program approval meeting all the requirements of 40 CFR 403.8 and 403.9. The application must have been submitted in accordance with the compliance schedule in the POTW's NPDES permit or by July 1, 1983, if no time limitations are contained in the permit.

3.5 Sludge Management Certification

For this section of the application, the POTW must provide a specific description of its current sludge disposal method(s) and a certification (statement and signature by an authorized POTW representative) stating that granting removal credits will not cause the POTW to violate any applicable regulations, (whether Federal, State or local) which govern the current or

planned sludge disposal option(s) employed by the POTW. The documentation developed in support of the POTW's local limits will typically satisfy the technical requirements of this certification. Clearly, the granting of removal credits cannot allow the discharge of any pollutant to exceed the maximum allowable plant influent load established for the particular treatment plant in question. The data and evaluation supporting the certification statement must be available at the POTW and may be requested by the Approval Authority as part of the removal credits application. The sludge certification includes the following Federal statutory provisions and regulations plus any permits issued to implement these or more stringent State or local regulations:

- Section 405 of the Clean Water Act
- Solid Waste Disposal Act (SWDA) [including Title II more commonly referred to as the Resource Conservation and Recovery Act (RCRA) and State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of SWDA]
- Clean Air Act
- Toxic Substances Control Act
- Marine Protection, Research and Sanctuaries Act.

In order to receive removal credit authority in those situations where the POTW is currently out of compliance with any applicable sludge requirements, the POTW may, as an alternative, be able to demonstrate to the Approval Authority that it will be in compliance when its industrial users meet the categorical pretreatment standards as modified by the removal credits. Where the POTW receives removal credit authority under these circumstances, the Approval Authority will establish specific procedures by which the POTW must verify that they are indeed meeting the applicable sludge requirements upon full implementation of the revised discharge standards. Where there are any questions, the POTW should contact the Approval Authority concerning sludge certification requirements prior to preparing the removal credit application. Also, it should be noted that if greater sludge management costs are incurred as a result of granting removal credits, the additional costs will not be eligible for EPA grant assistance.

POTWs should be aware that new Federal sludge regulations are currently being developed and will be promulgated in the near future. Once promulgated, all POTWs will be required to comply, at a minimum, with these regulations. POTWs should bear this in mind to help prevent a situation in which future sludge regulations necessitate the modification or revocation of the previously approved removal credit authority to enable compliance with new sludge regulations. Presently, the RCRA EP Toxicity Test and 40 CFR 257 regulations on PCB and cadmium levels represent the only quantifiable Federal regulations relating to toxic pollutants in municipal sludge destined for land disposal. However, there are many state and local regulations with specific pollutant quantity limitations based on the disposal option used. POTWs must be familiar with applicable regulations or guidelines to ensure a complete application package is prepared. EPA Sludge Management Task Force documents may help in evaluating the extent and hazards of sludge contamination.

As part of the application, the POTW should provide an analytical demonstration or evaluation that all applicable sludge disposal regulations will continue to be met after the removal credits are implemented. This demonstration involves assuming that the revised standards are implemented and met by industry and then, based on this assumption, determining the concentration in the sludge of the pollutant(s) for which removal credits are sought. Categorical standards, when implemented, will usually result in a decrease in total pollutant loading entering the POTW. This remains the case for categorical standards revised by a removal credit in most cases. However, this will be less of a decrease of pollutant loading than would be realized if non-revised categorical standards were fully implemented. In almost all cases, then, implementation of removal credits will at least maintain the status quo with respect to the concentration and mass of toxic pollutants in the POTW sludge and in many cases will result in a decreased loading over current levels. Again, the modified categorical standards cannot allow industrial users to discharge the pollutant(s) affected by the removal credit in an amount that exceeds the maximum allowable plant influent load.

After removal credit approval, the POTW should conduct periodic sludge analyses for the pollutants affected by removal credits to ensure that

compliance with sludge disposal regulations is being maintained. This type of sludge monitoring may be required by the Approval Authority. IUs benefiting from the removal credit may provide financial assistance for the increased sludge monitoring. Step-by-step procedures for demonstrating compliance (both before and after removal credit approval) are discussed below. In addition, an example of this demonstration is presented in the Example Application provided in Appendix C.

The first step is to determine whether implementing a categorical limitation revised by the removal credit will permit an increase in the amount of a toxic pollutant in the POTW system that exceeds the maximum allowable influent loading determined in the development of local limits. This may occur if the existing total pollutant loading from all industries discharging the pollutant is at or near the maximum allowable load. If discharges from affected industries using the modified categorical standard(s) result in the maximum allowable influent concentration (or mass) being exceeded, the removal credits cannot be granted. If, however, the implementation of modified categorical standard(s) results in a pollutant loading that does not exceed the amount determined during local limit development, the application can be considered by the Approval Authority.

The calculation to determine the pollutant load entering the system at the discharge limit prescribed by the modified categorical standard proceeds as follows.

First, those sources of the pollutant in question that will not be affected by removal credits must be considered. These sources usually include residential and commercial dischargers, street runoff (for combined sewer systems) and noncategorical industrial users or unregulated industrial processes which discharge the pollutant. The amount of the pollutant discharged by these sources can generally be obtained from the local limits technical information.

Second, the total amount of the pollutant to be contributed by industries discharging at the level allowed by the modified standards is calculated. If

the categorical limit is concentration based (mass of pollutant per volume of wastewater), then the modified limit is multiplied by the maximum daily regulated flow rate from all categorical dischargers of the pollutant and subsequently multiplied by an appropriate conversion factor to obtain the pollutant mass loading (mass of pollutant per day). The following equation illustrates this procedure:

$$P_t = 8.34y \sum f_i$$

where:

P_t = total pollutant contributed by industries using modified categorical standard (lb/d)

y = revised concentration based categorical standard (mg/l)

f_i = maximum daily regulated flow rate from categorical discharge i (mgd).

If the categorical limit is production based (mass of pollutant per number of units of production), then the modified limit is multiplied by the total daily number of units produced by industries in each subcategory.

$$P_t = y \sum U_i$$

where:

y = revised production base categorical standard (mass/unit)

U_i = production rate of categorical industry (units/time)

This amount is then added to the amount contributed by "unaffected" sources to obtain the total treatment plant influent loading for the pollutant of concern. The resulting figure is a projected maximum loading of the pollutant to the treatment plant in mass per day. This is the figure that must be compared to the maximum allowable plant influent load determined for local limits.

At this step, it is recommended that the POTW evaluate the proportion of the influent pollutant loading that will deposit in sludge. Metals removed during treatment are generally deposited in the sludge. Therefore, the consistent removal rate determined in the application should be used to calculate

the concentration of metals in sludge. Several organic priority pollutants (e.g., polynuclear aromatic hydrocarbons, of which there are 13 on the EPA priority pollutant list) behave similar to metals in that the removal mechanism is primarily by adsorption to settling particles and deposition in the sludge. Many organic pollutants, however, do not accumulate to a significant level in the sludge but are instead removed from the wastewater by biological and/or chemical destruction, volatilization or other mechanisms which do not result in sludge deposition of the pollutant. The POTW may not have originally developed local limits for these or other pollutants and will be addressing these issues for the first time. Calculation of the amount of these pollutants deposited in sludge may require fate and effect studies in the POTW treatment system. These sampling studies will provide data to calculate the percentage of the pollutant entering the POTW which is deposited in the sludge. This percentage can be expressed as a fraction and multiplied by the calculated pollutant loading entering the plant to determine the total pollutant loading that will be deposited in sludge.

Most sludge disposal regulations provide mass based pollutant limits (mass of pollutant per mass of sludge). Therefore, the amount of a pollutant deposited in the sludge (mass per day) must be divided by the total mass of sludge generated per day to obtain the total mass of pollutant per mass of sludge. The projected maximum level of the pollutant in the sludge is then compared with applicable sludge disposal regulations to verify that compliance will be maintained.

3.6 NPDES Permit Limit Certification

The final application requirement is a certification (statement and signature by an authorized POTW representative) that implementation of the removal credits will not cause a violation of the POTW's permit limits and conditions. Similar to the sludge disposal certification requirements, a POTW that is currently out of compliance with applicable limitations and conditions in its NPDES permit may be able, as an alternative, to demonstrate to the Approval Authority that it will be in compliance when its industrial user(s) are required to meet the categorical pretreatment standards as modified by the removal credit provision. Also, the data and evaluation supporting this certification should be available at the POTW and may be requested by the Approval Authority as part of the application.

POTWs should note that Approval Authorities are being encouraged to establish NPDES permit limits for each toxic pollutant which is included in an approved removal credits application. In addition, the Agency (Office of Water Enforcement and Permits) has issued a memorandum (July 24, 1985) encouraging toxicity testing requirements and possible limits on toxicity in municipal NPDES permits using biomonitoring. In view of this, the POTW's certification that implementation of removal credits will not violate existing or future permit limits must be given careful consideration. It is strongly recommended that the POTW request information from the Approval Authority concerning future permit limits if toxic limits are not currently included in the POTW's NPDES permit.

Toxic pollutant loadings can cause violation of the POTW NPDES permit primarily by two mechanisms. First, toxic pollutant loadings can exceed the removal capability of the POTW treatment system causing a direct violation of a toxic pollutant limitation in the NPDES permit. Second, reduced process efficiency due to interference from high pollutant loads can cause NPDES violations, e.g., high priority pollutant concentrations interfering with the biological processes could cause BOD violations of the NPDES permit. The majority of POTW NPDES permits, however, do not currently contain toxic pollutant limitations. Thus, the major analysis of whether application of removal credits may lead to violation of the NPDES permit conditions will be a demonstration that implementation of the revised limits will not cause POTW treatment plant interference which may result in violations of existing permit conditions. The POTW must demonstrate that violation of NPDES permit limitations will not occur as a result of either mechanism.

Again, a comparison of the pollutant loading resulting from the modified standards and the maximum allowable plant influent load is of primary importance. Technical analyses that were used to support the POTW's development of local limits can be used to help support the request for removal credits. Documentation of the existing local limits developed as part of the pretreatment program should indicate the maximum levels of pollutants in the influent to the treatment plant that can be tolerated and still prevent interference with the operation of the plant (including unacceptable sludge contamination),

and violation of the NPDES permit conditions or of water quality standards. Application of removal credits must not enable industrial users to discharge pollutants that, in total amount, exceed the maximum allowable plant influent load.

Implementation of revised categorical standards may reduce the toxic pollutant loading below existing levels and allow a POTW not in compliance with its NPDES permit to come into compliance. This is especially true where the industrial users currently discharge pollutants to the POTW with no limitations or very lenient limitations.

3.6.1 NPDES Compliance Demonstration

The demonstration of NPDES permit compliance involves calculation of the anticipated increase or decrease of the pollutant concentrations in the influent to the treatment plant due to revising the categorical standards and the resulting effect on treatment processes and effluent. Also, the POTW's past history of compliance with NPDES permit conditions for all treatment plants and an assessment of the extent and type of violations should be presented in the application. Step-by-step procedures for developing this demonstration are given below. In addition, an example of this demonstration is presented in the Example Application in Appendix C.

The first step in developing the NPDES permit compliance demonstration is to determine the maximum level of the pollutant in the treatment plant influent prior to and after revision of the categorical standards. The method for calculating the increased pollutant discharge to the system in mass per day was given in the previous subsection. This mass loading, when divided by the average plant flow and an appropriate conversion factor, gives the influent concentration (mass per volume) which is the maximum level of the pollutant expected in the plant influent with revised categorical standards in place. Where local limits (i.e., maximum allowable plant influent loading) have not already been developed, the maximum level of the pollutant is then used to determine if the biological treatment processes used at the plant will be inhibited. Since most biological (secondary) systems follow primary treatment, the maximum projected influent to the secondary treatment process is

calculated by multiplying $1-r_p$ by the maximum projected influent concentration to the plant where r_p is the pollutant removal efficiency of the primary process. This maximum projected influent to the secondary process should then be checked with the typical threshold concentration values for inhibitory effects. Typical values are given in Table 3.1 for activated sludge, nitrification, and anaerobic sludge digestion. These typical values can be useful to a POTW in predicting whether interference will occur if implementation of a removal credit allows an increase in toxic pollutant loading or whether implementation of categorical standards modified by the removal credit will be sufficient to eliminate interference that may currently be causing a POTW to violate its NPDES permit requirements. The POTW may be able to show by statistical analysis of plant operations or other methods that the typical values for process inhibition do not apply to that particular treatment plant. Thus, POTWs may be able to demonstrate that interference with plant operations will not occur if discharges result in concentrations that exceed the values in Table 3.1. Plant specific monitoring (including bench scale testing and pilot plant operation) of removal efficiency, changes in the respiration rate of the flora and fauna in the biological unit, and other measurements may help the POTW more accurately define the inhibitory effects of various pollutant concentrations.

For a tertiary treatment process (such as nitrification), the same procedure used above for secondary processes can be used to calculate the maximum projected influent concentration to the tertiary process. This is done by substituting r_{p+s} for r_p where r_{p+s} is the total removal efficiency of the primary and secondary processes.

For determining the potential for biological inhibition of the sludge treatment processes (such as anaerobic sludge digestion), the influent concentration to the sludge treatment process can be calculated by using the following formula, referred to as the "sludge influent concentration equation:"

$$I_{sp} = r_m \frac{Q_p}{Q_{sp}} I_p$$

Table 3.1

**Threshold Concentrations of Toxic Pollutants
That Could Inhibit Biological Treatment Processes**

Toxic Pollutant	Threshold of Inhibitory Effect on Activated Sludge	Threshold of Inhibitory Effect on Nitrification	Threshold of Inhibitory Effect on Anaerobic Sludge Digestion
Arsenic	0.04 mg/l	---	1.6 mg/l
Cadmium	1.0 mg/l	5.0 mg/l	0.02 mg/l
Chromium (total)	10.0 mg/l	55.0 mg/l	100.0 mg/l
Chromium (hex)	1.0 mg/l	5.0 mg/l	50.0 mg/l
Copper	0.1 mg/l	0.05 mg/l	1.0 mg/l
Cyanide	0.05 mg/l	0.34 mg/l	1.0 mg/l
Lead	0.1 mg/l	0.5 mg/l	250.0 mg/l
Mercury	0.1 mg/l	2.0 mg/l	.365 mg/l
Nickel	1.0 mg/l	0.5 mg/l	2.0 mg/l
Zinc	0.08 mg/l	0.08 mg/l	5.0 mg/l

*Concentrations are specified at influent of the unit process in dissolved form.

References: (1), (3) (5) and (12) in Table 3.2.

where: I_{sp} = maximum projected concentration in sludge process influent
 r_m = consistent removal rate at the plant
 Q_p = plant flow rate
 Q_{sp} = sludge flow rate
 I_p = maximum projected plant influent concentration

The value obtained for I_{sp} is then compared with threshold levels for inhibitory effects to ensure that the sludge treatment process will not be affected. Note that this methodology is applicable primarily to metals and organic pollutants that are removed almost exclusively by deposition in the sludge. When considering the majority of the organic pollutants, the value of r will need to be modified based on the actual proportion of the organic pollutant that is removed to the sludge.

As noted on Table 3.1, the threshold inhibition levels are expressed as influent pollutant concentrations to the unit process in the dissolved form. The above methods of calculation yield the projected total concentration of the pollutant. In many cases they will yield a close approximation of the pollutant in the dissolved form. The major exception will typically be the calculation of influent concentration to sludge processes using the sludge influent concentration equation. A significant fraction of this concentration may not be in the dissolved form. Thus, if calculated concentrations exceed the threshold inhibition levels, the POTW should consider additional methods to more closely estimate the concentration in the dissolved form. One alternative would be to conduct sampling of the sludge stream entering the sensitive processes and analyze for both total and dissolved concentrations of the pollutant(s) in question. The ratio of dissolved to total pollutant concentrations could then be multiplied by the concentration calculated by the sludge influent equation to yield a closer approximation of the expected dissolved pollutant concentration entering the sludge processing units after removal credits are implemented (this approximation assumes that the ratio of dissolved to total pollutant concentration will not change as the influent concentration changes). Another approximation of the dissolved pollutant concentration entering the sludge processing unit is to estimate the pollutant

concentration in the effluent liquid phase from the unit process. This is estimated by multiplying $(1-r)$ by the maximum projected influent concentration to the plant where r is defined as the consistent removal rate through all treatment units at the plant. This concentration should be a close approximation of the dissolved concentration of the pollutant in the sludge from the unit process. Also note that once the sludge enters the sludge treatment unit (e.g., anaerobic digester), the relative proportions of the pollutant in the dissolved and total form can change due to different conditions that exist within the sludge treatment unit. This factor can increase or decrease the likelihood that biological inhibition of the sludge unit will occur.

In regard to effluent quality, where the POTW's NPDES permit does not have toxic pollutant limits (for the pollutants covered by the credits), the POTW should ensure that water quality criteria or standards (if available) will continue to be met after the categorical standards are revised. Again, the Approval Authority will usually incorporate NPDES permit limits for the toxics involved in the removal credits application. The POTW should contact the Approval Authority concerning future toxic pollutant limits in the NPDES permit during the preparation of the removal credits applications. For reference purposes, a summary of EPA's Water Quality Criteria for priority pollutants is presented in Table 3.2.

To make the effluent qualities calculation, the maximum projected plant effluent concentration is calculated from the maximum projected plant influent concentration and compared to the criteria or standards. The plant effluent concentration is $(1-r)$ times the plant influent concentration where r is the consistent removal rate through all treatment units at the plant. The dilution factor of the plant effluent in the receiving waters is determined from the ratio of the flow rates of the effluent and receiving waters during low flow periods. The maximum level in the receiving waters contributed by the POTW is calculated by taking the proportion of the POTW and receiving water flow rates times the maximum projected plant effluent concentration. The maximum pollutant level expected in the receiving water can then be estimated by adding the maximum level contributed by the POTW (estimated above) to the receiving water background level of the pollutant measured

Table 3.2

Water Quality Criteria

PARAMETER	FRESHWATER AQUATIC LIFE TOXICITY		SALTWATER AQUATIC LIFE TOXICITY	
	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)
Acenaphthene	1,700 ug/l	520 ug/l	970 ug/l	710 ug/l
Arolein	68 ug/l	21 ug/l	Toxicity to algae occurs at concentrations as low as 500 ug/l	
Acrylonitrile	7,550 ug/l	2,600 ug/l	55 ug/l	--
Aldrin/ Dieldrin	(3 ug/l) (2.5 ug/l)	--	(1.3 ug/l)	--
Antimony	9,000 ug/l	(.0019 ug/l)	(0.71 ug/l)	(0.0019 ug/l)
Arsenic	(440 ug/l)	1,600 ug/l	--	--
Asbestos	--	--	508 ug/l	--
Benzene	5,300 ug/l	--	--	--
			5,100 ug/l	No data for 24 hr. average, however, effects found in fish exposed for 168 days to 700 ug/l
Benzidine	2,500 ug/l	--	--	--
Beryllium	130 ug/l	5.3 ug/l	--	--
Cadmium	(1.05 (ln(hardness)))-3.73)	(1.05 (ln(hardness)))-8.53)	(59 ug/l)	(4.5 ug/l)
Carbon Tetra- chloride	35,200 ug/l	--	50,000 ug/l	--
Chlordane	(2.4 ug/l)	(0.0043 ug/l)	(0.09 ug/l)	(0.0040 ug/l)
Chlorinated Benzenes	250 ug/l	--	160 ug/l	129 ug/l
Chlorinated Ethanes:				
1,2-Dichlo- roethane	118,000 ug/l	20,000 ug/l	113,000 ug/l	--
-Trichlorethane:				
1,1,2 Tri- chlorethane	18,000 ug/l	9,400 ug/l	--	--
1,1,1 Tri- chlorethane	--	--	31,200 ug/l	--

Table 3.2

Water Quality Criteria (Continued)

PARAMETER	FRESHWATER AQUATIC LIFE TOXICITY		SALTWATER AQUATIC LIFE TOXICITY	
	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)
-Tetrachloro-ethane	9,320 ug/l	2,400 ug/l	--	--
1,2,2,2-Tetra-chloroethane	--	--	9,020 ug/l	--
Pentachlorethane	7,240 ug/l	1,100 ug/l	390 ug/l	281 ug/l
Hexachlorethane	980 ug/l	540 ug/l	940 ug/l	--
Chlorinated Naphthalenes	1,600 ug/l	--	7.5 ug/l	--
Chlorinated Phenols:				
4-Chloro-3-Methylphenol	30 ug/l	--	--	--
2,4,6-Tri-chlorophenol	--	970 ug/l	--	--
2,3,5,6-Tetra-chlorophenol	--	--	440 ug/l	--
4-chlorophenol	--	--	29,700 ug/l	--
Chloroalkyl Ethers	238,000 ug/l	--	--	--
Chloroform	28,900 ug/l	1,240 ug/l	--	--
2-Chlorophenol	4,380 ug/l	--	--	--
Chromium:				
Hexavalent	(21 ug/l)	(0.29 ug/l)	(1,260 ug/l)	(18 ug/l)
Trivalent	(1.08(1n(hardness)) + 3.48)ug/l	44 ug/l	10,300 ug/l	--
Copper	(.94(1n(hardness)) - 1.23)ug/l	(5.6 ug/l)	(23 ug/l)	(4.0 ug/l)

Table 3.2

Water Quality Criteria (Continued)

PARAMETER	FRESHWATER AQUATIC LIFE TOXICITY		SALTWATER AQUATIC LIFE TOXICITY	
	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)
Cyanide	(52 ug/l)	(3.5 ug/l)	30 ug/l	2.0 ug/l
Free Cyanide (HCN+CN ⁻ , as CN)				
DDT and Metabolites	(1.1 ug/l)	(0.001 ug/l)	(0.13 ug/l)	(0.0010 ug/l)
TDE	0.6 ug/l	--	3.6 ug/l	--
DDE	1,050 ug/l	--	14 ug/l	--
Dichloro- benzenes	1,120 ug/l	763 ug/l	1,970 ug/l	--
Dichloro- ethylenes:				
1,1-Dichloro- ethylene	11,600 ug/l	--	224,000 ug/l	--
2-4-Dichlorophenol	2,020 ug/l	465 ug/l	--	--
Dichloropro- panes	23,000 ug/l	5,700 ug/l	10,300 ug/l	3,040 ug/l
Dichloropro- penes	6,060 ug/l	244 ug/l	790 ug/l	--
2-4-Dimethyl- phenol	2,120 ug/l	--	--	--
2-4 Dinitro- toluene	330 ug/l	230 ug/l	590 ug/l	decrease in algal cell numbers occur at 370 ug/l
1,2-Diphenyl- hydrazine	270 ug/l	--	--	--
Endosulfan	(0.22 ug/l)	(0.056 ug/l)	(0.034 ug/l)	(0.0087 ug/l)
Endrin	(0.18 ug/l)	(0.0023 ug/l)	(0.037 ug/l)	(0.0023 ug/l)
Ethylbenzene	32,000 ug/l	--	430 ug/l	--
Fluoranthene	3,980 ug/l	--	40 ug/l	16 ug/l
Haloethers	360 ug/l	122 ug/l	--	--
Halomethanes	11,000 ug/l	--	12,000 ug/l	6,400 ug/l
Heptachlor	(0.52 ug/l)	(0.0038 ug/l)	(0.053 ug/l)	(0.0036 ug/l)

