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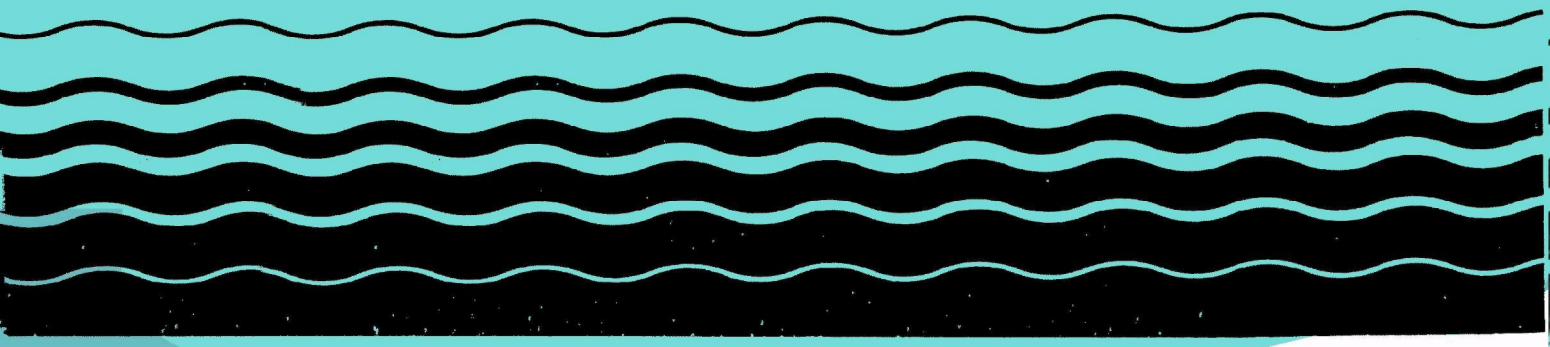
Training Manual for NPDES Permit Writers



TRAINING MANUAL FOR NPDES PERMIT WRITERS

The material in this manual is for instructional purposes only. It was developed to illustrate the application of technical principles of the NPDES regulations and does not necessarily represent official policy of the U.S. EPA.

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BASIC COURSE FOR PERMIT WRITERS

CHAPTER I: INTRODUCTION

INTRODUCTION

Purpose and Format

The purpose of this manual is to provide basic training in the writing of a National Pollutant Discharge Elimination System (NPDES) permit. It is designed for new permit writers, but may also serve as a refresher for experienced permit writers. It will also be useful for anyone who has an interest in the NPDES permit program and how it operates.

The format used in presenting this material follows the actual process of writing an NPDES permit, from the time an application is received, through the time a permit becomes final. The significant permit-related issues, such as evidentiary hearings, which may arise after permit issuance, are also discussed. Thus, the chapters are presented in the sequence in which the events would actually take place. Related topics, such as variances, are discussed briefly at the point in the process these items would normally be addressed by the permit writer. A more detailed explanation of these topics is given later in a separate section.

It is recognized that each EPA Regional office or approved State will have NPDES permit processing procedures which have been specially adapted for a specific geographical area and which incorporate local requirements. Therefore, it is the purpose of this manual to provide an explanation of those elements of the program which are common to any State or Regional office which issues NPDES permits. Particular emphasis will be given to those areas which historically have been difficult steps in the permit process. To the extent possible, practical examples are used to demonstrate the concepts which are discussed. The overall approach is designed to make the process clearer and the relevant information more accessible to the permit writer.

Overview of the NPDES Program

The NPDES permit process is authorized by Section 402(a)(1) of the Clean Water Act. The permit process begins with the submittal of a permit application by the owner or operator of a facility desiring to discharge wastewater. All discharges of wastewater to waters of the United States from point sources must have an NPDES permit.

The authority to issue permits may be delegated to States meeting certain technical, administrative and legal requirements. The NPDES permit program is administered by 10 EPA Regions and 37 approved NPDES States as of January 1, 1985. Not all of these states have received delegation for all four categories of programs - NPDES General (municipal and industrial), NPDES for Federal Facilities, Pretreatment, and General NPDES Permits.

Evolution of the NPDES Program

The NPDES program in its current form has evolved from a number of legislative initiatives dating back to the mid-1960's. In 1965, Congress enacted legislation requiring States to develop, by 1967, water quality standards for all interstate waters. Despite increasing public concern and increased federal spending, by 1971, just over half of the states had fully-approved programs establishing water quality standards. This lack of success in developing adequate water quality standards programs, combined with ineffective enforcement of the federal water pollution legislation, and the effectiveness of the environmental movement, prompted the federal government in 1970 to advance the Refuse Act Permit Program (RAPP) as a vehicle to control water pollution.

The RAPP program required each discharger of wastes into public waterways to obtain a federal permit from the U.S. Army Corps of Engineers that would specify abatement requirements. William Ruckelshaus, the first Administrator of the new Environmental Protection Agency, endorsed the joint program with the Corps of Engineers soon after confirmation, and on December 23, 1970, the permit program was mandated through Presidential Order. EPA and the Corps of Engineers rapidly began to prepare the administrative and technical basis for the permit program. However, unanticipated problems plagued the program almost immediately.

In December, 1971, the Refuse Act Permit Program was struck down by a decision of the Federal District Court in Ohio (Kalur vs Resor) which held that the issuance of permits constituted a "major environmental act" requiring the preparation of an environmental impact statement for each permitted facility under the National Environmental Policy Act (NEPA) of 1969. The concept of a permit program survived, however, and in November 1972, Congress passed new water pollution control legislation featuring the NPDES permit program as the centerpiece of a national water pollution control effort.

The enactment of the 1972 Amendments to the Federal Water Pollution Control Act marked a distinct change in philosophy of water pollution control in the United States. The 1972 amendments shifted the emphasis away from a water quality-based or ambient control strategy toward a technology-based or "end-of-pipe" control strategy. This shift in emphasis from water quality to technology was demonstrated by a corresponding shift in relative importance of water quality standards and effluent limitations.

The first round NPDES permits issued between 1972 and 1976 provided for control of a number of "traditional" pollutants, but focused on BOD, TSS, pH, oil and grease and

some metals by requiring use of "Best Practicable Control Technology Currently Available" (BPT). A majority of all major permits issued to industrial facilities in the first round of NPDES permitting contained effluent limitations based on "best professionl judgment" (BPJ) because regulations prescribing nationally uniform effluent limitations were generally unavailable.

The amendments to the 1972 legislation (Clean Water Act of 1977) shifted emphasis from controlling conventional pollutants to controlling toxic discharges. This era of toxic pollutant control is referred to as the "second round" of permitting. Direct dischargers of toxic pollutants into navigable waters are controlled by the inclusion of "Best Available Technology Ecomomically Achievable" (BAT) limitations in permits. The conventional pollutants (BOD, TSS, pH, fecal coliform and oil and grease) controlled by BPT in the first round of permitting are subject to a new level of control termed "Best Conventional Pollutant Control Technology" (BCT) in the second round. At the beginning of the second round many of the permits were issued as "short term" BPT permits while awaiting the promulgation of national effluent limitation guidelines.

To control pollutants beyond BAT, various technology-based requirements of the Clean Water Act will need to be employed in an integrated strategy in order to protect water quality. The strategy will require both biological and chemical methods to address the toxic and nonconventional pollutants from industrial and municipal sources. As a further vehicle to improve efficiency in permit issuance, the use of general permits will need to be expanded. The challenge for the NDPES program in the 80's is to maintain the momentum established in the 1970's in the first round of permit issuance in the face of increasingly complex permitting issues and limited permitting resources.

TYPES OF NPDES PROGRAM AUTHORITY

NPDES program authority can be divided into four elements:

- o Municipal and Industrial Permit Program
- o Federal Facilities Program
- o Pretreatment Program
- o General Permit Program

Each of these program areas is discussed briefly below. In addition, the first three program areas are discussed in detail in the relevant portions of this document.

Municipal and Industrial NPDES Programs

As stated previously, anyone who wishes to discharge wastewater into waters of the continental U.S. must obtain an NPDES permit. There are certain common elements to any NPDES program, regardless of the type of wastewaters being regulated. However, there are also some signficant differences. Generally speaking, "municipal" wastewaters includes the sanitary wastes from residential and commercial sources, while "industrial" wastewater refers to those wastes generated as the result of an industrial process.

Municipal wastewaters contain primarily biodegradable organic matter and thus treatment processes typically combine simple settling (primary treatment) with biological treatment (secondary treatment). In biological treatment, microorganisms biochemically oxidize the wastewaters. Industrial treatment technologies may be similar to those used in municipal treatment systems or they may be quite different. Permit limitations would be designed to monitor levels of the parameters of concern - whether from municipal or industrial sources.

In the most clear-cut example, an industrial plant discharges its process wastes to a specially designed treatment facility with a "direct" discharge of treated wastewater to a receiving stream and a completely separate treatment facility serves a municipality. At the municipal wastewater treatment facility, sanitary wastes would be treated and discharged to a receiving stream. Due to the fact that the composition of the wastewater is different in each of these situations, different treatment technologies would be employed. The final treated wastewaters (effluents) would be reflective of the type of wastewater being treated, thus a different set of NPDES conditions would apply in each case.

In general, the information which is presented in the following Chapters is applicable to both municipal and industrial NPDES permits. Where specific considerations apply to only one or the only program area, it will be so stated.

Pretreatment Program

In actual practice, wastewaters are typically mixtures from different sources. This is particularly true in a municipal setting, in which a portion of the wastewater which is discharged to a publicly-owned treatment works (POTWS) may be sanitary-type wastes from residential or commercial sources, while another portion may be comprised of industrial process wastes. Since the treatment process employs a biological process for the treatment of sanitary wastes, it is susceptible to "upset" from toxic industrial wastes. Thus, it is often necessary to require pre-treatment of industrial wastes which are discharged to municipal sewerage systems. These industrial discharges are called indirect discharges since they go through a municipal treatment system before being discharged to the receiving waters. Pretreatment, and other specific issues which are applicable only to a municipal NPDES program will be discussed in more detail in Chapter III.

Federal Facilities

As referred to previously in the discussion of delegation, the authority to administer the NPDES program to Federal facilities is an additional programmatic responsibility for NPDES states. "Federal" facilities refer to installations which are owned and operated by the U.S. government. They may generate industrial-type wastes (such as a U.S. Navy shipyard) or sanitary-type wastes, (such as from a U.S. Army training facility). The permit writer who is required to prepare a permit covering a federal facility should apply the applicable guidance in order to develop limitations which are adequate to control the wastes which are generated. For example, a Navy facility which has a direct discharge from a metal finishing facility would be subject to promulgated effluent limitation guidelines which apply to metal finishers.

It should be noted, however, that federal facilities which generate sanitary waste are not considered POTWs and are therefore subject to industrial effluent limitations. For such facilities, the permit writer would be required to develop limitations which reflect BAT. Such determinations would involve the application of best professional judgement, if no promulgated guideline was applicable.

General Permits

General Permits are a management tool designed to enable the approved State to issue one permit covering a specified class of dischargers within a defined geographic area. General permits apply the same set of limitations to a group of dischargers that would be imposed through individual permits. As with pretreatment and federal facilities, a State must either request modification to an approved NPDES program, or have its request for general permit authority be a part of a concurrent request for NPDES authority. However, unlike pretreatment and federal facilities authority, there is no requirement that an NPDES State seek general permit authority; it is an optional program element.

The geographic areas for which general permits are designed to cover should correspond to existing geographic or political boundaries such as:

- o Designated planning areas
- o Sewer districts
- o City, county, or state boundaries
- o State highway systems
- o Standard metropolitan statistical areas
- o Urbanized areas

The types of sources which the general permit may be written to cover include:

1) Separate Storm Sewers

2) A category of minor point sources if the sources have certain elements in common:

   a) Involve similar operations
   b) Discharge the same type of wastes
   c) Require the same effluent limitations or operating conditions
   d) Require similar monitoring
   e) The Director feels they are appropriately handled through general permits

From an administrative standpoint, general permits are issued, modified, revoked and reissued, or terminated in accordance with the procedures followed for individual NPDES permits (see Chapters 9 and 12). Additional requirements for general permits may be found in Section 122.28 of the Regulations.

CHAPTER II: THE APPLICATION FORM AND ADDITIONAL INFORMATION

THE APPLICATION FORM

Who Needs a Permit?

Anyone who discharges pollutants or proposes to discharge pollutants to waters of the United States, needs to obtain a discharge permit. There are some exceptions. They are those discharges which are covered under a general permit (§ 122.28) or those types of discharges which are excluded under § 122.3 (e.g. certain discharges from marine vessels, non-point source runoff, and indirect discharges to publicly-owned treatment works).

Most direct dischargers have an existing permit but they must reapply for a permit renewal six months before their current permit expires. Renewals of existing permits far exceed the number of new permit applications. New permit applications fall into two classes: "new sources" and "new discharges". New Sources are those facilities constructed after New Source Performance Standards have been promulgated. Other new facilities, which did not begin discharging until after August 13, 1979, are considered "new dischargers". A more detailed definition of "new source" may be found in the glossary and in § 122.29 of the Regulations.

How Does One Apply for a Permit?

The type of application forms which proposed dischargers must complete has changed as the NPDES program has evolved. The older forms will eventually be replaced by revised application forms. The forms which are currently in use are as follows:

Form 1 is a general form and is used with all "series 2" NPDES permit applications (currently, 2B and 2C). It provides general information such as the name of the facility, location, contact person, etc. The other five forms are used depending upon the type or class of discharger.

Standard Form A and Short Form A are used by publicly owned treatment works (POTW's). The standard form is used for major dischargers and the short form is used for minor dischargers. Definitions of "major" and "minor" may be found on the application forms. (These two forms will eventually be replaced by Form 2A and Form 2A-S, respectively).

Form 2B is used by concentrated animal feeding operations or aquatic animal production facilities.

Form 2C is used by existing industrial dischargers, including privately owned waste treatment facilities and water treatment plants whether publicly or privately owned. (Form 2C-S is a short version of Form 2C and is proposed for future use by those dischargers which do not discharge process waters, such

as a discharger of only non-contact cooling waters. This is a form developed to ease the application burden for facilities which can use this type of form instead of 2C).

Standard Form C is used for new manufacturing and commercial discharges.

Short Form C is used for new minor manufacturing and mining dischargers.

Short Form D is used for new minor commercial dischargers.

(The above three application forms will eventually be replaced by Form 2D for new sources and new dischargers).

The number of existing sources using Form 2C is approximately 48,000 with 15,000 of those expected to be able to utilize Form 2C-S. Animal feedlot permits (Form 2B) number about 2,900 while new industrial dischargers are expected to stay in the hundreds.

As the number of permits for existing sources far exceeds all other types discharge permits, the processing of Form 2C will be the main topic of concern, with respect to industrial discharges. Many of the comments are also applicable to Standard Form A and Short Form A for POTW's.

When is an Application Made?

Federal regulations (§122.21) reguire that applications for new discharges must be made 180 days before discharges actually begin. Applications for permit renewals must be made 180 days before the expiration of the existing permit. Individual states however, may have slighty different schedules. Further, the State Director or the Regional Administrator may allow individual applications to be submitted at dates later than these, but not later that the expiration date of the existing permit.

REVIEWING THE APPLICATION

The principle aspects of application review are review for completeness and for accuracy. As the draft permit is based upon the information included in the application, the application must be complete and accurate. This point cannot be stressed strongly enough. Experience from permit writers across the country has shown that this can be an especially troublesome part of the process. Owners of facilities which are required to file an application are sometimes unfamiliar with the application form. For an existing facility, it is possible that the forms which must be used for reissuance are different than the forms which were used at the time the permit was originally issued.

A considerable amount of correspondence may be required before the permit writer obtains an application which can be considered "complete" and "accurate". Some offices employ checklists for the review of application forms. In addition, it is often useful to use form letters to send to applicants when certain portions of the application are either missing or inadequate. As the permit writer gains experience in writing permits, he will be able to better detect omissions and errors in the permit application form.

Is the Application Complete?

As a minimum the application form must have all applicable spaces filled in. In fact, the form instructions state that all items must be completed and that NA or "not applicable" should be used to show that the item had been considered. Blanks on the form can occur for a number of reasons such as:

- o something (NA, a value, a check mark) was inadvertantly left out
- o The applicant had difficulty determining the correct response, and rather than provide misleading or incorrect information, the space was left blank.

A response to the blank items must be obtained. This can be in writing or in some cases by telephone. Because of the administrative record (this topic is discussed more fully in Chapter VII) that must be maintained in the processing of an application, and the possibility of hearings, only minor items should be handled by telephone, and even these must be documented in writing. Returning the application to the applicant for completion is the preferred method. Of course, a new application could be submitted after the applicant has been advised of the need. This may save some processing time.

If the changes or corrections to any application are extensive, the applicant may be required to submit a new application. Supplementary information, such as more detailed production information or maintenance and operating data of a treatment system may also be required to process the permit (supplementary information can also be obtained at a later date, when the permit writer is actually drafting the permit). An application is said to be complete when the Director is satisfied with the completeness of all submitted materials.

Two items which are often overlooked by applicants are the map required as an attachment to Form 1 and the process line diagram required by Part IIA of Form 2C. These two items are invaluable tools for the permit writer. It is also important that the location and description of the outfalls and the description of processes, Parts I and IIB, correspond to the map and the process line diagram.

Many of the omissions also typically occur in the sections of the application which require data submissions. Applicants may fail to submit data which are necessary to properly characterize the facility. Examples of the types of data which the permit writer will need to obtain before the application can be considered complete, are given below:

- o Are required toxic organic pollutants (GC/MS fractions) listed?

  Example: An application from a plastics processor fails to list any GC/MS fraction.

  Discussion: A plastics processor is required to test for the volatile GC/MS fraction (Table 2C-2 in the application form instructions and §122.21(g)(7)(ii)(A) of the NPDES Regulations).

- o Are required heavy metals listed?

  Example: A primary felt producer marks thallium and beryllium as "believed absent in the wastewater".

  Discussion: While thallium and beryllium are not expected to be found in a felt producer's discharge, page 2C-3 of the application form instructions and § 122.21(g)(7)(ii)(B) require testing for these metals. Occaisionally, unexpected contaminants will be present in a waste stream due to poor "housekeeping", unusual production methods, or for other reasons. The comprehensive testing requirements which apply to the various categories of industry are designed to determine whether any unexpected contaminants are present in significant quantities as well as to determine levels of pollutants which are known to be present. In the above example, the submission incomplete, since additional information is needed, and inaccurate, since "believed absent" is wrongly indicated.

- o Are all expected pollutants listed?

  Example: A producer of wood rosin based derivatives does not indicate the presence of zinc in his wastewater.

  Discussion: Zinc is used as a catalyst in the production of wood rosin bases derivatives. This type of information can be found in the effluent limitations development documents. Testing for zinc is also required.

Practical Exercise: Consider the plastics processor, the felt producer, and the producer of wood rosin based derivatives, mentioned above, and answer the following questions:

- o Which toxic organic pollutants are they required to test for?

- o Which heavy metals are they required to test for?

- Which metals would you expect to find in their wastewaters regardless of whether testing is required or not?

  Discussion: The application form in Table 2C-2 and §122.21(g)(7)(ii)(A) of the NPDES regulations require testing of the volatile GC/MS fraction by the plastics processor, and testing of all four GC/MS fractions by the felt producer and the producer of wood rosin based derivatives. Page 2C-3 of the application instructions and §122.21(G)(7)(ii)(B) require testing of all of the heavy metals listed in item V part C1 of the application form by all three manufacturers. For the expected metals, see the effluent limitations development documents for information.

Is The Application Accurate?

A permit application should also be accurate. In other words, not only should all of the necessary information be submitted (completeness), it must also be correct. While it may be difficult to detect certain inaccuracies, a number of common mistakes and omissions can be readily detected. When mistakes are detected, they must be corrected. The permit writer should follow the same procedures for correcting inaccurate information, as are used for obtaining missing information. The following are examples of the type of review which the permit writer must conduct:

- Do the concentration, mass, and flow values correspond?

  Example: Suppose the maximum daily flow is shown as 1.2 MGD, maximum daily suspended solids is 23 mg/l, and the maximum daily mass discharge is reported as 230 pounds per day.

  Discussion: In this case, the maximum daily flow and concentration purportedly occurred on the same day to give the maximum daily discharge. While the maximum flow and the maximum concentration can occur on the same day, it is an unlikely event. Accordingly, when the data on the application form indicate that this has happened, the permit writer should investigate whether this in fact is the case or it is an error. The same holds true for the maximum 30 day values, although it is a somewhat more likely occurrence.

- Do the reported values correctly correspond to the existing permit and previous application, montoring data, waiver requests and effluent guidelines development documents?

  Example: The previous permit had a limitation of 38 pounds per day for oils and grease. The application reports an average of 3.3 pounds per day.

  Discussion: There is apparently a problem in calculation here. It could be simply a shift in the decimal point, or it could involve some other type of error. It also could

represent a significant change in production techniques or treatment efficiencies.

- Do concentration values correspond with analytical detection limits?

  Example: The acid GC/MS fraction (phenols) compounds are all reported as less then 1 mg/l.

  Discussion: The detection limits for the compounds are all in this fraction are near 10 ug/l (ppb). Probably the 4AAP method for phenols was used, rather than the the required testing procedure using GC/MS.

ADDITIONAL INFORMATION

In addition to the formal application form, the permit writer should consider additional sources of information for development of a draft permit. A review of background information and a facility inspection are valuable sources of information.

Background Information Review

In addition to the permit application, the permit writer should consider any additional background information on the facility which may be relevant. Much of this information may already be available in the permit file or office.

File information includes the current permit, the rationale for the current permit (if one was prepared), Discharge Monitoring Reports (DMRs), compliance inspection reports, and any correspondence concerning compliance problems, any information on changes in plant conditions, and communications with other agencies. Much of this information, particularly DMR data, may be already stored in various automated data tracking systems (see Chapter XIII). The permit writer should utilize these sources of information, where available. Other information present in the office should include effluent guidelines, related Development Documents, reference textbooks on specific industry categories, the Treatability Manual, State Water Quality Standards, and receiving water quality data, such as that available from the STORET system. The permit writer should also consider reviewing the other environmental permit information, if appropriate, such as RCRA permit files.

This information should be reviewed for completeness. As needed, supplemental data may be requested from various State Agencies, EPA's Industrial Technology Division, and the applicant.

Facility Inspection

It is often said that "a picture is worth a thousand words". This is certainly true of the various types of facilities the permit writer is likely to encounter. For the permit writer to gain an adequate understanding of the more complex facilities, it is highly desirable that a visit be made to the facility to personally inspect the site. This would be especially true if significant pollution control or treatment improvements will be required, there have been frequent problems in complying with the present permit, there are known problems with spills or leaks or with contaminated surface runoff, or there is onsite storage, treatment, or disposal of hazardous wastes. As discussed above, the information from other environmental permit programs (i.e., CERCLA, RCRA) may be important in this regard.

The inspection should include a detailed review of production processes in order to evaluate what toxic or hazardous substances may be present in raw materials and associated contaminants, as

well as in products and by-products. The water uses, the resulting wastewater streams, and any in-process pollution controls should be reviewed. This information is needed to assist in selecting toxic pollutants to be limited and in evaluating possible in-process control improvements.

The inspection should also include a review of wastewater treatment facilities, their performance and operation, and maintenance practices. This is useful in evaluating the adequacy of existing treatment, in assessing the feasiblity of improvements, and in evaluating performance data. Effluent monitoring points, sampling methods, and analytical techniques should be reviewed to define any needed changes and to evaluate the quality of DMR data.

Raw material and product storage and loading areas, sludge storage and disposal areas, hazardous waste management facilities including onsite disposal areas, and all process areas should be observed to determine the need for controls on surface runoff and for specific best management practices.

The time required to conduct an adequate inspection will vary according to the complexity of the facility. For facilities with only a few basic processes, one main waste treatment system, limited in-process controls, few surface runoff outfalls, and limited onsite management of sludges or hazardous wastes, an adequate inspection can be completed in 1 or 2 days. Complex, larger plants with several treatment systems, numerous outfalls, and extensive ancillary activities may require several days to inspect.

Time spent on plant inspections often results in time savings during permit preparation. However, time and/or travel resources are generally not adequate to allow inspection of all facilities that are desirable. In such cases, the permit writer may be able to obtain much of the desired information from the next (or previous) compliance monitoring inspection. This requires advance planning to review the permit application and background information so the compliance inspector can be alerted to specific information needs.

Aerial photographs are an excellent aid for conducting a plant inspection and may provide much of the needed information on the potential for contamination of surface runoff and on ancillary activities in the absence of an inspection. Aerial photographs may be obtained from a variety of sources including the Environmental Servvices Division in some EPA Regions, the National Enforcement Investigation Center, EMSL - Las Vegas, the Environmental Photo Interpretation Lab - Vint Hill, VA, and private contractors.

III. DEVELOPING THE DRAFT PERMIT

GENERAL CONSIDERATIONS

Contents of a Permit

Once the permit writer is satisfied that a complete and accurate application has been received, and necessary background information has been obtained, he may proceed to the next step: drafting the actual permit conditions. This step is the "heart" of the process and may require a considerable expenditure of time and effort on the part of the permit writer. The draft permit, at a minimum, will consist of the following sections:

- Effluent Limitations
- Monitoring Requirements
- Standard Conditions
- Special Conditions

Each of these sections will be discussed at length in subsequent chapters. The overall objective is to develop a draft permit which takes into account all available information on a particular facility and its receiving waters, as well as all applicable NPDES program guidance with respect to that type of facility, and establishes effluent limits and associated requirements for the discharges.

Importance of Documentation

During the course of developing the draft permit, the permit writer should bear in mind the importance of carefully documenting each step in the process. There are several reasons for this. First, it will assist the permit writer in developing the permit in a thorough and logical fashion. Also, it will become part of the official record with respect to the facility and will serve to explain the rationale for the permit limits and to counter any challenges to the derivation of the permit terms and conditions. Another reason for careful documentation is staff turnover. New staff members must be able to clearly determine the history of various vacilities.

As a general rule, it is better to thoroughly document every step of the permit drafting process than to rely on one's memory or on an abbreviated Administrative Record (this subject discussed in more detail in Chapter X.

EFFLUENT LIMITATIONS

Overview

Effluent limitations are developed by three methods:

- o Effluent Limitations Guidelines
- o Water Quality Considerations
- o Best Professional Judgment (BPJ)

Each of these methods will be discussed in detail in subsequent sections, however a brief overview is useful.

In general, derivation of limits using the first method is usually the most straight forward, since it involves the application of a guideline which has already been scientifically derived. Effluent limitations guidelines (ELG's) should be used where it has been determined that the water quality standards will not be contravened by the use of effluent guidelines. Such discharges are sometimes called "technology-based," and represent and represent "end-of-the-pipe" technology. In some cases, particularly for toxic pollutants, technology-based limits may also be achieved as a result of in-process controls.

Many situations require the development of limitations according to water quality considerations. In these situations, site specific limits, more stringent than ELG's, must be developed in order to protect the water quality of the receiving waters (ambient conditions). Such bodies of water are sometimes called "water quality-limited". Usually, water quality-based limits will only be required for selected parameters; the other limitations will be technology-based.

Best Professional Judgement (BPJ) is used in cases where effluent limitations guidelines are not available for the particular pollutant or industrial category under consideration. There are a number of sources of information and a methodology which the permit writer may utilize in making a BPJ determination.

Often a permit will have limitations on different parameters developed by different means, and occasionally, the limitations on a single parameter will be derived through a combination of methods. For example, an effluent may have total suspended solids limited by effluent guidelines, oil and grease limited by BPJ, ammonia by aquatic toxicity (water quality considerations), and BOD by effluent guidelines for part of the year and by water quality considerations (dissolved oxygen) for the remainder of the year. Theoretically, limits could be established for each parameter to be limited by both water quality considerations and by technology-based factors. The most stringent of the two values would normally be applied.

Statistical Considerations

Effluent limitations are probably the most important part of the permit. The effluent limitations are the primary mechanism for the control of discharges of pollutants. It is therefore important that the permit writer have a basic understanding of the principles of effluent variability and permit limit derivation.

The quality of the effluent from a treatment facility will normally vary over time. If BOD data for a typical treatment plant are plotted against time, the day-to-day concentrations variations can be seen (See Figure 3-1). Some of this behavior can be described by constructing a frequency-concentration plot. From this plot, one can see that for most of the time, BOD concentrations are near some average value. Any treatment system can be described using the mean concentration of the parameter of interest (i.e., the long term average) and the variance (or coefficient of variation) and by assuming a particular statistical distribution (usually lognormal).

Permit limits are generally set at the upper bounds of acceptable performance. Requirements are usually expressed using two types of permit limits. The daily maximum permit limit is the maximum allowable value for any single observation. The average daily or "monthly" permit limit is the maximum allowable value for the average of all observations obtained during one month. (Average daily limits for weekly periods are also used for POTW's.) If permit limits are set too high relative to the long term average, a discharger not complying with expected performance will not exceed the limits. If permit limits are set too low, a discharger that is complying with expected performance may frequently exceed the limits.

Regulatory agencies have settled on an exceedance rate for deriving permit limits of 1 % to 5 % (typically, 1% exceedence rates for the daily maximum, 5% exceedence rate for the monthly average). These exceedence rates correspond to the 99th to 95th percentiles of a cummulative probability distribution. As can be seen form the graphical representation in Figure 3-2, the 99th percentile limit is less stringent than the 95th percentile limit. Thus, a discharger complying with expected performance has a 95-99% chance of not exceeding their permit limits in any single monitoring observation. However, over the long run, that same plant is statistically expected to discharge in excess of its permit limits one to five percent of the time. In actual practise, other factors such as reduced production levels part of the time may result in exceedences of permit limits. Conversely, if poor operation and maintenance or producttion increases occur, permit violations may occur more frequently.

