WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

INSPECTION

MANUAL

Water Quality Program

Publication Number 92-76

WATER QUALITY PROGRAM
INSPECTION MANUAL

June 1992

First Edition

Washington State Department of Ecology

NOTE TO READERS

This Inspection Manual is a reference document for anyone conducting water quality inspections within the Department of Ecology. It is made available to people outside of the agency at cost through the PUBLICATIONS OFFICE, DEPARTMENT OF ECOLOGY, OLYMPIA, WA 98504-7600. The manual will be updated and new sections added periodically. If you wish to be notified of revisions to the manual please mail the registration notice form at the bottom of this page. You will then be notified of the availability and cost of revisions.

Please send your registration notice form and any comments about the manual to:

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Inspection Manual
Publication Number 92-76

NAME _____

STREET _____

CITY, STATE, ZIP _____

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Dewey Weaver
Point Source Section

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CHAPTER 1. INTRODUCTION

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CHAPTER 1. INTRODUCTION

The purpose of this manual is to provide guidance to permit managers and inspectors who conduct water quality compliance inspections.

Compliance inspection objectives include:

- Documenting facility compliance with applicable laws and regulations, permits, orders, and compliance schedules
- Determining the ability of the facility to maintain compliance with laws, regulations, permits and orders
- Identifying the need for corrective action, permit modification, and/or enforcement to correct violations

The guidance described in this manual is recommended for use while performing Class 1, Class 2, and other inspections at a broad range of facilities to include municipal treatment plants, industrial facilities, state permitted land discharge sites, and unpermitted facilities.

To help the reader quickly locate specific topics, a more detailed excerpt from the master *Table of Contents* has been included with each chapter. Also, appendices have been placed at the end of each chapter for reference.

While the manual is intended as a training tool for new inspectors and a reference for all inspectors it is by no means all inclusive. Inspectors are encouraged to consult companion reference books such as the *Lab Users Manual, the Enforcement Manual and Standard Methods for the Examination of Water and Wastewater* as well as training materials from such courses as the U.S. Environmental Protection Agency's (USEPA) Basic Inspector Training.

To maintain relevancy, this manual will be updated on a regular basis with the first revision tentatively scheduled for June 1993. User comments and suggestions will be used to improve the document. As you use this manual, please make note of changes you would like to see and send them to the Point Source Section, Mail Stop 7696.

Legal Authority

The legislation establishing the Department of Ecology explains the intent of the Washington State Legislature (the Legislature):

> "The Legislature recognizes, and declares it to be the policy of this state, that it is a fundamental and inalienable right of the people of the state of Washington to live in a healthful and pleasant environment and to benefit from the proper development and use of its natural resources."

The mission of the Department of Ecology (Ecology) is to protect, preserve, and enhance Washington's environment and promote the wise management of our air, land, and water for the benefit of current and future generations.

The Federal Water Pollution Control Act (FWPCA) Amendments of 1972 established the long-term position of Congress that ecological concerns be placed ahead of economic concerns in stating the goals of zero discharge of pollutants into navigable waters, to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," and to achieve a water quality level that would protect fish, shellfish, and wildlife while providing for recreation in and on the water wherever attainable. A reliance on 'best available technology economically achievable" as an interim strategy to reduce pollutant discharges necessitated a system of evaluating equipment and practices to gauge compliance with the FWPCA. Since 1977, the law and its revisions have been popularly called the Clean Water Act (CWA). Major amendments were enacted in 1977, 1981, and 1987. The major change in these most recent amendments is a greater emphasis on water quality-based permitting for to2dc pollutants.

In 1985 the Legislature established the Puget Sound Water Quality Authority to develop a plan for water quality protection in Puget Sound. Elements of this plan are included in this Inspection Manual and in the Permit-writer's Manual of the Water Quality Program of Ecology to facilitate its implementation state-wide.

The Legislature has empowered Ecology with "jurisdiction to control and prevent the pollution of surface and ground waters" and to "have the right to enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting and investigating conditions relating to the pollution of or the possible pollution of any of the waters of this state."

The authority to inspect a discharger facility is also a condition of the National Pollutant Discharge Elimination System (NPDES) and state waste discharge permits.

The Water Quality Inspector

Primary Role

A primary role of the inspector is to assure compliance with water quality laws and regulations by maintaining an enforcement presence. Compliance with environmental laws is influenced greatly by the likelihood that those who do not comply Will be detected. The inspector promotes compliance by the use of techniques which detect violators and thereby indirectly rewards those facilities and operators who are adhering to the law. The likelihood of detection when coupled with quick and inevitable enforcement action is a strong motivator towards voluntary compliance.

Primary Objective

The inspector's primary objective is to assemble information and report facts. In order to meet this objective, he or she must have a clear understanding of the technical information necessary to evaluate compliance and an understanding of the regulations and the NPDES and state waste discharge program requirements. The inspector must be skilled in obtaining the critical information which is necessary to determine compliance or noncompliance. Inspectors should observe standard procedures when conducting inspections to assure effectiveness and legality.

Conduct

Inspectors represent Ecology in their dealings with the regulated community and must conduct themselves in a professional manner at all times. Cooperation and good working relations with facility personnel should be established and maintained, but the inspector is not a "friend". A skilled inspector has developed the ability to obtain significant information through conversation with facility employees and knows how to follow up on these leads. Ecology inspectors will dress appropriately, wear protective clothing or equipment, and follow safety precautions as required.

Information Source

The inspector serves as a source of regulatory information and tactfully provides technical assistance to facility representatives by directing them to useful sources of information relevant to problems observed at the facility. The inspector may discuss remedial actions that might be explored and may refer questions and problems to other personnel with pertinent expertise. However, the inspector should be cautious about offering advice because this could jeopardize future enforcement action or create liabilities for the Department.

Conflict of Interest

A conflict of interest may exist whenever an Ecology employee has a personal or private interest in a matter which is related to the employee's official duties and responsibilities. It is important to avoid even the appearance of a conflict of interest since this damages the integrity of the department and its employees in the eyes of the public. The inspector must constantly be aware of situations which are, or give the appearance of being, conflicts of interest when dealing with others in or outside the government. An Ecology employee is forbidden to solicit or accept any gift, gratuity, entertainment, favors, loans, or anything else of monetary value from any entity which has a contractual or financial relationship with Ecology, which has interests that may be substantially affected by such employee's official actions, or conducts operations which are regulated by Ecology (42.18 RCW and 42.22 RCW). The acceptance of food and refreshments of nominal value, such as coffee during a plant inspection where the arrangements are consistent with the transaction of official business, is an exception to the above stated rule. Report any attempted efforts at bribery immediately to your supervisor.

Types of Inspections

Class I Inspection

Class 1 inspections are walk-through inspections, including a visual inspection of the facility and some examination of records (self-monitoring reports, procedures manuals, operation and maintenance records, etc.). Class 1 inspections may be both announced and unannounced. Whether the inspection is announced or unannounced should be clearly noted on the inspection form. Periodically, all Class 1 inspection candidates should receive an unannounced inspection.

Class 2 Inspection

Class 2 inspections include all of the Class 1 activities plus sampling (effluent, sediment, etc.) and analyses. The most important objective of a Class 2 inspection is to compare the results from samples collected during the inspection with the requirements and limits specified in the permit to determine if the facility is violating the conditions of the permit. Another objective is that of gathering data that will be used by the permit manager to modify or reissue the permit (often one or two years before reissuance). EPA form 3560-3 is routinely used on Class 2 inspections and has been included for reference in Chapter 1, Appendix A. This form must be completed to get credit for a Class 2 inspection from EPA and may be turned in before all lab work is completed. The scope of these inspections is variable, ranging from a single sample at an industrial facility to a multi-day, multi-sample event carried out by Environmental Investigations and Laboratory Services (EILS) at a wastewater treatment plant. Class 2 inspections are generally more intensive than Class 1 inspections, with more detailed analysis of facility compliance to include:

- Extensive examination of records
- A review of past noncompliance
- Facility staffing considerations
- Review of laboratory procedures

Class 2 inspections may be both announced and unannounced. Whether the inspection is announced or unannounced should be clearly noted on the inspection form. Periodically, all Class 2 inspection candidates should receive an unannounced inspection.

Pretreatment Compliance Inspection

Pretreatment compliance inspections identify deficiencies or problems with the publicly owned treatment work's (POTW) pretreatment program. The inspections are used to verify reported information, review Industrial Users (IUs) files for completeness, and determine whether changes or modifications need to be made to the POTW's sewer use ordinances, enforcement procedures, local limits, or any other part of the POTW's pretreatment program.

Inspection Candidate Selection

Pending the development and implementation of a formal selection system, inspection candidates should be selected by taking into account such factors as:

- Compliance history
- Achieving the greatest benefit in terms of environmental protection or human health
- Fairness--a neutral, nonbiased selection process should be used which targets specific inspection sites using such criteria as industry type, size of facility and amount of pollutants generated
- Randomness--to encourage compliance by all facilities, including those at the lowest priority level, a portion of the inspection candidates should be chosen at random
- Type of facility and type of permit (major, significant minor, or minor).
- Length of time since last inspection
- Status of permit-all facilities should be inspected prior to permit renewal.

Inspection Frequency

Similar to inspection candidate selection, the frequency with which a particular facility is inspected is dependent on such factors as:

- Selection priority (see Inspection Candidate Selection)
- Compliance history
- Regional and program staffing and budget considerations
- Program plan commitments

CHAPTER 1

APPENDIX A

NPDES COMPLIANCE INSPECTION REPORT

United States Environmental Protection Agency
Washington, D. C. 20460

EPA NPDES Compliance Inspection Report

Form Approved.
OMB No. 2040-0057
Approval expires 4-30-88

Section A: National Data System Coding

Transaction Code (1) (2) 5 | NPDES (3–11) | yr/mo/day (12–17) | Inspection Type (18) | Inspector (19) | Fac Type (20)

Remarks (21–66)

Reserved (67–69) | Facility Evaluation Rating (70) | BI (71) | QA (72) | Reserved (73–74) | Reserved (75–80)

Section B: Facility Data

Name and Location of Facility Inspected	Entry Time ☐ AM ☐ PM	Permit Effective Date
	Exit Time/Date	Permit Expiration Date

Name(s) of On-Site Representative(s)	Title(s)	Phone No(s)

Name, Address of Responsible Official	Title	
	Phone No.	Contacted ☐ Yes ☐ No

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

	Permit		Flow Measurement		Pretreatment		Operations & Maintenance
	Records/Reports		Laboratory		Compliance Schedules		Sludge Disposal
	Facility Site Review		Effluent/Receiving Waters		Self-Monitoring Program		Other:

Section D: Summary of Findings/Comments *(Attach additional sheets if necessary)*

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Telephone	Date
Signature of Reviewer	Agency/Office	Date

Regulatory Office Use Only

Action Taken	Date	Compliance Status
		☐ Noncompliance ☐ Compliance

EPA Form 3560-3 (Rev. 3-85) Previous editions are obsolete.

INSTRUCTIONS
Section A: National Data System Coding (i.e., PCS)

Column 1: Transaction Code: Use N, C, or D for New, Change, or Delete. All inspections will be new unless there is an error in the data entered.
Columns 3-11: NPDES Permit No. Enter the facility's NPDES permit number. (Use the Remarks columns to record the State permit number, if necessary.)
Columns 12-17: Inspection Date. Insert the date entry was made into the facility. Use the year/month/day format (e.g., 82/06/30 = June 30, 1982).
Column 18: Inspection Type. Use one of the codes listed below to describe the type of inspection:

A - Performance Audit	E - Corps of Engrs Inspection	S - Compliance Sampling
B - Biomonitoring	L - Enforcement Case Support	X - Toxic Sampling
C - Compliance Evaluation	P - Pretreatment	
D - Diagnostic	R - Reconnaissance Inspection	

Column 19: Inspector Code. Use one of the codes listed below to describe the lead agency in the inspection.

C - Contractor or Other Inspectors (Specify in Remarks columns)	N - NEIC Inspectors
E - Corps of Engineers	R - EPA Regional Inspector
J - Joint EPA/State Inspectors-EPA lead	S - State Inspector
	T-Joint Sta-te/EPA Inspectors-State lead

Column 20: Facility Type. Use one of the codes below to describe the facility.
1 - Municipal. Publicly Owned Treatment Works (POTWs) with 1972 Standard Industrial Code (SIC) 4952.
2 - Industrial. Other than municipal, agricultural, and Federal facilities.
3 - Agricultural. Facilities classified with 1972 SIC 0111 to 0971.
4 - Federal. Facilities identified as Federal by the EPA Regional Office.
Columns 21-66: Remarks. These columns are reserved for remarks at the discretion of the Region.
Column 70: Facility Evaluation Rating. Use information gathered during the inspection (regardless of inspection type) to evaluate the quality of the facility self-monitoring program. Grade the program using a scale of 1 to 5 with a score of 5 being used for very reliable self -monitoring programs, 3 being satisfactory, and 1 being used for very unreliable programs.
Column 71: Biomonitoring Information. Enter D for static testing. Enter F for f low through testing. Enter N for no biomonitoring.
Column 72: Quality Assurance Data Inspection. Enter Q if the inspection was conducted as followup on quality assurance sample results. Enter N otherwise.
Columns 73-80: These columns are reserved for regionally defined information.

Section B: Facility Data

This section is self-explanatory.

Section C: Areas Evaluated During Inspection

Indicate findings (S, M, U, or N) in the appropriate box. Use Section D and additional sheets as necessary. Support the findings, as necessary, in a brief narrative report. Usethe headings given on the report form (e.g., Permit, Records/ Reports) when discussing the areas evaluated during the inspection. The heading marked "Other" may include activities such as SPCC, BMP's, and multimedia concerns.

Section D: Summary of Findings/ Comments

Briefly summarize the inspection findings. This summary should abstract the pertinent inspection findings, not replace the narrative report. Reference a list of attachments, such as completed checklists taken from the NPDES Compliance Inspection Manuals and pretreatment guidance documents, including effluent data when sampling has been done. Use extra sheets as necessary.

CHAPTER 2. PLANNING THE INSPECTION

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CHAPTER 2. PLANNING THE INSPECTION

Planning before an inspection is essential to the overall success of an inspection. Planning the inspection ensures that it will be properly focused and efficiently conducted. The essential elements of the planning process include:

- Review of facility background,
- Inspection Plan development,
- Preinspection notification(s), and
- Review of safety considerations.

Each of these elements is discussed in greater detail below.

Review of Facility Background

Collection and analysis of available background information is essential to the effective planning and overall success of an inspection. Materials obtained from Ecology files and from personnel experienced in dealing with the facility or similar facilities will enable the inspector to be familiar with the operation and history of the facility.

General information on most facilities is available from a variety of sources. If there is a permit in force, many of the important areas of concern will already be noted. However, do not rely on the completeness of previous permits and inspection reports for the development of an information base on the facility to be inspected. Some common information you will want to collect is listed in Table 2-1. All items listed in the table may not be necessary for all inspections. Generally, Class 2 inspections and complex facilities require more background information.

A summary of the names, titles, and telephone numbers of responsible facility officials is especially helpful. Make special note of the environmental contact person if one is specifically designated. Review past inspection reports for any special entry requirements pertaining, for example, to safety requirements, sanitary concerns or confidentiality issues. Of special importance for sampling inspections is information about access to sampling locations; location and type of sampling equipment at the facility; type, location, and access to flow monitoring equipment; and location and construction of monitoring wells and lysimeters.

Always review the current regulations, policies, and guidance to determine their potential impact on the facility. Check to see if there are specific Best Management Practices (BMPs) in the federal regulations. Also check the facility's compliance and enforcement history pertaining to any environmental statutes (NPDES, TSCA, RCRA, CERCLA, FIFTZA, CAA).

Table 2-1. Information commonly gathered during the inspection planning process.

General Facility Information

- Facility maps
- The current permit application
- Previous permits - History of production levels
- For discharges to land: geology, hydrogeology, and hydrological data of the area
- Changes in facility conditions since last permit issuance
- Aerial photographs, if available
- Names, titles, locations, and phone numbers of facility officials and other responsible personnel

Applicable Regulations, Requirements, and Limitations

- Copies of federal, state, and local regulations
- Receiving surface water and groundwater quality standards
- Copies of recently-issued permits to similar facilities (if available)
- Special exemptions and waivers (if any)
- Information concerning air, solid, and hazardous waste treatment and disposal

Facility Compliance and Enforcement History pertaining to environmental statutes (NPDES, TSCA, RCRA, CERCLA, FIFRA, CAA)

- Correspondence among the facility and local, state, and federal agencies
- Complaints, reports, follow-up studies, findings, remedial actions taken
- Documentation on previous violations, exceedances, and corrective actions
- Self-monitoring data and reports
- Previous inspection reports
- Administrative Orders, Notices of Violation, and Penalties
- On-site laboratory capabilities and analytical methods used
- Previous Discharge Monitoring Reports (DMRs)

Pollution Control and Treatment Systems

- Description and design data for pollution control system and process operation
- Sources and characterization of discharge
- Type and amount of wastes discharged
- Spill prevention contingency plans
- Available bypasses or diversions and spill containment facilities
- Pollution control units, treatment methods, and monitoring systems
- Generic information contained in EPA development documents, the EPA Treatability Manual and Ecology's Technical Guidance Manual
- Consultant reports

Previous inspection reports should receive special scrutiny. Previous Class 2 inspection reports and receiving water reports can be accessed by checking the EILS bibliography for dates, authors, and titles of relevant reports. These reports often highlight problems at the facility and provide recommendations for their solution.

You should also become familiar with the pollution control and treatment systems during the inspection planning process. A good understanding of the systems helps your ability to assess the quality of the processes during your first visit and will reduce the need for a second visit to the facility.

Review Discharge Monitoring Reports (DMRs) from the past year or more.

After interviewing all available Ecology personnel and other data sources, you are ready to prepare your Inspection Plan. The Inspection Plan helps you to execute the inspection in an orderly, methodical, and thorough manner. It becomes especially important as facility size and complexity increases. Each inspection is different, therefore it is not possible to create a single checklist or Inspection Plan that will be applicable to all inspections.

Inspection Plan Development

A comprehensive plan is helpful in organizing and conducting an inspection. The inspector may spend more time planning the inspection than actually conducting it. When developing the Inspection Plan, you should consider the objectives of the study and the information needed to meet these objectives. The objectives of most inspections are usually to 1) verify production, chemical use, spill-plan requirements, and location of outfalls; 2) observe processes and equipment; 3) evaluate the potential for applying BMPs; and 4) review compliance with permit conditions or administrative orders.

After the objectives of the inspection are clear, the information needs to meet the objectives can be determined. The procedures and resources that will be used to acquire the information can then be considered and planned.

Decide what personnel and equipment will be needed and what records need to be reviewed at the facility. Both of these topics are discussed in greater detail below.

When the objectives, procedures, resources, personnel, and equipment have been identified, a schedule of inspection activities and the time requirements to carry out those activities are then estimated. Remember to include the time required to prepare the inspection report. Inspection activities will dictate the safety concerns that must be considered.

Developing the Inspection Plan:

1) Create Sampling Plan (if necessary)
2) Review Staffing Needs
3) Review Equipment Needs
4) Define Resources
5) Schedule Activities

Always coordinate with the Manchester Lab when collecting and submitting samples. There are specific procedures for taking samples and sending them for analysis. You may also need to coordinate sampling with other programs if it is to be a joint inspection. In addition, dischargers may request split samples.

Preparing the Sampling Plan

The preparation of the sampling plan can be a major undertaking. The reader is referred to Chapter 4, Sampling, which contains detailed information on its development.

Staffing

Most inspections are more thorough when more than one inspector participates. Even though it is the inspector who determines the pace of the inspection, it may still be difficult for one person to assimilate all that is passing by and being said. Try to include another inspector on complex inspections, especially Class 2 inspections, or when a safety concern exists. This also makes the best use of the facility representative's time, perhaps negating a follow-up inspection at a later date to cover what was missed or misunderstood on the initial inspection. Part of the planning should include a discussion of the strategy of how to assign the various inspection functions.

When appropriate, include inspection personnel from other programs. As inspection schedules are approximated, issue a list of the facilities likely to undergo inspection in the near future. This will allow other programs to determine whether they will take part in the inspections as well as facilitate input on issues pertaining to the facilities (i.e., from similar or neighboring facilities). Encourage participation from the other programs. When another program cannot participate, consider including another employee from the same program in the inspection. Another inspector may be available who is familiar with the facility type or the geographic area.

Equipment

Prepare an equipment checklist for your own use and consider putting together an inspection kit containing most of the important items. The equipment needed during an inspection depends on the facility. In general, you need equipment to take and record measurements and observations, sampling equipment, and safety-related items. A list of the more common items is provided in Table 2-2. The use of three items-the camera, tape recorder, and field notebook, are discussed in more detail below.

Table 2-2. Inspection tools commonly required during an inspection		
Ecology photo ID	pocket knife	pH test kit
business cards	watch	ammonia test kit
applicable laws and regs.	binoculars	floating markers or dyes
bound field notebook	campus	composite samplers
Inspection checklist	calculator	plastic bags
Camera/film	flashlight	paper towels
hard hat	tape recorder	custody seals
safety glasses/goggles	sledge hammer	sample tags
Protective gloves	manhole hook	sample transmittal forms
ear plugs	tape measure	ice chest/ice
Coveralls	levels	sample containers
rubber boots	thermometer	
traffic safety cones	chlorine test kit	

Cameras-Photographs (slide, print, polaroid, or video) often provide the most accurate documentation of the inspector's observations, and they are outstanding sources of information for use in hearings, informal meetings, and facility files. Additionally, the Attorney General's Office has stated that photos may be the single best source of documentation when defending a case before the Pollution Control Hearings Board (PCHB).

In order for photos to be effective documentation, they must have accompanying information entered into the inspector's field notebook or a facility map (see Chapter 2, Appendix A). This documentation should include the following:

- Date
- Time
- A brief description of the scene, if necessary
- Anything unusual about the way the photo was taken
- The number(s) of related samples (if any)
- Who took the photo
- A scale reference in photo, if necessary

Chapter 2, Appendix A provides an example from the U.S. Environmental Protection Agency (USEPA) of good photographic documentation technique.

Inherent in the right to inspect is the right to document with photographs. It is usually a good idea to extend to the facility the courtesy of letting them know you will be taking photographs.

Municipal or public facilities will probably not mind the inspector taking photographs, but you may be challenged by industrial facility representatives in regard to proprietary processes or national security. If a mutually agreeable compromise cannot be worked out, respect the permittees wishes, document their concerns, express your concerns, and review the situation with your supervisor. This may constitute denial of consent to inspect.

Tape Recorders--Inspectors may tape record their own comments as they inspect a facility but they cannot tape someone else without their prior approval. This would include the use of a video camera as well as a tape recorder. Tape recordings should be transcribed soon after the inspection and a hard copy included in the inspection file.

Field Notebook--The core of all documentation relating to an inspection is the field notebook, which provides accurate and inclusive documentation of all inspection activities. A bound notebook with water resistant paper should be used and entries may be made in ink or in pencil. Errors should not be erased but crossed out with a single line through the erroneous entry. The notebook will form the basis for written reports and should contain only facts and pertinent information. The general process for an inspection is to observe, question, and record. Entries into the notebook should be written as clearly and neatly as possible. Language should be objective, factual, and free of personal feelings or terminology that may be inappropriate. Pages should not be removed from the notebook, but the front pages may be reserved for a table of contents. The field notebook is the property of The Washington State Department of Ecology (Ecology) and should not be considered the inspector's personal record. The field notebook is critical in maintaining continuity and reconstructing events and may become part of the file or record at the regional office.

Minimum information for every inspection should include: date, location, member(s) of the inspection team, time of commencement and conclusion of inspection, type of inspection, weather conditions, names of facility representatives, sample locations, process descriptions, and references to other pertinent information gathered or generated during the inspection. The final page of information for each inspection should be signed by the inspector.

All conditions, practices, and other observations that will be useful in preparing the inspection report should be recorded in the field notebook. Wherever possible, include sketches with labeled locations, distances, and compass orientation or reference points. The inspector should note any special or unusual conditions or activities, but the obvious conditions are also important to record. Conditions can change with time, and it is easy to confuse facilities with each other when conducting numerous inspections during the same time period. So notebook entries, which form the basis of the inspection report, should be as complete as possible. Names and titles of facility personnel and the activities they perform should be listed along with the statements they have made. Other useful information might include the record-keeping procedures used at the facility and references to any photographs-taken during the inspection.

Maps, drawings, and charts are valuable tools in producing an accurate schematic representation of the facility under inspection (see Chapter 2, Appendix B).

Interviewing Skills--The interview can be a very effective inspection tool. Information such as; who you were talking to? what was asked?, and what did they answer? Should be recorded in your field notebook.

Sometimes, the way a question is asked can be more important than the question itself. The inspector should try not to give a possible answer when asking a question. For example, "Where do you keep the laboratory records?" is preferable to "You have all the necessary laboratory records, don't you?"

Simple, direct questioning in a friendly manner followed by ample time to answer is a good approach. The inspector should try to establish a rapport and keep it going through the interview.

Facility employees may be questioned during any stage of the inspection. When introducing yourself, it is often a good idea to give your business card to the potential interviewee. Sometimes, an employee who is reluctant to provide information during an inspection may elect to call you at a later time.

Preinspection Notification

Notifying Local Authority

Notify the local authority when an inspection is planned in a facility discharging to a POTW. The municipality may send a representative to accompany the Ecology inspector. Situations where flows can be directed to storm drains or to sanitary systems are especially appropriate for co-inspection. Issues raised and conditions discovered during an inspection of a facility on a pretreatment system should be directed to the appropriate permit manager and any designated pretreatment staff in the regional office.

Notifying the Facility

Class 1 and Class 2 inspections may be both announced and unannounced to the facility. Unannounced inspections are believed to be more effective by many people inside and outside Ecology because they minimize the possibility of last minute "adjustments" by the facility. A potential disadvantage to unannounced inspections is that upon arrival a key facility contact may not be available or the facility may not be operating. Nevertheless, all facilities should periodically receive an unannounced inspection. Class 2 inspections are usually more difficult to set up because of sampling and analysis considerations but opportunities to inspect unannounced or at least to minimize the notification period should not be overlooked.

Safety

The inspection of wastewater and other environmental pollution control facilities always poses a certain degree of hazard. The use of proper safety equipment and the execution of safe practices will serve to minimize the potential for injury.

It is the responsibility of every inspector to:

- Be thoroughly familiar with all safety guidance and practices
- Maintain safety equipment in good condition and proper working order
- Use safety equipment in accordance with guidance received, and label instructions or as dictated by common sense
- Dress appropriately for the particular activity and wear appropriate protective clothing
- Discuss special safety precautions, attire, or other requirements with facility personnel
- before, inspecting
- Use any safety equipment customary in the establishment being inspected
- If in doubt get out. Call off the inspection if a hazardous condition is encountered, and:

    - Defer the inspection to a later time pending correction of the hazardous condition.

    - Alert company management and the Department of Labor and Industries if facility employees are also believed to be at risk.

Safety Training

Inspectors should be trained to recognize hazardous situations such as confined spaces or hazardous material spills. Confined spaces such as manholes, metering vaults, and other unventilated areas, for example, may contain inadequate amounts of oxygen or collect toxic gases such as hydrogen sulfide, carbon monoxide, or hydrogen cyanide as well as explosive gases such as methane. Pending the development of a specific water quality inspector training program, a high priority should be given to on-the-job training provided by veteran inspectors to less experienced inspectors. Emphasis in this training should be on respiratory, chemical, and physical hazard recognition and avoidance.

Standard Safety Equipment

All program inspectors should obtain the following standard inspection equipment from Central Stores (* indicates recommended minimum safety equipment for all inspections).

*hard hat
*gloves (disposable and reusable)
*ear plugs
*ear muffs
*safety glasses

*rubber boots (knee high)
rubber boots (hip length)
flashlight
rain gear
rubber overboots
*safety vest

For special needs, a wide variety of additional equipment is available from Central Stores such as boot liners, Tyvek coveralls, dog repellant, and ELSA units (Emergency Life Saving Apparatus).

When necessary, traffic cones, markers, warning signs, and barricades should be used to properly divert traffic around sampling and observation locations and manholes. The state Department of Transportation dictates requirements for traffic control in public areas.

Facilities Requiring Special Equipment/Training/Procedures

The inspection of certain facilities may require special training, equipment, and procedures. Pending adoption of a Water Quality Program Safety Policy, it is recommended that inspectors consult with their supervisors before inspecting:

- Treatment, storage, and disposal facilities (TSDs) for hazardous wastes and;

- Cleanup site remedial activity areas

Before inspecting one of the above facilities, the inspector should review the file (including the site safety plan) which should be located within the lead program (Toxic Cleanup or Solid and Hazardous Waste). From the files the inspector will determine if the inspection can be accomplished by staying outside the "exclusion zone", and what minimum level of personal protective equipment (and by implication, training) will be required, inside and outside the exclusion zone. In no case should an inspector conduct an inspection at one of the above facilities without the proper level of training required for the site, or the proper safety equipment.

The water quality inspector should not go into areas where respiratory protection is required. If it is determined that such an area requires inspection, the water quality inspector should attempt to get the job done by someone trained to work in that environment, e.g., someone from Toxics Cleanup Program or Solid and Hazardous Waste Program.

Toxic Samples

Samples collected for lab analysis that are suspected of having toxic properties should be labeled and transported according to guidelines established in the Ecology "Lab User's Manual."

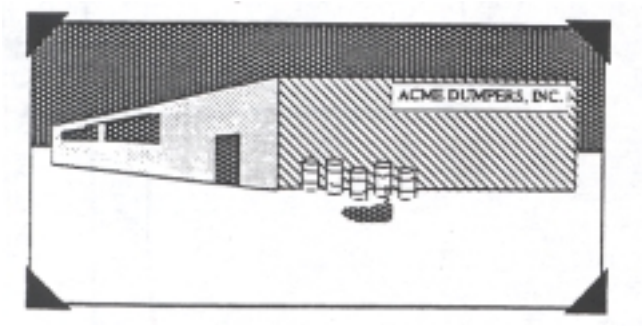
CHAPTER 2

APPENDIX A

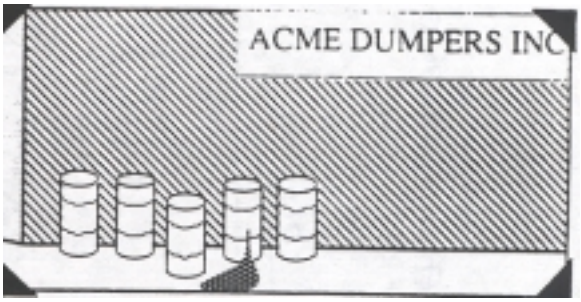
PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPHIC DOCUMENTATION:

Photographic documentation should tell the story with as little need for narrative as possible. This is done by shooting series of establishing shots followed by subject and then tight or close-up photographs. The proper terms are the "establishing" or broad perspective shot: the "medium" or subject shot; and the tight" or close up shot.

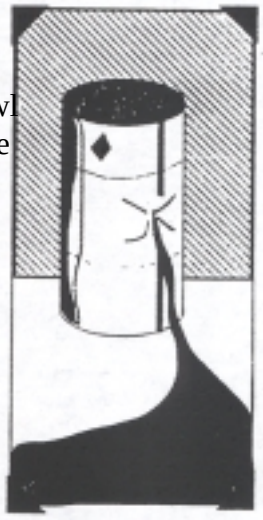


The "**establishing shot**" is a photograph taken from a distance which shows not only the subject but one or several permanent landmarks which can be used for reference in establishing the exact location.

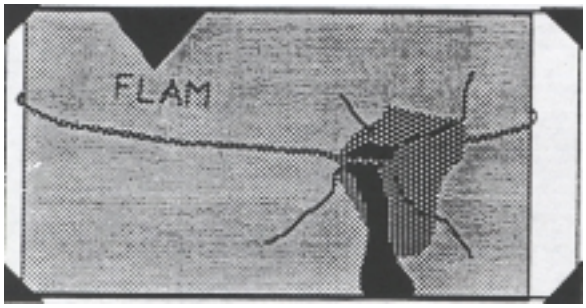


"Establishing shots" should show an identifiable landmark. It may also be important to show the compass orientation of the subject. (i.e. the drums were on the south side of the building.)