Table 3.2

Water Quality Criteria (Continued)

PARAMETER	FRESHWATER AQUATIC LIFE TOXICITY		SALTWATER AQUATIC LIFE TOXICITY	
	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)
Hexachloro-butadiene	90 ug/l	9.3 ug/l	32 ug/l	--
Hexachloro-cyclohexane:				
Lindane	(2 ug/l)	(0.08 ug/l)	(0.16 ug/l)	--
BHC	100 ug/l	--	0.34 ug/l	--
Hexachloro-cyclopentadiene	7 ug/l	5.2 ug/l	7.0 ug/l	--
Isophorone	117,000 ug/l	--	12,900 ug/l	--
Lead	(1.22(ln(hardness)) ^e -0.47)ug/l	(2.35(ln(hardness)) ^e -9.48) ug/l	668 ug/l	25 ug/l
Mercury				
Naphthalene	2,300 ug/l	620 ug/l	(3.7 ug/l)	(0.10 ug/l)
Nickel	(.76 (ln(hardness)) ^e +4.02)ug/l	(.76 ln(hardness)) ^e +1.06 ug/l	2,350 ug/l	--
	27,000 ug/l	--	(140 ug/l)	(7.1 ug/l)
Nitrobenzene	230 ug/l	--	6,680 ug/l	--
Nitrophenols	5,850 ug/l	--	4,850 ug/l	--
Nitrosamines			3,300,000 ug/l	--
Pentachloro-phenol	55 ug/l	3.2 ug/l	53 ug/l	34 ug/l
Phenol	10,200 ug/l	2,650 ug/l	5,800 ug/l	--
Phthalate	940 ug/l	3 ug/l	2,944 ug/l	--
Polychlorinated Biphenyls	--	(0.014 ug/l)	--	(0.030 ug/l)
Polynuclear Aromatic Hydrocarbons	--	--	300 ug/l	--
Selenium	(260 ug/l)	(35 ug/l)	(410 ug/l)	(54 ug/l)
Silver	(1.72(ln(hardness)) ^e -6.52) ug/l		(2.3 ug/l)	--

Table 3.2

Water Quality Criteria (Continued)

PARAMETER	FRESHWATER AQUATIC LIFE TOXICITY		SALTWATER AQUATIC LIFE TOXICITY	
	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)	ACUTE (Maximum)	CHRONIC (24. Hr. Ave.)
Tetrachloro-ethylene	5,280 ug/l	840 ug/l	10,200 ug/l	450 ug/l
Thallium	1,400 ug/l	40 ug/l	2,130 ug/l	--
Toluene	17,500 ug/l	--	6,300 ug/l	5,000 ug/l
Toxaphene	(1.6 ug/l)	(0.013 ug/l)	(0.070 ug/l)	--
Trichlorethylene	45,000 ug/l	--	2,000 ug/l	--
Zinc	(0.83(ln(hardness))+1.95) ug/l	(47 ug/l)	(170 ug/l)	(58 ug/l)

Reference: "Ambient Water Quality Criteria," EPA 440/5-80, October, 1980.

upstream of the POTW. The background level is obtained by sampling and analysis of the receiving water upstream of the POTW considering that such samples should be taken downstream of any other discharges to the receiving water with allowance for a mixing zone. The use of mixing zones is appropriate for evaluating compliance with criteria in most States. Each State's mixing zone policy is somewhat unique. State standards must be consulted to determine appropriate application of a mixing zone so that proper calculations of acceptable instream concentrations can be made. In addition, guidance on determining suitable mixing zone dimensions and their applications is provided in the Office of Water's Technical Support Document for Water Quality-based Toxics Control (July 1985). This document gives specific recommendations on the design of toxicologically based mixing zones and should be consulted when analyzing effluent mixing conditions. The maximum level in the receiving waters after the addition of the POTW discharge can then be compared with water quality criteria or standards to verify that they will continue to be met after revision of the categorical standards. An example of this water quality calculation is found in the model removal credits application on page C-10.

Table 3.3

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4. Alternative Procedures Available To Satisfy Application Requirements

The removal credits provision allows for alternative means and procedures to demonstrate consistent removal where sampling and analysis data are not complete or suitable for demonstrating consistent removal. Plant data may not accurately reflect actual pollutant removals due to the effects of dilution by nonindustrial wastes and the limits of analytical procedures such that quantifiable influent and/or effluent concentrations cannot be measured. However, the inherent complexities of any alternate methodology proposed by a POTW necessitates both a clear justification for its use, and careful evaluation by the Approval Authority.

POTWs need to be aware that alternative means and procedures may only be used with the concurrence of the Approval Authority, and that these alternate procedures will also be subject to review by EPA Regional staff and EPA Headquarters Office of Water Enforcement and Permits. As such, POTWs are advised to carefully consider their decision to pursue this option, and to consult with the Approval Authority regarding the method's appropriateness at the earliest possible stage. A discussion of each of the alternatives available is presented below.

4.1 Use of Historical Data For POTW Removals

Complete sampling and analytical data for 12 sets of influent and effluent samples may not provide enough data points to accurately predict the plant's consistent removal rate. In another instance, the POTW may have

sampled for only six months but wants to apply for removal credits as soon as possible. Where applicable, POTWs may wish to rely on available historical data concerning the pollutants in question. In many instances, these data were gathered for other reasons (i.e., pretreatment program development, water quality or sludge quality studies, or as the basis for the design of replacement equipment or plant expansion). This type of database can be included to calculate POTW removal rates of the toxic pollutants providing samples were collected at proper locations, with proper care and attention to sampling and analytical techniques and at approximately equivalent frequencies (at least one per month).

In evaluating whether historical data are usable for calculating consistent removal rates, the applicant must determine whether sampling and analytical techniques were in conformance with current requirements. Sampling and analytical protocols, particularly for some toxic pollutants, are periodically refined and improved. It is possible, therefore, that historical data were collected under different protocols than are now required and that the sampling techniques were inconsistent with those needed for removal credits, which must be based on 24-hour composite samples (except in those cases where the type of pollutant being sampled dictates grab samples be used). Similarly, the POTW should verify that analytical techniques associated with historical data were in conformance with Federal requirements for priority pollutant sampling, with detection limits that will be suitable for removal credit calculations.

Another major factor is that the POTW must ensure historical data are representative of the wastestream currently entering the plant. This includes such considerations as changes in the community served by the POTW (especially with regard to industrial users) and treatment plant operational parameters and processes. The historical data must be carefully evaluated for these considerations before it is used for calculation of consistent removal.

In regard to the IUs of the system, then the POTW must demonstrate to the Approval Authority that industrial contributors continue to discharge similar quantities and concentrations of toxic pollutants of concern. In the last ten

years, advances in industrial technology, new processes and compounds, energy and water conservation, economic incentives to recover pollutants which were previously discharged, and an increased awareness of environmental issues have caused many industrial facilities to change their internal processes and operations, often dramatically altering flow rates and wastewater characteristics. Before a POTW relies on its own historical sampling data, industrial consistency should be demonstrated by showing that the industrial community served by the POTW (in particular, the sampling results of IU monitoring) has remained consistent over that period. The relative proportions of industrial vs. residential/commercial flow during the historical period and at present should also be indicated. Other indicators for industrial dischargers, such as employment statistics or water usage, are not by themselves adequate to provide this verification. If such verification cannot be provided, then the POTW may be limited in its use of historical data.

Another prerequisite for use of historical data is that the POTW demonstrate its operations have not changed since the data were collected. It is relatively straightforward to indicate that the POTW unit operations are the same but it is also important to note whether POTW operational changes may have affected toxic pollutant removals. For example, the addition of chemicals or varying the dose rate of chemicals can dramatically affect the removal of metals with only a minimal effect on BOD or TSS removals. Changes in wastewater pH may affect operations as well as removal of some toxic pollutants, particularly metals. Similarly, volatilization of certain organic priority pollutants may be a function of a variety of factors including turbulence, aeration horsepower supplied, and temperature. If there have been substantial modifications or additions to the POTW since the period that the historical data was collected, then historical data is probably invalid.

4.2 Use of Alternative Sampling Designs

Some POTWs may want to propose an alternative sampling program based on factors that would result in more than 12 equally spaced samples being used in calculating consistent removal. Situations such as a POTW with seasonally discharging industries or POTWs that experience significantly different weather conditions (e.g., temperature, precipitation) may justify a change in

sampling frequency. In these cases, it may be more appropriate to take a different number of samples during one time of the year than another. Plants with these different seasonal conditions may need to take a higher number of samples during a particular season. The affected IUs may provide technical insight into appropriate alternative sampling designs. However, regardless of the total number of samples collected, all sampling data must be used and at least one sample each month is required. Furthermore, the data should be handled such that the resulting removal rate is representative of the entire year. In some cases this may require that different numbers of samples each month be averaged and then these averaged monthly influent and effluent values themselves be averaged to compute the representative removal rate.

4.3 Use of Treatability Studies or Removal Data From Similar Treatment Plants To Demonstrate Removal

Some POTWs may not be able to detect the pollutants in their influent or effluent for which removal credits are being sought. This is particularly true of systems where industrial contributions of priority pollutants are small relative to the total flow into the treatment plant and also in the case of many of the organic priority pollutants. These POTWs, with the Approval Authority's concurrence, may take advantage of provisions in the regulations which allow for use of alternative data sources from treatability studies or data transfer from a similar POTW. Again, interaction with the IUs serviced by the POTW may help define possible alternative data sources.

4.3.1 Treatability Studies

If treatability studies are to be used, the POTW must demonstrate that the removal rates obtained apply to the full-scale POTW. The criteria that would need to be addressed and demonstrated in the POTW's application for removal credit authority include the following:

- Similar influent pollutant characteristics
- Attempts to collect actual pollutant removal data were unsuccessful
- Consistent influent and effluent sampling were uninfluenced by recycle streams

- Proper sampling and analytical techniques were employed
- Operation of the pilot plant was in the same manner as the facility being modeled.

This last item requires the POTW to demonstrate that treatability studies were set up properly and operated with the same constraints as the full scale facility. POTWs interested in performing treatability studies are encouraged to consult the Approval Authority for more specific information on setting-up and operating such a study.

4.3.2 Transfer of Data From Similar POTWs

Another alternative provided by the regulations for demonstrating consistent removal is to rely upon data from similar treatment plants. While this alternative may be difficult, the POTW must attempt to demonstrate that these data are accurately transferrable for the pollutants of concern. Transfer of data for one pollutant to another pollutant is especially difficult. EPA, through its many sampling programs and industry studies, has found very few occurrences of reliable "indicator" pollutants.* Therefore, it may be difficult to show that a pollutant removal rate at a POTW with the same basic operation as the applicant plant will be equivalent to the removal rate for the pollutant at the applicant plant.

Before the pollutant data is transferred to the applicant POTW, the POTW should evaluate such issues as the chemical form of the pollutant, acclimation, synergism and antagonism of the various pollutants, type and location of recycle streams within a plant, and any other factors that may contribute to the problem of reliable data transfer from one plant to another. For example, the removal of toxic pollutants is complicated because removal depends largely upon the percent of the pollutant in soluble versus suspended form (most measurements only report the "total" metal concentration) and the removal mechanisms available for a particular pollutant. Since toxic pollutants are

*An indicator pollutant is an easy-to-measure pollutant that will predict either the occurrence or removal of a more difficult to measure pollutant.

primarily associated with industrial contributors, the nature of the pollutant composition is likely to be industry specific. Thus, the ratio of soluble to suspended concentrations for any pollutant may vary, even when two cities have a similar total pollutant concentration.

A POTW that wishes to demonstrate that sampling results at another POTW are directly transferable for use in the calculation of removal credits should address the following questions:

- Whether the plant unit operations and operational characteristics (such as SRT, MLSS, aeration rate, etc.) are similar
- Whether the composition of industrial dischargers (including type of pollutants, concentrations and flow volume) is approximately the same for both plants, and POTW influent wastewater characteristics (including daily load fluctuations and the effects of infiltration/inflow) are similar
- Whether the variability in performance of the two plants, at least as measured in conventional pollutants, is comparable
- Whether raw water characteristics at both plants are similar
- Whether the sampling and analytical techniques used to generate the data to be used are satisfactory for the purposes of removal credit calculation, and would satisfy all of the requirements of the regulations
- Whether the data accurately reflect the current industrial composition and the current POTW operations that are to be portrayed
- Whether the pollutants present in sludge are comparable.

5. Sampling and Analytical Requirements

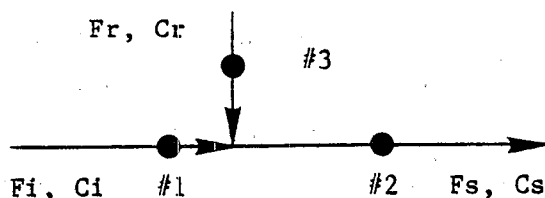
5.1 Sampling Methods

The removal credit regulation requires at least 12 representative samples of the POTW's influent and effluent taken at approximately equal intervals throughout one full year (historical data or an alternative sampling design may be used under certain circumstances with the Approval Authority's concurrence). A POTW may accept assistance from its industrial users in the form of financial support to cover the cost of additional sampling, and technical support to aide the POTW in selecting appropriate sampling equipment and techniques, and perhaps even to contribute employee time and labor. It is ultimately the affected industrial users that benefit from the granting of removal credit authority and therefore the IU's should be encouraged by the POTW to participate in applying for and maintaining the removal credit. Typically, laboratory analyses must be based on composite samples unless grab samples are more appropriate. The regulation does not attempt to specify when grab samples are more appropriate, but rather provides general guidance in Appendix E of the regulations along with a description of the methods. Appendix E of the regulations recommends that influent and effluent data be obtained by 24-hour flow-proportional composite sampling. It is recommended that effluent sample collection be delayed to compensate for hydraulic detention within the treatment plant. The detention period is defined as the hydraulic residence time through the plant without consideration of recirculating flows. The Approval Authority may require detention time compensation.

An exception to composite samples is where the pollutants being analyzed cannot be held for an extended period because of biological, chemical or physical interaction which may take place after sample collection and affect the results. For these pollutants, such as cyanide, phenol, and a number of toxic organics, grab sampling should be employed. The collection of influent grab samples according to the suggested procedures should precede the collection of effluent samples by approximately one detention period.

When collecting or examining existing analytical data, it is important to determine whether the influent and effluent samples are suitable for calculating removal credits. A common problem with the use of analytical data is that influent samples do not always accurately characterize the POTW influent. This can be particularly true where a POTW is considering use of a historical data base and the samples were not collected for the primary purpose of calculating an accurate percent removal. Many POTWs contain internal plant recycle lines from various sludge processing operations back to the headworks. Sampling downstream from recycle flows is often suitable for routine POTW activities or to calculate unit process loading rates, but data obtained from such a sample point are not appropriate to calculate removal credits. Thus, POTW sampling of influent at a convenient or perhaps often used location that includes these recycle flows will substantially overstate percent removals. In order to calculate an accurate percent removal, influent samples must be taken upstream of all recycle flows. Because of the importance of this issue, the POTW should address it in the application (a flow diagram is often useful) and the Approval Authority must verify that pollutant removals were correctly calculated.

A problem that may arise for some POTWs is that sampling prior to all recycle flows is not necessary for routine treatment plant operations. Therefore, some POTWs will have a piping system that is arranged such that obtaining a sample prior to all recycle flows may be almost physically impossible. Where a POTW can demonstrate that it falls into this category, it will be necessary to obtain the correct value for the influent concentration to the treatment plant by conducting a mass balance around the point that can be sampled, subtracting out the pollutant concentration attributable to recycle flows. For example, the piping configuration may be represented as below:



where Fr is a recycle flow (in units of volume per time) with a pollutant concentration of Cr . The sampling location necessary to obtain an accurate influent sample for calculating consistent removal is location #1. If it is not possible to sample at location #1, the concentration at that point would have to be calculated by measuring the flows (Fr and Fs) and concentrations (Cr and Cs) at locations #2 and #3. The proper influent pollutant concentration (Ci) would then be calculated as follows:

$$Ci = \frac{(Fs)(Cs) - (Fr)(Cr)}{Fs - Fr}$$

This method of obtaining the influent pollutant concentration is not the preferred method and should only be used when absolutely necessary. The POTW should obtain the prior concurrence of the Approval Authority before investing time and money into the sampling and analysis to calculate the influent concentration by this method.

5.2 Analytical Methods

As specified in the final removal credit rule, the POTW is to use the analytical techniques prescribed in 40 CFR 136 for sample analysis. The POTW may use alternate analytical methods if the Approval Authority concurs or has established alternate methods. Analytical techniques for certain pollutants may not be contained in 40 CFR 136 or the technique may be inappropriate. In such cases an alternative analytical technique may be used with the concurrence of the Approval Authority. Other sources of analytical techniques include Standard Methods for the Examination of Water and Wastewater; Fifteenth Edition, published by the American Public Health Association, Washington, D.C.; Handbook for Sampling and Sample Preservation of Water and Wastewater (EPA Publication No. 600/4-82-029); and Methods for Chemical Analysis of Water and Wastes (EPA Publication No. 600/4-79-020).

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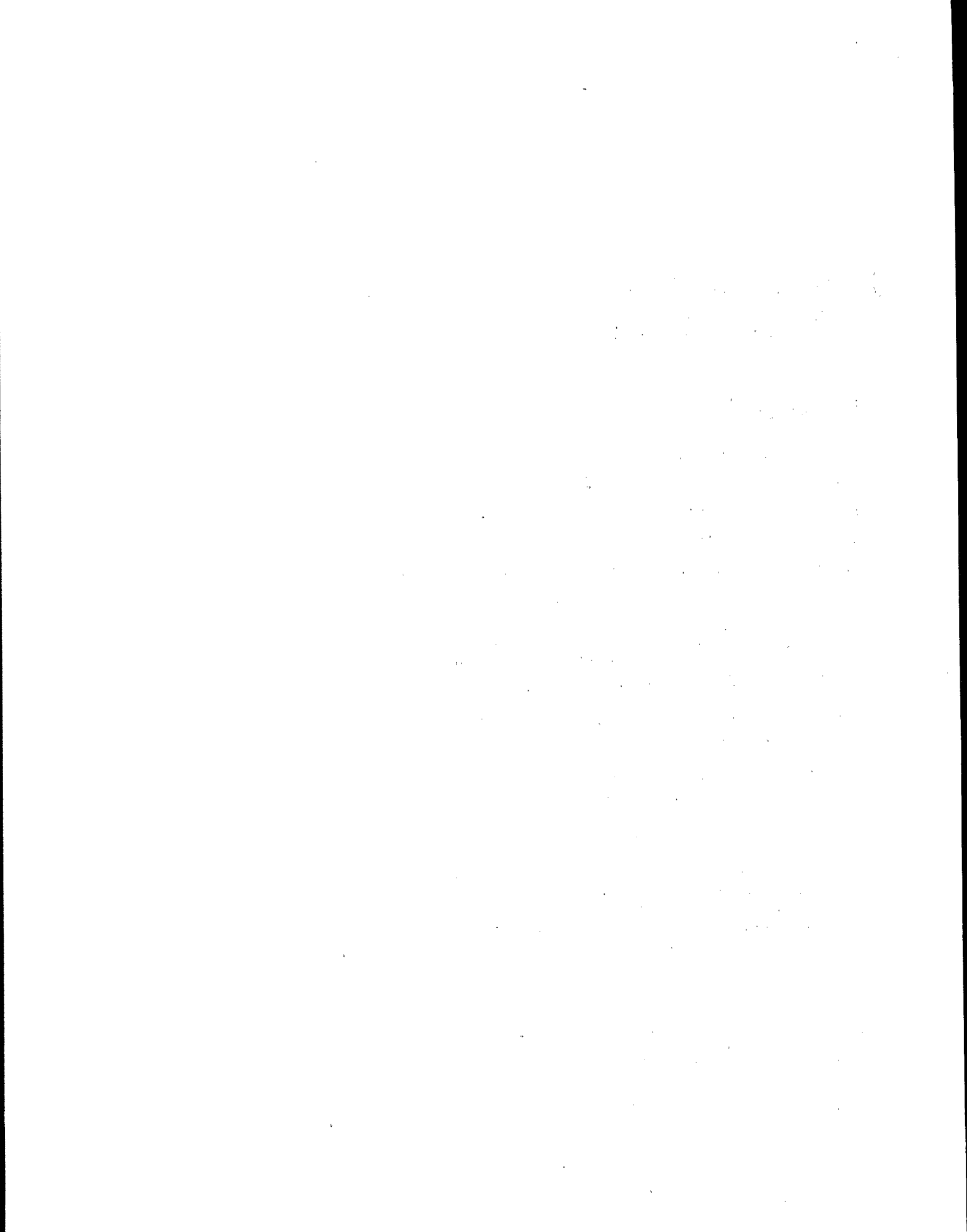
Guidance for the Approval Authority

The revised removal credit regulation defines roles and responsibilities of the Approval Authority in the removal credit process. These can be divided into three general areas:

- Reviewing and approving POTW proposals to satisfy application requirements
- Reviewing the removal credit application and taking appropriate action
- Ongoing review and monitoring of the POTW to determine that consistent removals and other application requirements continue to be achieved.

Each of these roles and responsibilities will be discussed in more detail in the following chapters. Some Approval Authority functions are straightforward; others require that Approval Authority officials exercise technical or policy discretion. Where appropriate in these chapters, guidance will be included concerning the Approval Authority's exercise of that discretion.

Upon submission, a POTW application may be found to be inadequate in some areas. The Approval Authority reviewer should give careful consideration to any weaknesses in an application and then provide specific and constructive guidance to POTW officials to correct any noted problems. By providing clear and specific comments to the POTW, the reviewer can save the POTW time in revising its application and ensure that subsequent resubmissions respond adequately to the reviewer's concerns.



6. Review of Removal Credit Applications

6.1 General

This section addresses the Approval Authority's review of a removal credit application. The specific information required in a removal credit application is described in Part I of this manual. The review of most items submitted in an application is straightforward. These items and a brief description of the criteria to be met are listed below:

- Calculations of consistent removal and revised discharge limits - Check to make sure that appropriate data were used and the calculations were done correctly. The technical issues associated with this aspect of the application review are particularly important.
- Pretreatment program certification - Check to make sure the POTW has an approved pretreatment program or qualifies for an exception.
- Sludge management certification - Check the requirements applicable to the POTW's method of sludge use or disposal to verify that the requirements match those stated in the application and that granting removal credits will not cause a violation of these requirements.
- NPDES permit limit certification - Check the NPDES permit limits and compliance file to determine if granting the credits will cause the POTW to violate NPDES permit limits and conditions. If it has been in violation in the recent past, an assessment of the potential for a reduction or increase in future violations should be made.