It is important to note that statistical variability is already "built in" with respect to the effluent limitation guidelines, and the permit writer need not perform a separate evaluation in those cases where a permit limitation is derived from a guideline.

EFFLUENT LIMITATION GUIDELINES

Technology-Based Requirements of the Clean Water Act

The permit writer will find several terms which are frequently used in the discussion of Effluent Limitation Guidelines (these terms will also be employed in the discussion of best professional judgement). The terms are derived from Section 301(b) of the Clean Water Act and refer to various levels of treatment which apply to particular categories of pollutants. Included also are deadlines for meeting these levels of treatment (these terms are also summarized in the glossary).

The Act required all industries discharging wastes into navigable waters to achieve by July 1, 1977, the "best practicable control technology currently available" (BPT). This control technology represents the average of the best existing waste treatment performance within each industry category or subcategory.

By July 1, 1984, the Act required the application of effluent limitation technology based on the best control and treatment measures that have been developed or that are capable of being developed within the industrial category or subcategory. These effluent limitations are as follows:

- Toxic and Nonconventional Pollutants - Application of the "best available technology economically achievable" (BAT).

- Conventional Pollutants - Application of the "best conventional pollutant control technology" (BCT).

By way of definition, Conventional pollutants include such parameters as Biochemical Oxygen Demand, Total Suspended Solids, Fecal Coliform, pH and oil and grease. Toxic pollutants are those defined in Sec. 307(a)(1) of the Act and include heavy metals, and man-made organic compounds. The "priority pollutant" list is often mentioned in this regard). Non-conventional pollutants are those which do not fall under either of the above categories and include parameters such as Chemical Oxygen Demand. A listing of the toxic pollutants appears in the Appendix.

New source performance standards (NSPS) are also established for new industrial direct dischargers. The intent of this special set of guidelines is to set limitations which represent "state of the art" treatment technology to new sources, since such dischargers have the opportunity to install the latest in treatment treatment technology at the time of start-up. Established facilities often have to retrofit existing treatment units to meet BAT guidelines. This can be a costly and time-consuming process and thus more lenient requirements are usually applied for existing facilities. NSPS go into effect at the commencement of a new facility's operation, and are described as the "best available

demonstrated control technology, processes, operating methods or other alternatives including, where practicable, a standard permitting no discharge of pollutants."

Several important points should be stressed in connection with these requirements. First, it is important to understand the overall intent of these regulations. Technology-based limits (i.e. effluent limitation guidelines) consider the category of industry which produces the pollutant. Thus, the regulations take into account the specific factors unique to a particular type of industry (manufacturing process, type and quantity of pollutants generated, types of treatment facilities available to treat the pollutants, etc.) In using this approach, the regulations remove any economic advantage based upon pollution control for similar categories of industry. In theory, for example, a pulp and paper mill on the west coast of the U.S. would be required to meet the same BCT pollution controls for sulfate as an identical plant located on the east coast (unless there were special site-specific water quality concerns which had to be addressed).

In addition, it is important to note that regulations have historically incorporated a phased or gradual approach with respect to existing facilities. Initially, industries were required to meet BPT by July 1, 1977, with BAT and BCT required by July 1, 1984. In most cases, for conventional and and nonconventional pollutants, BCT and BAT levels of treatment were found to be no more stringent than the old BPT levels and therefore, in many cases, BPT may equal may equal BCT or BAT. In other words, the best practicable treatment may also be the best available treatment. However, BAT levels for for many toxic pollutants have been added to the guidelines, where no such requirements previously existed under the BPT requirements. In general, additional treatment beyond that required to meet the old BPT requirements has not been required.

Schematically, the process can be shown as follows:

Pollutant Category	Level of Treatment	Statutory Deadline
Conventional	BPT	July 1, 1977
Conventional	BCT	July 1, 1984
Non-conventional	BPT	July 1, 1977
Non-conventional	BAT	*July 1, 1984
Toxic	BPT	July 1, 1977
Toxic	BAT	July 1, 1984

(*Not later than three years after the date such limitations are placed in the permit, or July 1, 1984, whichever is later, but in no case later than July 1, 1987)

General Considerations with respect to the use of Effluent Limitation Guidelines

The use of effluent limitations guidelines for the development of effluent limitations appears at first to be straightforward: determine production and multiply by the appropriate factor contained in the guidelines. For example, a bleach kraft tissue plant produces 234,000 lbs. per day, and the daily maximum guideline for BOD is 13.65 lbs per 1000 lbs of product. The effluent limitation then should then be 3194 lbs per day (234,000 x 13.65/1000 = 3,194). However, the process is often more complicated than this simple example would indicate.

Some of the difficulties associated with the use of guidelines include:

- o Determination of the proper category and subcategory of the facility.
- o Proper use of the guidelines applicable to the category or subcategory under consideration.
- o Classification of plants which fall under more than one subcategory and/or have multiple products with multiple measures of production.
- o Determination of the measure of production.
- o Use of alternate limits
- o Application of mass vs. concentration limits

The location of applicable effluent guidelines requires a familiarity with several sources of information, particularly the Federal Register system. The Federal Register can often seem overwhelming to anyone who is unfamiliar with this document and its companion document, the Code of Federal Regulations. However, it is very helpful for the permit writer to have a basic understanding of these documents. Their importance to the permit writer stems from the fact that all of the effluent guidelines which are promulgated by the Environmental Protection Agency are published there. In addition, any rulemaking action which affects the NPDES permit program is published there.

The Federal Register System is the vehicle for disseminating information about federal regulations or the regulations themselves. These regulations are the results of a federal agency action based upon federal legislation enacted by

Congress and have the "full force and effect of law." In the case of the NPDES permit program, the EPA proposes regulations under the authority given to the Administrator of EPA by the Clean Water Act.

Any actions relative to these regulations (proposed rulemaking, public notice, final rulemaking, etc.) are published in the Federal Register, which is published every weekday. All entries which appear in the Federal Register follow a standard format. This is designed to assist the reader by summarizing all of the relevant information with respect to the entry.

All federal regulations are compiled in order in the Code of Federal Regulations (CFR). In the case of EPA and the NPDES program, all of the applicable regulations, are shown in Title 40, Part 400 (effluent limitation guidelines) and Parts 122-124 (program regulations). Changes in, or additions to the regulations are published in the Federal Register. These revisions are incorporated in the yearly update of the Code of Federal Regulations. The Federal Register system also contains various "finding aids" which will assist the permit writer in locating the applicable guidelines.

In addition to the Federal Register System, there are a number of other documents which will be useful to the permit writer in the process of locating applicable guidelines and other background information. These include the Development Documents for the various industrial categories, which are produced by EPA's Industrial Technology Division. These documents contain the rationale for the development of the effluent guidelines and include a considerable amount of background information which may prove useful to the permit writer. In addition, the Industrial Technology Division has compiled a document which summarizes and cross-references all of the currently promulgated guidelines.

Categorization

In order for the permit writer to properly use and apply effluent guidelines information, he must first determine what industrial category applies to the facility under consideration.

In determining which category/ies a facility comes under, the Standard Industrial Code (SIC) is helpful. Item VII of Application Form 1 requires that the applicant provide the SIC code for the activity covered by the permit application. Permit offices should have a listing of SIC's corresponding with effluent guideline categories (see Appendix). Usually, an SIC will determine the appropriate category, but not necessarily the subcategory. For example, a turpentine producer, SIC 2861, falls under the Gum and Wood Chemicals Manufacturing category. In this particular case, SIC 2861 and the Gum and Wood Chemicals Manufacturing category correspond. Once the category is established, it is just a matter of determining which subcategory the facility falls under.

Usually, plants do not fall into a single category and then a single subcategory. In this regard, it is helpful not to place the plant into a category or subcategory, but rather find those categories under which the plant falls. This may require some research and probing on the part of the permit writer. For example, an integrated washing machine producer (SIC 3633) would be expected to fall into the Mechanical Products category. Because of the wide ranging activities needed for integrated production, this manufacturer also comes under Porcelain Enameling, Metal Finishing, and Plastic Molding and Forming categories.

In determining which subcategories are applicable to a plant is best to determine the categories first and then by careful analysis of the plant, determine the subcategories. The determination of applicable categories can be accomplished by quickly classifying the categories as 'not applicable' or 'possibly applicable'. For example, if a brewery were under consideration, Iron and Steel Manufacturing would obviously not be applicable while Organic Chemicals might be, depending on the extent of recovery and processing of by-products. A careful analysis of the production of the plant and comparison to the subcategories under Organic Chemicals would establish which, if any, of the subcategories are applicable.

Production

Many effluent limitation guidelines are expressed in terms of allowable pollutant discharge rate per unit of production rate. To determine permit limits, these standards are multiplied by the facility's production rate. Thus it is necessary for the the permit writer to determine the facility's actual production, based upon information supplied by the permittee.

The ideal situation for the application of effluent limitations guidelines is where production is constant from day to day and month to month. Production for the purposes of calculating the limitations would then be the average production rate. In practice, production rates are not as constant as the ideal situation. They vary because of market factors, maintenance, product changes, down times, breakdowns, and facility modifications. The production rate of a facility will vary with time, and thus determination of production may be problematical.

To apply effluent limitation guidelines to a facility which has varying production rates, the permit writer should determine a single estimate of the long term average production rate that is expected to exist during the next term of the permit. This single production value is then multiplied by both the daily maximum and monthly average guideline limitations to obtain permit limits.

The permit writer should avoid the use of a limited amount of production data in estimating the production for a specific facility. For example, the data from a particular month may be unusually high and thus lead to the derivation of an effluent limitation which is not actually reflective of the normal plant operations. As previously explained in the Introduction to this Chapter, effluent limitation guidelines already account for variations which occur within long term production rates. Therefore, the use of too short a time frame in the calculation of production based limitations for a specific industrial facility may lead to "double accounting" of the variability factors.

The objective in determining a production estimate for a facility is to develop a single estimate of the long term average production rate (in terms of mass of product per day) which can reasonably be expected to prevail during the next term of the permit. The following example illustrates the proper application of guidelines:

> Example: Company A has produced 331,500 tons, 301,500 tons, 361,500 tons, 301,500 tons, and 361,500 tons per year for the previous five years. The use of the long term average production (331,500 tons per year) would be an appropriate and reasonable measure of production, if this figure was most representative of the actual production expected to occur over the next term of the permit and this number did not represent a temporary increase in pro-

duction. Also, in evaluating these gross production figures, the number of production days must be considered, If the number of production days per year is not comparable, the numbers must be converted to production per day before they may be compared. To convert from the annual production rate to average daily rate, the annual production rate is divided by the number of production days per year. To determine the number of production days, the total number of normally scheduled non-production days are subtracted from the total days in a year.

If Company A normally has 255 production days per year, the annual production rate of 331,500 tons per year would yield an average daily rate of 1,300 tons per day. If pollutant X has an effluent limitaiton guideline of 0.1 lbs./1000 lbs. for the maximum daily average, the effluent limitations would be calculated as follows:

Monthly Average Limit (Pollutant X)

$$1{,}300 \frac{\text{tons}}{\text{day}} \times \frac{2000 \text{ lbs}}{\text{ton}} \times \frac{0.10 \text{ lbs.}}{1000 \text{ lbs.}} = 260 \text{ lbs./day}$$

Daily Maximum Limit (Pollutant X)

$$1{,}300 \frac{\text{tons}}{\text{day}} \times \frac{2000 \text{ lbs.}}{\text{ton}} \times \frac{0.15 \text{ lbs.}}{1000 \text{ lbs.}} = 390 \text{ lbs./day}$$

In the example above, the production during the highest year of the last five years was used as the estimate of production. This estimate is appropriate when production is not expected to change significantly during the permit term. However, if historical trends, market forces, or company plans indicate that a different level of production will prevail during the permit term, a different basis for estimating production should be used.

Alternate Limits

If production rates are expected to change significantly during the life of the permit, the permit can include alternate limits. These alternate limits would become effective when production exceeds a threshold value, such as during seasonal production variations. Definitive guidance is not available with respect to the threshold value which should "trigger" alternate limits. However, it is generally agreed that a 10 to 20 percent fluctuation in production is within the range of normal variability, while changes in production substantially higher than this range (such as 50 percent) could warrant consideration of alternate limits. The major characteristics of alternate limits are best described by illustration and example:

Example: Plant B has produced 334,800 tons,. 260,400 tons, 220,000 tons, 240,800 tons, and 206,500 tons per year for

the previous five years. The high year is significantly higher than the rest and the permittee has made a plausible argument that production is expected to return to that level. The guideline for pollutant X is 0.08 lbs./1000 lbs. for the monthly average and 0.14 lbs./1000 lbs. for the daily maximum. The alternate effluent limitations could be calculated as follows:

Primary Limits:

- Basis of calculation: 260,400 tons/yr. = 1,050 tons/day (248 production days per year)

- Applicable level of production: less than 1,050 tons per day average production rate for the month

  Monthly Average Limit

  $$1{,}050 \frac{\text{tons}}{\text{day}} \times 2000 \frac{\text{lbs.}}{\text{ton}} \times \frac{0.08 \text{ lbs.}}{1000 \text{ lbs.}} = 168 \text{ lbs./day}$$

Daily Maximum Limit

$$1{,}050 \frac{\text{tons}}{\text{day}} \times 2000 \frac{\text{lbs.}}{\text{ton}} \times \frac{0.14 \text{ lbs.}}{1000 \text{ lbs.}} = 294 \text{ lbs./day}$$

Alternate Limits:

- Basis of calculation: 334,800 tons/yr. = 1,350 tons/day

- Applicable level of production = more than 1,050 tons/day average production rate for the month

  Monthly Average Limit = 216 lbs./day

  Daily Maximum Limit = 378 lbs./day

Alternate limits should be used only after careful consideration and only when a substantial increase or decrease in production is likely to occur. In the example above, the primary limits would be in effect when production was at normal levels. During periods of significantly higher production, the alternate limits would be in effect. When production reverted to normal levels, the primary limits would have to be met. In addition, alternate limits may also be appropriate in the case of special processes or product lines. The thresholds, measures of production and special repoting requirements must be detailed in the permit.

Multiple Products or Multiple Categories

Another complication is the situation of multiple products or multiple categories and subcategories. Determination of production and the calculation of the effluent limits will depend on the specific conditions. A typical case would be the integrated washing machine producer mentioned earlier. In this

case, the production in each of the categories is determined and multiplied by the appropriate factor for each category with the permit limits being the sum of these. Some guidelines also specifiy the terms of production so that nominal production rates will have to be adjusted to correlate to the terms specified in the guidelines.

Mass vs. Concentration Limits

Most of the effluent limitations for industrial facilities are expressed in terms of allowable mass (in units of pounds or kilogams) of pollutant per day. The permit writer should also consider the use of concentration limits. The rationale for including concentration limits is to encourage the proper operation of the treatment facility at all times. In the absence of concentration limits, a permittee could theoretically reduce treatment efficiency during low flow periods and still meet the facility's mass-based effluent limits. For example, Company A could have an average daily wastewater flow of 0.9 MGD. On a given day, the wastewater flow might drop to 0.6 MGD. In this example, pollutant "X" could be 150% of the 'normal' average. However, the company would still be in compliance with its permit, unless concentration limits were also included. The following calculation illustrates this matter:

Example: (Note: 8.34 is a conversion factor for converting gallons to liters)

For Company A, the mass limits for pollutant "X" have been set as follows:

Daily Maximum = 260 lbs/day; Monthly Average = 390 lbs/day

- Average Flow Conditions (0.9 MGD):

$$\frac{60 \text{ lbs/day}}{(8.34)(0.9 \text{ MGD})} = 35 \text{ mg/l} = \text{monthly average concentration}$$

- Low Flow Conditions (Example: 0.6 MGD)

$$\frac{260 \text{ lbs/day}}{(8.34)(0.6 \text{ MGD})} = 52.5 \text{ mg/l monthly average}$$

(150% of concentration during average flow!)

In determining applicable effluent concentration limitations, the monthly average and daily maximum mass limits divided by the average flow will provide concentrations which are appropriate:

$$\frac{260 \text{ lbs/day}}{(8.34)(0.9\text{MGD})} = 35 \text{ mg/l monthly average}$$

$$\frac{390 \text{ lbs/day}}{(8.34)(0.9\text{MGD})} = 52 \text{ mg/l daily maximum}$$

In the example above, it should be noted that the long term average flow is used to calculate both the monthly average and daily maximum concentrations. The use of the long term average flow is appropriate for the calculation of maximum concentration, in that it will reflect the range of concentrations which could be expected in a well operated plant. The use of the maximum daily flow is not appropriate to determine the daily maximum concentration from the daily maximum mass limitation as it will reduce the maximum concentration below the value which could be expected in a well operated plant. In fact, the "maximum concentration" calculated this way could be less than the average concentration. For example, Company A has a maximum daily flow of 1.6 MGD. Using this flow, the maximum concentration is calculated to be 29 mg/l, which is less than the average concentration limit of 35 mg/l. Concentration limits derived by these calculations should be evaluated using historical monitoring data and engineering judgment to be sure they are reasonable.

In certain instances, the use of concentration limits may be counter productive since they may discourage the use of innovative techniques such as water conservation. As an example, if a facility had a history of providing efficient treatment of its wastewater and also wished to practice water conservation, inclusion of concentration limits would probably not be appropriate. To summarize, the applicability of concentration limits should be a case-by-case determination based upon the professional judgment of the permit writer.

WATER QUALITY CONSIDERATIONS

Overview

Water quality-based limitations are used in a permit when it has been determined that more stringent limits than technology-based effluent guidelines must be applied to a discharge, in order to protect the "designed use" of the receiving waters. Water quality-based limits are generally more difficult to develop than ELGs since they involve a site-specific evaluation of the discharge and its effect on the receiving stream. Such an evaluation may include the collection of monitoring data on the receiving stream, and a mathematical analysis, possibly involving a computer program. In order to gain a clear picture of this situation, the permit writer must be familiar with the concepts of water quality criteria and water quality standards.

Water Quality Criteria

Two terms are frequently used when discussing water quality considerations: "criteria" and "standards". Water quality criteria refer to scientifically derived ambient limits (expressed in terms of concentration) which are developed by EPA for various pollutants of concern. These are recommended levels which should not be exceeded in a body of water in order to protect aquatic life and human health. For example, the maximum criteria for chromium are 50 ug/l total chromium for domestic water supplies and 11 ug/l hexavalent chromium for freshwater aquatic life. A criterion, in some cases, may be a narrative statement instead of a constituent concentration.

Water quality criteria are published by EPA as guidelines for use by the states in establishing their own standards. EPA periodically updates its lists of water quality criteria. The previous lists of water quality criteria are referred to as the Green, Blue, and Red Books, published in 1968, 1973 and 1976 respectively. In November 1980, EPA announced the publication of water quality criteria documents for 64 of the 65 pollutants designated as toxic under the Clean Water Act. These criteria update some but not all of the criteria found in the Red Book. Other amendments to the criteria have recently been proposed. Where criteria in the Red Book have not been updated, they remain valid.

Water Quality Standards

Every state is required (Section 303 of the CWA and 48 FR 51400) to develop water quality standards applicable to the various bodies of water within the state. Water quality standards are composed of two parts:

- Use classifications
- Narrative and/or Numerical Standards

1) Use Classifications

Use classifications describe the uses for which each state intends its waters to be suitable. The Clean Water Act requires each state to classify all of the waters within its boundaries according to intended use. (CWA § 303(c)(2)). In establishing the classifications, the states are to consider the value of water for:

- o public water supplies
- o protection and propagation of fish and wildlife
- o recreation
- o agriculture and industrial water supplies
- o navigation

Water quality standards, including use classifications, are to be reviewed by the states and, where appropriate, modified at least every three years. EPA's amended regulations specify that all classifications that do not provide for protection and propagation of fish and wildlife and water recreation must be reexamined to determine whether new developments warrant an upgrading. Although all water quality standards are subject to review at least every three years, the state is encouraged to identify priority water bodies for "in-depth review" under this schedule.

An important feature of the water quality standards regulation is an anti-degradation requirement. If a designated use is currently being attained, the water body may not be classified for a less stringent use. For example, if a water body is being used for fishing and potable water supply, the water body must be classified for those or more stringent uses regardless of the current classification or development pressures. Also, if water quality is better than necessary to maintain aquatic and recreation uses, that level of water quality must be maintained unless the State meets the conditions discussed in the Water Quality Standards Regulation.

Classification of the designated uses of water segments is primarily a state responsiblity. Currently most U.S. waters have been classified pursuant to the Clean Water Act. Procedures for reclassification are established under State laws and may require hearings, state environmental agency reviews and sometimes legislative action. All state reclassifications of water quality uses are subject to EPA review and approval in accordance with the provisions of Clean Water Act.

2) Numerical and/or narrative standards

A numerical water qaulity standard may use a national water quality criterion as a basis for regulation or enforcement, but the standard may differ from a criterion because of prevailing local natural conditions, the importance of a particular waterway, ecomomic considerations, or the degree of safety that may be desired for a particular ecosystem. For example, the dissolved

oxygen standards which would apply to a trout stream would undoubtedly be more stringent than those applicable to a shipping channel. State standards typically include some pollutant levels which should not be exceeded (e.g., nutrients, heavy metals, bacteria. etc.) as well as stream conditions which should be maintained (e.g. pH ranges, dissolved oxygen levels, etc.)

Where numerical values adequate to protect a designated use cannot be derived, the state may also establish narrative criteria Where narrative criteria are adopted, EPA requires the state to indicate how it will implement the standard, e.g., through periodic field sampling of the habitat or bioassays of the effluent (acute and chronic toxicity testing).

In some instances, criteria may be used to help interpret a narrative standard. For example, a state may specify as a narrative standard that all waters shall not be toxic to aquatic life or human health. In the absence of any state numerical standards for toxics, the national criteria may be used to define expected levels of toxicity.

Standards and criteria usually refer to ambient conditions, i.e., the concentration of the pollutant in the body of water itself. However, some state standards may include effluent standards as an adjunct to ambient standards.

Determination of Water Quality-Based Limits

The permit writer must consider the effect of the discharge from the facility under consideration upon any applicable state water quality standards. If, after calculation of BPT, BCT, or BAT limitations, receiving waters are still not projected to meet the water quality standards for the applicable use classifications, dischargers into such waters are subject to further effluent reduction. In addition, states are required to identify waters within their boundaries that are in violation of applicable water quality standards and to establish a priority ranking for such waters. Those waters are referred to as water quality-limited segments. States' identification of water quality-limited segments must be approved by EPA. Where a state has identified water quality-limited segments, it must adopt limitations for dischargers affecting the water quality of each segment which will ensure that the standards are met.

In states where EPA is the permitting authority, NPDES permits may not be issued until the affected state (or in some cases an interstate agency) either certifies that the permit satisfies appropriate state water quality laws or waives its right to do so. States have wide latitude to impose permit conditions pursuant to their own laws, including the right to impose effluent limitations more stringent than those imposed by federal law.

General Concepts of Water Quality Modeling

The primary tool which is utilized by regulatory agencies in setting water quality-based limits is the water quality model. A complete explanation of the process of water quality modeling is beyond the scope of this document; however, the important considerations in this process may be described. It is unlikely that the permit writer will become directly involved in developing complex water quality models since this is an area which is usually assigned to a specialized work group within the regulatory agency. It is very important, however, that the permit writer have an understanding of the considerations inherent in this process. The permit writer will use the end product of this process -- a water quality-based limit -- and therefore should know, in general terms, how the number was derived. In addition, the permit writer will often need to conduct a quick "desk-top" analysis to see if further water quality analysis is needed.

Water quality modeling studies provide information to assist in making effective decisions on levels of treatment required for a source or sources of pollutant load. Models are directed at establishing a quantitative relationship between a particular waste load and its impact on water quality. These relationships make it possible to assess the effect of incremental changes in the discharge of specific constituents upon the receiving

waters. With this capability, one is able to identify the maximum wasteload that can be discharged by a permittee without violating a water quality standard, and to thereby determine a cost-effective level of treatment. Cost-effectiveness, in this context, relates to the minimum level of treatment that will achieve a specified water quality objective, and assumes that costs are proportional to level of treatment. In some cases, the results of these studies are used to allocate wasteloads among a number of users.

Complications in determining cause-effect relationships and projecting impacts result from many factors. The primary one is the rate at which various reactions take place. This is particularly important in BOD/DO reactions where the resulting dissolved oxygen concentration is determined by competing reactions of oxygen consumption from BOD, ammonia, and organic nitrogen decay, and oxygen replenishment from reaeration. Because of the array of variable elements (temperature, stream flow, load level, reaction rates) that must be considered to establish rate coefficients and examine alternate conditions, computerized mathematical models are generally employed to make the necessary calculations.

One of the disadvantages of using mathematical models is their tendency to prevent the development of an understanding of the system and its responses by most involved parties other than the model analyst. This is because all pertinent interactions are embodied "within the model," and often only the final output is presented for review. However, mathematical models that are properly utilized can contribute greatly to our understanding of the system. Proper utilization can be checked by application of a simpler "desk-top" model in which the analyst conducts all calculations using simple equations and average inputs.

The level of effort that can be applied to the performance of a waste load allocation covers a broad spectrum in terms of resources assigned to collect water quality data and the extent of analysis efforts to calibrate and verify mathematical models. At one extreme, simple preliminary analyses would rely on existing data and estimates of additional information needed to perform the analysis. At the other extreme, water quality modeling studies could be quite thorough and comprehensive. While an effort approaching either of these extremes could be reasonable and appropriate under a particular set of circumstances, the general case would entail an intermediate level of effort.

Specific Considerations in the Water Quality Modeling Process

1. Classes of Pollutants

The selection of an appropriate water quality model depends upon the nature of the pollutant(s) of concern. Two classes

of pollutants are generally separated for modeling purposes:

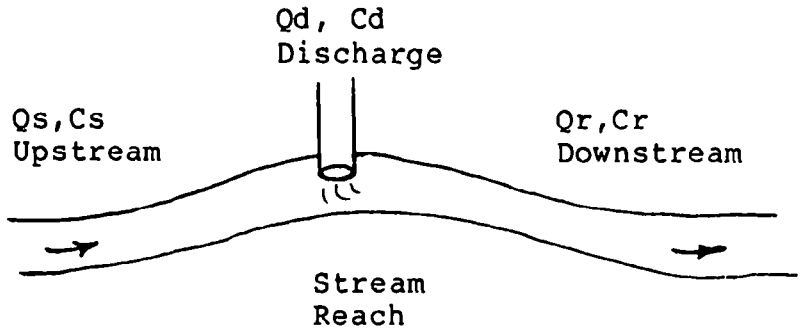
a) Conservative Substances

b) Non-conservative Substances

a. Modeling Conservative Substances

Conservative substances are those which are mitigated primarily by natural stream dilution after entering receiving bodies of waters, and include pollutants such as heavy metals. A "mass balance" or volume-to-volume water model is commonly used to develop effluent limitations for conservative pollutants. The mass-balance model allows the analyst to equate the mass of pollutants upstream of a given point (generally at a pollutant discharge, tributary stream or lateral inflow) to the mass of pollutants downstream after complete mixing. Using the simplified diagram below, the general formula for the mass-balance model is as follows:

$$QdCd + QsCs = QrCr$$



Qd = waste discharge flow (mgd or cfs)
Cd = pollutant concentration in waste discharge (mg/l)
Qs = background stream flow (mgd or CFS) above point of discharge
Cs = background in-stream pollutant concentration (mg/l)
Qr = resultant in-stream flow, after discharge (MGD or cfs)
Cr = resultant in-stream pollutant concentration (mg/l) in the stream reach (after complete mixing occurs)

The equation can be rearranged as follows to determine the downstream effect of a particular discharge concentration:

$$Cr = \frac{(Qd \times Cd) + (Qs \times Cs)}{Qr}$$

The equation can be further rearranged to determine the permit limit necessary to achieve a given in-stream concentration, such as a water quality standard:

$$Cd = \frac{Cr\ (Qd + Qs) - (Cs \times Qs)}{Qd}$$

As an example, assume a stream has a flow of 1.2 cfs and a background zinc concentration of 0.80 mg/l. The State standards for zinc are 1.0 mg/l or less. The allowable zinc discharge with a flow of 200,000 gpd is:

200,000 gpd = 0.31 cfs

$$Cd = \frac{1.0)(0.31 + 1.2) - (0.80)(1.2)}{0.31} = \frac{1.51 - 0.96}{0.31} = \frac{.55}{0.31}$$

Cd = 1.75 mg/l

b. Modeling Non-Conservative Substances

Non-conservative substances are those which are mitigated by natural biodegradation or other environmental decay or removal processes in the receiving stream after instream mixing and dilution have occurred. Examples of non-conservative pollutants are BOD_5, Ammonia, and Bacteria. Non-conservative models are used when it becomes important to determine the expected in-stream impact of a non-conservative pollutant at some point downstream of a pollutant loading.