The **medium or subject shot**" will emphasize a specific object or event. Sometimes it will be shot in series to view all sides. "Post-its may be used to identify the item in the photograph. Numbers or identifiers on the "Post-its" can be recorded in the field log for reference and easy identification when writing the narrative report.



"**Tight or Detail shots**" should show the issue under review and/or enough information to identify the specific item or event in question.



Show the subject from as many angles as possible. Arguments will often be raised about what is not shown in the photographs.

10/8/90 CLEAN CHEMICALS ARE US. (4)

NOTES OF JOHN DOE

PHOTO RECORD

- ALL PHOTO'S TAKEN ON 10/8/90
- " " " W/ CANON AE-1 W/ 50 mm LENS AND ASA 100 FILM.

#7 - PHOTO OF SPILL FROM TANK 1, 9:00 AM,

#8 - PHOTO OF UNLABELED DRUM IN DRUM STORAGE AREA, 9:05 AM

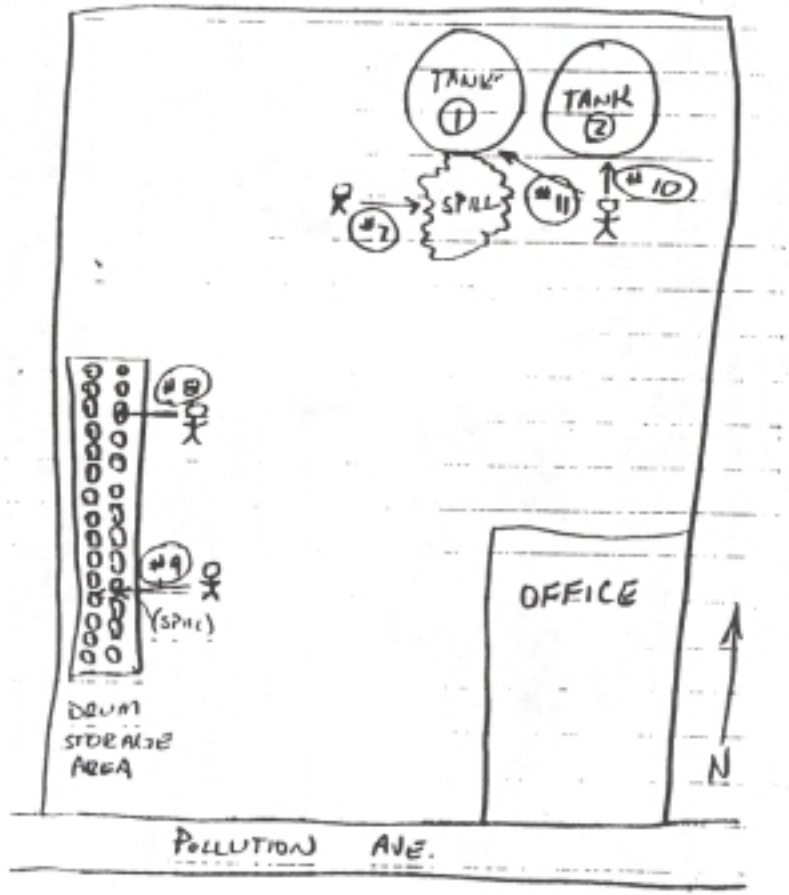
#9 - PHOTO OF SPILL FROM A LEAKING DRUM 9:10 AM

#10 - PHOTO OF TANK 2, LIES IN THE SHADOW OF TANK 1, 9:15

#11 - PHOTO OF AREA WHERE TANK 1 IS LEAKING FROM, 9:20

10/8/90 CLEAN CHEMICALS ARE US. (5)

PHOTO LOG

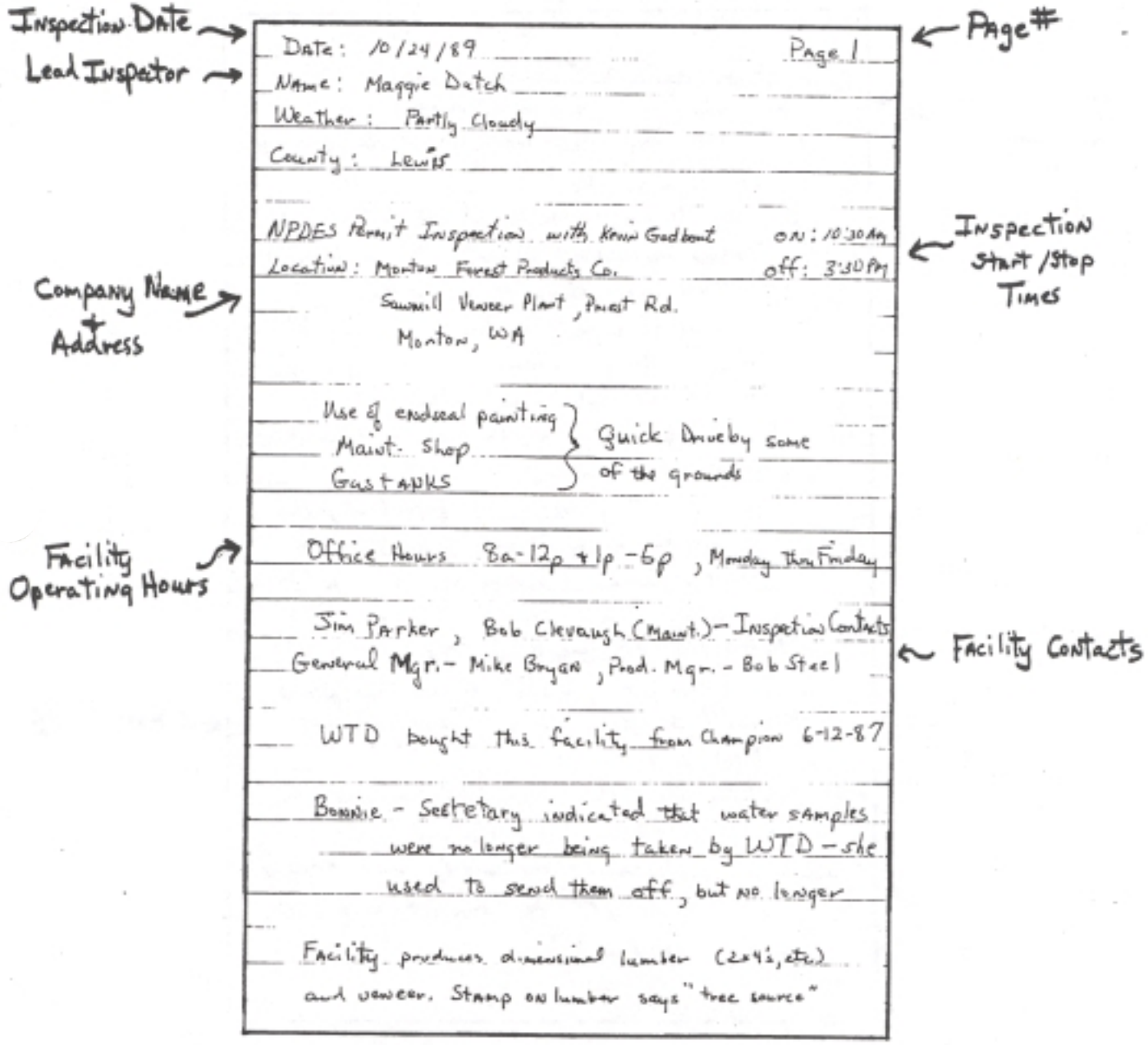


NOTES OF John Doe

CHAPTER 2

APPENDIX B

FIELD NOTEBOOK ENTRY EXAMPLES


Inspection Date
Lead Inspector
Page #
Date: 10/24/89
Page 1
Name: Maggie Datch
Weather: Partly Cloudy
County: Lewis
NPDES Permit Inspection with Kevin Godbout
on: 10:30 Am
Location: Morton Forest Products Co.
off: 3:30 PM
Inspection Start/Stop Times
Company Name + Address
Sawmill Veneer Plant, Priest Rd.
Morton, WA
Use of enclosed painting
Maint. Shop
Gas tanks
Quick Drive by some of the grounds
Facility Operating Hours
Office Hours 8a-12p + 1p-6p, Monday thru Friday
Jim Parker, Bob Clevaugh (Maint.) - Inspection Contacts
General Mgr. - Mike Bryan, Prod. Mgr. - Bob Steel
Facility Contacts
WTD bought this facility from Champion 6-12-87
Bonnie - Secretary indicated that water samples were no longer being taken by WTD - she used to send them off, but no longer
Facility produces dimensional lumber (2x4's, etc.) and veneer. Stamp on lumber says "tree source"

Initial(s) of Speaker →

Page 2 ← Page #

Before tour Mtg. with Jim P. - Maint. Supervisor

K - Notification of change of ownership

K - monthly monitoring of wastewater discharge - are reports available?

J - Reports are available on site but didn't know they needed to be sent. Files in sawmill office

K - 2yrs. worth of monitoring reports
- copy of permit on site
- copy of spill plan
- copy of solid waste plan

} Request to Sel

Jim left to look for these documents

J - No solid / plan

- No spill plan - oil absorbent pillows present in waste water collection system.

- containment around oil house w/ drain and drain plug

K - list of emergency #'s ?

J - card file only, no written plan

K - will send copy of guidance for these plans ← Follow-up

Note: Potential WQ problem around plant
- steam conditioning - no discharge allowed, but caustics in H_2O for conditioning high pH

← Page #

Reference → To facility sketch

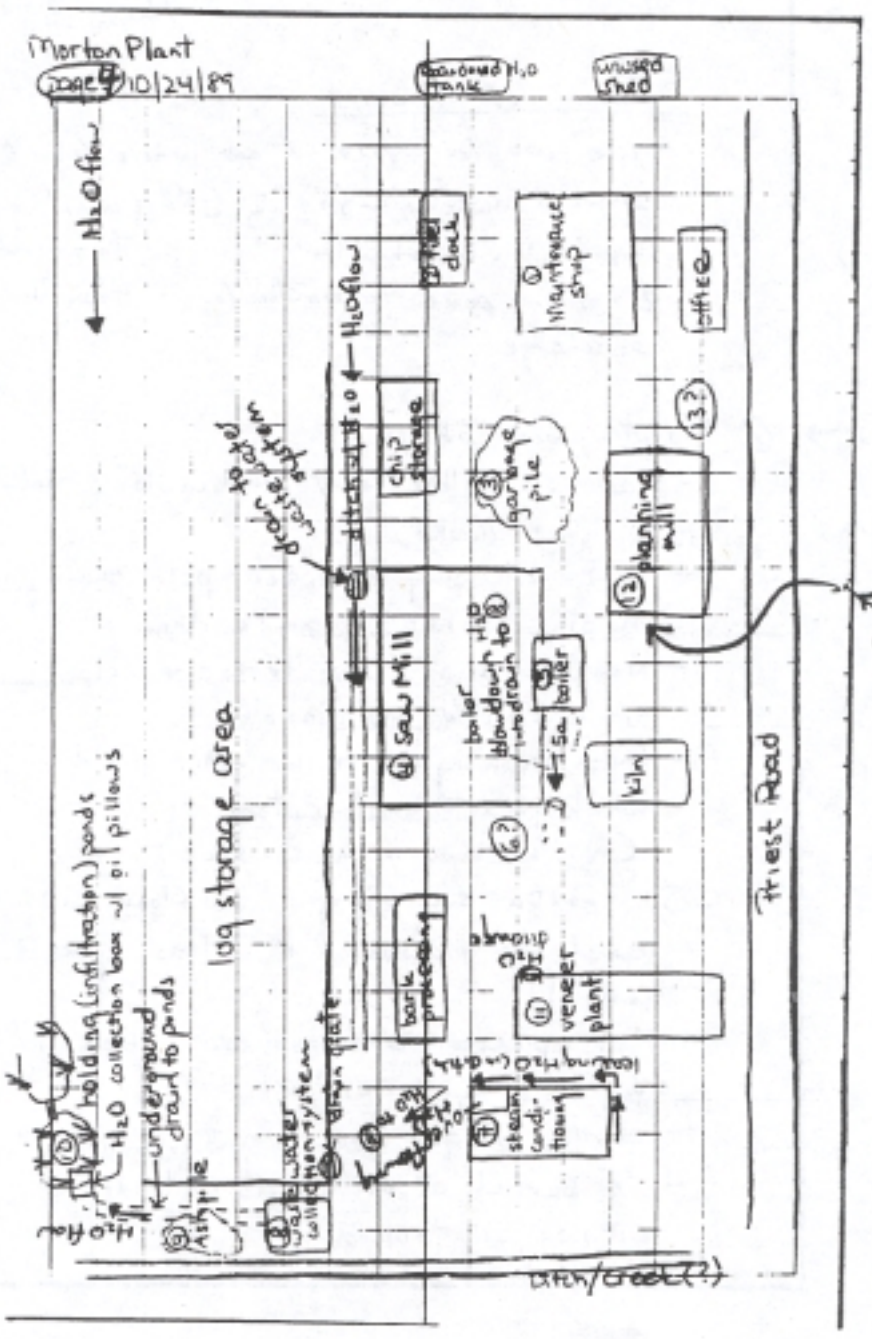
Tour of Facility

- We would like to see whole facility
- start at wastewater facility (Note: didn't do this - weended there)
- chips sold to Weyerhaeuser
- 2 holding ponds for wastewater discharge

① Maintenance Shop
- Waste oil collected/stored in storage tank
- 3 large Tanks
- Parts cleaning - solvent - petroleum naptha un1255 (present in drums)
- many drums of antifreeze + coolant, some spilled on floor
- truck washing - by boiler - drainfield which goes to waste system (no washing in maint. shop)
- Jim stated that oil spills on floor are cleaned up + disposed of in trash (goes to landfill)
  They appeared to be soaked up from floor w/ "Kitty Litter"
- empty 55 gal. drums outside
- ½ barrel of oil + H_2O outside, sitting on ground.

Facility Sketch

Page #
Date



CHAPTER 3. CONDUCTING THE ON-SITE EXAMINATION

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CHAPTER 3. CONDUCTING THE ON-SITE EXAMINATION

Four major elements comprise the on-site examination: entry of the facility, the opening conference, the examination of the facility, and the closing conference (Figure 3-1). After the on-site examination, you will need to prepare an inspection report and possibly follow up with the facility. Each of these elements is discussed in detail below.

Entry of Facility

Authority

The authority for entry into any facility where we suspect or are investigating pollution is Chapter 90.48.090 of the Revised Code of Washington (RCW) which states:

> "The department or its duly appointed agent shall have the right to enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting and investigating conditions relating to the pollution of or the possible pollution of any of the waters of this state."

Additional regulatory authority is cited in Sec. 308(a)(4)(B) of the Clean Water Act (CWA) and Chapters 173-216-110 and 173-220-150 Washington Administrative Code (WAC) for the permit programs:

> "The permittee shall allow the department or its authorized representative upon the presentation of credentials and at reasonable times: To enter upon permittee's premises in which an effluent source is located or in which any records are required to be kept under terms and conditions of the permit, subject to any access restrictions due to the nature of the project; To have access to, and copy at reasonable cost, any records required to be kept under terms and conditions of the permit; To inspect any monitoring equipment or method required in the permit; and to sample any discharge of pollutants. Reasonable times shall include normal business hours, hours during which production, treatment, or discharge occurs, or times when the department suspects a violation requiring immediate inspection."

The Fourth Amendment to the U.S. Constitution is often cited to restrict entry to private facilities. The amendment does not prohibit searches, it only forbids unreasonable searches. A reasonable search involves the likelihood that a wastewater discharge exists and that entry is attempted during normal working hours or when there is suspicion of an illegal discharge or condition.

Inspectors may be challenged as to their legal authority, technique, and competency and receive antagonistic remarks and actions. The inspector should strive to cordially explain the authority, objectives, and the reasons for the inspection protocol. Legal inspection authority should not be flaunted, only cited when requested by the facility agent.

Enter Facility

↓

Present credentials
Obtain consent

Conduct Opening Conference

↓

Outline objectives of the inspection
Review the agenda
Review plant history and other checklist items
Check for any changes in production or treatment processes

Examine the Facility

↓

Inspect the physical facilities and processes
Inspect process control equipment
Verify flow rates in production and treatment areas
Inspect storm water effects
Examine material storage areas
Note and consider quality of equipment maintenance
Review records
Review on-site laboratory facilities, if present
Determine stream flow rates, if needed
Verify that byproducts are being properly disposed
Examine safeguards against accidental discharge
Examine discharge areas

Conduct Closing Conference

Review and confirm your observations
Identify any missing information
Review deadlines for any requested information

Figure 3-1
Major elements of the On-site Inspection

Timing

Arrival at the facility should occur during normal operating hours unless other arrangements have been made with the permittee. The owner or agent in charge should be located as soon as the inspector arrives on the premises. This does not preclude surveying the premises from the exterior or other publicly accessible areas prior to entry. When the effluent or storm water outfall is located outside the premises this would be especially appropriate.

Credentials

When the proper facility officials have been located, the inspector must introduce him or herself as an Ecology inspector and present the proper credentials. These credentials identify the holder as a lawful representative of the Department of Ecology authorized to perform water quality inspections. The credentials must be presented whether requested or not. Credentials should never leave the sight of the inspector.

Consent

Consent to inspect the premises must be given by the owner or agent at the time of the inspection. As long as the inspector is allowed to enter, entry is considered voluntary and consensual. *Absence of an expressed denial constitutes consent.*

It is the policy of Ecology to enter a facility only when consent is given or implied. Although the inspector has the right to enter, a warrant will be secured for entry when entry has been denied in order to avoid prolonged litigation of some claim asserted by a facility.

Consensual entry will be the norm for most inspections. Whenever there is difficulty in gaining consent to enter, inspectors should tactfully probe the reasons and work with facility agents to overcome the problems. If it is a permitted facility, the inspector should explain that denial of consent is a violation of their permit. If the facility is unpermitted, the inspector should explain the authority to "inspect and investigate conditions relating to the pollution of or the possible pollution of, any of the waters of the state" granted under RCW 90.48.090. Care should be taken to avoid threats of potential penalties, inflammatory arguments, or anything that may be construed as coercive or threatening. A statement that "I will get a warrant" may be construed as usurping the authority of the court and thereby coercive. If the inspector feels compelled to refer to the warrant process, the proper statement is "I intend to seek (or apply for) a warrant."

It could be pointed out that issuance of a permit renewal requires inspection as well as being a condition of the permit in force. If the situation is beyond the ability of the inspector to manage, the home office should be contacted for guidance. Supervisory personnel may confer with attorneys to discuss the desirability of obtaining an administrative warrant.

All observations pertaining to the denial are to be carefully noted in the field notebook as soon as possible. Note the authority of the facility representative denying entry, reasons stated for entry denial, and any reasonable suspicions of why entry was denied. Such information will be important should a warrant be sought.

Conditional Consent

On occasion a facility may attempt to restrict your activities by imposing requirements or constraints.

Waivers/Releases--When the facility provides a "blank" sign-in sheet, log, or visitor register, it is acceptable for inspectors to sign. The inspector should not sign any type of waiver or "visitor release" that would limit the liability of the facility or restrict the use of information gathered from the facility. If such a waiver is presented, the inspector should politely explain that he/she is not authorized to sign and request a blank sign-in sheet.

Confidentiality --Information gathered in the course of the inspection becomes public record. Inspectors should never sign any agreement to hold as confidential what is observed or discovered during an inspection. Claims of confidentiality from the permittee, even if agreed to by EPA under the Freedom of Information Act, must be formally approved by the Department of Ecology. State law (Chapter 42.17 RCW and Chapter 173-03 and 173-220 WAC) provides a more stringent test to sustain a claim of confidentiality than federal law.

Inspectors should carefully consider whether information claimed as confidential by the permittee is required to fulfill the objectives of the inspection.

Additional Safety Training -- A facility may request that the inspector complete safety training or use safety equipment beyond that required by law. Generally, inspectors should use safety equipment offered/required for their own safety unless it is perceived that safety is being used as an avoidance tactic. However, inspectors have the right to decline the safety training program that is required of the facility operators unless the waste discharge permit specifically addresses facility requirements.

Photographic Restrictions -- Court cases have demonstrated that inspectors have the right to take photographs, sample, tape record, electronically monitor or use any other method commonly utilized to "inspect." Additional information may be found in the subsection "Cameras" of Chapter 2.

Other Special Requirements -- Some types of facilities require special apparel and precautions as a condition of entry. Where such preparation is routine for facility employees, the inspector should submit to those procedures. Hairnets, for food preparation establishments and coveralls to assure a dust-free environment for electronics manufacturers are two of special entry provisions. Make note of any such procedures required and submitted to in the field notebook.

If you are prevented from entering any facility or certain areas of the facility for routine inspections, or are, asked to submit to any unreasonable requirements, note these events and notify your supervisor.

Upland fish hatcheries have special disinfection requirements and specific guidelines have been developed. These are included in Chapter 3, Appendix A.

Delay of Entry

In some cases, permittees will not deny but will delay entry under the guise of obtaining necessary authority or security clearance. While such delays may be due to confusion or ignorance, they may also be an attempt to buy time to allow plant personnel to cease or coverup illegal practices. Such delays should be regarded as violations of the right of entry conditions of the permit and treated accordingly. Delays of more than five minutes are unreasonable and should not be tolerated. Permittees with legitimate security or safety obligations should work out ahead of time the necessary procedures to reduce any delays to a minimum. Short safety briefings are acceptable. If the permittee refuses or unreasonably delays entry, the inspector should advise the permittee's agent that such refusal or delay is a violation of the permit. If entry is still denied or delayed, the inspector should leave the site and notify his/her supervisor.

Withdrawal of Consent

Occasionally, a facility may consent to an inspection and later withdraw the consent while the inspection is in progress. Consent to the inspection may be withdrawn at any time after entry has been made. The inspector should follow the procedure explained under "Consent" above for initial denial of entry. All activities and evidence gathered prior to the withdrawal of consent are valid.

Security

Certain facilities, including those with military, intelligence, nuclear-related, and law enforcement functions, may have special security or access requirements necessitated by the facilities mission. Advance planning is necessary in order to obtain security clearance for these facilities. Information gathered from inspections of such a facility may also be classified. At least one inspector should be designated and have the level of security clearance needed to conduct inspections of such facilities.

Opening Conference

Once credentials have been presented and legal entry has been established, the inspector can proceed to outline inspection plans with facility officials. At the opening conference, the inspector provides names of the inspectors, verifies names and positions of the permittee's

agents, the purpose of the inspection, authorities under which the inspection is being conducted, and the procedures to be followed. Cooperation and establishment of a good relationship with the permittee ensures the success of the inspection and the permitting process. An outline of the inspection objectives informs facility officials of the purpose and scope of the inspection and may help avoid misunderstandings. A discussion of the order in which operations will be inspected helps eliminate wasted time by allowing officials time to make records available and start up intermittent operations.

It is important that a facility official accompany the inspector during the inspection not only to describe the site and its operating characteristics, but also for safety and liability considerations. Document the names, titles, and functions of facility personnel who accompany the inspector on the tour.

Information that can be gathered in the opening conference includes: plant history, number of employees, outline of the plant operation, source of discharges, source of water supply, wastewater volumes, history of effluent quality, knowledge of the receiving water, past inspections, personnel responsible for production operation, wastewater treatment, and reporting.

Facility officials should be informed during the opening conference of their right to receive a split of any physical sample collected on the premises for laboratory analysis. If they wish to receive split samples, arrangements can be made at this point to secure samples during the inspection.

At permitted facilities, a reference copy of the current permit should be carried to the inspection. Verify the following information from the permit in force:

- That a copy of the permit is on site
- The name and address of the facility is correct
- The name and location of the receiving water is correct
- The number and location of the discharge point(s) are correct
- That the principal products and production rates are. correct-Industries frequently make production changes because of the introduction of new technologies, new products, new processes, etc... Therefore, the inspector should inquire if the permittee has made any changes in production processes, raw materials, amount of finished product, water usage waste usage processes, or other changes. The inspector should determine if the permittee has made changes that could increase the discharge of pollutants above the effluent limitations specified in the permit
- That sampling and analysis records including original lab bench sheets or logs are maintained for a minimum of three years

- That original charts from continuous monitoring equipment are available

- That documents required in the permit are available. These include Operations and Maintenance Manuals, Operation logs, BMP plans, Spin Control plans, etc.

- Compliance schedule status

Examination of Facilities

Inspectors should conduct their inspections with a high degree of professionalism. Because the inspector is usually the initial or only contact between the operator and Ecology it is imperative that he/she be dignified, tactful, courteous, and diplomatic. To promote good working relations and establish a cooperative atmosphere the inspector should be firm but responsive. The inspection should be developed and reported with complete objectivity. Inspectors should not speak of any person, other regulatory agency, manufacturer or industrial product in a derogatory manner. Information acquired during an inspection is for official use only. No favors or benefits should be accepted under circumstances that might be construed as influencing the performance of the duties of the inspector.

The inspection is restricted to conditions that have an effect on the quality of the effluent discharged from the permitted facility. Sources of water pollution that are not a direct consequence of the process of the facility must also be considered. Electrical transformers, storage of hazardous and dangerous wastes, nonpoint sources, storage tanks, and the condition of air pollution control equipment are some examples of potential sources of water pollution to consider and report to appropriate programs.

The inspector should ask the same types of questions regarding processes and fate of wastewater that were put forth in the opening conference. It is important to understand the treatment process, production process, and the schedule of operation. Typically, the inspection will proceed through a facility in a logical "beginning to end" progression, but there may be times when you will want to alter this strategy. For example, if you suspect that the facility may try to change something in the final treatment process in response to your unannounced visit, you should go there directly. Generally, the inspector should maintain an attitude of cooperation with the facility representatives by not putting them on the defensive. Remind them that you are vitally interested in helping them to be good neighbors and maintain good water quality.

The inspector should be on the lookout for design situations where flows could be directed from the approved flow plan to unsuitable destinations. Treatment basins, vessels, tanks, and pipes may have connections that were used in a previous treatment (or nontreatment) scheme, which if used could circumvent the current treatment process. An old primary settling basin might have a valve and connection to a storm drain which could cause a bypass of the secondary treatment or a chlorine contact chamber. Floor drains in process areas may or may not go to containment or treatment areas. Older facilities in particular have added-on treatment systems full of potential

bypass situations. These bypasses should be removed, sealed, or fixed shut with locks depending on overflow considerations.

All information should be independently verified, if possible, through observation, sampling, dye testing, consulting other agencies, etc. The inspector should ask for explanations frequently until the process and wastewater treatment system is understood. The inspector should also question anything that does not appear logical from an economic or technical standpoint. Be sure it all makes sense.

You learn more from listening than from talking so try to let the facility representative do the talking. Try to ask open-ended questions. From the conversation you will get a sense of whether the representative is being evasive or answering your questions head on. The inspector should let the respondent finish a thought and avoid interrupting even if you already have a thorough knowledge of the process. During the inspection you should listen for contradictions and discrepancies between explanations. In this regard, it is often useful to ask at least two or three people at the facility the same questions.

Making Recommendations During the Inspection

A valid and valuable role for the inspector is to provide technical assistance and guidance to the permittee. In the course of an inspection, an inspector may observe, or be asked about operational problems that can be readily corrected by providing advice or assistance to the operator. Where the inspector is knowledgeable about plant operations and actions to improve plant performance can be readily identified, such advice or informal assistance should be given. Caution must be exercised to ensure that the regulatory posture with respect to subsequent or current enforcement action is not compromised. Any advice or informal assistance offered by the inspector must be adequately documented in the field notebook.

Recommendations for major corrective actions should not be made on the spot, but rather reviewed with your supervisor following the inspection and submitted in writing subsequent to the review.

Observation of Production and Treatment Facilities

Using the Inspection Plan as a guide, the inspector conducts interviews, takes measurements, makes observations, and documents his/her findings using the field notebook and camera. Some of the categories of problems you are most likely to notice are shown in Table 3-1. Additional common inspection elements relevant to the issuance or renewal of a permit are shown in Table 3-2.

Table 3-1. Possible problems with treatment facilities, by category.

Abnormal Buildups during Treatment

- Excessive plant growth in stabilization ponds
- Excessive scum, solids, foam, floating material accumulation in treatment or settling tanks
- Freezing wastewater in ammonia stripping towers
- Fouling of fabric in microscreens with grease and solids
- Mechanical fouling of activated carbon columns
- Sludge accumulation in clarifiers (indicated by floating sludge pads and gas bubbles)

Unusual Discharges

- Surcharging of influent lines and overflow weirs

Alternate Discharge Points

- Old valves or channels from previously upgraded systems
- Pipes or channels showing occasional use
- Erosion or runoff from land discharge sites

Abnormal/Obnoxious Odors

- From wet wells, grit chambers, aerobic and anaerobic biological units, scum removal devices, sludge handling facilities

Broken or Unusual Equipment

- Note the presence of special pumps
- Presence of floating aerators in diffused air systems
- "Jerry-rigged" systems
- Any structure that appears to be temporary
- Clogged sprinklers, dripping nozzles, and broken pipes (land discharge)

Other Basic Observations

- Are byproducts of treatment or production being disposed of properly?
- Are safeguards adequate to prevent the discharge of untreated or partially-treated wastes?
- Does receiving water or receiving landmass appear normal?
- Is there evidence of past spills?
- Is there ponding of wastewater on the irrigation field? (land discharge)

Table 3-2. Common elements of an inspection.

Items needing verification:

- The receiving water or receiving POTW
- The permit fee category of the facility
- Sampling procedures/lab qualifications (ability to provide accurate DMRs
- Lab accreditation
- Credentials of operators for POTWs
- Fate of waste stream during a power failure or equipment breakdown
- Treatment equipment and strategies
- Discharge frequencies
- Adequacy of containment structures around tanks, sludge, product and chemical storage areas
- The receiving water for no detrimental impacts

Items needing documentation:

- Plans for future operation, expansion, and production
- Maintenance schedules
- History of operation, age of equipment
- Toxic and hazardous materials in use or generated
- Water recycling or material reclaiming processes
- Evidence of past spills
- Adequacy of barrel storage facilities
- Fate of storm water runoff
- Potential groundwater impacts
- Drainage patterns
- Sediment accumulation around the outfall
- Unusual vegetation and receiving water conditions
- Soil condition

Items needing review:

- Lab logs for consistency with DMRs
- Flow data for inflow/infiltration impacts (POTWs)
- Subjective management attitude toward environmental compliance
- The MSDS file, looking for possible water quality concerns
- The Spill Prevention Plan
- Housekeeping conditions, especially fate of oils and maintenance wastes

Process Control Monitoring--Process control monitoring is essential to the effective operation of most biological treatment plants. While process control monitoring is generally not included in permits, it may be found in an order or permit when there is a history of noncompliance. Whether or not it is part of the permit, the inspector should review the plant process control protocols. The lack of process control, especially in complex processes such as activated sludge, indicates a high potential for future compliance problems.

Illicit Discharges to Storm Sewer--If there is a possibility for illicit discharge to storm sewers, such as at a facility on a pretreatment program, inspect the treatment facility or other devices used to transport wastewater to the POTW. Potential or actual diversions to storm water may be present due to historical practices.

The inspector should try to verify the inputs to storm water flow by direct observation during dry weather to observe non-storm water flows. Wet weather inspections assess actual storm water quantities, qualities, and drained areas. The actual method used to determine input sources will depend on local conditions. Dyes or floating markers may be used during wet conditions and water surges may be used during dry conditions. Five gallons of water poured down a sink or floor drain, which results in a surge of water in a storm water basin, is good evidence of an improper connection.