The Approval Authority conducting the review should also consider historical information and records of the POTW's operation and compliance status in making the determination to grant a removal credit authorization.

Such information may include: the POTW's pretreatment program submission; operational and effluent data for the wastewater treatment plant(s); 301(h) waiver applications; pretreatment program audit reports; and the NPDES permit compliance file.

6.2 Procedural Requirements

The Approval Authority must review the application in accordance with the procedures in 40 CFR 403.11. These are the same procedures used to review pretreatment program submissions. After the Approval Authority has completed review of the application, it can approve or deny the application, or it can authorize a lower removal credit than the POTW sought. Additional discussion of the procedural requirements of 40 CFR 403.11 may be found in Guidance Manual for POTW Pretreatment Program Development, EPA, Office of Water Enforcement and Permits, October 1983.

6.3 Consistent Removal Rate

The Approval Authority should conduct a review of data in the removal credit application to determine if the removal rates are reasonable, considering the following:

- Treatment plant processes employed
- Sludge generation and disposal method used
- Maintenance of a consistent quality effluent in compliance with the POTW's NPDES permit limits.

In addition, the removal rates demonstrated by other similar POTWs can be compared with the removal credits being requested. This type of comparison, using the data discussed below, is intended to serve only as a guide for a review of POTW influent and effluent data to obtain a general idea of the removal rates which are considered typical of many conventional secondary biological treatment plants.

In 1978, EPA began a project which is commonly referred to as the "40 POTW Study," formally titled Fate of Priority Pollutants in Publicly Owned Treatment Works, Volumes I and II (EPA 440/1-82/303, September 1982). The Agency initiated the study to determine the removal of toxic pollutants in 40 well-operated POTWs that were meeting secondary treatment effluent limits. The scope of the project included 6-day, 24-hour sampling at the 40 POTWs, representing a variety of municipal treatment technologies, size ranges, and percentages of industrial flow. The types of treatment plants sampled included activated sludge plants, trickling filter plants, pure oxygen activated sludge plants, an RBC plant, an aerated lagoon, and four treatment plants that have both activated sludge processes and trickling filters in parallel modes. The information discussed below is from the 40 POTW Study and focuses on metals. Information on organic priority pollutants was much less consistent, and particular attention should be given to removal credits requests for these. As more information concerning the behavior of organic pollutants in POTW treatment systems becomes available, EPA will issue further guidance.

Removal data from the 40 POTW Study for the nine toxic metals detected in POTW influents 50 percent or more of the time are summarized in Table 6.1. Presented in the table are percent removals for two subgroups of analytical data: removals where the priority pollutant average influent concentration was greater than zero, and removals when the plant average influent concentration was significantly above the pollutant's detection limit. For this table, "significantly above the detection limit" was defined as four times the most frequent detection limit to minimize the effect of the detection limit on calculating percent removals. The number of data points for each subgroup is indicated by N.

Table 6.1 shows that 50 percent of the POTWs sampled achieved minimum priority pollutant metal removals ranging from 35 percent to 97 percent. The purpose of the 40 POTW Study was to measure the effectiveness of well operated POTWs in removing priority pollutants considering a range of treatment processes and influent characteristics. Thus, one of the selection criteria for identifying the POTWs sampled during the study was that an engineering

**Table 6.1 Summary of Minimum
Percent Removals⁽¹⁾ Achieved by Secondary Treatment**

Parameter	N ⁽²⁾	<u>Average Influent > 0</u>				<u>Average Influent > Lower Limit⁽³⁾</u>		
		50	75	80	90	N	Percent of Plants 50	Lower Limit (ug/l) ⁽⁴⁾
Zinc	40	77	64	55	44	40	77	80
Cyanide	40	59	36	33	5	40	59	4
Copper	40	82	58	56	46	40	82	8
Chromium	40	76	66	64	48	35	76	20
Nickel	36	35	18	17	8	22	32	40
Silver	36	95	82	79	66	2	94	20
Mercury	35	86	65	61	25	9	86	800
Lead	34	97	74	58	35	3	81	200
Cadmium	29	93	46	39	4	12	92	8

- (1) Removals based on average influent and effluent concentration.
- (2) N = Number of plants meeting average influent criteria.
- (3) Lower limit chosen significantly above (approximately 4 times) the parameter's detection limit.
- (4) Mercury in ng/l.

judgement be made that POTWs were well operated. Approval authorities may not conclude that all POTWs applying for removal credits are well operated and capable of attaining the range of removal found in the study. Conversely, factors such as operation, design, sludge settling characteristics, etc., may combine to produce a removal rate higher than the range shown for some pollutants. The 40 POTW Study values for removal rates for priority pollutant metals are presented in this manual solely to give Approval Authorities the benefit of the results of an extensive study of priority pollutant removal in POTWs. The values should not be presumed to be the highest or lowest rates of consistent removal a given POTW can demonstrate. A removal request for a removal credit significantly higher than that found in the 40 POTW Study, however, should alert an Approval Authority to scrutinize the factors at the particular POTW which appear to demonstrate an unusually high removal rate. If the application does not contain sufficient information to support the removal rate, the Approval Authority must request additional information to fully analyze the reasons why such removals may be achievable at that POTW. The results of the 40 POTW Study should not be used to deny a request for removal credit authorization higher than the removals found in the Study. Similarly, if a POTW is only able to demonstrate a consistent removal lower than the range found in the Study, the Approval Authority should not assume an error was made in the application process. The applying POTW may not maintain the type of operating procedures that were determined to be good operating practices in selecting candidate POTWs for the study or for other reasons may not be able to achieve removals found in the study.

The 40 POTW Study also analyzed removals for selected conventional and priority toxic pollutants at the various treatment plants sampled. Among the treatment plants examined, trickling filters, activated sludge, the RBC, and the pure oxygen systems achieved good removals of conventional pollutants and most of the measurable priority pollutants. At those plants that had activated sludge and trickling filter systems in parallel, the activated sludge process appeared to remove slightly more priority pollutant metals and organics than the trickling filter. However, for some parameters, the trickling filter process achieved higher removal rates.

Primary treatment was less effective than any secondary treatment for conventional and priority pollutant removal. It should be noted, however, that the primary effluent samples from this study are probably not representative of treatment plants employing only primary treatment since the primary treatment plants considered in this study in all cases preceded secondary treatment. Secondary treatment plants (which generate a much greater volume of sludge than primary plants) return many of the sludge processing side streams to the primary tanks. This practice often causes the influent to the primary tanks to be much higher in organic loading than the influent to a typical primary treatment plant. Nevertheless, primary treatment removed from 10 to 57 percent of priority pollutant metals based on the plant influent and the primary effluent.

6.4 Sludge Management Certification

The Approval Authority must review the POTW's method of sludge disposal and its ability to comply with any applicable Federal, State, or local laws or regulations governing specific disposal methods. The method of sludge disposal determines the applicable pollutant criteria. For those POTWs utilizing more than one method of disposal, all applicable criteria must be complied with. Currently, there are three primary methods of disposal for which there are major Federal regulations: landspreading, landfilling, and incineration. These regulations are shown in Table 6.2. In addition to these Federal regulations, all applicable State and local requirements must be met.

During the review of a removal credit application, the Approval Authority should confirm that all applicable regulations have been properly considered by the POTW to determine their effect on sludge management options. The various regulatory agencies at the Federal and State level have requirements for or in most cases will at least address the following pollutants: arsenic, boron, cadmium, copper, chromium, lead, mercury, nickel, PCBs, and zinc. Once all applicable disposal regulations are identified, the POTW should have calculated the effect of applying the removal credit on the pollutant concentration in the sludge. Step-by-step procedures outlining this development were provided in Section 3.5 of this manual. The Approval Authority must then review the POTW's information to determine that adequate

Table 6.2

Major Federal Regulations Relating to Sewage Sludge Disposal

Sludge Disposal	Regulation	Date of Promulgation	Authority
1. <u>Landspreading</u>			
a. Food-Chain Application	40 CFR 257	9/79	RCRA/CWA
b. Non-Food-Chain Application	40 CFR 257	9/79	RCRA/CWA
2. <u>Land Disposal</u>			
a. Solid Wastes (non-hazardous)	40 CFR 257	9/79	RCRA/CWA
b. Hazardous Wastes	40 CFR 260 et seq.	5/80	RCRA
c. PCBs Disposal	40 CFR 761	5/79	TSCA
3. <u>Incineration</u>			
a. New Stationary Sources of Air Emissions	40 CFR 60	10/75	CAA
b. Hazardous Pollutants	40 CFR 61	10/75	CAA
c. Hazardous Wastes	40 CFR 260 et seq.	5/80	RCRA
d. PCBs Disposal	40 CFR 761	5/79	TSCA
4. <u>Ocean Dumping</u>	40 CFR 220 et seq.	1/77	MPRSA

Key: RCRA = Resource Conservation and Recovery Act
 CWA = Clean Water Act
 TSCA = Toxic Substances Control Act
 CAA = Clean Air Act
 MPRSA = Marine Protection, Research, and Sanctuaries Act

protection of the sludge is maintained with the implementation of removal credits.

6.5 NPDES Permit Certification

The removal credit regulation requires that an application contain a certification that, by granting removal credits, the POTW will not violate its NPDES permit limits and conditions. The Approval Authority should verify that the POTW has fully considered the potential impact of revised discharge limits on its ability to meet its NPDES requirements. The POTW should document, in its application, that it has adequately considered two major impacts:

- Interference with its operations
- Its ability to meet specific discharge limitations in its permit.

In contrast to the situation described above, some NPDES permits will already contain limitations for toxic pollutant discharges because of State water quality standards or as a result of a wasteload allocation on a water quality limited stream. Where removal credit authority is sought for pollutants contained in the POTW's NPDES permit, the POTW must demonstrate that loadings of the pollutant that result from granting the removal credit will not exceed the capacity of the its treatment system to remove those pollutants to the levels required in the NPDES permit. The application should contain sufficient documentation to allow the Approval Authority to evaluate the analysis. The Approval Authority should approve the application only after the POTW has fully and accurately demonstrated by calculations the capacity of the POTW treatment system to remove the anticipated loadings of pollutants limited in the NPDES permit. Again the technical information prepared as part of the development of local limits should provide this information.

As an aid in the review, the Approval Authority will generally have historical NPDES monitoring data that the POTW has submitted. The past history of the plant in maintaining a consistent quality effluent, therefore, can be reviewed by the Approval Authority. This review may give an indication

of the plant's operational stability and its ability to maintain the consistent removal rate specified in the application. The data to be reviewed might include, where available, effluent data, treatment plant operating information, and NPDES violation incidents. If a particular plant has consistently met its effluent limits and experienced few upsets or operational problems, then it is likely the plant will be able to maintain consistent removal. However, if the plant has had a series of operational problems and been unable to consistently comply with its effluent limits, it will be less likely to achieve consistent removal of toxic pollutants. For this latter case, only a removal rate lower than the rate requested in the application might be authorized by the Approval Authority.

For the case of a POTW applying for removal credit authority even though NPDES compliance may not be achieved until categorical industries comply with the adjusted categorical standards for the pollutant applied for, the Agency has taken the following position. The POTW will not receive removal credit authority until compliance with its NPDES permit for the pollutant applied for is demonstrated. This does not apply in instances where the NPDES permit violation is unrelated to the pollutant for which removal credits are being sought.

6.6 NPDES Permit Modifications

The pollutant discharge limitations, requirements and conditions contained in a POTW's NPDES permits are key to both the removal credit application process, and enforcement of the demonstrated removal rate. There are two types of revisions which are necessary to the success of this process. The Approval Authority should include in the permit:

- Discharge limitations for the parameters for which removal credits are sought
- A requirement that the POTW maintain its demonstrated consistent removal rate
- Sampling and reporting requirements.

Discharge limitations should be incorporated into a POTW's NPDES permit for each parameter for which a removal credit is sought. These permit limitations serve a dual function; providing a broader technical basis for the development of local limits and assuring the protection of receiving stream water quality. Inclusion of the demonstrated consistent removal rate in the NPDES permit provides both documentation and the necessary mechanism for any later enforcement actions. The procedure by which the POTW must demonstrate consistent removal should also be included in the revised permit. Calculation and reporting of a rolling twelve month average would provide such a demonstration. Sample NPDES permit modification language for removal credits is provided for guidance in Appendix D of this manual.

The Approval Authority is encouraged to provide guidance to NPDES and Pretreatment delegated States so that permit modifications proceed as expeditiously as possible. Delegated States should consider developing the necessary removal credit agreements and permit modifications as an activity during their 106 planning procedures. It is suggested that simultaneous public notices be issued for approval of the removal credit application and the permit modifications. Since some States may have delegation for NPDES authority only, the Regions should make the preparations necessary to ensure coordinated actions. Because of the workload of permit modifications in most NPDES delegated States, there may be a significant lag between removal credits approval and the permit modifications. To avoid having this situation, the approval letter, by itself, may require special sampling and should be workable and enforceable without an immediate permit change.

6.7 Review of POTW Proposals to Use Alternative Methods of Demonstrating Consistent Removal

As discussed in Section 3.2.2 and Chapter 4, any alternate method of demonstrating consistent pollutant removal requires the concurrence of the Approval Authority. Proposals for the use of an alternate method to demonstrate consistent removal should be submitted for concurrence in advance but may be contained as a part of the application for removal credit authority. It is clearly advisable that POTWs submit such proposals prior to their application rather than assuming that alternate procedures will be approved.

Such advanced approval will minimize the chance that a POTW will invest a large amount of time and resources pursuing an application strategy that the Approval Authority may find deficient.

Proposals to use alternate methods for demonstrating consistent removal fall into two general categories:

- Proposals to vary the sampling and analysis plan based on at least 12 samples over a one-year period at approximately equal intervals, or
- Proposals to demonstrate consistent removal using data other than actual plant influent and effluent sampling results.

The requirements of such proposals are discussed in Chapters 4 and 5 and will not be repeated here. Additional review guidance, however, is provided.

6.7.1 Proposals to Vary the Sampling and Analysis Plan and Use of Historical Data

The general rule is that each application for removal credit authorization must be supported by at least 12 influent and effluent samples taken at approximately equal intervals over one year. The purpose of the requirement is to ensure that data are collected that fairly represent yearly and seasonal variations in treatment system loading and efficiency. POTWs may have previously collected data that they feel accurately represent influent and effluent pollutant concentrations but such data may not have been collected over a year at approximately monthly intervals. The removal credit regulation provides flexibility to allow such data to be used to satisfy the sampling and analysis requirements in whole or in part. Thus, a POTW may have results of six existing sample analyses collected at what they feel is an appropriate time interval and propose to collect only six additional samples.

In reviewing such proposals, the Approval Authority should first evaluate (1) the reasons for using an alternative sampling scheme and (2) whether the POTW has submitted sufficient information upon which to base an independent determination that the proposal will adequately represent the seasonal and yearly variations in POTW loading and performance. Where historical data are used that may have been collected for another purpose, the Approval Authority

should be satisfied that sampling procedures, analytical procedures, sampling frequencies, and other relevant factors are consistent with sampling and analysis methods to establish removal credits. These and other issues associated with use and evaluation of historical data were discussed in more detail in Section 4.1.

Alternatively, a sampling plan that includes 12 samples obtained over approximately equal intervals during a one-year period may not be practical or representative of yearly and seasonal variation. Some POTWs may include significant industrial users that conduct seasonal businesses. In such cases, alternative sampling designs may be necessary to meet the objectives of the regulations. When reviewing alternative sampling programs, the Approval Authority should note that many POTWs cannot representatively illustrate consistent removal with only 12 data pairs. In these instances, it may be necessary to require that a larger number of samples be collected.

6.7.2 Proposals to Demonstrate Consistent Removal by Methods Other than Influent and Effluent Sampling

The effects of dilution by nonindustrial wastes and the limitations of available analytical methods may combine to make it difficult or impossible to demonstrate consistent removal using influent and effluent sampling. Such situations will occur when analytical results for a pollutant are below the detection limit for a given analysis. In such cases, removal may be occurring, but the analytical method may be unable to demonstrate it. Under such circumstances, the regulation provides for alternate procedures to demonstrate consistent removal. The Approval Authority must concur with the use of the alternate procedures. The specific procedures were discussed in Chapter 4.

In considering whether to concur with a specific method of demonstrating consistent removal, the reviewer should be guided by the principles underlying the revised removal credit regulation. Consistent removal should be demonstrated for a specific POTW, its treatment process, and its wastewater loading. Whether the POTW proposes to calculate demonstrated removal based on historical data, treatability studies, demonstrated removal at other facilities, or other methods, the reviewer must decide whether adequate justification has been provided to demonstrate that: (1) the alternate data accurately

represents the removal capability of the specific POTW and; (2) the alternative method is based on facts and comparisons that can adequately represent the removal capability of the POTW applying for removal credits. Without requiring a POTW to justify that alternate data are representative of its plant and its treatment system can the use of alternate data sources become a variation of the previously proposed national removal credit concept. EPA has determined that such generalized removal credits are not technically sound and are not permitted by the Clean Water Act.

6.8 Additional Considerations for Reviewing Applications of POTWs With 301(h) Waivers

Generally, NPDES permit limitations for POTWs are based on the capabilities of secondary treatment technology. Section 301(h) of the Act authorizes POTWs that discharge into marine waters to apply for NPDES permits based on less stringent treatment than secondary treatment for biochemical oxygen demand and suspended solids removal and pH control. Among the regulatory requirements for evaluating such 301(h) waiver requests is that a detailed analysis be conducted of the impact that less stringent limitations will have on the marine receiving waters.

When reviewing the removal credit application from a POTW with a NPDES permit based on a 301(h) waiver, the Approval Authority should be aware of the extensive impact analyses conducted to support the waiver from secondary treatment requirements. Pollutant discharge at levels greater than what would be expected due to implementation of removal credits could require reevaluation of conclusions that were drawn based on the proposed discharge presented in the 301(h) application and the assumption that categorical standards would be achieved. For example, the 301(h) impact analysis may have concluded that a proposed discharge would not cause a sufficiently significant impact to require a specific NPDES permit limitation when categorical standards are met. With removal credits, however, a sufficient impact may be found. It is the applicant's responsibility to demonstrate whether the implementation of removal credit will affect the proposed discharge's compliance with all 301(h) criteria. As a result, when an Approval Authority reviewer considers an application for removal credits from a POTW that has an NPDES permit based on

a 301(h) waiver, it will be necessary to consult the 301(h) decision document. The reviewer should also solicit input from the Approval Authority staff responsible for the 301(h) waiver for the POTW.

7. Modification or Withdrawal of Removal Credits

When removal credits are authorized, the POTW's demonstrated consistent pollutant removal becomes an enforceable part of its NPDES permit. The Approval Authority must periodically review and evaluate the POTW's compliance with removal credit provisions to ensure that all the conditions are being met. This review should be conducted at least annually (such as when annual reports required by the removal credits provision are received). The Approval Authority may require more frequent reporting at its discretion. An evaluation of compliance with most of the conditions is straightforward. The POTW must maintain and enforce an approved pretreatment program, ensure that the sludge disposal method meets all regulatory requirements, ensure that the NPDES permit limits and conditions are not violated, and verify that the POTW is maintaining its consistent removal rate. The removal credits regulation requires that removal credit authorization be modified or withdrawn if any of these conditions are not met. In particular, if the POTW's actual removal efficiency becomes "consistently and substantially lower" than the removal credit authorized, the credit authority will be modified to allow a lower removal rate or totally withdrawn. However, even if a consistently and substantially lower removal rate cannot be demonstrated by the procedures below, the Approval Authority may take an enforcement action against any removal credit permit violation.

7.1 POTW Monitoring and Reporting Frequency

POTWs that have been granted removal credit authority must submit a compliance report to the Approval Authority at least once per year. This report must contain analytical data for samples taken of the influent and effluent for the reporting period. Samples must have been collected at least once per month unless otherwise specified by the Approval Authority.

The Approval Authority has the discretion to require a more frequent compliance demonstration through additional reporting. For example, this compliance determination could be based on a periodic rolling 12-month average. Examples of situations that possibly warrant more frequent sampling and reporting include the following:

- In the early stages of program implementation, the Approval Authority may conclude that once per year reporting of consistent removal data is inadequate to track the continuing performance of some or all POTWs. A good policy may be to initially require all POTWs with removal credit authority to report more frequently than once per year. After a compliance history has been established, the Approval Authority might conclude that POTWs with a good compliance record can be adequately tracked with once per year reports. POTWs having more difficulty maintaining their consistent removal rate would continue to report more frequently until their compliance records improved or the Approval Authority gathered sufficient data to consider modifying or withdrawing removal credit authority.
- Where a POTW has experienced problems complying with its NPDES permit, or has a history of system upsets, but was able to demonstrate to the Approval Authority that it has corrected those problems, the Approval Authority may require more frequent reporting to ensure that problems have, in fact, been corrected.
- Where a POTW treats a high fraction of industrial wastes subject to a removal credit or discharges into a sensitive receiving water, relatively frequent reporting might be made a necessary condition of obtaining removal credit authority.
- Where the POTW used treatability studies or other alternative data as a supplement to or in lieu of plant influent/effluent data to demonstrate consistent removal, more frequent reporting of actual sampling data should be required. In this case, additional data collected in the months following approval will allow the Approval Authority to continue to assess the POTW's actual removal rate and, where necessary, modify or withdraw the POTW's removal credit authority.

7.2 Criteria

From the reports submitted by the POTW, the Approval Authority must determine if the POTW has continued to achieve the removal rates claimed in its application. If reports submitted by the POTW or studies performed by the Approval Authority at the POTW show the removal rates to be consistently and substantially lower than the approved rate, then the Approval Authority has cause to modify or revoke the POTW's removal credit. While EPA intends to issue detailed guidance on determining what constitutes "consistently and substantially lower," the following guidance is provided in the interim.

Part of the Approval Authority's decision concerning whether or not the removal rate has dropped consistently and substantially involves using best professional judgment. When the removal rate data contained in the POTW's compliance report are shown to deviate significantly from the original consistent removal data, then the Approval Authority should evaluate the cause of the deviation, and its impact on the approved rate. If the reported removal rate for all pollutants is still greater than or equal to the approved removal credit, no modifications are necessary. However, if the reported removal rate is below the approved removal credit, then the Approval Authority must determine if it is significant enough to warrant action to modify or withdraw the approved removal credit. As mentioned previously, EPA intends to issue guidance for evaluating reported removal rates with approved removal rates. In any instance, an enforcement action can be taken against any removal credit permit violation by the Approval Authority.

For POTWs that have been given authority to grant conditional removal credits, authorization may be withdrawn after appropriate notice if the POTW fails to comply with the conditions for applying and maintaining that authorization. These conditions include operation of an approved pretreatment program, maintaining consistent removal, and complying with NPDES permit limits and conditions and sludge disposal requirements. Conditional removal credits may also be terminated for certain industrial users by the POTW or the Approval Authority. The circumstances where this would occur are those in which the industrial users have failed to submit the proper information required by the Baseline Monitoring Report or have violated other pretreatment requirements.