In the simplest cases of modeling non-conservative substances, an assumption is made that the pollutant undergoes a "first-order" decay and/or removal in the stream. This type of model (first order decay) assumes that the rate of pollutant removal is a constant function of the instream concentration of the pollutant and can be mathematically expressed as:

$\frac{dC}{dt} = -KC$, where:

C = instream pollutant concentration at time = t
K = 1st order decay rate, t^{-1} or 1/t

The above expression can be integrated to the general form shown below:

$C_t = C_o e^{-Kt}$, where:

C_t = downstream concentration at time = t

C_o = initial instream concentration at point of discharge (i.e. at time, t = 0). C_o is calculated using the mass balance equation for conservative substances.

t = time of flow from point of waste discharge to downstream point of interest

K = instream 1st order decay or removal rate

The instream decay/removal rate is generally assumed to be a function of a single biological or physical/chemical process. However, the K rate may actually be a composite of several individual mechanisms and their associated rates (e g., biodegradation, volatilization, etc.). When this is the case, K is usually considered to be the summation of these individual rates if the individual decay mechanisms are acting independently each other and each decay mechanism is a 1st order process.

There are several special purpose models involving non-conservative substances. Perhaps the most typical situation in which a model is applied involves a determination of the downstream dissolved oxygen concentration due to the discharge of oxygen-consuming substances such as BOD. Various modifications of a model originally developed by Streeter and Phelps are used in this situation. These models utilize a seperate decay rate for both carbonaceous and nitrogenous BOD in performing a time-variable balancing of deoxygenation and reaeration. In using a simple DO model, the user will input a set of design conditions. If these result in a downstream violation of the DO criteria, then the input data can be modified and the process repeated until no violation is calculated.

2. Model Inputs

There are a number of important factors which must be considered when determining the values to be used in any type of water quality modeling application.

a. Stream Flow

The stream flow used is normally a low flow, when the discharge will have the greatest impact. For BOD5, D.O., etc., the 7Q10 is the generally accepted flow. The term 7Q10 refers to a 7 consecutive day average flow with a return period of 10 years. Flows with different return periods have been used in some cases. Some of the criteria documents for specific pollutants indicate which flows should be used in assessing impacts for those pollutants. In addition, The Technical Support Document for Water Qualtiy Based Toxics Control (EPA - July, 1985) provides guidance in this area.

Generally, the most severe water quality problems occur in the upper tributaries rather than in the main stem of rivers, simply on the basis of the lower quantity of stream water available for dilution. In fact, the 7Q10 for many tributaries is zero. In these cases, the effluent limitations would be equal to the stream standards (sometimes referred to as a "self-sustaining effluent) unless State WQS specify otherwise. Also, such streams may require a use-attainability analysis to see if the WQS are appropriate.

In some cases, the upstream concentrations exceed the State standards. In these situations, three factors must be considered.

First, it can be argued that it is not the dischargers' responsibility to clean up the waterway, and that the discharger should not have limitations which are more severe than the State standards. This effectively puts a floor to the effluent limitation at the receiving water standard. Second, if the source of the water discharged is the same body of water as that which receives the discharge, the provisions of § 122.45(h) Net Limitations may be applicable. Third, the WQS may need to be revised via a use-attainability analysis.

b. Waste Flow

The design waste flow, Qd used for water quality modeling is usually the same flow used in the determination of technology-based limitations as discussed previously. For industrial dischargers, it should be the expected average flow rate which corresponds to the representative production rate selected for determining technology-based mass limitations. Where industrial discharge rates may vary seasonally due to manufacturing process schedules, Qd should reflect the discharge rate which is expected to occur during critical low stream flow conditions. For sewage discharges, Qd should be the design flow for the treatment facilities.

c. In-stream Concentration

In the simplest case, assuming instream background concentration (Cs) is zero, the mass balance equation;

$$Cd = \frac{Cr(Qd + Qs) - (CsQs)}{Qd} \quad \text{becomes} \quad \frac{Cr(Qd + Qs)}{Qd}$$

As Cs increases above zero, the resulting allowable Cd decreases, thereby making Cs an important factor in determining effluent limitations.

There are various sources of data which the analyst may consult. State regulatory agencies may have ambient, water quality monitoring data taken at low flow, available for the stream under consideration. In addition, historical data can be retrieved from the EPA STORET system. It may be necessary, however, to perform special stream surveys for a particular modeling effort. Assumptions would have to be made in order to use this input for a low flow condition. If Cs is not equal to zero, Cs should ideally reflect natural background conditions (which would be present in the absence of man's activity in the watershed). Where applicable, background stream quality data may have to be adjusted to account for known pollutant contributions from other point sources on the receiving stream above the discharge point in question. This normally occurs during the process of "wasteload allocation" among dischargers on the same stream segment. (This concept is discussed in more detail in a following section).

d. Reaction Rates (K rates)

As discussed earlier, most water quality models predict downstream concentrations from two pieces of information: the initial instream concentrations of the pollutant and the rates at which instream reactions occur. The first item, as described previously, can be calculated in a relatively straightforward manner by performing a mass balance of the upstream concentration with the discharger's effluent concentration. A determination of the second item is generally more complex, since reaction rates may actually describe several simultaneous processes in a single number.

e. Photosynthesis, Respiration and Nutrient Loading

Under certain conditions, the discharge of nutrients, phosphorus and nitrogen, can stimulate the excessive growth of free-floating algae or attached vegetation. This can occur in impoundments, lakes or ponds, or slow-moving reaches in free-flowing streams. The result is the production of a diurnal swing in the dissolved oxygen. This appears as a rise in DO during the daylight hours and drop during the night. If this condition becomes excessive, nutrient control becomes an additional issue in setting effluent limits.

f. Mixing Zones

Most models use essentially an instantaneous model, where all the discharge and all the receiving waters are instantaneously mixed. This obviously does not occur in the physical world, but it is a good approximation in a number of situations where there is rapid mixing of the entire stream flow and the discharge. The more common situation involves a mixing zone. Many State Water Quality Standards allow a zone of mixing in which less stringent criteria apply than apply to the rest of the water body.

The criteria that apply to mixing zones vary from State to State. In some States there are explicit requirements for for water quality within mixing zones (such as no acute toxicity, floating materials, or deposit forming solids). In other states, there are no reqirements or the requirements are ambiguous. The allowable size of mixing zones also varies by State. Most States specify that the zone must not be as wide as the stream in order to allow a zone of passage for fish. Very few States specify the the allowable length. Usually, the size of the mixing zone is determined on a case-by-case basis taking into account the critical resource areas that need to be protected.

It is important to note that mixing zones should be evaluated and used for regulation in cases where mixing is not complete with-

in a short distance of the outfall. In the majority of cases involving conventional pollutants, mixing has been assumed to be complete since the impact of these pollutants occurs downstream. The regulatory authority has conducted the evaluation of the discharge and calculation of permit limits based on effuent dilution in the full stream flow. Evaluation and control based on a mixing zone has usually been limited to situations where mixing is known to be poor (e.g. shore-hugging plumes and discharges to large river, lakes, and estuaries). However, if mixing is assumed to be rapid and complete when it is not, a toxic discharge that appears to meet water quality standards may actually cause zones of chronic toxicity that extend for miles. Therefore, regulatory agencies should carefully evaluate mixing. Further detailed guidance on this topic is available in Technical Support Document for Water Quality Based Toxics Control

Model Development

It is important to remember that all models are simplifications of natural systems. Every kinetic pathway cannot be specifically represented in a model; overall concepts must be used. As a result, the specific values for reaction rates vary between waters and even at times within the same water. Model calibration defines the unique values of these rates; sensitivity analyses are performed as a part of the calibration process in order to assess the sensitivity of the model to changes in the various assumptions made by the model. It is important to verify these assumptions so that attention may be focused on obtaining the most accurate values for these factors, thereby allowing the best possible determination of effluent limitations necessary to protect water quality.

Sensitivity analyses with respect to models for non-conservative substances involves re-running the computer program (or "desk-top" model) while modifying various modeling input variables with a reasonable range. This will result in numerous computer runs producing a range of downstream conditions which correlate to a range of possible effluent limitations and treatment processes. The next step in the sensitivity analysis process is to determine which set of input and output represents the most valid set. The mass-balance model is generally a straightforward computation. Although there is no "sensitivity" to this model in the sense mentioned above, the model results can and should be tested under certain circumstances to assure that the effluent limits are appropriate.

The process of model verification consists of a comparison between calculated responses and observed phenomena. It involves actual data collection in order to determine how well the model

actually describes the system being modeled.

Derivation of Permit Limits to Enforce the Water Quality Models

The next step in this process is the direct responsibility of the permit writer, and involves the derivation of permit limits to enforce the WLA. At first glance, this may appear to be a relatively straight-forward process, however, there are a number of factors which must be taken into consideration. The model provides a measure of effluent quality that is necessary to protect water quality in the receiving water. It is very important to consider how the model addresses variability in effluent quality. For example, a model output for nutrients or bioaccumulative pollutants could be expressed as the average effluent quality, because the total loading of these pollutants is of concern. On the other hand, an output for toxic pollutants is normally expressed as a maximum value for the effluent beause the concentration of these pollutants is of more concern than the total loading. Therefore, it is important to recognize that the duration and frequency of occurrence of the required effluent quality is an important aspect of a water quality model.

There is a significant risk of incorrectly utilizing the output from a water quality model, if effluent variability and the basis for both the water quality model and the permit limits are not considered. The permit writer should be especially careful to ensure that the limits designed to implement the recommendations of water quality models are consistent with the assumptions and requirements associated with water quality models. A detailed discussion of this topic is provided in the Technical Support Document for Water Quality Based Toxics Control.

Wasteload Allocation

The difficulty of setting water-quality-based limitations is further complicated where water quality in a segment is affected by more than one discharger, and the burden of effluent reduction must be allocated among the various dischargers.

A regulatory agency's first step in establishing a waste load allocation scheme for a water segment is to determine the total maximum daily load (TMDL) of discharges a segment can receive without exceeding the applicable water quality standard. The TMDL established by the state must be submitted to EPA for its approval before incorporation into the state's water quality management plan. As a rule, TMDLs are established only for the five conventional pollutants -- BOD, pH, total suspended solids, fecal coliform bacteria, and oil and grease -- and ammonia and phosphorus.

Once the state has determined the amount of discharge a segment can assimilate without violating water quality standards, that amount less the amount of capacity reserved by the state, if any, is allocated among dischargers. The states are responsible for the establishment and implementation of the allowable schemes. Most allocation schemes have divided the allowable effluent discharges among permittees on the basis of the proportion of the total effluent a facility has discharged into the stream in the recent past. Limitations are currently expressed as total loadings or, much less frequently, as concentrations, or both, and are incorporated as conditions in each of the individual facilities' NPDES permits.

Water-Quality Based Control of Toxic Pollutants

There are a number of special considerations which apply to the specific area of developing permit limitations and conditions for toxic pollutants. This is an extremely important area which is increasingly becoming an integral part of EPA and state permit programs. It is therefore recommended that all permit writers have a basic understanding of the subject. For additional information, the reader is referred to the Technical Support Document for Water Quality-Based Toxics Control.

1. National Policy

EPA issued a national policy on water quality-based permit limits for toxic pollutants on March 9, 1984 (49 FR 9016). The main feature of this policy is the statement that an integrated strategy, using both biological and chemical methods will be necessary to control the discharge beyond the application of the Best Available Technology (BAT). Thus, the policy recognizes that it is not always possible to set limits on every chemical of concern (as determined by either a technology-based limit or as established by a water quality model). There may often be too many chemicals to limit or there may be unknown toxicants. In addition, chemical limits do not address the extent to which a wastewater discharge may impact aquatic organisms (bioavailability). It is therefore necessary, in some instances, to use toxicity as an assessment tool and effluent control parameter.

2. Toxicity Testing

Toxicity is measured by exposing organisms to wastewater or receiving water samples to determine the effects to the organisms. Different species exhibit different sensitivity to a toxicant. It is impossible to generalize about which species are most sensitive to a particular effluent containing a mixture of chemicals. Effluent and ambient samples are often are of unknown composition. Thus, it is impossible to predict which of several organisms will be most sensitive. The purpose of toxicity testing is to measure a portion of the range of sensitivity that would be expressed in the natural community and then use a test organism from the more sensitive end of

that range to characterize the effect on the community. The selection of test organisms is not important as long as the selected organisms represent ecologically diverse taxa. At least 3 species should be tested to select the most sensitive.

Usually the test is set up to determine the dilution of sample that causes some effect endpoint. Common endpoints are 50% mortality (LC_{50}) and no observable effects (NOEL). Acute toxicity is effects that occur from exposures of short duration relative to an organism's lifespan. Chronic toxicity is effects that occur from exposures of long duration (concerned principally with growth, reproduction, and latent mortality). Toxicity is often expressed as the dilution of sample that causes the test endpoint (or the concentration of chemical that causes the endpoint). For example, a water sample is diluted in a serial dilution series and no effects are observed in dilutions below 25% sample. The NOEL is expressed as 25% sample.

To use criteria, facilitate modeling, and express permit limits, it is recommended that toxicity be expressed as toxic units. A toxic unit is merely the inverse of the sample fraction. Toxicity expressed as percent sample is divided into 100 to obtain toxic units. The example above can be expressed as 4 chronic toxic units. When using toxic units it is important to distinguish acute toxic units from chronic toxic units.

Toxicity testing is often utilized as a screening and assessment tool as a preliminary step in the process of setting water quality based permit limitations for toxic pollutants. Preliminary testing may indicate that the effluent is not toxic and that toxicity-based based limits are not warranted. Toxicity testing may also take the form of a monitoring requirement. Such a requirement could be used in conjunction with toxicity-based limits or as a separate condition. In the latter case, results of the testing requirement would serve to indicate whether the existing limitations were sufficient or whether more stringent limitations were required.

3. Toxicity as a Water Quality Criteria

EPA has developed the following recommended criteria with respect to toxicity:

Criteria for acute protection:

- Magnitude: less than 0.3 acute toxic units to the most sensitive of at least 3 test organisms
- Duration: as a 1-day average
- Frequency: no more frequently than once every 3-5 years

Criteria for chronic protection:

- Magnitude: less than 1.0 chronic toxic units to the most sensitive of a least 3 test organisms
- Duration: as a 4-day average
- Frequency: no more frequently than once every 3-5 years

Many state water quality standards contain the general requirement that: "there shall be no discharge of toxic pollutants in toxic amounts." This general requirement can also be the basis of a permit limitation, as will be discussed in a following section.

Derivation of Water quality-Based Permit Limits

There are basically two methodologies which may be used in setting permit limits:

a. Dilution Method

The first method is relatively simple and involves a minimal investment of time and resources. It is based upon an assessment of the basic relationship between criteria, effluent quality, and assimilative capacity:

(effluent toxicity) x (1/Dilution factor) $\leq$ criterion

where effluent toxicity and the criterion are expressed in toxic units and the dilution factor is the factor by which the effluent is diluted in the receiving water (e.g., 1 MGD effluent into 9 MGD receiving water yields a dilution factor of 10).

For multiple sources assume additivity:

$$\frac{(Qe\ Te)}{(Qe) + Qs} \leq \text{criterion}$$

Qe = effluent flow
Te = effluent toxicity
Qs = stream flow

The assumption of additivity can be tested by using ambient (in-stream) toxicity tests. Note that limitations depend on the dilution and the criteria. Permit limits can be developed without prior testing of the effluent discharge.

For example: permit limit = criterion x dilution factor

The advantage of this method is that it is easy and relatively straightforward. The disadvantage is that it is not as accurate as the more complex methods available which involve data generation.

b. Detailed Method

The second method is considerably more complex and involves several parts:

(1) Screening and Assessment

In conjunction with this method an assessment prior to permit limit development in order to:

- determine or confirm that an impact exists
- develop data on test organism sensitivity to avoid the 10X species sensitivity factor

- o develop data on effluent variability in order to use dynamic exposure models
- o assess the dispersion for mixing zone analysis

The applicant should be required to provide the data necessary to make the assessment. A tiered assessment approach is recommended. Uncertainty factors are used to account for insufficient data. In any tier, if impact is projected the permit writer can either go to limit development or permit the applicant to collect more data and eliminate one of the uncertainty factors.

(2) Modeling

The objective is to model the assimilative capacity in order to determine the relationship between sources of pollutants and attainment of the criteria. Three types of models may be used for this purpose. Each has advantages and disadvantages.

- o Standard steady state
- o Dynamic computer models
- o Acute and chronic steady state

(3) Setting Permit Limits

Limits must enforce the Wasteload Allocation (WLA)

WLA and limits may have to be different because each may use a different expression of effluent quality or have incongruent assumptions about probability of occurrence.

Toxicity Reduction Evaluation

One mechanism that can be used in bringing a discharger into compliance with a difficult water quality-based requirement is a toxicity reduction evaluation (TRE). A TRE is a study conducted in order to to determine what control options are effective for complying with either toxicity or chemical concentration requirements. In most cases the plant manager should be responsible for conducting a TRE. A TRE can be done prior to permit issuance, during the permit term in response to a monitoring trigger, during the permit term in response to exceedances of limits, or in response to an administrative order.

BEST PROFESSIONAL JUDGMENT

Overview:

The third method of developing effluent limitations is by means of Best Professional Judgement (BPJ). It is used in those cases where an effluent limitation guideline has not been promulgated for the industry or pollutant under consideration and where a water quality standard is not applicable. BPJ is defined as the highest quality technical opinion developed by a permit writer after consideration of all reasonably available and pertinent data or information which forms the basis for the terms and conditions of an NPDES permit.

The authority for BPJ is contained in Section 402(a)(1) of the Clean Water Act which authorizes the EPA Administrator (or the head of an EPA-approved NPDES State Agency) to issue a permit containing "such conditions as the Administrator determines are necessary to carry out the provisions of this Act" prior to taking the necessary implementing actions, such as the establishment of effluent limitations guidelines.

Background:

BPJ has proven to be a valuable authority and tool for NPDES permit writers over the years. Because it is so broad in scope, BPJ allows the permit writer considerable flexibility in establishing permit terms and conditions. Inherent in this flexibility, however, is the burden on the permit writer to show that his/her BPJ is based on sound engineering analysis. The determination of a permit condition (e.g., a limit on a particular pollutant) is subject to challenge by the permittee and, if unresolved through negotiation between the parties, may be the subject of an evidentiary hearing or other legal challenge. Therefore, the need for the permit condition and the basis for its establishment should be clearly defined and documented. References used to determine the BPJ condition should be identified. In short, the rationale for a BPJ permit must be carefully drafted to withstand the scrutiny of not only the permittee but also the public and, ultimately, a hearing officer.

During the first round of NPDES Permits in the early-to-mid 1970's, a majority of permits, perhaps as many as 75%, were based on the authority of section 402(a)(1). These first round so-called best engineering judgment (BEJ) permits were drafted because effluent guidelines were not available for many industries (BEJ was the forerunner of Best Professional Judgement). As effluent guidelines began to be promulgated, permit writers had to rely less on their "BEJ" and could apply the effluent limitations in permits. Of course, where limits established by water quality considerations are more stringent than the technology-based requirements as established by an effluent limitation guideline or the BPJ of the permit writer, the water quality standard prevails and forms the basis of the permit condition.

As we enter the "age of toxic pollutant control" in the 1980's, we must become more rigorous in our determination of BPJ conditions in permits. The NPDES Regulations in §125.3 state that permits developed on a case-by-case basis under Section 402(a)(1) of the Act must consider: 1) the appropriate technology for the category or class of point sources of which the applicant is a member, based upon all available information, and 2) any unique factors relating to the applicant.

Establishing BPJ Conditions in Permits:

In setting BPJ limitations, the permit writer must consider several specific factors. The factors which are enumerated below, are also those required to be considered in the development of effluent limitations guidelines, and therefore, are often referred to as the "304(b)" factors:

1) For BPT requirements:

   a) The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application

   b) The age of equipment and facilities involved requirements)

   c) the process employed

   d) The engineering aspects of the application of various types of control techniques

   e) Process changes

   f) Non-water quality environmental impact (including energy requirements)

2) For BCT requirements:

   * Items b-f above, plus the following requirements:

   a) The resonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived

   b) The comparison of the cost and level of reduction of such pollutants from the discharge of publicly-owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources

3) For BAT requirements:

* Items b-f of the BPT requirements, plus the following:

e) The cost of achieving such effluent reduction

A permit writer must consider each of the factors in §125.3 of the NPDES regulations in establishing BPJ-based conditions in permits. Precisely how this is to be done is not defined and, in fact, probably would limit the permit writer's flexibility to address site-specific conditions at a facility which directly affect the terms and conditions of the permit. Remember, BPJ has an element of judgment or "educated opinion" in it. An engineer with the proper tools should be able to establish BPJ conditions in permits which are both technically sound and reasonable.

A technically sound and reasonable permit is not likely to be successfully challenged by the permittee or a third party. In this context, technically sound" permit conditions means that the conditions are achievable with existing technology and "reasonable" means they are achievable at a cost which is affordable by the facility. Historically, some of the other factors such as age, process employed and non-water quality impacts have assumed lesser importance than the technical and economic feasibility (technically sound and reasonable) tests.

BPJ Permitting Tools

References (data sources, tools, etc.) for BPJ permit writing are numerous and voluminous. As one gains experience drafting BPJ permits, it is common practise to rely on some references more than others. The following references and brief explanations are intended to introduce the permit writer to some of the BPJ data sources which have proven useful over the years and are listed on the following page.

BPJ Permitting Tools

- o Abstracts of Industrial NPDES Permits
- o Treatability Manual
- o NPDES Best Management Practices Guidance Document
- o Technical Support Document for the Development of Water Quality-Based Pemit Limitations for Toxic Pollutnats
- o Economic Achievability Protocol ("Workbook for Determining Economic Achievability for NPDES Permits", August 1982)
- o NEIC Reports on Specific Facilities
- o Toxicity Reduction Evaluations for Selected Industries
- o Industry Experts within EPA
- o Effluent Guidelines Information
    - ° §308 questionnaires
    - ° Screening & verification data
    - ° Development Documents
    - ° Contractors' Reports
    - ° Proposed Regulations
    - ° Project Officers
- o Pollutant Compliance System (PCS) Data
- o Permit File
    - ° Previous NPDES application forms
    - ° Discharge Monitoring Reports
    - ° Compliance Inspection Reports
- o Other Media Permit Files (RCRA permit applications, SPCC plans, etc.)
- o The Literature (technical journals, books, etc.)

MUNICIPAL PERMIT CONSIDERATIONS

Overview

The previous section explained the three basic approaches used for setting NPDES permit limitations in an industrial setting. These general approaches are also applicable to municipal NPDES permits. However, there are some distinct differences which bear special consideration. There are several important program areas which apply specifically to municipal discharges. These are:

- o Secondary Treatment Definition
- o Construction Grants
- o National Municipal Policy
- o Pretreatment

Each of these four topics will be discussed in the sections which follow. A complete explanation of all of the aspects of these programs is outside the scope of this document. Rather, the intent is to explain how these programs relate to the process of writing municipal NPDES permits. The reader is referred to the various documents listed in the bibliography for more detailed discussions of these programs.

1) Technology - Based Requirements

For purposes of discussion, one may think of municipal wastewater treatment facilities as being analagous to a single industrial category. The type of technology-based limit which is applicable to this category is called "secondary treatment." Secondary treatment limits are defined by regulation (Part 133) and are used for all effluent-limited situations. The use of conventional secondary treatment limits are analagous to guidelines for primary industries and do not involve BPJ decisions by the permit writer.

Recent changes to the secondary regulation (initiated by the 1981 Amendments to the CWA) have introduced the BPJ concept to certain classes of municipal permits that formerly incorporated conventional secondary treatment. This "equivalent to secondary" treatment classification is discussed in the following section.

2) Best Professional Judgement

As with industrial permitting considerations, BPJ is sometimes exercised in setting limits in municipal permits when water quality considerations are not limiting and when the use of limits based on the conventional secondary definition is inappropriate.

The use of BPJ for municipal permits involves the consideration of various site-specific factors which may lead to the development of effluent limitations which less stringent than conventional

secondary treatment limits, but which reflect treatment technologies which are considered to be "equivalent to secondary". The various site specific factors which must be considered in this process include the type of treatment technology employed and the operating history of the treatment facility or of similar facilities. This topic is discussed in detail under Secondary Treatment Definition.

3) Water Quality Considerations

The same general water quality considerations which were discussed previously apply to municipal discharges. However, when assessing water quality impacts with respect to municipal discharges, the driving factor is usually in-stream dissolved oxygen concentration. The reason for this stems from the fact that the primary pollutant in muncipal wastewater is oxygen-demanding matter (of both carbonaceous and nitrogenous origin). In some cases, "nutrients" (NO_3 & PO_4) may also be of concern. Where a wasteload allocation model or an areawide water quality plan indicates the need for more stringent limits than technology-based limits (conventional "secondary" or "equivalent to secondary"), the permit's effluent limitations must reflect these more stringent limits. In these cases, higher levels of treatment must be applied to achieve desired effluent levels. Such treatment may involve some additional treatment steps to augment a secondary treatment system. These steps might involve additional aeration or recycle. The resulting treatment scheme is then called "advanced secondary", "greater than secondary", or "tertiary" - depending upon the type of system. Finally, the permit writer should be aware of the need to consider water quality-based limitations on toxic pollutants, in those situations where the contribution from industrial wastes to a municipal facility may be significant.

Secondary Treatment Definition

The most important aspect of municipal wastewater is that it is amenable to biological treatment. In this type of treatment, micro-organisms are brought into contact with the wastewater under a certain set of conditions and biologically oxidize the organic matter present. The biological component of a municipal treatment plant is termed secondary treatment and may be preceded by simple settling (primary treatment). Just as effluent limitation guidelines applicable to an industrial category establish effluent limitations based upon the appropriate treatment technology applicable to the industrial category, municipal guidelines have been established based upon the efficiency of secondary treatment systems. This has historically been defined in terms of: 1) the desired effluent concentrations of 5-Day Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS) -- these levels were defined in the past as 30 mg/l of both BOD_5 and TSS; 2) the percent removal for BOD_5 (effluent concentration vs. influent concentration) was specified as 85% for secondary treatment; and 3) the pH value must be maintained between 6.0 and 9.0 in the effluent.

However, the definition of secondary treatment has recently been modified. On September 20, 1984 the EPA published the revised secondary treatment regulations (Part 133). These regulations change the treatment limitations and permitting process for trickling filters and waste stabilization ponds that qualify as "equivalent to secondary" treatment. Several important concepts form the basis for this revision of the regulations:

(1) Certain classes of biological treatment facilities that are capable of achieving significant reductions in BOD and suspended solids, but cannot consistently achieve secondary treatment, should be defined as separate and distinct from secondary treatment facilities.

(2) These facilities (equivalent to secondary) are cheaper and easier to operate and, therefore, are utilized by smaller communities. The provisions established by EPA should provide for continued use of these technologies where possible.

(3) The technology based effluent limitation approach used to establish secondary treatment should be retained for "equivalent to secondary" treatment limits.

(4) Water quality must not be adversely affected by the application of equivalent secondary treatment.

(5) Costly treatment plant upgrading or replacement should be avoided where equivalent facilities are operating sufficiently (e.g., achieving their original design performance levels).

(6) Regulations should address variations in facility performance due to geographic, climatic or seasonal conditions.

In recognition of the above factors, the revisions entail a change in the traditional definition of secondary treatment. The major change is a shift away from uniform limitations for all secondary facilities to an individual, case-by-case limits decision for specific POTWs. The capability and performance of an individual plant is assessed, and limits are selected from a range of possible values. Although this process has been used for industrial facilities, the concept has generally not been applied to municipal permits (with the exception of interim permit limits).

To be eligible for "equivalent to secondary" limitations a municipal treatment works must meet all of the following criteria:

(1) The principal treatment process is a trickling filter or lagoon (e.g., the largest percentage of BOD and TSS removal is provided by the trickling filter or lagoon system).

(2) The effluent quality consistently achieved, despite proper operating and maintenance practices, is in excess of 30 mg/l BOD_5 and suspended solids.

(3) The treatment works as a whole provides significant biological treatment such that a minimum 65% reduction of BOD_5 is consistently attained (30-day average).

Obviously, a treatment works that is operating beyond its design hydraulic or organic loading limit is not considered an eligible facility. If overloading or structural failure are causing poor performance, the solution to the problem is construction, not effluent limitation adjustment. There are several important implications of the Secondary Treatment Regulation as it applies to specific municipal permitting issues. These issues are discussed below.

New Plant Limitations

The permitting authority must set more stringent limits for new facilities if an analysis of new plant performance shows that more stringent limits (than 30/30) can be me (133.105(f)). Recently, a wide range of designs (solids contacts channels, covers, etc.) have been used on trickling filters to improve their performance. This situation creates a performance dichotomy between old trickling filters annd current state-of-the-art plants. The regulations recognize this disparity and encourage States to establish separate limits for new trickling filters based on current design practices in the State. Where possible, an analysis of similar plants in other States is the preferrred method for establishing permit limits, where in-State data on new trickling filters is not available. Where no performance data is available for determining new plant capability, literature values may be used.

An upper limit of 35 mg/l BOD and TSS for new trickling filters is suggested in the regulation. This values recognizes the improved performance possible with new trickling filter technology. It also provides some incentive for municipalities to construct new trickling filters.

Calculating Permit Limits for Equivalent Secondary Facilities

In most cases the permit limits for equivalent facilties should be selected from the 30-45 mg/l BOD and TSS "range" established by the regulation. Obviously, not all permits will be set at the top of range - 45 mg/l. The selection must be based on current performance data for the last two years of operation (at a minimum).

Where the plant performance data contains erroneous values due to plant upsets, or other situations not associated with poor operation or maintenance, an adjustment to the permit limit calculation may be made. The data for the month in question may

be adjusted by dropping the erroneous daily level and recalculating the monthly average based on the remaining daily values. Another alternative is to analyze monthly average values for a period greater than 2 years and drop the monthly averages that are erroneous due to explained upset situations. Discharge Monitoring Report data should be used for calculations whenever possible. The available effluent monitoring records must support the permit limits decision for an equivalent secondary facility. Remember, the burden of proof for performance data and demonstration of proper operation and maintenance is the responsibility of the municipality.