Floor drain and sewer grate covers that lead to storm water lines should be adequately marked to preclude use for disposal of materials and liquids that should properly go to the sanitary sewer, be recycled, or retained for hazardous waste disposal. Generally, internal floor drains should not lead to stormwater lines.

The inspector should assess the adequacy of safeguards to exclude spills from storm drain systems. Hazardous and dangerous material storage areas should be bermed to contain the contents of the largest drum should it rupture, plus an additional ten percent of its volume.

Materials Storage--Products that may have a detrimental impact on waters should be stored in secure areas to prevent runoff. Sludge storage and transport areas should be examined to assess the probability of runoff into surface or ground waters via storm drains or other means. The inspector should look around the process area for containers and labels of the materials used as process additives, raw materials, and in the clean-up process. The label information and location in the plant where found should be documented and the function and approximate use rate for materials of interest should be established. Plant workers are the best source of unbiased information for materials used in their sections.

Maintenance of Equipment--Good maintenance is one aspect of good operation and indicates that plant operating personnel are giving adequate emphasis to the plant's facilities and performance. The inspector should inquire about the maintenance programs for mechanical equipment, lighting around pollution control devices, cleaning of areas where waste accumulates, and protective paint on units and color-coded piping systems.

The inspector should also note the physical condition of the equipment in the process line. Corrosion and unusual deposits or accumulations of materials can be a clue to unsatisfactory practices not otherwise evident at the time of inspection. High water or other liquid marks are often present in ponds, tanks, or walls. Rust caused by oxidation due to high chlorine levels is another common indicator. If a vital treatment unit is out of service, the inspector should determine when it was taken out of service, the type of failure, when it will be put back into service, and whether Ecology was notified.

Records Review--When reviewing records, inspectors should enter into the field notebook the kinds of records examined, and the reasons for examining them, and their locations. The inspector will want to know if the required records are readily available, maintained and if they demonstrate compliance or noncompliance. There are many kinds of records useful in a compliance inspection such as:

- Discharge monitoring reports
- Permits
- Hazardous waste generation
- Food processing wastes applied to land
- Sludge quantities hauled
- Operation records
- Waste oil removal
- Production records (if permit limits are based upon production)
- Shipping records

The inspector should check for the completeness and accuracy of required records and reports and photocopy any of importance.

Verification of Production Rates--Facilities that have effluent limits based on production should supply verification of reported production levels. Depending upon circumstances, the inspector may want independent verification in the form of a notarized statement by an independent auditor of what production has been during certain periods of the last permit cycle. When this information is not routinely on-hand at a facility, the inspector should request such verification be supplied prior to permit renewal. The inspector should also be alert to conditions or statements which may reflect declining or changing levels of production or sales.

Flow Verification--For permits with flow limits or mass-based effluent limits, the permittee must accurately determine the quantity of wastewater being discharged to comply with the permit requirements. Flow measurement serves to provide operating and performance data on the wastewater treatment system.

Two types of wastewater flow can be encountered: closed channel flow and open channel flow. Closed channel flow occurs under pressure in a liquid-full conduit (usually a pipe). Flow in closed channels is usually measured by a metering device inserted into the conduit. The Venturi meter, the Pitot tube, and the electromagnetic flowmeter are closed channel devices and usually encountered only where liquids and sludges are pumped under pressure.

Open channel flow occurs in conduits that are not liquid-filled. Partially full pipes, not under pressure, are classified as open channels. Open channel flow is the most prevalent type of flow at regulated discharge points.

Primary devices for measuring open channel flow, including flumes and weirs, are calibrated and inserted in the open channel. Accurate flow measurements can be obtained by measuring the depth of the liquid (head) at a specific point of the primary device. In a weir application, for example, the flow rate is a function of the head of liquid above the weir crest. A secondary device is often used to automate the measurement of flow based on the primary device. Floats, ultrasonic transducers, and bubblers sense the liquid head and convert to a signal that can be recorded as indicated flow on a totalizer or strip chart. The signal may also control a flow proportioning composite sampling device. Strip chart recordings are very useful when examining flows. Abrupt changes in flow might indicate intentional flow changes, accidental upsets, or equipment malfunctions. Facilities with a 24-hour operation and large treatment systems should have consistent effluent flow rates, which justifiably vary only due to production changes, precipitation surges, or unavoidable bypasses. A properly maintained strip chart recording device should be accurately tracing recorded conditions to coincide with the time of day. The date and time of day which correlates with the pen trace should be periodically verified by the operator responsible for its maintenance and use.

The permittee must obtain accurate wastewater flow data to calculate mass loading (quantity) from measured concentrations of pollutants discharged as required by most discharge permits. The accuracy of flow measurement varies widely with the device, its location, environmental conditions, and other factors such as maintenance and calibration. Faulty fabrication, construction, and installation of primary devices are common sources of errors. Improper calibration, misreading, and variation in the speed of totalizer drive motors are major errors related to secondary devices.

When evaluating facility installed devices, the inspector should:

- Inspect the primary device for evidence of corrosion, scale formation, or solids accumulation that may bias the flow measurement
- Inspect historical records for evidence of continuous flow measurements. Compare periods of missing data with maintenance logs for explanations of measuring system problems
- Observe the flow patterns near the primary device for excessive turbulence or velocity
- Ensure that the flow measurement system or technique being used measures the entire wastewater discharge as required by the permit. A careful inspection should be conducted to determine whether there are any wastewater diversions or bypasses around the system
- Review and evaluate calibration and maintenance programs for the discharger's flow measurement system. The permit normally requires that calibration be checked regularly,

often annually, by a qualified calibration service. A record of such service should be verified

- Verify that flow measuring devices are sensitive for normal flow and sized adequately for maximum flows
- Be sure that the head is measured at the appropriate location
- Assure appropriate equation or rating curve is being used
- Measure head, calculate flow, and compare result to both the flow chart and totalizer to evaluate the accuracy of the entire system

Detailed information and flow formulas are available in a number of publications such as the EPA Handbook for Sampling and Sample Preservation of Water and Wastewater (EPA-600/4-82-029) and texts or manuals on hydraulics.

Receiving Water Flow Verification--An important consideration in the renewal of a permit which must incorporate a mixing zone to meet water quality standards is the rate of stream flow. Many of the streams throughout the state have 7Q10 flow rates established and these records may be available from U.S. Geological Survey (USGS), EILS, or Water Resources (a seven-day 10-year low flow is the lowest average flow for seven consecutive days that has an average recurrence interval of 10 years).

For those streams that do not have 7Q10 flow rates established, the inspector should consider measuring the actual flow rate through the use of a velocity meter, staff rod and the "Q" Program. Flow rates established in this manner should be characterized during critical conditions such as summer or winter low flows. The inspector should check at the regional office for the necessary equipment and an individual qualified to provide instruction in its use or contact EHS for assistance. Actual flow rates can be compared to the flow rates supplied through calculations from the Water Resources Program and reasonable adjustments or calibrations performed.

Observation of Laboratory Facilities

Laboratory Accreditation--WACs 173-220 and 173-216 specify that monitoring data submitted to Ecology be prepared by an accredited laboratory according to the following schedule:

July 1, 1992	Major NPDES Permittees
July 1, 1993	All nonmajor NPDES Permittees with permitted average flow > 5 MGD,
July 1, 1994	All nonmajor NPDES Permittees with permitted average flow ≤ 5 MGD
July 1, .1993	All State Permittees with permitted average flow > 5 MGD
July 1, 1994	All State Permittees with permitted average flow ≤ 5 MGD

These requirements are effective and binding on all permittees under the authority of rule, regardless of whether they have been included as conditions of a permit.

The following parameters do not need to be accredited: flow, temperature, and parameters used solely for internal process control.

Chapter 3, Appendix B, provides a list of accredited labs for use by inspectors. The Point Source Section will work with the Quality Assurance Section to provide inspectors with updated lists of accredited laboratories on a regular basis.

Quality Assurance--The laboratory performing the analyses for the parameters reported in the facility DMR should have some form of Quality Assurance (QA) Program. The inspector should determine whether the program is adhered to by discussions with lab staff and examination of written records generated in accordance with the QA program. The lack of any QA program should be addressed in the permit renewal.

Laboratory Quality Assurance is required by 40 CFR Section 122.41 and Chapter 173-50-060 WAC which state that adequate laboratory controls, including QA procedures, must be provided. Each permittee's lab should have a QA program, documented in a written manual available to all personnel responsible for sampling and analysis. The manual should identify the individuals involved in the QA program and their responsibilities, and should document the standard operating procedures that meet user requirements in terms of specificity, completeness, precision, accuracy, representativeness, and comparability.

Laboratory Data --The inspector should review laboratory data for consistency with the values reported on DMRs. The only unbiased source of data is the original, unedited bench sheets used by the analyst in the recording and calculation of values obtained at the time the test is performed. Compare the values expressed in the bench sheets with the values in corresponding lab reports or lab logs and the values submitted to Ecology. The facility representative should be questioned on the procedure for transferring lab data to the DMRs, including any conversion factors used. The inspector should secure photocopies or photographs to document any unusual conditions.

The inspector should determine whether the lab and sampling staff seem competent to generate accurate and representative data. You may want to question lab staff for an explanation of schedules and routines, time required to perform tests, and who performs the tests. To gauge the experience and competence of the individuals who engage in sampling, testing and reporting, the inspector may ask specific questions regarding lab methods.

The inspector should verify that the sample types are as specified in the permit and the containers, collection and storage strategies are appropriate for the analyses to be performed.

A commonly violated requirement is the refrigeration or icing to 1 - 4.4°C for a composite sample as it is collected. For more information consult the Laboratory Users Manual and 40 CFR Part 136.

Test procedures should conform to those referenced in the permit. Any exceptions should be noted. More complete lab evaluation is required in the Class 2 inspection.

Quality Assurance Section Coordination--For the purpose of accrediting laboratories, the Quality Assurance Section within EILS routinely conducts detailed laboratory audits around the state. To minimize the duplication of efforts the Point Source Section will develop a process for information sharing between the QA Section and inspectors. The Quality Assurance Section suggests that when inspecting dischargers whose laboratories are already accredited by Ecology, the inspector should emphasize sampling and data reporting, and deemphasize the capability of the laboratory to accurately analyze samples.

Closing Conference

A final meeting with facility officials (if they desire it) will "wrap up" the inspection and allow you to:

- Review and confirm your observations
- Identify any missing information
- State how long the facility has to get information to you
- Identify who should provide the information and to whom they should provide it

The facility will understandably be interested in whether any violations were found. The inspector should discuss any specific, obvious violations and necessary immediate compliance steps with the facility. The inspector should be cautious, however, in drawing conclusions about overall compliance. It is almost never a good idea to indicate conclusions about overall facility compliance for three reasons:

- The inspector is a "witness of fact." Making on-site compliance determinations places the inspector in the role of cop and judge and it opens the door for emotional or personal prejudice. Additional time to reflect and correlate all that has been observed can sometimes alter initial conclusions.
- A unilateral decision made in the field may limit the decisions available to the agency. If the facility was told "There were no problems" and the agency determines there were, enforcement may be compromised. Conversely, unnecessary expense may be borne by the facility responding to premature or incorrect conclusions.

- For sampling inspections data must be reviewed

Overall facility compliance is best addressed following a review of all information, especially where sampling is conducted.

Inspection Report

The objective of an inspection report is to organize and coordinate all inspection information and evidence into a comprehensive, usable document. Inspection reports are essential and valuable tools in providing clear, concise methods for correcting problems and deficiencies noted during the inspection. Every effort should be made to complete the inspection report and distribute to the permit manager and discharger in a timely manner (i.e., within a maximum of 90 days for Class I inspections and 120 days for Class 2 inspections). The information should be objective and factual. The report should not speculate on motives or the ultimate result of the inspection findings. A well organized inspection report should follow the general guidelines discussed below.

Format

There is no single standard inspection report format within Ecology but a typical report could include:

- A cover letter thanking them for their assistance and reviewing significant results

- A copy of the EPA Form 3560-3 inspection checklist

- A narrative describing the organization of plant, participants in the inspection, summary of findings, etc. The EPA inspection report outline, included in Chapter 3, Appendix C, provides an example of the narrative portion of an inspection report

Information in the report should be accurate, relevant, and comprehensive.

Accurate--All information must be factual and based on sound inspection practices. Observations should be the verifiable result of firsthand knowledge.

Relevant--Information in an inspection report should be pertinent to the subject. Irrelevant facts and data will clutter a report, reducing its clarity and usefulness.

Comprehensive--Suspected violation(s) should be substantiated by as much factual, relevant information as feasible to gather. The more comprehensive the evidence is, the better and easier any subsequent enforcement action will be. All pertinent information should be organized into a complete package. Documentary support (photographs, sample results, and documentation) should be clearly referenced. The information should be presented in a clear, well organized manner.

Basic steps in preparing and writing the inspection report are as follows.

Reviewing the Information--The first step in preparing the narrative is to collect all information gathered during the inspection. The inspector's field notebook should be reviewed in detail. All evidence should be reviewed for relevance and completeness. A telephone call or, in unusual circumstances, a follow-up visit may be needed to obtain additional or supplementary information.

Organizing the Material--The information may be organized in many forms, depending on the individual need, but should be presented in a logical manner. The narrative should be organized so that it is understood easily. An example of an inspection report form is included in Chapter 3, Appendix C.

Referencing Accompanying Material--Documentary support for a narrative report should be clearly referenced so that the documents can be readily located. Documents should be checked for clarity.

Writing the Narrative Report--Once the material collected by the inspector has been reviewed, organized, and referenced, the narrative can be written. The purpose of the narrative is to record factually the procedures used in, and findings resulting from, the evidence-gathering process. The inspector should refer to routine procedures and practices used during the inspection, but should detail facts relating to potential violations and discrepancies. The field notebook is a guide for preparing the narrative report.

The main body of the report should contain all pertinent facts and information acquired during the inspection. It generally will contain three basic items listed below:

- Permittee Compliance History
- Documentary Support
- Supplementary Narrative Information

If the inspector has followed the steps presented in this manual, the report will develop logically from the organizational framework of the inspection. In preparing the narrative, write simply; avoiding stiff language. Use the active rather than the passive voice in the text. Write, "He said that..." rather than "It was said that..." Keep paragraphs brief and to the point. Proofread the narrative carefully.

Follow-up

Every effort should be made to "tie up" any loose ends in a timely manner. Long delays between the inspection date and the enforcement action have been problem with past cases presented before the PCHB. Follow-up is especially appropriate when:

- Sampling results become available
- Inspection data/information is promised by inspector or permittee
- An inspection is carried out without the permittee or the permittee's representative being present.

CHAPTER 3

APPENDIX A

UPLAND FISH HATCHERY INSPECTION GUIDELINES

Upland Fish Hatching and Rearing Facility Inspection and Sampling Procedures

Introduction

Upland Fish Hatching and Rearing facilities pose unique inspection and sampling challenges due to the potential for fish disease transmission, both within the facility and between facilities. The following sampling and inspection guidelines are intended to minimize any potential for disease transmission.

Many facilities have disinfection procedures for the protection of their stocks. It is reasonable for inspectors to undergo the same routine disinfection procedures workers and other outside visitors undergo. Special procedures may also be reasonable during periods of documented disease outbreaks. However, failure of a permittee to provide timely access during reasonable business hours or to interfere with sample collection is a permit violation and should be noted for possible enforcement action.

The need to inspect and take samples at upland fish facilities is necessary for an effective permit program. Right of entry provisions are specifically included as a condition of all discharge permits. Inspectors may make announced and unannounced inspections during normal business hours. Denial of access because the. proper company personnel are not present is a permit violation.

Guidelines

1. Upon arrival at an upland fish hatching and rearing facility, Ecology inspectors shall report to the facility office and identify themselves.

    a). Sign-in sheets may be signed provided no statement limiting the company's liability or extending any liability to Ecology or the inspector is included.

    b). Filling out of questionnaires is acceptable provided their use is not to delay or deny access. A copy of the completed questionnaire shall be retained by the inspector and filed with the inspection report. If the inspector is unable to retain a copy of the completed questionnaire, then shall not be filled out.

c). Inspectors should note the time of arrival and any unusual delays in their field notebook.

d). Inform hatchery representative of any visit to another hatchery within the last 48 hours,

2. Avoid unnecessary on-site vehicle traffic. If possible and, if re-quested, park in visitor parking areas and use hatchery vehicles (driven by Hatchery personnel) or walk between sampling points. If driving on-site, avoid parking near or driving through water. Stay on established roads or drives.

3. Disinfection procedures differ from facility to facility. Any disinfection procedures in effect at the facility which are routinely used by hatchery personnel should be complied with. This typically includes washing boots, gloves, and reusable sampling equipment in a chlorine or Iodophore (Iodine) solution. Inspectors should note all disinfection procedures in their field notebooks.

4. Facility sampling and inspection sequences to minimize any risk of disease transmission should be discussed with the facility manager or other on-site responsible party if available. If unavailable, the following guidelines shall be followed.

a). Avoid all unnecessary contact with hatchery influent and rearing waters.

b) Use only new or disinfected sampling equipment when sampling a facility's influent or water upstream of rearing or hatching vessels.

c). Sample in the direction of water flow through the facility. In the event of multiple water sources or pathways, sampling shall also be from youngest to oldest fish.

d). Egg hatching buildings are sensitive areas. Inspect the hatchery building prior to inspecting any other part of the-facility. Frequently one hatchery employee is assigned to work only in the hatchery building to avoid cross-contamination from older fish. Check with the employee on duty or the facility manager for any special disinfection procedures or access precautions.

e). Any Sampling of ponds or raceways containing diseased fish shall be done only after all influent sampling has been completed.

f). Sampling of facility effluents including any off line waste abatement ponds shall be done only after all influent and fish rearing area samples have been taken.

g). In the event an emergency disease (such as VHS) has been identified at a hatchery, discuss sampling and disinfection procedures with the facility manager. Because of the extremely serious nature of this disease, inspection and collection of samples from a facility undergoing a VHS Epizootic should be done only if absolutely necessary. If inspection and sampling is necessary, procedures should be discussed with the Department of Fisheries or Wildlife to ensure the disease will not be spread oft site. WDF and WDW disinfection procedures for the site shall be followed.

5. When inspecting and sampling multiple facilities, precautions must be taken to ensure diseases are not transmitted between facilities.

a). All sampling equipment including boots, gloves, current meters, thermometers, etc. shall be disinfected between facility inspections.

b). Inspection of a facility after the inspection of a facility which is undergoing an epizootic is to be avoided. If the subsequent inspection is necessary, thorough disinfection is required upon leaving the infected facility and again upon entry of the second.

CHAPTER 3

APPENDIX B

LIST OF ACCREDITED LABS

LABS ACCREDITED BY DEPARTMENT OF ECOLOGY
as of June 1, 1992

Activity	Address	City	St	Zip	Contact	Telephone	CI	CII	OI	OII	R	M	B
AAA Superior Lab	S 16924 Curtis Road	Cheney	WA	99004	Cheryl Blake	(509) 448-1740	X						
AC2 Laboratories, Inc	30400 Downhill Drive	Steamboat Springs	CO	80487	Scott Habermehl	(303) 879-6590	X	X	X	X	X		
Advanced Silicon Materials, Inc.	3322 County Road "N" NE PO Box 1667	Moses Lake	WA	98837	John McPeek	(509) 765-2106	X						
Atchem Laboratory	104 West 31st Street	Boise	ID	83714	Suzanne Howell	(208) 336-1172	X	X	X				
Alden Analytical Labs	1001 Klickitat Way SW	Seattle	WA	98134	John Buerger	(206) 623-3660	X		X	X			
Alta Analytical Laboratory. Inc.	5070 Robert J. Mathews Parkway, Suite	El Dorado Hills	CA	95630	Bob Peterson	(916) 933-1640				X			
AmTest	14603 NE 87th St	Redmond	WA	98052	Shawn Moore	(206) 885-1664	X	X	X	X		X	X
Analytical Resources, Inc.	333 Ninth Ave North	Seattle	WA	98109	David Mitchell	(206) 621-6490	X	X	X	X		X	
Analytical Technologies (Fort Collins)	225 Commerce Drive	Fort Collins	CO	80524	Jodie Barr	(303) 490-1511	X		X	X			
Analytical Technologies (Renton)	560 Naches Ave SW, Suite 101	Renton	WA	98055	Fritz Grothkopp	(206) 228-8335	X	X	X	X			
Analytical Technologies (San Diego)	5550 Morehouse Dr	San Diego	CA	92121	Patricia A. Schroder	(619) 458-9141	X	X	X	X			
AnslytIKEM	2400 West Loop South, STE 300	Houston	TX	77027	Stephen Rabke	(713) 960-8557							X
Anametrix	1961 Concourse Drive, STE E	San Jose	CA	95131	Larry Kent	(408) 432-8192	X	X	X	X			
Aqua Test, Incorporated	28620 Maple Valley Hgwy SE	Maple Valley	WA	98038	Linda Mount	(206) 432-9360	X					X	
Aquatic Environmental Sciences	644 Old Eaglemount Road	Port Townsend	WA	98368	Dale Bonar	(206) 732-4464	X					X	
Aquatic Research	3927 Aurora Ave N	Seattle	WA	98109	Steve Lazoff	(206) 632-2715	X	X					
Battelle Marine Research Labs	439 W Sequim Bay Rd	Sequim	WA	98382	Eric Crecelius	(206) 683-4151	X	X					X
Battelle NWL Chem Measurements Lab	P.O. Box 999, Bldg 329, MS P8-08	Richland	WA	99352	J. L. Daniel	(509) 376-7069		X					
Bioconsultants, Inc.	2897 152nd Avenue NE	Redmond	WA	98052	John Majnarich	(206) 869-4224						X	X
Boise Cascade Corp (Steilacoom)	4302 Chambers Creek Rd	Steilacoom	WA	98388	Janet L Benke	(206) 588-2115	X						
Boise Cascade Corp (Wallula)	PO Box 500	Wallula	WA	99363	Cheryl Benar	(509) 546-3417	X						
Boise Cascade Paper Div (Vancouver)	PO Box 690	Vancouver	WA	98666	Fredrick A. Weber	(206) 690-7000	X						
BP Oil Company	PO Box 8, 3901 Unick Rd	Ferndale	WA	98248	Dennis Banta	(206) 384-8207	X	X				X	
Bremerton/Kitsap Cty Health Dept Lab	109 Austin Drive	Bremerton	WA	98312	Jesusa Magdamit	(206) 478-5285						X	
Burlington Environ'l Corporate Lab	2203 Airport Way S, STE 400	Seattle	WA	98134	Kathy Kreps	(206) 223-0500	X	X	X	X			
Cascade Analytical, Inc.	3019 GS Center Road	Wenatchee	WA	98801	Laura Mrachek	(509) 662-1888	X	X	X				
Cenref Labs	695 North 7th Avenue	Brighton	CO	80601	Alan Kerschen	(303) 659-0497	X	X	X	X			
Central Kitsap Water Treatment Plant	12350 St. Hwy. 303NE	Poulsbo	WA	98370	Carig Hanson	(206) 779-7720						X	
Century Testing Labs	P.O. Box 1174	Bend	OR	97701	Bruce Bale	(503) 382-6432	X	X	X	X			

Activity	Address	City	St	Zip	Contact	Telephone	CI	CII	OI	OII	R	M	B
CH2M Hill (Corvallis)	2300 NW Walnut Blvd	Corvallis	OR	97339	Mike Stanaway	(503) 752-4271	X						X
CH2M Hill (Redding)	5090 Caterpillar Road	Redding	CA	96003	Terry Davis	(916) 244-5227	X	X	X	X	X		
Columbia Aluminum Co	85 John Day Dam Rd	Goldendale	WA	98620	Lester McCoy	(509) 773-7350	X	X	X			X	
Columbia Analytical Svcs (Bothell)	18912 N. Creek Parkway, STE 118	Bothell	WA	98011	Mike Higgins	(206) 486-6983	X		X				
Columbia Analytical Svcs (Kelso)	P.O. Box 479	Kelso	WA	98626	Lawrence Jacoby	(206) 577-7222	X	X	X	X		X	X
Columbia/Bio Medical Lab	1200 North 14th Avenue	Pasco	WA	99301	Harden Kohler	(509) 547-3336						X	
Cowlitz Cty Regional Water Tmnt Plant	207 4th Ave N	Kelso	WA	98632	Don Hultgren	(206) 577-3127	X					X	
Des Moines Creek Water Treatment Plant	PO Box 98704, 1200 S. 216th	Des Moines	WA	98198	John Hura	(206) 824-2760	X					X	
Ecology and Environment, Inc.	4285 Genesee St.	Cheektowaga	NY	14225	Ray Piccione	(716) 631-0360	X	X	X	X			
ECOVA	18640 NE 67th Court	Redmond	WA	98052	Alan Jones	(206) 883-1900							X
Edmonds Wastewater Tmnt Plant	250 5th Ave N	Edmonds	WA	98020	Tina Higman	(206) 771-0220	X						X
Ellensburg Wastewater Treatment Plant	420 N Pearl St	Ellensburg	WA	98926	Irma Grogan	(509) 962-7269	X						X
ENSECO-California Analytical Lab	2544 Industrial Blvd	West Sacramento	CA	95691	Anne Boschert	(916) 372-1393	X	X	X	X			
ENSECO-CRL	7440 Lincoln Way	Garden Grove	CA	92641	Paul Christi	(714) 898-6370	X	X	X	x			
ENSR Consulting and Engineering	1716 Heath Parkway	Fort Collins	CO	80524	Kurt Drottar	(303) 493-8878	X						X
Enumclaw Wastewater Taint Plant	2041 Railroad Street	Enumclaw	WA	98022	Bing Basim	(206) 825-1115	X					X	
ETC Environmental Labs	320 Tesconi Circle	Santa Rose	CA	95401	Jennifer Roseberry	(707) 544-5570	X	X	X	X			
Eureka Laboratories	6790 Florin Perkins Rd.	Sacramento	CA	95826	Steve Leung	(916) 381-7953	X	X	X	X			
Everett Wastewater Treatment Plant	3200 Cedar St.	Everett	WA	98201	Robert Waddle	(206) 259-6819	X	X				X	X
EVS Consultants, Inc	2517 Eastlake Ave E	Seattle	WA	98102	Cathy McPherson	(206) 328-4188						X	X
EWU Limnology Laboratory	260 Hall of Sciences, MS 72	Cheney	WA	99004	Ray Soltero	(509) 359-2532	X					X	
Forks Wastewater treatment Plant	PO Box 1998	Forks	WA	98331	Dan Wahlgren	(206) 374-3124	X						
Friedman & Bruye	3008-B 16th Ave. West	Seattle	WA	98119	Mark Perin	(206) 285-8282	X	X	X				
Georgia-Pacific Corp (Bellingham)	PO Box 1236	Bellingham	WA	98227	Jerry Price	(206) 676-7263	X	X					
GT Environmental Labs (Concord)	4080 Pike Lane	Concord	CA	94520	Debra Tiernan	(415) 685-7852	X	X	X	X			
GT Environmental Labs (Torrance)	20000 Mariner, Suite 300	Torrance	CA	90503	Minsoon Song	(213) 371-1044	X	X	X	X			
IML (Bozeman)	910 Technology Blvd, Suite 8	Bozeman	MT	59715	Jack Felkey	(406) 586-8450			X	X			X
IML (Sheridan)	1633 Terra Avenue	Sheridan	WY	82801	Bill Fielder	(307) 674-7506	X	X					
Inland Aqua-Tech, Inc.	Spokane Industrial Park, Bldg S-19, E	Spokane	WA	99216	Lee Henry	(509) 928-5651	X	X					
Invert-aid	8414 280th Street East	Graham	WA	98338	Diane Robbins	(206) 846-2774							X
IT Analytical Services (Austin)	5307 Industrial Oaks Blvd, Suite 160	Austin	TX	78735	A. Clark-Wusterhausen	(512) 892-6684	X	X	X	X			
IT Analytical Services (Richland)	2800 Geo Washington way	Richland	WA	99352	Douglas Swenson	(509) 375-3131					X		
IT Corp Special Analysis Lab	312 Directors Drive	Knoxville	TN	37923	Bruce Wagner	(615) 690-3211				X			
ITT Rayonier (Port Angeles)	700 N. Ennis	Port Angeles	WA	98362	Brian Jones	(206) 457-3391	X						
James River Corp Camas Hill	4th and Adams	Camas	WA	98607	Alan Prouty	(206) 834-3021	X						
Kaiser Aluminum & Chemical (Mead)	E 2111 Hawthorne Rd	Mead	WA	99021	Pat Hampton	(509) 467-1656	X						
Kalama Chemical Company	1296 NW Third	Kalama	WA	98625	Kate Dugas	(206) 673-2550	X						
Keystone/WEA	12242 SW Garden Place, Bldg #1	Tigard	OR	97223	Jeffrey Sprenger	(503) 624-2773				X			

Activity	Address	City	St	Zip	Contact	Telephone	CI	CII	OI	OII	R	M	B
Laucks Testing Labs, Inc	940 So Harney St	Seattle	WA	98108	Harry Romberg	(206) 767-5060	X	X	X	X		X	X
Law Environmental National Labs	112 Town Park Drive	Kennesaw	GA	30144	Dale Darley	(404) 421-3324	X	X	X	X			
Lynnwood Wastewater Tmnt Plant	19100 44th Ave W (PO Box 5008)	Lynnwood	WA	98046	Don Davis	(206) 775-1971	X					X	
Manchester Environmental Lab	7411 Beach Drive East	Manchester	WA	98353	Bill Kammin	(206) 895-4737	X	X	X	X		X	X
Materials Testing & Consulting	P.O. Box 309, 1729 Britt	Mount Vernon	WA	98273	Lawrence Henderson	(206) 424-7560	X	X	X	X			
McLaren Environmental Engineering	11101 White Rock Road	Rancho Cordova	CA	95670	Shakoora Azimi	(916) 638-3696	X	X	X	X			
METRO Environmental Labs	322 W Ewing	Seattle	WA	98119	Lyn Faas	(206) 684-2301	X	X	X	X		X	X
Montgomery Labs	555 East Walnut Street	Pasadena	CA	91109	Edythe Irwin	(818) 568-6500	X	X	X	X	X		
Mount Vernon Wastewater Tmnt Plant	1401 Britt Rd	Mount Vernon	WA	98273	Bill Fullner	(206) 336-6219	X					X	
North Creek Analytical	18939 120th Ave WE, Suite 101	Bothell	WA	98011	Scot Cocanour	(206) 481-9200	X	X	X	X		X	
Northwestern Aquatic Sciences	PO Box 1437	Newport	OR	97365	Richard Caldwell	(503) 265-7225							X
Ogden Environmental & Energy Svcs	5510 Morehouse Dr	San Diego	CA	92121	Barry Snyder	(619) 458-9044							X
OMI (Gresham)	20015 NE Sandy Blvd	Portland	OR	97230	Shawn Cassidy	(503) 661-4997	X						
Pace, Incorporated	11 Digital Drive	Novato	CA	94949	Mark Valentini	(415) 883-6100	X	X	X	X			
Pacific Environmental Lab	9405 SW Nimbus Ave.	Beaverton	OR	97005	Howard Boorse	(503) 644-0660	X	X	X	X			
Pacific Environmental Laboratory	674 Harrison St	San Francisco	CA	94107	Valerie Gray	(415) 243-2582	X	X	X	X			X
Pacific NW Environmental Lab	6645 185th NE, Suite 100	Redmond	WA	98052	Karen Kotz	(206) 885-0083	X	X	X	X			X
Perametrix Bioassay Laboratory	13020 Northup Way	Bellevue	WA	98005	Tim Thompson	(206) 455-2550							X
Pendleton Woolen Mills	PO Box 145, #2 17th St	Washougal	WA	98671	James Nail	(206) 835-2131	X						
Ponderay Newsprint Company	P.O. Box 130	Usk	WA	99180	Lori Blau	(509) 445-2162	X						
Port Angeles Water Treatment Plant	PO Box 1150, 321 E Fifth	Port Angeles	WA	98362	Terry Siebens	(206) 457-0411	X						X
PSI - Hall-Kimbrell	4820 West 15th Street	Lawrence	KS	66049	Cindy Wilbur	(913) 865-9437		X	X	X			
Pullman Wastewater Tmnt Plant	PO Box 249	Pullman	WA	99163	Pat Wiltzius	(509) 334-4555	X						X
Rittenhouse-Zeman & Associates	7409 SW Tech Ctr Dr., STE 135	Portland	OR	97223	Margherita Smith	(503) 639-3400	X		X				
SCS Analytical Labs	2860 Walnut Avenue	Long Beach	CA	90806	Lam Ho	(310) 595-9324	X	X	X	X			
Selah Wastewater Treatment Plant	115 W Naches Ave	Selah	WA	98942	Joe Ford	(509) 697-4201	X						X
Sequim Wastewater Treatment Plant	P.O. Box 2108	Sequim	WA	98382	Wayne Balholm	(206) 683-3883	X						X
Shell Oil Co (Anacortes)	PO Box 700	Anacortes	WA	98221	E.J. Ledet	(206) 293-9143	X	X					X
Silver Valley Laboratories, Inc.	PO Box 929 1 Government Gulch	Kellogg	ID	83837	Kevin Booth	(208) 784-1258	X	X					
Sound Analytical Services	4813 Pacific Highway E	Tacoma	WA	98424	Chris Shaeffer	(206) 922-2310	X	X	X	X			
Spectra Labs, Inc	2221 Ross Way	Tacoma	WA	98421	Mike Minner	(206) 272-4850	X	X		X			
Spokane Industrial Water Treatment Plant	N 3808 Sullivan Rd	Spokane	WA	99216	Scott Brown	(509) 924-1720	X						
Sunnyside Wastewater Treatment Plant	818 E. Edison Ave	Sunnyside	WA	98944	Leonard Johnson	(509) 837-5206	X						X
Texaco, Inc	P0 Box 622	Anacortes	WA	98221	Roland Garbs	(206) 293-0884	X	X					X
Triangle Labs	801-10 Capitola Drive	Durham	NC	27713	Albert Winston	(919) 544-5729				X			
USPCI Analytical Services	4322 S 49th West Ave	Tulsa	OK	74107	Beth Walker	(918) 446-1162	X	X	X	X			
Vanalco, Inc.	P0 Box 9805	Vancouver	WA	98666	Dick Newell	(206) 696-8622	X	X					X
Vancouver Westside Water Tmnt	1800 Kotobuki Way	Vancouver	WA	98660	Richard Vaughn	(206) 696-0959	X	X					X