7.3 Procedures and Schedule

After the Approval Authority has decided that the withdrawal of a POTW's removal credit authority or modification of that credit is warranted, the Approval Authority must take the following actions:

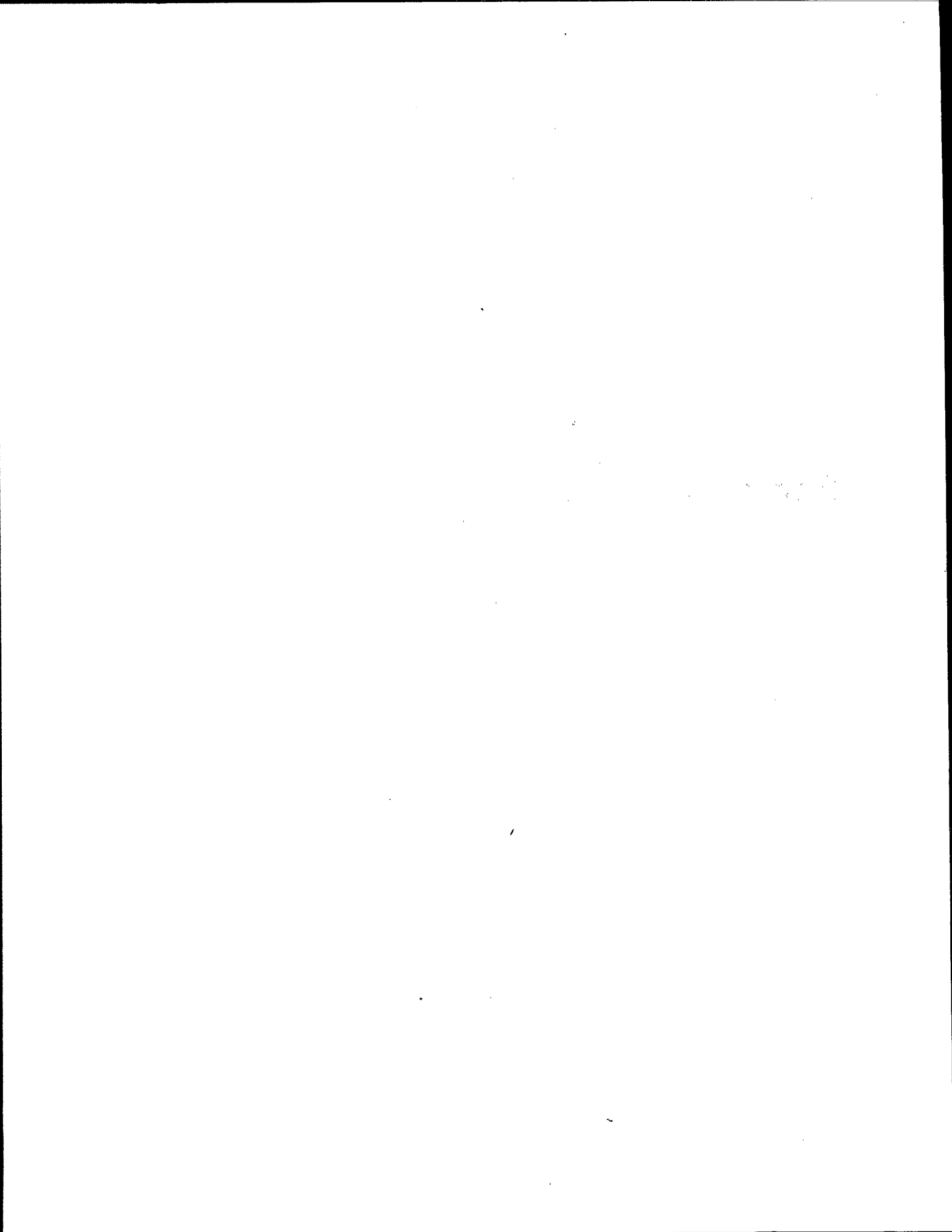
- Issue a public notice of the intent to withdraw/modify the POTW's removal credit authorization
- Provide a public comment period of at least 30 days
- Provide an opportunity for interested persons to request a public hearing.

The above procedures are required by 40 CFR 403.11(b)(1) and (2). The mailing list for the public notice must include, at a minimum, the POTW and the industrial users to whom revised discharge limits have been applied.

If the Approval Authority decides withdrawal or modification is justified (after the above actions have been completed and a public hearing has been held or denied), a public notice must be published in the same newspaper as the tentative notice was published. The Approval Authority must also notify and provide the basis for that decision to the POTW, all industrial users to whom revised limits have been applied, and each person who has requested individual notice. Following the above notices and official withdrawal or modification, all industrial users that had received the removal credit will be subject to the modified (if the removal credit was modified) or to the categorical pretreatment standard discharge limits (if the removal credit was withdrawn). The industrial users must achieve compliance with these more stringent limits within a reasonable time as established by the Approval Authority, not to exceed the period of time allowed in the applicable categorical pretreatment standard (i.e., typically three years).

For example, if a categorical pretreatment standard provided for a compliance period of three years from the date of promulgation, an industrial user affected by the modification or withdrawal of a removal credit could be granted a maximum compliance period of three years from the date of modification or withdrawal of the removal credit. However, the Approval Authority

can establish a shorter period for compliance after considering the necessary adjustment to existing treatment technology or the amount of additional treatment that must be installed.



Appendix A

Removal Credit Provision Final Rule

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 403

[FRL 2557-7]

General Pretreatment Regulations for Existing and New Sources; Removal Credits

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: On September 28, 1982, the Environmental Protection Agency (EPA) proposed extensive revisions to the removal credits section of the General Pretreatment Regulations (40 CFR Part 403). EPA proposed these changes to make the removal credits provision simpler and more workable. After considering all significant comments submitted on the proposed changes, EPA is today promulgating in final form the revised removal credits section of the pretreatment regulations.

DATES: This regulation shall become effective September 17, 1984. For purposes of judicial review, this regulation is issued at 1:00 PM eastern time on August 19, 1984.

FOR FURTHER INFORMATION CONTACT: Craig Jakubowicz, Permits Division (EN-336), U.S. Environmental Protection Agency, 401 M St., SW., Washington, D.C. 20460, (202) 426-4793.

SUPPLEMENTARY INFORMATION:

I. Background

On June 26, 1978, EPA promulgated, in 40 CFR Part 403, the General Pretreatment Regulations which established mechanisms and procedures for controlling the introduction of wastes from industry and other non-domestic sources into publicly owned treatment works (POTWs) (43 FR 27736). Following promulgation, several parties brought actions in Federal court challenging these regulations. Pursuant to the terms of a settlement agreement entered into by EPA and some of the parties to the litigation, the Agency promulgated amendments to the General Pretreatment Regulations for Existing and New Sources on January 28, 1981 (46 FR 9404). These amendments were originally scheduled to take effect on March 13, 1981. However, acting under the President's memorandum of January 29, 1981, EPA postponed the effective date until March 30, 1981 (46 FR 11972, February 12, 1981). On March 27, 1981, the Agency indefinitely suspended the effective date of the amendments pursuant to Executive Order 12291 (46 FR 19936, April 2, 1981).

On October 13, 1981, EPA terminated the indefinite postponement of the January 1981 amendments and established January 31, 1982, as their effective date (46 FR 50502). On the same day, EPA invited comment on a proposal that the effective date of the amendments be further postponed (46 FR 50503). Most of the 1981 amendments were allowed to go into effect on January 31, 1982. However, a few of the amendments, including the removal credits provision, were further postponed (47 FR 4518, February 1, 1982). On July 8, 1982, the United States Court of Appeals for the Third Circuit held that EPA's original indefinite suspension violated the Administrative Procedure Act, and directed EPA to put all the pretreatment amendments, including the removal credits section, into effect retroactive to March 30, 1981 (*Natural Resources Defense Council v. EPA*, 683 F. 2d 752 (3d Cir. 1982)).

An important part of the June 1978 General Pretreatment Regulations and the January 1981 amendments was the section governing removal credits (section 403.7). That section was designed to implement a 1977 amendment to section 307(b)(1) of the Clean Water Act (CWA), which allows a POTW to provide industrial users with a "credit" (in the form of reduced pretreatment requirements) for removal of pollutants by the POTW. Industrial users which qualify for such a credit are allowed to discharge larger quantities of regulated pollutants to the POTW than would otherwise be allowed by the applicable categorical pretreatment standard. The removal credits section established the conditions under which POTWs would obtain authority to grant removal credits and provided the means by which these removal credits should be determined.

Notwithstanding the streamlining included in the 1981 amendments, the removal credits provision was still criticized by some as being so burdensome and unworkable as to discourage POTWs from applying for removal credit authority. In fact, this removal credit rule was one of the provisions of the General Pretreatment Regulations challenged, albeit unsuccessfully, in the pretreatment litigation (*National Association of Metal Finishers (NAMF) et al. v. EPA*, 719 F. 2d 624 (3d Cir. 1983)). In addition to the general allegation of unworkability, several specific aspects of the regulation were attacked. Industry groups and some POTWs were critical of the requirement that a POTW have an approved pretreatment program, arguing that this condition for removal credit authority went beyond any requirement

specified in § 307(b)(1) of the Clean Water Act. These groups also asserted that unless a POTW maintained its initially approved removal rates, the ongoing POTW monitoring and reporting of its removals could result in a change of its removal rates and the industries adjusted discharge limits every six months, thus creating a "moving target" that would make continuing compliance for industrial users difficult, if not impossible, to achieve. The overflow requirements also were objected to as impossible to comply with. All these arguments were rejected by the U.S. Court of Appeals for the Third Circuit in upholding the 1981 removal credits provision.

In response to the criticisms of past removal credits rules, on September 28, 1982, EPA proposed further modifications to the removal credits section to create a clearer, more flexible and workable provision. EPA today is promulgating in final form a revised removal credit regulation, incorporating some of the modifications proposed in September 1982.

II. National Removal Rates

The most controversial proposed change to the removal credits section was the provision for "national removal rates." This would have permitted a qualified POTW to rely on national removal rates developed by EPA, rather than on rates established through the collection of data by the POTW to demonstrate its actual removal performance. Some commenters responding to the September 28, 1982, proposal supported the proposed national removal rates. Some of these commenters contended that the proposed national credits concept was too restrictive in its application because it only applied to certain eligible POTWs (i.e., those achieving secondary treatment levels and fulfilling certain other requirements). Other commenters argued that the proposed national rates were too low, and thus would not grant adequate relief to a POTW's industrial users. Another group of commenters argued that the proposed national removal credits approach was illegal. These commenters also argued that the national credits concept was unsound as a matter of policy because the proposed removal rates exceeded the actual removal capability at approximately 50% of the eligible POTWs.

Because of the controversy over the national removal credits policy issue and the challenge to the legality of this approach, EPA has reevaluated the national removal credits concept. The Agency has concluded, upon

reconsideration, that Congress intended that a removal credit be granted for a particular pollutant only to the extent that a particular POTW can demonstrate that it removes the pollutant. The language of the statute, buttressed by the legislative history, indicates that removal credits are to be based upon case-by-case removal determinations, rather than upon a nationally determined rate. Moreover, EPA has concluded upon reconsideration that, on balance, policy considerations in implementing the pretreatment program envisioned by Congress favor the case-by-case determination of removal credits rather than reliance upon national credits.

Under section 307 (b) and (c) of the CWA, EPA is required to promulgate pretreatment standards for the introduction of toxic pollutants into a POTW. These standards must be designed to prevent the discharge of any pollutant which interferes with, passes through or otherwise is incompatible with a POTW.

In 1977, Congress amended section 307(b)(1) of the CWA to specifically provide for removal credits. The relevant language of section 307(b)(1) is as follows:

If, in the case of any toxic pollutant . . . introduced by a source into a [POTW], the treatment by such works removes all or any part of such toxic pollutant and the discharge from such works does not violate that effluent limitation or standard which would be applicable to such toxic pollutant if it were discharged by such source other than through a [POTW], and does not prevent sludge use or disposal by such works in accordance with section 405 of this Act, then the pretreatment requirements for the sources actually discharging such toxic pollutants into such [POTW], may be revised by the owner or operator of such works to reflect the removal of such toxic pollutant by such works.

(Emphasis added). As the highlighted language indicates, Congress intended that a removal credit be granted only where some removal, whether by treatment or incidentally, by a particular POTW is actually achieved at the POTW.

A clear indication of this statutory intent is found in the legislative history of the Clean Water Act. In the House debate on the conference report accompanying the Act, Congressman Roberts stated that any credit to an industrial user of a POTW must "reflect the degree reduction of . . . [a] pollutant achieved by the treatment works." (A *Legislative History of the Clean Water Act of 1977* (hereinafter cited as *Legis. Hist.*, vol. 3, p. 343)). Furthermore, in the Senate debate on the Conference report, Senator Muskie

stated that "EPA and the permitting States may approve case-by-case modifications of the national pretreatment standards—or local credits—for documented pollutant removals attained by a [POTW]." (*Legis. Hist.*, vol. 3, p. 461). In fact, Congress rejected the idea of establishing a national credit due to the variability among POTWs' abilities to remove a particular pollutant. As stated in the Senate report on the 1977 proposed amendments to the Act:

Another reason for minimizing the consideration of removals in the development of national pretreatment standards is that the performance of treatment works on industrial waste, except in those few cases where the system is specifically designed to treat a certain type of industrial waste, is extremely variable. Data that have been presented to this committee indicate that secondary treatment removal efficiency for metals varies between 10 and 70 percent. Variability of such magnitude makes the assumption of specific levels of removal, when setting national standards, almost impossible. (*Legis. Hist.*, vol. 4, p. 691).

Finally, in the recent decision of the United States Court of Appeals for the Third Circuit in the pretreatment litigation (*NAMF et al. v. EPA*, supra), the court stated that section 307 (b) (1) of the Act allows for a removal credit only in those instances in which a POTW is actually removing a pollutant. The court also cited and assigned significance to the legislative history discussed above in support of its reading of the statute. Based on the statutory language, legislative history, and recent court decision just discussed, EPA believes it lacks legal authority to establish national removal credits.

Equally important, EPA has carefully reconsidered national removal credits in light of the statutory policy underlying the general requirements to promulgate pretreatment standards to prevent interference, pass through and sludge problems. While EPA continues to recognize the administrative advantage inherent in the use of national removal credits, the Agency believes that case-by-case determinations of actual POTW removals is the only reliable means to assure that credits granted are consistent with actual POTW removals. This in turn will assure that removal credits will not result in a net reduction of treatment by the POTW and its regulated industrial users.

Based upon all the above consideration, EPA has decided not to promulgate national removal credits. EPA has retained the basic regulatory approach embodied in previous removal credits provisions that authorize POTWs to apply for removal credits

based upon case-by-case demonstrations. However, as discussed below, the Agency has modified the regulation in some respects to make the program more efficient and to grant as much certainty as possible to POTWs that are granted removal credit authority and industrial users that rely upon removal credits.

III. Discussion of the Final Removal Credit Provision

Today's final rule requires POTWs to demonstrate consistent removal by sampling their actual individual plant performance, as was required under the 1978 and 1981 regulations. However, POTWs may use historical sampling data or use sampling schemes other than the 12 month sampling scheme generally prescribed. Important changes to the regulation are the elimination of the complicated adjustment for combined sewer overflows and the simplification of approval procedures, including the addition of a provision that allows a POTW to apply for removal credit authority at any time. A detailed discussion of all the changes is provided below.

Section 403.7(a)—Introduction

This introductory paragraph remains almost the same as in the September 28, 1982, proposal. For the reasons discussed above, however, the provisions pertaining to POTWs applying for the national removal rates have been omitted. In addition, the definition of "Sludge Requirements" in § 403.7(a)(1)(ii) now includes a reference to the Marine Protection, Research and Sanctuaries Act (MPRSA), which was inadvertently omitted in the proposal. Otherwise, the introduction is the same as at proposal.

Section 403.7(a) sets out the definitions and ground rules under which POTWs can obtain authorization to give removal credits. Paragraph (a)(2) makes it clear that the POTW has complete discretion in deciding whether to award removal credits. A POTW qualifying for removal credit authority may decline to give removal credits at all to a certain industrial category or to one or more industrial users in a category, or it may award a lower removal credit than it is authorized to give. In addition, paragraph (a)(2) now stipulates that once a POTW has been authorized to grant removal credits and has extended those credits to the appropriate industrial users, it will be the industrial users that actually will calculate their revised discharge limits. As proposed, the POTW was obligated to perform this task for all its industrial

users receiving removal credits. Because calculating revised limits merely requires inserting the authorized removal credit and applicable categorical pretreatment standard into the mathematical formula specified at paragraph (a)(4) of the regulation, the Agency believes that it will be simpler and less administratively burdensome if each affected industrial user performs this function for itself rather than relying on its POTW to do so. This also applies if, at some future time, the removal credits a POTW is authorized to grant are modified.

Paragraph (a)(3) outlines the five prerequisites for a POTW to obtain authorization to give removal credits.

The POTW must: (1) Apply for and receive authorization to grant removal credits; (2) demonstrate consistent removal; (3) have an approved local pretreatment program or qualify for the exception to this requirement; (4) meet all applicable sludge requirements; and (5) continue to comply with all its NPDES permit limits and conditions. Paragraph (a)(4) identifies the basic equation from which one calculates the revised discharge limits. This equation is the same as the one contained in the 1978 regulations and the 1981 amendments.

Paragraph (a)(3)(iv) also advises POTWs that if granting removal credits forces them to incur greater sludge

management costs than they would incur in the absence of granting removal credits and the POTW is eligible for Federal construction grant funding under the Clean Water Act, EPA will not pay for the additional sludge management costs. The final removal credits section, like the 1981 amendments, also provides that the POTW must remain in compliance with local, state and Federal requirements applicable to the sludge management method employed by the POTW after granting removal credits. The following table, reprinted from the September 28, 1982, proposal, summarizes the EPA regulations which potentially apply, at present, to sludge disposal.

MAJOR FEDERAL REGULATIONS RELATING TO SEWAGE SLUDGE DISPOSAL

Sludge disposal	Regulation	Date of promulgation; authority
1. Landspreading:		
a. Food-chain application	40 CFR Part 257	9/79 RCRA/CWA
b. Non-food chain application	40 CFR Part 257	9/79 RCRA/CWA
2. Land disposal:		
a. Solid wastes (nonhazardous)	40 CFR Part 257	9/79 RCRA/CWA
b. Hazardous wastes	40 CFR Parts 260 et seq.	5/80 RCRA
c. PCB's disposal	40 CFR Part 761	5/79 TSCA
3. Incineration:		
a. New stationary sources of air emissions	40 CFR Part 60	10/75 CAA
b. Hazardous pollutants	40 CFR Part 61	10/75 CAA
c. Hazardous wastes	40 CFR Parts 260 et seq.	5/80, 1/81 RCRA
d. PCB's disposal	40 CFR Part 761	5/79 TSCA
4. Ocean Dumping	40 CFR Part 220 et seq.	1/77 MPRSA

Key:

RCRA=Resource Conservation and Recovery Act.
CWA=Clean Water Act.
TSCA=Toxic Substances Control Act.
CAA=Clean Air Act.
MPRSA=Marine Protection, Research, and Sanctuaries Act.

Only rarely will POTW sludge be considered a hazardous waste subject to the requirements of 40 CFR Part 260, *et seq.* or exhibit a sufficiently high concentration of PCBs to become subject to the requirements of 40 CFR Part 761. EPA anticipates, therefore, that POTWs applying for removal credits will usually be subject only to the landspreading and land application requirements of 40 CFR Part 257; the sludge incineration requirements of 40 CFR Parts 60 and 61; or the ocean disposal requirements of 40 CFR Part 220 *et seq.* (in addition to State and local requirements).

Also included in the final regulation, at § 403.7(a)(3)(iv), is a provision designed to accommodate POTWs that are not presently in compliance with sludge requirements applicable to their chosen sludge disposal practice but will be in compliance when the industrial users install the technology needed to comply with their categorical pretreatment standard(s) (as adjusted by the removal credit). The provision is intended to benefit industrial users who otherwise would be unable to get a

removal credit until after they had already installed the technology necessary to meet the full pretreatment standard. A POTW that can demonstrate that it will be compliance with any applicable sludge requirements when the industrial users meet the applicable pretreatment standard (as modified by the removal credit) will be deemed to have satisfied the sludge requirements provision.

Section 403.7(a)(3)(v) of the final rule also requires, as a prerequisite to removal credit authorization, that the POTW remain in compliance with its NPDES permit limits and conditions after giving removal credits. As proposed, a POTW was only required to maintain compliance with any toxic limits in its permit for which it is granting a removal credit. Today's final rule clarifies the Agency's intent that removal credit authority not be granted if a violation of the POTW's permit limitations or conditions would result.

For example, if a POTW's section 301(h) waiver application has been approved, the POTW's NPDES permit may contain conditions to assure that

the POTW maintains water quality that protects a balanced indigenous population of aquatic biota. If the Approval Authority determines that granting removal credits would cause such permit conditions to be violated, then the removal credit application must be denied.

Section 403.7(a)(3)(v) can also be satisfied in a manner analogous to that provided in § 403.7(a)(3)(iv). That is, the POTW can demonstrate that it will be in compliance with its permit limitations and conditions when industrial users comply with their categorical pretreatment standards, as modified by the removal credit.

Section 403.7(a)(3)(iii) and (d)—Local Pretreatment Program Requirement and Exception Thereto

Paragraph (a)(3)(iii) of the final rule is the same as proposed on September 28, 1982, and for the most part similar to its counterpart in the 1981 general pretreatment amendment. It provides that a POTW must develop a local pretreatment program as a prerequisite to obtaining removal credit

authorization unless development of such a program is not required by Part 403.

Paragraph (d) provides that a POTW can grant "conditional" removal credits prior to approval of its local program if the POTW submitted a complete application for pretreatment program approval, meeting all the requirements of §§ 403.8 and 403.9 of the General Pretreatment Regulations, in accordance with the compliance schedule in its NPDES permit or by July 1, 1983, where no permit deadline exists. All industrial users who wish to receive conditional removal credits must supply the POTW with the baseline monitoring report information required by § 403.12(b) (1)-(7) (except for new or modified industrial users who must only submit the information required by § 403.12(b) (1)-(6)). Finally, the POTW must make a demonstration of its consistent removals, in accordance with the requirements specified in § 403.7(b) of the regulation, submit a complete application and comply with all the other conditions for receiving removal credit authority as specified in the regulation.

Conditional removal credits are available in only a limited number of cases. Only a POTW that submitted a complete program application in accordance with the compliance schedule in its permit, or by July 1, 1983, where no schedule deadline existed, and the Approval Authority has not yet formally acted upon that application, would the POTW be eligible for conditional removal credits authority. If a POTW failed to submit its program in such a timely manner, it is not eligible for conditional credit authority. In addition, a POTW is ineligible for conditional removal credit authority if it is on a new compliance schedule by virtue of an administrative order or some other enforcement mechanism, and a date beyond July 1, 1983, has been established as the deadline for submission of a complete, approvable program. For a POTW that did submit its application on time and had been granted conditional credit authority, but upon review its program submission is determined non-approvable, such a POTW's conditional credit authority will be withdrawn.