Often a trickling filter or lagoon will be combined with another biological process (i.e., activated sludge process) in one treatment plant. In this case, if the trickling filter or lagoon qualifies for equivalent secondary limits, the permit limits for the treatment plant can be derived by averaging the equivalent secondary and conventional secondary treatment limits. To accomplish this, a flow-weighted average of the process effluent concentration limits should be calculated. This value will be the plant outfall limitations for the permit. An alternative to this approach is the use of internal waste stream (Section 122.45(h)) limitations for each biological process effluent line.

The permit writer should encourage the continued use of existing trickling filters and lagoons, where appropriate, through the application of appropriate equivalent secondary limits. However, the permit writer must be sure that these facilities are capable of meeting the proposed effluent limits without causing water quality impacts before the permit limits can be adjusted. If one cannot determine this, equivalent secondary limits cannot be used in the permit.

Alternative State Requirements (ASRs)

The ASR provision of the regulation allows States the flexibility to set permit limits above the national range (less stringent than 45 mg/l BOD and TSS) in certain situations. Where lagoon suspended solids requirements are already above 45 mg/l in accordance with §133.103(c); an ASR by the State is not necessary, unless higher limits are desired. To establish an ASR, the State must:

1) identify a group of equivalent facilities that warrant different permit limits (than the values contained in Part 133) and

2) justify the higher permit limitations for these facilities.

The group of facilities can be selected because of climatic or geographic location, the type of technology used or any other

supportable criteria. The analysis of plant data for the group must be statistically sound and the method presented in Technical Support Document must be followed. The ASR must be approved by the EPA Region before permits can be written using the ASR values. The public notice of a proposed ASR is the responsibility of the State. EPA will publish approved ASRs in the Federal Register.

Carbonaceous BOD (CBOD) Limits

The EPA recognizes that the CBOD test will provide more accurate information on treatment plant performance in many cases However, the use of CBOD in permits should be focused on facilities with known or suspected nitrification problems such as underloaded and new facilities with long detention times. These conditions favor nitrifying bacteria and can lead to erroneous BOD test results.

The final secondary regulations allow optional use of a carbonaceous BOD_5 ($CBOD_5$) limit and test procedure in municipal permits as a substitute for the standard 5-day BOD. This substitution is totally at the discretion of the permitting authority. To establish a CBOD limit for an equivalent treatment facility, the permitting authority must have data to show that nitrifying bacteria in the treatment plant are causing the BOD test results to be inaccurate. Extensive BOD/COD comparisons should not be necessary because the actual CBOD limit will be established by (1) determining the BOD limit that can be met through proper operation and maintenance (the same process for any trickling filter or lagoon) and (2) if the BOD limit is between 30 and 45 mg/l - the CBOD limit is set 5 units lower (e.g., between 25 and 40 mg/l).

The EPA approved test procedures in 40 CFR Part 136 now contain a CBOD (nitrogen inhibited) test procedure. The CBOD test is listed as "Parameter no. 14, Table IB" in the October 26, 1984 Federal Register. If a CBOD limit is used in the permit, the permit must specify the EPA approved CBOD test procedure which is explained in the 15th edition of Standard Methods for the Examination of Water and Wastewater.

The CBOD test can be specified for any municipal permit, however, the BOD/CBOD relationship (5 mg/l difference) may not apply outside the 20-45 mg/l BOD range. If CBOD limits will be used for equivalent secondary permits above 45 mg/l (BOD), a BOD/CBOD relationship should be established during the ASR process. Where parallel BOD/CBOD test data are available, they must be submitted to the EPA Regional office with the proposed Alternative State Requirements for approval. For permit limits below 20 mg/l (BOD), the corresponding CBOD limit should be developed during an Advanced Treatment Review or from the wasteload allocation. Note that use of CBOD in the permit is not a substitute for nitrogen or ammonia limits if in-stream nitrification or ammonia toxicity is creating a problem.

Construction Grants

The previous section examined the technology-based effluent limitations with respect to municipal dischargers -- both as originally defined and as recently redefined. In cases where a discharger cannot meet the effluent limitations established in their NPDES permit, it is obvious that treatment facility upgrade or construction of new facilities is required. Where this situation arises in connection with industrial permits, the industry is responsible for constructing the necessary treatment facilities with corporate funds in a time frame acceptable to the permit writer and the permitting authority. However, in the case of municipal facilities (POTW's), a different funding mechanism is available.

Section 201 of the CWA provides for "construction grants" for municipalities. This program involves a cost-sharing arrangement in which the federal government provides 55% of the cost of the treatment facility while the local government must provide the remaining 45% (prior to October 1, 1984, the federal "share" was 75% and the local share was 25%). It is not necessary for the permit writer to be familiar with all of the intricacies of the construction grants program, but it is important to understand the impact of this program upon establishing limits on municipal NPDES permits.

Statutory History

The Clean Water Act orginally established July 1, 1977, as the statutory deadline for publicly-owned treatment works (POTWs) to comply with both water quality-based and technology-based permit requirements. Congress later authorized the EPA (or State) to extend the compliance deadline for certain municipalities. In order to receive an extension under §301(i) of the CWA, a municipality had to apply by June 1978 and to demonstrate in its application that construction could not be completed by the July 1, 1977 deadline, or that the Federal government had failed to provide grants in time to allow the POTW to meet the deadline. EPA or the State was authorized to extend the compliance date for such POTWs to the earliest date by which grants would be made available and construction could be completed, but no later than July 1, 1983.

In 1981, Congress recognized the need to provide additional time for some POTWs to achieve compliance and amended §301(i) to allow eligible facilities additional time to comply with their applicable effluent limits. EPA or the State is authorized to extend the compliance date for eligible POTWs to the earliest date by which grants are available, and construction can be completed, but no later than July 1, 1988.

A POTW is eligible for an extension beyond 1983 only where reductions in the amount of financial assistance under the CWA or changed conditions affecting the rate of construction, beyond the

control of the owner or operator, made it impossible to complete construction by July 1, 1983. Any municipality that is not currently in compliance with its permit requirements and has not received a §301(i) extension, is in violation of the July 1, 1977, statutory compliance deadline. There are, however, many §301(i) applications that have never been acted upon.

In 1981, Congress also amended other sections of the CWA to provide significant reform and redirection to the Federal Construction Grants Program. Congress, for example, amended §201 of the CWA to reduce both the number of categories of POTW construction costs that are eligible for Federal funding after September 1984, and the federal share of the total eligible costs. These changes indicate a Congressional intent to reduce local dependence on Federal funding assistance and to increase local accountability for achieving compliance with the requirements of the CWA.

Relationship of Construction Grants Program to Permit Writing

The important aspect of the construction grants program as it applies to the permit, is the need for a determination of the eligibility of the POTW for federal funding to construct the necessary treatment facilities. The effluent limitations contained in the permits for such facilities should reflect the limits which are required, based upon either water quality or technology. The attainable, interim effluent limitations should be contained as part of the compliance schedule, tied to the funding arrangements. Permittees that are not eligible to receive such funding and which are not in compliance with required effluent limitations are in violation of their limits and must take corrective action. This differentiation is clearly defined in the National Municipal Policy.

National Municipal Policy

Because of historic and current problems with municipal compliance, the EPA developed the National Municipal Policy in Jan., 1984. The policy places renewed emphasis on improving municipal compliance rates in order to protect the Nation's water quality. The policy basically reaffirms that municipalities must comply with the statutory deadlines in the CWA, whether or not they receive Federal funds. While the deadlines in the CWA apply to all POTWs, the policy states that the EPA will focus its compliance efforts on (in order of priority):

1) fully constructed POTWs that previously received Federal funding assistance and are not currently meeting their permit limits,

2) on all other major POTWs, and

3) on minor POTWs that are contributing significantly to an impairment of water quality.

The policy also recognizes that there may be extraordinary circumstances that make it impossible for some municipalities to comply even by 1988. In such cases, provided that the municipality has acted in good faith, the EPA will work with the States and the affected municipalities to establish enforceable schedules for achieving compliance as soon as possible thereafter. These schedules will also require such municipalities to undertake appropriate, interim abatement measures. Nothing in the Policy is intended to impede or delay any ongoing or future enforcement actions. There are several principles which should be used by the Regions and States as a guide in developing State-specific strategies and compliance schedules for affected municipalities. These are as follows:

1) Responsibility for compliance rests with each community

2) Funding decisions should be based on the potential for water quality improvement

3) Special emphasis should be based on the potential for water quality improvement

4) Special emphasis should be placed on compliance by POTW's that have completed construction of the necessary treatment facilities.

* 5) Construction grant agreements must be honored, and grant and permit schedules must be coordinated.

* 6) EPA and States should provide municipalities with as much certainty as possible regarding applicable permit limits prior to requiring commitments to major capital investments.

* 7) Compliance schedules should be reasonable

* 8) Where compliance cannot be achieved promptly, POTWs should take appropriate, interim steps toward compliance with applicable effluent limits.

*(The municipal permit writer should be particularly aware of items 5 through 8 above, in developing permit limitations and compliance schedules).

The National Municipal Policy establishes several steps that non-complying municipalities must follow to reach compliance with permit limits. The municipality must submit a Municipal Compliance Plan (MCP) or Composite Correction Plan (CCP) to demonstrate how and when compliance can be achieved. The compliance schedule from the MCP or CCP (once approved by the State or EPA) is inserted in a permit or Administrative Order (§309(a)(5)(A)). The permit writer may be involved in permit modification to incorporate compliance schedules as a result of the Municipal Policy. In general, compliance schedules should be in place by the end of 1985 to ensure that compliance can be achieved by 1988.

Pretreatment

Another municipal permitting issue which the municipal permit writer must be aware of is the pretreatment program. The following sections provide a brief overview of the program. The concluding section discusses the relationship of the pretreatment program to the NPDES progam and the role of the municipal permit writer with respect to the pretreatment program.

Statutory History

The discharge of industrial pollutants into municipal sewer systems can result in water pollution and related problems at the local wastewater treatment plant. Congress decided that the most feasible solution to this problem is to regulate discharges from industrial users and, where necessary, require pretreatment by these users to remove pollutants from their wastewaters prior to discharge into municipal sewers. The Clean Water Act focuses pretreatment requirements on the control of toxic pollutants by establishing pretreatment standards for industrial and commercial dischargers in specific industrial categories determined to be the most significant sources of the 65 classes of toxic pollutants referenced in Section 307(a) of the Act. In other parts of the Act, Congress assigned the primary responsibility for enforcing national pretreatment standards to the local publicly owned treatment works (POTWs).

To implement this mandate, EPA first issued the General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403) on June 26, 1978. Revised regulations became effective on March 30, 1981. The Regulations establish procedures, responsibilities, and requirements for EPA, States, local governments, and industry.

Objectives of the Pretreatment Regulations

There are four major problems that can be prevented through implementation of a local pretreatment program:

(1) Interference with POTW operations: Since municipal wastewater treatment systems are designed primarily to treat domestic wastes, the introduction of nondomestic wastes may affect these systems. For example, the bacteria in activated sludge treatment systems can be inhibited by toxic pollutants. The result is interference with the treatment process, which means that domestic and industrial wastes may be improperly treated before being discharged into the receiving stream.

(2) Pass-through of pollutants: Even if pollutants do not interfere with the treatment systems, they may pass through POTWs without being adequately treated because the systems are not designed to remove them.

(3) Municipal sludge contamination: The removal of certain pollutants (particularly metals) by the POTW's treatment system can result in contamination of its sludge. Such contamination can limit the POTW's sludge management alternatives and increase the cost of appropriate sludge disposal methods.

(4) Exposure of workers to chemical hazards: When combined with domestic wastes, industrial wastes can produce poisonous gases, such as hydrogen sulfide, which are hazardous to POTW personnel.

The General Pretreatment Regulations require that any POTW (or combination of POTWs operated by the same authority) with a design flow greater than 5 million gallons per day (mgd) must establish a pretreatment program as a condition of its NPDES permit. POTWs with design flows less than 5 mgd may also be required to establish a pretreatment program if nondomestic wastes cause upsets, sludge contamination, or violations of the POTW's NPDES permit conditions. About 1,500 of the nation's 15,000-plus POTWs must develop pretreatment programs. The remaining municipal treatment plants are not believed to be receiving industrial wastes of concern at this time and will probably not be required to develop pretreatment programs unless local circumstances regarding their industrial users change.

Prohibited Discharges and Categorical Standards

The General Pretreatment Regulations establish "prohibited discharge standards" and "categorical pretreatment standards" to control pollutant discharges into POTWs. Prohibited discharge standards apply to all industrial and commercial establishments connected to POTWs. Categorical pretreatment standards apply to users in 25 specific industrial categories determined to be the most significant sources of toxic pollutants. In addition, POTWs are required to establish more stringent local limits where necessary to protect the environment or the municipal sewage system.

Prohibited discharge standards protect the POTW treatment plant and its operations by prohibiting the discharge of pollutants that:

- Create a fire or explosion hazard in the sewers or treatment works
- Are corrosive (With a pH lower than 5.0)
- Upset the treatment processes or cause a violation of the POTW's discharge permit.

- o Increase the temperature of wastewater entering the treatment plant to above 104°F (40°C).

Each categorical pretreatment standard is published by EPA as a separate regulation. The standards contain limitations for pollutants commonly discharged within each specific industrial category. All firms regulated by a particular category are required to comply with these standards, no matter where they are located in the United States.

Relationship of the Pretreatment Program to the NPDES Program

States participate in the National Pretreatment Program because the Federal pretreatment regulations require all States that administer NPDES programs to develop and administer State pretreatment programs. States with approved programs have the responsibility of overseeing and coordinating the development of local pretreatment programs, and approving or disapproving local pretreatment program submissions. If a State does not administer a pretreatment or NPDES program, then EPA is the Approval Authority for local pretreatment programs. However, many States participate in pretreatment activities even before their State program is approved.

POTWs are notified by EPA or their State water pollution control agencies that they are required to develop local pretreatment programs. A compliance schedule is attached to the NPDES permit when the permit is re-issued or revised, which outlines milestones and dates for program completion. The municipality will generally be allowed up to a year to prepare a local program submission. Thus, the development and implementation of a pretreatment program is an integral and enforceable component of the POTW's NPDES permit. The compliance schedule requires each POTW to develop and document the necessary authorities, information, and procedures to implement its local program. The typical program elements specified in the compliance schedule are:

(1) Industrial Waste Survey - the POTW must identify and evaluate the nondomestic dischargers to its treatment system.

(2) Legal Authority - the POTW must operate under legal authority that will enable it to apply and enforce the requirements of the General Pretreatment Regulations and any other Federal, State, or local standards and requirements needed to control nondomestic discharges.

(3) Compliance Monitoring - the POTW must develop procedures for monitoring its industrial users to determine compliance and noncompliance with pretreatment standards and requirements.

(4) Procedures - the POTW must develop administrative procedures to implement its pretreatment program.

(5) Resources - the POTW must have sufficient resources (funds, equipment, and personnel) to operate an effective and ongoing program.

The local program is developed and carried out be the POTW with guidance and assistance from EPA or from those States that have State pretreatment authority delegated to them by EPA.

Role of the Permit Writer

An NPDES State or an EPA Region will often designate an individual or work group to serve as the pretreatment expert(s). However, in some NPDES authorities, the reponsibility for overseeing a particular pretreatment program will be assigned to the permit writer who develops the permit conditions for a POTW which must incorporate a pretreatment program. In either case, the permit writer must be familiar with requirements of the pretreatment program since, as discussed above, they will become an integral part of the NPDES permit.

Once the local pretreatment program has been reviewed and approved by EPA or the State, the NPDES permit must be modified or reissued to incorporate the approved program as an enforceable part of the permit. The municipality must operate the local program as outlined in the approved program document and report to EPA or the State in accordance with the permit conditions.

MONITORING

The previous section dealt with the selection of permit limits. The next task of the permit writer is to establish monitoring requirements for these limits. Monitoring is truly the cornerstone of the NPDES program. It is the primary means of ensuring that the permit limitations are met. It is also the basis for enforcement actions against permittees who are in violation of their permit limits.

It is important to understand that monitoring in the context of an NPDES permit is primarily carried out by the permittee, and is therefore a self-monitoring program. The ideal situation would be one in which the regulatory agency and/or an independent laboratory collected and analyzed samples from the permitte's waste stream. However, since this is not logistically or financially possible, the burden falls to the permittee. Potential problems which can result from a self-monitoring system include improper sample collection, poor analytical technique, falsification of records, and other abuses of the system.

There are several tools available to the regulatory agency to prevent or minimize these problems. Compliance monitoring consists of periodic monitoring of a permittee's discharge and is conducted by the regulatory agency. If the compliance monitoring results differ significantly from those the permittee has been reporting, the reasons for the discrepancy should be discovered and corrected. Facility inspections should be routinely performed by regulatory agency personnel and should consist of a thorough inspection of the treatment facility. This visual observation of the site will allow the inspector to determine whether the facility is capable of producing an effluent which will meet its permit limits. The facility inspection should also include an inspection of the laboratory facilities and may involve a detailed review of the laboratory techniques used (if the permittee performs the tests on site). The subject of compliance monitoring is discussed in more detail under Chapter XIII.

Monitoring Points

An integral part of the monitoring conditions for a particular facility are the monitoring points. The point at which a sample is collected, can have a dramatic effect upon the monitoring results for that facility. For example, a facility may have several waste streams from different plant processes. The waste stream from a particular process may contain extremely high amounts of a particular pollutant which may reflect "poor housekeeping", inadequate treatment facilities, or other problems. When diluted with other waste streams from other parts of the plant, it may be difficult to detect the problem area. Thus, it may be necessary to require internal monitoring points in order to detect these problem areas. Authority to address internal waste streams is provided in § 122.45(h) of the Regulations.

The permit writer should determine the appropriate points for monitoring and should specify these in the permit.

Monitoring Frequency

Factors which need to be considered when determining monitoring frequency include:

- o Design capacity of treatment facility
- o Type of treatment method utilized
- o Significance of the pollutants
- o Cost of monitoring relative to discharger's capabilities

State and EPA Regional offices usually recommend monitoring frequencies based upon the design capacity of the treatment facility. The following table is typical:

Plant Capacity	Flow	Other Parameters
0-0.099 MGD	Weekly	Quarterly
0.1-0.99 MGD	Daily	Monthly
1.0-4.99 MGD	Record continuously Report daily flow	Weekly
over 5.0 MGD	Report continuously Report daily flow	Daily

In addition, recommended monitoring frequencies for POTW's include a consideration of the type of treatment method employed (e.g. an activated sludge facility would be required to monitor more frequently than a stabilization pond). Monitoring frequencies should be increased if the pollutant is a particularly significant pollutant for the water body (e.g. BOD_5 for an oxygen-limited stream) or if it is a significant component of the producer's waste stream (e.g. chromium waste for a tannery).

If the cost of monitoring is significant considering the capability of the discharger, the frequency can be decreased (the term "significant", in this context, can be related to the "BAT Economic Achievablity Analysis Workbook"). This is especially true if some other parameter will act as an indicator or surrogate (e.g., BOD_5 acts as an indicator for the priority pollutants in the Wood and Gum Chemicals category).

In addition to monitoring pollutants which are limited by the permit, other parameters may be monitored to collect information. This may be done when insufficient information exists to set a limit, but where there is a water quality concern. For For example, a biomonitoring requirement may be set on a semi-annual basis, even though there is no effluent limitation for

"toxicity units". The selection of parameters and monitoring frequency will require judgement on the part of the permit writer.

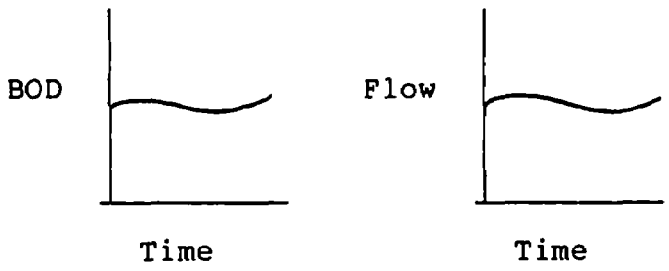
Useful tools for the permit writer in establishing monitoring requirements include any general State or EPA guidance, Abstracts of Industrial NPDES permits, information from facility inspections, and plant performance data (DMR's).

Types of Sampling

In addition to establishing monitoring frequencies, the permit writer will need to determine the type of sample required. There are basically two types of sample: "grab" and "composite". Grab samples, as the name implies, involve a single, discrete sample. Where the quality of the waste stream being sampled is not likely to change significantly over time, a grab sample is an appropriate type of sample.

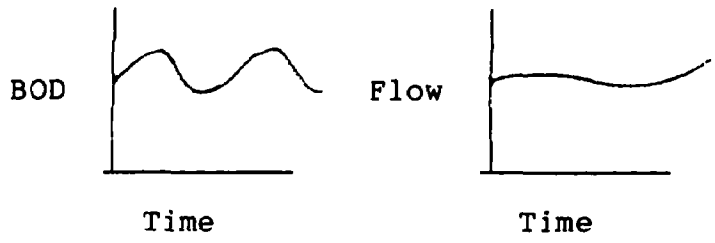
When the material being sampled varies significantly over time as the flow changes, a composite sample is desirable. In this type of sample, a number of representative samples are taken over time (time-proportioned composite) or based upon equal volumes of flow (flow-proportioned composite). After the samples have been collected, they may be composited together and analyzed as a single sample for reporting purposes. However, the permittee may also wish to analyze the individual portions of the composite for determining trends, etc.

Three situations, and the type of sampling which would be appropriate in each case, are illustrated below:



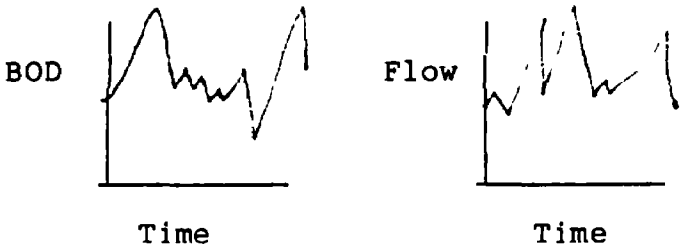
Case 1

- o Slight daily fluctuation in pollutant concentration and flow
- o Recommendation: Grab samples (frequency dependent upon permit writer's judgement)



Case 2

- o Regular fluctuations in pollutant loading over the course of the day
- o Very slight fluctuations in flow
- o Recommendation: Time-proportioned composites (e.g. one sample per hour for 24 hours) and assign "weighting factor" to high pollutant loadings



Case 3

- o Irregular fluctuations in pollutant loadings over the course of the day
- o Erratic fluctuations in flow
- o Recommendation: Flow-proportioned sample (e.g. sample triggered avery 5,000 galons)

As can be seen in Case 2, samples may be composited by time or flow and a representative sample will be assured. However, where both flow and pollutant concentration fluctuate dramatically, a flow-proportioned sample should be taken since a greater quantity of pollutant will be discharged during these periods (concentration x flow = quantity). As an alternative, time-proportioned samples may be taken with flow records used for "weighting" the significance of various samples.

Analytical Methods

The analytical methods which are required in conjunction with monitoring requirements, are usually specified in the "Standard Conditions" (see next section). It is usually sufficient to require that all analyses be performed in accordance with the following standard references:

- o 40 CFR § 136, 49 FR 43250, October 26, 1980
- o Methods for the Chemical Analysis of Water and Wastes; EPA 600/4-79/020, 1979, Revised March, 1983
- o Test Methods: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA 600/4-82/057, July 1982

For some parameters (paricularly biomonitoring requirements), it may be necessary to specify the analytical methods required.

STANDARD CONDITIONS

Overview

As stated earlier, the effluent limitations are the "heart" of the permit. The Standard Conditions play an important supporting role with respect to the actual limits since these conditions delineate the legal, administrative, and procedural requirements of the permit.

Types of Standard Conditions

Standard Conditions, sometimes called "boilerplate" conditions, will consist of preprinted forms containing conditions which are the same for all permits. They cover the following topics (the portion of this document which discusses these conditions in more detail is shown in parenthesis).

- o Definitions (see Glossary)
- o Testing Procedures (see Chapter III - "Monitoring")
- o Records Retention (see Chapter XIII - "Responsibilities of the Permitee")
- o Notification Requirements (see Chapter XIII)
- o Responsibilities (see Chapter XIII)
- o Reopener Clause (see below)

Standard Conditions should also incorporate applicable Federal and State statutes by reference or by recitation. Use of the Standard Conditions helps assure uniformity and consistency of all permits issued by a delegated State or EPA Regional office. Standard Conditions are usually developed and updated, as necessary, by the legal staff or upper management of the permit issuing authority.

The permit writer needs to be aware of the contents of the Standard Conditions, since it may often be necessary to explain portions of these conditions to a permittee. The permit writer should also keep abreast of any changes in the Standard Conditions, as statutes or regulations are revised. An example set of Standard Conditions may be found in the Appendix.

Reopener Clause

The reopener condition provides for automatically reopening an effective NPDES permit during the term of the permit to incorporate necessary changes to the permit limitations or conditions. The specific circumstances which would necessitate reopening the permit should specified in the reopener clause. It may be necessary to reopen a permit due to external reasons, such as the promulgation of more stringent federal effluent guidelines for a specific

industrial category. However, it may also be desirable to reopen a permit to incorporate changes which are applicable to a unique situation. The latter case typically occurs when a permit writer does not have access to all of the information which is pertinent for establishing permit limitations at the time the permit is drafted. An example is when an area wide wasteload allocation study is performed due to water quality cosiderations which requires more stringent limitations than were used in the permit.

In any situation which is "triggered" by a reopener clause, the permit is modified to incorporate the appropriate change. There are numerous other causes for modification of a permit. This topic is discussed in more detail in Chapter XII.

SPECIAL CONDITIONS

Overview

Special conditions, as the name implies, are those conditions which are developed for the specific permit under consideration. They are not included in the effluent limitations section, since they do not contain specific limits. Rather, they require that the permittee undertake particular activities which are usually designed to reduce the quantity of pollutants being discharged or reduce the potential for discharge.

They may include additional monitoring activities, which will alert the permit writer to the need to impose more stringent limitations at a future date, if warranted. They may also include a clause to increase or decrease monitoring, depending upon the monitoring results or certain changes in processes or products, etc. Three of the most common types of special conditions are:

- o Compliance Schedules
- o Biomonitoring
- o Best Management Practises

The permit writer should not feel constrained to restrict Special Conditions to these three categories; however, these three will be discussed in detail.

Compliance Schedules

Compliance schedules often involve construction of facilities and are sometimes called construction schedules. These schedules are usually negotiated with the discharger and assure that he will come into compliance with the final permit limitations within a realistic timeframe. Occasionally, the schedule includes completion of engineering studies. Sometimes the remainder of the schedule can be completed only after the study is completed. Sometimes the schedule may entail installation of monitoring equipment, or may otherwise be integrated with the BMP.

For POTW's, compliance schedules requiring the construction of additional pollution control facilities to meet more stringent permit conditions, is often tied to the "constuction grants" program. This program is authorized by Section 201 of the Act, and involves federal funding of a proportionate share of the cost of the new or upgraded facilities in certain cases. Privately-owned treatment facilities (i.e., industrial facilities) are not eligible for these funds.

Biomonitoring

The subject of Biomonitoring is discussed in Chapter III - "Water Quality Considerations".

Best Management Practises

Best Management Practices or BMPs are measures to prevent or mitigate water pollution from sources ancillary to the industrial manufacturing or treatment process. BMPs are broad and may include processes, procedures, human actions or construction. In essence, they are anything a plant manager, department foreman, environmental engineer, consultant or employee may identify as a method to abate water pollution. They may inexpensive, such as a liquid level alarm in a material transfer operation, or they may be costly, such as secondary containment around a tank farm. In short, BMPs can be just about anything that does the job - the job of preventing toxic pollutants or hazardous substances from damaging the aquatic environment.

Experience has shown that three quarters of all spills of hazardous chemicals can be attributed, in one way or another, to human error. Improper procedures, lack of training and poor engineering are among the major causes of spills. BMPs are aimed at preventing spills and similar environmental incidents by stressing the importance of management and employee awareness of potential spill situations.

Traditionally, NPDES Permits have contained chemical-specific, numerical effluent limits. Effluent guidelines are not always available to prescribe these limits nor to guarantee water quality sufficient for the protection of indigenous aquatic life. To improve water quality, the Clean Water Act (CWA) provides for water pollution controls supplemental to effluent limitation guidelines.

Best Management Practices are one such supplemental control. Pursuant to Sections 304 and 402 of the CWA, BMPs may be incorporated as permit conditions. In the context of the NPDES program, BMPs are actions or procedures to prevent or minimize the potential for the release of toxic pollutants or hazardous substances in significant amounts to surface waters. BMPs, although normally qualitative, are expected to be most effective when used in conjunction with numerical effluent limits in NPDES permits.

BMPs in NPDES Permits

BMPs are placed in permits in two basic ways: BMP plans and site or pollutant-specific BMPs. Site-specific BMPs may be imposed as specific conditions of the BMP plan or as independent provisions of the permit. BMP plans are usually kept on-site and made available to the permitting authority on request. The normal compliance schedule is to require preparation of the plan within six months and implementation within twelve months of permit issuance. Nine specific requirements have been identified as a basis for developing BMP plans in the NPDES program. Site-specific or pollutant-specific BMPs are left to

the discretion of the permit writer and are highly dependent on a careful review of the circumstances at a particular facility. The minimum requirements of a BMP plan are presented below.