Activity	Address	City	St	Zip	Contact	Telephone	CI	CII	OI	OII	R	M	B
Plant													
Walla Walla Water Treatment Plant	Rte 5, Box 79, 571 Hatch St	Walla Walla	WA	99362	Jerry Yokel	(509) 527-4509	X						X
Water Management Laboratories, Inc	1515 80th St E	Tacoma	WA	98404	Chris Mueller	(206) 531-3121	X	X					X
Weston Analytics	208 Welsh Pool Rd Pickering Ind'l Pk	Exton	PA	19341	Dianne Therry	(215) 524-7360	X	X	X	X			
Weston Western Anal'l Division	212 Frank West Circle	Stockton	CA	95206	Bosco Ramirez	(209) 957-3405	X		X				
Weston-Gulf Coast Labs, Inc.	2417 Bond Street	University Park	IL	60466	Donna McCarthy	(708) 534-5200	X	X	X	X			
Weyerhaeuser Anal'l & Testing Svcs	WTC 2F25	Tacoma	WA	98477	Kari Doxsee	(206) 924-6148	X	X	X	X			X
Weyerhaeuser Co (Longview)	PO Box 188 3401 Industrial Way	Longview	WA	96632	Carla Yetter	(206) 425-2150	X						
WMI Environmental Monitoring Labs	2100 Cleanwater Drive	Geneva	IL	60134	Paul Duffy	(708) 208-3115	X	X	X	X			
WPPSS Environmental Sciences	PO Box 968 (Mail Drop 280)	Richland	WA	99352	Terry Northstrom	(509) 377-8462	X	X					X
Yakima Wastewater Treatment Plant	2220 East Viola St	Yakima	WA	98902	Scott Stockton	(509) 575-6077	X	X	X			X	X

CI = Chemistry I - Genera
CII = Chemistry II - Trace Metals
OI = Organics - GC, HPLC
OII = Organics - GC-MS
R = Radiological
M = Microbiological
B = Bioassay

CHAPTER 3

APPENDIX C

MODEL EPA INSPECTION REPORT

MODEL EPA INSPECTION REPORT

I. Introduction

A. General Information

1. Purpose of inspection (i.e., complaint, routine, etc.)

2. State facts of inspection (i.e., date, time, location, name of agent-in-charge, etc.)

3. Participants in the inspection

B. Facility Background

1. List the type of operations performed at the facility

2. List names and titles of facility officials interviewed, as well as names and titles of officials responsible for day-to-day operations

3. Other facility information such as ownership status (non-profit, corporation, etc.), size of the organization, and related firms to subsidiaries

C. Summary of Findings

1. Give a brief summary of inspection findings

II. Inspection Activities

A. Entry/Opening Conference

1. Describe the procedures used for arrival and entry into the facility; include any problems or special circumstances (i.e. entry with a warrant)

2. Summarize the topics discussed during the opening conference

B. Records

1. List of the type of records reviewed, noting the reasons for their review, and referencing documents that were borrowed or copied

2. Note, if any, inadequacies in record keeping procedures

C. Evidence Collection

1. Note and reference any statements taken during the inspection
2. Describe and reference photographs
3. Reference any drawings, maps, charts, or other documents made or taken during the inspection
4. Describe any observations which help to establish violations

D. Physical Samples

1. Describe the purpose for taking samples
2. Describe the exact location from which they were obtained
3. Describe sampling techniques used
4. Describe the physical aspects of the sample (i.e., color, texture, viscosity, etc.)
5. Describe chain-of-custody procedures
6. Summarize lab results. Include actual data in the appendix.

E. Closing Conference

1. Note and reference receipts for samples and documents given to facility officials
2. Note any recommendations, referrals, etc. made to facility officials

III. Attachments

A. List of Attachments

1. Prepare a list of all documents, analytical results, photographs, and other supporting information.

B. Documents

1. Attach copies of all documents and other evidence collected during the inspection, including analytical results.
2. In cases where documentary evidence cannot be included, it may be possible to substitute descriptive information.
3. Attach copies of any checklists used during the inspection.

CHAPTER 4. SAMPLING

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CHAPTER 4. SAMPLING

The quality of an inspection hinges on the ability of an inspector to collect accurate, representative data. Sampling is a complex process involving planning, preparation, and site investigation. As inspectors collect samples, they must also take into account sample-specific requirements based on biological and chemical properties as well as procedural requirements. The inspector should be familiar with techniques necessary for accurate sampling of wastewaters. The Environmental Investigations and Laboratory Services (EILS) Program is your resource for a variety of services concerning environmental data, analysis, and sampling.

This chapter outlines major considerations for taking samples and makes several references to materials located in the Appendices at the end of this chapter. In large part, the material in this chapter was excerpted from the 1991-92 Enforcement Training Modules and the *Lab User's Manual*. Inspectors are encouraged to consult these documents as well as *Standard Methods for the Examination of Water and Wastewater and EPA's Handbook for Sampling and Sample Preservation of Water and Wastewater* (EPA-600/4-82-029) for additional information. Also referenced is the *Guidelines and Specifications for Preparing Quality Assurance Project Plans,* (Ecology Document No. 91-16). All inspectors should read this document and have access to a reference copy.

Planning the Sampling Project

Good planning assures that samples will be taken at the proper time and place with the proper procedures. Planning provides a framework for addressing the problem, gathering information, and establishing strategies, objectives, and a goal (Figure 4-1). Chapter 4, Appendix A contains guidance from the EILS program for designing a Class 2 inspection. After reviewing the background information on the facility and identifying the problem(s), you are ready to begin the planning process. Presampling activities can be broken down into 1) Developing the Overall Plan and 2) Preinspection Preparation.

Developing the Overall Plan

Determine the Type of Survey--Are you assessing point source impacts, nonpoint sources, or both? What type of work is it (permit compliance, mixing zone evaluation, total maximum daily load analysis, agriculture, urban runoff, etc …)?

Sampling Locations--Define the physical boundaries of your study area. The upstream limit or reference station should have homogeneous water quality and be above the influence of any target discharges. The downstream limit is where your measurements end.

PROBLEM: Several letters from concerned landowners and citizens are received by your office complaining about poor water quality and unpleasant smells in a small stream in your area. In reviewing the letters, you determine that a large dairy farm several miles upstream may be causing the problem. You call several contacts in the area and discover that the dairy farmer uses the stream as a watering hole and often sprays manure in fields adjacent to the stream. You postulate that the dairy farm is causing a nonpoint water quality problem.

GATHERING INFORMATION: Next you talk to several co-workers and one remembers a water quality assessment done on the stream about 10 years ago. You look through the office files and find a study done by EILS. The report identified that nonpoint source pollution was the major problem in the drainage and recommended follow-up work. Bacteria levels in the stream were highest in the vicinity of the dairy farm. In the files, you also find documentation of numerous complaints over the years about dairy wastes entering the stream. You decide to follow-up on the complaints and historical data by doing some additional sampling.

GOAL: Determine if the dairy farm is degrading water quality in the stream.

OBJECTIVES: 1) monitor fecal coliform loads at stations which bracket the suspected problem area; 2) do a streamside walk to evaluate any potential sources entering the stream; and 3) assess impacts by comparing upstream and downstream data.

STRATEGIES: Measure fecal coliform levels and stream discharge during a critical loading period. Sites should bracket the dairy farm with additional samples to be collected at any other potential loading sources.

Figure 4-1.
An example of proper planning.

Sampling sites should be placed at all loading sources within the study area.

Sampling stations should be located where complete mixing has occurred, unless you are specifically evaluating a mixing zone. In most cases, maps or a reconnaissance visit can help you determine how many samples will be needed to characterize a problem. Preliminary sampling of conductivity or temperature across a waterbody can help characterize mixing characteristics. The cross-channel transect may suggest that mixing is not complete and that your station should be moved further downstream. A mixing-zone model like RIVPLUME can also be used to predict when mixing is complete.

Consider Survey Timing--The timing of sample collection should be scheduled to best characterize the water quality problem. For example, water quality impacts from a municipal point source are often most severe while the receiving water flow is low. An industrial point source may have a greater impact on receiving waters at another time of the year (e.g., food processors discharge most at harvest time). In the case of a major industrial contributing to a Wastewater Treatment Plant (WWTP), sampling should occur during the time of high production. If rainfall causes a significant increase in flow, sampling should occur during a storm event--particularly if WWTP efficiency is an objective. Nonpoint source impacts are generally more sporadic, and often are related to wet weather, storm events, or certain land-use activities (e.g., irrigation, fertilizing, construction, etc…). Storm event surveys may present special difficulties such as limited access on weekends or holidays and unpredictable weather patterns. However, optimal survey timing may be roughly estimated by looking at historical streamflow data, climatological records, discharge monitoring reports, and so on.

Select Parameters--This is very much study-specific. Make sure you understand potential transport mechanisms. For example, you may need to sample suspended solids and organic carbon to accurately estimate the fate of some toxicants. You should also be aware of ancillary parameters which are necessary to evaluate a contaminant of interest against a criterion or standard. For example, most metals require hardness values to evaluate toxicity, ammonia criteria are based on ambient temperature and pH values; and temperature is required to calculate the percent saturation of dissolved oxygen in a waterbody.

The Compliance Monitoring Section (CMS) does Class 2 inspections continuously and has developed a number of shortcuts for making the routine work more efficient. One of these is a complete list of all parameters specified in 40 CFR 136 ANALYTICAL PROCEDURES, a description of the analytical method, the 40 CFR and Standard Method (SM) number and the "lower reporting limit" (lrl) achievable with that method. Lrl is defined as the level below which the result is reported as "not detected." This list is included as Chapter 4, Appendix B. The CMS also has a spreadsheet that can quickly produce a matrix table listing all parameters and sampling stations. It will also calculate the total lab cost and show proposed sample splits between inspector and permittee. An example of this table is included as Chapter 4, Appendix C, and is available upon request.

Define the Confidence Limits of the Survey--Will a field study based on a few samples meet your objectives and be defensible? Are you interested in statistical analyses? Statistical methods and formulas are available to estimate in advance the appropriate number of samples. These

formulas take into account sample variance and the degree of accuracy desired to derive a statistically valid sample size. Basically, the smaller the sample variance, the fewer samples are required for a given level of accuracy. What level of confidence in the data and your interpretation of the conditions will be gained from adding stations, samples, or getting better laboratory detection limits?

Which element of your analysis has the greatest degree of error? Does the level of precision you want for other elements make sense relative to this margin of error? For example, it doesn't make sense to measure discharge by timing an orange floating downstream, and then ask for very low parameter detection limits from the lab in order to calculate loads.

Measurement/Analytical Procedures--Define all analytical procedures to be performed. This includes field measurements and the procedures performed in the laboratory. These, too, relate to the project objectives. The plan should state that the method will measure a particular parameter in a particular matrix of interest over a specified range of values to achieve one or more of the project objectives. The project plan should also reference published methods or standard operating procedures or describe the measurement or analytical procedures in detail. After choosing which procedures you will need, you should submit both your *Sample Container Request* form and your *Presampling Notification* form (refer to the "Coordinate with the Laboratory" section below) to the Lab.

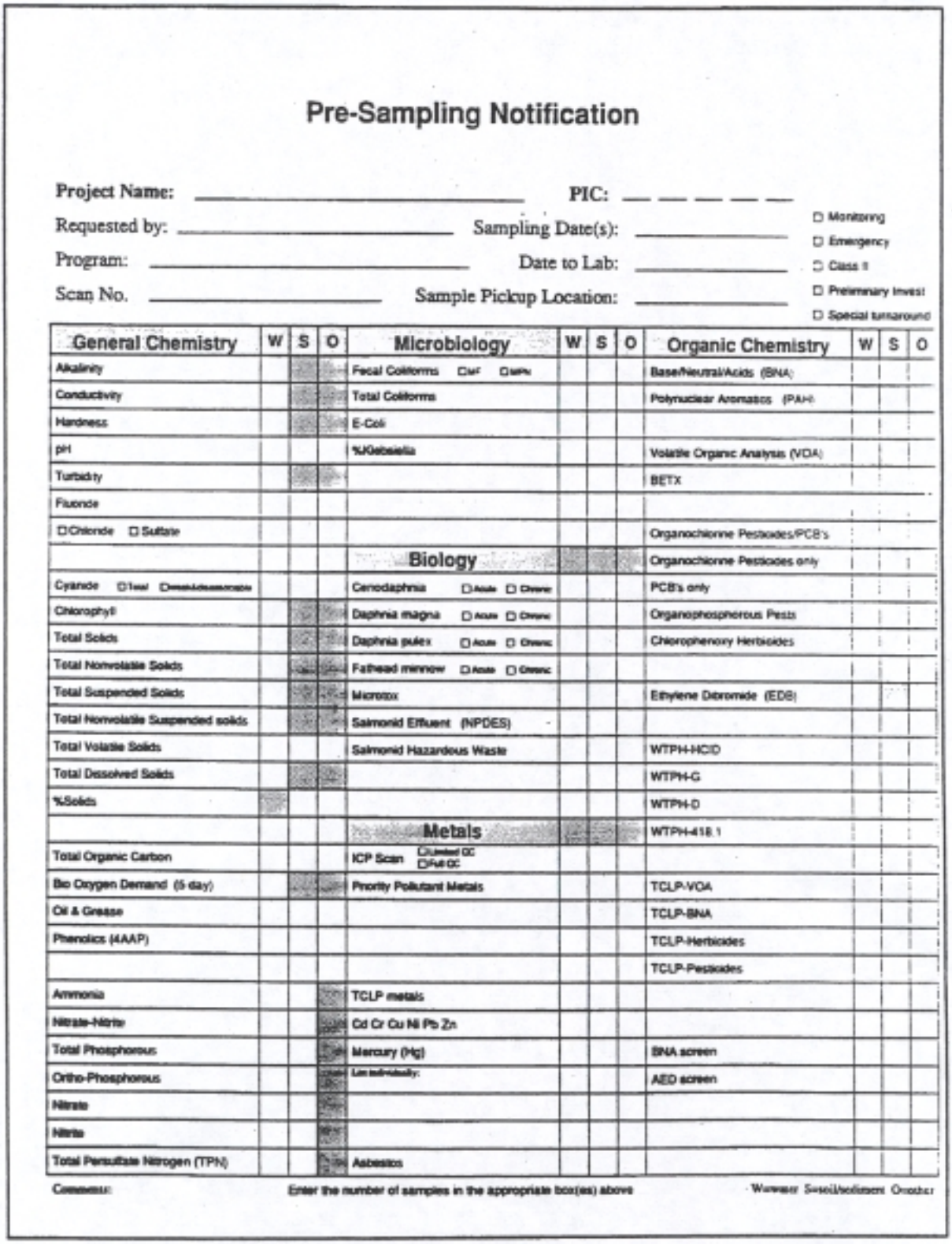
Develop the QA/OC Plan--All field investigations should include a field QA/QC plan. Refer to the Quality Control Procedures section later in this chapter for more information.

Review Sampling Procedures--It is necessary to review sampling procedures and to plan for all samples that are intended to be collected. This includes the collection, preservation, storage and transportation of the samples. The sampling procedures should relate directly to the project objectives. Thus, the plan should state that the sample win be collected in a particular way and at a particular time and place to achieve one or more of the project objectives. The project plan should reference published methods or standard operating procedures or describe the sampling procedures in detail. You should submit a *Sample Container Request* form at this time (procedures for choosing containers are discussed later in this chapter).

Coordinate with the Laboratory--You will also need to submit a *Presampling Notification* form (Figure 4-2) and a *Sample Data & Analysis Required* (Figure 4-3) form to the lab. You should feel confident with your parameter selection and the levels of detection you are requesting. For example, will the detection limit for your metals analysis allow you to evaluate compliance with water quality standards.

> *Presampling Notification* form--The *Presampling Notification* form provides the Lab with advance information about planned sampling events. In cases where the sample load is beyond laboratory capacity, advance notice allows the laboratory staff to solicit bids and prearrange for analyses at contract laboratories. Chapter 4, Appendix D contains detailed procedures for preparing this form.

Figure 4-2
Presampling notification form



Pre-Sampling Notification

Project Name: _____ **PIC:** _ _ _ _ _ _

Requested by: _____ Sampling Date(s): _____

Program: _____ Date to Lab: _____

Scan No. _____ Sample Pickup Location: _____

☐ Monitoring
☐ Emergency
☐ Class II
☐ Preliminary Invest
☐ Special turnaround

General Chemistry	W	S	O	Microbiology	W	S	O	Organic Chemistry	W	S	O
Alkalinity				Fecal Coliforms ☐MF ☐MPN				Base/Neutral/Acids (BNA)			
Conductivity				Total Coliforms				Polynuclear Aromatics (PAH)			
Hardness				E-Coli							
pH				%Gebesella				Volatile Organic Analysis (VOA)			
Turbidity								BETX			
Fluoride											
☐Chloride ☐Sulfate								Organochlorine Pesticides/PCB's			
				Biology				Organochlorine Pesticides only			
Cyanide ☐Total ☐				Cerodaphnia ☐Acute ☐Chronic				PCB's only			
Chlorophyll				Daphnia magna ☐Acute ☐Chronic				Organophosphorous Pests			
Total Solids				Daphnia pulex ☐Acute ☐Chronic				Chlorophenoxy Herbicides			
Total Nonvolatile Solids				Fathead minnow ☐Acute ☐Chronic							
Total Suspended Solids				Microtox				Ethylene Dibromide (EDB)			
Total Nonvolatile Suspended solids				Salmonid Effluent (NPDES)							
Total Volatile Solids				Salmonid Hazardous Waste				WTPH-HCID			
Total Dissolved Solids								WTPH-G			
%Solids								WTPH-D			
				Metals				WTPH-418.1			
Total Organic Carbon				ICP Scan ☐Limited QC ☐Full QC							
Bio Oxygen Demand (5 day)				Priority Pollutant Metals				TCLP-VOA			
Oil & Grease								TCLP-BNA			
Phenolics (4AAP)								TCLP-Herbicides			
								TCLP-Pesticides			
Ammonia				TCLP metals							
Nitrate-Nitrite				Cd Cr Cu Ni Pb Zn							
Total Phosphorous				Mercury (Hg)				BNA screen			
Ortho-Phosphorous				Lab individually:				AED screen			
Nitrate											
Nitrite											
Total Persulfate Nitrogen (TPN)				Asbestos							

Comments: Enter the number of samples in the appropriate box(es) above Wastewater Sweil/Sediment Other

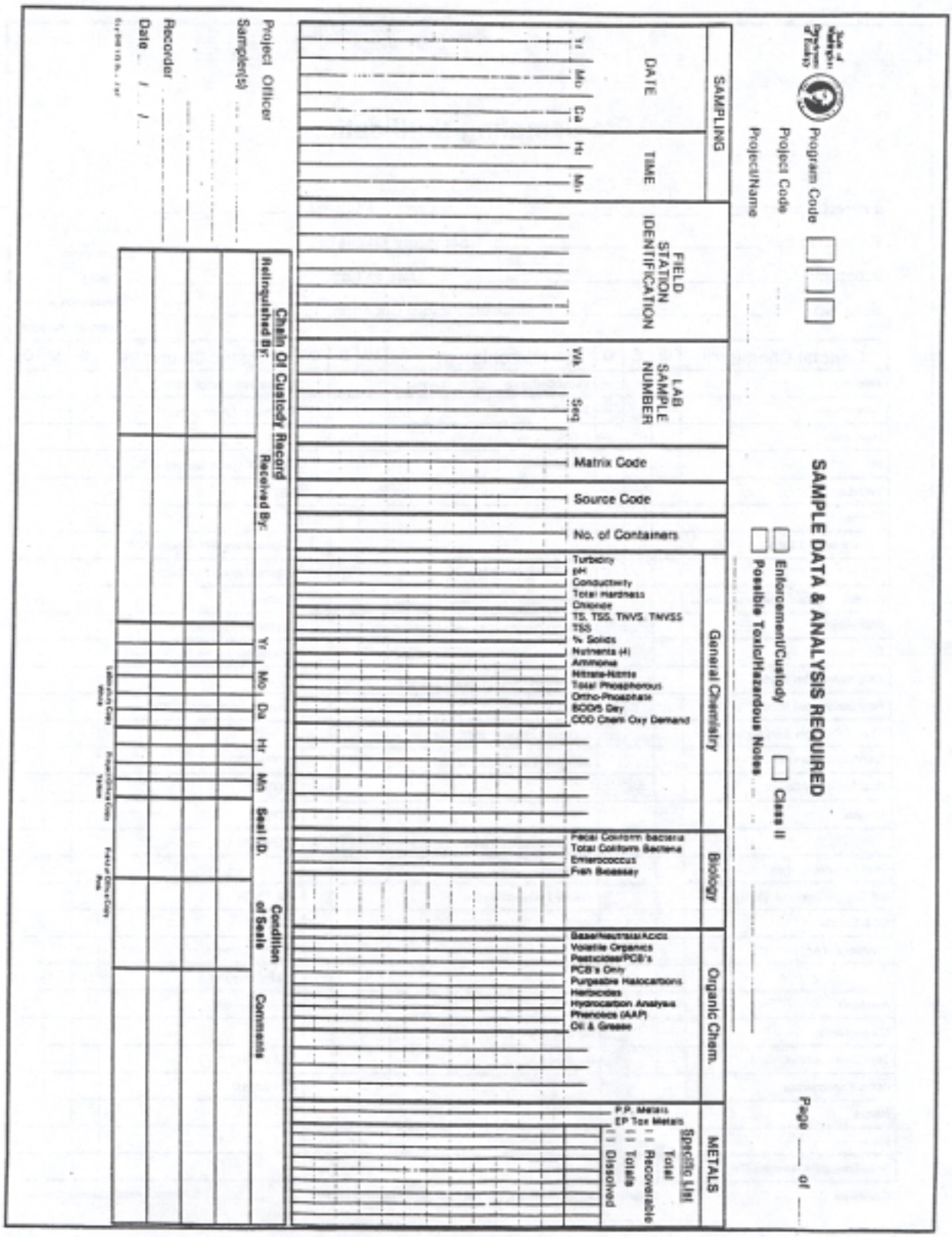


Figure 4-3
Sample Data & Analysis Required form.

Sample Data & Analysis Required form--The Sample Data & Analysis Required form is the formal and legal request of the sampler for specific analytical work. This form should accompany all samples entering the laboratory. Its purpose is to document the sampling event and the analyses requested for the sampler, the laboratory, and the agency's data records. Chapter 4, Appendix D contains detailed procedures for preparing this form.

Preinspection Preparations

Anything that can be done to plan ahead should be done. Once in the field, your options to obtain bottles and replacement parts, or time to establish survey stations, become limited.

Make a Checklist--Make up a detailed list for your sampling survey and mark off equipment as you load your vehicle. The checklist may include: instruments (pH meter, conductivity meter, thermometer, current meter, etc.); number and type of sample containers (30 fecal coliform, 5 BOD, 5 total suspended solids, etc.); boating gear (fuel, off, life vests, depth sounder, etc.); clothing (boots, raingear, sunglasses, full change of clothes, etc.); and other miscellaneous gear (flashlight, rope, sample tags, ice chest, etc.).

Familiarize Yourself with Equipment--Make sure the instruments you will be using work well and are available during your field investigation. Know how to calibrate and troubleshoot. Have sufficient calibration standards and cleaning solutions. If available, bring along backup meters.

Review Chain-of-Custody Procedures--There are specific and detailed chain-of-custody requirements that must be followed. Refer to the Chapter 4, Appendix F, Chain of Custody.

Schedule Sample Transport--Determine the means of sample transport to the lab (bus, plane, UPS, etc.). Obtain departure and arrival schedules, decide on the mode of transport, let the lab know where to pick up the samples. Make sure that the samples will arrive at the lab before holding times expire. Your sampling schedule is often dictated by the sample transport schedule. Chapter 4, Appendix G contains detailed information on how to mail samples to the Manchester lab from all areas of the state.

Confirm Field Contacts--If possible, double-check with field contacts on meeting places and schedules several days prior to the survey. Review your survey plans and schedule people to assist you, if needed.

Prepare Sample Labels--Prepare sample labels and lab submittal forms as much as possible prior to the survey. Use nonrunning ink and water-resistant paper.

Clean Field Equipment--The level of cleaning will be dependent on the type of analysis you are doing. The following are three different levels of decontamination procedures.

Nutrients and Metals	Organics	Metals and Organics
A) Soap & water wash	A) Soap & water wash	A) Soap & water wash
B) Hot water rinse	B) Hot water rinse	B) Hot water rinse
C) 10% nitric acid	C) Deionized rinse (3X)	C) 10% nitric acid
D) Deionized water rinse (3X)	D) Acetone rinse	D) Deionized rinse (3X)
E) Air dry	E) Air dry	E) Acetone rinse
F) Foil wrap	F) Additional solvent rinse (if different from D)	F Air dry
	G) Air dry	G) Additional solvent rinse (if different from E)
	H) Deionized rinse (3X)	H) Air dry
	I) Air dry	I) Deionized rinse (3X)
	J) Foil wrap	J) Air dry
		K) Foil wrap

Failure to properly clean equipment between stations can result in cross-contamination of samples and subsequent loss of valid data. Several alternatives exist such as: clean the equipment before going into the field and use dedicated equipment at each specific sample location; decontaminate equipment in the field; or use disposable equipment. Decontamination may introduce some quality control problems based on the type agents used. The most common problems include solvent carry-over and inadequate removal of previous sample media, especially viscous oil, tars, and wood preservatives. The best procedure to assure adequate quality control is scrupulous cleaning with soap and water and/or decon solutions using heavy-duty brushes. A good quality control check on field decontamination procedures is the preparation of a rinsate (equipment) blank.

Perform Reconnaissance Survey--A recon can be very helpful for gathering first-hand site information like site accessibility, or getting permission to access private property. Talking with wastewater treatment plant operators or farmers about routines and cycles can help establish your sampling schedule.

Conducting the Field Investigation

Following are a few points to consider when sampling in the field.

Keep a Sense of Order--Sample upstream to downstream (or reverse) to best meet project objectives. The upstream to downstream order can sometimes create contamination problems downstream after upstream sites are sampled. However, the reverse order does not allow plug-flow sampling of a specific block of water. Estuarine or tidal river areas can also influence sampling station order depending on tide cycles.

Instrument Calibration--Try to calibrate instruments immediately before using. Keep a detailed calibration log, including field checks and calibrations. A postcalibration at the end of the day is a good quality control check. Protect field meters against excessive exposure to water, shock, heat, or cold.

Field Splits--A sample that is divided into equal portions and analyzed separately. Splits are often sent to different laboratories to compare results. Obtaining accurate splits must be done with great care to ensure samples of equal comparison.

Communications with Manchester--Contact the lab and let them know your samples are being delivered. See the "Communications with the Lab" section of this chapter for a detailed discussion of information which should be relayed to them during a sampling project.

Flexibility in the Field--Watch and be prepared for unexpected sources of contamination, and be flexible enough to deal with them. If you feel unsure about the performance of a field meter such as pH or conductivity, send some samples to the lab for a check.

Sample Collection

Sample collection is an important part of the self-monitoring program. Without proper sample collection procedures, the results of such monitoring programs are neither useful nor valid, even with the most precise and accurate analytical measurements.

Samples should be collected at the location specified in the permit. In some instances the location in use may not be adequate for the collection of a representative sample. The inspector should determine the most representative sampling location possible.

The objective of sampling as stated in Standard Methods for 7he Examination of Water and Wastewater (1989) (Standard Methods) is;

> "to collect a portion of material small enough in volume to be transported conveniently and handled in the laboratory while still accurately representing the material being sampled. This objective implies that the relative proportions or concentrations of all pertinent components will be the same in the samples as in the material being sampled, and that the sample will be handled in such a way that no significant changes in composition occur before the tests are made."

Detailed sampling information may be found in the literature within the description of specific methods. Table 4-1 lists some general considerations from Standard Methods. Additional considerations for sampling conducted at municipal and industrial facilities are shown in Table 4-2.

Sample Types

There are two basic types of samples: Grab Samples and Composite Samples. Grabs are necessary for Volatile Organic Compounds (VOCs), fecal coliform, cyanide, and oil & grease. Grabs are appropriate when flows are highly variable, and also for quality assurance. Grab-composites are necessary for fish bioassays because of the large volume of sample needed.

Table 4-1. General considerations for taking environmental or wastestream samples.

- The analyses of pH, chlorine, temperature, ammonia, dissolved gases, and soluble sulfide should be done on site at the time of inspection.
- Be careful not to contaminate the sample container, including the lid. Some sample bottles will contain a preservative; be careful not to spill it out when filling.
- Immediately label and store samples on ice.
- Rinse each sample bottle two or three times with the water being collected unless the bottle contains a preservative or dechlorinating agent.
- Generally, collect samples upstream from where you are standing, beneath the surface; in quiescent areas, take care to avoid collecting surface scum and do not disturb sediments.
- When collecting river or stream samples, observed results may vary with depth, stream flow, and distance from shore and from one shore to the other. If equipment is available, take an "integrated" sample from top to bottom in the middle of the stream, or from side to side at mid-depth, in such a way that the sample is integrated according to flow. If only a grab sample can be collected, take it in the middle of the stream and at mid-depth.
- Before collecting samples from distribution systems, flush lines sufficiently to insure that the sample is representative of the supply, taking into account the diameter and length of the pipe to be flushed and the velocity of flow.
- The proper fullness of sample containers varies, depending on the analysis to be performed and mode of transport to the lab. Fill container full for most organics determinations and leave space for microbiological samples (for aeration and mixing etc. Oil and grease sample bottles should be filled 3/4 full to minimize sample loss at the lab. For samples that will be shipped, try to leave an air space of about 1% of container capacity to allow for thermal expansion.
- The number of samples taken depends on the inspection objective, type of site inspected and information desired. Refer to *Standard Methods for the Examination of Water and Wastewater* (1989) and *EPA's Handbook for Sampling and Sample Preservation of Water and Wastewater* (EPA-600/4-82-029).
- Special precautions are necessary for samples containing organic compounds and trace metals. Because many constituents may be present at concentrations of micrograms per liter, they may be totally or partially lost if proper sampling and preservation procedures are not followed.