Section 403.7(b)—Demonstrated Consistent Removal

The primary criticism of the removal credits provisions in the past was that the requirements for demonstrating a POTW's consistent removals were unworkable. National removal credits were proposed by EPA as one way to address this concern. Although national

credits cannot be promulgated for the reasons discussed above, the Agency anticipates that the demonstration procedures finalized today will adequately address some of the concerns that would have been addressed by the national removal rates.

Generally, a POTW will collect 12 influent and effluent samples at approximately equal intervals throughout one full year, analyze these samples for the appropriate pollutants and calculate its consistent removal. In lieu of or as a supplement to this sampling, a POTW may use a historical data base or an alternative sampling design to demonstrate its consistent removals. EPA recognizes, however, that there might be problems with this approach in some cases. Under some circumstances, a pollutant known to be contributed to a POTW's system may not be detectable in either the influent or effluent sample, or both. There are several possible explanations for this result. In some cases, a pollutant will be undetectable in the influent because the industrial discharges to a POTW will be diluted by all the other wastewaters contributed to the POTW's system. In other cases a pollutant will be degraded or will volatilize in the sewer system. In still other instances, installation of pretreatment technology by industries discharging to a POTW may have reduced pollutant loadings to such low levels that pollutants cannot be detected.

If a pollutant is measurable in some influent and effluent samples, or is measurable in some influent samples but not measurable in any effluent samples, § 403.7(b)(4) specifies that all of the samples are to be used to demonstrate a POTW's consistent removal. Influent and effluent observations below the level of detectability are to be set at a value equal to the detectability limit.

If a POTW cannot measure a pollutant in some of its influent and/or effluent samples and it chooses not to utilize any sampling data, or if it is unable to measure a pollutant in any of its influent samples, § 403.7(b)(4) specifies that a POTW may make some other alternative showing to demonstrate its removal capability. For example, a POTW may rely on treatability studies from POTW's with similar characteristics (e.g., comparable categorical industrial dischargers; comparable industrial/non-domestic and domestic wastewater flows; comparable POTW treatment systems). The Approval Authority must approve

of the POTW's alternative demonstration.

In addition to these provisions, two other features finalized today make a demonstration of actual consistent removal easier and more flexible. First, instead of taking the average of the lowest 50 percent of measured removals as was required under the 1981 amended regulations, consistent removal is calculated in the final rule as the difference between the average influent and effluent concentrations in all of the sample data. This method, which does not exclude sample observations, provides a more accurate and equitable estimate of the actual removal generally achieved than the method employed in the 1981 regulation. Second, rather than prescribe rigorously the manner in which the samples are to be collected, the final rule describes these sampling procedures in an appendix as guidance.

Although the options discussed above may reduce the problem of non-detectability in a number of cases, EPA recognizes that there may be occasional instances in which a POTW will be unable to satisfy any of the demonstration requirements. This potentially could create an inequity between certain POTW's. A POTW with a high concentration of pollutants in its influent can measure and thus demonstrate removals. A POTW with a low concentration of pollutants in its influent may be unable to detect incoming pollutants, even though some are known to be discharged to its system. Unless such a POTW can make an alternative demonstration, as provided for in the removal credits regulation, it will be ineligible for removal credit authority. EPA acknowledges that if national removal rates were made available, some POTW's with low levels of pollutants in their influent would be eligible for removal credit authority. However, in view of Congress' intention that a POTW's removal rates be case-specific based on demonstrated actual removals, as discussed in detail above, EPA believes that prohibiting a grant of removal credit authority is justified when a POTW is unable through any means to show any removal of a regulated pollutant.

Section 403.7(c)—Provisional Removal Credits

Ordinarily, removal credits will be sought for pollutants which are being discharged currently in measurable concentrations into a POTW. Occasionally, however, a new or modified industrial facility will want a removal credit for a pollutant which is

not being discharged at measurable concentrations into the POTW from any facility. The POTW is obviously incapable of demonstrating actual removal prior to the discharge of the pollutant into the POTW treatment system. Therefore, the final rule provides at paragraph (c) that consistent removal may be provisionally demonstrated using data from treatability studies, provided that actual consistent removal is demonstrated in the conventional manner within 18 months of the commencement of the discharge.

Procedures for modifying or withdrawing provisional removal credits were not included in the proposed removal credits provision. Today's final rule includes such procedures. The process is the same as for withdrawal of conditional removal credits.

Section 403.7(e)—POTW Application for Authorization To Give Removal Credits and Approval Authority Review

The provisions governing removal credits applications are the same as proposed on September 28, 1982, and are considerably more streamlined than their counterparts in the 1981 amendments. Basically all that has to be submitted in a list of the pollutants for which removal credits are sought; data demonstrating actual consistent removal; the proposed new limits; a certification that the POTW has an approved local pretreatment program or qualifies for the exception to this requirement; a description of the POTW's current method of managing its sludge; and a certification that granting removal credits will not cause the POTW to violate applicable sludge requirements and NPDES permit limits and conditions. In contrast with the 1981 amendments, which restricted the submission of applications to certain times, the revised section provides that qualified POTW's can submit applications at any time. The Approval Authority is required to review the POTW's application in accordance with the procedures in § 403.11, which provide for completion of review within 90 days from public notice of the application unless a public hearing is held or the public comment period extended, in which case the Approval Authority may have up to another 90 days.

Section 403.7(f)—Continuation or Withdrawal/Modification of Authorization To Grant Removal Credits

The final rule, like the September 28, 1982, proposal, states that once a POTW has received authorization to give

removal credits for a pollutant regulated in a categorical pretreatment standard, the POTW may automatically extend that removal credit to the same pollutant when regulated in other categorical standards unless granting the removal credit will cause the POTW to violate any applicable sludge requirements or permit conditions. This provision makes explicit what was never expressly stated in the January 1981 amendments; that is, once removal credit authorization is received for a particular pollutant, the POTW may, without reapplication, give the same credit for that pollutant when regulated in other categorical standards. The POTW may, of course, elect not to extend the removal credit for a particular pollutant to other categorical standards or particular facilities in an industry category.

Upon being granted removal credit authority, the removal credits will be included in the POTW's NPDES permit. Because the procedures to initially authorize a POTW to grant removal credits are essentially the same as those to modify or revoke and reissue a POTW's permit to incorporate the removal credits (i.e., notice, comment and opportunity for a public hearing), the Approval Authority should consider commencement of the process to amend the POTW's permit simultaneously with the formal review of a complete application for removal credit authority. This would reduce the administrative burden of acting separately on the removal credits application and permit change.

As a condition of continued authorization to give removal credits, the POTW must continue to comply with all the requirements of paragraph (a)(3)(iii)-(v). Compliance with these requirements may be examined by the Approval Authority at any time, but at the very least, must be ascertained upon reissuance of the NPDES permit. The penalty for failure to comply with the paragraph (a)(3) requirements is withdrawal or modification of the removal credits. The regulation specifies the procedures to be followed when initiating an action to modify or withdraw.

Today's final removal credits regulation does differ considerably in one aspect from that which was proposed. Prior removal credits rules were criticized as unworkable in part because of the potential uncertainty they created. POTW's were required to submit periodic compliance reports that included sampling data to indicate whether or not they were maintaining their approved consistent removal rates.

Failure to maintain that removal rate could potentially result in an immediate adjustment of its approved removal rates to reflect the change. In turn, the industrial users applicable categorical pretreatment standards reflecting the removal credit would also have to be readjusted to reflect the POTW's new removal rates.

The final rule promulgated today diminishes the uncertainty of changing removal credits and shifting industrial discharge limits. Once a POTW satisfies the demonstration requirements and does not violate the criteria specified in paragraph (a)(iii)-(v), the removal credits will generally remain set for the term the POTW's NPDES permit. The removal credits could be modified or withdrawn during the permit term only in the case of consistently and substantially poor POTW performance. As a means of monitoring for occurrences of those circumstances in which a readjustment would be necessary, POTW's are required to submit compliance reports at least annually to the Approval Authority for its review that include sampling data to indicate their removal capability. A minimum of one sample per month during the reporting period is required and all the sampling data must be included in the report. As the POTW's removal performance will be reevaluated when its permit expires, sampling data included in these compliance reports also can be used to justify continuation of the removal credits or to calculate its new removal capability at the end of the permit term.

A removal credit determination is based on the removal efficiency (i.e., percent removal) of a pollutant at the POTW. Variability in removal efficiency is inherent in any treatment system, even those that are specifically designed to remove particular pollutants. POTW's, however, are generally designed to remove suspended solids and biodegradable organic materials, not heavy metals, cyanide or non-biodegradable toxic organics. The removals of toxic pollutants are for the most part incidental to the secondary treatment employed by POTW's.

In addition to the design of the POTW, there are a number of other factors that contribute towards the variability in removal efficiency. These include the state of the pollutant (whether soluble or insoluble); pollutant concentrations in the influent; dilution of the raw wastewater; or the detection limit of a particular pollutant. Because of the combined effect of these factors and site-specific conditions at a POTW, it is impossible to determine the expected

variability on a pollutant-by-pollutant basis across all POTWs.

The Agency recognizes that some variability will exist and that nothing can be done to totally eliminate it. Recognizing this variability factor, the Agency strongly believes that a fair balance must be struck between ensuring continued consistent removal of a pollutant which formed the basis for the removal credit and the need of POTWs and their industrial users to have a degree of certainty in the removal credit and the adjusted categorical pretreatment standards reflecting the credit. To obtain this balance, the Agency has established a criterion for making a finding that a POTW is no longer achieving proper removals of a given pollutant.

Before the Approval Authority begins a proceeding to modify or withdraw the removal credits prior to permit expiration, it must make a finding that "the POTW's consistent removal rate is consistently and substantially lower than the removal credit specified in the POTW's NPDES permit." This criterion is established so that a POTW does not lose its removal credit authority during the permit term because of minor problems at the POTW or situations outside of the POTW's control that temporarily reduce its originally demonstrated removal efficiency. However, if it is determined that the POTW's consistent removal rate is consistently and substantially lower than the removal credit, this indicates serious problems at the POTW and justifies invocation of the modification or withdrawal provisions of the regulation. This regulatory approach, assuming that initially established removal credits will be effective for the life of the POTW's NPDES permit absent substantially worsened POTW performance or a violation of the conditions specified in paragraph (a)(3) of the rule, should provide the desired balance of consistent removals and POTW/industry certainty.

The "consistently and substantially lower" criterion was purposefully adopted to allow all the relevant facts of any particular situation to be considered in deciding whether removal credits should be modified. A more specific criterion (e.g., designating a particular percent reduction in a POTW's removal rates as substantial) would be technically inappropriate, since the degree of unavoidable variability in a POTW's removal rate is likely to vary from plant to plant. It is thus more appropriate that the Approval Authority make a decision, on a case-specific basis, whether a POTW's removals have

substantially worsened on a consistent basis. If the Approval Authority initiates the procedures to modify or withdraw the credit based upon such a decision, the affected POTW and its industrial users would have an opportunity at that time to challenge the decision and demonstrate that the POTW's removals have not consistently and substantially worsened.

While the averaging of 12 monthly samples will tend to stabilize the POTW's removal rate, it should be noted that some variations in the yearly rates must be expected. Key to the impact of this yearly variation on both POTW's and industry is the magnitude of the credit a POTW is considering to grant. The following table shows the effluent limits that an electroplater would have to meet, depending on the removal credit granted to the POTW.

Removal credit (percent)	Cadmium (mg/l)	Zinc (mg/l)
0.....	1.2	4.2
20.....	1.5	5.25
30.....	1.71	6.0
40.....	2.0	7.0
50.....	2.4	8.4
60.....	3.0	10.5
70.....	4.0	14.0
80.....	6.0	21.0
90.....	12.0	42.0

The granting of a removal credit anywhere in the range of 40 and 60 percent results in a range of industrial effluent limits which can probably be met by the same industrial treatment technology—2.0 to 3.0 mg/l for cadmium and 7.0 to 10.5 mg/l for zinc. The impact of a reduced removal credit on an industrial user would be small since the same technology would have been employed. However, this is not the case for those POTW's that intend to grant credits in the 80-to-90 percent range. Removal credits from 80 to 90 percent would allow industrial users to install little or no technology to meet the limits. The failure of the POTW to demonstrate these high removals will have major impacts on the industrial users which may be required to install additional technology if the removal credit is reduced. POTW operators should be aware that the demonstration of high removals (75-90 percent) is difficult and should be thoroughly evaluated to provide their industrial users long-term and stable effluent limits.

Another difference between today's final rule and the September 28, 1982, proposal are the procedures for modifying or withdrawing removal credits when circumstances arise that warrant a change. As proposed, if a POTW failed to maintain its consistent removal rate or violated some other

eligibility criteria (e.g., violated sludge requirements or its permit limits), the POTW had to notify the Approval Authority, return to compliance within six months and satisfy the Approval Authority that the problem would not be likely to recur. If, at the end of this six-month period, the POTW did not return to compliance or satisfy the Approval Authority that the problem is non-recurring in nature, the Approval Authority would have had to revoke or modify the removal credits. The Approval Authority could, however, have extended the time for compliance for up to one year if the POTW demonstrated good faith efforts to return to compliance. Where the removal rates were modified or withdrawn, industries would have had to comply with the modified discharge limits or original categorical standard, whichever was the case, within 18 months.

After reevaluating this proposed change, taking into account public comments received, EPA has decided not to finalize the procedures as proposed. Instead, the modification/withdrawal procedures in today's final rule are more similar to those specified in the 1981 removal credits provision. The significant difference is that the procedures promulgated today provide for notice and comment before the removal credits are modified or a POTW's authority to grant removal credits is withdrawn. The Agency believes the process adopted by the final rule better serves the requirements of adequate due process.

Under the final rule, the Approval Authority is required to make a preliminary determination that a POTW is in violation of any of the eligibility criteria specified in paragraph (a)(3)(iii)-(v), or that its ongoing removals are substantially and consistently lower than the removal credits. The Approval Authority shall then, in accordance with the procedures found in § 403.11(b) (1) and (2) of the General Pretreatment Regulations, issue a public notice of its intent to modify or withdraw, and provide for public comment and an opportunity for a public hearing on the matter. It is during this time that a POTW, its industrial users or any interested party can present a case against modification or withdrawal. At the close of the public comment period and after a public hearing (if one is held), the Approval Authority will make its final decision based on all available information, including that received in comments and at the hearing. If the removal credits are to be modified or removal credit authority withdrawn, the POTW and its industrial users must be

notified and apprised in writing of the reasons for the modification or withdrawal. Where the removal credits are modified, the affected industrial users will be required to comply with the readjusted discharge limits, or, in the case of withdrawal of removal credit authority, with the original limits prescribed by the applicable categorical pretreatment standards. Compliance with these limits must be achieved within a reasonable time following modification or withdrawal. The amount of time allowed for compliance from the date that the removal credit is modified or withdrawn must be no greater than the amount of time allowed for compliance in the applicable categorical standard. For example, if a pretreatment standard provided for a compliance period of three years from the date of promulgation, an industrial user affected by the modification or withdrawal of a removal credit could be granted a maximum compliance period of three years from the date of modification or withdrawal. Of course, the Approval Authority could establish a shorter period for compliance after considering the necessary adjustment to existing treatment technology or the amount of additional treatment that must be installed.

IV. Summary of Public Participation

Numerous governmental agencies, individuals, industries, and trade associations provided comments on the proposed removal credit rule published in the *Federal Register* on September 28, 1982. The following parties provided comments: Detroit Water and Sewerage District; Caterpillar Tractor Company; Air Products and Chemicals, Inc.; South Carolina Department of Health and Environmental Control; Howard M. Cohen; Village of Sauget, IL; League of Women Voters of Maryland, Inc.; Barge, Waggoner, Summer and Cannon; Midland-Rose Corp.; Great Lakes Tomorrow, M/M Gordon V. Bond; General Motors Corp.; American Iron and Steel Institute; Natural Resources Defense Council; National Association of Metal Finishers; American Paper Institute; National Forest Products Association; Steven H. Bigelow; Conoco, Inc.; The Standard Oil Company (Ohio); Bausch and Lomb; Anne W. Amacher, Ph.D.; Chemical Manufacturers Association; Texaco, Inc.; League of Women Voters of South Carolina; The League of Women Voters of Kentucky; Monsanto Company; Babcock and Wilcox; Metropolitan Denver Sewage Disposal District No. 1; Standard Oil Company (Indiana); League of Women Voters of Marion County, GA; County Sanitation Districts of Los Angeles

County; League of Women Voters of Findlay, OH; and the Chicago Association of Commerce and Industry.

Comment: The majority of comments received addressed various aspects of the national removal credits concept, including the legality of national removal credits, the method of calculating the national removal rates, national credits for non-toxic pollutants and the procedures a POTW must follow to obtain and maintain removal credit authority when utilizing national credits.

Response: The comments regarding the legal basis of national removal credits have been addressed in the comprehensive discussion regarding this issue in the preamble. Since national credits have not been retained in the final rule, comments regarding certain technical aspects (e.g., selection of 25th percentile, the broad definition of POTW "compliance" with secondary treatment, the impact of negative removal rates in calculating the national removal rates) have become irrelevant. Similarly, those comments addressing the procedures and preconditions for utilizing national credits have also become irrelevant.

Comment: One commenter suggested that the removal credit regulation provide POTWs the option of substituting their local standards applicable to indirect dischargers for the national categorical pretreatment standards when these local standards are based on local receiving water quality or sludge disposal criteria.

Response: The removal credit concept established in section 307(b) of the Clean Water Act, provides for a credit against a national categorical pretreatment standard equal to or less than the demonstrated removal by a POTW for a specific pollutant. If a POTW can demonstrate that its actual removal rate would allow an adjustment to the categorical pretreatment standard that results in a standard less stringent than the POTW's current local standard for a particular pollutant, then the POTW may impose its local standard. If, however, the adjusted categorical standard remains more stringent than the local standard, then the adjusted categorical pretreatment standard must be applied.

Comment: One commenter objected to the procedure whereby a POTW self-certifies that it complies with applicable sludge requirements, limits and conditions in the POTW's NPDES permit, and that it has an approved pretreatment program. The objection concerned the amount of discretion given the POTW to determine

independently the complex factual matters on which initial and continuing qualification for removal credit depends.

Response: The final regulation provides that a POTW must certify that it has an approved pretreatment program and that by granting removal credits it will not violate any permit limits or conditions, or applicable Federal, State and local sludge requirements. The Agency retains the authority to review the certifications and independently verify their accuracy. Information regarding the status of the local pretreatment program and compliance with NPDES permits is readily available. In many instances, the Agency staff making the initial review of the removal credit authority application are also responsible for tracking the POTW's performance in the other two areas. Similarly, compliance with sludge requirements can be easily corroborated either by communicating within the Agency or by contacting the appropriate State or local agency. Additionally, the applicant must describe its sludge management plan. In those instances where the information is not sufficient to determine whether the POTW will continue to be in compliance with sludge requirements, the Agency may request more information.

Comment: Many comments questioned the Agency's basis for imposing additional conditions for obtaining removal credit authority that are not specifically provided in section 307(b) of the CWA. Specifically, the comments concerned the requirement that: (a) A POTW have an approved pretreatment program; (b) comply with all applicable Federal, State and local sludge management and disposal requirements; and (c) be in compliance with its NPDES permit discharge limits for the toxic pollutant(s) for which removal credits are sought. The comments suggested that the Agency could only impose those criteria explicitly mentioned in section 307(b) (i.e., that a POTW remove all or any part of the toxic pollutant, that the discharge from the POTW does not violate the effluent limitation or standard which would be applicable if the pollutant were discharged by the source other than through the POTW and that the POTW's sludge use or management be in compliance with the requirements established under section 405 of the Clean Water Act).

Response: The Agency believes that the imposition of these preconditions to removal credit authority is not only a logical exercise of its discretion, but is directed by the statute and congressional intent. This response will

address each of the three conditions separately since each condition is based on different premises.

The "compliance with toxic limits" requirement in section 403.7(a)(3)(v) of the removal credit rule was first imposed as a regulatory requirement as proposed in September 1982. This provision has been changed in the final rule, for the reasons previously discussed, to require the POTW to maintain compliance with all limits and conditions in its NPDES permit after granting removal credits. This requirement is consistent with the broad purposes of section 307(b) that discharges from industrial users of POTWs not interfere with a POTW's ability to comply with its NPDES permit.

The second requirement is that a POTW have an approved pretreatment program. The Agency believes that the imposition of this requirement is a proper exercise of the Agency's authority to ensure that a POTW minimizes the potential of pass through of pollutants or interference with the POTW and was contemplated by Congress when it amended the Federal Water Pollution Control Act in 1977 (the Clean Water Act). The statutory language and the legislative history, when read together, provide the requisite authority to require a pretreatment program as a precondition to a POTW's authority to grant removal credits.

The 1977 amendments added two new provisions relating to pretreatment. One provision, section 402(b)(8), imposes on POTWs that receive discharges from industries subject to categorical pretreatment standards a requirement to develop a local pretreatment program. The second provision, in section 307(b)(1), allows POTWs to adjust categorical standards to reflect the POTW's ability to remove any or all of the regulated pollutant. These two provisions are given meaning when read in light of the legislative history which clearly shows that Congress intended that removal credits be integrally tied to an approval pretreatment program.

The Senate, when debating the conference report, addressed this connection between removal credits (discussed as "local credits") and local pretreatment programs:

Where a local compliance program is approved, EPA and the permitting States may approve case-by-case modifications of the national pretreatment standards—or local credits—for documented pollutant removals attained by a publicly owned treatment works. To receive a local credit there must be a demonstration that the pollutant is degraded or treated; credits will not be given for dilution * * *. Tying local credits to local

compliance programs not only provides an incentive for local participation, but more importantly, it provides assurance that the removal levels which justified the local credits will be maintained by a publicly owned treatment works committed to operating a sound pretreatment program. (*Legis. Hist.*, Vol. 3, p. 461-462).

The House similarly discussed the relationship between the two provisions in its debate of the conference report:

Under the amendment to section 307(b) the Administrator would establish national pretreatment standards for toxic pollutants based on the best available technology economically achievable, or any more stringent effluent standards under section 307(A). Then in applying these pretreatment standards through its pretreatment programs, the owner or operator of a municipal treatment works could modify the requirements applicable to individual classes of sources introducing that pollutant into the treatment works to reflect the degree of reduction of that pollutant achieved by the treatment works (emphasis added). (*Legis. Hist.*, Vol. 3, p. 342-343.)

It is apparent that the Agency has effectuated Congressional intent by imposing this precondition for removal credit authority. Moreover, the Agency believes that it has adequate authority to impose such a requirement to accomplish the goal of avoiding the potential for pass through or interference under its broad rulemaking authority to section 501 of the CWA.