Minimum Requirements of a BMP Plan

1. General Requirements

   - o Name and location of facility
   - o Statement of BMP policy and objective
   - o Review by plant manager

2. Specific Requirements

   - o BMP committee
   - o Risk identification and assessment
   - o Reporting of BMP incidents
   - o Materials compatibility
   - o Good housekeeping
   - o Preventive maintenance
   - o Inspections and records
   - o Security
   - o Employee training

BMP Committee

The BMP committee is that group of individuals within the plant organization which is responsible for developing the BMP plan and assisting the plant management in its implementation, maintenance and updating. Thus, the committee's functions are similar to those of a plant fire prevention or safety committee. Plant management, not the committee, has overall responsibility and accountability for the quality of the BMP plan.

The scope of activities and responsibilities of the BMP committee should include all aspects of the facility's BMP plan, such as identification of toxic and hazardous materials addressed in the plan; identification of potential spill sources; establishment of incident reporting procedures; development of BMP inspections and records procedures, review of environmental incidents to determine and implement necessary changes to the BMP plan; coordination of incident notification, response, and clean-up procedures; establishment of BMP training programs for plant personnel; and aiding interdepartmental coordination in carrying out the BMP plan.

Risk Identification and Assessment

The areas of the plant subject to BMP requirements should be identified by the BMP committee, plant engineering group, environmental engineer or others in the plant. Each such area should be examined for the potential risks of discharges to receiving waters of toxic pollutants or hazardous substances from ancillary sources. Any existing physical means (dikes,

diversion ditches, etc.) of controlling such discharges also should be identified.

A hazardous substances and toxic chemicals inventory (materials inventory) should be developed as part of the risk identification and assessment. The level of detail of the materials inventory should be proportionate to the quantity of toxic pollutants and hazardous substances on site and their potential for reaching the receiving waters.

Reporting of BMP Incidents

A BMP incident reporting system is used to keep records of incidents such as spills, leaks, runoff and other improper discharges for the purpose of minimizing recurrence, expediting mitigation or cleanup activities, and complying with legal requirements. Reporting procedures defined by the BMP committee should include: notification of a discharge to appropriate plant personnel to begin immediate action; formal written reports for review and evaluation by management of the BMP incident and revisions to the BMP plan; and notification, as required by law, of government and environmental agencies.

Materials Compatibility

Materials compatibility includes the consideration of: compatibility of the chemicals being stored with the container materials; compatibility of different chemicals upon mixing in a container; and compatability of the container with its environment. The BMP plan should provide procedures to address these three aspects in the design and operation of the equipment used for the storage or transfer of toxic and hazardous materials.

Incompatible materials can cause equipment failure resulting from corrosion, fire or explosion. Equipment failure can be prevented by ensuring that the hazardous substances or toxic pollutants are compatible with the container contents and the surrounding environment.

Good Housekeeping

Good housekeeping is the maintenance of a clean, orderly work environment and contributes to the overall facility pollution control effort. Periodic training of employees in housekeeping techniques for those plant areas where the potential exists for BMP incidents reduces the possibility of mishandling of chemicals or equipment.

Examples of good housekeeping include neat and orderly storage of bags, drums and piles of chemicals; prompt cleanup of spilled liquids to prevent significant runoff to surface waters; sweeping, vacuuming or other clean-up of accumulations of dry chemicals as necessary to prevent them from reaching receiving waters; and provision for storage of containers or drums to keep them from protruding into open walkways or pathways.

Preventive Maintenance

An effective preventive maintenance (PM) program is important to prevent environmental incidents. A PM program involves inspection and testing of plant equipment and systems to uncover conditions which could cause breakdowns or failures with resultant significant discharges of chemicals to surface waters. The program should prevent breakdowns and failures by adjustment, repair or replacement of items.

A PM program should include a suitable records system for scheduling tests and inspections, recording test results and facilitating corrective action. Most plants have PM programs which provide a degree of environmental protection. A BMP plan should not require the development of a redundant PM program. Instead, the plan should reinforce the objective to have qualified plant personnel (e.g., BMP committee, maintenance foreman or environmental engineer) evaluate the existing plant PM program and recommend to management those changes, if any, needed to address BMP requirements.

A good PM program includes: identification of equipment or systems to which the PM program should apply; periodic inspections or tests of identified equipment and systems; appropriate adjustment, repair, or replacement of items; and maintenance of complete PM records on the applicable equipment and systems.

Inspections and Records

An inspection and records system detects and documents actual or potential BMP incidents. The BMP plan should include written inspection procedures and optimum intervals between inspections. Records to show the completion date and results of each inspection should be signed by the appropriate supervisor and maintained for a period of three years. A tracking or follow-up procedure should be instituted to assure that adequate response and corrective action have been taken. The record-keeping portion of this system can be combined with the existing spill reporting system in the plant.

The inspection and records system should include those equipment and plant areas having the potential for significant discharges. To determine the inspection frequency and inspection procedures, experienced personnel should evaluate the causes of previous incidents, the likelihood of future incidents, and assess the probable risks for incident occurrence or recurrence. Consideration should be given to the nature of chemicals handled, materials of construction, and site-specific factors including age, inspection techniques and cost effectiveness of BMPs employed.

Security

A security system prevents accidental or intentional entry to a plant which might result in vandalism, theft, sabotage or other improper or illegal use of plant facilities that could

cause a BMP incident. Most plants have security systems to prevent unauthorized entry.

The BMP plan should describe those portions of the existing security system and any improvements which are necessary to ensure that toxic chemicals are not discharged to receiving waters in significant quantities as a result of unauthorized entry. Documentation of the security system may require separate filing from the BMP plan to prevent unauthorized individuals from gaining access to sensitive or confidential information.

Employee Training

Employee training programs should instill in personnel, at all levels of responsibility, a complete understanding of the BMP plan. Training should address the processes and materials on the plant site, the safety hazards, the practices for preventing discharges, and the procedures for responding properly and rapidly to toxic and hazardous materials incidents.

Meetings should be conducted at least annually to assure adequate understanding of the objectives of the BMP plan and the individual responsibilities of each employee. Typically, these could be a part of routine employee meetings for safety or fire protection. Such meetings should highlight previous spill events or failures, malfunctioning equipment, and new or modified BMPs.

Training sessions should review the BMP plan and associated procedures. Just as fire drills are used to improve an employee's reaction to a fire emergency, spill or environmental incident drills may serve to improve the employee's reactions to BMP-related incidents. Plants are encouraged to conduct spill drills on a quarterly or semi-annual basis. Spill or incident drills serve to evaluate the employee's knowledge of BMP-related procedures and are a fundamental part of employee training.

Site-Specific of Pollutant-Specific BMPs

Site-specific and pollutant-specific BMPs are those designed to address conditions peculiar to a facility or pollutant. The need for specific BMPs at a facility often will be discovered in conjunction with other permit-related activities, such as compliance inspections. Poor housekeeping or a history of spills, for example, indicate a need for site-specific BMPs to supplement the quantitative effluent limits on specific pollutants in the permit. These "situation-specific" BMPs may be conventional, such as secondary containment around a storage tank or innovative, such as siting containers so that a spill caused by a careless forklift operator will not flow into the river. Other examples of site-specific BMPs are contained in recent NPDES permits:

CHAPTER IV: VARIANCES

VARIANCES

Overview

In addition to specifying national goals for water pollution control, the Clean Water Act provides a mechanism for modification of requirements of the Act in exceptional cases. These modifications are called "variances". There are very specific provisions which must be met by an applicant before a variance may be granted. As the term implies, a variance is the unusual situation, and thus the permit writer should not expect to routinely receive variance requests. Nevertheless, the permit writer should be aware of the major types of variances and the basic requirements for each, since he will most likely be the person to conduct the initial reviews of such requests before submitting them for the review of the State Director (if applicable), the EPA Regional office, and EPA headquarters. The permit writer should consult § 124.62 of the Regulations for the procedures for decisions on the various types of variances.

A variance request must ordinarily be submitted before the close of the public comment period. The numbers associated with the variances described below (except FDF) are the corresponding section of the Clean Water Act which provide for the variance. In each case, a definition of the variance and the factors which should be considered in a technical review of the variance request, are provided.

Economic (301(c)

Definitions:

Section 301(c) provides for a variance for non-conventional pollutants from BAT effluent guidelines due to economic factors. The variance may also apply to non-guideline limits in accordance with § 122.21(l)(2)(iii) of the Regulations. The request for the variance from effluent limitations developed from BAT guidelines is normally filed by the discharger during the public notice period for the draft permit. Other filng time periods may apply as specified in § 122.21(l)(2). The application must show that the modified requirements:

1) represent the maximum use of technology within the economic capability of the owner of operator; and

2) will result in further progress toward the "no discharge goal".

Considerations for Technical Review of Requests:

The methodologies for determining economic capability for regulated and unregulated industries differ. Regulated industries are those in which Public Utility Commissions (PUCs) set the firm's rate of return, such as the electric utility industry.

Regulated firms should perform two financial calculations. EPA generally will grant a variance only if both tests indicate that the pollution control equipment is not economically achievable and the applicant can demonstrate reasonable further progress.

Most firms are unregulated. Unregulated firms should calculate three financial tests to determine if they are eligible on economic grounds for a Section 301(c) variance. Guidance for conducting these financial tests is available from EPA's Office of Water Enforcement and Permits. EPA generally will grant a variance only if all three tests indicate that the required pollution control is not economically achievable and the applicant makes the requisite demonstration about reasonable further progress.

With respect to the second requirement for a 301(c) modification ("reasonable further progress toward the no-discharge goal"), the applicant must at a minimum demonstrate compliance with all applicable BPT limitations and pertinent water quality standards. In addition, the proposed alternative must provide for a reasonable degree of improvement in the applicant's discharge.

Water Quality (301(g)

Definition:

Section 301(g) provides for a variance for non-conventional pollutants from BAT effluent guidelines due to localized environmental factors. They may also apply to non-guideline limits in accordance with § 122.21(l)(2)(iii) of the Regulations. The discharger must file a variance application which meets the following requirements:

1) The modified requirements must result in compliance with: (a) BPT or pretreatment guidelines; or (b) water quality standards of the receiving stream;

2) No additional treatment will be required of other point or non-point source dischargers as a result of the variance approval; and

3) The modified requirements will not interfere with attainment or maintenance of water quality to protect public water supplies, protection and propagation of a balanced population of shellfish, fish, and wildfowl, and allow recreational activities in and on the water. Also, the modified requirements will not result in quantities of pollutants which may resonably be anticipated to pose an unacceptable risk to human health or the environment, acute or chronic toxicity, or synergistic properties.

Consideration for Technical Review of Requests

The permit writer should review the request to ensure that it complies with each of the requirements for this type of variance.

This variance request involves a great deal of water quality assessment, including aquatic toxicity, mixing zone and dilution model analysis, and possible site-specific criterion development. In addition, many complex human health effects must be assessed including carcinogenicity, teratogenicity, mutagenicity, bioaccumulation, and synergistic propensities. All permit writers should should use the EPA draft 301(g) technical guidance manual to assist them in assessing a completed variance request.

If the discharger applies for a variance under Section 301(g), the discharger is only eligible to apply for a variance under 301(c) during the same time period as 301(g). Typical industries that have appled for 301 (g) variances include: Iron and Steel, Steam Electric, Inorganic Chemicals. Non-ferrous Metals, Aluminum Forming, and Pesticides.

Innovative Technology (301(k)

Definition:

Section 301(k) provides for an extension of the deadline for compliance with BAT deadlines until 7/1/87 if a direct discharger of toxic and nonconventional pollutants meets the following criteria:

1) Uses an innovative production process that will result in an effluent reduction greater than required.

2) Installs an innovative control technique that is likely to reduce the effluent below required levels.

3) Achieves the required BAT effluent limits with an innovative system which is expected to cost significantly less.

4) This system must also have the potential for industry-wide application.

Considerations for Technical Review of Requests:

In reviewing 301(k) variance request, the permit writer should consider whether a treatment technology or production process is truly innovative. There is no definitive cut-off date for the length of time a technology might be considered innovative. However, a technology would generally cease to be considered innovative after it had operated at full scale in a commercial plant for a full cycle of the plant's operations.

In addition, a review of the variance request should include an evaluation of whether the innovative technology is likely to perform significantly better than BAT or at significantly lower costs. Finally, the request must show that the innovative technology has the potential for industry-wide application. This is defined as being applicable to two or more facilities in one or more industrial category.

Fundamentally Different Factors

Definition:

Part 125, Subpart D of the Regulations provides for variances based upon Fundamentally Different Factors (FDF). FDF variances for direct dischargers are available from effluent guidelines regulations for BPT, BCT, and BAT for toxic, conventional, and non-conventional pollutants if the individual facility is found to be fundamentally different from the factors considered in establishing the effluent guidelines Approval of an FDF variance can result in an effluent limitation which is either more or less stringent for a particular discharger than would result from application of national effluent guidelines. The FDF variance may be requested by the discharger or proposed by the permit writer or any other interested parties. An FDF variance cannot be approved if violations of water quality standards will result.

Considerations for Technical Review of Requests:

Factors needed to justify a variance of this type include factors relating to a discharger's facilities, equipment, and processes which differ from those considered in the subctegory classification in the effluent guidelines. The review/proposal of an FDF variance is completed on a case-by-case basis. The burden of proof lies with the entity requesting the variance.

If the variance is requested by a discharger, standard permit review procedures and variance application procedures (as described in the "overview" section) should be utilized. If the permit writer determines that an FDF variance is warranted and not applied for, the rationale should be developed by the permit writer. The rationale should be discussed with the permit applicant prior to forwarding of the draft permit to the State and discharger. Approval by the Regional Administrator and concurrence by the Director, Office of Water Permits and Enforcement is required.

CHAPTER V: FACT SHEET

FACT SHEET

Overview

A fact sheet is a document which briefly sets forth the principle facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit. The Fact Sheet requirements are described in §§124.8 and 124.56 of the Regulations.

Components

A fact sheet should contain the following elements:

1. A brief description of the type of facility
2. The type and quantity of wastes discharged
3. For a PSD permit, the degree of increment consumption expected to result from operation of the facility
4. A brief summary of the basis for the draft permit conditions
5. Reasons why any requested variances do not appear justified
6. A description of the procedures for reaching a final decision on the draft permit including:
   a) The dates of the public comment period and the address where comments will be received
   b) Procedures for requesting a hearing
   c) Any other public participation procedures
7. Name and telephone number of as person to contact for additional information
8. Provisions satisfying the requirements of Section 124.56 of the Regulations:
   a) Explanation of derivation of effluent limitations
   b) Explanation of any conditions applicable to toxics, internal waste streams or indicator pollutants
   c) A sketch or detailed description of the location of the discharge

d) For EPA - issued permits, the requirements of any State certification

When is a Fact Sheet needed?

The NPDES regulations (§124.8(a)) require that a Fact Sheet be prepared for every major NPDES permit, for every NPDES permit which incorporates a variance, or requires an explanation under §124.56(b) (toxic pollutants, internal waste stream, indicator pollutants and for privately owned waste treatment facilities), for every NPDES general permit, and for every permit that the Director finds is the subject of widespread interest or which raises major issues.

In addition to the legal requirements, there is a second reason for developing a fact sheet which may be even more important. When the permit being issued expires in up to 5 years, the entire permit issuance procedure will have to be repeated. Without a well documented rationale, much of the work will have to be redone and/or there will be conjecture and guessing as to the development of the permit. This is also true if a modification is initiated during the life of the permit.

While the Fact Sheet requires a brief summary of the basis, a more extensive permit rationale usually ought to be developed for the files (the permit writer is encouraged to include an extensive permit rationale in the fact sheet "statement of basis" portion, if challenges to the permit are expected). A permit rationale could be as short as 2-3 pages for a relatively simple permit or as long as 10-20 pages for an extremely complicated permit (e.g., several discharge points, BPJ determinations, etc.)

What is included in the "basis" portion of a Fact Sheet?

In the "basis" portion of the Fact Sheet (Item #4 on the previous page) or in a permit rationale, each pollutant which is limited should be included in the Fact Sheet. For each pollutant the following questions should be answered:

- Why the limitations were established at their levels
- What sort of limitations they are (i.e. effluent guidelines water quality, or BPJ)
- Whether the effluent guidelines used were BPT, BCT, or BAT
- Which water quality standards or criteria were used
- Whether any pollutants were indicators for other pollutants
- Citations to appropriate wasteload allocation studies, guidance documents, etc.

If a separate rationale is prepared, the above items should be more extensive than the minimum amount recommended for a Fact

Sheet. Remember, the Fact Sheet only requires a summary of the principle facts. In addition, a discussion of the rationale and calculations for the development of the effluent limitations and permit conditions should be included. If production-based limits are involved, the production level must be given and calculations and rationale used in determining the production level should be presented. It should be noted, at this point, that the permit writer is advised to consult the regulations with respect to confidentiality (§ 122.7). Occaisionally, additional production information, beyond that which is normally required in the permit application, will be required to establish permit limitations for a particular facility. In addition, production data for a facility which is not covered by a guideline may be required to draft permit limits. In such cases, the permittee may claim that such information is confidential, and therefore that it should not appear in documents available to the public, such as the fact sheet. Such claims should be carefully evaluated in cooperation with the legal staff of the permitting authority in order to determine whether the provisions under § 122.7 apply.

Often it is as important to keep a record of items which were not included in the draft permit, such as the following:

- Why was BPJ or effluent guidelines used instead of water quality-based limitations? (i.e. were the limitations checked to see that water quality considerations did not govern the setting of permit limit?)

- Why was biomonitoring not included?

- Why were pollutants which were reported on Form 2C, not specifically limited in the permit?

- Why is a previously limited pollutant no longer limited in the draft permit?

To summarize, the permit writer should be aware of the legal requirement to prepare a fact sheet for major facilities, those with widespread interest, and for permits which incorporate unusual elements (variances etc.). The basis portion of the fact sheet is the most important part of the fact sheet and should be expanded for the benefit of the permanent file (permit rationale). In addition to the minimum legal requirement to develop fact sheets for certain permits, it is highly recommended that the State permit writer document the permit rationale for every permit. (EPA permit writers are required to prepare a "statement of basis" (section 124.) briefly describing the derivation of permit limits, for every permit for which a fact sheet is not required).

CHAPTER VI: PUBLIC NOTICE

PUBLIC NOTICE

Overview

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or of other significant actions with respect to an NPDES permit or permit application. The basic intent of this requirement is to ensure that permitting decisions are not made in a "vacuum" and that all interested parties have an opportunity to comment on significant agency actions with respect to a permit application or a permit. The statutory basis for the public notice process may be found in Section 124.10 of the Regulations and describes the various aspects of this requirement.

What type of Actions must receive public notice?

The following types of actions must receive public notice:

1. Tentative denial of an NPDES permit application (not necessarily applicable to State programs)

2. Preparation of a draft NPDES permit

3. Scheduling of a hearing

4. Granting an appeal of an EPA-issued permit under Section 124.74 of the Regulations

The permit writer should be primarily concerned with Items 1,2, and 3 above. It is important to note that no public notice is required when a request for a permit modification, revocation, reissuance, or termination is denied.

When must a public notice be given?

Public notice of the preparation of the draft permit (including a notice of intent to deny a permit application) must allow at least 30 days for public comment. The draft permit is usually submitted for public notice after it has undergone internal review by the regulatory agency that is issuing the permit. State-issued permits will typically undergo public notice after EPA has reviewed and commented on the draft permit. In the special case of those EPA-issued permits which require an Environmental Impact Statement (EIS), public notice is not given until after a draft EIS is issued.

Methods Applicable to the Public Notice Process

Public notice of the various NPDES-related activites which require the public notice process is given by several methods:

1) Publication of a notice in daily or weekly newspaper within the area affected by the facility or activity. In addition, for permits issued by EPA, publication in the Federal Register is required.

2) Direct mailing to various interested parties. This mailing list should include the following:

   - o The applicant
   - o Any other agency which is required to issue a RCRA, UIC, PSD, or AOA permit for the same facility
   - o All appropriate government authorities ("sister" agencies, U.S. Fish and Wildlife Services, National Marine Fisheries Service, neighboring states etc.)
   - o Users identified in the permit application of a privately owned treatment works

Contents of the Public Notice

A public notice should contain certain basic information including the following:

1. Name and address of the office processing the permit action.
2. Name and address of the permittee or applicant and, if different, of the facility regulated by the permit.
3. A brief description of the business conducted at the facility
4. Name, address, and telephone number of a contact from whom interested persons can obtain additional information.
5. A brief description of the comment procedures required.
6. For EPA-issued permits, the location and availability of the administrative record.
7. Any additional information considered necessary.

CHAPTER VII: PUBLIC COMMENTS

PUBLIC COMMENTS

Overview

Public notice of a draft permit may elicit comments from concerned individuals or agencies. This is especially true if the draft permit is controversial or of widespread interest. Frequently, such comments are simply requests for additional information. However, some comments are of a substantive nature and suggest modifications to the draft permit or indicate that the draft permit is inappropriate for various reasons. In such cases, those parties providing comments must submit all reasonable arguments and factual material in support of their positions (Note: Commenters will only be able to submit reasonable arguments and factual material if the permit writer's approach is clearly stated in the fact sheet).

An interested party may also request a public hearing (see discussion under "Public Hearing. To the extent possible, it is desirable to respond to all public comments as quickly as possible. In some cases it may be possible to "defuse" a potentially controversial situation by providing further explanation of permit terms and conditions. It is also good public relations to inform parties who provide public comments that their comments have been received and are being considered.

The regulatory agency is obliged to respond to all written comments (in accordance with Section 124.17 of the Regulations) at the time a final permit decision is reached (in the case of EPA-issued permits) or at the time a final permit is actually issued (in the case of State-issued permits). The response should incorporate the following elements:

1) Changes in any of the provisions of the draft permit and the reasons for the changes

2) Description and response to all significant comments on the draft permit which were raised during the public comment period or during any hearing.

Reopening of the Public Comment Period

In the event that any information submitted during the public comment period raises substantial new questions about the draft permit, one of the following actions may occur (if any of these actions are taken, public notice as described earlier must be given):

1) A new draft permit is prepared

2) A revised fact sheet or statement of basis is prepared

3) The comment period is reopened (but is limited only to new findings)

CHAPTER VIII: PUBLIC HEARING

PUBLIC HEARING

When is a public hearing held?

A public hearing may be requested in writing by any interested parties. The request should state the nature of the issues proposed to be raised during the hearing. However, a request for a hearing does not automatically necessitate that a hearing be held. A public hearing should be held when there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision.

Thus, the decision of whether or not to hold a public hearing is actually a "judgement call". Such decisions are usually made by someone other than the permit writer. However, the permit writer will be responsible for ensuring that all of the factual information in support of the draft permit is well documented.

Public Notice of Public Hearing

Public notice of a public hearing must be given at least 30 days prior to the public meeting (Public notice of the hearing may be given at the same time as public notice of the draft permit and the two notices may be combined).

The public notice of the hearing should contain the following information:

1) Reference to the date of the public notice relating to the permit.

2) Date, time, and place of the hearing.

3) Brief description of the nature and purpose of the hearing, including the applicable rules and procedures.

Contents of Public Hearing

A Presiding Officer is responsible for the hearing's scheduling and orderly conduct. Anyone may submit written or oral comments concerning the draft permit at the hearing. The Presiding Officer should set reasonable time limits for oral statements. The public comment period may be extended by so stating during the hearing.

CHAPTER IX: FINAL PERMIT ISSUANCE

FINAL PERMIT ISSUANCE

The final permit may be issued after the close of the public notice period and after State certification has been received (for permits issued by EPA). The public notice period includes:

- o the 30-day period which gives notice of intent to issue or deny the permit
- o the 30-day period advertising a public hearing (if applicable)
- o any extensions or reopening of the comment period

Final EPA permit decisions are effective immediately upon issuance unless comments request changes in the draft permit, in which case the effective date of the permit is 30 days after issuance (or a later date if specified in the permit). As discussed earlier under "Public Comments," any comments that are received must be answered at the time of final permit issuance (in the case of delegated States) or after a final decision is reached in the case of EPA.

Once the final permit has been issued, the issuing authority should integrate the permit limitations and any special conditions into the agency's tracking system. This will ensure that facility's performance will be tracked and the agency will be alerted to the need for corrective action in the event of violations of the permit limitations or special conditions.

CHAPTER X: ADMINISTRATIVE RECORD

ADMINISTRATIVE RECORD

Importance of the Administrative Record

The administrative record is the foundation upon which the issuance of a permit rests. If EPA is the issuer, the administrative record is required by regulation (§124.9 and §124.18). All supporting materials must be made available to the public, whether a State or EPA issues the permit. The importance of maintaining the permit records in a neat, orderly, complete and retrievable form cannot be over emphasized. The record allows personnel from the regulatory agency to reconstruct the justification for a given permit. It also must be made available to the public and may be examined during the public comment period and any subsequent public hearing.

Developing the Record

The record for a draft permit consists, at a minimum, of certain specific documents, namely:

1) The application and supporting data
2) The draft permit
3) The statement of basis or fact sheet
4) All items cited in the statement of basis or fact sheet, including calculations used to derive the permit limits
5) All other items in the supporting file

The requirement for the inclusion of the fact sheet in the administrative record is applicable to State NPDES programs. EPA prepares a statement of basis for every draft permit for which it is Responsible.

Materials that are readily available in the issuing Regional Office, or published material that is generally available need not be physically included with the record as long as it is specifically referred to in the statement of basis or fact sheet. If a separate, detailed permit rationale has been prepared, it should be referenced. For new source draft permits only, the administrative record requires the inclusion of any environmental impact statement or environmental assessment.

The last listed category above includes such items as meeting reports and correspondence with the applicant and correspondence with other regulatory agency personnel. In addition, trip reports and telephone memos are included in the record. These reports must be complete and clear. Standard report forms should be used when available. If the reports are fairly short, they can be handwritten provided they are neat and legible. This applies also to calculations and sketches.

All correspondence, notes, and calculations must show the date and the name of the writer as well as all other persons involved. Since correspondence is subject to public scrutiny,

references or comments that do not serve an objective purpose should be avoided. Finally, when performing calculations or documenting decisions, they should be presented in such a way that they can be reconstructed and the logic behind the decisions or calculation can easily be seen. It is actually better to be redundant in these cases. Decisions or calculations which are used as part of the development of the statement of basis or fact sheet are very important in that they may be needed to defend the fact sheet or the statement of basis.

The record for the final permit consists of the record for the draft permit, all comments received on the draft permit and any responses, the transcript of any hearing held, and any written material received at the hearing.

CHAPTER XI: LEGAL CHALLENGES TO A FINAL PERMIT

LEGAL CHALLENGES TO A FINAL PERMIT

Overview

In the process of developing a draft permit and during the public notice period, the permit writer should carefully consider the legitimate concerns of the permittee as well as the concerns of any third party who may have an interest in the permit terms and conditions. However, there will inevitably be situations in which a permit is issued in spite of the objections of the permittee or a third party. In such instances, the permittee or an interested party may choose to legally contest the NPDES permit.

There are various mechanisms available to resolve legal challenges to NPDES permits. In the case of EPA-issued permits, the administrative procedure involved is called an evidentiary hearing. Many delegated States also have administrative procedures designed to resolve challenges to the conditions of a permit. These procedures involve hearings presided over by an administrative officer. For the sake of convenience, these hearings will be referred to as "evidentiary hearings" in the following discussion. They will naturally be known by different names in different states. However, any permit writer who is involved in a legal challenge to an NPDES permit will need to be concerned with issues which are similar to those discussed below.

Role of the Permit Writer

Aside from preparation of the Administrative Record and notices, the permit writer need not concern himself with procedural matters relating to evidentiary hearings. All requests for evidentiary hearings are coordinated through the office of the EPA Regional Counsel or the appropriate State legal personnel. The permit writer's first involvement with the hearing process will come as a result of designation of the trial staff and his role will be limited to that of a witness and technical advisor to legal counsel.

The permit writer should not concern himself with the legal defense of a permit or permit conditions, but should be familiar with those laws, regulations, and policies which may affect the permit. He should be thoroughly familiar with the technical basis for the permit conditions. For example, if the effluent limits are based on water quality requirements, the permit writer should thoroughly study any applicable basin plan or water quality simulation used to develop the effluent limits, and be prepared to defend any assumptions inherent in the plan or simulation.

If BPJ limits are based on proposed effluent guidelines, it will be necessary to carefully review not only the guidelines themselves, but all applicable data, including the development document for the specific guidelines.

Technical defense of other BPJ requirements is much more difficult. The permit writer should be sure that (a) the information on which BPJ limits are based are unimpeachable; (b) the limits were derived from the data in a logical manner, in accordance with established procedures; and (c) the BPJ limits so derived are technically sound and meet BCT/BAT standards for economic reasonableness.

As technical advisor to legal counsel, the permit writer's most important function is to develop direct testimony in support of defensible (but contested) permit conditions. No attempt should be made to support technically indefensible conditions. If such a condition is based on legal requirements rather than technical concerns, it is the Attorney's responsibility to provide support. However, since the legal counsel may not be thoroughly familiar with particular regulations or sections of law, it is appropriate for the permit writer to bring such items to counsel's attention. Contested permit conditions which are not technically defensible and are not based on any legal requirement, should be brought to counsel's attention, with advice that EPA or the state agency should withdraw those conditions.

The second most important advisory function of the permit writer is assisting counsel in the development of questions for cross-examination of the opposing witnesses. Questions should be restricted to the subject material covered by the witness' direct testimony, and should be designed to elicit an affirmative or negative response, rather than an essay-type response. If a question must be phrased in such a way that the witness could attempt lengthly explanations, counsel should be forewarned.