Table 4-2. Considerations for taking environmental or wastestream samples at municipal facilities.

Influent samples should be taken:

- downstream of the last sidestream entering the treatment plant;
- upstream of return flows, (e.g., return activated sludge, various super- & subnatants);
- downstream of the bar screens and grit chamber;
- away from depositional areas (eddies) of the flow regime;
- in areas that are not downstream of the last pump station if the pump delivers intermittent surges of influent. In these situations, the sampling station should be in the wet well of that pump station;
- by a 24-hour automatic composite sampler. A strainer must be attached to the end of the sampling tube to prevent clogging. It must be totally submerged at all times--if the compositor sucks air, the proper amount of sample won't be collected. Swirl the sample bottle repeatedly when pouring sample into the individual containers.

Effluent samples should be taken:

- where flow can also be measured. However, close proximity to weirs may not be ideal because the effluent is not well mixed upstream and oil & grease tend to accumulate downstream;
- postchlorination. The Lab routinely seeds all BOD_5, samples, which eliminates the need to add sodium thiosulfate in the field to neutralize the affect of the chlorine;
- using grab-composite samples if they are for bioassays. The three grabs should be collected during flows containing the maximum concentration of pollutants toxic to the test organism.

Sludge samples should be taken:

- as a manual composite sample using priority-pollutant-cleaned stainless steel utensils;
- to be reflective of the point of final disposal;
- at measuring weirs or other areas of good agitation where the sludge is well mixed;
- at various depths and locations in digesters. If drawn from a tap(s) the flow should be greater than 2 ft/sec; let the tap flow for a while before sampling;
- using manual sampling techniques in most situations;

Sampling to determine permit compliance must be the same type as that required in the permit. If the permit requires a composite sample and a grab sample is collected, the grab sample results are arguably *not* useful for determining permit compliance.

Grab Samples--When a source is known to be fairly constant in composition over period of time or space, then the sample may be said to represent a longer time period or larger volume, or both, than the specific point at which it was collected. In such circumstances, some sources may be represented quite well by single grab samples. Examples are some water supplies, some surface waters, and rarely, some wastewater streams. When a source is known to vary with time, grab samples collected at suitable intervals and analyzed separately can document the extent, frequency, and duration of these variations.

Composite Samples--A composite sample is a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples.

Generally, a composite sample may be a "time-composite" or a "flow-proportional" sample. A time-composite sample is composed of discrete sample aliquots collected in a container at constant time intervals providing representative samples irrespective of stream flow. A flow-proportional sample is collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased, while maintaining a constant time interval between the aliquots.

Composite samples are most useful for observing average concentrations that will be used, for example, in calculating the loading or the efficiency of a wastewater treatment plant. As an alternative to the separate analysis of a large number of samples, followed by computation of average and total results, composite samples represent a substantial saving in laboratory effort and expense. Composite samples should be taken by the flow-proportional approach if wastewater flows are highly variable and/or total loading to a water-quality-limited segment is of concern.

Communications with the Lab

The Manchester Laboratory's (the Lab) sample receiving staff are trained to ensure that you receive all of the information required to successfully complete your sample analysis. Table 4-3 lists some of the primary functions and contacts in the Lab.

Contact the Lab whenever you need help. As a few examples, you will want to call the lab if you:

- Want information about methods, analyses or detection limits
- Are planning a sample event
- Have just collected samples on an unplanned sampling event

Table 4-3. Environmental Investigations and Laboratory Services (EILS) Program Resources available to support water quality investigations.

Where to Phone/FAX: Phone: (206) 895-4737/38/39/40, the SCAN prefix is 744.

Where to mail samples: Department of Ecology
Manchester Laboratory
7411 Beach Drive East
Port Orchard WA 98366

Services provided:
- laboratory analyses
- waterbody-specific environmental data
- special environmental studies (as resource allow)
- laboratory audits

Specific Contacts:

Subject	Name
Request for Analysis – Scheduling Analysis Time	Pam Covey Stuart Magoon
Sample Tracking	Eugenia Wilson Pam Covey
Sample Containers—Courier Service	Kitty Bickle Will White
General Chemistry	Despina Strong
Metals	Despina Strong
Organics	Dick Huntamer Bob Carrell
Bioassays	Margaret Stinson
Microbiology	Nancy Jensen
Asbestos	Susan Davis
Lab Users Manual	Analytical Management Unit

- Are requesting courier services
- Want to make sure that your samples have arrived safely at the lab
- Need to learn the status of your samples in the laboratory
- Need to alert us of a change in project requirements
- Require a duplicate copy of a report
- Have questions about cost accounting for your project
- Require information about past projects or copies of archived data.

The Lab will usually be in contact with you in the event that they have questions concerning the timing or analyses of a project you are planning. The Lab will also call if further information is needed or if your samples do not arrive.

FAX (206-895-4357, SCAN prefix 744) the laboratory when necessary. The FAX machine is always on. As a few examples, you may want to FAX the lab if you:

- Require delivery of a list of sample containers on a rush basis
- Want to send a quick copy of a *Presampling Notification* form
- Want to inform them of an emergency sample set at any time
- Can't get through on their telephone lines

Quality Control Procedures

Quality Control is the application of statistical procedures to evaluate and control the accuracy of data. Accuracy includes precision, a measure of the effects of random error, and bias, a measure of the effects of systematic errors.

A field Quality Assurance/Quality Control (QA/QC) plan should be a part of all field investigations. Guidelines and Specifications for Preparing Quality Assurance Project Plans (Ecology Document No. 91-16) provides the project manager with a systematic format for planning any data-collection project. The guidelines describe 14 elements which should be considered before the first sample is collected or measurement is made. The manual will help you develop Data Quality Objectives (DQOs), which are qualitative or quantitative statements of the precision, bias, representativeness, completeness, and comparability necessary for the data to serve the objectives of the project. The number of QA/QC samples taken in the field is directly related to the level of confidence an investigator wants in her/his findings. There is no hard and fast rule to the number of QA/QC samples to be taken. A general "rule of thumb" is that about 10-20% of all samples should be dedicated to satisfying QA/QC requirements.

Quality control is also important for field instrumentation and measurements. For example, variability in stream discharge measurements can be assessed by taking two independent measurements, one after the other. Detailed calibration and maintenance records should kept for all field instruments. Often, instrument response win drift over the course of a day. To monitor drift, the instrument should be checked periodical1y against known standards.

Quality Control Samples

The two basic types of field quality control samples are Field Blanks and Replicates.

Field Blanks--Blanks are QC samples which do not contain the parameter of interest. Field blanks will detect bias due to contamination. They should be measured or analyzed like ordinary samples. The project manager is responsible for interpreting the results. Possible sources of contamination can be the following:

- Sample containers
- Sampling equipment
- Filtration equipment
- Surroundings
- Preservatives
- Transportation or storage practices
- Other samples

Field blanks should be used to detect specific problems or to meet legal or regulatory requirements. Three common types of field blanks are as follows:

> Transport blanks, which are carried to and from the field along with the sample containers. They will detect contamination in the sample containers or cross-contamination during shipment;
>
> Transfer blank, which are prepared in the field while splitting or transferring samples. They will detect contamination from the surroundings, contamination in the sample containers or cross-contamination during shipment; and,
>
> Sampling (Equipment, Rinsate) blanks, which are prepared by exposing distilled water to the containers and equipment used to collect the samples. They will detect contamination in the sampling equipment, contamination in the sample containers or cross-contamination during shipment.

Field blanks cost as much to analyze as samples and only provide an indication that the samples themselves may be contaminated. Field blank results should not be used to correct sample results. The project manager should plan carefully to avoid contamination and use the minimum number of field blanks necessary to provide confidence that the results are not biased.

Replicates--Replicates are QC samples which are identical to another sample. Replicate samples are collected at the same time and place and are preserved, stored and analyzed under identical conditions. They provide an estimate of the total variability (precision) in the results. Total precision includes variability due to:

- Sampling a nonhomogeneous matrix
- Differences in time and space among the replicate samples
- Transferring or splitting a nonhomogeneous sample
- Preservation, transportation and storage and,
- Measurement or analysis.

Because no two samples are truly identical, there will be some component of sampling variability in the total variability. This component can often be minimized by carefully following standard procedures for collection, preservation, and storage of the samples.

Sometimes samples are split into two or more aliquots in the field. If replicate split samples are sent to the same laboratory for analysis, the precision for those split samples may be different from the precision calculated from the laboratory replicates. This may be due to variability in the process of splitting the samples.

If split samples are subjected to different measurement or analytical methods or are sent to different laboratories in order to compare the results, a check standard whose concentration is unknown to the analyst should accompany the split samples. Then, if the results for the split samples do not agree, the results for the blind check standards will provide an indication of which method or laboratory has the problem.

Spiking samples in the field is not recommended because of the difficulty of handling a concentrated solution of a contaminant under field, conditions.

Parameter Selection

The five major categories of contamination that need to be assessed include 1) General and Physical Chemistry, 2) Metals, 3) Organics, 4) various Microbiological Parameters, and 5) Aquatic Toxicology. The following section provides some guidance on selecting methods for analyzing these parameters. You should refer to the Lab Users Manual and other references for more additional guidance. The proper selection of Parameters to be analyzed is affected by both site-specific factors and reporting requirements of various regulations.

General and Physical Chemistry

Many parameters must be measured in the laboratory whereas others must be measured in the field. This section expands on the material presented in Chapter 4, Appendix B. Five-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), and pH frequently appear as permit parameters in present day permits and are mentioned first.

Five-day Biochemical Oxygen Demand--BOD_5 is an empirical test in which standardized laboratory procedures are used to determine the relative oxygen requirements of wastewaters, effluents, and polluted waters. It measures the oxygen utilized during a specified incubation period for the biochemical degradation of organic material and, the oxygen used to oxidize inorganic material such as sulfides and ferrous iron. Ideally, this will take place in the wastewater treatment plant (WWTP) rather than in the receiving water. BOD_5 typically measures the carbonaceous demand, but may include nitrogenous demand when the WWTP is nitrifying. Nitrification takes place when long wastewater retention times allow the slower reacting nitrifying bacteria to exert an oxygen demand. This may result in a misleading BOD_5 number. So, when it is suspected that this condition exists, *Inhibited* BOD_5 can be requested. It is, also referred to as carbonaceous BOD_5 ($CB0D_5$). The analytical protocol used eliminates the effect of nitrifying bacteria.

Soluble BOD_5 is a measure of the BOD_5 in solution. The lab protocol calls for filtering the sample first and then running the regular BOD_5 protocol. The sampling procedures at WWTP's which employ rotating biological contractors (RBCs) and/or treat a large amount of wastewater from food processors often call for this parameter.

TS, TNVS, TSS, and TNVSS--TS (total solids), TNVS (total nonvolatile solids), TSS (total suspended solids), and TNVSS (total nonvolatile suspended solids) are referred to on the *Presampling Notification* form as Solids(4). A Class 2 sampling design should routinely call for Solids(4) from the composited sample. This will provide useful information on what's dissolved and what fraction of the wastewater is organics.

pH--pH is usually measured in the field because it has a very short (2 hour) holding time.

Conductivity--Conductivity is measured in the field whenever pH is measured and is also sampled and analyzed in the lab. Most WWTPs don't remove much conductivity throughout the process so, if there is a significant change between influent and effluent, then further investigation is warranted. It has also proven to be invaluable on those rare occasions when needed to establish that the sample collected in the field is indeed the sample analyzed at the lab.

Chemical Oxygen Demand--Chemical oxygen demand (COD) is a parameter which is closely related to BOD_5. The lab protocol calls for chemical, rather than biological, digestion. The COD number should always be higher than the comparable BOD_5 number. It is the better parameter to use if the influent has toxicity which may be killing the bacteria. However, the

Manchester Lab is strongly discouraging the use of the test because of the disposal problems associated with mercury called for in the protocol.

Nutrients--Nutrient information can be useful when revealing a shortage, as well as an excess, of nitrogen and phosphorus compounds. Nitrite and nitrate are nearly always reported as combined (NO_2+NO_3) and not measured separately due to the short holding time. Kjeldahl nitrogen is out of vogue and seldom used. Persulfate is a new alternative for measuring organic nitrogen. Ortho-phosphorus (free ions) is the more common parameter employed in WWTP analysis. Total P includes the bound-up forms and is the parameter of choice when comparing to receiving water limits (where a ratio of 10 parts nitrogen to 1 part phosphorus is considered healthy). Sometimes permits require a minimum amount of in-process phosphorus.

Alkalinity--Alkalinity is a useful parameter for confirming that nitrification is taking place in the treatment process. Seven parts of alkalinity are consumed for each part of ammonia.

Hardness--Hardness is essential when comparing some metals to the water quality criteria to establish toxicity.

Turbidity--Turbidity measures the amount of colloidal solids and is one of the criterion in the water quality standards. However, it is a parameter which must be used with caution. It is hard to tell from the results what amount of solids are present, e.g., floc/fluff in clarifier effluent may app ear turbid but have a TSS under 10 mg/L

Cyanide--Cyanide is a priority pollutant but analyzed at the Lab as part of General Chemistry. It has to be requested specifically. Two separate field tests have to be conducted to determine if sulfide and chlorine are causing interferences.

Metals

NPDES permits require the use of total recoverable methods (there is no EPA "total" metals methods). If the purpose of the sample is to measure compliance with effluent limits or receiving water criteria, request total recoverable metals.

Categorizing Metals by Regulatory Authority for Analysis

1. The ***Metals 6*** procedure includes tests for:

   Cadmium Chromium Copper Lead
   Nickel Zinc

These are the metals commonly found in *runoff from roads and parking lots*. They originate in vehicle exhaust and tires and from air particulates.

2. The 8 ***TCLP Metals*** (formerly EP Tox) include the following:

Arsenic	Barium	Cadmium	Chromium
Lead	Mercury	Selenium	Silver

These are required by the Resource Conservation and Recovery Act (RCRA) and the State Dangerous Waste Regulations (WAC 173-303 and amendments) for characterization of potentially hazardous wastes.

3. The 13 ***Priority Pollutant Metals*** include the Metals 6 and the following:

Antimony	Arsenic	Beryllium	Mercury
Selenium	Silver	Thallium	

These are regulated by the Clean Water Act through the NPDES permit program for municipal and industrial dischargers.

4. The 23 ***Target Analyte List*** metals include the Priority Pollutant metals and the following:

Aluminum	Barium	Calcium	Cobalt	Iron
Magnesium	Manganese	Potassium	Sodium	Vanadium

These are regulated by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) through the Superfund program for hazardous waste sites.

Which Type of Analysis Do I Request, Total Metals or Dissolved Metals? --You will generally use Total Metals for permit compliance unless specified otherwise in the permit.

TOTAL METALS ANALYSIS: When you request a Total Metals analysis, the samples will be digested in strong acid to dissolve any metals which may be in the particulate phase of the sample and to destroy any metal complexes. This digestion is much more severe than any process which might occur in the environment, *so Total Metals will include those which are not biologically available and are mobile only with the suspended solids.*

DISSOLVED METAIS ANALYSIS: When you request a Dissolved Metals analysis, the sample should be filtered in the field. *The analysis is performed on the filtrate and the results include only the soluble portion of the metals.*

Methods Used to Analyze Metals--If you need to analyze a single metal, then choose your analysis using the list of procedures.

Flame Atomic Absorption Spectrometry (AA), which provides low reporting limits for:

Potassium

Graphite Furnace Atomic Absorption Spectrometry (GFAA or Furnace AA), which provides low reporting limits for the following:

Antimony	Arsenic	Cadmium	Chromium
Lead	Nickel	Selenium	Silver
Thallium			

The atomic absorption methods analyze one metal at a time and are, therefore, more time consuming and expensive.

Inductively Coupled Plasma Atomic Emission Spectrometry (ICP), which provides low reporting limits for the following:

Aluminum	Barium	Boron	Iron
Magnesium	Manganese	Molybdenum	Silica
Strontium	Tin	Zinc	

Inductively Coupled Plasma Mass Spectrometry (ICP/MS), which will provide the lowest reporting limits and the widest concentration range for most of the metals.

The ICP methods provide simultaneous, multi-element analysis. The ICP scan with limited QC available at the Manchester Laboratory is an excellent, inexpensive screening method for most of the metals. The ICP/MS system should be on line later this year.

Organics

Methods--Methods for analyzing organics are chosen according to regulatory requirements.

The *500 Series* methods are required under the Safe Drinking Water Act for drinking water monitoring. The *600 Series* methods are required under the Clean Water Act for NPDES compliance monitoring. The *SW846* methods are required under RCRA for hazardous waste projects. The *CLP* methods are required *under* CERCLA for *Superfund projects* only.

What Kind of Analysis Should I Request?--The appropriate analysis is chosen based on your knowledge of the compounds present. If you are looking for a particular compound or class of compounds, you should contact the laboratory to determine which method to choose. If you do not know what compounds are present you should select *Gas Chromatography with Mass Spectrometry Detection* (GC/MS), which provides simultaneous identification and quantitation

of volatile (VOA) and base, neutral, and acid extractable (BNA) organic compounds. The detection limits for most compounds are higher than for other methods and GC/MS analysis is also more expensive. This is a good screening method, when you do not know which compounds may be in the samples.

Petroleum Products

Soil Samples--New procedures are being adopted for soils analysis. When you submit a soil sample to check for petroleum contamination, *request Method WTPH-HCID*, and give the lab all the information you can about the sample and what you are looking for.

The first step in this procedure can identify and roughly quantify the following categories of compounds:

Gasoline -	leaded, regular unleaded, premium unleaded
Diesel -	#2 diesel fuel, heating oil
Lubricating Oils -	automatic transmission fluid, power steering fluid, single & multi-grade motor oil
Kerosene -	jet fuel
Organic Solvents	
DOT 3 Hydraulic Brake Fluid	

Product sources may be able to be matched with samples of contamination if you provide source samples for *all* potential sources. Otherwise, a match with a particular source does not eliminate the possibility that another source would also match (i.e., this is not a unique "fingerprint" match procedure).

If you need more specific identification, the lab can then use additional procedures which may even distinguish among different tanks containing the same product (e.g., two tanks of regular unleaded gasoline at the same station).

Water Samples--Similar procedures are available for contaminated water. For now, request the Manchester Laboratory Hydrocarbon ID Method and give the lab all the information you can about the sample and what you are looking for.

Microbiological Parameters

Fecal coliforms are bacteria generally associated with fecal wastes from warm-blooded animals, including man. As such, they serve as an indicator of potential disease-causing organism. These samples have a relatively short holding time of 30 hours. They are always taken as postchlorination grabs and sent to the lab that day. A field measurement of chlorine residual is always taken at the same time, and serves as a useful, closely related parameter. Both "free" and "total" chlorine are measured. "Free" means unattached ions--which are much more toxic in the environment. "Total" means "free" plus other forms. It is the same as residual chlorine, which is the term commonly found in permits. The choice of fecal coliform analysis is dependent on the presence of chlorine, other toxic chemicals and marine water.

If your sample is free of chlorine and other chemicals toxic to microbiological "bugs" and is not marine water, then use the membrane filter (MF) method. This method (SM17 Method 9222D) is preferred for most effluents, surface waters and ground waters. This method often yields low and erratic results for chlorinated or toxic waste waters and marine waters.

If your sample contains chlorine, toxic wastes or marine waters, use the Most Probable Number (MPN) method (SM17 9221 C.1).

If you're unsure as to which method to use, request both methods and compare their results before deciding to use the MF method. Do not expect exact agreement between the two methods when they are applied to chlorinated or *toxic* effluents. Look for significantly and consistently lower results for the membrane filter method, indicating failure to recover some organisms. The membrane filter method is considerably less expensive than the MPN method.

Interpreting Test Results--Fecal coliforms generally decrease over time so, if the fecal coliform result is abnormally high, check for *Klebsiella*, which increase in the culture medium. *Klebsiella* thrives in the effluent from pulp and paper mills and sugar refineries. It may also show up in the effluent from waste treatment plants serving food processors.

There is no easy and reliable way to distinguish between human and animal sources of fecal coliform bacteria. To positively identify a specific source, conduct a sanitary survey.

Total Coliform counts are only used for drinking water and to screen materials for land disposal or underground injection.

There are no check standards available for the coliform tests.

Aquatic Toxicology

The Manchester Lab conducts a number of acute and chronic biomonitoring tests. Consult the Lab and the Lab User's Manual for more information.

Bibliography

Handbook for Monitoring Industrial Wastewaters, EPA, Technology Transfer, August, 1973

Choosing and Requesting Sample Containers

Sample Container Order and Delivery

A supply of precleaned sample containers for all types of samples taken by Ecology staff are kept in supply in the laboratory warehouse. Sample containers supplied by the laboratory meet the EPA specifications for contaminant-free sample containers.

They can be ordered for use in any sampling event for which the samples win be sent to Manchester Laboratory. Since sample bottles are ordered based on projections of clients' needs, we keep a moderate supply of those most commonly used. Requests for containers that are beyond the capacity of our in-house stock must be ordered from the distributor.

Requesting Sample Containers

Contact the lab courier by telephone or submit a *Request for Sample Containers* form (Figure 4-4) along with your *Presampling Notification* form (Figure 4-2). A copy of the *Request for Sample Containers* form can be found in Chapter 6, Forms. Normal sample container requests take about two weeks. Special exceptions can be made in emergency situations.

To be sure that you will receive all of the proper sample containers you need for a major sampling event, please order containers as soon as possible after the project plan is complete. This will assure you of complete, in-time delivery. If your project is extremely large or if unusual bottles are required, it is likely that we will have to place a special order for your containers. Please give five to six weeks advance notice to allow time to order the appropriate bottles for large projects.

SAMPLE CONTAINER REQUEST/INVENTORY FORM

To: _____ Project Name: _____

From: _____ Phone: _____

Date Containers Needed: _____ Today's Date: _____

Send Containers to: (location) EVENT _____ Circle One: 1)RESTOCK or 2) SCHEDULED SAMPLING

Type of Container	No. Taken Requested	Type of Container	No. Taken Requested
500 ml. poly clear (gen chem)		250 mL. glass (Fecal Coli)	
1 Litter cubitainer (gen chem)		500 mL glass (mult. micro tests)	
125 mL. poly clear (hardness)		250 mL. glass w/ thio (Fecal Coli)	
250 mL poly amber (CN)		500 mL. glass w/ thio (mult. micro tests)	
1000 mL.clear glass (O&G)		4 oz. specimen cup (Fecal Coli)	
1000 mL clear glass (phenol)		1 liter cubitainer (metals)	
60 mL poly (TOC)		500 mL. clear glass (Hg)	
1000 mL poly clear (solids)		8 oz. clear glass (trace levels)	
1 gal. Cubitainer (BOD)		4 oz. clear glass (trace levels)	
125 ml. poly clear (NUTS or COD)		2 oz. clear glass (trace levels)	
125 mL poly amber (ORTHO PHOS)		1 gallon clear glass (organics)	
1000 mLpoly amber (Chlorophyll)		1/2 gallon clear glass (organics)	
1.5 oz. clear glass (non trace levels)		1000 mL..amber glass (EDB or TOX)	
2 oz. Clear glass (non trace levels)		1000 mL. clear glass (trace levels)	
4 oz. Clear glass (non trace levels)		40 mL. vial w/ septum lid (VOA or BTEX)	
8 oz. Clear glass (non trace levels)		4oz. clear glass w/ septum lid (VOA soil)	
5 gal. Cubitainer (bioassay)			
2 1/2 gal. cubitainer (bioassay)			

Other Supplies: _____ Blanks: _____

Sample Tags: _____ Forms: _____

Chain of Custody Seals: _____ Misc. Needs _____

Figure 4-4
Sample container request/inventory form

Selecting the Proper Sample Container

A list of the sample containers that the lab maintains in stock, and their uses, can be found in Figure 4-4 of this document.

To select the proper sample container for an analysis, see Chapter Four, Appendix F. This appendix is from the Lab Users Manual, so check with the Lab for updates, etc. Find the parameter of interest in the far left-hand column titled Analysis. The second column lists the sample matrix to which the information applies, and in the third column is the minimum volume required for the analysis. Read across the row to find the container type in the third column from the right. The second column from the right offers information about the type of sample preservation required, and the right-hand column is coded for special instructions, including the need for field testing and preservation. See the footnotes at the end of Appendix F for the meaning of each of the codes.

Various container sizes, shapes, colors, and materials are specified for storage of samples for different parameters. Why does the laboratory specify different containers for different analyses?

Bottle Size--The size of the sample bottle is selected to contain the minimum volume required to run the analysis. In most cases the volume also includes enough sample material to run the required in-lab QA/QC samples.

Bottle Color--Some analytes are light-sensitive. Amber bottles protect samples from light.

Shape--Wide-mouth bottles are used for soils, sediments, and oil and grease samples, among others. Wide-mouth bottles are usually specified to allow easy access to the sample.

Bottle shape varies as well as simply mouth size. Although the same sample volume may be required for two different analyses, a preservative may be used for one and not the other. It is therefore important that the bottle containing the preservative be kept separate from others. The bottle shape is used in cases such as these to visually distinguish the container for one analyte from that for another.

Materials Used--Materials used for sample containers include glass, polyethylene, and Teflon. Glass is used to contain samples for organic analytes and some other analyses to avoid potential contamination from any organic materials leached from the bottle.

The container selected to hold a sample can influence the analytical results in several important ways:

- Contaminants can leach from the container into the sample, increasing the level of the target analytes. For example, it is for this reason that

polyethylene materials are not used for samples collected for trace level organic analyses.

- The sample material can adhere or adsorb onto the surface of the container, decreasing the effective amount available for analysis. To minimize losses due to adsorption onto the surfaces of the container, organic analytes are typically extracted from the original sample containers.

Sample Container Lids--A Teflon liner is used in all specially cleaned bottles and cubitainers. Teflon is inert and nonadherent.

A rubber septum with a Teflon liner is employed in the cap of bottles used for volatile organic samples. This flexible cover creates an airtight seal, avoiding analyte loss.

Cleaning Protocol

Different cleaning protocols and levels of QA/QC are available for varying uses of sample containers. The EPA cleaning methods are specified under OSWER Directive #9240.0-05, *Specifications and Guidance for Obtaining Contaminant-Free Sample Containers* (July 1989), with specific sample container material, preparation, cleaning and QA/QC requirements. A copy of these cleaning procedures can be found in the Lab User's Manual. Precleaned sample containers supplied by the Lab are selected from vendors meeting these criteria.

Sample containers supplied by the laboratory have been cleaned appropriately for their recommended use. It is important that you request and utilize a container that has been appropriately cleaned for the parameter of interest. A container that hasn't been properly cleaned for the analyte of interest may increase or decrease the concentration of analyte or interfere with its analysis.

Packaging Samples for Shipment to the Lab

The use of good sample packaging techniques helps to prevent shipping damage, delay in delivery, and sample degradation during transport. Major considerations for packaging samples are discussed below.

Remember to close *lids tightly*. Any of the lids can leak, but the 500 ml bottles seem especially prone to leakage. Leakage means not only loss of sample material, but also the potential for contamination of other samples and health hazards for those who handle the samples.

To protect sample couriers and receiving personnel from contact with potentially hazardous wastes, *clean the outside of containers.* Wash or wipe the outside of any dirty containers and dispose of contaminated protective gear such as gloves rather than shipping them with your samples.

Extra time taken in packaging your samples can dramatically reduce transport breakage. Table 4-4 lists many items that are helpful for packing and shipping samples.

Package *large glass containers* in “bubble” packing material or the equivalent to protect them during shipment. Place the smooth side next to the sample container. Bubble packing materials are effective and reusable. Place wrapped containers into a reinforced cardboard box or sample cooler for shipping. If you do not use "bubble-wrap" or equivalent material around the containers, use pieces of cardboard to separate and protect them. Use sheets of cardboard cut to the size of the box to reinforce and stabilize cardboard boxes for shipping.

Smaller glass containers can be packaged with foam wrapping material, the "bubble" material described above for large containers, or in "locking" type plastic bags with styrofoam beads or other packing material. Sleeves made of synthetic sponge material are available from the lab for safely shipping large numbers of Volatiles (VOA) containers.

Sample coolers are available from the laboratory in various sizes. The largest coolers used are either the 48 or 54 quart size, depending on the manufacturer. Coolers larger than these are not recommended because of the weight of environmental samples and the need to minimize the risk of back injuries.

Sample coolers equipped with lockable stainless steel cable loops or hasps are available from the laboratory for maintaining chain of custody while shipping enforcement samples, and are recommended especially for samples that must be shipped via commercial carriers or that cannot be stored in a secure area at all times. Ask anyone in the Analytical Management unit of the laboratory for a custody cooler equipped with the stainless steel loops for affixing custody seals and padlocks.

Use glass filament tape to secure the lids of coolers and boxes before shipment.

Cooling Samples

Most sample matrices must be preserved during shipment by cooling. You can use various types of packaging for ice or packets of "Blue Ice". Place bags or packages of ice or reusable "Blue Ice" packets (three or four per cooler) around the samples. The freezable liquid-filled bubble packing material can also be a useful coolant. If you have access to dry ice, it can be used to cool samples during shipment. Be sure to contain the dry ice in newspaper or cardboard to avoid freezing the samples.

Table 4-4. A Shopping List of Packing and Shipping Materials

Sample coolers, large 48-54 qt., midsize 25 qt. or small 16 qt.	These are available from the laboratory.
Custody sample coolers	Available from the laboratory.
Foam "sleeves" for VOA bottles	Available from the laboratory for packing multiple VOA samples, these sleeves are the safest way to ship 40 ml OA vials.
Cardboard boxes and sheets of cardboard	Cardboard boxes are great for shipment of smaller samples. Sheets of cardboard are useful reinforcement for the bottoms of cardboard boxes and to separate samples in sample coolers.
Locking type "Ziploc" plastic bags	For enclosing sample paperwork in the sample cooler during shipment. Also useful for securely enclosing a small sample container packed in styrofoam beads or other packing material.
Glass filament strapping tape	This is the sturdy tape that should be used to secure the outside of all cardboard boxes. Also used to keep sample coolers closed during shipment.
Wide clear plastic tape	Handy for attaching paperwork in a plastic bag to the top of the sample cooler or box. Also used to protect the shipping label from damage by moisture during shipment.
Styrofoam beads	Not considered environmentally friendly, but reuse them if you have some on hand. It's a great packing material.
"Bubble-wrap"	Several kinds are available. Regular, in which the "bubbles" are filled with air, and a freezable liquid type, in which each bubble is filled with liquid. When the liquid type is frozen, it becomes an ice wrap to preserve the samples during transport. Both types are reusable.
Vermiculite	Another good packing material, environmentally safe, but more costly than some of the other options.
"Blue Ice"	Freezable, reusable coolant for sample coolers. The airlines and some parcel services are now requiring use of nonleaking ice in our sample coolers.

Loose ice is not advised for samples being shipped by commercial carriers since the ice will melt and may leak out of the sample cooler into the surrounding cargo. Ice may give the appearance that the samples are firmly packed, but by the time they arrive at the laboratory, they are often rattling loosely in the cooler. Some may be submerged or broken. On occasion water has leaked out of coolers into cargo compartments. Because of problems like this the cargo airlines have requested that we not ship coolers containing ice at all.

Loose ice is not a problem for samples that will be picked up by a laboratory courier within a day after shipment. Be sure to put the plug into the drain at the bottom the cooler and tape it securely. Never mix loose ice with styrofoam beads, a combination that creates a special kind of mess in the sample receiving area.