The Agency's position was judicially sanctioned in a recent decision by the U.S. Court of Appeals for the Third Circuit in *National Association of Metal Finishers (NAMF) et al. v. EPA*, 719 F. 2d 624 (3d Cir. 1983). Petitioners in that case specifically challenged the local pretreatment program requirement claiming that the Agency acted without authority in imposing this precondition to granting removal credits. The court disagreed with petitioners and adopted the reasoning set out above as the basis of the agency's authority.

The third requirement, that the POTW maintain compliance with all applicable Federal, State, and local sludge disposal requirements after granting removal credits, was also challenged by commenters as being contrary to the statute. The Agency maintains the position it presented in the regulations promulgated on January 28, 1981, which included the current provision regarding compliance with sludge disposal requirements. Essentially, the Agency continues to believe that it is acting within its authority granted by sections 307(b) and 405 of the CWA in conditioning removal credit allowances on continued compliance with applicable requirements established under the Solid Waste Disposal Act

(including Title II of this Act, more commonly referred to as the Resource Conservation and Recovery Act (RCRA)), the Clean Air Act, the Toxic Substances Control Act (TSCA), the Marine Protection, Research and Sanctuaries Act (MPRSA), and State regulations developed under Subtitle D of RCRA. (For a more detailed discussion of this issue, see 46 *Fed. Reg.* at 9428.) In addition, it should be noted that these sludge requirements were contained in the 1981 General Pretreatment Regulations upheld by the Third Circuit in *NAMF et al. v. EPA*, *supra*.

Comment: Several comments were received which supported the exclusion of the combined sewer overflow (CSO) compensation factor when calculating the revised categorical standard. Several comments were received which argued that the CSO factor should have been retained.

Response: EPA has analyzed the relationship of CSOs and removal credits in two different ways. The first approach examined the amount of time CSO events occur. In 1978, 15 POTWs were surveyed to determine the frequency of rainfall-triggered overflows. The Agency determined that the average POTW will incur combined sewer overflow only 7.3 percent of the time. Even assuming that no treatment occurs during an overflow situation, the measurable effect on the revised categorical standard is not significant. Therefore, compensation for CSOs on the basis of time is not necessary. (For a detailed example of the effect CSOs can have on the revised standard based on the time CSO events occur, see the proposed removal credits rule in the September 28, 1982 *Federal Register* (47 FR at 42701)).

The second approach examined the amount of pollutants that escaped treatment during CSO events. This involved the toxic pollutants discharged by industry which are not treated at the POTW during CSO events and which settle in the sewer system during normal dry conditions, and are resuspended during CSO events. Recent EPA data indicate that approximately 30 percent of the toxic metals in a combined sewer flow (i.e., during wet weather conditions sufficient to produce an overflow event) are due to the problem of resuspension. The concern relative to removal credits is that toxics resuspended under wet weather conditions are carried out the overflow point. As a result, a portion of the toxic pollutants contributed by industrial users never reach the POTW and is therefore not removed.

EPA analyzed the data collected on heavy metals to determine the amount of pollutants resuspended. The amount of resuspension was then included in a mass balance to determine the amount of untreated heavy metals discharged during a CSO event. This analysis indicated that, on average, eight percent of the metals bypassed the POTW and were thus not treated. After applying this eight percent bypass factor to several sample removal rates, the Agency concluded that its effect on the adjusted industrial discharge limit would be minimal. Thus, neither the frequency of CSO events nor the amount of toxics discharged during such events warrant a regulatory provision requiring CSOs to be factored into the formula for determining a removal credit.

Comment: Two comments suggested that POTWs must have an affirmative obligation to seek removal credit authority. Giving POTWs the discretion to seek or not seek removal credits could frustrate the intent of the provision and may result in unnecessary treatment.

Response: The statute provides that a POTW "may" seek removal credit authority. EPA is not empowered to require a POTW to seek removal credit authority.

Comment: Several commenters raised the issue of a POTW's "compliance" with a stated removal rate and the grounds for withdrawal or modification of removal credits. This comment involves two concerns. The first is the POTW's concern for some degree of latitude before a POTW is considered to be out of compliance with its demonstrated removal rate. The second is the concern of industrial users who, having obtained removal credits and designed treatment facilities to meet a stated standard, desire to have some reasonable period without any change to their discharge standards. Industrial users are essentially seeking some degree of certainty in their limits for planning purposes.

Response: As discussed above in detail, the Agency strongly believes that a fair balance must be struck between ensuring continued consistent removal of a pollutant which formed the basis for the removal credit and the need of industrial users to have some guarantee of certainty, for a reasonable period of time, as to their discharge limits. To obtain this balance, the Agency has developed a criterion to determine when the POTW is no longer achieving consistent removal for a given pollutant.

Comment: Many commenters questioned the Agency's procedure for handling influent and effluent samples when the pollutant is not detectable.

Most commenters suggested that for effluent samples the appropriate procedure is to assign the samples a concentration value of zero and not to assume that the concentration is at the level of detectability for that pollutant. Otherwise, they argued, the procedure may fail to reflect the full extent of the actual removal efficiency.

Response: The Agency believes that, in general, the use of the detection limit as an estimate of immeasurable concentrations in an effluent, where the influent was detectable, will provide a better approximation of actual removals than will the use of a zero value. Using zero as a measure of the effluent concentration necessarily results in a conclusion that the pollutant is experiencing a 100% removal by the POTW. Such a result is theoretically unlikely and inconsistent with the Agency's POTW removal data collected from 50 well-operated secondary treatment plants. The use of the detection limit is likely to produce a somewhat conservative estimate of removals. However, in most cases, the calculated removal should not be much lower than the actual removal and generally should be more accurate (and more environmentally protective) than that calculated by assuming a zero discharge effluent. In any event, in cases of non-detectability, the POTW has the option of making an alternative demonstration to qualify for removal credit authority.

Comment: One commenter questioned the proposed procedure for addressing violations by the POTW of its removal rate and the sanctions available. The commenter argued that the procedure may allow the violation to persist too long and represent an unnecessary endangerment to the environment because of interference, pass through and sludge contamination.

Response: The Agency agrees that the proposed procedure which could allow up to 12 months before withdrawal or modification procedures are instituted provided too much latitude to a POTW which is experiencing problems. Consequently, the Agency is amending this provision. As discussed above, today's final rule recognizes that some variability in a POTW's removal rates can be expected. However, if a POTW's removal capability does consistently and substantially worsen, indicating that a serious problem exists and requiring long-term corrective measures be taken, or it violates any other precondition of its removal credit authority, the Approval Authority will initiate the process to withdraw a POTW's authority to grant removal credits or to modify those credits. Public

notice of this action will be given, and a comment period and opportunity for a hearing provided for. The Agency believes that once grounds for modification or withdrawal do arise, the procedures in the final rule allow for prompt action by the Approval Authority. In addition, these procedures more adequately satisfy due process requirements than past procedures.

Comment: Some commenters objected to the 18 month time limit for industrial users to comply with the pretreatment standard once a removal credit has been modified or withdrawn. They argued that the time limit should be three years.

Response: The Agency partially agrees with this argument. The Agency has revised this part of the regulation to provide that the time period for compliance be no longer than the time allowed in the pretreatment standard or such shorter time as determined after considering the amount of additional treatment that must be installed. This time period is the same as was allowed under the 1981 revised removal credit regulation.

Comment: Some commenters questioned the adequacy of the compliance reporting requirements. They believed that one annual report will not be sufficient to detect quickly any drops in removal efficiencies.

Response: The Agency disagrees with this contention. A POTW's initially demonstrated removal rates were based on 12 representative samples taken over the course of one full year. Requiring one compliance report per year that includes a similar sampling requirement (i.e., 12 representative samples taken at equal intervals over that year) provides an accurate means of comparing a POTW's ongoing performance with its originally approved demonstrated removal efficiency. These reports will be reviewed by the Approval Authority. Furthermore, while the new regulations will minimally only require one annual report, there are several other sources of information which can augment the removal rate compliance reporting. In addition to this report, a POTW will be providing other reports as part of their NPDES permit and pretreatment program. POTWs will also be subject to pretreatment program audits and inspections which can be used to investigate a POTW's compliance with its removal rates.

Comment: Many commenters questioned the provision in the proposed rule which provides that the removal rates demonstrated by the POTW that formed the basis for removal credits become enforceable conditions of the POTW's NPDES permit. The commenters

suggested that the provision would discourage POTW's from applying for removal credit authority.

Response: Incorporating the removal credits as an enforceable condition into the POTW's NPDES permit was clearly intended by Congress when section 307(b) was passed. The House debate on the conference report contained the following statement: "Any effluent reduction attained by the treatment works and used to justify a modification of pretreatment requirements must be a permit condition enforceable against the owner or operator of the treatment works" (*Legis. Hist.*, Vol. 3, p. 343).

Thus, it is clear that this requirement was contemplated by the Congress. The argument that this will act as an impediment to POTW's seeking removal credit authority does not militate against the requirement. It only assures that the POTW will strive to maintain its consistent removal rates. It should also prove to be an incentive for industrial users enjoying the benefit of removal credits to take greater interest in the POTW's operation and pretreatment program.

Comment: One comment raised the issue of whether the proposed method for calculating the removal rate is appropriate. The commenter argued that the technique of averaging all the influent and effluent samples will mask variability and may result in a distortion of the removal efficiency.

Response: As the Agency stated in the proposed rule, the technique of averaging the influent and effluent data will provide a more reliable estimate of the actual removal generally achieved than the method used in the 1981 regulations. No sample observations will be excluded from the calculation.

Miscellaneous

In the September 28, 1982 proposal, several sections of the General Pretreatment Regulations were proposed to be amended because they referenced the removal credits provision. Today's action finalizes those changes to conform to the new removal credits section.

In addition to these changes, § 403.8(e) also is being revised. Section 403.8(e) specifies specific circumstances for modifying or revoking and reissuing a POTW's permit. These grounds include, among others, incorporation of a compliance schedule for development of a POTW's pretreatment program, section 301(h) and section 301(i) permit conditions and an approved POTW pretreatment program. By today's action, § 403.8(e) is revised to specify that incorporation of the removal credits granted by a POTW is cause for

modifying or revoking and reissuing a POTW's permit. Amending § 403.8(e) in this way is consistent with Congress' intent, as discussed above, that the removal credits be placed in the POTW's permit and thus be an enforceable permit condition. In addition, past removal credit provisions and the September 28, 1982, removal credit proposal required incorporation of removal rates into the permit.

Executive Order 12291

Under Executive Order 12291, EPA must judge whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation simplifies existing requirements and will have the ultimate effect of reducing pollution control costs. It is not a major regulation because it does not meet the criteria set forth in the Executive Order.

Regulatory Flexibility Act

Under the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, EPA is required to prepare a Regulatory Flexibility Analysis to assess the impact of rules on small entities. No regulatory flexibility analysis is required, however, where the head of the agency certifies that the rule will not have a significant economic impact on a substantial number of entities. I hereby certify, pursuant to 5 U.S.C. § 605(b), that today's final action will not have a significant impact on a substantial number of small entities.

List of Subjects in 40 CFR Part 403

Confidential business information; Reporting and recordkeeping requirements; Waste treatment and disposal; Water pollution control.

Dated: July 27, 1984.

William D. Ruckelshaus,
Administrator.

PART 403—GENERAL PRETREATMENT REGULATIONS FOR EXISTING AND NEW SOURCES OF POLLUTION

For the reasons set out in the preamble, 40 CFR Part 403 is amended as follows:

1. The authority citation for 40 CFR Part 403 is as follows:

Authority: Sec. 54(c)(2) of the Clean Water Act of 1977 (Pub. L. 95-217), sections 204(b)(1)(C), 208(b)(2)(C)(iii), 301(b)(1)(A)(ii), 301(b)(2)(A)(iii), 301(b)(2)(C), 301(h)(5), 301(i)(2), 304(e), 304(g), 307, 308, 309, 402(b), 405, and 501(a) of the Federal Water Pollution Control Act (Pub. L. 92-500), as amended by the Clean Water Act of 1977.

2. 40 CFR 403.7 is revised to read as follows:

§ 403.7 Removal credits.

(a) **Introduction**—(1) **Definitions.** For the purpose of this section:

(i) "Removal" means a reduction in the amount of a pollutant in the POTW's effluent or alteration of the nature of a pollutant during treatment at the POTW. The reduction or alteration can be obtained by physical, chemical or biological means and may be the result of specifically designed POTW capabilities or may be incidental to the operation of the treatment system. Removal as used in this subpart shall not mean dilution of a pollutant in the POTW.

(ii) "Sludge Requirements" shall mean the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): section 405 of the Clean Water Act; the Solid Waste Disposal Act (SWDA) (including Title II more commonly referred to as the Resource Conservation Recovery Act (RCRA) and State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of SWDA); the Clean Air Act; the Toxic Substances Control Act; and the Marine Protection, Research and Sanctuaries Act.

(2) **General.** Any POTW receiving wastes from an Industrial User to which a categorical Pretreatment Standard(s) applies may, at its discretion and subject to the conditions of this section, grant removal credits to reflect removal by the POTW of pollutants specified in the categorical Pretreatment Standard(s). The POTW may grant a removal credit equal to or, at its discretion, less than its consistent removal rate. Upon being granted a removal credit, each affected Industrial User shall calculate its revised discharge limits in accordance with subparagraph (4) of this paragraph. Removal credits may only be given for indicator or surrogate pollutants regulated in a categorical Pretreatment Standard if the categorical Pretreatment Standard so specifies.

(3) **Conditions for authorization to give removal credits.** A POTW is authorized to give removal credits only if the following conditions are met:

(i) **Application.** The POTW applies for, and receives, authorization from the Approval Authority to give a removal credit in accordance with the requirements and procedures specified in paragraph (e) of this section.

(ii) **Consistent removal determination.** The POTW demonstrates and continues to achieve consistent removal of the pollutant in accordance with paragraph (b) of this section.

(iii) *POTW local pretreatment program.* The POTW has an approved pretreatment program in accordance with and to the extent required by Part 403; provided, however, a POTW which does not have an approved pretreatment program may, pending approval of such a program, conditionally give credits as provided in paragraph (d) of this section.

(iv) *Sludge requirements.* The granting of removal credits will not cause the POTW to violate the local, State and Federal Sludge Requirements which apply to the sludge management method chosen by the POTW. Alternatively, the POTW can demonstrate to the Approval Authority that even though it is not presently in compliance with applicable Sludge Requirements, it will be in compliance when the Industrial User(s) to whom the removal credit would apply is required to meet its categorical Pretreatment Standard(s) as modified by the removal credit. If granting removal credits forces a POTW to incur greater sludge management costs than would be incurred in the absence of granting removal credits, the additional sludge management costs will not be eligible for EPA grant assistance.

(v) *NPDES permit limitations.* The granting of removal credits will not cause a violation of the POTW's permit limitations or conditions. Alternatively, the POTW can demonstrate to the Approval Authority that even though it is not presently in compliance with applicable limitations and conditions in its NPDES permit, it will be in compliance when the Industrial User(s) to whom the removal credit would apply is required to meet its categorical Pretreatment Standard(s), as modified by the removal credit provision.

(4) *Calculation of revised discharge limits.* Revised discharge limits for a specific pollutant shall be derived by use of the following formula:

$$y = \frac{x}{1-r}$$

where:

x=pollutant discharge limit specified in the applicable categorical Pretreatment Standard

r=removal credit for that pollutant as established under paragraph (b) of this section (percentage removal expressed as a proportion, i.e., a number between 0 and 1)

y=revised discharge limit for the specified pollutant (expressed in same units as x)

(b) *Establishment of Removal Credit: Demonstration of Consistent Removal.* A POTW may be authorized to grant a removal credit that does not exceed its consistent removal rate. In order to

demonstrate consistent removal, the POTW shall, for each pollutant with respect to which removal credit authorization is sought, collect influent and effluent data and calculate consistent removal in accordance with the following requirements. As a condition of retaining removal credit authorization, the POTW's consistent removal must continue to be equal to or greater than the removal credit.

(1) *Number of samples.* At least twelve representative samples of influent and effluent shall be taken at approximately equal intervals throughout one full year. Upon concurrence of the Approval Authority, a POTW may utilize an historical data base either in lieu of or as a supplement to these twelve samples. In order to be approved, the historical data base must be representative of the yearly and seasonal conditions to which the POTW is subject and be representative of the POTW's performance for at least one year. As an alternative to the above, a POTW, upon concurrence of the Approval Authority, may utilize an alternative sampling design, as long as the alternative design provides for samples to be taken at times which are representative of the POTW's normal operating conditions and the different seasonal conditions to which the POTW is subject.

(2) *Method of Sampling.* The POTW must use the composite sampling method unless the grab sampling method is more appropriate. A description of these methods and suggestions on when each method should be used are included in Appendix E as guidance.

(3) *Method of Analysis for Pollutants.* The POTW shall analyze the samples for pollutants in accordance with the analytical techniques prescribed in 40 CFR Part 136. If 40 CFR Part 136 does not contain analytical techniques for the pollutant in question, or if the Approval Authority determines that Part 136 analytical techniques are inappropriate, the analysis shall be performed using validated analytical methods or any other applicable analytical procedures approved by the Approval Authority, including procedures suggested by the POTW.

(4) *Calculation of Consistent Removal.* (i) The consistent removal, denoted by r, for a specific pollutant shall be the difference between the average concentrations of the pollutant in the influent of the POTW, denoted by I, and the average concentrations of the pollutant in the effluent of the POTW, denoted by E, divided by the average concentrations of the pollutant in the influent, denoted by I, as follows:

$$r = \frac{I-E}{I}$$

The average concentrations of the pollutant in the influent and effluent shall be calculated by taking the arithmetic average of all influent and effluent data, respectively. In calculating consistent removal under the subparagraph, all sample data must be used.

(ii) If a pollutant is only measurable in some of the influent and effluent samples (including the situation where it is not measurable in any effluent samples) and the POTW elects to calculate consistent removal in accordance with paragraph (b)(4)(i), influent and effluent observations below the limit of detectability should be assigned a value equal to the limit of detectability. In calculating consistent removal under paragraph (b)(4)(i), all sample data, including those set at the limit of detectability, must be used.

(iii) If a pollutant is only measurable in some influent and effluent samples (including the situation where it is not measurable in any effluent samples) and the POTW elects not to calculate consistent removal in accordance with paragraph (b)(4)(i), or if a pollutant is not measurable in any of the influent samples (in which case the sample data may not be used to calculate consistent removal in accordance with paragraph (b)(4)(i)), the POTW may (A) use historical data as provided in paragraph (b)(1) of this section to calculate consistent removal, or (B) upon the concurrence of the Approval Authority, the POTW may use data from treatability studies, demonstrated removal at similar treatment facilities or provide some other alternative means to demonstrate its consistent removal.

(iv) For purposes of this paragraph, "measurable" refers to the ability of the analytical method to quantify as well as identify the presence of the pollutant in question. "Limit of detectability" refers to the lowest limit at which the analytical method can quantify the pollutant in question.

(c) *Provisional credits.* For pollutants which are not being discharged currently (i.e., new or modified facilities, or production changes) the POTW may apply for authorization to give removal credits prior to the initial discharge of the pollutant. Consistent removal shall be based provisionally on data from treatability studies or demonstrated removal at other treatment facilities where the quality and quantity of influent are similar. Within 18 months after the commencement of discharge of

pollutants in question, consistent removal must be demonstrated pursuant to the requirements of paragraph (b). If, within 18 months after the commencement of the discharge of the pollutant in question, the POTW cannot demonstrate consistent removal pursuant to the requirements of paragraph (b) of this section, the authority to grant provisional removal credits shall be terminated by the Approval Authority and all Industrial Users to whom the revised discharge limits had been applied shall achieve compliance with the applicable categorical Pretreatment Standard(s) within a reasonable time, not to exceed the period of time prescribed in the applicable categorical Pretreatment Standard(s), as may be specified by the Approval Authority.

(d) *Exception to POTW Pretreatment Program Requirement.* A POTW required to develop a local pretreatment program by § 403.8 may conditionally give removal credits pending approval of such a program in accordance with the following terms and conditions:

(1) All Industrial Users who are currently subject to a categorical Pretreatment Standard and who wish conditionally to receive a removal credit must submit to the POTW the information required in § 403.12(b)(1)-(7) (except new or modified industrial users must only submit the information required by § 403.12(b)(1)-(6)), pertaining to the categorical Pretreatment Standard as modified by the removal credit. The Industrial Users shall indicate what additional technology, if any, will be needed to comply with the categorical Pretreatment Standard(s) as modified by the removal credit;

(2) The POTW must have submitted to the Approval Authority an application for pretreatment program approval meeting the requirements of §§ 403.8 and 403.9 in a timely manner, not to exceed the time limitation set forth in a compliance schedule for development of a pretreatment program included in the POTW's NPDES permit, but in not case later than July 1, 1983, where no permit deadline exists;

(3) The POTW must:

(i) Compile and submit data demonstrating its consistent removal in accordance with paragraph (b) of this section;

(ii) Comply with the conditions specified in paragraph (a)(3) of this section; and

(iii) Submit a complete application for removal credit authority in accordance with paragraph (e) of this section;

(4) If a POTW receives authority to grant conditional removal credits and the Approval Authority subsequently

makes a final determination, after appropriate notice, that the POTW failed to comply with the conditions in paragraphs (d)(2) and (3) of this section, the authority to grant conditional removal credits shall be terminated by the Approval Authority and all Industrial Users to whom the revised discharge limits had been applied shall achieve compliance with the applicable categorical Pretreatment Standard(s) within a reasonable time, not to exceed the period of time prescribed in the applicable categorical Pretreatment Standard(s), as may be specified by the Approval Authority.

(5) If a POTW grants conditional removal credits and the POTW or the Approval Authority subsequently makes a final determination, after appropriate notice, that the Industrial User(s) failed to comply with the conditions in paragraph (d)(1) of this section, the conditional credit shall be terminated by the POTW or the Approval Authority for the non-complying Industrial User(s) and the Industrial User(s) to whom the revised discharge limits had been applied shall achieve compliance with the applicable categorical Pretreatment Standard(s) within a reasonable time, not to exceed the period of time prescribed in the applicable categorical Pretreatment Standard(s), as may be specified by the Approval Authority. The conditional credit shall not be terminated where a violation of the provisions of this paragraph results from causes entirely outside of the control of the Industrial User(s) or the Industrial User(s) had demonstrated substantial compliance.

(6) The Approval Authority may elect not to review an application for conditional removal credit authority upon receipt of such application, in which case the conditionally revised discharge limits will remain in effect until reviewed by the Approval Authority. This review may occur at any time in accordance with the procedures of § 403.11, but in no event later than the time of any pretreatment program approval or any NPDES permit reissuance thereunder.

(e) *POTW application for authorization to give removal credits and Approval Authority review—(1) Who must apply.* Any POTW that wants to give a removal credit must apply for authorization from the Approval Authority.