Finally, the permit writer should remember that in requesting an evidentiary hearing the permittee has declared an adversary relationship with the regulatory agency, and he must refrain from discussions about the case without prior consultation with legal counsel. In the role of witness and/or technical advisor the permit writer should:

- o Cultivate credibility
- o Never imply or admit weakness in his area of expertise
- o Never attempt to testify about subjects outside his area of expertise
- o Always maintain communication with counsel

CHAPTER XII: PERMIT MODIFICATION, REVOCATION, AND TRANSFER

PERMIT MODIFICATION, REVOCATION AND TRANSFER

Overview

After the final permit is issued, there is still a possibility that the permit will need to be modified or revoked prior to the expiration date. Modifications differ from revocations or reissuances (see following sections). In a permit modification, only the conditions subject to change are opened, while all other permit conditions remain in effect. A permit modification may be triggered for several reasons. A representative of the regulatory agency may conduct an inspection of the facility which may indicate a need for the modification. In addition, information submitted by the permittee as required by the permit may suggest such a change. The permittee may also request that a modification to the permit be made.

There are two classifications of modifications: major and minor. From a procedural standpoint, they differ primarily with respect to the public notice requirement. Major modifications require public notice, while minor modifications do not.

Minor Modifications

Minor modifications are generally those changes which are of a non-substantive nature (e.g., typographical errors) or those which require more stringent permit conditions. The conditions for minor modification are described in Section of the Regulations 122.63 and may be summarized as follows:

(1) To correct typographical errors.

(2) To require more frequent monitoring/reporting.

(3) To change an interim compliance date in the schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date requirement.

(4) To allow for a change in ownership when no other change is necessary.

(5) To allow for a change in the construction schedule for a new source discharger.

(6) To allow for the deletion of a point source outfall, that does not result in the discharge of pollutants from other outfalls except in accordance with permit limits.

Major Modifications

Virtually all modifications that result in less stringent conditions must be treated as major modification, with provisions for public notice and comment. Generally speaking, a permit will not be modified during the term of the permit if the facility is in compliance with permit conditions. Conditions which would

necessitate a major modification of a permit are described in Section 122.62 of the Regulations and include:

(1) Alterations: When alterations or changes in operations occur, which justify new conditions that are different from the existing permit.

(2) Information: When information is received which was not available at the time of permit issuance.

(3) New Regulations: When standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision.

(4) Compliance Schedules: When good cause for modification of compliance schedule exists, such as an Act of God, strike, flood, etc.

(5) Variance requests: When requests for variances, net effluent limitations, pretreatment, etc. are filed within the specified time, but not granted until after permit issuance

(6) 307(a) Toxics: To incorporate applicable 307(a) toxic guidelines

(7) Reopener: Conditions in the permit which required that it be "reopened" under certain circumstances.

(8) Net Limits: Upon request of a permittee who qualifies for effluent limitations on a net basis under Section 122.45(g&h).

(9) Pretreatment: As necessary to adjust the compliance schedule for the development of the pretreatment program (Section 403.8(e) of the Regulations).

(10) Failure to Notify: Upon failure of an approved State to notify another State whose waters may be affected by a discharge from the approved State.

(11) Non-Limited Pollutants: When the level of discharge of any pollutant which is not limited in the permit exceeds the level which can be achieved by the technology-based treatment requirements appropriate to the permit.

(12) Use of Toxics: When the permittee begins or expects to use or manufacture toxic pollutants which were not reported in the permit application.

(13) Notification Levels: To establish "notification levels" for toxic pollutants which are not limited in the permit but must be reported if concentrations in the discharge exceed these levels.

(14) Commpliance Schedules for Innovative or Alternative Facilities: To modify the compliance schedule in light of the additional time that may be required to construct this type of facility.

Revocation of Permits

There may be situations which arise during the life of the permit which are cause for revocation (i.e. cancellation) of the permit. Such circumstances include the following (see Section 122.62(b) of the Regulations:

(1) Non-compliance by the permittee with any condition of the permit

(2) Misrepresentation or omission of relevant facts by the permittee

(3) A determination that the permitted activity endangers human health or the environment

(4) A temporary or permanent reduction or elimination of a discharge (e.g. plant closure)

(5) Notification of a proposed transfer of a permit

Once the permit is revoked, it can only be placed into effect again by the reissuance process, which will require a new permit application. All of the above situations may also be addressed through the permit modification process, however, a case-by-case determination will need to be made.

Transfer of Permits

Regulatory agencies will occasionally receive notification of a change in ownership of a facility covered by an NPDES permit. Such changes require that a permit be transferred. There are two provisions for transfer of permits:

(1) Transfer by Modification or Revocation: The transfer may be made during the process of modification, either major or minor. It may also be addressed by revoking and subsequently reissuing the permit.

(2) Automatic Transfer: A permit may be automatically transferred to a new permittee if three conditions are met:

(a) The current permittee notifies the Director 30 days in advance of the transfer date.

(b) The notice includes a written agreement betwen the old and new owner on the terms of the transfer.

(c) The Director of the regulatory agency does not indicate that the subject permit will be modified or revoked.

CHAPTER XIII - PERMIT COMPLIANCE AND ENFORCEMENT

PERMIT COMPLIANCE AND ENFORCEMENT

Overview

It is essential that the limitations and conditions contained in an NPDES permit be met by the permittee, otherwise the permit becomes a meaningless document. There are various methods which may be used by a regulatory agency to determine whether or not a permittee is in compliance with the permit limits and the various other conditions of their NPDES permit. In addition, there are a host of enforcement actions which may be taken by the regulatory agency in response to various permit violations.

The permit writer may or may not become actively involved with the compliance monitoring and enforcement of the terms and conditions of the NPDES permits which they have written. The extent of the permit writer's involvement will usually depend upon the organizational structure of the regulatory agency. Larger, centrally organized agencies will typically have specialized personnel responsible for enforcing the terms of NPDES permits. In other organizations, the individual who writes the permit will also be responsible for such enforcement activities as DMR tracking, facility inspections, and enforcement recommendations.

Regardless of the type of organizational structure within a regulatory agency, the permit writer should have an appreciation for the various aspects of a meaningful NPDES compliance enforcement program. The way in which permit requirements are expressed has a direct bearing on the permittee's self-monitoring program and on the regulatory agency's compliance monitoring and enforcement activities.

PERMIT COMPLIANCE

Responsibilities of the Permittee

The permit stipulates the "self-monitoring" requirements that are the responsibility of the discharger. Typically, this portion of the permit sets forth the frequency and type of sampling (grab and/or composite) requirements, as well as the flow monitoring, analytical, and data reporting requirements. The required information obtained by the permittee's self-monitoring program is reported to the permitting agency using a Discharge Monitoring Report (DMR). The DMR is submitted to the permitting agency on a regular schedule delineated in the permit. The validity or quality of the DMR data is the responsibility of the permittee and is a direct result of the adequacy and functioning of the permittee's self-monitoring program. For the program to function properly, it must be organized in a way that provides the data and the response required by the permit.

Development of Self-Monitoring Program

A self-monitoring program can be viewed as an organized system of component parts, typically including sampling, flow measurement, laboratory analyses, recordkeeping and reporting. It consists of both technical and administrative activities, which are of equal importance to the smooth and proper operation of the program and to meeting permit requirements. There are certain general elements common to developing and maintaining a successful self-monitoring program: These elements are as follows:

- o Reviewing permit requirements and setting program objectives
- o Establishing staff training
- o Developing a quality assurance (QA) plan
- o Conducting periodic evaluations of the program

Record Keeping and Reporting Requirements

The development of the type of self-monitoring program discussed above will enable the permittee to fulfill two of its major responsibilities under an NPDES permit: recordkeeping and reporting. The NPDES permit system requires permittees to maintain records and to report periodically on the amount and nature of the waste components in the effluent. The individual facility permit will stipulate recordkeeping and reporting conditions.

The permittee's recordkeeping responsibilities focus on three areas:

- o Knowledge of specific information required by the permit
- o Maintenance of accurate records
- o Maintenance of records for the required holding period

The type of data required to be kept by the facility will be determined by and described in the permit. Generally, however, the following types of information should be maintained by a facility (if applicable):

- o Sampling and Analysis Data
- o Monitoring Records
- o Laboratory Records
- o Facility Operating Records
- o Plant Records
- o Best Management Practices Plan
- o Management Records
- o POTW Pretreatment Records

Along with the maintenance of selected records, the permittee is required to submit various reports to the permitting agency. The types of reports and the frequency of submission are specified in the permit. The following are typical types of reports:

- Compliance Schedule Status Reports: In cases where a treatment facility cannot meet statutory effluent limitations immediately, a compliance schedule is included in the permit. Reports must be submitted to the permitting agency which provides an update on the status of compliance with that schedule.

- POTW Pretreatment Requirements: Various reports may be required when developing or meeting pretreatment requirements.

- Emergency Reports: Emergency reports are required in cases of noncompliance that are serious in nature, usually relating to toxic or hazardous substances.

- Discharge Monitoring Reports: The Discharge Monitoring Report (DMR) is a routine compliance report that gives a summary of the permittee's discharge on a monthly or quarterly basis. The DMR provides data on flow measurement, sample collection and laboratory analyses.

Responsibilities of the Regulatory Agency: Compliance Monitoring

As used by EPA, "compliance monitoring" is a generic term which includes all activities undertaken by Federal or State regulatory agencies to ascertain a permittee's adherence to an NPDES permit. Compliance monitoring data collected as part of the NPDES program are used in compliance evaluation and in support of enforcement.

A primary function of the compliance monitoring program is the verification of compliance with permit conditions including effluent limitations and compliance schedules. Compliance monitoring may be described as comprising two elements:

- Compliance Review - the review of all written material relating to the status of a permittee's compliance

- Compliance Inspection - all field related regulatory activities conducted to determine compliance

Compliance Review

"Compliance review" is the review of all written material relating to the status of a permittee's compliance with an NPDES permit. These materials include Compliance Schedule Reports (CSR), DMRs, and Compliance Inspection Reports (CIR). These materials originate from the permittee or the regulatory authority. Third parties, including public and private interest groups, may also submit materials relevant to the compliance review process.

If a State has not been delegated the authority to implement the NPDES program, compliance reviews of all permittees in that State are the responsibility of the EPA. In a State that has been delegated NPDES authority EPA retains oversight responsibility for the State compliance program.

Compliance/enforcement personnel use two primary sources of information to carry out their compliance review responsibilities:

1. Permittee Files: These files will include CSRs, CIRs, DMRs, enforcement actions, and any other correspondence (e.g. summaries of telephone calls, copies of warning letters, etc.).

2. Permit Compliance System (PCS): PCS is a data management system used to compile all relevant facts about a facility's permit conditions, self-monitoring data, the inspections performed, and any enforcement actions taken. PCS is the national data base for the NPDES program. As such, PCS promotes national consistency and uniformity in permit and compliance evaluations. To accomplish this goal, all required data are to be entered into and maintained regularly in PCS.

   NPDES permits must be enforceable and capable of being tracked by PCS. There may be situations where permit limits and monitoring conditions are not initially compatible with PCS entry and tracking. In these cases, States should ensure that appropriate steps are taken by the permit writer to identify difficult permits to the PCS coder (either in the State or the Region) and to mutually resolve any coding issues. To assist PCS coders in accurately interpreting and coding the permit into PCS and to assist enforcement personnel in reviewing permittee self-monitoring data and reports in a timely manner, permit writers should apply the following practises:

   - Require permittees to submit DMRs monthly. Permittees complete DMRs on a monthly basis. However, some permit requirements are written such that only quarterly DMR submittal is necessary. Thus, monthly DMRs may be held by the permittee until the end of the quarter. This prolongs the evaluation process and delays any enforcement action that may be necessary if there are significant violations. By requiring monthly submittal of DMRs, enforcement personnel can review the DMRs and take appropriate action in a timely manner.

   - Require the permittee to report flow. Flow may not need to be limited, but it needs to be reported. Having flow data in PCS will enhance PCS' analytical and management capabilities as requested by Regions and States. Compliance/enforcement personnel will be able to determing compliance trends and total loadings. Also, the data can be used to help set water quality-based standards.

- o Use discretion in setting alternate limits. Examples of alternate limits include, but are not limited to, limits that change based on stream flow or influent flow, production type or level, and temperature of the effluent. Seasonal limits are acceptable; however, changes in limits based on seasons must begin on the first of the month, not the middle of the month.

  It is essential that permit writers develop limits that are clear and that cannot be misinterpreted. Alternate limits often contain ambiguities which many cause problems for the permittee, compliance/enforcement personnel, and PCS coders. Where a permit contains several sets of alternate limits, the conditions which "trigger" each set of alternate limits should be clear, so that the permittee and the regulatory agency will know which DMR is required under a particular set of conditions. Uncertainty about the applicablility of various sets of alternate limits may also create problems for PCS coders in accurately interpreting the limits, thereby affecting the reliability of the data in PCS. Because PCS is used for compliance review, it is crucial that the data be reliable.

- o Contact the person responsible for coding permits into PCS. Mutually resolve any coding issues so that the permit conditions are accurately transferred into PCS.

Compliance Inspection

"Compliance inspection" refers to all field-related regulatory activities conducted to determine permit compliance. Such field activities may include evaluation inspections (non-sampling), sampling inspections, other specialized inspections, and remote sensing. Certain inspections, such as Diagnostic Inspections (DI) and Performance Audit Inspections (PAI), in addition to providing information to support enforcement action, aid the regulatory agency in evaluating the facility's problems. Compliance Biomonitoring Inspections (CBI) are specifically targeted at facilities whose effluent is suspected or identified as causing toxicity problems that threaten the ecological balance of the receiving waters.

Compliance Inspections are undertaken for one or more of the following purposes:

1. Ensure that permit requirements are being met or determine if permit conditions are adequate.

2. Check the completeness and accuracy of permittee's performance/compliance records.

3. Assess adequacy of the permittee's self monitoring and reporting program.

4. Evaluate the permittee's operation and maintenance activities.

5. Observe the status of construction required by the permit.

6. Address water quality and other specific problems and follow-up in areas where water quality-based controls were implemented.

ENFORCEMENT

Once a facility has been identified as having apparent permit violations, EPA or the delegated State proceed to a review of the facility's compliance history. Such a review should focus on the magnitude, frequency, and duration of violations. Significant permit violations are identified and a determination of the appropriate enforcement response is made.

Section 309 of the Act authorizes the Agency to bring civil or criminal action against facilities which violate their NPDES permit conditions. The EPA Regions and the delegated States have specific procedures for reviewing self-monitoring and inspection data and for deciding what type of enforcement action is warranted. Typical types of enforcement actions include the following acivities (listed in increasing order of severity):

- o Inspection "debriefing," calling attention to deficiencies
- o Telephone Call
- o Letter of Violation
- o Notice of Violation
- o Administrative Order
- o Judicial Action
- o Criminal Investigation

When making determinations on the level of the enforcement response, the technical and legal staff of the regulatory agency should consider the degree of the permit violation, the degree of economic benefit obtained through the violation, previous enforcement actions taken against the violator, and the deterrent effect of the response on the similarly situated regulated community Equally important, are considerations of fairness and equity, national consistency, and the integrity of the NPDES program.

In the final analysis, the way in which a permit is written directly affects the type of enforcement action that can be taken. Each permit must be written clearly and without ambiguities so that it can be tracked effectively and used to protect the Clean Water Act against frequent and significant violations.

INDEX TO APPENDICES

APPENDIX A

GLOSSARY

Administrator - the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Approved program or approved State - a State or interstate program which has been approved or authorized by EPA under Part 123.

Average monthly discharge limitations - the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation - the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Best Management Practices ("BMPs") - schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Continuous dicharge - a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

CWA - the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Public Law 96-483 and Public Law 97-117, 33 U.S.C. 1251 et. seq.

CWA and regulations - the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily discharge - the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitation expressed in units of mass, the "daily dicharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement (e.g. concentration) "daily discharge" is calculated as the average measurement of the pollutant over the day.

"daily discharge" is calculated as the average measurement of the pollutant over the day.

Director - the Regional Administrator or State Director, as the context requires, or an authorized representative. When there is no "approved State program," and there is an EPA administered program, "Director" means the Regional Administrator. When there is an approved State program, "Director" normally means the State Director. In some circumstances, however, EPA retains the authority to take certain actions even when there is an approved State program.

Discharge of a pollutant - (a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or (b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point other than a vessel or other floating craft which is being used as a means of transportation.

Discharge Monitoring Report ("DMR") - the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA.

Draft permit - a document prepared under §124.6 indicating the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a "permit." A notice of intent to terminate a permit, and a notice of intent to deny a permit, as discussed in §124.5, are types of "draft permits." A denial of a request for modification, revocation and reissuance, or termination, as discussed in §124.5, is not a "draft permit." A "proposed permit" is not a "draft permit."

Effluent limitation - any restriction imposed by the Director on quantities, discharge rates, and concentrations or pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Effluent limitations guidelines - a regulation published by the Administrator under section 304(b) of CWA to adopt or revise "effluent limitations."

Facility or activity - any NPDES point source or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

General permit - an NPDES permit issued under §122.28 authorizing a category of discharges under the CWA within a geographical area.

Hazardous substance - any substance designated under 40 CFR Part 116 pursuant to section 311 of CWA.

Indirect discharger - a nondomestic discharger introducing pollutants to a publicly owned treatment works.

Major facility - any NPDES facility or activity classified as such by the Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director.

Maximum daily discharge limitation - the highest allowable "daily discharge."

Municipality - a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of CWA.

National Pollutant Discharge Elimination System (NPDES) - means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. The term includes an "approved program."

New discharger - any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants".

(b) That did not commence the discharge of pollutants at particular site prior to August 13, 1979.

(c) Which is not a "new source."

(d) Which has never received a finally effective NPDES "permit" for discharges at that site.

New source - any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

(a) After promulgation of standards of performance under section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

(c) Except as otherwise provided in an applicable new source performance standard, a source is a "new source" if it

meets the definition of "new source" in §122.2, and

(i) It is constructed at a site at which no other source is located; or

(ii) It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or

(iii) Its processes are substantially independent of an existing source at the same site. In determning whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.

Owner or operator - the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Point Source - any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, condult, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which pollutants are or may be discharged.

Pollutant - dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act or 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

Primary industry category - any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D.D.C. 1979); also listed in Appendix A of Part 122.

Privately owned treatment works - any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (b) not a "POTW."

Process wastewater - any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Proposed permit - a State NPDES "permit" prepared after the close of the public comment period (and, when applicable, any public hearing and administrative appeals) which is sent to EPA for review before final issuance by the State. A "proposed permit" is not a "draft permit."

Publicly Owned Treatment Works ("POTW") - any device or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality. This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator - the Regional Administrator of the appropriate Regional Office of the Evironmental Protection Agency of the authorized representative of the Regional Administrator.

Schedule of compliance - a schedule of remedial measures included in a "permit", including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations.

Secondary industry category - any industry category which is not a "primary industry category."

State Director - the chief administrative officer of any State or interstate agency operating an "approved program," or the delegated representative of the State Director.

Toxic pollutant - any pollutant listed as toxic under section 307(a)(1) of CWA.

APPENDIX B

PART 122 - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Subpart A - Definitions and General Program Requirements

Subpart B - Permit Application and Special NPDES Program Requirements

Subpart C - Permit Conditions

APPENDIX C

REGULATIONS MATRIX

TOPIC	CFR NUMBER
Application	122.21 a through o
General Permit	122.28
Backsliding Prohibition	122.44(c),(l)
Best Management Practices	122.44(j)
BPJ Authority	125.3(c)
BPJ Source Materials	125.3(g)),(h)
Bypasses	122.41(m)
Calculating Conditions	122.45
Compliance Program Requirements	123.26
Compliance Schedules	122.47
Conditions Applicable to Specified Categories	122.42
Confidentiality	122.7
Continuous Discharge	122.45(d)
Continuation of Expiring Permits	122.6
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Duration of Permits	122.46, a,b,c,d,e,f
Effective Date	122.5
Enforcement Authority	123.27
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Establishing Permit Conditions	122.43
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Operation and Maintenance	122.41(e)
POTWs, Land Application & Wells	122.50
Primary Industry Categories	Appendix A
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Production	122.45(b)
Program Submission, Elements of	123.21
Prohbitions	122.4
Recording & Reporting Requirements	122.48
Reissuances	122.44(i)
Reopener	122.44(c)
Signatories to Permit Applications	122.22
Standard Conditons	122.41
Storm Water Discharges	122.26 122.3 122.28
Termination of Permits	122.64
Toxics - Application & Testing	122.21(g)(7), (9) & (10)
Toxics - Control Strategy	122.42(a) 122.62(a)(12)
Toxic Pollutants - Development of Specific Conditions	122.44(e)
Toxics - Toxicity-Based Limits	125.3(c)(4)
Transfer of Permits	122.61
Upsets	122.41(m)
Water Quality Standards and State Requirements	122.44(d)

§401.26 Toxic Pollutants

The following comprise the list of toxic pollutants designated pursuant to section 307(a) of the Act:

1. Acenapththene
2. Acrolein
3. Acrylonitrile
4. Aldrin/Dildrin[1]
5. Antimony and compounds[2]
6. Arsenic and compounds
7. Asbestos
8. Benzene
9. Benzidine[1]
10. Beryllium and compounds
11. Cadmium and compounds
12. Carbon tetrachloride
13. Chlordane (technical mixture and metabolites)
14. Chlorinated benzenes (other than dichlorobenzenes)
15. Chlorinated ethanes (including 1,2-di-chlorobenzenes)
16. Chloroalkyl ethers (chloroethyl and mixed ethers)
17. Chlorinated naphthalene
18. Chlorinated phenols (other than those listed elsewhere; includes trichlorophenols and chlorinateed cresols)
19. Chloroform
20. 2-chlorophenol
21. Chromium and compounds
22. Copper and compounds
23. Cyanides
24. DDT and metabolites[1]
25. Dichlorobenzenes (1,2-, 1,3- and 1,4-dichlorobenzenes)
26. Dichlorobenzidine
27. Dichloroethylenes (1,1- and 1,2 dichloroethylene)
28. 2,4-dichlorophenol
29. Dichloropropane and dichloropropene
30. 2,4-dimethylphenol
31. Dinitrotoluene
32. Diphenylhydrazine
33. Endosulfan and metabolites
34. Endrin and metabolites[1]
35. Ethylbenzene
36. Fluoranthene
37. Haloethers (other than those listed elsewhere; includes chlorophenylphenyl ethers, bromophenylphenyl ether, bis(dichloroisopropyl) ether, bis-(chloroethoxy) ether, bis-(chloroethoxy) methane and polyclorinated diphenyl ethers)
38. Halomethanes (other than those listed elsewhere; includes chlorophenylphenyl ethers, bromophenylphenyl ether, bis(dichloroisopropyl) ether, bis-(chloroethoxy) methane and polychlorinated diphenyl ethers)

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1 Effluent standard promulgated (40 CR Part 129).

2 The term "compounds" shall include organic and inorganic compounds.

39. Heptachlor and metabolites
40. Hexachlorobutadiene
41. Hexachlorocyclohexane
42. Hexachlorocyclopentadiene
43. Isophorone
44. Lead and compounds
45. Mercury and compounds
46. Naphthalene
47. Nickel and compounds
48. Nitrobenzene
49. Nitrophenols (including 2,3-dinitrophenol, dinitrocresol)
50. Nitrosamines
51. Pentachlorophenol
52. Phenol
53. Phthalate esters
54. Polychlorinated biphenyls (PCBs)[1]
55. Polynuclear aromatic hydrocarbons (including benzanthracenes, benzopyrenes, benzofluoranthene, chrysenes, dibenz-anthracenes, and indenopyrenes)
56. Selenium and compounds
57. Silver and compounds
58. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)
59. Tetrachloroethylene
60. Thallium and compounds
61. Toluene
62. Toxaphene[1]
63. Trichloroethylene
64. Vinyl chloride
65. Zinc and compounds

[44 FR 44502, July 30, 1979, as amended at 46 FR 2266, Jan. 8, 1981; 46 FR 10724, Feb. 4, 1981]

§401.16 Conventional pollutants

The following comprise the list of conventional pollutants designated pursuant to section 304(a)(4) of the Act:

1. Biochemical oxygen demand (BOD)
2. Total suspended solids (nonfilterable) (TSS)
3. pH
4. Fecal coliform
5. Oil and grease

[44 FR 44503, july 30, 1979; 44 FR 52685, Sept. 10, 1979]

APPENDIX E

EFFLUENT GUIDELINES DIVISION
PROPOSED AND FINAL RULES - PRIMARY CATEGORIES

FEDERAL REGISTER CITATIONS
(1979 - Present)

8/31/84
(Revised)

PROPOSED AND FINAL RULES - PRIMARY CATEGORIES
FEDERAL REGISTER CITATIONS
(1979 - Present)

8/31/84

Industry	40 CFR PART	TYPE RULE	SIGNATURE*	FEDERAL REGISTER CITATION	
Aluminum Forming	467	PROPOSED	11/05/82	47 FR 52626	11/22/82
		PROMULGATION	09/30/83	48 FR 49126	10/24/83
		Correction	02/29/84	49 FR 11629	03/27/84
Battery Manufacturing	461	PROPOSED	10/29/82	47 FR 51052	11/10/82
		PROMULGATION	2/27/84	49 FR 9108	03/09/84
		Correction	4/09/84	49 FR 13879	04/09/84
		Correction	7/09/84	49 FR 27946	07/09/84
Coal Mining	434	PROPOSED	12/30/80	46 FR 3136	01/13/81
		PROMULGATION	09/30/82	47 FR 45382	10/13/82
		Correction	--	48 FR 58321	11/01/83
		Prop. Amend.	--	49 FR 19240	05/04/84
		Ext. of Comments	--	49 FR 24388	06/13/84
Coil Coating					
Phase I	465	PROPOSED	12/30/80	46 FR 2934	01/12/81
		PROMULGATION	11/05/82	47 FR 54232	12/01/82
		Amendment	--	48 FR 31403	07/08/83
		Amendment	--	48 FR 41409	09/15/83
		Correction	--	49 FR 33648	08/24/84
Phase II (Canmaking).....	465	PROPOSED	01/31/83	48 FR 6268	02/10/83
		PROMULGATION	11/08/83	48 FR 52380	11/17/83
		Correction	03/29/84	49 FR 14104	04/10/84
Copper Forming	468	PROPOSED	10/29/82	47 FR 51278	11/12/82
		PROMULGATION	08/04/83	48 FR 36942	08/15/83
		Amendment	--	48 FR 41409	09/15/83
Electrical/Electronic Components					
Phase I	469	PROPOSED	08/11/82	47 FR 37048	08/24/82
		PROMULGATION	03/31/83	48 FR 15382	04/08/83
		Interim Final/ Prop. Amend.	--	48 FR 45249	10/04/83
		Final Amendment	--	49 FR 5921	02/16/84
Phase II	469	PROPOSED	02/28/83	48 FR 10012	03/09/83
		PROMULGATION	11/30/83	48 FR 55690	12/14/83
		Correction	--	49 FR 1056	01/09/84
Electroplating [Pretreatment - PSES]	413	PROPOSED	01/24/78	43 FR 6560	02/14/78
		PROMULGATION	08/09/79	44 FR 52590	09/07/79
		Prop. Amend.	--	45 FR 45322	07/03/80
		Prop. Amend.	--	46 FR 9462	01/28/81
		Prop. Amend.	--	46 FR 55200	09/02/81
		Prop. Amend.	--	46 FR 43972	09/02/81
		Prop. Amend.	--	47 FR 38462	08/31/82
		Prop. Amend.	--	48 FR 2776	01/21/83
		Final Amend.	--	48 FR 32462	07/15/83
		Correction	--	48 FR 43682	09/26/83
		Final Amend.	--	48 FR 41409	09/15/83
Foundries (Metal Molding and Casting)	464	PROPOSED	10/29/82	47 FR 51512	11/15/82
		Notice of Additional Data	--	49 FR 10280	03/20/84
		PROMULGATION	(12/84)	---	---
Inorganic Chemicals					
Phase I	415	PROPOSED	07/10/80	45 FR 49450	07/24/80
		PROMULGATION	06/16/82	47 FR 28260	06/29/82
		Correction	--	47 FR 55226	12/08/82
Phase II	415	PROPOSED	09/30/83	48 FR 49408	10/25/83
		PROMULGATION	07/26/84	49 FR 33402	08/22/84

Administrator's signature; ( ) is the projected schedule approved by the court on August 25, 1982; October 26, 1982; August 2, 1983; January 6, 1984; and July 5, 1984.

NOTE: THIS LISTING DOES NOT INCLUDE RULEMAKING ACTIVITIES SUBSEQUENTLY PUBLISHED BETWEEN PROPOSAL AND PROMULGATION UNLESS THE SCHEDULED PROMULGATION HAS NOT YET BEEN COMPLETED. THESE, AND PUBLICATIONS ISSUED PRIOR TO 1979, ARE IDENTIFIED IN THE PREAMBLES TO EACH PROMULGATED REGULATION.