Place packing material around the containers in the cooler or box to immobilize them during shipment, and place the coolant around the packing material. Blue Ice or other contained coolants are recommended if you use styrofoam beads or other particulate packing material.

Paperwork

Place all of your paperwork into a sealable "locking" type plastic bag and make sure that it is shipped with the samples. Put it inside the cooler or box with the samples, or, for larger shipments, you can tape the paperwork in its plastic pouch to the top of the cooler/box.

Shipping Samples to the Lab with Commercial Carriers

Samples can be shipped by means of any of several common carriers. The Lab receives shipments made by Greyhound bus service, Federal Express, and the United Parcel Service. They will not accept shipments sent C.O.D. Samples and other packages should be sent to the Manchester Laboratory at the following address:

Manchester Environmental Laboratory
7411 Beach Drive East
Port Orchard, Washington 98366-8204

Chapter 4, Appendix G contains general guidelines and specific information for shipping by air, bus, UPS, and Federal Express from all areas of the state.

Holding Times and Sample Preservation

The holding time is defined as the time period between sample collection and extraction, or between extraction and analysis. For a majority of analytical procedures employed by the Manchester Laboratory, holding times are defined by administrative regulation, in the Federal Register, Volume 40, Number 209 (Rules and Regulations) or by the specified analytical method. Chapter 4, Appendix H contains a list of holding times and preservatives/preservation techniques for various parameters.

The holding time "clock" starts at the time of collection.

Note

If you are collecting sample material for an analysis with a very short holding time, be sure to document the exact time of day the sample was collected on the Sample Data & Analysis Required form.

If a short holding time applies to any of the samples to be collected in a sampling event, it is wise to learn in advance the speediest and most reliable method of transporting the samples to the laboratory from the site and to collect samples for those analytes in separate containers.

Established holding times and preservation techniques are an integral part of the analytical procedure, and are closely monitored both by the Manchester Laboratory and by the qualified contract laboratories from whom services are purchased.

Why Have Holding Times Been Established?

Environmental analytes of interest may be volatile, reactive, or subject to other types of change. The rate at which volatilization, growth, or other changes occur depends on the environment. Cooling the sample and/or adding preservatives slows the rate of change, extending the holding time. Very short holding times are established for parameters whose levels may change rapidly regardless of methods of preservation.

How Are Holding Times Established?

The length of holding times have been established in a number of different ways. Holding times for some water matrices are based on analytical studies, but many have been established for convenience without supporting technical data. Technical requirements for sample holding times have only been established for water matrices; those set for soils and sediments have been extrapolated from the holding times established for water.

Short holding times are established because of changes that are constantly taking place, as in the case of coliforms, or cyanides (CN) which could be reacting, or BOD, a biologically active system.

Preservatives

It is normally the intention of a sampling event to ascertain the. levels of analyte that are present at a site at the time of sampling. Because some of the analytes of most interest can be volatile, reactive, or subject to change, preservatives are used for a number of analytes.

Preservatives perform some of the following functions:

- *Inhibit chemical reactions*. An example is the use of ascorbic acid to prevent the formation of trihalomethanes in samples for volatile organic analysis.

- *Keep the parameter of interest in solution*. For example, nitric acid is used to preserve aqueous samples for metals analysis. An acidic environment prevents both precipitation of the metals and also helps prevent adsorption onto the walls of the sample container.

- *Prevent microbial degradation*. HCL is used in samples for volatile organics analysis to retard bacterial degradation.

- *Prevent chemical decomposition.* One example is in the case of the acid used in nutrient samples to hold constant the NO_2/NO_3 equilibrium.

Samples for which no preservative is effective must be analyzed within short holding times.

What Significance Does Holding Times Have For My Sample?

Some holding times are required from a regulatory standpoint, and must be strictly observed if the sample data is to be used in an enforcement action. For other samples, however, holding times are not a magical barrier between good data and bad data. Useful information can still be gained from most samples, even if analyzed after the specified holding time.

The Federal Register Volume 55, No. 126, states in describing the TCLP procedures:

> "If sample holding times are exceeded, the values obtained will be considered minimal concentrations. Exceeding the holding time is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time will not invalidate characterization if the waste exceeds the regulatory level."

Thus, if the level of a TCLP target compound exceeds the regulatory level, the holding time is not important. It is only when trying to show that a sample does not exceed the regulatory level that the holding time becomes critical.

Other issues to consider include the relevance of the holding time for your particular project. When examining the outflow from a point source, the main concern is with identification and quantitation of potential contaminant species, and the holding times are of importance. If the sample is waste that has been in the environment for a long time, the holding times are less significant. The most effective way to evaluate the relevance of holding times is to become aware of the analytical reasons and requirements behind them and the degree to which the target analytes tend to persist in the environment (e.g. PCBs, chlorinated pesticides).

Chapter Four, Appendix H, contains a listing of holding times and preservation techniques/ reagents for water samples; from the Federal Register Volume 49, Number 205, pages 28-29. The laboratory observes a holding time for soil/sediment organic analysis of 14 days for extraction and 40 days for analysis, from the Test Methods for Evaluating Solid Waste, SW-846, Third Edition, even for those analyses for which no official holding time has been established.

CHAPTER 4

APPENDIX A

DESIGNING A CLASS 2 INSPECTION

Table 1 - Designing a Class II Inspection

Understanding the Types of Objective Statements

	Purpose Statement	Objective Statement	Null Hypothesis
Often associated with:	Studies	Surveys/Inspections	Applied research
Level of Specificity	Specifies information needed; May not specify types and amount. (if data needed.	Specifies either implicitly or directly the types and amount of data, e.g., is this a screening survey, a compliance inspection, or an inspection to support reissuance of the permit?	Specifies a measurable variable; specifies quantitative, rather than qualitative, endpoints which will be proven either true or false.
Predominant form of final data:	Descriptive.	Raw numerical.	Statistically massaged
Observations:	Might be the type of statement used by permit writer when (s)he doesn't know specific types and amounts of self- monitoring data to request, i.e., a fishing expedition.	Should prompt user to think through what (s)he will do with the data when it arrives, i.e., to what will it be compared standards, criteria, limitations, guidelines?	Data interpretation approaches, Data Quality Objectives and statistical analysis methods should be established in advance.
		Should prompt user to think through data quality objectives during design,	Might be established to aid in achieving objective statements.
		Might be established to aid in achieving purpose statements.	

	Purpose Statement	Objective Statement	Null Hypothesis
Examples:	• establish whether chemical Composition of sediments has changed as a result of source control measures. • establish the variability of the effluent. • determine baseline or background conditions prior to discharge. • characterize toxicity in _____, _____, _____ by using bioassays. • support reissuance of the permit. • provide a data base for designing future improvements.	• determine whether mercury concentrations in sediments have changed as result of' source control measures. • determine compliance with the effluent limits. • analyze performance or the WWTP by determining loading and whether 86% of capacity has been reached for BOD5and ISS. • determine whether acute toxicity is likely to occur in the receiving water. • determine whether state water quality standards are being met. • detect the extreme value of ammonia during the high use season.	• mercury concentration in sediments will decrease by at least 50% in the fourth year as a result of source control measures. • the concentration of ammonia in the effluent will remain the same from year 1 to year 4 (despite additional production). • the discharge of phosphorus during the dry season is greater than the yearly average.

Table 2 - Designing a Class 11 Inspection
"Putting the Pieces Together

Objective Statement	What Introductory Questions Should be Asked?	What Will Results be Compared to?	What Parameters Should be Sampled?	What Stations Should be Sampled?
1. Determine compliance with effluent limits in the permit	What are the effluent limits? Which analytical methods should be requested? Are WWTP flow measurements accurate?	Effluent limits in permit	BOD_5, TSS, pH Flow Fecal, residual chlorine	Raw sewage and final effluent Influent or effluent Effluent only
2. Analyze performance of the WWTP by determining loading and whether 85% of capacity has been reached for BOD_5 and TSS.	Does "capacity" mean design criteria? Septic tank pumpers? Other slug loads? Are WWTP flow measurements accurate?	Section 5.11 <u>Prevention of Facility Overloading or more recent orders</u> <u>Criteria for Sewage Works Design</u> WPCF technical journals Metcalf and Eddy	BOD_5 , TSS, pH, oil and grease Flow D.O., TSS, TVSS RAS Depth of sludge blanket	Raw influent and final effluent Influent or effluent Aeration basin Return sludge Clarifier
3. Chemically characterize the influent and effluent	Is the industry load significant? What type? Pesticides? PCB? Cyanide? Arsenic? Dilution ratio in receiving water? Which analytical methods should be requested?	Water quality criteria	PP metals and organics, ammonia Chlorine residual	Raw sewage and final effluent (composited except VOAs) Final effluent

Objective Statement	What Introductory Questions Should be Asked?	What Will Results be Compared to?	What Stations Should be Sampled?	What Stations Should be Sampled?
4. Analyze the sludge.	Is the sludge lagoon dredgings or digested? Is the influent load of toxics or organic solids highly variable?	?	?	?
4a. Chemically characterize the digested sludge.	Is the industrial load significant? What types? VOCs?	?	PP metals and organics	Raw or digested sludge
4b. Evaluate the sludge stabilization process.	Aerobically or anaerobically stabilized? Composted? What is the method of sludge use or disposal? Is the 2° process extended aeration or ditch?	Municipal and Domestic Sludge Utilization Guidelines Dangerous Waste Regulations Standards for the Disposal of Sewage Sludge: Proposed Rule Control of Pathogens in Municipal Wastewater Sludge for Land Application Under 40CFR Part 257	PP metals and organics, TCLP, nutrients total and volatile solids, total; and fecal, E Coli pounds to waste	Raw sewage, final effluent, digested sludge Tank and digested sludge Waste line
5. Assess the toxicity of effluent using bioassays.	Freshwater or marine species? One each from fish, invertebrate, plant? Which specific species? Acute? Chronic? Both? Screening at 100% or serial dilutions? Dilution ratio in receiving water? Sample to be taken pre- or post-Chlorination?	Dilution ratio	Hardness, temperature	Final effluent: pre- or post-Chlorination (grab composites)

CHAPTER 4

APPENDIX B

ANALYTICAL PROCEDURES

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

GENERAL CHEMISTRY

Parameter	Method	Reference EPA / SM-17	Lower Reporting Limit
Acidity, as $CaCO_3$	Potentiometric titration to pH 8.3 with NaOH	305.1/2310 B	1 mg/L
Alkalinity, as $CaCO_3$	Potentiometric titration to pH 4.5 with HSO,	310.1/2320 B	1 mg/L
NH_3 as N	Colorimetric, automated Phenate	350.1/4500-NH_3 H	0.01 mg/L
BOD_5	D.O. depletion, after 5 days @ 20°C	405.1/5210 B	3 mg O2/L
$CBOD_5$	BOD, with nitrification inhibitor	/5210 B	3 mg O2/L
COD	Titrimetric	410.1/5220 B	4 mg/L
Color	Spectrophotometric	110.1/2120 E	3 units
Conductivity	Wheatstone bridge	120.1/2510 B	1 μmho/cm @ 25 °C
CN-, Total	Automated Colorimetric(1)	335.2/4500-CN E	0.002 mg/L
F, Total	Automated complexone	340.3/4500-F E	0.01 mg/L
Hardness, as $CaCO_3$	EDTA Titrimetric	130.2/2340 C	1 mg/L
pH	Electrometric	150.1/4500-H B	(± 0.1 units)
Kjeldahl N (Org-N + NH_3)	Automated$_2$ SO_4, Digestion, colorimetric phenate	351.1/ NA	0.01 mg/L
NO_3 as N	Colorimetric	352. 1/ NA	0.01 mg/L
$N0_3$ NO_2 as N	Colorimetric, automated Cd reduction	353- 2/4500-$N0_3$ F	0.01 mg/L
NO_2 as N	Colorimetric, automated w/o Cd reduction	354.1/4500-NO_2 B	0.01 mg/L
Oil & Grease	Extraction, gravimetric	413.1/5520 B	1 mg/L

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

GENERAL CHEMISTRY (Continued)

Parameter	Method	Reference EPA / SM-17	Lower Reporting Limit
TOC	Combustion - Infrared	415/1531-B	4 mg/L
PO_4 as P	Automated ascorbic acid	365.1/4500 P F	0.01 mg/L
Phenols	Automated colorimatric	420.2/NA	2 µg/L
P. Total	Persulfate digestion, Automated ascorbic acid	365.1/4500-P B(5) /4500-P F	0.01 mg/1
TS	Gravimetric, 103-105 °C nitrification inhibitor	160.3/2540 B	1 mg/L
TSS	Filter, Grav. 103-105 °C	160.2/2540 D	1 mg/L
TNVS & TNVSS	Gravimetric, 550 °C	160.4/2540 E	1 mg/L
	(The above four determinations constitute the "Solids(4)" procedure.)		
TDS	Gravimetric, 180 °C	160.1/2540 C	1 mg/L
SS	Gravimetric	160.5/2540 F	1 mg/L
SO_4	Ion Chromatography	300.0/4110 B	0.01 mg/L
Surfactants	Colorimetric	425.1/5540- C	1 mg/L
Turbidity	Nephelometric	180.1/2130-B	1 NTU

(1) Method 335.2 has beenmodified by automating the colorimetric detn.

References – EPA = Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020 (Rev. March, 1983). SM-17 = Standard Methods for the Examination of Water and Wastewater, 17th Ed. (1989).

Lower Reporting Limit (LRL) – the level below which the result is reported as "not detected at the lower reporting limit."

BOD_5 - 5-Day Biochemical Oxygen Demand
COD = Chemical Oxygen Demand
TSS = Total Suspended Solids
TNVSS = Total Nonvolatile Suspended Solids
SS = Settleable Solids
TOC = Total Organic Carbon
TS = Total Solids
TNVS = Total Nonvolatile Solids
TDS = Total Dissolved Solids
NTU = Nephelometric Turbidity Unit
$CBOD_5$ = 5-Day Carbonaceous Biochemical Oxygen Demand (Inhibited BOD_5)

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

METALS

Parameter	Method2	EPA Method Number	Lower Reporting Limit (ug/L)
Al	ICP-AES	200.7	50
Sb (PP)*	ICP-AES	200.7	200
	GFAA	204.2	10
As (PP)*	ICP-AES	200.7	300
	GFAA	206.2	5
Ba	ICP-AES	200.7	5
Be (PP)	ICP-AES	200.7	5
Cd (PP)	ICP-AES	200.7	50
	GFAA	213.2	0.5
Ca	ICP-AES	200.7	10
Cr (PP)	ICP-AES	200.7	20
	GFAA	218.2	1.0
CR+6	GFAA	218.5	1.0
Co	ICP-AES	200.7	50
	GFAA	219.2	5
Cu (PP)	ICP-AES	200.7	10
	GFAA	220.2	5
Fe	ICP-AES	200.7	20
Pb (PP)*	ICP-AES	200.7	200
	GFAA	239.2	5
Mg	ICP-AES	200.7	20
Mn	ICP-AES	200.7	5
Hg (PP)	CVAA	245.1	0.1
Mo	ICP-AES	200.7	20
Ni (PP)	ICP-AES	200.7	100
	GFAA	249.2	5
K	ICP-AES	200.7	1,000
	AA	258.1	10

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

METALS (Continued)

Parameter	Method2	EPA Method Number	Lower Reporting Limit (ug/L)
Se (PP)*	ICP-AES	200.7	400
	GFAA	270.2	5
Ag (PP)	ICP-AES	200.7	10
	GFAA	272.2	1
Na	ICP-AES	200.7	50
Tl (PP)*	ICP-AES	200.7	500
	GFAA	279.2	10
Zn (PP)	ICP-AES	200.7	30

Lower Reporting Limits for metals are the concentrations below which results are qualified as estimated (J) and are generally 5 times the calculated instrument detection limit. The relative standard deviation at the LRL should be about 10%.

PP = priority pollutant metal. Priority pollutants have been identified as toxic in an EPA Consent Decree. Technology-based effluent limits and guidelines are required for these substances.

* - These metals are normally determined in wastewater by either ICP-AES or by GFAA. The procedure used by the lab depends upon the required detection limit which, in turn, depends on the effluent limit and/or on the expected concentration of the metal in the sample. The QA project plan should specify the required detection limit and the method which will meet that requirement. Otherwise, the sample is screened for these metals by ICP-AES and, if any of the metals are not detected, the sample is re-analyzed by GFAA.

AA = flame atomic absorption spectrometry.
GFAA = graphite furnace atomic absorption spectrometry.
CVAA = cold vapor atomic absorption spectrometry.
ICP-AES = Inductively-coupled plasma atomic emission spectroscopy.

Method – The full text of Method 200.7, “Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes,” is given in Appendix C of 40 CFR 136.

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

SEMI-VOLATILE ORGANIC COMPOUNDS
(Base/Neutral Acid Extractables)

The following compounds are analyzed by a modification of EPA Method No. 625:

Acenaphthene	Acenaphthylene
Anthracene	Benzo(a)anthracene
Benzo(a)pyrene	Benzo(b), Benzo(k)fluoranthene
Benzo(g,h,i)perylene	Benzylbutylphthalate
Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether
Bis(2-ethylhexyl)phthalate	4-bromophenylphenyl ether
2-chloronaphthalene	2-chlorophenol
4-chlorophenylphenyl ether	Chrysene
Dibenzo(a,k)anthracene	1,2-, 1,3-, 1,4-dichlorobenzene
3,3'-dichlorobenzidine	2,4-dichlorophenol
Diethylphthalate	2,4-dimethylphenol
Dimethylphthalate	Di-n-butylphthalate
Di-n-octylphthalate	2,4-, 2,6-dintrotoluene
Fluoranthene	Fluorene
Hexachlorobenzene	Hexachlorobutadiene
Hexachlorocyclopentadiene	Hexachloroethane
Indeno(1,2,3-c,d)pyrene	Isophorone
Naphthalene	Nitrobenzene
N-nitrosodimethylamine	N-nitrosodi-n-propylamine
N-nitrosodiphenylamine	Phenanthrene
Phenol	Pyrene
1,2,4-trichlorobenzene	

Reporting limits of about 5 µg/L are generally achieved for the above compounds in 1 liter water samples.

4-chloro-3-methylphenol	2,4-dinitrophenol
2-, 4-nitrophenol	Pentachlorophenol
2,4,6-trichlorophenol	4,6-dinitro-2-methylphenol

Reporting limits of about 25 µg/L are generally achieved for these phenols in 1 liter water samples.

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

VOLATILE ORGANIC COMPOUNDS

The following compounds are analyzed by EPA Method No. 624:

Bromodichloromethane
Bromoform
Carbon tetrachloride
Chloroethane
Chloromethane
1,2-, 1,3-dichlorobenzene
1,1-dichloroethene
1,2-dichloropropane
Ethylbenzene
1,1,2.2-tetrachloroethane
Toluene
Trichloroethene
Vinyl Chloride
Benzene
Bromomethane
Chlorobenzene
Chloroform
Dibromochloromethane
1,1-, 1,2-dichloroethane
trans-1,2-dichloroethene
cis-, trans-1,3-dichloropropene
Methylene chloride (Dichloromethane)
Tetrachloroethene
1,1,1-, 1,1,2-trichloroethane
Trichlorofluoromethane

Reporting limits of about 5 μg/L are generally achieved ford the above compounds in water samples.

ORGANOCHLORINE PESTICIDES AND PCBS

Pesticides

Aldrin
alpha-, beta-, delta-BHC
gamma-BHC (Lindane)
Chlordane
4,4'-DDD
4.4'-DDE
4.4'-DDT
Dieldrin
Endosulfan I, II, sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Toxaphene

PCBs

Arochlor-1016
Arochlor-1221
Arochlor-1232
Arochlor-1242
Arochlor-1248
Arochlor-1254
Arochlor-1260

Pesticides and PCBs are routinely analyzed by Method 608 since Method 625 does not detect pesticides at very low levels. Detection Limits for Method 608 (Gas Chromatography with Electron Capture Detection) are in the range of 0.01 to 0.1 μg/L for pesticides and 0.1 to 1 μg/L for PCBs in water samples.

40 CFR 136 ANALYTICAL PROCEDURES
used at the Manchester Laboratory

BIOLOGICAL TESTS

Parameter	Method	Reference
Fecal Coliform	Membrane Filter	9222 D
Total Coliform	Membrane Filter	9222 B

OTHER PROCEDURES
available at the Manchester Laboratory

Method	**Reference**
Trout	DOE 80-12
Daphnia magna	EPA600/D-87/080
Microtox	Microtox Manual – for water samples Puget Sound Protocols (5/86) – for sediments/sludge
Hyallela	Nebeker, et al, 1984
Fathead minnow*	EPA/600/4-89/001
Rhepoxynius abronius	Swartz, R. C., et al., ASTM STP 854(1985)

Note: Due to the specialized nature of these tests and the long lead times required for preparation of the organisms, Margaret Stinson MUST be contacted several weeks in advance of the date samples will be submitted.

*Manchester Lab contracts this test out to a commercial laboratory.

OTHER PROCEDURES
available at the Manchester Laboratory
(Continued)

Miscellaneous Procedures

Parameter	Method	Reference	Lower Reporting Limit
PAHs	HPLC GC/FID	EPA-610 (water) (water)	0.25 µg/L
% Solids	Gravimetric, 103-105°C	SM-17 2540 G	N/A
Cl	Ion Chromatography	SM-17 4110 B	0.1 mg/L
TOX	Act. C trap, pyrolisis, microcoulometric titration	EPA-450.1 (water) SW846-9020 (seds)	
EOX		MEL internal SOP (seds)	
TOC	Combustion (800°C), IR detection	Lab in-house METHOD (SEDS)	
BNA Organics	Soxhlet Extraction, GC/MS	Modified SW846- 8270 (seds)	
Resins/ Fatty acids	GC/MS	Modified NCASI- 85.10 (water/seds)	
Guiacols/ Catechols	GC/MS	Modified NCASI- 86.01 (water/seds)	
VOA	Purge and trap, capillary GC/MS	Modified SW846- 8240 (seds)	
Pests/PCBs	Soxhlet extraction, GC/EC	Modified SW846- 8080 (seds)	
Fecal Coliform	MPN	SM16-908C	

CHAPTER 4

APPENDIX C

SAMPLING SCHEDULE AND PARAMETER MATRIX EXAMPLE

Example Sampling Schedule and Parameter Matrix

Table 1 – Sampling Schedule and Parameters Analyzed – Miller Creek, 4/91

Location:	Inf-c	Inf-MC	Inf-1	Inf-2	Eff-c	Eff-cr	Eff-MC	Eff-1	Eff-2	Eff-gc	Sig-gc	Blank
Type:	comp	comp	grab	grab	comp	comp	comp	grab	grab	g-comp	g-comp	trnsf
Date:	23-24	23-24	4/23	4/24	23-24	23-24	23-24	4/23	4/24	4/24	4/24	4/23
Time:	na	na	am	am	na	na	na	am	am	na	na	am
Parameter Lab Log#:	1781-05	–06	–07	–08	–09	–10	–11	–12	–13	–14	–15	–16
GENERAL CHEMISTRY												
Conductivity	E	E	E	E	E	E	E	E	E	E		
Alkalinity	E	E			E	E	E			E		
Hardness	E	E			E	E	E			E		
SOLIDS 4	E/MC	E			E/MC	E	E			E		
% Solids											E	
% Volatile Solids											E	
BOD5	E/MC	E			E/MC	E	E					
BOD SOL	E	E			E	E	E					
TOC (water)	E	E			E	E	E					E
TOC (soil)											E	
NH3-N	E	E			E	E	E					
NO2-NO3-N	E	E			E	E	E					
NO2	E	E			E	E	E					
NO3	E	E			E	E	E					
Phosphorous - Total	E	E			E	E	E					
Oil and Grease			E	E				E	E			
F-Coliform MF								E	E			
T-Coliform (sediment)											E	
VOC (water)			E					E				E
VOC (sludge)											E	
BNAs (water)	E				E							
BNAs (sludge)											E	
Pest/PCB (water)					E							
PP Metals	E				E		E				E	E
BIOASSAYS												
Salmonid (acute)										E		
Fathead Minnow (chronic)										E		
FIELD OBSERVATIONS												
Temp	E	E	E	E	E	E	E	E	E	E		E
pH	E	E	E	E	E	E	E	E	E	E		E
Conductivity	E	E	E	E	E	E	E	E	E	E		E
D.O								E		E		
Chlorine (total)												

E – Analysis by Ecology

MC – Analysis by Miller Creek

**to provide toxicity criteria comparison at 50 mg/l as CaCO3 hardness
As,Cd,Pb,Nl,Se,Ag,Tl-AA graphite furnace; Sb,Be,Cr,Cu,Zn-ICP
HG-cold vapor AA

CHAPTER 4

APPENDIX D

INSTRUCTIONS FOR FILLING OUT *PRESAMPLING NOTIFICATION* AND *SAMPLE DATA & ANALYSIS REQUIRED* FORMS

Pre-sampling Notification and *Sample Data & Analysis Required* Forms

The *Pre-sampling Notification* Form

Purpose of the Form--The purpose of the *Pre-sampling Notification* form is to provide the Manchester Laboratory with advance information about planned sampling events. The Lab uses the information to make informed decisions about such things as required staffing levels, timing for routine equipment maintenance, guiding clients in choice of sampling dates. In cases where the sample load is beyond laboratory capacity, advance notice allows the laboratory staff to solicit bids and pre-arrange for the analyses at contract laboratories.

Planned Sampling Events--If you are planning a project that will be sent to the Manchester Laboratory for analysis, fill out the *Pre-sampling Notification* form as a part of the process and mail or FAX it to the laboratory before you sample.

Filling out the Form for Planned Events--The *Pre-sampling Notification* form will be photocopied in the sample entry process, so please make entries in dark ink. Send this form to the lab at least *two weeks* before sampling if possible.

Filling in the Blanks: The *Pre-sampling Notification* Form--Following is a list of the blank spaces and lines to be found on the *Pre-sampling Notification* form, and the appropriate type of response for each:

	Lines to be fill in
Program Index Code (PIC)	The Five-digit-Ecology account code. This is required for all projects, and is used in Ecology's internal cost accounting system.
Project Name	Project name or identification - use the same name as the one that will be used on the *Sample Data & Analysis Required* form in the Name/Location section.
Sampling Date(s)	The date the samples will be collected. Please alert us if sampling will be carried out over more than one day, using a separate request for each day if required for clarity.
Date To Lab	The date the samples will arrive at the laboratory.
	Boxes to be filed in
Monitoring	EILs routine monitoring only
Emergency	Check the Emergency box if appropriate. Alert us as to the nature of the emergency and the required turnaround time.
Class 2 Inspection permit inspection.	Check box if the sampling event is an industrial or municipal
Preliminary Invest. citizen complaint.	Used for unplanned samples, e.g. an inspection in response to a

Special Turnaround	Check box if you need data back at a time other than standard turnaround time.
Analysis Requested	Indicate the *number* of samples for each analysis in the appropriate box. If the analytical parameter is not listed, write it in on one of the blank lines and indicate how many samples will be collected for each matrix.
Comments	Special instructions/warnings to the lab. e.g., pure product, potentially hazardous. etc. These notes can convey not only health and safety issues, but also alert the analyst of samples that may contain very high levels of analyte. If undiluted, these kinds of samples can contaminate the analytical equipment, sometimes overloading it to the point of taking it out of service while it is being flushed and decontaminated.

Sample Data & Analysis Required Form

Purpose of the Form--The purpose of the *Sample Data & Analysis Required* form is to document the sampling event and the analyses requested for the sampler, the laboratory, and the agency's data records. Laboratory staff use the information from this form as the final word on such things as sample identification, analyses required, project officer, and the Program Index Code (PIC) to be charged.

Once the samples are checked into the lab, the *Sample Data & Analysis Required* form is routinely photocopied for distribution to the units in which the work will be done. For this reason, and for readability, entries should be made in dark ink.

Analysis Required Section--The Analysis Required portion of this sheet is to provide a checklist for the field investigator to indicate which analyses are required for each sample. Check the boxes that apply to your sample. If you require an analyte that isn't listed on the form, first alert the lab staff, write it into one of the blank areas at the top and then check the box below on the sample row(s) for which it is to be run.

Filling in the Blanks: *The Sample Data & Analysis Required Form*--Following is a list of the blank spaces and lines to be found on the Sample Data and Analysis Required Form and the appropriate type of response for each.

	Lines to be filled in
Program Code	Fill in the five-digit Ecology Program Index Code (PIC) associated with your project into the three boxes at the top of the page. We need this cost accounting information to enter your samples in the sample queue. Space for five digits will be added when the form is updated.
Project Code	Eight-digit alphanumeric code given the project by the lab.
Project	Project name--the name you designate for the project with its location, city and county. The project name is used to identify the samples and should be the same as that used on the *Pre-sampling Notification* form. It's a good idea to use the same name for all

	future sampling at the same site for clarity in communications about the project.
Enforcement/Custody	Check the box if you require chain-of-custody procedures. Fill in the Chain-of-Custody section.
Toxic/Hazardous Notes	Use this to note any special tests or comments concerning the: samples.
Date/Time	Date and time samples were taken.
Field Station Identification	The identification that you give to your sampling station. This eight digit alphanumeric identification will be printed on the final report that is issued by the laboratory, and should be selected in a way that helps you unambiguously identify the individual sample site.
Lab Number	Assigned by the lab at the time of sample entry unless a block of numbers has been preassigned for the project. The first two digits of the sample number represent the week number the sample is entered into the laboratory computer system, or in the case of pre-assigned numbers, the week the sample was collected. Preassigned numbers are recommended for large projects. When multiple sample containers are taken at single stations for a variety of analyses, all containers associated with that station get the same sample number.
Matrix	Enter the appropriate two digit matrix code, key on the back of the *Sample Data & Analysis Required* form.
Source Code	Enter the appropriate two digit source code, see the list of codes on back of the Sample *Data & Analysis Required* form. If none apply, use OO.
Number of Containers	Write in the number of containers for each sampling site in the appropriate column. Note that some analyses require special containers or have minimum volume requirements. See the section on sample containers.
Analytical Parameters	Enter a check mark to indicate the desired analyses in the column corresponding to the appropriate station or lab number.
Project Office	The person to whom we are to send the final report. Enter first and last names. If no *Pre-sampling Notification* form has been submitted for the project, please write your SCAN number near your name.
Samplers	Fill in name(s) of the samplers on the project.
Recorder	Signature of the person filling out the sheet.

Date	Date of sampling/filling out the form.
Chain-of-Custody	Fill out this portion of the form if required for your project. See the section on Chain-of-Custody procedures. Chain-of-Custody procedures are important for enforcement samples.

CHAPTER 4

APPENDIX E

CHAIN-OF-CUSTODY PROCEDURES

Chain-of-Custody Procedures

Chain-of-custody is a series of procedures designed to trace a sample or set of samples from the moment of collection, through transport, analysis and reporting. The analytical results might then be used in legal proceedings. Chain-of-custody requires that each sample can be properly identified, and that a record be kept of the names and identification of all persons with whom the sample comes into contact. The person in custody must have full and verifiable control of the samples at all times. When these procedures are properly followed, it can be demonstrated to the court that the samples are positively identified and that they have not been contaminated or tampered with in any way.

A sample is considered to be under a person's custody if it is

- in the individual's physical possession,
- in the individual's sight,
- secured in a tamper-proof way by that individual, or
- secured by the individual in an area that is restricted to authorized personnel.

Elements of chain-of-custody include the following:

- Sample Identification
- Security seals and locks
- Security procedures
- Chain-of-custody forms/Request for Analysis
- Field Logbook

Sample Identification

Chain-of-custody requires positive, separate identification of each sample collected during the sampling event. *To be sure that the identification of the sample is positive, we recommend that you both use separate sample I.D. tags and write the sample identification on the gummed label on the sample container, if there is one.* Duplicate labeling is suggested because of our experience that labels can smudge or be detached from the container due to melting ice and moisture condensation.