(2) *To whom application made.* An application for authorization to give removal credits (or modify existing ones) shall be submitted by the POTW to the Approval Authority.

(3) *When to apply.* A POTW may apply for authorization to give or modify removal credits at any time.

(4) *Contents of the Application.* An application for authorization to give removal credits must be supported by the following information:

(i) *List of pollutants.* A list of pollutants for which removal credits are proposed.

(ii) *Consistent Removal Data.* The data required pursuant to paragraph (b).

(iii) *Calculation of revised discharge limits.* Proposed revised discharge limits for each affected subcategory of Industrial Users calculated in accordance with paragraph (a)(4) of this section.

(iv) *Local Pretreatment Program Certification.* A certification that the POTW has an approved local pretreatment program or qualifies for the exception to this requirement found at paragraph (d) of this section.

(v) *Sludge Management Certification.* A specific description of the POTW's current methods of using or disposing of its sludge and a certification that the granting of removal credits will not cause a violation of the sludge requirements identified in paragraph (a)(3)(iv) of this section.

(vi) *NPDES Permit Limit Certification.* A certification that the granting of removal credits will not cause a violation of the POTW's NPDES permit limits and conditions as required in paragraph (a)(3)(v) of this section.

(5) *Approval Authority Review.* The Approval Authority shall review the POTW's application for authorization to give or modify removal credits in accordance with the procedures of § 403.11 and shall, in no event, have more than 180 days from public notice of an application to complete review.

(6) *EPA review of State removal credit approvals.* Where the NPDES State has an approved pretreatment program, the Regional Administrator may agree in the Memorandum of Agreement under 40 CFR 123.24(d) to waive the right to review and object to submissions for authority to grant removal credits. Such an agreement shall not restrict the Regional Administrator's right to comment upon or object to permits issued to POTW's except to the extent 40 CFR 123.24(d) allows such restriction.

(7) Nothing in these regulations precludes an Industrial User or other interested party from assisting the POTW in preparing and presenting the information necessary to apply for authorization.

(f) *Continuation and withdrawal of authorization—(1) Effect of*

authorization. (i) Once a POTW has received authorization to grant removal credits for a particular pollutant regulated in a categorical Pretreatment Standard it may automatically extend that removal credit to the same pollutant when it is regulated in other categorical standards, unless granting the removal credit will cause the POTW to violate the sludge requirements identified in (a)(3)(iv) of this section or its NPDES permit limits and conditions as required by (a)(3)(v). If a POTW elects at a later time to extend removal credits to a certain categorical Pretreatment Standard, industrial subcategory or one or more Industrial Users that initially were not granted removal credits, it must notify the Approval Authority.

(2) *Inclusion in POTW permit.* Once authority is granted, the removal credits shall be included in the POTW's NPDES Permit as soon as possible and shall become an enforceable requirement of the POTW's NPDES permit. The removal credits will remain in effect for the term of the POTW's NPDES permit, provided the POTW maintains compliance with the conditions specified in subparagraph (4) of this paragraph.

(3) *Compliance monitoring.* Following authorization to give removal credits, a POTW shall continue to monitor and report on (at such intervals as may be specified by the Approval Authority, but in no case less than once per year) the POTW's removal capabilities. A minimum of one representative sample per month during the reporting period is required, and all sampling data must be included in the POTW's compliance report.

(4) *Modification or withdrawal of removal credits.* (i) Compliance with the conditions in paragraph (a)(3)(iii)-(v) of this section may be examined by the Approval Authority whenever it elects and must, at the very least, be examined whenever the POTW's NPDES permit is reissued. If the Approval Authority determines, on the basis of compliance monitoring reports or other information available to it, that the conditions specified in paragraphs (a)(3)(iii)-(v) of this section are not being met, the Approval Authority shall withdraw the POTW's authority to grant removal credits or modify those credits in accordance with the procedures specified in subparagraph (iii) below.

(ii) If, during the term of the POTW's NPDES permit, the Approval Authority determines that the POTW's consistent removal rate is consistently and substantially lower than the removal credit specified in the POTW's NPDES permit, the Approval Authority shall either withdraw the POTW's authority to grant removal credits or modify those

credits in accordance with the procedures specified in subparagraph (iii) below.

(iii) If the Approval Authority tentatively determines, under subparagraphs (i) or (ii) above, that the withdrawal of a POTW's authority to grant removal credits or modification of those credits is warranted, the Approval Authority shall, in accordance with the procedures specified in § 403.11(b) (1) and (2) of this section, issue a public notice, provide a public comment period of at least 30 days and provide an opportunity for interested persons to request a public hearing. The mailing list for the public notice shall include, at a minimum, the POTW and Industrial Users to whom revised discharge limits have been applied. If the Approval Authority finally determines to withdraw the POTW's authority to grant removal credits or to modify those removal credits the POTW is authorized to grant, it shall notify the POTW, all Industrial Users to whom revised limits have been applied and each person who has requested individual notice of its decision and the basis for that decision. Notice shall also be published in the same newspaper as the original notice of the tentative determination was published. Following such notice and modification or withdrawal, all Industrial Users to whom revised discharge limits have been applied shall be subject to the modified discharge limits or the discharge limits prescribed in the applicable categorical Pretreatment Standard(s), as appropriate, and shall achieve compliance with such limits within a reasonable time, not to exceed the period of time prescribed in the applicable categorical Pretreatment Standard(s), as may be specified by the Approval Authority.

(g) *Removal credits in State-run pretreatment programs under § 403.10(e).* Where an NPDES State with an approved pretreatment program elects to implement a local pretreatment program in lieu of requiring the POTW to develop such a program (as provided in § 403.10(e)), the POTW will not be required to develop a pretreatment program as a precondition to obtaining authorization to give removal credits. The POTW will, however, be required to comply with the other conditions of paragraph (a)(3) of this section.

3. 40 CFR 403.6(a)(2)(ii) is revised to read as follows:

§ 403.6 National Pretreatment Standards: Categorical Standards.

(a) * * *

(2) * * *

(ii) Citing evidence and reasons why a particular subcategory is applicable and why others are not applicable. Each such statement shall contain an oath stating that the facts contained therein are true on the basis of the applicant's personal knowledge or to the best of his information and belief.

4. In 40 CFR 403.8, paragraph (a) is revised and paragraph (e)(6) is added to read as follows:

§ 403.8 POTW pretreatment programs: Development by POTW.

(a) POTWs required to develop a pretreatment program. Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (mgd) and receiving from Industrial Users pollutants which Pass Through or Interfere with the operation of the POTW or are otherwise subject to Pretreatment Standards will be required to establish a POTW Pretreatment Program unless the NPDES State exercises its option to assume local responsibilities as provided for in § 403.10(e). The Regional Administrator or Director may require that a POTW with a design flow of 5 mgd or less develop a POTW Pretreatment Program if he or she finds that the nature or volume of the industrial influent, treatment process upsets, violations of POTW effluent limitations, contamination of municipal sludge, or other circumstances warrant in order to prevent interference with the POTW or Pass Through.

(e) * * *

(6) incorporate the removal credits (established under § 403.7) in the POTW permit.

5. In 40 CFR 403.11, the introductory text, paragraph (a), and the introductory text of paragraph (b) are all revised. Paragraph (b)(3) is removed.

§ 403.11 Approval procedures for POTW pretreatment programs and POTW granting of removal credits.

The following procedures shall be adopted in approving or denying requests for approval of POTW Pretreatment Programs and applications for removal credit authorization:

(a) *Deadline for review of submission.* The Approval Authority shall have 90 days from the date of public notice of any Submission complying with the requirements of § 403.9(b) and, where removal credit authorization is sought

with §§ 403.7(d) and 403.9(d), to review the Submission. The Approval Authority shall review the Submission to determine compliance with the requirements of § 403.8 (b) and (f), and, where removal credit authorization is sought, with § 403.7. The Approval Authority may have up to an additional 90 days to complete the evaluation of the Submission if the public comment period provided for in paragraph (b)(1)(ii) of this section is extended beyond 30 days or if a public hearing is held as provided for in paragraph (b)(2) of this section. In no event, however, shall the time for evaluation of the Submission exceed a total of 180 days from the date of public notice of a Submission meeting the requirements of § 403.9(b) and, in the case of a removal credit application, §§ 403.7(d) and 403.9(b).

(b) *Public notice and opportunity for hearing.* Upon receipt of a Submission the Approval Authority shall commence its review. Within 5 days after making a determination that a Submission meets the requirements of § 403.9(b), and, where removal credit authorization is sought, §§ 403.7(d) and 403.9(d), the Approval Authority shall:

* * * * *

§ 403.12 [Amended]

6. 40 CFR 403.12 is amended by removing paragraphs (i) and (j) and redesignating the remaining paragraphs (k)-(n) as (i)-(l) accordingly.

7. A new Appendix E is added to 40 CFR Part 403 and reads as follows:

Appendix E—Sampling Procedures

I. Composite Method

A. It is recommended that influent and effluent operational data be obtained through 24-hour flow proportional composite samples. Sampling may be done manually or automatically, and discretely or continuously. If discrete sampling is employed, at least 12 aliquots should be composited. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. All composites should be flow proportional to either the stream flow at the time of collection of the influent aliquot or to the total influent flow since the previous influent aliquot. Volatile pollutant aliquots must be combined in the laboratory immediately before analysis.

B. Effluent sample collection need not be delayed to compensate for hydraulic detention unless the POTW elects to include detention time compensation or unless the Approval Authority requires detention time compensation. The Approval Authority may require that each effluent sample is taken approximately one detention time later than

the corresponding influent sample when failure to do so would result in an unrepresentative portrayal of actual POTW operation. The detention period should be based on a 24-hour average daily flow value. The average daily flow should in turn be based on the average of the daily flows during the same month of the previous year.

II. Grab Method

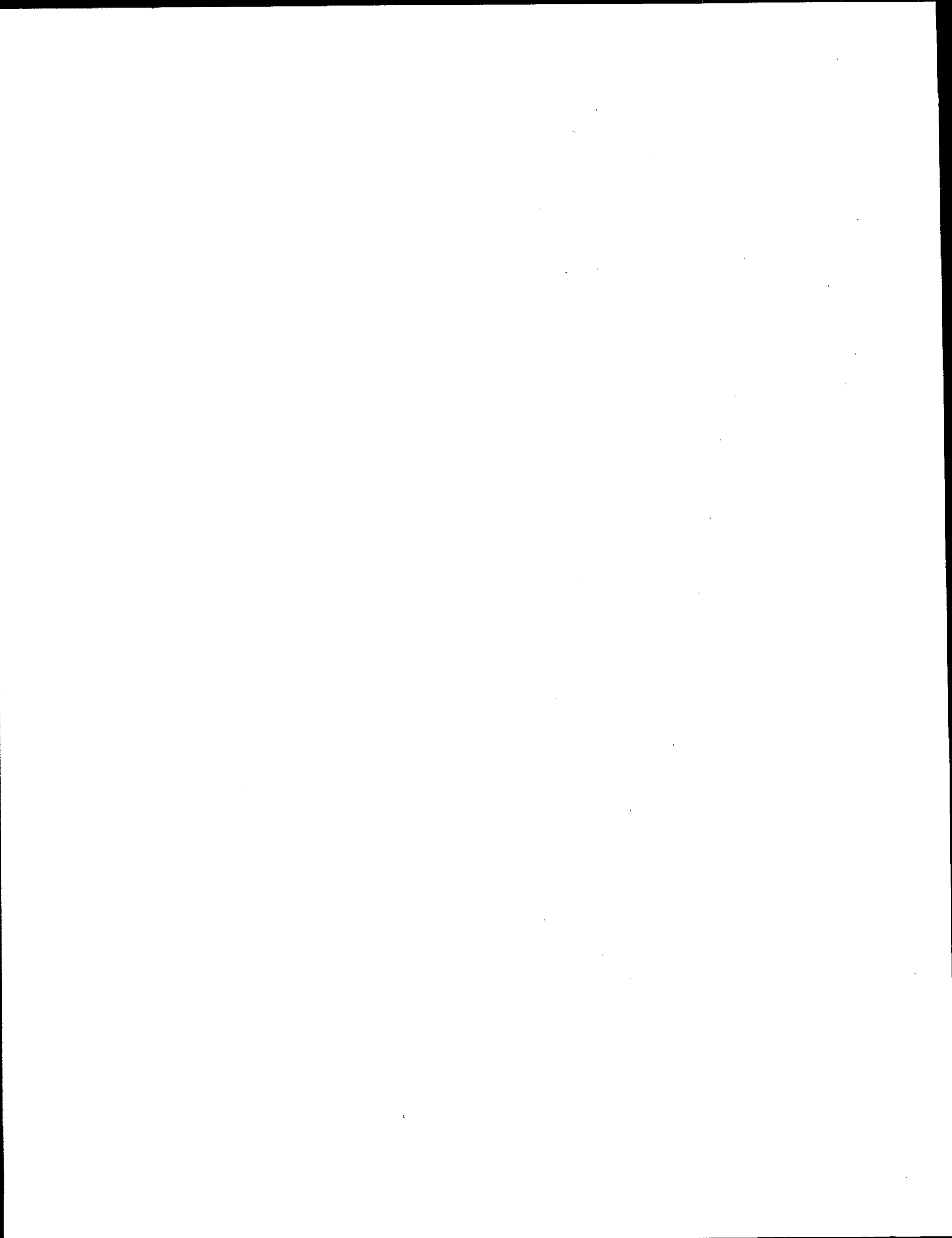
If composite sampling is not an appropriate technique, grab samples should be taken to obtain influent and effluent operational data. A grab sample is an individual sample collected over a period of time not exceeding 15 minutes. The collection of influent grab samples should precede the collection of effluent samples by approximately one detention period except that where the detention period is greater than 24 hours such staggering of the sample collection may not be necessary or appropriate. The detention period should be based on a 24-hour average daily flow value. The average daily flow should in turn be based upon the average of the daily flows during the same month of the previous year. Grab sampling should be employed where the pollutants being evaluated are those, such as cyanide and phenol, which may not be held for an extended period because of biological, chemical or physical interaction which take place after sample collection and affect the results.

[FR Doc. 84-20433 Filed 8-2-84; 8:45 am]

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Appendix B

Detection Levels for Priority Pollutants



Appendix B

Method Detection Levels for Priority Pollutants

PRIORITY POLLUTANT ^a	Detection Level (ug/L)	EPA Method
1. acenaphthene	1.8	610
2. acrolein	0.6	603
3. acrylonitrile	0.5	603
4. benzene	0.2	602
5. benzhidine	0.08	605
6. carbon tetrachloride	0.12	601
7. chlorobenzene	0.25	601
8. 1,2,4-trichlorobenzene	0.05	612
9. hexachlorobenzene	0.05	612
10. 1,2-dichloroethane	0.03	601
11. 1,1,1-trichloroethane	0.03	601
12. hexachloroethane	1.6	625
13. 1,1-dichloroethane	0.07	601
14. 1,1,2-trichloroethane	0.02	601
15. 1,1,2,2-tetrachloroethane	0.03	601
16. chloroethane	0.52	601
17. bis (2-chloroethyl) ether	0.3	611
18. 2-chloroethyl vinyl ether (mixed)	0.13	601
19. 2-chloronaphthalene	1.9	625
20. 2,4,6-trichlorophenol	0.64	604
21. parachlorometa cresol	0.36	604
22. chloroform (trichloromethane)	0.05	601
23. 2-chlorophenol	0.31	604
24. 1,2-dichlorobenzene	0.15	601
25. 1,3-dichlorobenzene	0.32	601
26. 1,4-dichlorobenzene	0.24	601
27. 3,3-dichlorobenzidine	0.13	605
28. 1,1-dichloroethylene	0.13	601
29. 1,2-trans-dichloroethylene	0.1	601
30. 2,4-dichlorophenol	0.39	604
31. 1,2-dichloropropane	0.04	601
32. 1,2-dichloropropylene (trans 1,3-dichloropropene)	0.34	601
33. 2,4-dimethylphenol	0.32	604
34. 2,4-dinitrotoluene	0.02	609
35. 2,6-dinitrotoluene	0.01	609
36. 1,2-diphenylhydrazine	b	b
37. ethylbenzene	0.2	602
38. fluoranthene	0.21	610
39. 4-chlorophenyl phenyl ether	3.9	611
40. 4-bromophenyl phenyl ether	2.3	611

Method Detection Levels for Priority Pollutants (Continued)

PRIORITY POLLUTANT ^a	Detection Level (ug/L)	EPA Method
41. bis (2-chlorisopropyl) ether	0.8	611
42. bis (2-chloroethoxy) methane	0.5	611
43. methylene chloride (dichloromethane)	0.25	601
44. methyl chloride (chloromethane)	0.08	601
45. methyl bromide (bromomethane)	1.18	601
46. bromoform (tribromomethane)	0.2	601
47. dichlorobromomethane	0.1	601
48. chlorodibromomethane	b	601
49. hexachlorobutadiene	0.34	612
50. hexachlorocyclopentadiene	-	-
51. isophorone	5.7	609 FID ^c
52. naphthalene	1.8	610
53. nitrobenzene	3.6	609 FID
54. nitrophenol	0.45	604
55. 4-nitrophenol	2.8	604
56. 2,4-dinitrophenol	13.0	604
57. 4,6-dinitro-o-cresol	16.0	604
58. N-nitrosodimethylamine	0.15	607
59. N-nitrosodiphenylamine	0.81	607
60. N-nitrosodi-n-propylamine	0.46	607
61. pentachlorophenol	7.4	604
62. phenol	0.14	604
63. bis (2-ethylhexyl) phthalate	2.0	606
64. butyl benzyl phthalate	0.34	606
65. di-n-butyl phthalate	0.36	606
66. di-n-octyl phthalate	3.0	606
67. diethyl phthalate	0.49	606
68. dimethyl phthalate	0.29	606
69. benzo (a) anthracene (1,2-benzanthracene)	0.013	610 HPLC ^d
70. benzo (a) pyrene (3,4-benzopyrene)	0.023	610 HPLC
71. 3,4-benzofluoranthene	0.018	610 HPLC
72. benzo (k) fluoranthene (11, 12-benzofluoranthene)	0.017	610 HPLC
73. chrysene	0.15	610 HPLC
74. acenaphthylene	2.3	610 HPLC
75. anthracene	0.66	610 HPLC
76. benzo (ghi) perylene (1, 12-benzoperylene)	0.076	610 HPLC
77. fluorene	0.21	610 HPLC
78. phenanthrene	0.64	610 HPLC
79. dibenzo (a,h) anthracene (1,2,5,6-dibenzanthracene)	0.03	610 HPLC
80. indeno (1,2,3-cd) pyrene (2,3-o-phenylenepyrene)	0.043	610 HPLC
81. pyrene	0.27	610 HPLC
82. tetrachloroethylene	0.03	601

Method Detection Levels for Priority Pollutants (Continued)

PRIORITY POLLUTANT ^a	Detection Level (ug/L)	EPA Method
83. toluene	0.2	602
84. trichloroethylene	0.12	601
85. vinyl chloride (chloroethylene)	0.18	601
86. aldrin	0.004	608
87. dieldrin	0.002	608
88. chlordane (technical mixture & metabolites)	0.014	608
89. 4, 4'-DDT	0.012	608
90. 4, 4'-DDE (p, p'-DDX)	0.004	608
91. 4, 4'-DDD (p, p'-TDE)	0.011	608
92. Alpha-endosulfan	0.014	608
93. Beta-endosulfan	0.004	608
94. endosulfan sulfate	0.066	608
95. endrin	0.006	608
96. endrin aldehyde	0.023	608
97. heptachlor	0.003	608
98. heptachlor epoxide	0.083	608
99. Alpha-BHC	0.003	608
100. Beta-BHC	0.006	608
101. Gamma-BHC (lindane)	0.004	608
102. Delta-BHC	0.009	608
103. PCB-1242 (Arochlor 1242)	0.065	608
104. PCB-1254 (Arochlor 1254)	b	608
105. PCB-1221 (Arochlor 1221)	b	608
106. PCB-1232 (Arochlor 1232)	b	608
107. PCB-1248 (Arochlor 1248)	b	608
108. PCB-1260 (Arochlor 1260)	b	608
109. PCB-1016 (Arochlor 1016)	b	608
110. toxaphene	0.24	608
111. antimony (total)	10	FUR ^e
112. arsenic (total)	10	FUR
113. asbestos (fibrous)	b	
114. beryllium (total)	1	FLAME ^f
115. cadmium (total)	1	FUR
116. chromium (total)	5	FUR
117. copper (total)	1	FUR
118. cyanide (total)	20	DIST ^g
119. lead (total)	10	FUR
120. mercury (total)	0.2	CV ^h
121. nickel (total)	10	FUR
122. selenium (total)	5	FUR
123. silver (total)	1	FUR

Method Detection Levels for Priority Pollutants (Continued)

PRIORITY POLLUTANT ^a	Detection Level (ug/L)	EPA Method
124. thallium (total)	10	FUR
125. zinc (total)	1	FUR
126. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	0.003	

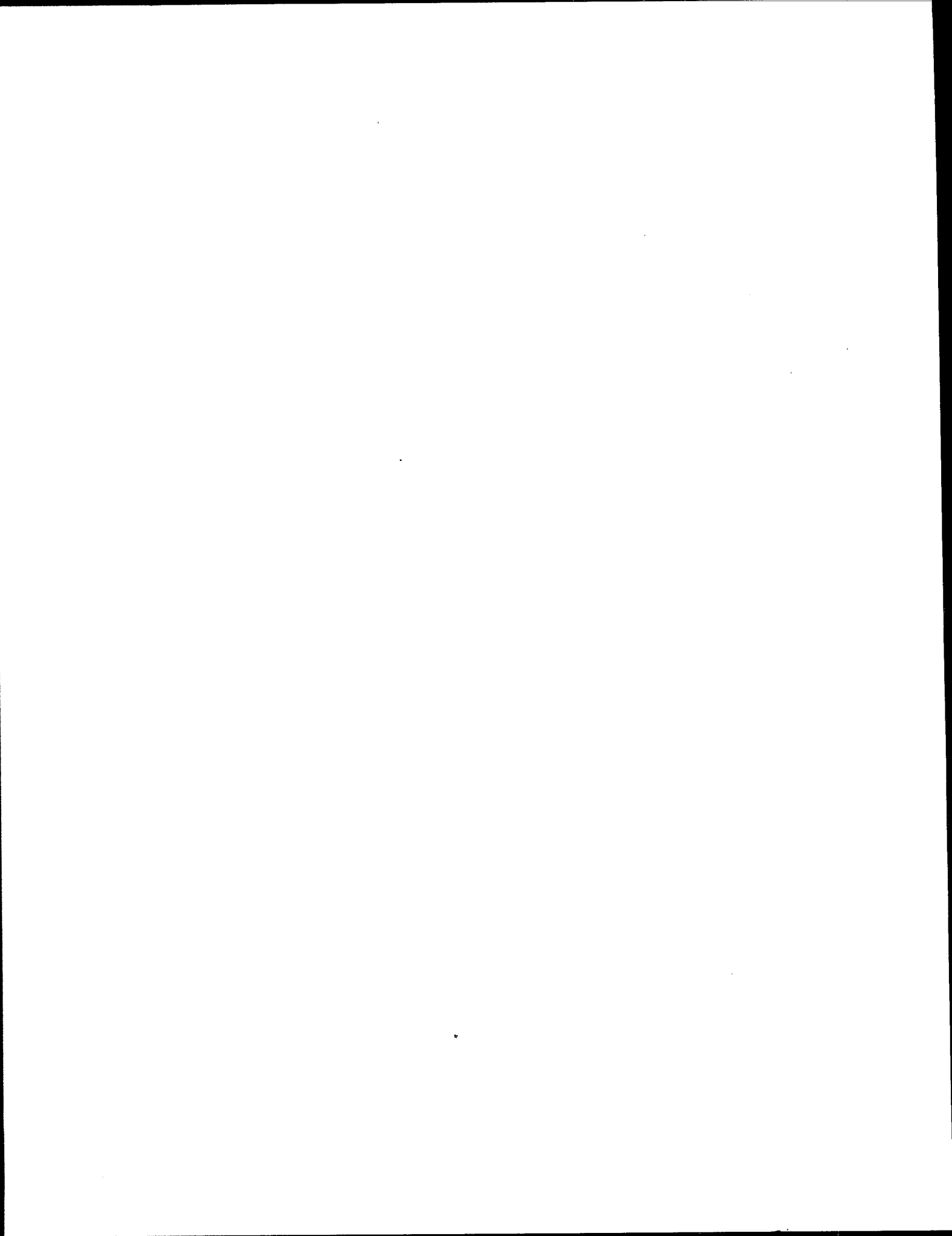
- a This numbering does not correspond with numbers on EPA's list of priority pollutants.
- b No detection limit determined.
- c Flame ionization detection (FID).
- d High pressure liquid chromatography (HPLC).
- e Furnace (FUR).
- f Flame (FLAME).
- g Distillation (DIST).
- h Cold vapor (CV).