EFFLUENT GUIDELINES DIVISION
PROPOSED AND FINAL RULES - PRIMARY CATEGORIES
FEDERAL REGISTER CITATIONS
(1979 - Present)

8/31/84

- continued -

Industry	40 CFR PART	TYPE RULE	SIGNATURE*	FEDERAL REGISTER CITATION	
I Steel Manuf.	420	PROPOSED	12/24/80	46 FR 1858	01/07/81
		PROMULGATION	05/18/82	47 FR 23258	05/27/82
		Correction	--	47 FR 24554	06/07/82
		Correction	--	47 FR 41738	09/22/82
		Final Amend.			
		Correction	--	48 FR 51773	11/14/83
		Prop. Amend.	--	48 FR 46944	10/14/83
		Correction	--	48 FR 51647	11/10/83
		Final Amend.	--	49 FR 21024	05/17/84
		Correction	--	49 FR 24726	06/15/84
		Correction	--	49 FR 25634	06/22/84
Leather Tanning & Finishing	425	PROPOSED	06/13/79	44 FR 38746	07/02/79
		PROMULGATION	11/07/82	47 FR 52848	11/23/82
		Correction/ Notice of Availability/ Amendment	--	48 FR 30115	06/30/83
		Amendment	--	48 FR 31404	07/08/83
		Correction	--	48 FR 32346	07/15/83
		Correction	--	48 FR 35649	08/05/83
		Correction/ Amendment [PSES]	--	48 FR 41409	09/15/83
		Notice of Availability	--	49 FR 17090	04/23/84
° Metal Finishing	433 & 413	PROPOSED	08/11/82	47 FR 38462	08/31/82
		PROMULGATION	07/05/83	48 FR 32462	07/15/83
		Final Amend.	--	48 FR 41409	09/15/83
		Correction	--	48 FR 43682	09/26/83
° Nonferrous Metals					
ase I	421	PROPOSED	01/31/83	48 FR 7032	02/17/83
		PROMULGATION	02/23/84	49 FR 8742	03/08/84
		Correction	--	49 FR 26739	06/29/84
		Correction	--	49 FR 29792	07/24/84
Phase II.....	421	PROPOSED	05/15/84	49 FR 26352	06/27/84
		Ext. of Comments	--	49 FR 33026	08/20/84
		PROMULGATION	(11/84)	---	---
Nonferrous Metals Forming	471	PROPOSED	02/03/84)	49 FR 8112	03/05/84
		PROMULGATION	(10/84)	---	---
Ore Mining	440	PROPOSED	05/25/82	47 FR 25682	06/14/82
		PROMULGATION	11/05/82	47 FR 54598	12/03/82
° Organic Chemicals and Plastics & .... Synthetic Fibers	414 & 416	PROPOSED	02/28/83	48 FR 11828	03/21/83
		Notice (Confidential Information)	--	49 FR 34295	08/29/84
		PROMULGATION	(02/85)	---	---
Pesticides.....	455	PROPOSED	11/05/82	47 FR 53994	11/30/82
		Proposed (Analytical Methods)	--	48 FR 6250	02/10/83
		Notice of Availability	--	49 FR 24492	06/13/84
		Ext. of Comments	--	49 FR 30752	08/01/84
		PROMULGATION	(11/84)	---	---
Petroleum Refining.....	419	PROPOSED	11/27/79	44 FR 75926	12/21/79
		PROMULGATION	09/30/82	47 FR 46434	10/18/82
		Prop. Amend.	--	49 FR 34152	08/28/84

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EFFLUENT GUIDELINES DIVISION
PROPOSED AND FINAL RULES - PRIMARY CATEGORIES
FEDERAL REGISTER CITATIONS
(1979 - Present)

8/31/84

- continued -

Industry	40 CFR PART	TYPE RULE	SIGNATURE*	FEDERAL REGISTER CITATION	
° Pharmaceuticals	439	PROPOSED	11/07/82	47 FR 53584	11/26/82
		PROMULGATION	09/30/83	48 FR 49808	10/27/83
		Correction	--	48 FR 50322	11/01/83
		PROPOSED -			
		NSPS	--	48 FR 49832	10/27/83
		BCT Cost	--	49 FR 8967	03/09/84
		Extension	--	49 FR 17978	04/26/84
		Notice of Availability	--	49 FR 27145	07/02/84
° Plastics Molding & Forming	463	PROPOSED	02/03/84	49 FR 5862	02/15/84
		PROMULGATION	(09/84)	---	---
° Porcelain Enameling	466	PROPOSED	01/19/81	46 FR 8860	01/27/81
		PROMULGATION	11/05/82	47 FR 53172	11/24/82
		Final Amend.	--	48 FR 31403	07/08/83
		Final Amend.	--	48 FR 41409	09/15/83
		Prop. Amend.	--	49 FR 18226	04/27/84
° Pulp & Paper	430 & 431	PROPOSED	12/11/80	46 FR 1430	01/06/81
		PROMULGATION	10/29/82	47 FR 52006	11/18/82
		Notice of Availability	--	48 FR 11451	03/18/83
		Correction	--	48 FR 13176	03/30/83
		Final Amend.	--	48 FR 31414	07/08/83
		Notice (FDF)	--	48 FR 43682	09/16/83
		Correction	--	48 FR 45105	10/06/83
		Public Hearing (NPDES decision)	--	48 FR 45841	10/07/83
		PROPOSED (PCB)	--	47 FR 52066	11/18/82
		Extension	--	48 FR 2804	01/21/83
Steam-Electric	423	PROPOSED	10/03/80	45 FR 68328	10/14/80
		PROMULGATION	11/07/82	47 FR 52290	11/19/82
		Final Amend.	--	48 FR 31404	07/08/83
Textile Mills	410	PROPOSED	10/16/79	44 FR 62204	10/29/79
		PROMULGATION	08/27/82-	47 FR 38810	09/02/83
		Notice of Availability	--	48 FR 1722	01/14/83
		Correction	--	48 FR 39624	09/01/83
Timber	429	PROPOSED	10/16/79	44 FR 62810	10/31/79
		PROMULGATION	01/07/81	46 FR 8260	01/26/81
		Final Amend.	--	46 FR 57287	11/23/81

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APPENDIX F

NPDES LITIGATION - FINAL RULEMAKING

I. BACKGROUND

On June 7, 1979, EPA promulgated revised National Pollutant Discharge Elimination System (NPDES) permit regulations that implemented the 1977 Amendments to the Clean Water Act. Almost immediately, EPA was sued over portions of the new regulations. On May 19, 1980, EPA consolidated procedures and regulations for five individual permit programs, including the NPDES permit program. Again, EPA was sued. The two challenges to EPA's regulations were combined by the Court into one petition. To resolve the issues under contention, EPA held extensive negotiations with both industry and environmental groups that lasted nearly two years. The outcome of these negotiations were four separate settlement agreements signed by EPA and industry representatives. Environmental groups were not parties to any of the settlement agreements.

Two of the settlement agreements affect the NPDES program. One, the "Common Issues" settlement agreement, covered issues common to at least two of the five permit programs and final rules substantially similar to the settlement agreement were promulgated by EPA on September 1, 1983. Another settlement agreement covered only the NPDES permit program. Proposed rules implementing the NPDES Litigation settlement agreement were published on November 18, 1982.

The final NPDES Litigation rulemaking contains over 30 separate issues. The following is a concise summary of the essential facts or implications of the varied issues grouped by subject. The final rules represent a balance between the legitimate concerns of the industry litigants and the significant opposing comments received during the public comment period.

II. CHANGES AFFECTING WHO MUST HAVE A PERMIT

A. Storm Water Discharges - §§122.26, 122.3, 122.28

existing: Regulations exempt only uncontaminated rural discharge of channeled storm water runoff form coverage as point sources requiring NPDES permits.

proposed: Storm water discharges defined only as contaminated storm water runoff.

final: All storm water conveyances located in urbanized areas or on lands used for industrial or commercial activities are storm water point sources that must obtain a permit.

III. CHANGES AFFECTING ABILITY TO CONSTRUCT AND OPERATE

A. Construction Ban - §122.29(c)(4)

existing: Construction of a new source for which an EIS is required cannot begin until EPA issues a permit incorporating any EIS-related conditions unless the applicant signs binding written agreement to comply with all EIS-related conditions or the RA determines construction will not cause significant impacts.

proposed: Proposal eliminated the construction ban. The owner/operator of a new source may proceed with construction at own risk; EPA will not consider site restoration or construction alterations in evaluating NEPA recommendations and issuing the permit.

final: Retains the existing construction ban.

IV. CHANGES IN APPLICATION PROCESS AND TESTING REQUIREMENTS

A. Toxic Control Strategy §§122.21(g)(7),(g)(9) and (g)(10)

existing: Permit applicants must test for all toxic pollutants known or believed to be discharged, identify pollutants expected to be discharged during next five years at twice the levels in original application, and identify pollutants expected to be used or manufactured during the next five years.

proposed: Permit applicants must only test for toxic pollutants expected to be discharged on a routine or frequent basis in concentrations above 100 ppb; applicants also must test for conventionals and nonconventionals that are limited in an applicable effluent limitations guidelines. Other pollutants need only to be identified. Potential future discharges need not be identified on the application.

final: Permit applicants must test for all toxic pollutants known or believed to be discharged in concentrations above 10 ppb. Proposed testing for conventional and nonconventionals adopted. Applicants must identify currently used or manufactured toxic pollutants, but need not identify future discharges.

B. Storm Water Discharges - §122.26, also §§122.2, 122.28

existing: Regulations impose application requirements on storm water discharges that are the same as those for non-process industrial discharges.

proposed: Regulations will substantially reduce application requirements imposed on storm water discharges that must have a permit.

final: All storm water point sources must submit applications within 6 months. Discharges limited by effluent guidelines, located in urban areas or located in plant associated areas, must submit full applications (Forms 1 and 2c). Other storm water point sources must only submit Form 1, but must also supply additional narrative information on discharge.

V. REVISIONS AFFECTING STANDARD PERMIT CONDITIONS

A. Toxic Control Strategy - §122.42(a), 122.62(a)(12)

existing: The regulations require permittees to report when they begin to use or manufacture a toxic pollutant not reported in the application. Such information provides a cause for permit modification. The permittee must notify the Director as soon as it becomes aware that it is discharging a toxic pollutant that is not limited in the permit at levels exceeding five times the maximum value reported in its permit application.

proposed: The regulations will not require permittees to report new toxics used or manufactured after application (and drops the permit modification cause), and notification requirements for new toxic discharges will be tied to discharges occurring on a "routine or frequent" basis, with notification required at higher concentration levels for non-routine discharges.

final: Adopts proposal.

B. Notice of Physical Additions or Alterations - §122.41(l)(1)

existing: Permittee must notify Director of any planned physical alterations to its facility.

proposed: Notice of facility changes are required only when they significantly change the nature or quantity of pollutants discharged that are neither limited in the permit nor subject to other notification requirements.

final: Adopts proposal.

C. Bypasses - §122.41(m)

existing: Bypasses of treatment facilities that do not violate permit limits are allowed only for essential maintenance. Bypass in violation of permit limits is allowed only if (1) there were no feasible alternatives (such as the use of back-up equipment); (2) the bypass is necessary to prevent loss of life, personal injury, or severe property damage and (3) if prior notice is given to the Director.

proposed: Bypasses not violating permit limits are allowed if bypass points are adequately monitored. Upon a sufficient showing by offshore oil rigs, bypasses of produced water may be allowed without monitoring. Bypasses violating permit limits are prohibited if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement.

final: Retains existing provision prohibiting bypasses that do not violate permit limits, except where the bypasses are for essential maintenance. Bypass provision covering backup equipment is promulgated as proposed.

D. Proper Operation and Maintenance - §122.41(e)

existing: Proper operation and maintenance (O&M) of all treatment facilities is required at all times. Proper O&M is defined to include adequate funding, operator staffing and training, etc. Backup facilities are required only when necessary to achieve compliance with permit limits.

proposed: Clarifies that backup treatment systems only have to be operated when necessary to achieve compliance with permit limits. Eliminates "management controls" from the definition of proper O&M.

final: Adopts proposal.

E. Signatories to Reports - §122.22(b)

existing: All reports and any other information required of a permittee (other than an application) must be signed by a principal executive officer of a corporation or a duly authorized representative who can only be a person or position having overall responsibility for the facility or activity.

proposed: Principal executive officer would be allowed to authorize an individual or position having overall responsibility for environmental matters for the company to sign reports.

final: Adopts proposal.

VI. CHANGES AFFECTING THE DEVELOPMENT OF SPECIFIC CONDITIONS

A. Toxic Control Strategy - §122.44(e)

existing: The regulations require that Directors control all toxic pollutants either used or manufactured by the facility or discharged at levels greater than those achievable by BAT technology.

proposed: Directors need only control those toxic pollutants for which there is potential for discharge at levels greater than those achieveable by BAT technology, although the Director may limit any pollutant.

final: Adopts proposal.

B. New Source Criteria - §122.29(b)

existing: Discharger is classified as a new source if it is a new facility, if it totally replaces an existing source, or if construction changed the nature or quantity of pollutants discharged.

proposed: Construction at an existing source, but less than total replacement of the facility, would only result in a new source if the constructed facility functions substantially independent of the existing source.

final: Adopts the substantially independent test and clarifies the test by adding additional criteria: the extent to which 1) the new facility is integrated with the existing plant, and 2) the new facility is engaged in the same general type of activity as the existing source.

C. Disposal to Wells - §122.45(j), 122.50

existing: Mass-based effluent limitations are adjusted in proportion to the amount of the permittee's wastewater that is diverted to wells, POTWs or land application. Thus, dischargers may not meet technology-based limits by diverting a portion of their waste discharge.

proposed: Dischargers are allowed to install less extensive treatment than envisioned by BPT, BCT or BAT when a part of the wastes go to wells or land; these methods of disposal would be considered treatment and any adjustments for disposal to wells or land is eliminated.

final: Retains existing regulation.

D. BPJ [§402(a)(1)] Authority - §125.3(c)

existing: Director can set limits for particular pollutants on a case-by-case basis where there is no applicable effluent guideline or where a guideline has been issued covering the facility but the guideline does not control the particular pollutants.

proposed: Specifies those statutory factors that must be considered in setting case-by-case limits and requires permit writer to describe the basis for these limits in the fact sheet, including how each of the factors was applied.

final: Retains the list of statutory factors but has not adopted the fact sheet portion of the proposal.

E. Draft Development Documents and Treatability Manual - §125.3

existing: Permit writers are required to consider draft development documents and treatability manual in establishing BPJ limits.

proposed: Clarifies that permit writers are not bound by draft development documents or guidance, although all pertinent information, including these documents, must be considered.

final: Adopts proposal.

F. Net/Gross - §122.45(g) and (h)

existing: Generally, effluent limits shall not be adjusted for pollutants in the intake waters, unless allowed by the applicable guidelines or if certain stringent conditions are met.

proposed: Discharger receives net credit to the extent that the discharger uses guidelines technology or other equivalent technology and still cannot meet technology-based limits because of pollutants in the intake waters. Dischargers may receive net credit for discharge of raw water clarifier sludge.

final: Effluent limits may be adjusted to reflect credit for intake water pollutants if allowed by a guideline or if the discharger can demonstrate that the guideline technology cannot meet the technology-based limits due to intake water pollutants. Credit is only allowed to the extent necessary to meet the applicable limit and is only authorized for generic pollutants if the constituents of the generic pollutant in both intake water and effluent are substantially similar. Rule does not apply to raw water clarifier sludge.

G. Total Metals - §122.45(c)

existing: Permit effluent limits must be expressed in terms of the total metal, not the dissolved form, unless applicable effluent guidelines provide otherwise.

proposed: Permits limits must be expressed in terms of total recoverable metals unless a guideline or water quality standard specifies a different form or a permit writer determines a different measure is necessary to carry out the CWA.

final: Adopts proposal.

H. Toxics Control Strategy - Toxicity-Based Effluent Limits - §125.3(c)(4)

existing: Permit writers may issue permits that express effluent limitations in terms of toxicity, either in place of or in addition to the traditional mass (pounds of pollutant) or concentration limits.

proposed: Proposed to delete the regulatory provision. Preamble discouraged permit writer from setting toxicity-based limits until the Agency adopts a fromal position on whether and how to use toxicity testing in the permitting process.

final: Retains existing provision based on Agency issuance of policy on use of toxicity-based effluent limitations (February 3, 1984).

I. Actual Production - §122.45(b)

existing: Mass-based permit limits are set on the basis of a reasonable measure of actual production (five-year historical production figures).

proposed: Preamble made clear that the appropriate test in setting limits is what is reasonable, not necessarily five years. Would allow alternative permit limits for the automotive industry.

final: Expands proposal to allow other industries other than automotive industry to be covered by alternative permit limits.

J. Imposition of Water Quality Conditions Stayed by a Court or Agency - §122.44(d)(3)

existing: If a State certification that otherwise would establish conditions necessary to meet water quality standards is stayed by a State court or agency the Regional Administrator must include in the permit conditions necessary to meet those standards.

proposed: State has an additional 60 days to remove stay and reinstate certification before certification is deemed waived and permit is issued.

final: Adopts proposal.

K. Incorporation of NEPA-based Conditions in Permits - §122.44(d)(9)

existing: Permits must incorporate EIS-related conditions or limits.

proposed: Allows greater freedom to permittees to challange the application of NEPA conditions in individual permits.

final: Adopts proposal; regulations take no position on particular circumstances under which NEPA conditions may be imposed in permits; EPA's authority to impose EIS-related conditions is unchanged.

L. Compliance Schedule Prohibition - §122.47(a)

existing: New sources and new dischargers that began discharging after August 1979 cannot receive compliance schedules, and therefore, such sources must have their pollution control equipment in place and operating when they begin discharging.

proposed: New sources and new dischargers may receive compliance schedules if necessary to achieve compliance with requirements established after construction began and established less than three years before beginning discharge.

final: Adopts proposal.

M. Anti-Backsliding - §122.44(c) and (l)

existing: No permit based upon Best Professional Judgment (BPJ) may be reissued with less stringent limitations, except in limited circumstances.

proposed: Allows backsliding to less stringent permit limitations where a less stringent guideline is promulgated subsequent to issuance of a BPJ permit.

final: Retains existing provision except BPJ permits may be reissued with less stringent limitations if permittee can demonstrate wholly disproportionate operation and maintenance costs compared to similar facility with permit based on subsequent guidelines.

VII. PROCEDURAL CHANGES

A. Modification of Permits to Conform to Revised Rules - §§122.62(a); 124.5

existing: No provision.

proposed: Permit modification will be allowed for permits issued on or after March 9, 1982 to conform to certain changes resulting from the settlement agreement.

final: Adopts proposal except for those provisions being retained in existing form and not being changed in accordance with settlement agreement.

B. Mistake and Failure of Technology to Achieve BPJ Limits - §122.62

existing: The grounds for permit modification do not include technical mistakes or failure of technology to meet BPJ limits.

proposed: Permits may be modified to correct mistakes, errors of law and to take into account the failure of technology to achieve BPJ limits.

final: Adopts proposal.

C. Deferral of Hearing on New Source Determination - §122.21(k)

existing: The Regional Administrator can defer a hearing on a new source determination until the evidentiary hearing on the permit.

proposed: Deferral of hearing on new source determinations will be authorized only when all parties agree.

final: Adopts proposal.

D. Obligation to Submit Evidence and Raise Issues -§§124.13; 124.76

existing: Interested persons must raise all issues and submit all factual contentions and supporting material by the close of the public comment period and prohibits admission into evidence of other material at an evidentiary hearing except for "cause."

proposed: Allows evidence to be submitted after close of public comment period, if factual contentions had been submitted during the public comment period. Regional Administrator may reopen comment period, at which time all supporting material must be submitted.

final: Adopts proposal.

E. Scope of Cross-Examination - §124.85(b)(16); 124.121(a)(1)

existing: Regulations governing evidentiary hearings allow no cross-examination on matters of "policy" except to the extent necessary to disclose the factual basis for permit conditions.

proposed: While there may be no cross-examination on matters of policy, there may be cross-examination on facts that form the basis for EPA policy, if the cross-examination relates to the factual basis for permit requirements in question; same rules are extended to nonadversary panel hearings.

final: Adopts proposal.

F. Ex Parte Communications - §124.78

existing: Ex parte contacts between EPA "trial staff" and the decision-maker are prohibited. Witnesses are not prohibited from contact with decision-makers unless they are designated members of trial staff.

proposed: EPA witnesses and permit writers are designated as members of the "trial staff."

final: Adopts proposal.

G. Applicability of Panel Hearing Procedures to Initial Permits and Variances - §124.111

existing: Administrative Procedure Act (APA) provides several less stringent procedural requirements for formal hearings on the issuance of "initial licenses" than apply in other formal adjudications. "Nonadversay panel" (NAP) hearings for initial permits and for the first decision on a variance for any permittee employs these less stringent requirements.

proposed: NAP proceedings can only be held with the consent of the applicant.

final: Retains existing provision.

H. Role of Panel Members in Panel Hearings - §§124.120; 124.124; 124.126

existing: EPA employees who prepared draft permits may sit on the panel at a Non Adversary Panel hearing and may advise the decision-maker (Administrative Law Judge or the Adimistrator on appeal).

proposed: Permit writers may not serve on NAP panels.

final: Adopts proposal.

VIII. CHANGES AFFECTING ENFORCEMENT

Upset Defense - §122.41(n)

existing: EPA recognizes an upset defense to temporary noncompliance with technology-based permit limits when caused by factors beyond the permittee's control and when the permittee can identify the specific cause of the upset.

proposed: An upset defense would also be allowed for violation of water quality-based permit limits as long as instream water quality standards are met throughout the upset.

final: Retains existing provision, except for a minor clarification to the requirement that permittee's identify the cause of the upset (rather than the specific cause).

APPENDIX G

AN OVERVIEW OF WATER QUALITY-BASED TOXICS CONTROL

Permits Division
U. S. Environmental Protection Agency

February, 1985

A. Water Quality-based Toxics Control in the NPDES Permit Program

1. Why water quality now?

More and more NPDES industrial and municipal permits are achieving final treatment technologies. Water quality controls will be the primary post-BAT mechanism for limiting toxics in NPDES permits.

2. Why use toxicity as an assessment and regulatory parameter?

Permitting authorities are faced with toxic water quality impacted receiving waters which are very complex and for which single chemical water quality standards are limited. Single chemical limits cannot always be used to limit toxic effects because there will be too many chemicals to limit, there will be unknown problem toxicants, and bioavailability will not be assessed on a site specific basis.

Toxicity testing will be most effective in complex situations because:

(1) The ability to measure the presence of a toxic pollutant is not limited by the ability to chemically analyze for the pollutant.

(2) The measurement of the toxicity of a water sample incorporates the site-specific effects of chemical interactions that effect the bioavailability or toxicity of the pollutants.

(3) The measurement of the toxicity of a water sample incorporates the site-specific effects of multiple pollutants on the test organisms.

(4) The measurement of toxicity is a more cost effective means to determine the toxicity effects of complex wastewater and ambient water samples compared to chemical analysis and extrapolation of effects.

B. National Policy

EPA has issued a policy (49 FR 9016, March 9, 1984) on water quality-based permit limits for toxic pollutants. The major features of the policy are as follows:

1. To control toxics beyond BAT, an integrated strategy using both biological and chemical methods is to be followed.

2. State standards of a narrative nature ("no toxics in toxic amounts") can be the basis for control.

3. §308 and §402 of the Clean Water Act allow EPA and the States to require chemical, toxicity, and instream data to assure compliance with standards.

4. Effluent toxicity can and should be used as a parameter for permit limits.

5. EPA will assure that each Region has the technical capability for assessments and can provide technical support to the States.

C. Considerations in Using Toxicity

1. What is a toxicity test?

   - Toxicity is measured by exposing organisms to water or wastewater samples to determine the effects to the organisms.

   - Usually the test is set up to determine the dilution of sample that causes some effect endpoint. Common endpoints are 50% mortality (LC_{50}) and no observable effects (NOEL).

   - In addition to testing a serial dilution of sample, a test can be conducted using undiluted sample and noting the degree of mortality, impairment of growth/reproduction, or other effects. This type of test provides a cheap way to assess large segments of a river (termed ambient testing).

   - Acute toxicity is effects that occur from exposures of short duration relative to an organism's lifespan. Chronic toxicity is effects that occur from exposures of long duration (concerned principally with growth, reprodution, and latent mortality).

2. Expressing toxicity

   - Toxicity is often expressed as the dilution of sample that causes the test endpoint (or the concentration of chemical that causes the endpoint). For example, a water sample is diluted in a serial dilution series and no effects are observed in dilutions below 25% sample. The NOEL is expressed as 25% sample.

   - To use criteria, facilitate modelling, and express permit limits, it is recommended that toxicity be expressed as toxic units. A toxic unit is merely the inverse of the sample fraction. Toxicity expressed as percent sample is divided into 100 to obtain toxic units. The example above can be expressed as 4 chronic toxic units.

   - When using toxic units it is important to distinguish acute toxic units from chronic toxic units.

3. Species sensitivity -

   - Different species exhibit different sensitivity to a toxicant. It is impossible to generalize which species is most sensitive to a particular toxicant. Because effluent and ambient samples are of unknown composition, it is impossible to predict which of several organisms will be most sensitive.

- The purpose of toxicity testing is to measure a portion of the range of sensitivity that would be expressed in the natural community and then use a test organism from the more sensitive end of that range to characterize the effect on the community.

- Field comparisons between toxicity and ecological impact have shown that using the most sensitive of several organisms accurately reflects ecological impact.

- The selection of test organisms is not important as long as the selected organisms represent ecologically diverse taxa. At least 3 species should be tested to select the most sensitive.

4. Costs

- Costs for toxicity tests are comparable to chemical analyses.

- Costs are decreasing as demand increases. Currently acute tests cost from $200-400 and recently developed short term chronic tests cost from $500-1000.

D. Water Quality Criteria

1. Criteria have 3 components:

   Magnitude - how much toxicity or chemical is allowable

   Duration - how long can exposure be greater than the allowable magnitude (limited by specifying a period in which to average the exposure)

   Frequency - how often can violations occur without significantly affecting the aquatic community

2. Toxicity criteria are analogus to chemical criteria. Criteria below apply to ambient water (e.g., beyond the mixing zone).

   o Criteria for acute protection:

     Magnitude: less than 0.3 acute toxic units to the most sensitive of at least 3 test organisms

     Duration: as a 1-day average

     Frequency: no more frequently than once every 3-5 years

   o Criteria for chronic protection:

     Magnitude: less than 1.0 chronic toxic units to the most sensitive of at least 3 test organisms

     Duration: as a 4-day average

     Frequency: no more frequently than once every 3-5 years

3. Frequency may be modified based on site-specific factors related to the sites' ability to recover from impact (recruitment potential, ecosytem sensitivity, size of the area experiencing impact, etc.)

E. Basic Relation

1. Preventing impacts involves the relationship between criteria, effluent quality, and assimilative capacity. Toxicity is handled exactly the same as chemical concentration.

2. Basic relation:

(effluent toxicity) x (1/Dilution factor) $\leq$ criterion

3. For multiple sources assume additivity:

$$\frac{(Qe\ Te)}{(Qe) + Qs} \leq \text{criterion}$$

Qe = effluent flow
Te = effluent toxicity
Qs = stream flow

The assumption of additivity can be tested by using ambient toxicity tests

4. Note that limitations depend on the dilution and the criteria. Permit limits can be developed without prior testing of the effluent discharge.

For example: permit limit = criterion x dilution factor

F. Screening and Assessment

1. Reasons for conducting an assessment prior to permit limit development:

   a. to determine or confirm that an impact exists

   b. to develop data on test organism sensitivity to avoid the 10X species sensitivity factor

   c. to develop data on effluent variability in order to use dynamic exposure models

   d. to assess the dispersion for mixing zone analysis

2. The applicant should be required to provide the data necessary to make the assessment.

3. A tiered assessment approach is recommended. Uncertainty factors are used to account for insufficient data. In any tier, if impact is projected, the State can either go to limit development or permit the applicant to collect more data and eliminate one of the uncertainty factors.

4. Uncertainty factors

   a. Species sensitivity; 10X; dropped if 3-5 species tested and the most sensitive identified

   b. Effluent variability; 10-100X; used in assessment only, not in limit development; dropped if variability is adequately characterized.

   c. Acute-chronic ratio; 10X; not really an uncertainty factor; used to convert acute toxicity data to chronic toxicity data

5. Recommendations

   Persistency - assume conservative (well treated effluent should not change within the relatively small mixing zone) - can test using ambient toxicity

   Multiple sources - assume the toxicity of multiple sources is additive - can test using ambient toxicity

   Dispersion - assess if mixing is not obviously rapid. Assuming completely mixed conditions may allow a toxic plume to extend for many miles. A dye or conductivity study is recommended.

G. Modelling

The objective is to model the assimilative capacity in order to determine the relationship between sources of pollutants and attainment of the criteria.

Type 1 - Standard steady state

a. all inputs assumed constant (stream flow, effluent flow, effluent quality, etc.)

b. yields a single value for required effluent quality

c. advantage: ease of use

d. disadvantage: variability is not considered. The only way to address the duration and frequency aspects of the criteria is in the selection of a river flow rate. Provides no information for permit development on acceptable effluent variability. Is generally overprotective.

Type 2 - Dynamic computer models

a. considers the variability in the inputs

b. yields the required effluent quality in terms of a long term average and coefficient of variation

c. three types of models available: continuous simulation, lognormal probability analysis, Monte Carlo analysis

d. advantages: provides information on acceptable effluent variability; more accurate representation of effects (less overprotective)

e. disadvantage: more effort required. Data requirements depend on the type of model used.