Gummed Sample Labels

Some sample containers come with labels already in place, others with loose labels in the container box, and a few come without gummed labels. Affix loose labels to the sample containers and fill out the label at the time of collection.

Using a waterproof pen, write the sample identification on the gummed labels on the sample containers. Include at least the following information:

- Name of sampling project site and/or individual place of collection;
- Name or initials of collector;
- Date of collection, and the time of day if required for your sample or project; and,
- Sample number, if you have received sample numbers prior to sampling.

If the above data are not enough to positively identify the collector or the sample, additional information should be provided. The time of collection is important if you need to establish the time of day that an event occurred, or to monitor timely analysis of parameters with short holding times.

Sample Tags

Gummed paper sample labels can peel off and be lost as condensation occurs on the surface of the sample container. Therefore, in addition to the gummed labels described above, attach sample tags to the sample containers to avoid sample misidentification if the label should be lost. Include the same information as that written on the gummed label:

- Name of sampling project site and/or individual place of collection;
- Name or initials of collector;
- Date of collection, and the time of day if required for your sample or project; and,
- Sample number, if you have received sample numbers prior to sampling.

Write the sample data onto the tags at the time of collection using waterproof ink, and then rubber band the tags securely around the necks of the sample containers.

As noted previously, the time of collection is important if you need to establish the time of day that an event occurred, or to monitor timely analysis of parameters with short holding times.

Security Tape, Seals and Locks

Security measures such as security tape, paper sample seals, serial numbered wire tags and locks all serve to assure that the integrity of the sample cannot be compromised without more than a reasonable effort.

Items used as evidence of sample security should be stored in a secure area, and never discarded in a place accessible to the public.

All security items except padlocks are available from the Manchester Laboratory.

Paper Sample Seals and. Custody Tape/Strips

Use sample seals or tape to detect unauthorized tampering with samples between the time of sampling and the time of analysis. Either type of security tape should be marked with the following information:

- Collector's name or initials
- Date sealed
- Sample identification
- Sample number if available

If the above data are not enough to positively identify the collector or the sample, additional information should be provided.

Paper Seals--Paper seals should be pressed firmly into place across the lid and neck of the sample container, and notched at the neck level in such a way that the seal must be torn to open the container. Affix the seal to the container before the sample leaves your custody.

Security Tape/Strips--Serrated-edge security strips are more tamper-resistant than paper seals, and are thus preferable. They should be pressed across the cap and onto the neck of the container in a similar way to the paper seals, but the strip material is fragile and need not be notched to break upon opening the container. The strips adhere strongly, tear when removal is attempted, and color-bleed if chemical means are used to remove them.

What do I do if the Tape is Broken?--If a paper seal or tape is broken either by accident or for a necessary purpose such as sample preservation, leave the remains of the broken seal on the container and immediately document the break in the seal in the sample custody section of the Sample Data & Analysis Required form (the Field data sheet) or other custody record that remains with the sample. Include the date, your name, identification and the reason for opening the container. Place a new seal onto the container in such a way as to leave the position of the old seal clearly visible. It is important not to create the impression that there has been an attempt to cover up the fact that the container was opened, nor to delay documentation for another time. The most convincing documentation is done immediately, leaving no time lapses in the custody record.

Green Wire Identification Tags

Green wire labels with ID numbers are used to identify locked sample coolers or custody lockers. The serial number on each green label must be accurately copied onto the chain-of-custody section at the bottom of the Sample Data and Analysis Required form, also called the Field Data Sheet. This assures that those receiving the samples can positively identify the sample set with your paperwork.

A wire identification tag should be placed across the latch of a cooler or locker in such a way that the wire must be cut to open the sample cooler or package. This type of label can be used as evidence of security only if it must be broken to open the package or to remove the samples. If the package can be opened without removal of the wire tag, it cannot be used as proof that the samples are intact.

If the wire is cut by accident or mistake, you should immediately document the event on the chain-of-custody form, including with the date, your name, and purpose for opening the locker or container. A new seal should then be placed onto the custody locker and the new seal number documented on the chain-of-custody form.

Padlocks and Combination Locks

Padlocks and/or combination locks may be used to secure environmental samples that may be cited in any enforcement action. They may also be used to secure sample storage rooms/areas such as walk-in coolers or refrigerators, storage lockers, and custody sample coolers. Sample coolers that have lockable stainless steel cable loops or hasps are available from the laboratory for shipping enforcement samples, and are recommended especially for those samples which must be shipped or that cannot be locked into a secure area at all times. *Ask the laboratory for a custody cooler equipped with the stainless steel loops for affixing custody seals and padlocks.*

Security Procedures

Security procedures include such measures as locking the room where environmental samples are stored, employee sign-out for non-duplicable keys, the use of combination locks for securing environmental samples, and periodically changing the combinations of those locks. As with other security measures, these procedures are not absolutely foil-proof, but are designed to assure that the integrity of the samples cannot be compromised without more than a reasonable effort.

Locking of Sample Storage Areas

The security of the area where environmental samples are stored should be reviewed periodically. Considerations should include:

- Tighter security is not necessarily better security. The best security is that which results when reasonable measures are used consistently by all personnel, and never ignored or circumvented.

- Maximum security measures should be used during evenings and weekends when Ecology employees are not around. This might include the use of combination locks on the doors.

- Security measures should suit the use of the site and time of day. For instance, it would be time-consuming to have to open combination locks during the workday to enter an area that is used routinely. Even if sensitive samples are kept in the area, if employees are present all day a simple key lock will suffice.

- Individual locking storage areas may be provided within a larger refrigerated sample storage area to offer greater security for projects of small to moderate size.

- The combinations for locks should be changed periodically, and also whenever a sampler in the program or region leaves the agency.

Storing Security Seals/Tape/Tags

Items used as evidence of sample security should be stored in a secure area, and never discarded in a place accessible to the public. The security tape, tags and seals used by our agency are special-ordered and not commercially available; it would be difficult for anyone outside the agency to obtain them. These measures are taken to discourage the few people who would want to tamper with environmental samples taken by Ecology.

Request for Sample Analysis/Chain-of-Custody Forms

Sample Data & Analysis Required Form

Fill out the Sample Data & Analysis Required form (also called the chain-of-custody form) to accompany each project or group of samples to the laboratory. The Sample Data sheet requests the following information:

- Program Code, your five digit alphanumeric Program Index Code or PIC

- Project Code, a project number that is added by the laboratory

- Project/Name, the name of your project. We can enter up to 39 characters on our computer.

- Box to check for Enforcement/Custody

- Box to check to indicate Possible Toxic/Hazardous Notes

- Line on which to enter information about possible toxicity/sample hazards

- Box to check if the project is a Class 2 inspection
- Date and time of sampling
- Field station identification for each sample or sampling site
- Lab sample numbers for each sample (These are added at the laboratory unless you've requested sample numbers ahead of time)
- Matrix Code: Find the numerical matrix code corresponding to your sample on the back of the form.
- Source Code: Find the numerical source code corresponding to your sample on the back of the form.

Chain-of-Custody Record

Ecology's chain-of-custody record is found at the bottom of the Sample Data & Analysis Required form. It is to accompany each sample or group of samples. The record includes the following information:

- Sample number(s)
- Signature of collector
- Date and time
- Address of collection
- Sample type(s)
- Signatures of all persons involved in the chain of possession
- Inclusive dates of possession

Field Log Book

Record all information pertinent to a field survey or sampling event in a log book or project file. All records of conversations, field notes, analytical results, etc. should be filed with the project.

The following should be included in your field notebook as they are applicable:

- Date
- Name of the sample collector
- Location of sampling point
- Purpose of sampling
- Sample matrix or type

- Name and address of a contact person for the site
- Producer of material being sampled
- Address of producer if different from location

Additional helpful information would include suspected sample composition, including concentrations, number and volume of samples taken, description of sampling point and sampling method, date and time of collection, collector's sample identification number(s), sample distribution and how transported, references such as maps or photographs of the sampling site, field observations and measurements, and signatures of personnel responsible for the observations. If the sample is waste water, it would be important to identify the process that is producing the waste stream, if known. Because sampling situations vary widely, no specific rules can be given as to the information to be entered in the log book. It is desirable to record sufficient information so that one could reconstruct the sampling event without reliance on the collector's memory.

Reference: Standard Methods for the Examination of Water and Wastewater, 1989, 17th Edition. Edited by Lenore S. Clesceri, Arnold E. Greenberg, and R. Rhodes Trussell

CHAPTER 4

APPENDIX F

SAMPLE CONTAINER SELECTION

SAMPLE CONTAINERS

Analysis	Matrix	Minimum Volume Required	Container	Preservative	See Foot Note
Acidity	Water	250 mL	500 mL w/m poly	Cool to 4° C	
Alkalinity	Water	250 mL	500 mL w/m poly	Cool to 4° C	
BOD	Water	2000 mL	2 L w/m poly	Cool to 4° C	
Chloride	Water	100 mL	500 mL w/m poly	Cool to 4° C	
COD	Water	100 mL	125 mL w/m poly	H_2SO_4 to pH <2[c]	(S)
Color	Water	250 mL	500 mL w/m poly	Cool to 4° C	
Chlorophyll	Water	1000 mL	1000 mL amber poly	Cool to 4° C	
Conductivity	Water	250 mL	500 mL w/m poly	Cool to 4° C	
Cyanide	Water	250 mL	250 mL amber n/m poly	NaOH to pH >12 ascorbic acid [c]	(FTP)
Cyanide	Soil	100 g	125 mL glass jar	Cool to 4° C	
Fluoride	Water	100 mL	500 mL w/m poly	Cool to 4° C	
Fluoride	Soil	100 g	125 mL glass jar	Cool to 4° C	
Fluoride	Tissue	6 oz	Whirlpak Bags	Cool to 4° C	
Grain Size	Soil	--	Whirlpak Bags	Cool to 4° C	
Hardness	Water	100 mL	125 ml n/m poly	HNO_3 to pH<2[c]	(S)
Nitrogen, Total Kjeldahl	Water	125 mL	125 mL clear w/m poly	H_2SO_4 to pH<2[c]	(S)
-Ammonia	Water	125 mL	125 mL clear w/m poly	H_2SO_4 to pH<2[c]	(S)
-Nitrate	Water	125 mL	125 mL clear w/m poly	H_2SO_4 to pH<2[c]	(S)
-Nitrite	Water	125 mL	125 mL clear w/m poly	H_2SO_4 to pH<2[c]	(S)
Nuts 3*	Water	125 mL	125 mL clear w/m poly	H_2SO_4 to pH<2[c]	(S)
Oil & Grease	Water	750 mL	1 L glass jar	HCl to pH<2[c]	(L)
Oil & Grease	Soil	100 g	125 mL glass jar	Cool to 4° C	
pH	Water	100 mL	500 mL w/m poly	Cool to 4° C	
pH	Soil	100 g	125 mL glass jar	Cool to 4° C	
Phenol	Water	750 mL	1 L w/m glass jar	H_3PO_4 and $FeSO_4$ and $CuSO_4$ [c]	(S)
Phenol	Soil	100 g	125 mL glass jar	Cool to 4° C	
Phosphorus, -Total	Water	125 mL	125 mL clear w/m poly	H_2SO_4 to pH<2[c]	S
Phosphorus, -Ortho	Water	125 mL	125 mL amber w/m poly	Cool to 4° C	
% Solids	Soil	100 g	125 mL glass jar	Cool to 4° C	
Salinity	Water	250 mL	500 mL w/m poly	Cool to 4° C	
Silica	Water	250 mL	500 mL w/m poly	Cool to 4° C	
Solids 4,* -Solids	Water	1000 mL	1000 mL w/m poly	Cool to 4° C	
-Settleable	Water	1000 mL	1000 mL w/m poly	Cool to 4° C	
-Suspended	Water	1000 mL	1000 mL w/m poly	Cool to 4° C	
-Total Solids	Water	500 mL	500 mL w/m poly	Cool to 4° C	
Sulfide	Water	250 mL	500 mL w/m poly	Zinc acetate, NaOH to pH<9[c]	(S)

Analysis	Matrix	Minimum Volume Required	Container	Preservative	See Foot Note
Sulfide	Soil	100 g	125 mL glass jar	Zinc acetate, NaOH to pH<9[c]	(S)
Sulfate	Water	100 mL	500 mL w/m poly	Cool to 4° C	
TOC	Water	50 mL	60 mL n/m poly	H_2SO_4 to pH<2[c]	(S)
TOC	Soil	100 g	125 mL glass jar	Cool to 4° C	
Turbidity	Water	100 mL	500 mL w/m poly	Cool to 4° C	
Gen-Chem –Acidity –Alkalinity –Chloride –Color –Conductivity –Fluoride –pH –Sulfate –Turbidity	Water	1000 mL	1000 mL w/m poly	Cool to 4° C	
Fecal Coli (FC)	Water	250 mL	250 ml glass autoclaved bottle	Cool to 4° C	TH
Fecal Coli	Soil	250 g	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
Fecal Coli	Tissue	250 g	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
Total Coliform (TC)	Water	250 mL	250 mL glass autoclaved bottle	Cool to 4° C	TH
Total Coliform (ME)	Soil or Tissue	250 mL	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
Enterococci	Water	250 mL	250 mL glass autoclaved bottle	Cool to 4° C	TH
Enterococci	Soil or Tissue	250 g	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
Fecal Strep (FS)	Water	250 mL	250 mL glass autoclaved bottle	Cool to 4° C	TH
Fecal Strep (ID)	Soil or Tissue	250 mL	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
Bacterial ID	Water	250 mL	250 mL glass autoclaved bottle	Cool to 4° C	TH
Bacterial ID	Soil or Tissue	250 g	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
% KES	Water	250 mL	250 mL glass autoclaved bottle	Cool to 4° C	TH
Iron/Sulfur	Water	250 mL	250 mL glass autoclaved bottle	Cool to 4° C	TH
Iron/Sulfur	Soil or Tissue	250 g	Whirlpak Bags or sterile specimen cup	Cool to 4° C	
Micro-Biology*		500 mL	2 – 250 mL glass autoclaved bottles	Cool to 4° C	TH
Metals, Total	Water	500 mL	Metals cub/1 Liter poly (OF)	HNO_3 to pH<2	L
Metals, Diss.	Water	500 mL	Metals cub/1 Liter poly (OF)	Filter	
Metals, TCLP	Water	500 mL	Metals cub/1 Liter poly (OF)	--	
Metals, TCLP	Soil	250 mL	8 oz glass (OF)	--	

Analysis	Matrix	Minimum Volume Required	Container	Preservative	See Foot Note
Mercury	Water	500 mL	Metals cub or n/m glass jar	HNO_3 to pH<2	
Salmonid Bioassay (HW)	Solid/Liquid	50 g	250 mL glass jar (OF)	Cool to 4° C	
Salmonid Bioassay, Effluent	Water	10 gallons	2 – 5 gal cubitainers	Cool to 4° C	
Daphnia magna/ Daphnia pulex Acute test	Water	½ gallon	½ gal glass jars (OF)	Cool to 4° C	
Daphnia magna/ Daphnia pulex, 7d Chronic test	Water	2 gallons	1 gal glass jar x 2 (OF)	Cool to 4° C	
Cariodaphnia dubia 7 day Chronic test	Water	1 gallon	1 gal glass jar (OF)	Cool to 4° C	
Daphnia magna/ Daphnia pulex Solid phase test	Water	½ gallon	½ gal glass jar (OF)	Cool to 4° C	
Fathead minnow larval survival & growth, 7 day Chronic test	Water	10 gallons	5 gal cubitainer x 2	Cool to 4° C	
Marine Amphipod Solid phase test	Water	½ gallon	½ gal glass jar (OF)	Cool to 4° C	
Bivalve Larvae Pacific Oyster, Blue Mussel, 48hr Acute test	Water	5 gallons	5 gal cubitainer	Cool to 4° C	
Hyallella Azteca Solid phase test	Water	½ gallon	½ gal glass jar (OF)	Cool to 4° C	
Microtox photobacterium phosphoreum	Water	8 oz	8 oz glass jar (OF)	Cool to 4° C	
Echinoderm Sperm cell fertilization	Water	8 oz	8 oz glass jar (OF)	Cool to 4° C	
Acute Oral Rat Toxicity test	Water	8 oz	8 oz glass jar (OF)	Cool to 4° C	
BNA/PEST/PCB	Water	4000 mL	1 gal glass jar 9OF)	Cool to 4° C	
TCLP, BNA/PEST/PCB	Soil	250 g	8 oz glass jar (OF)	Cool to 4° C	
TCLP Herbicides	Water	2000 mL	½ gal glass (OF)	Cool to 4° C	
Phenols/ Gualcols/ Catechols	Water	400 mL	1 gal jar (OF)	H_2SO_4 to pH<2	
Resin Acids/Fatty Acids	Water	4000 mL	1 gal glass jar (OF)	NaOH to pH>10	
Herbicides	Soil	250 g	8 oz glass (OF)	Cool to 4° C	
Hydrocarbon, -Halogenated	Water	200 mL	250 mL glass jar (OF)	Cool to 4° C	
Hydrocarbon ID	Water	4000 mL	1 gal glass jar (OF)	Cool to 4° C	

Analysis	Matrix	Minimum Volume Required	Container	Preservative	See Foot Note
Hydrocarbon ID	Soil	250 mL	8 oz glass jar (OF)	Cool to 4° C	
Hydrocarbon ID	Product	40 mL	40 mL VOA vial	Cool to 4° C	
Hydrocarbon -Purgable -Chlorinated	Water	40 mL	40 mL VOA vial	Cool to 4° C	(FTP,2)
Lipids	Tissue	20 g	8 oz glass jar	Freeze	
Organophos -CI Pest/PCB	Water	4000 mL	1 gal glass jar (OF)	Cool to 4° C	
Organophos -CI Pest/PCB	Soil	250 g	8 oz glass jar (OF)	Cool to 4° C	
Total Organics					
-Total Organic Halides (TOX)	Water	500 mL	1000 mL amber n/m glass (OF)	Cool to 4° C	
EDB	Water	500 mL	1000 mL amber n/m glass (OF)	Cool to 4° C	
PAH	Water	4000 mL	1 gal glass jar (OF)	Cool to 4° C	
TPH	Water	4000 mL	1 gal glass jar 9OF)	HCl to pH<2, Cool to 4° C	(FP,P)
TPH	Soil	250 mL	8 oz glass jar (OF)	Cool to 4° C	(2,P)
VOA	Water	40 mL	40 mL VOA vial	HCl, Ascorbic acid, Cool to 4° C	(FTP,2,P)
BTEX	Water	40 mL	40 mL VOA vial	HCl, Cool to 4° C	
VOA	Soil	40 g	40 mL VOA vial or 2 oz septa jar	Cool to 4° C	
BTEX	Soil	40 g	40 mL VOA vial or 2 oz septa jar	Cool to 4° C	

n/m = narrow mouth w/m = wide mouth
(OF) = organic free with Teflon lined lids, with certificate of analysis
(WOC) = same cleaning procedure as (OF) but without certificate of analysis
cub = polyethylene cubitainer
FP = preservation needs to be done in the field
2 = use 2 sample containers per sample
P = purer the product the less volume needed
FTP = field test and preserve (see field procedure flow chart sent with field kits)
L = preserved in lab within 24 hours of arrival to lab
S = container is sent by lab with preservative in it
[c] = Cool to 4° C
*Nuts 3 = ammonia, nitrate/nitrite, total phosphorus
*Solids 4 = suspended, total, total non-volatile, and total non-volatile suspended solids
*Microbiology = FC, TC, ME, FS, ID, %KES Submit 1 = 500 mL bottle if two tests are requested, and an additional 250 mL for each additional test
TH = if chlorine is suspected in sample, then request bottle with Thio preservative in it.

CHAPTER 4

APPENDIX G

SHIPPING TIPS

SHIPPING TIPS

Air

Horizon Air Cargo

If it's convenient to your sampling site, you can ship your sample cooler or box via Horizon Air cargo lines, with which Ecology has an account. Packages must be taken to the Horizon Air freight office at the airport. Cities that have Horizon Air cargo service include:

Bellingham	Moses Lake
Pasco	Port Angeles
Pullman	Seattle
Spokane	Walla Walla
Wenatchee	Yakima

For departure times and directions to reach the air cargo office in each of these cities, call the Horizon Air freight office toll-free, **1-800-547-7660.**

Tips for shipping by air cargo:

- Ecology has an account number for shipping by Horizon Air; be sure to get the number from your office or program before you go out on the sampling event.

- Hazardous samples, such as flammable materials or compressed gases cannot be shipped by air cargo. They will accept radioactive materials in the White Label 1 or Yellow Label 2 categories.

- Take extra care in packing your samples for shipment, using plenty of packing material around the samples. Secure the cooler or container so it can't come open during shipment. Place styrofoam containers into cardboard boxes for shipment; Horizon Air won't accept styrofoam coolers or containers.

- Since air cargo doesn't deliver directly to the lab it is most important that you call us to let us know that the samples are coming. Alert someone in the Analytical Management group at the lab of the date and time the samples are to arrive. It is also helpful to have the air bill number so we can call the airline and make sure that the samples have arrived before going to the airport to pick them up.

- Horizon Air has requested that we not ship coolers containing ice, either loose or in bags. They have had a number of experiences with ice melting and leaking out of the coolers into the surrounding cargo. Frozen "Blue Ice" packets are a practical alternative to ice and can De reused. Use three or four for a full cooler. Dry ice coolant is fine.

- Ship the cooler or package to SeaTac airport for pickup by Ecology's Manchester Laboratory courier.

Bus

Greyhound Bus

Greyhound ranks second to Federal Express in cost. It has the advantage of having many shipping locations around the state.

There are a number of different types of Greyhound service, depending on the holding time requirements of your samples. The services include regular bus cargo, overnight service, same day service, and next bus out (NBO) service. The cost increases with the priority assigned. Next bus out service is approximately double the cost of regular service. Double check the arrival date for the various services before you ship.

Shipments have not always been on time for shipping samples with short holding times, but the number of Greyhound terminals around the state make it a practical way to ship less urgent samples.

Let us know when you're sending samples via Greyhound to the Olympia terminal and we'll pick them up. The Olympia terminal is preferred since our courier comes through Olympia daily.

Tips for shipping by Greyhound:

- Be sure to get the Ecology account number for shipping by Greyhound before you go out on the sampling event.
- Before traveling to a remote site find the location of the nearest Greyhound terminal. Call Greyhound for locations and schedules; they have handy printed schedules for their routes.
- Take extra care in packing your samples for shipment, using plenty of packing material around the samples. Secure the cooler or container so it can't come open during shipment.
- Alert someone in the Analytical Management group at the lab of the date the samples are to be at the Olympia Greyhound terminal. The laboratory courier reaches the Olympia Greyhound station around 7:20 A.M. daily. Routine sample shipments arriving in Olympia before that time get the fastest pickup and delivery to the lab. Please alert the lab if you have a critical or emergency project scheduled for arrival later in the day.
- Ship the samples to the Olympia Greyhound terminal for pickup by the Manchester Laboratory courier.

Common Carrier

United Parcel Service

United Parcel Service (UPS) is a reliable shipping service, offering next day air delivery as well as standard ground service. UPS is the least expensive way to ship samples from many locations.

Depending on your project, there can be some disadvantages to using UPS. Sample coolers must usually be taken to the UPS terminal, and UPS hours may not coincide with requirements for field sampling. Their offices close by 5:00 or 6:00 P.M. Call their toll-free number, 1-800-222-8333 for locations and schedules of UPS offices. We receive UPS shipments in a timely fashion but have experienced occasional breakage.

Tips for shipping by UPS:

- Be sure to get your program or office UPS account book for shipping by United Parcel Service before you go out on the sampling event. Check with your program or office to find out about the mobile UPS account book. If you don't have the account book you'll need cash or a personal check to ship by UPS; they don't take credit cards.

- Learn the location and the hours of the nearest UPS office before traveling to a remote site. Some UPS offices are open for only a few hours each day around the time of the daily pickup and delivery. Call their toll-free number, 1-800-222-8333 for locations and schedules of UPS offices.

- UPS places restrictions on the size and weight of the packages that they accept. The length plus the girth of the package cannot exceed 130 inches, and the weight must not exceed 70 pounds. The sizes of all of Ecology's coolers are well within these limits, and we are unlikely to exceed the weight restriction with our normal 48 or 54 quart size coolers.

- Samples to be shipped by UPS should be packed to withstand a four-foot drop without damage. Take extra care in packing your samples for shipment, using plenty of packing material around the samples. Secure the cooler or container so it can't come open during shipment.

- There are restrictions on shipping hazardous materials by UPS. If you know the name(s) of the chemical compound(s) contained in your sample, you can call United Parcel's toll-free number, 1-800-222-8333. They can tell you:

  -the DOT shipping name for the chemical(s) you've collected
  -the hazard class of the compound
  -the UN number
  -a list of the special labels required for shipping the material

UPS will inform you about requirements, but does not supply the necessary DOT labels for shipping hazardous materials. A surcharge of $5 is added to the shipping charges for packages containing hazardous materials. If you know in advance the probable names of the chemicals you'll be sampling, it's a good idea to call a few days ahead of the sampling event so you can have all of the required materials and labels on hand. Packages containing hazardous materials must be taken to the terminal, and can't be shipped from a pickup point.

- UPS now requires the use of non-leaking ice in our shipments.

- Allow ample time for shipping when collecting samples with short holding times. If possible, collect those samples last to allow the maximum holding time possible.

- Double check the arrival date for the various services offered by UPS before you ship. In some areas of the state, especially away from cities, we've found that packages sent by ground service may arrive on the same day as the more, expensive Next Day Air service.

- When you return to the office, send a copy of your shipping receipt to Roberta Payne in the Fiscal office. It is the responsibility of that office to verify UPS shipping charges on a weekly basis.

- Ship samples and other packages directly to the Manchester Laboratory.

Federal Express

Federal Express is a fast, reliable way to ship samples. It is the most expensive method, and thus is less used than the other carriers, but for a really time-critical sample it may be worthwhile. Federal Express operates on Saturdays as well as weekdays, which can be an advantage for shipping. Saturdays are not regularly scheduled workdays for the laboratory so deliveries should not be scheduled on Saturday except by prior arrangement. If you have a critical project that must be sent over a weekend, call ahead to be sure that someone will be at the lab to receive the samples.

Tips for shipping by Federal Express:

- Ecology has an account number for shipping by Federal Express: be sure to get the number from your office or program before you go out on the sampling event.

- Federal Express provides a list of all of their locations in a comprehensive book.

- Samples to be shipped by Federal Express should be packed to withstand a four-foot drop without damage.

- Federal Express places restrictions on the size and weight of the packages that they accept. The length plus the girth of the package cannot exceed 130 inches, and the length in the longest dimension cannot exceed 108 inches. The weight must not exceed 150 pounds, significantly higher than the UPS weight limit of 70 pounds. The size and weight of all of Ecology's coolers are well within these limits.

- There are restrictions on shipping hazardous materials by Federal Express. If you know the name(s) of the chemical compound(s) contained in your sample, you can call Federal Express' toll-free number. 1-800-238-5355, Monday through Friday from 7:00 A.M. to 8:30 P.M., Saturdays 8:00 A.M. to 5:00 P.M., Eastern Standard Time. Ask for extension 1666, which is the hazardous material shipping information hotline. They can tell you:

    -the DOT shipping name for the chemical(s) you've collected
    -the hazard class of the compound
    -the UN number
    -a list of the special labels required for shipping the material

If you know in advance the probable names of the chemicals you'll be sampling, it's a good idea to call a few days ahead of the sampling event so you can have all of the required materials and labels on hand.

Courier Service/Shipping Recommendations from Ecology Offices

From the Southwest Regional Office

Courier service for Ecology samples is available from the Southwest Regional Office Monday through Friday at 7:00 A.M. Samples should be left in the walk-in cooler in the boat shed building. A copy of the Sample Data & Analysis Required form or a note about where to find the samples should be left in the "In-basket" just inside the door leading to the cooler, the one on the far end of the building. This alerts the courier that the samples are ready to be taken to the lab. There are often a number of samples in the

walk-in cooler that are not ready for transport to the lab, so the signal of the paperwork is important to distinguish your project from the others and avoid delays in transport and analysis.

Shipping From Other Locations in Olympia

Daily courier service is available from other locations in Olympia as requested either by submitting a Request for Analysis form or by telephone request. The courier starts work from the Southwest Regional Office Monday through Friday at 7:00 A.M.

Shipping From the Northwest Regional Office

Service from the Northwest Regional Office is available upon request, either by submitting a Request for Analysis form or by telephone request. Telephone the lab between the hours of 8:00 A.M. and 4:30 P.M. Couriers are sent routinely to commercial laboratories in the Seattle/Redmond area; please call for courier service as early in the day as possible so that sample pickup can be included with one of our regular trips.

Since the laboratory is within the Northwest Region, it may sometimes be convenient for you to transport samples to the laboratory yourself. Let us know if this is your intention and we'll be expecting you, alerting the front desk that you're coming. The laboratory's work schedule is Monday through Friday from 8:00 A.M. to 4:30 P.M.; it's especially important to make arrangements with us in advance if you'll be arriving outside these hours.

Shipping From the Central Regional Office

Samples are typically shipped from the Central Regional Office via either United Parcel Service (UPS) or Greyhound bus service. Tips from experienced shippers in the Central Region include:

Shipping from Yakima by United Parcel Service, UPS

- There are two ways to ship samples via United Parcel Service in Yakima. The first is to ship from Ecology's Washington Street office. UPS picks up packages from the Washington Street office in Yakima Monday through Friday by 2:30 P.M. Let the secretary at Washington Street know if you'll have samples for shipment by UPS. The secretary will add the Ecology UPS account number and make sure that they are picked up.

The other way to ship via UPS is to take the package or cooler to the UPS office. UPS in Yakima is at 501 West Valley Boulevard. They're open from 1:00 to 6:00 P.M. Monday through Friday.

Shipping from Yakima by Greyhound bus

- The Greyhound terminal in Yakima is open for freight service from 8:00 A.M. to 4:30 P.M. Monday through Friday, and Saturdays and Sundays from 8:00 A.M. to 4:00 P.M. The phone number for Greyhound in Yakima is (509) 457-5131. If you plan to ship by Greyhound, it's a good idea to get the bus schedule from Yakima or from the terminal nearest your sampling site to Olympia before leave for the sample site.

The last bus for Olympia leaves Yakima each day at 3:40 P.M. The time of arrival in Olympia depends on the amount of other freight being shipped and/or the type of service is requested. Next Bus Out service guarantees that the samples will be in Olympia by 9:00 A.M. the next day. The exact time of arrival for other types of Greyhound service depends on the amount of freight being carried on the bus.

- Allow enough time to get to the Greyhound station at 602 East Yakima Avenue about a half hour before the bus departure time.

- See the general tips for shipping by Greyhound.

Shipping from Yakima by Horizon Air cargo

- Packages to be shipped via Horizon must be taken to Horizon Air freight at the Yakima airport. To reach the freight door, as you drive around the one-way circle around the Yakima airport, turn before you reach the terminal into the free freight parking area. If you pass the freight parking lot you'll have to go around the airport circle again. Take your package or sample cooler to the Horizon freight door on the backside of the building. Their hours are from 5:00 A.M. to .12:00 P.M. daily.

The last flight from Yakima to SeaTac leaves at 7:15 P.M. Monday through Friday. This means that the packed sample coolers can arrive at the terminal as late as about 6:45 P.M. Monday through Thursday evenings and arrive at SeaTac for next morning pickup by the lab courier. For more information about departure times, call the Horizon Air freight office toll-free, 1-800-547-7660, or the Horizon freight office in Yakima at (509) 248-8695.

- See the general tips for shipping by Horizon Air Cargo.