Source: "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater," Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268. EPA-600/4-82-057. July 1982.

This table lists the analytical methods and appropriate method detection limits for the EPA priority pollutants. The information contained in "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater" represents an effort to provide procedures that are as uniform and cost effective as practical for a wide cross-section of chemical compound classes. Due to the variable chemical and physical properties of the parameters, some compromises had to be made. Therefore, in some of the methods, the extraction procedures, cleanup procedures and determinative steps are not optimum for all parameters.

Appendix C

Model Removal Credit Application



Model Removal Credit Application

Introduction

The Proppa City Sewerage District (PCSD) hereby requests authorization to grant removal credits under the provisions of 40 CFR 403.7 as revised on August 3, 1984. PCSD has had relatively few problems with upsets or interference at its treatment plants and metal levels in the sludge are relatively low. Although removal rates of chromium at the treatment plants are consistently high in most cases, the removal rate requested has been reduced 25 percent to allow for a safety margin which should ensure that PCSD will consistently achieve the proposed removals. The District certifies that these removal credits, if granted to its industries, will not adversely affect the treatment processes at the plants or sludge disposal methods, or cause a violation of its NPDES permit limits and conditions or of sludge requirements as defined in 40 CFR 403.7(a)(1)(ii).

PCSD's application follows the application requirements specified in 40 CFR 403.7(e)(6) as revised in August 1984. Treatment plant analytical data have been collected for the last 12 months as required by the regulation. Any questions regarding the data or other information in this application should be addressed to Ray Topper, Pretreatment Unit Chief, 618-618-6186.

1. List of Pollutants

PCSD requests authorization to grant removal credits for chromium.

2. Consistent Removal Data

PCSD operates two wastewater treatment plants, Rio Creek and Maine River Plants. Both plants have secondary treatment and employ activated sludge processes. PCSD collected 12 samples of the influent and effluent from its two treatment plants at approximately the same time of the month for the last 12 months (October 1983 - September 1984). Analytical results of the sampling and flow data for the sampling days are shown in Tables 1 and 2. Where the pollutant was not detected or was detected but could not be assigned a quantitative concentration in a sample, a value equal to the limit of detectability was assigned to the sample. Sampling was conducted in accordance with

Table 1

Analytical Data for Chromium for the Rio Creek Plant

Sample Date	Chromium Concentration (ug/l)		Flow Rate (mgd)
	Influent	Effluent	
10/15/83	42	18	6.2
11/15/83	32	8	5.8
12/15/83	36	13	6.3
1/15/84	22	7	6.7
2/15/84	44	12	6.4
3/15/84	48	20	5.3
4/15/84	12	ND	5.1
5/15/84	22	4	5.2
6/15/84	32	9	6.0
7/15/84	34	11	6.4
8/15/84	18	ND	6.4
9/15/84	18	17	6.6

Average Influent Average Effluent
Conc. (I) = 31.66 Conc. (E) = 10.25

ND = Not Detected (the limit of detectability, 1 ug/l, was used)

Table 2**Analytical Data for Chromium for the Maine River Plant**

Sample Date	Chromium Concentration (ug/l)		Flow Rate (mgd)
	Influent	Effluent	
10/10/83	1600	640	10.3
11/10/83	600	320	8.1
12/10/83	850	270	9.7
1/10/84	920	310	10.8
2/10/84	1230	560	11.0
3/10/84	470	510	9.6
4/10/84	440	240	8.9
5/10/84	590	190	7.9
6/10/84	1050	580	11.8
7/10/84	1230	590	10.2
8/10/84	960	360	11.7
9/10/84	1110	550	9.9

Average Influent	Average Effluent
Conc. (I) = 920.8	Conc. (E) = 426.6

methods suggested in Appendix E of the removal credits regulation. Samples were analyzed in accordance with techniques prescribed in 40 CFR 136.

The consistent removal rates for the treatment plants were calculated using the following formula:

$$r = \frac{I-E}{I}$$

where: r = consistent removal percentage rate for a pollutant

I = average concentration of the pollutant in the influent

E = average concentration of the pollutant in the effluent

The calculations for the Rio Creek plant is:

$$r = \frac{31.66 - 10.25}{31.66} = .68 = 68\%$$

The calculation for the Maine River plant is:

$$r = \frac{920.8 - 426.6}{920.8} = .54 = 54\%$$

PCSD intends to use the lower removal percentage, 54 percent, as the removal rate for the entire system. This will allow a uniform set of revised standards to be employed for the entire system (as opposed to revising two sets of standards for industrial users discharging to the two plants).

3. Calculation of Revised Discharge Limits

The industrial categories and subcategories for which chromium discharge limits would be revised are the following:

<u>Industrial Category/Subcategory</u>	<u>No. IUs</u>
Electroplating (All subcategories have same limitations)	5
Metal Finishing (All subcategories have same limitations)	4
Leather Tanning and Finishing	2
Subpart D Retan - Wet Finish Sides	1
Subpart H Pigskin	1

To allow itself and the industrial users a margin of safety, PCSD elects to use a removal rate 25 percent less than shown at the treatment plant. Therefore, a rate of 40.5 percent will be used for its removal credit application. This removal rate is then used to revise the discharge limit specified in the categorical pretreatment standard using the following formula:

$$y = \frac{x}{1-r}$$

where: y = revised discharge limit

x = pollutant discharge limit specified in the categorical pretreatment standard

r = consistent removal rate = 40.5 percent

As an example, the calculation for the maximum discharge limit for any one day for chromium in the Electroplating Standards is:

$$y = \frac{7.0}{1-.405} = 11.8 \text{ mg/l}$$

The revised discharge limit for chromium is 11.8 mg/l.

The revised discharge limits for all the affected industrial users are shown below.

Chromium Limitations (mg/l)

	Maximum for Any One Day		Average	
	Standard	Revised	Standard	Revised
Electroplating	7.0	11.8	4.0	6.7
Metal Finishing	2.77	4.65	1.71	2.87
Leather Tanning and Finishing				
Subpart D	19	31.9	12	20.2
Subpart H	12	20.2	8	13.4

4. Local Pretreatment Certification

I certify that PCSD received approval of its pretreatment program on June 6, 1984 and that the PCSD pretreatment program is adequately staffed and

funded to carry out the duties and responsibilities of a POTW as specified in 40 CFR 403.

Ray Topper
Pretreatment Unit Chief

5. Sludge Management Certification

PCSD currently disposes of the sludge from its two treatment plants in the Mid-State Regional Landfill after digestion and vacuum filtration. The regulations that apply to this disposal method are the Mid-State Regional Landfill regulations and the solid and hazardous waste regulations promulgated under authority of the Resource Conservation and Recovery Act (RCRA).

Under RCRA, if sludge is determined to be a hazardous waste, sludge handling and disposal must comply with special design and operating standards. The only likely reason the sludge would be a hazardous waste is if it exhibited the characteristic of EP toxicity (40 CFR 261.24). The filtered sludge from the two plants was tested for EP toxicity in June and July of 1984 using the procedures specified by EPA and none of the sludges was determined to be a hazardous waste. The pollutant closest to the maximum concentration allowed in the test, lead, was over ten times less than the limit.

Granting removal credits for chromium will result in increased concentrations of chromium to the treatment plants. If other unregulated pollutants (particularly other metals) are discharged by facilities receiving removal credits, concentrations of those pollutants may also rise. To the extent higher concentrations of metals are removed from the wastewater, they will result in higher concentrations in the treated sludge. It is difficult to estimate the increased concentration of other pollutants that will result from removal credits for chromium and the effect the combined rise in pollutant concentration will have on EP toxicity. Due to the large margin of current compliance, however, PCSD is confident that the increased pollutant loadings caused by granting removal credits for chromium will not cause the sludge to exhibit characteristics of EP toxicity.

The Mid-State Regional Landfill regulations specify that municipal sludges disposed of in the landfill cannot contain greater than 10,000 mg/kg of chromium. Violations of this limit occurred occasionally prior to development of the PCSD pretreatment program and compliance with the categorical standards by the electroplating and leather tanning facilities in the City. It now appears that if removal credits are granted, compliance with applicable disposal regulations will be maintained. This can be demonstrated by the following discussion and calculations.

The procedure for assuring that compliance with sludge disposal methods will continue to be achieved after the categorical standards are revised is to calculate the maximum increase of metals in the sludge due to the standards revision and to determine if compliance with sludge disposal regulations will be maintained. This discussion will center on the sludge from the Maine River Plant because of the relatively higher levels of chromium in its sludge.

The first step is to calculate the increase in chromium from the industrial users in each industrial category. For the Electroplating category, this was done by taking the difference between the revised and original discharge limit and multiplying by the total categorical industry electroplating process wastewater flow rate into the Maine River Plant. The total maximum regulated process flow rate from all of the categorical electroplating facilities is 270,000 gpd. Therefore the calculation is as follows:

$$270,000 \text{ gpd} \times (11.8 - 7.0)\text{mg/l} \times 3.78 \text{ l/gal} = 4,898,880 \text{ mg/day}$$

Since the Metal Finishing Standards are not yet in effect and the Electroplating Standards apply to all the metal finishing facilities, there is no need to calculate the increase of chromium from these facilities.

The maximum regulated process flow rates from the Subpart D and H Leather Tanning and Finishing facilities are 135,000 gpd and 86,000 gpd, respectively. The calculations for these facilities are:

$$\text{Subpart D: } 135,000 \text{ gpd} \times (31.9 - 19)\text{mg/l} \times 3.78 \text{ l/gal} = 6,582,870 \text{ mg/day}$$

$$\text{Subpart H: } 86,000 \text{ gpd} \times (20.2 - 12)\text{mg/l} \times 3.78 \text{ l/gal} = 2,665,656 \text{ mg/day}$$

Total chromium discharged for all electroplating and leather tanning and finishing facilities is 14,147,406 mg/day.

The average removal rate of chromium at the Maine River Plant is 54 percent. Therefore, this percentage of the projected increase of chromium would be deposited in the sludge. The total maximum increase of chromium in the sludge would be 54 percent of 14,147,406 mg/day or 7,634,600 mg/day. Dividing this figure by the number of kilograms of sludge generated by the Maine River Plant per day (50,980 kg/day) gives an increase of chromium in the sludge of 150 mg/kg.

The highest recorded level of chromium in the Maine River Plant sludge since the last of the industrial users discharging chromium to the plant installed a pretreatment system (this occurred on May 18, 1984) was 7,863 mg/kg on June 15, 1984. When the maximum increase attributable to the removal credit is added to the maximum level of chromium found in the sludge, a value of 8,013 mg/kg is obtained. This potential maximum level of chromium in the sludge is less than the Mid-State Regional Landfill limit of 10,000 mg/kg. Therefore, compliance with applicable sludge disposal regulation should be maintained. Furthermore, PCSD will continue to monitor chromium in the sludge after the categorical standards are revised to ensure that applicable sludge disposal regulations will be met.

I certify, based upon my inquiry of those individuals immediately responsible for the above demonstration and for operation of the PCSD pretreatment program and treatment plants operations, that PCSD will continue to achieve compliance with all applicable sludge disposal regulation after categorical standards are revised.

Ray Topper
Pretreatment Unit Chief

6. NPDES Permit Limit Certification

PCSD has had very few problems at its two treatment plants. Both plants are meeting their NPDES permit limits and conditions consistently. To provide assurance that the treatment plants will continue to meet their NPDES permit limits and conditions after categorical standards are revised, the maximum increase of chromium in the influent to the plants will be calculated and the potential effects on the treatment plants evaluated. This discussion will only cover the Maine River Plant because the influent to the Rio Creek Plant has relatively low levels of chromium. A two or threefold increase of chromium in the Rio Creek Plant influent, although highly unlikely, would have little effect on the plant's operations and treatment efficiency.

The first step is to determine the maximum level of chromium in the influent to the plant after categorical standards revision. The increase of chromium in the influent to the plant is calculated dividing the increase of chromium discharged to the system due to revising the categorical standards (as determined in the previous section) by the approximate average flow for the Maine River Plant (10 MGD) as shown below:

$$14,147,406 \times \frac{1}{10 \text{ MGD} \times 3,785 \text{ l/gal}} = .37 \text{ mg/l}$$

The maximum concentration at the influent to the plant that has occurred since the last of the industrial users discharging chromium to the plant installed a pretreatment system was 1,230 ug/l (1.23 mg/l) on July 10, 1984. Therefore the maximum projected plant influent concentration is 1.60 mg/l (1.23 + .37 mg/l). This maximum projected influent is then used to determine if the activated sludge or anaerobic sludge digestion processes used at the plant will be inhibited.

The chromium removal efficiency of the primary clarifier (.27) is used to determine the influent concentration to the activated sludge process by the following calculation:

$$1.6 \text{ mg/l} (1-.27) = 1.168 \text{ mg/l}$$

Checking this concentration with the threshold concentration for chromium of 10 mg/l in the EPA document, Guidance Manual for POTW Pretreatment Program Development (October 1983), it is unlikely that the activated sludge process will be inhibited.

To check that the anaerobic digestion process will not be inhibited, the concentration of chromium at the influent to the digestors must be calculated. Using the average removal rate for chromium (54 percent) as the proportion of chromium entering the digestors, and the flow rate to the digestors (.1 mgd), the influent to the digestors can be derived by the following calculation:

$$.54 \times \frac{(10 \text{ mgd}) 1.60 \text{ mg/l}}{(.1 \text{ mgd})} = 86.4 \text{ mg/l}$$

Checking this value with the threshold value for anaerobic sludge digestion of 100 mg/l from the same reference above shows that the anaerobic digestion process should not be inhibited.

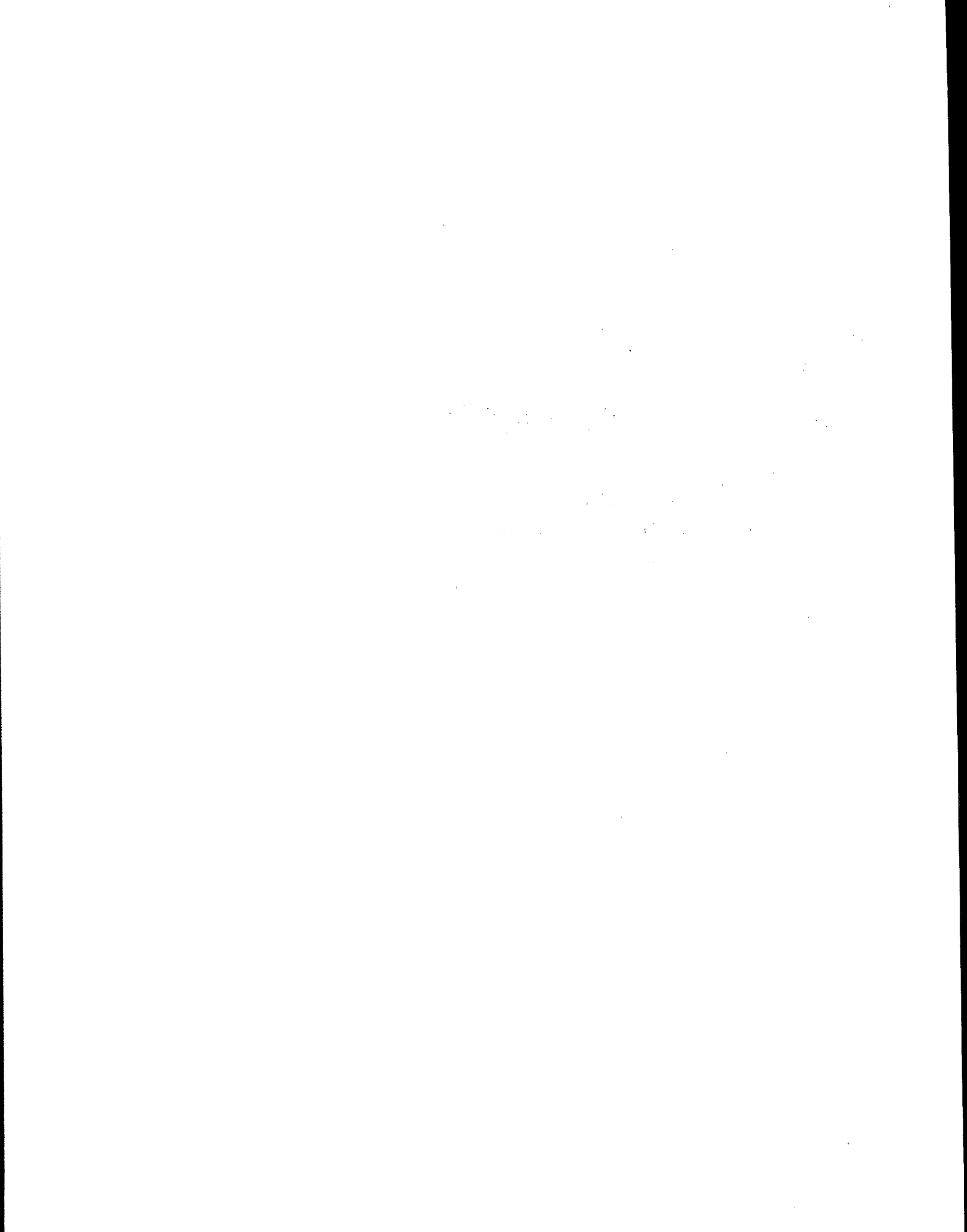
There are no chromium discharge limits in the NPDES permits for the Main River of Rio Creek Plants. However, as a final check, the maximum projected plant effluent concentration of chromium based on the maximum projected plant influent concentration will be determined to check that water quality criteria will continue to be met after revision of the categorical standards. The plant effluent concentration is (1-.54) times the plant influent concentration, therefore the maximum projected effluent concentration is $.46 \times 1.60$ mg/l or .736 mg/l. The receiving stream flow rate (Maine River) is 100 mgd giving a dilution ratio of 10:1 thus reducing the maximum concentration of chromium in the river to .0736 mg/l or 73.6 ug/l. Comparing this value with the water quality criteria for total chromium for the Maine River of 100 ug/l, it appears that water quality criteria will continue to be met after the categorical standards are revised.

(REVISED 7/26/85)

I certify, based upon my inquiry of those individuals immediately responsible for the above demonstration and for operation of the PCSD pre-treatment program and treatment plants, that PCSD will not violate any of its NPDES permit limits and conditions after categorical standards are revised.

Ray Topper
Pretreatment Unit Chief

Note: This certification addresses POTW effluent limits for pollutants subject to removal credits.



Appendix D

Sample NPDES Permit Modification Language for Removal Credits

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and the role of the accounting department in ensuring the integrity of the financial statements. It also highlights the need for regular audits and the importance of transparency in financial reporting.

2. The second part of the document focuses on the implementation of internal controls to prevent fraud and ensure the accuracy of financial data. It outlines the key components of a robust internal control system, including segregation of duties, authorization procedures, and regular monitoring and evaluation.

3. The third part of the document addresses the challenges faced by organizations in managing their financial resources effectively. It discusses the importance of budgeting, forecasting, and financial analysis in making informed decisions and optimizing resource allocation.

4. The fourth part of the document explores the role of technology in modern accounting and finance. It highlights the benefits of using accounting software, data analytics, and automation to streamline processes, reduce errors, and improve the efficiency of financial reporting.

5. The fifth part of the document discusses the importance of ethical considerations in financial management. It emphasizes the need for integrity, honesty, and transparency in all financial transactions and the role of the accounting department in ensuring compliance with ethical standards and regulations.

6. The sixth part of the document provides a summary of the key points discussed and offers recommendations for organizations to improve their financial management practices. It stresses the importance of continuous learning, adaptation, and collaboration between different departments to achieve financial success.

Sample NPDES Permit Modification Language for Removal Credits

The Permittee is hereby authorized to modify the national categorical pretreatment standard pursuant to Title 40 of the Code of Federal Regulations Section 403.7 (40 CFR 403.7). This authority is granted contingent upon the Permittee's continued compliance with the demonstrated removal rates for the pollutants shown below and as documented in the Permittee's application dated _____ and any data submitted in support thereof. This authority to modify only extends to those pollutants and industrial categories. The Permittee, with prior notice to the Approval Authority, may extend the removal credit to other categorical pretreatment standards as they become applicable provided the extension will not cause the Permittee to violate its NPDES permit or applicable sludge management requirements.

APPROVED REMOVAL RATE(S)

Pollutant Parameter

Removal Rate

The Permittee will comply with the following sampling and reporting requirements in order to demonstrate continued adherence to its stated consistent removal rate and compliance with:

- Influent and effluent sampling, at least once per month or as more frequently as necessary to show consistent removal
- Permittee will report the results of its influent and effluent sampling at least once per year in its annual compliance report or more often as the Approval Authority requires.
- [May be other requirements or stipulations as deemed necessary by the Approval Authority. (e.g., rolling 12-month average)]

Unless otherwise modified or withdrawn as provided in 40 CFR 403.7(f)(4), the authority granted herein shall remain effective until the expiration of this _____ NPDES permit.

Note: This sample language only applies to the approved removal rates, and does not apply to monitoring that must be performed by the POTW to demonstrate compliance with any toxic limits in the NPDES permit.