Type 3 - Acute and Chronic Steady State

a. an interim approach in which two models are used — one for acute protection and one for chronic protection — and the duration criterion is applied to the required effluent quality

b. yields two effluent requirements -- a 1-day requirement and a 4-7 day average requirement

c. advantages - provides some information on acceptable effluent variability. Easy to apply.

d. disadvantage - overprotective compared to dynamic models (although not as overprotective as standard steady state)

H. Permit Limits

1. Limits must enforce the Wasteload Allocation (WLA)

2. WLA and limits may have to be different because each may use a different expression of effluent quality or have incongruent assumptions about probability of occurrence.

3. Recommendations:

   a. For standard steady state WLA, use value as monthly average limit for nutrients and bioaccumulative pollutants and as daily max for toxic pollutants and toxicity.

   b. For dyanamic model WLA, derive limits from the long term average and coefficient of variation using standard permit limit statistical procedures.

   c. For acute and chronic steady state WLA, (1) backcalculate required long term average for each WLA, (2) determine which requirement is limiting, and (3) calculate limits from long term average and CV.

4. When limiting toxicity, use a study called a toxicity reduction evaluation to implement a compliance schedule and ensure progress toward compliance.

5. Any chemical or parameter limited as a principal control mechanism should be monitored at least once per month and preferably once per week.

APPENDIX H

Permit

MODEL NPDES PERMIT FORMAT

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. §1251 et seq., hereinafter the "Clean Water Act", or "Act") and attendant regulations incorporated by the U.S. Environmental Protection Agency under Title 40 of the Code of Federal Regulations ---

(Name of Discharger) (hereinafter "Permittee")

is authorized to discharge from its (description of facility), located at

(insert Address)

to the receiving waters named (identify)
in accordance with the effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III herein. The permit consists of this cover sheet, Part I - 3 page(s), Part II - 21 page(s), and Part III - 5 page(s).

All references to Title 40 of the Code of Federal Regulations are to regulations that are in effect on the effective date of this permit. Unless otherwise specified herein, all terms are defined as provided in the applicable regulations in Title 40 of the Code of Federal Regulations.

This permit shall become effective on (insert date). This permit and the authorization to discharge shall expire at midnight (insert date).

Date

Director

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Sample Effluent Limitations).

1. During the period beginning on the effective date of this permit and lasting through expiration, the Permittee is authorized to discharge from outfall serial number 001, non-contact cooling water, sanitary wastewater and stormwater.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Daily Average	Daily Maximum	Measurement Frequency	Sample Type
Flow, ^{3}/day(MGD)	-	-	1/Month	Instantaneous
Temperature °C(°F)	-	-	1/Week	Grab
Other Permits				

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per month by grab sample.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with monitoring requirements specified above shall be taken at the following location(s): at the nearest accessible point but prior to actual discharge of mixing with the receiving waters.

The Permittee shall not augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with the above limitations.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Sample Effluent Liitations).

2. During the period beginning effective date and lasting through expiration date the Permittee is authorized to discharge from outfall serial number 002, treated process wastewater.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day (lbs/day)		Other Units(Specify)		Measurement	Sample
	Avg. Monthly	Max. Daily	Avg. Monthly	Max. Daily	Frequency	Type
Flow-m^3/Day (MGD)				(0.01)	Continuous	Avg. Max. Min.
TSS			31 mg/l	60 mg/l	2/Month	8-hr Composite
Oil and Grease				15 mg/l	2/Month	Grab
Aluminium				.5 mg/l	2/Month	8-hr Composite
Chromium			0.18 mg/l	2.6 mg/l	2/Month	8-hr Composite
Iron			2.0 mg/l	3.0 mg/l	2/Month	8-hr Composite
Cyanide			0.02 mg/l	0.07 mg/l	1/Quarter	Grab
*Total Toxic Organics				2.13 mg/l	1/Quarter	Grab
**Copper					1/Month	8-hr Composite
**Zinc					1/Month	8-hr Composite
**Lead					1/Month	8-hr Composite

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored daily by a grab sample.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken from the following location: at the point of discharge.

The Permittee shall not augment the use of process wastewater or otherwise dilute the wastewate as a partial or total substitute for adequate treatment to achieve compliance with the above limitations.

B. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substance:

1. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits, or that will adversely affect aquatic life or water fowl;

2. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

3. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuissance;

4. In amounts that either singly or in combination with other substances that are toxic to human, animal, or aquatic life;

5. In ammonts that are condusive to the growth of aquatic weeds or algea to the amount that such growths become inimical to more desireable forms of aquatic life, or create conditions that are unsightly, or constitutes a nuissance in any other fashion.

6. In amounts that will impair designated instream or downstream water uses.

C. SCHEDULE OF COMPLIANCE

1. The Permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of non-compliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

Part II

STANDARD CONDITIONS FOR NPDES PERMITS

SECTION A. GENERAL CONDITIONS

1. Duty to Comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

2. Toxic Pollutants

The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

3. Penalities for Violations of Permit Conditions

Any person who violates a permit condition is subject to a civil penalty not to exceed $10,000 per day for each violation. Any person who willfully or negligently violates permit conditions is subject to a fine of not less than $2,500 nor more than $25,000 per day for each violation, or by imprisonment for not more than 1 year, or both.

4. Duty to Reapply

(a) If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a renewal permit. The Permittee shall submit a new application at least 180 days before the expiration date of this permit, unless permission for a later date has been granted by the Director.

(b) Where EPA is the Permit Issuing Authority for the renewal permit, the terms and conditions of this permit continue in force under 5 U.S.C. §558(c) until the effective date of the new permit (or permit denial) only if the Permittee has submitted a timely and complete application under 40 CFR §122.21 for a renewal permit and the Permit Issuing Authority, through no fault of the Permittee, does not issue a new permit (or deny the permit) before the expiration date of this permit. The permit continued under 5 U.S.C. §558(c) remains fully effective and enforceable, including subject to the actions set forth in 40 CFR §122.6(c).

5. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

6. Permit Actions (Modification, Revocation and Reissuance, or Termination)

(a) This permit may be modified, revoked and reissued, or terminated for cause (as described in 40 CFR §§122.62, 122.63, and 122.64), including, but not limited to: (1) Violation of any terms or conditions of this permit; (2) Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or (3) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(b) Notwithstanding Paragraph II-A-6(a) above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit may be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.

(c) Notwithstanding Paragraph II-A-6(a) above, this permit may be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(A), (C), (D), (E) and (F), or 304(b)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved contains different contains different conditions or is otherwise more stringent than any effluent limitation in this permit; or controls any pollutant not limited in this permit.

7. Effect of Permit/Other Laws

(a) Issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to persons or property, or invasion of other private rights, or any infringement of Federal, State or local laws or regulations.

(b) Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under autority preserved by section 510 of the Clean Water Act.

(c) Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under Section 311 of the Act.

(d) Except as provided in permit conditions on "Upsets", Paragraph II-B-4 below, and pH Excursions, Paragraph II-D-7 below, nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance with a permit condition.

(e) Pursuant to Section 509(b)(1)(F) of the Clean Water Act, a challenge to the validity of permit conditions, including the effluent limitations in Part I-A of this permit, shall not be a defense to an enforcement action under Section 309 or 505 of the Clean Water Act. Each and every violation of a permit condition is subject to an enforcement action.

(f) Compliance with the terms of this permit does not constitute a defense to any action brought under §504 of the Clean Water Act, or any other law governing protection of public health or welfare, for any imminent and substantial endangerment to public health or welfare.

8. Onshore or Offshore Construction

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any waters of the United States.

9. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable time any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

SECTION B. OPERATION AND MAINTENANCE

1. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the Permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

2. Need to Halt or Reduce not a Defense

It shall not be defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities

a. Definitions

(i) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

(ii) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations.

The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Paragraphs II-B-3(c) and (d), below.

c. Notice

(i) Anticipated bypass. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; (including an evaluation of the anticipated quality and effect of the bypass.)

(ii) Unanticipated bypass. The Permittee shall submit notice of an unanticipated bypass as required in Paragraph II-D-7 (24-Hour Notice).

d. Prohibition of bypass.

Bypass is prohibited and the Director may take enforcement action against the Permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The Permittee submitted notices as required under Paragrpah II-B-3(c) above.

e. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph II-B-(3)(d).

(4) Upset

(a) Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations becuase of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Paragraph II-B-4(c), below, are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(i) An upset occurred and that the Permittee can identify the specific cause(s) of the upset;

(ii) The Permitte facility was at the time being properly operated;

(iii) The Permittee submitted notice of the upset as required in Paragraph II-D-7 below, (24-hour notice); and

(iv) The Permittee complied with any remedial measures required under Paragraph II-A-5 above.

(d) Burden of proof. In any enforcement proceeding the Permittee seeking to establish the occurrence of an upset has the burden of proof.

5. A Schedule of Maintenance

Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during noncritical water quality periods and carried out in a manner approved by the Director.

6. Power Failures

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the Permittee shall either:

In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if such alternative power source is not in existence, and no date for its implementation appears in Part I,

Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

7. Removed Substances

This permit does not authorize discharge of solids, sludge, filter backwash, or other pollutants removed in the course of treatment or control or wastewaters to waters of the United States unless specifically limited in Part 1-A. All solids, sludges, filter backwash, or other pollutants removed from, or resulting from the treatment or control of discharges must be disposed of in accordance with all applicable Federal, State, and Local requirements.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Samples and measurements taken for the purposes of monitoring shall be representative of the volume and nature of the monitored activity.

2. Sampling Points

All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director.

3. Flow Measurements

Appropriate flow measurements devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ± 10% from the true discharge rates throughout the range of expected discharge volumes. Once-through condenser cooling water flow which is monitored by pump logs, or pump hour meters as specified in Part I of this permit and based on the manufacturer's pump curves shall not be subject to this requirement. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:

a. "A Guide of Methods and Standards for the Measurement of Water Flow", U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 97 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD catalog No. C13.10:421.)

b. "Water Measurement Manual", U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by catalog No. 127.19/2:W29/2, Stock No. S/N 24003-0027.)

c. "Flow Measurement in Open Channels and Closed Conduits", U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or micofiche from National Technical Information Service (NTIS), Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

d. "NPDES Compliance Flow Measurement Manual", U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-77, September 1981, 135 pp. (Available from the General Services Administration (8BRC), Centralized Mailing Lists Services, Building 41, Dever Federal Center, Denver, CO 80225.

4. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

5. Calibration

The Permittee shall periodically calibrate and perform maintenance on all monitoring and analytical equipment used to monitor the pollutants discharged under this permit, at intervals which will ensure the accuracy of measurements.

6. Testing Variability Not a Defense

If the Permittee believes or has reason to believe that monitoring or sampling results reflect an analytical variability so as to render the results inaccurate, he may monitor or sample more frequently than required by this permit. The validity of the testing results, whether or not the Permittee has monitored or sampled more frequently, shall not be a defense to an enforcement action under §§309 or 505 of the Clean Water Act.

7. pH Effluent Limitations Under Continuous Monitoring

Notwithstanding Paragraphs I of this permit, where the Permittee continuously measures the pH of wastewater pursuant to a requirement or option in this permit, excursions from the range provided in Paragraphs I-A are permitted, provided:

(a) The pH limitation in Paragraphs I-A of this permit is based upon a requirement imposed under 40 CFR Subpart N.

(b) The total time during which the pH values are outside the required range of pH values shall not exceed 446 minutes in any calendar month; and

(c) No individual excursions form the range of pH values shall exceed 60 minutes.

(d) For purposes of this section, an "excursion" is an unintentional and temporary incident in which the pH value of discharge wastewater exceeds the range set forth in Paragraphs I-A of this permit. The number of individual excursions exceeding 60 minutes and the total accumulated excursion time in minutes occurring in any calendar month shall be reported in accordance with Paragraph II-D-5 of this permit.

8. Penalties for Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

9. Rentention of Records

The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recording for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

10. Monitoring Records

Records of monitoring information shall include:

a. The date, exact place and time of sampling or mesurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

11. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR) pursuant to Paragrpah II-D-5. Such increased frequently shall also be indicated.

12. Averaging of Measurements

Calculations for limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes.

The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under Paragraph II-D-9.

2. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of this permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application at least 180 days prior to commencement of such discharges, or if such changes will not violate the effluent limitations specified in this permit, by notice in writing, to the Director of such changes. Following such notice, the permit may be modified or revoked and reissued pursuant to 40 CFR §122.62(a) to specify and limit any pollutants not previously limited.

Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by the permit constitutes a violation.

3. Anticipated Noncompliance

The Permittee shall give advance notice to the Permit Issuing Authority of any planned change in the permitted facility or activity which may result in noncompliance with permit requirements. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during noncritical water quality periods and carried out in a manner approved by the Permit Issuing Authority.

4. Transfer

(a) In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

(b) This permit is nontransferable to any person except after notice to the Director and compliance with Paragraph II-D-4(c) below.

(i) Transfers by modification. Except as provided in paragraph II-D-(4)(c)(ii) below, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under 40 CFR §122.62(b)(2), or a minor modification made (under 40 CFR §122.63(d)), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(ii) Automatic transfers. This permit may be automatically transferred to a new permittee if:

(a) The Permittee notifies the Director at least 30 days in advance of the proposed transfer date;

(b) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

(c) The Director does not notify the existing Permittee and the proposed new permittee of his or her intent to modify or revoke and reissue the permit. A modification under the subparagraph may also be minor modification under 40 CFR §122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

5. Reporting of Monitoring Results

Monitoring results obtained during the previous calender (insert frequency, i.e. - month or quarter) shall be summarized for each month (each quarter if monitoring frequency is quarterly) and must be reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due (insert date). Duplicate signed copies of these, and all other reports required by Section D of Part II, (Reporting Requirements) of this permit shall be submitted to the Director and the State at the following addresses:

6. Compliance Schedules

Compliance schedule progress reports shall be submitted in accordance with Paragraph I-C-2.

7. Twenty-Four Hour Reporting

The Permittee shall orally report any noncompliance which may endanger health or the environment, within 24 hours from the time the Permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Director may waive the written report, on a case-by-case basis, when the oral report is made.

The following violations shall be included in the 24 hour report when they might endanger health or the environment.

a. An unanticipated bypass which exceeds any effluent limitation in this permit.

b. Any upset which exceeds any effluent limitation in this permit.

c. Violation of a maximum daily discharge limitation for any of the following pollutants (any toxic pollutant or hazardous substance, or any pollutant specifically identified as the method to control a toxic pollutant or hazardous substance.)

8. Other noncompliance.

The Permittee shall report all instances of noncompliance not reported under Paragraphs II-D-5, 6, and 7 above at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph II-D-7 above.

9. Other information.

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

10. Changes in Discharges of Toxic Substances

The Permittee shall notify the Director as soon it knows or has reason to believe:

a. That any activity has occured or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant (listed at 40 CFR 122, Appendix D, Table II and III) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(i) One hundred micrograms per liter (100 ug/l);

(ii) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

(iii) Five (5) times the maximum concentration value reported for that pollutant in the permit application;

b. That any activity has occured or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic polllutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification level".

(i) Five hundred micrograms per liter (500 ug/l);

(ii) One milligram per liter (1 mg/l) for antimony;

(iii) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7).

11. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

12. Signatory Requirements

a. All applications, reports, or information submitted to the Director shall be signed and certified.

b. All permit applications shall be signed as follows:

(i) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (A) a president, secretary, treasurer or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy - or decision-making functions for the corporation, or (B) the manager of one or more manufacturing production or operating facilities employing more then 250 persons or having gross annual sales or expenditures exceeding 25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(ii) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(iii) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes: (A) The chief executive officer of the agency, or (B) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

c. All reports required by this permit and other information requested by the Director shall be signed by a person described in paragraph II-D-(12)(b) above or by a duly authorized representative. A person is a duly authorized representative only if:

(i) The authorization is made in writing by a person described in paragraph II-D-(12(b) above;

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator or a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may be either a named individual or any individual occupying a named position); and

(iii) The written authorization is submitted to the Director.

d. Changes is authorization shall be made pursuant to 40 CFR §122.22(c).

e. Certification. Any person signing a document under Paragraphs II-D-10 shall make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

13. Availability of Reports

Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the Clean Water Act, permit applications, permits and effluent data shall not be considered confidential.

14. Penalties for Falsification or Reports

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

SECTION E. DEFINITIONS (Suggested definitions not addressed in 40 CFR Part 122)

1. Average - the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliform, the average shall be the geometric mean.

2. Mass/Day Measurements (The language in paragraph a, b, and c may be included as an alternative to the definitions of average monthly, average weekly, and daily maximum discharge limitations in §122.2).

   a. The "average monthly discharge" is defined as the total mass of all daily discharges sampled and/or measured during a calendar month on which daily discharges are sampled and measured, divided by the number of daily discharges sampled and/or measured during such month. It is, therefore, an arithmetic mean found by adding the weights of the pollutant found each day of the month and then dividing this sum by the number of days the tests were reported. This limitation is identified as "Daily Average" or "Monthly Average" in Part I of the permit and the average montly discharge value is reported in the "Average" column under "Quantity" on the Discharge Monitoring Report (DMR).

   b. The "average weekly discharge" is defined as the total mass of all daily discharges sampled and/or measured during the calendar week on which daily discharges are sampled and/or mesured during such week. It is, therefore, an arithmetic mean found by adding the weights of pollutants found each day of the week and then dividing this sum by the number of days the tests were reported. This limitation is identified as "Weekly Average" in Part I of this permit and the average weekly disharge value is reported in the "Maximum" column under "Quantity" on DMR.

   c. The "maximum daily discharge" is the total mass (weight) of a pollutant discharged during a calendar day. If only one sample is taken during any calendar day the weight of pollutant calculated from it is the "maximum daily discharge". This limitation is identified as "Daily Maximum", in Part I of this permit and the highest such value recorded during the reporting period is reported in the "Maximum" column under "Quantity" on the DMR.

   d. The "average annual discharge" is defined as the total mass of all daily discharges sampled and/or measured during the calendar year on which daily discharges are sampled and/or measured during each week. It is, therefore, an arithmetic mean found by adding the weights of pollutants found each day of the year and then dividing this sum by the number of days the tests were reported. This limitation is defined as "Annual Average" in Part I of this permit and the average annual discharge value is reported in the "Average" column under "Quantity" on the DMR.

3. Concentration Measurements

a. The "average monthly concentration", other than for fecal coliform bacteria, is the sum of the concentrations of all daily discharges sampled and/or measured divided by the number of daily discharges sampled/ and/or measured during such month (arithmetic mean of the daily coentration values). The daily concentration value is equal to the concentration of a composite sample or in the case of grab samples is the arithmetic mean (weight by flow value) of all the samples collected during that calendar day. The average monthly count for fecal coliform bacteria is the geometric mean of the counts for samples collected during a calendar month. This limitation is identified as "Monthly Average" or "Daily Average" under "Other Limits" in Part I of this permit and the average montly concentration value is reported under the "Average" column under "Quality" on the DMR.

b. The "average weekly concentration", other than for fecal coliform bacteria, is the sum of the concentrations of all daily discharges sampled and/or measured during a calendar week on which daily discharges are sampled and measured divided by the number of daily discharges sampled and/or measured during such week (arithmetic mean of the daily concentration values). The daily concentration value is equal to the concentration of a composite sample or in the case of grab samples is the arithmetic mean (weighted by flow value) of all the samples collected during that calendar day. The average weekly count for fecal coliform bacteria is the geometric mean of the counts for samples collected during a calendar week. This limitations is identified as "Weekly Average" under "Other Limits" in Part I of this permit and the average weekly concentration value is reported under the "Maximum" column under "Quality" on the DMR.

c. The "maximum daily concentration" is the concentration of a pollutant discharge during a calendar day. It is identified as "Daily Maximum" under "Other Limits" in Part I of this permit and the highest such value recorded during the reporting period is reported under the "Maximum" column under "Quality" on the DMR.

d. The "average annual concentration", other than for fecal coliform bacteria, is the sum of the concentrations of all daily discharges sampled and/or measured during a calendar year on which daily discharges are sampled and measured divided by the number of daily discharges sampled and/or measured during such year (arithmetic mean of the daily concentration values). The daily concentration value is equal to

the concentration of a composite sample or in the case of grab samples is the arithmetic mean (weighted by flow value) of all the samples collected during the calendar day. The average yearly count for fecal coliform bacteria is the geometric mean of the counts for samples collected during a calendar year. This limitation is identified as "Annual Average" under "Other Limits" in Part I of this permit and the average annual concentration value is reported under the "Average" column under "Quality" on the DMR.

4. Other Measurements

a. The effluent flow expressed as M3/day (MGD) is the 24 hour average flow averaged monthly. It is the arithmetic mean of the total daily flows recorded during the calendar month. Where monitoring requirements for flow are specified in Part I of this permit, the flow rate values are reported in the "Average" column under "Quantity" on the DMR.

b. An "instantaneous flow measurement" is a measure of flow taken at the time of sampling, when both the sample and flow will be representative of the total discharge.

c. Where monitoring requirements for pH, dissolved oxygen or fecal coliform bacteria are specified in Part I of this permit, the values are generally reported in the "Quality or Concentration" column on the DMR.

5. Types of Samples

Grab sample: An individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

Composite sample: A combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of facility over a 24 hour period. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically. For GC/MS Volatile Organic Analysis (VOA), aliquots must be combined in the laboratory immediately before analysis. Four (4) (rather than eight) aliquots or grab samples should be collected during actual hours of discharge over a 24 hour period and need not be flow proportioned. Only one analysis is required.

6. Calculation of Means

a. Arithmetic Mean: The arithmetic mean of any set of values is the summation of the individual values divided by the number of individual values.

b. Geometric Mean: The geometric mean of any set of values is the N^{th} root of the product of the individual values where N is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

c. Weighted by Flow Value: Weighted by flow value means the summation of each concentration times its respective flow divided by the summation of the respective flows.

7. Calendar Day

A calendar day is defined as the period from midnight of one day until midnight of the next day. However, for purposes of this permit, any consecutive 24-hour period that reasonably represents the calendar day may be used for sampling.

8. Abbreviations

The following abbreviations, when used, are defined below.

cu. M/day or M^3/day	cubic meters per day
mg/l	milligrams per liter
ug/l	micrograms per liter
lbs/day	pounds per day
kg/day	kilograms per day
Temp. °C	temperature in degrees Centigrade
Temp. °F	temperature in degrees Fahrenheit
Turb.	turbidity measured by the Nephelometric Method (NTU)
TNFR or TSS	total nonfilterable residue or total suspended solids

DO	dissolved oxygen
BOD	five-day biochemical oxygen demand unless otherwise specified
TKN	total Kjeldahl nitrogen as nitrogen
Total N	total nitrogen
NH_3-N	ammonia nitrogen as nitrogen
Total P	total phosphorus
COD	chemical oxygen demand
TOC	total organic carbon
Surfactant	surface-active agent
pH	a measure of the hydrogen ion concentration
PCB	polychlorinated biphenyl
CFS	cubic feet per second
MGD	million gallons per day
Oil & Grease	Freon extractable material
Total Coliform	total coliform bacteria
Fecal Coliform	total fecal coliform bacteria
ml/l	milliliter(s) per liter
NO_3-N	nitrate nitrogen as nitrogen
NO_2-N	nitrite nitrogen as nitrogen
NO_3-NO_2	combined nitrate and nitrite nitrogen as nitrogen
Cl_2	total residual chlorine

PART III

OTHER REQUIREMENTS

SECTION A. GENERAL BEST MANAGEMENT PRACTICES CONDITIONS

1. BMP Plan

For purposes of this part, the terms "pollutant" or "pollutants" refers to any substance listed as toxic under Section 307(a)(1) of the Clean Water Act, oil, as defined in Section 311(a)(1) of the Clean Water Act, and any substance listed as hazardous under Section 311 of the Clean Water Act. The Permittee shall develop and implement a Best Management Practices (BMP) plan which prevents, or minimizes the potential for the release of pollutants (may want to limit to hazardous or toxic pollutants) from ancillary activities, including material storage areas; plant site runoff; in-plant transfer, process and material handling areas; loading and unloading operations, and sludge and waste disposal areas, to the waters of the United States through plant site runoff; spillage or leaks; sludge or waste disposal; or drainage from raw material storage.

2. Implementation

The plan shall be developed within six months after the effective date of this permit and shall be implemented as soon as practicable but not later than 18 months after the effective date of this permit.

3. General Requirements

The BMP plan shall:

a. Be documented in narrative form, and shall include any necessary plot plans, drawings or maps.

b. Establish specific objectives for the control of pollutants.

(i) Each facility component or system shall be examined for its potential for causing a release of significant amounts of pollutants to waters of the United States due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc.

(ii) Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances to result in significant amounts of pollutants reaching surface waters, the plan should include a prediction of the direction, rate of flow and total quantity of pollutants which could be discharged from the

facility as a result of each condition or circumstance.

c. Establish specific best management practices to meet the objectives identified under Paragraph III-A-3(b), addressing each component or system capable of causing a release of significant amounts of pollutants to the waters of the United States, and identifying specific preventative or remedial measures to be implemented.

d. Include any special conditions established in Paragraph III-B of this permit.

e. Be reviewed by plant engineering staff and the plant manager.

4. Specific Requirements

The plan shall be consistent with the general guidance contained in the publication entitled "NPDES Best Management Practices Guidance Document" (June, 1981) and shall include the following as a minimum:

a. BMP Committee
b. Reporting of BMP Incidents
c. Risk Identification and Assessment
d. Employee Training
e. Inspections and Records
f. Preventive Maintenance
g. Good Housekeeping
h. Materials Compatibility
i. Security

5. SPCC Plans

The BMP plan may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the Act and 40 CFR Part 151, and may incorporate any part of such plan into the BMP plan by reference.

6. Hazardous Waste Management

The Permittee shall assure the proper management of solid and hazardous waste in accordance with regulations promulgated under Solid Waste Disposal Act, as amended (RCRA) (40 U.S.C. 6901 et. seq). Management practices required under RCRA regulations shall be referenced in the BMP plan.

7. Documentation

The permittee shall maintain a description of the BMP plan at the facility and shall make the plan available to the Director upon request.

8. BMP Plan Modification

The permittee shall amend the BMP plan whenever there is a change in the facility or change in the operation of the facility which materially increases the potential for ancillary activities to result in a discharge of significant amounts of pollutants.

9. Modification for Ineffectiveness

If the BMP plan proves to be ineffective in achieving the general objective of preventing the release of significant amounts of pollutants to surface waters and the specific objectives and requirements under paragraphs III-A-3(b) and (c), the permit and/or the BMP plan shall be subject to modification to incorporate revised BMP requirements.

SECTION B. SPECIFIC BMP CONDITIONS (Sample Conditions)

1. All process waste, and surface runoff from process areas subject to spills or leaks of raw materials or products containing toxic or hazardous materials, shall be contained and directed to the waste treatment plant or polishing pond.

2. Storage of wastewater treatment sludges, polishing pond dredgings and chrome treatment sludges shall be managed to minimize the potential for release of toxic or hazardous substances to navigable waters. Storage areas shall be graded to prevent run-on of surface runoff from adjacent areas and to prevent accumulation or ponding of precipitation in the storage areas. Management practices shall be designed to minimize infiltration of precipitation into sludge storage piles and to minimize leachate. Surface runoff and leachate from storage areas shall be conveyed to the final polishing pond through the existing storm drainage system. These management conditions are based upon the classification of stored sludges and dredgings as non-hazardous materials under applicable regulations for hazardous wastes (40 CFR Parts 260-265). Should any changes in the constituents of the materials being stored or in the definition of hazardous wastes result in the stored wastes or leachate from the storage piles meeting the definition of a hazardous waste, the Director shall be notified and the Permittee shall make the necessary changes in management practices to comply with applicable State and federal regulations for storage of hazardous wastes.

3. The existing "land farm" area for land disposal of wastewater treatment sludges located north of the sludge storage area shall be managed to minimize the potential for release of toxic or hazardous substances to navigable waters. Surface runoff from adjacent areas shall be diverted around the disposal area. Surface runoff from the disposal area

shall be conveyed to the storm drainage system tributary to the final polishing pond. Surface runoff from the disposal area shall not be allowed to discharge through Outfall #__.

4. All drums containing hazardous substances now stored west of the cooling towers shall either be removed from the plant site within 120 days or shall be managed in a storage area meeting the interim status standards of its RCRA permit requirements for storage of hazardous wastes in containers. (See 40 CFR 262.34 and Subpart I of Parts 264 and 265.) All other containers that have held hazardous wastes shall either be triple rinsed or otherwise managed so that they meet requirements for exclusion as a hazardous waste.

SECTION C. BIOMONITORING

1. The Effluent Toxicity limitation contained in Part I is the allowable acute toxicity and is expressed as the minimum LC-50 in percent effluent (the LC-50 is the concentration of effluent estimated to result in mortality to fifty percent of the test organisms). The required test organism is the fathead minnow (Pimephales promelas) tested over 96 hours in accordance with Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms, EPA-600/4-78-012, Revised July 1978.

2. The Permittee shall conduct monitoring of effluent toxicity once per month. One grab sample shall be collected and tested within 36 hours of collection. Results shall be reported as the 96-hr LC-50. Any test that does not meet quality criteria as described in the above referenced methods shall be repeated using a freshly collected sample as soon as practicable.

3. If effluent toxicity exceeds the limitation in Part I, the Permittee shall submit, if requested by the Director, within 45 days a plan and schedule for conducting a toxicity reduction evaluation. The toxicity reduction evaluation, when completed, shall determine how the Permittee can achieve the effluent toxicity limitation including an implementation schedule. After approval of the plan by EPA, the Permittee shall conduct the evaluation within the specified time frames. Upon completion of the toxicity reduction evaluation, this permit may be modified, or alternatively revoked and reissued, in order to incorporate appropriate permit conditions and compliance schedules.

SECTION D. OTHER CONDITIONS