Shipping From the Eastern Regional Office

Samples are shipped from the Eastern Regional Office via Horizon Air, United Parcel Service (UPS) or Greyhound bus service. Shipping instructions from experienced shippers in the Eastern Region include:

Shipping from Spokane by Greyhound bus

- Learn the Greyhound schedule from Spokane to Olympia before going out on the sampling event. The courier reaches the Olympia Greyhound station around 7:20 A.M. daily. Samples arriving in Olympia by that time get the fastest pickup and delivery to the lab. The last bus in the evening from Spokane to Olympia is at 6:30 P.M. If you want to ship by Greyhound, your sampling event must be timed so the packed sample coolers arrive at the terminal by around 6:00 P.M. This consideration may affect your choice of methods of shipment. The phone number for Greyhound in Spokane is (509) 624-5251.

- Allow enough time to get to the Greyhound station at West 1125 Sprague Street about a half hour before the bus departure time.

- See the general tips for shipping by Greyhound.

Shipping from Spokane by United Parcel Service. UPS

There are two ways to ship samples via United Parcel Service in Spokane. The first is to ship from the Regional office; UPS picks up packages from the office in Spokane Monday through Friday at 1:00 P.M. Let the office receptionist know if you'll have samples for shipment by UPS. The receptionist will add the Ecology UPS account number and make sure that they are picked up.

The other way to ship via UPS is to take the package or cooler to the UPS office at North 1016 Bradley Road. Their hours are from 9:00 A.M. to 5:30.P.M. Monday through Friday. Packed sample coolers must

arrive at the terminal by about 5:15 P.M. For the locations and hours of other UPS offices call their toll-free number, 1-800-222-8333.

- See the general tips for shipping by UPS.

Shipping from Spokane by Federal Express

There are three locations from which to ship packages via Federal Express from Spokane. First, Federal Express will pick up packages at the Regional office upon telephone request. To arrange for pickup, call toll-free, 1-800-238-5355, Monday through Friday from 7:00 A.M. to 8:30 P.M., Saturdays 8:00 A.M. to 5:00 P.M., Eastern Standard Time. Call before 3:30 for same-day pickup. Let the office receptionist know if you'll be shipping a package.

The other two locations from which to ship via Federal Express are at 515 North Havana, open from 8:00 A.M. to 5:00 P.M. Monday through Friday, and the Federal Express office at the airport at West 8404 Aviation Avenue, open from 8:00 A.M. to 5:45 P.M. Monday through Friday.

- See the general tips for shipping by Federal Express.

Shipping from Spokane by Horizon Air cargo

Packages to be shipped via Horizon must be taken to the cargo building at the Spokane airport. Their hours are from 6:00 A.M. to 10:00 P.M. Monday through Friday, and 6:00 A.M. to 1:00 P.M. on Saturdays. Horizon Air freight is not open on Sundays.

The last flight out of Spokane to SeaTac leaves at 9:30 P.M. Monday through Friday. This means that the packed sample coolers can arrive at the terminal as late as about 9:00 P.M. Monday through Thursday evenings and arrive at SeaTac for next morning pickup by the lab courier. For more information about departure times, call the Horizon Air freight office toll-free, 1-800-547-7660, or the Horizon freight office in Spokane at (509) 455-6950.

- See the general tips for shipping by Horizon Air Cargo.

Courier Service from Seatac Airport

Pickup at Seatac Airport is available upon telephone request. Ship samples with paperwork to the airport via Horizon Air cargo service, and call (206) 895-4737, SCAN 744-4737, alerting someone in the Analytical Management unit where and when the samples will be ready for pickup.

Special Arrangements

If none of these points is accessible from your sampling site, arrangements must be made with the lab for special sample pickup or shipment by a commercial carrier.

Note: Please be sure to let us know by telephone that you will be dropping samples off at a special pickup point. We

don't want your samples to become stranded.

Courier service from the laboratory to Olympia

Courier service from Manchester on Monday through Friday afternoons brings mail, analytical data packages, sample containers and sample coolers from the lab to SWRO, Woodland Square, the Industrial section, the Olympia Greyhound terminal and other locations as required.

CHAPTER 4

APPENDIX H

HOLDING TIMES FOR ENVIRONMENTAL ANALYSES

Holding Times for Environmental Analyses

Analysis	Holding Time	Preservation
Microbiology		
Coliform, fecal and total	30 hours	Cool to 4°C, 0.008% $Na_2S_2O_3$
Enterococci	30 hours	Cool to 4°C, 0.008% $Na_2S_2O_3$
Fecal Streptococcus	30 hours	Cool to 4°C, 0.008% $Na_2S_2O_3$
Klebsiella	30 hours	Cool to 4°C, 0.008% $Na_2S_2O_3$
Iron and sulfur bacteria	30 hours	Cool to 4°C, 0.008% $Na_2S_2O_3$
General Chemistry		
Acidity	14 days	Cool to 4°C
Alkalinity	14 days	Cool to 4°C
Ammonia NH_3	28 days	Cool to 4°C, H_2SO_4 to pH<2
BOD 5	48 hours	Cool to 4°C
BOD5 Inhibited	48 hours	Cool to 4°C
BOD 20	48 hours	Cool to 4°C
BOD 20 Inhibited	48 hours	Cool to 4°C
COD	28 days	Cool to 4°C, H_2SO_4 to pH<2
Color	48 hours	Cool to 4°C
Chloride	28 days	None required
Chlorophyll	24 hours	Cool to 4°C, keep away from sun
Conductivity	28 days	Cool to 4°C
Cyanide	14 days	Cool to 4°C, NaOH to pH>12, 0.6 g ascorbic acid*
Cyanide in Soil	14 days	Cool to 4°C
Fluoride in Water	28 days	None required
Fluoride in Soil	28 days	None required
Fluoride in Tissue	6 months	None required
Grain Size Sediments	6 months	None required
Hardness	6 months	HNO_3 to pH<2
Total Kjeldahl Nitrogen (TKN)	28 days	Cool to 4°C, H_2SO_4 to pH<2
Total Persulfate Nitrogen (TPN)	28 days	Cool to 4°C, H_2SO_4 to pH<2
Nitrate NO_3	48 hours	Cool to 4°C, H_2SO_4 to pH<2
Nitrite NO_2	48 hours	Cool to 4°C, H_2SO_4 to pH<2
Nitrate-Nitrite NO_3-NO_2	28 days	Cool to 4°C, H_2SO_4 to pH<2
Nuts	28 days	Cool to 4°C, H_2SO_4 to pH<2
Total Phosphate PO4	28 days	Cool to 4°C, H_2SO_4 to pH<2
Ortho Phosphate PO4	48 hours	Filter, cool to 4°C

*Used in the presence of residual chlorine.

Holding Times for Environmental Analyses, continued

Analysis	Holding Time	Preservation
Oil & Grease (O&G)	28 days	Cool to 4°C, HCI to pH<2
Oil & Grease in Soil	28 days	Cool to 4°C
pH	24 hours	Cool to 4°C
pH soil	24 hours	Cool to 4°C
Phenolics in Water (4AAP)	28 days	Cool, H_3PO_4, $FeSO_4$ and $CuSO_4$
Phenolics in Soil (4AAP)	28 days	Cool to 4°C
Total Phosphorus	28 days	H_2SO_4 to pH<2
Salinity	28 days	Cool to 4°C
Total (TS)	7 days	Cool to 4°C
Total Suspended (TSS)	7 days	Cool to 4°C
Total Volatile (TVS)	7 days	Cool to 4°C
Total Non-Volatile (TNVS)	7 days	Cool to 4°C
Total Non-Volatile Suspended (TNVSS)	7 days	Cool to 4°C
Total Dissolved (TDS)	7 days	Cool to 4°C
Settleable (SS)	48 hours	Cool to 4°C
Percent Solids, Soil/Tissue	7 days	Cool to 4°C
Solids 4 (TS, TSS, TNVS, TNVSS)	7 days	Cool to 4°C
Silica	28 days	Cool to 4°C
Specific conductance	28 days	Cool to 4°C
Sulfate	28 days	Cool to 4°C
Sulfide in Water	7 days	Zinc acetate, NaOH to pH>9
Sulfide in Soil	7 days	Zinc acetate, NaOH to pH>9
Surfactants	48 hours	Cool to 4°C
Turbidity	48 hours	Cool to 4°C
TOC in Water	28 days	H_2SO_4 to pH<2
TOC in Soil	28 days	None required
Metals		
Metals, except Hg and Cr VI	6 months	HNO_3 to pH<2
Metals, dissolved		Filter
Mercury in Water	28 days	HNO_3 to pH<2
Chromium VI (Hexavalent)	24 hours	Cool to 4°C

Holding Times for Environmental Analyses, continued

Holding times for organic analytes in water samples are often shorter than those for soil. Some of the entries in the column marked "Holding Time" below show two values separated by a slash (/). The first value is the holding time for water and the one to the right of the slash is the holding time for soils or sediments.

Analysis	Holding Time	Preservation
Organic Chemistry		
Semivolatiles, BNA	7/14 days	Cool to 4°C
Volatile Organics, VOA	7/14 days	Cool to 4°C, HCI, ascorbic acid
VOA Air Toxics		Room temperature
BETX	14 days	Cool to 4°C, HCI
Pesticides/PCBs	7/14 days	Cool to 4°C
PCBs only	7/14 days	Cool to 4°C
Organophosphorus pesticides	7/14 days	Cool to 4°C
Herbicides	7/14 days	Cool to 4°C
Hydrocarbon, chlorinated	7/14 days	Ascorbic acid
Tri-butyl tin	7/14* days	Cool to 4°C
Resin/Fatty acids	30 days	NaOH to pH>10, cool to 4°C
Phenolics (Guaiacols/Catechols/Phenols)		
PAH, Polynuclear aromatic hydrocarbons	7/14 days	Cool to 4°C
PAH Hazardous Waste Designation w/o HPLC	7/14 days	Cool to 4°C
TOX	14 days	Cool to 4°C
TPH, Total Petroleum Hydrocarbons	7/14 days	HCI to pH<2, cool to 4°C
Hydrocarbon ID	7/14 days	Cool to 4°C
Organic Screen (PAH, Phenolics, Creosote, etc.)		
Halogenated Hydrocarbons, HH	7/14 days	Cool to 4°C
% Lipids	NA	Freeze

*Frozen sediments can be held for 1 year before analysis per Puget Sound Estuary Protocol (PSEP) Guidelines.

Holding Times for Environmental Analyses, continued

Analysis	Recommended Holding Time	Preservation
Other Analyses		
Ignitability	None	Cool to 4°C
Air Filters	None	None
Asbestos	1 year	None
Personal Monitors	None	None

Although aquatic toxicology does not have specific holding time requirements, holding times are recommended by the methods and protocols. Recommended holding times are listed below.

Analysis	Recommended Holding Time	Preservation
Aquatic Toxicology		
HW Designation Salmonid	None	Cool to 4°C
Acute tests:		
Salmonid	72 hours	Cool to 4°C
Microtox	72 hours	Cool to 4°C
Hyallela	72 hours	Cool to 4°C
Daphnia sp.	72 hours	Cool to 4°C
Echinoderm Sperm Cell	72 hours	Cool to 4°C
Bivalve Larvae	72 hours	Cool to 4°C
Chronic tests:		
Daphnia sp.	72 hours	Cool to 4°C
Ceriodaphnia	72 hours	Cool to 4°C
Solid Phase Acute tests:		
Marine Amphipod (*Rhepoxynius*)	2 weeks	Cool to 4°C
Freshwater Amphipod (*Hyallela*)	2 weeks	Cool to 4°C
Daphnia magna	2 weeks	Cool to 4°C
Microtox	2 weeks	Cool to 4°C

CHAPTER 5. ENFORCEMENT

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CHAPTER 5. ENFORCEMENT

General Guidelines

Resources

This section is intended to give the inspector basic information related to enforcement. It is for the most part excerpted from the Ecology Enforcement Manual (July, 1990) and from Modules One and Two of the 1991-92 Enforcement Training presented by the Enforcement Unit, Central Programs. Inspectors are encouraged to consult these references for more detailed enforcement information.

Administrative/Civil Enforcement

Background of Civil Actions--Civil suits are suits in which the plaintiff (the party bringing the lawsuit) seeks to remedy a violation of a private right. Originally, civil cases could only result in monetary judgements and generally these cases were only among citizens. Over time, the concept of “injunctive relief” evolved, which allowed courts to stop an undesirable activity.

Modern government has found civil cases a good means of influencing citizens to do, or to stop doing, whatever the government wants done, or stopped. A government agency using the procedures of "administrative enforcement" acts on behalf of the citizens to protect private rights.

Administrative Enforcement--Enforcement of the law through civil judicial litigation is slow, cumbersome, and costly. Moreover, the enforcement of environmental regulations is often both scientifically and economically complex. Therefore, agencies have been given authority, through the statutes, to directly enforce laws and regulations. Essentially, the government has created a judicial system within the Executive Branch of the government.

Nearly all of the statutes enforced by Ecology contain provisions for civil enforcement. The details of each statute very widely, but the standard civil enforcement tools granted include Notices of Violations, Orders and Penalties.

Conditions of Administrative Enforcement--

> Standard of Proof--Civil enforcement actions require that a "preponderance of evidence" be against the defendant. This standard is commonly described as the 50% standard because as long as the agency issuing the action can "tip the scales" of evidence in its favor then a judgement will usually be in its favor.
>
> Evidence Allowed--The strict rules of evidence which are required in the trial courts are somewhat relaxed in civil litigation. Hearsay is allowed, public notice requirements are relaxed, and rights to hearings with a jury are relaxed.

Criminal Enforcement--Criminal suits are actions in which the state seeks to correct a violation of public or collective rights which are established in codified law. A common misconception is that government agencies pursue extreme violations with criminal prosecution. The truth, however, is that criminal cases are turned over to the Office of the Attorney General and they pursue the case on behalf of the state, not the agency.

> What Constitutes a Criminal Violation?--Generally, criminal behavior is defined as violation which was conducted knowingly, or intentionally and/or willfully. Additionally, any fraudulent reporting, testimony or record keeping is also considered a criminal action. Like civil enforcement, nearly all statutes being enforced by Ecology contain provisions for criminal actions.

Recognizing Potential Criminal Violations--Evidence of criminal wrongdoing is seldom blatant, and is usually quite subtle. Therefore the inspector should be alert to the types of findings listed below and view these as "red flags" which may indicate criminal action:

- Conflicting data: two sets of books, inconsistent monitoring reports of the same incident
- Conflicting stories: when an inspector is led to believe one thing, yet he/she finds something quite different in records or through observation
- Deliberate actions: when an employee says he was told to do something illegal
- Claims of ignorance about requirements: copies displaying knowledge are discovered in the records, or others make statements during interviews of knowledge

The above list is by no means all-inclusive. The point is, any conduct that may show an intentional and willful violation of the law could, be a criminal action.

Handling Possible Criminal Violations--A common mistake made by civil inspectors is to "back-away" from an inspection when possible criminal evidence is discovered. Just the opposite is the correct procedure when handling these inspections. When probable criminal activity is discovered, continue your inspection, gather appropriate samples and photographs. Take great care to properly document your observations by taking complete field notes, including the names and statements of witnesses, times, dates, and specific locations of records or equipment which may be useful in a later search.

Only in rare circumstances can information gathered during a Civil inspection be detrimental to a criminal case. There is never a need to issue a "Miranda warning" in a civil inspection. Generally, the information gathered in a civil inspection will be used as evidence to obtain a search warrant by the criminal investigator. In short, the civil inspection often determines the "probable cause" that is necessary for a criminal case.

Referring Possible Criminal Actions--Communication with the Criminal Investigations Unit is the key to any criminal case. When an inspector discovers possible criminal activity, they should phone the Criminal Unit to discuss the case and evidence discovered. If following these discussions, the inspector wants to officially refer the case, they should complete a criminal referral form and send it to the Criminal Unit. *The Criminal Unit does not consider phone conversations a formal case referral*. The Criminal Investigations Unit can be reached at 587-5086 or 553-8306.

Conditions of Criminal Enforcement--

> Standard of Proof--To prove a criminal violation, a prosecutor must prove his or her case 'beyond a reasonable doubt." If a reasonable doubt exists in the trier's mind about the defendant's guilt after the conclusion of a criminal case, the defendant is to be acquitted. This burden is much greater than the "50 percent standard" used in civil cases.
>
> Evidence Allowed--Because of possible violations to a defendants constitutional rights, the types of evidence allowed in a criminal case are much more stringent than in a civil case. Investigators may search a person or a person's property seeking evidence of alleged criminal activity only: (1) with the consent of the person; or (2) after obtaining a warrant based upon sworn testimony demonstrating that there is "probable cause" to believe that a crime has been committed and that the search is necessary to obtain evidence of the crime.

Preparing a Recommendation for Enforcement (RFE)

Time Period--The length of time between the inspection and enforcement action issue date is a commonly raised issue at Pollution Control Hearings Board (PCHB) hearings. The Board or opposing counsel often inquires "If this violation is so great as to justify this enforcement, why did it take Ecology (X number) of months to send the violating party the enforcement action?" Clearly this question puts Ecology in a very embarrassing position. Therefore, RFE's should be completed within two months after finishing the inspection.

Elements of the RFE--Like the inspection report, there is no standard recommendation for enforcement format which all inspectors use. Included in Chapter 5, Appendix A is the "boilerplate" outline of an RFE which is found in the *Enforcement Manual*. With word processors, large sections of the inspection report can be “cut and pasted” into the Recommendation for Enforcement.

Determining the Penalty Amount

Penalty Purpose--Both the Civil Courts and the Environmental Hearings Boards have ruled that civil penalties are not "punitive." Rather they are an enforcement tool which provides economic motivation to ensure compliance with the law. Civil penalties are viewed as a means for influencing the behavior of both the violator and the general regulated community. They are aimed at securing the correction of problems and the deterrence of future violations. It is not the

function of a penalty to compensate the public for a tangible loss. Three factors are used by the Hearings Boards to determine if the penalty amount assessed was reasonable.

Hearings Board's factors used to determine appropriate penalty amount include:

1. *The nature of the violation*
2. *The prior behavior of the violator*
3. *Actions taken by the violator to correct the problem*

The Nature of the Violation--The most significant factor is the nature of the violation. This factor involves both the gravity of the violation and the circumstances of its occurrence.

Specific criteria to be considered include:

- Severity of the violation in terms of public health and/or environmental impact. (Does not apply to NPDES violations, see PCHB 87-82)

- Magnitude of the violation in terms of type or amount of pollutant and resources affected and the duration or number of specific violations

- The degree of negligence involved in the violation, whether the violation was intentional, and precautions taken to prevent the violation

- The expressed statutory purpose

- Financial incentives to violate requirements or to continue violation

The Prior Behavior of the Violator--It is essential that you have a written record to document when the violation was first observed and what opportunities the violator has been given to comply. The board considers the overall compliance history as well as the specific history of the facility you are citing.

Specific criteria to be considered include:

- Record of similar violations or a pattern of violations indicating general disregard of environmental laws and rules

- Any past efforts to acquaint the violator with applicable requirements

Actions Taken by the Violator to Correct the Problem--Remedial actions are relevant because the purpose of civil penalties is to deter future violations of both the perpetrator and the general regulated community. The most influential post-violation activities are those occurring between the time the violations occurred and the time the penalty was assessed.

Specific criteria to be considered include:

- Degree of cooperation of the violator in working toward compliance
- Timeliness and appropriateness of corrective actions taken by the violator
- Compensation paid or agreed to for damages to public resources

Recommended Procedure--The Recommendation for Enforcement (RFE) should include a section which describes the rationale used to determine the appropriate penalty amount for each violation. The justification need only be a few sentences long and should address the same factors the Hearings Board will use when it hears an appeal. The following format could be used.

Example:

Violation Description

Unpermitted release of paint stripping rinse water.

Nature of Violation (Considers both the gravity of the violation and the circumstances of its occurrence)

This unpermitted release of paint stripping rinse water discharges onto a public beach where shellfish are harvested. The estimated rate of flow was 10 gpm. The concentration of metals in the sample collected was 5000 ppm. This discharge has an impact on both the environment and human health.

Prior Behavior of Violator (What opportunities the violator has been given to comply. The board considers the overall compliance history of the facility as well as the specific history for the violation you are citing)

The facility was first inspected on 1/10/89. During the inspection verbal warnings were issued (refer to field notes). A follow up inspection on 7/15/89 found that periodic discharges still occurred. A Notice of Violation (NOV) was issued 9/20/89. A follow up inspection was done on 2/10/90; the observations made at the 2/10/90 inspection are the basis for this penalty.

Actions Taken by Violator to Correct the Problem (The most influential post-violation activities are those occurring between the time the violations occurred and the time the penalty was **assessed)**

This violation was first noted on 1/10/89. The violation was documented to be occurring on 7/15/89 and as late as 2/10/90. In over a year this facility has done nothing to eliminate the illegal discharge.

Recommended Penalty Amount = $25,000

Appeals Process

How Your Enforcement Action Gets Appealed--All enforcement actions taken by Ecology are appealable. However, appeal procedures differ for different enforcement actions. Any *penalty* issued by the Department is appealable to Ecology as well as to the Pollution Control Hearings Board (PCHB). *Orders*, on the other hand, can only be appealed to the PCHB. See Figure 5-1.

Appeal to Ecology--

Step 1 - The penalized party submits an "Application for Relief (AFR)"
An AFR is a statement by violating parties which discusses why they feel Ecology's action was unjust or unduly harsh and why the action should be rescinded or reduced.

Ecology will only overturn or mitigate an enforcement action when new facts regarding the specific violation are presented.

EXAMPLE #1: In February 1986, Ecology inspectors found Packwood Lumber Company was discharging oil and pentachlorophenol (PCP) to Hall Creek. These discharges resulted in a large fish kill in the creek and Ecology penalized Packwood $30,000 for this violation. Packwood Lumber Company submitted an AFR requesting the penalty be mitigated for several reasons, some of which include: Packwood has not had time to conduct its own analyses of alleged pollutants; they are unaware of any spill of PCP; they do not believe that the drippings of PCP onto the ground could result in a discharge into the creek; any discharges which may have occurred could not have killed fish; the amount of oil Packwood is discharging is insignificant and posses no treat to humans or the environment; and Packwood has now implemented measures to prevent any future problems. *Ecology found no new facts or information in the AFR. Therefore they affirmed the penalty.*

EXAMPLE #2: In February 1989, the Wallula Boise Cascade paper mill experienced an air quality violation due to illegal releases of noncondensible gases (NCG). Ecology penalized Boise $900 for the violation. Boise Cascade submitted an AFR stating that the violation they were charged with was beyond their control and could not have been prevented. Their AFR stated that equipment used to treat NCGs became inoperable due to extremely cold temperatures not normally associated with the area. After reviewing the case, Ecology personnel determined that this release probably was unpreventable; furthermore, this Boise Cascade facility has a fairly good history of compliance. Therefore the penalty was canceled.

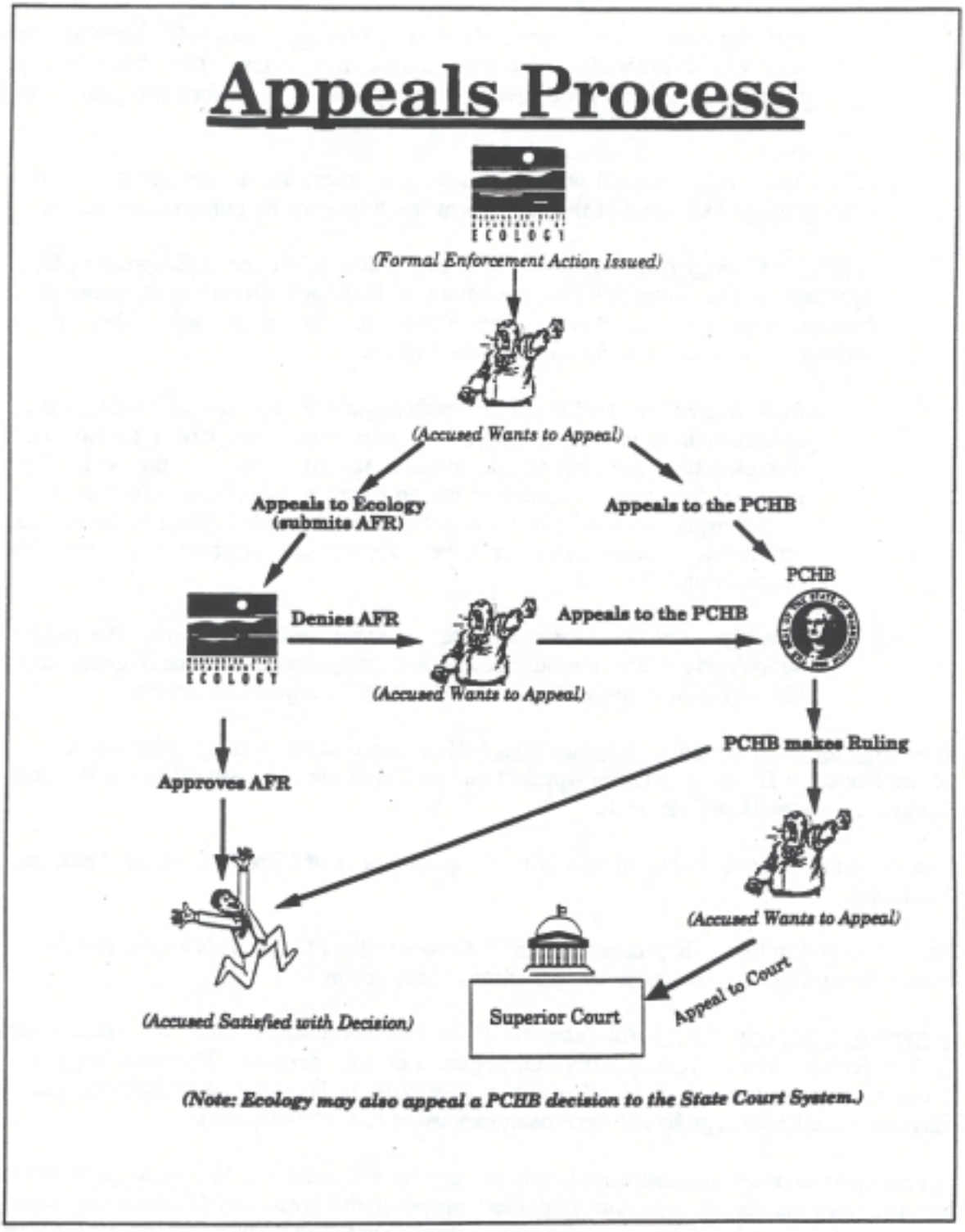

Figure 5-1
The appeals process.

AFR's must be submitted within 15 days after receiving an enforcement action. Ecology supplies a copy of the AFR form when it sends an enforcement action.

STEP 2 - Ecology responds to an AFR by sending a "Notice of Disposition Upon Application For Relief." This document is Ecology's formal notification of its decision regarding the AFR. The Notice of Disposition will either affirm, mitigate, or cancel the enforcement action taken.

Reviewing of the AFR is the responsibility of the inspector who originated the enforcement action. Generally, inspectors should prepare a memo which discusses how they feel the department should respond to the AFR. This memo should then be routed to the appropriate supervisor. Upon approval of the inspector's recommendation, the action should be given to the region's enforcement coordinator or other appropriate support staff for final preparation.

The Notice of Disposition will use the same docket number as the original action and requires the same review and routing process as the original action. Ecology should respond to an AFR within 30 days of it's receipt.

Appeal to an Environmental Hearings Board--If the accused are unhappy with the decision of the Notice of Disposition Upon Application For Relief, they can appeal to the Pollution Control Hearings Board (PCHB).

This appeal must occur within 30 days of receiving the Notice of Disposition Upon Application For Relief.

Persons may skip the AFR process and apply directly to the PCHB. This appeal must occur within 30 days after receiving Ecology's enforcement action.

Appeal to a Superior Court--All decisions of the PCHB are appealable to a higher court. Either Ecology or the violating party may appeal a Board's decision. However, appeals to a court can only be made after all administrative options, i.e., appeals to Ecology and an Environmental Hearings Board have been exhausted (RCW 34-05.534).

A court review of an administrative action or decision will usually be limited to questions of law, i.e., were the correct procedures followed, proper notice given, etc. Courts rarely review the facts of a case, such as, were standards actually exceeded or were testing procedures correct.

Do Your Actions Get Appealed?--Yes! Nearly 25% of all enforcement actions are appealed (based on 1985-89 data). Assume that every enforcement action you take will be appealed. This will insure that you investigate properly by taking good field notes, samples, and photos and citing proper RCWs and WACs.

The PCHB

What is the PCHB?--The Pollution Control Hearings Board (PCHB) was created in 1970 as part of the Environmental Hearings Office. The Board was created to provide a faster and more efficient procedure to handle appeals from decisions made by Ecology and all Air Authorities (RCW 43.21B).

Members and Terms--The PCHB consists of three members who are qualified experts in matters pertaining to the environment. One member must be an attorney and all members are appointed by the governor with the consent of the senate. PCHB members serve staggered, six year terms.

What Cases Can the Board Hear?--First of all, the PCHB strongly encourages settlements between all parties rather than litigation. However, cases which cannot be settled must be appealed to a board within 30 days after receipt of Ecology's Notice of Penalty or Notice of Disposition Upon Application for Relief.

The PCHB only has jurisdiction to hear and decide appeals from decisions made by Ecology, air pollution control boards, or local health departments. The PCHB is limited to hearing only the following types of cases:

- Civil penalties issued under the Clean Air Act (RCW 70.94), Dangerous Waste Act (RCW 70.105), Noise Control Act (RCW 70.107), Water Code 1917 Act (RCW 90.03), and Water Quality Act (RCW 90.48)

- Orders issued under the Water Resources Act (RCW 43.27A), Clean Air Act (RCW 70.94), Dangerous Waste Act (RCW 70.105), Flood Control Act (RCW 86.16), Water Rights Act (RCW 90.14) and Water Quality Act (RCW 90.48)

- The issuance, modification or termination of any permit, license or certificate granted by Ecology or one of it's appointed authorities

- Decisions of local health departments regarding solid waste permits

What Cases Cannot be Heard by the Board?--Hearings relating to the formation of air quality authorities, air quality standards and to settle disputes regarding certain uses of ground water cannot be heard by the Board.

- The Board cannot hear cases relating to Ecology's adjudication of water rights as set forth in RCW 90.03 and RCW 90.44

- Hearings conducted by Ecology to adopt, modify, or repeal rules cannot be heard by the PCHB

- Cases where Ecology is seeking criminal penalties

Consistent Problem Areas--The following list is based on conversations with attorneys with the AG's Office regarding cases tried before the PCHB. Clearly these examples are not related to every case, but they have shown up repeatedly.

- Not taking adequate samples (i.e. citing someone for a spill of hazardous waste without taking samples of the soil). The facility could claim that the alleged spill was nothing more than water
- Loosing track of the photo negatives
- Not tying the photos of individual violations to the site. This is most easily accomplished if the person taking the photo steps back and gets a wide angle view first, then steps in and gets a shot of the violation
- Having a very long delay between the inspection date and the enforcement action
- Lack of properly documenting an interview, i.e. "someone said something."
- Not using proper Chain-of-Custody procedures

Water Quality Program Specific Enforcement Guidelines

Introduction

This section provides guidance to Ecology's Water Quality Program personnel who are charged with implementing the Department's enforcement policy. These guidelines are intended for internal guidance only and are not intended as notice to potential violators of the specific scope or type of enforcement action which will be imposed should state statutes or rules be violated.

Authority

Authority for the State of Washington Department of Ecology (Ecology) to enforce state and federal water pollution control laws in the State of Washington is contained in Chapter 90-48 RCW. This authority includes issuance of notices of violation and administrative orders and the assessment of civil penalties for violation of provisions of Chapter 90.48 RCW or regulations or orders issued thereunder. The maximum civil penalty which may be assessed by Ecology is $10,000 per day per violation (90.48.144 RCW).

However, in accordance with RCW 90.48.450, if a violation relates to discharges from agricultural activities on agricultural land, consideration must be given to whether the enforcement action would contribute to the conversion of the land to nonagricultural uses. Any enforcement action shall attempt to minimize the possibility of conversion.

General Principles

The following statements describe general principles to be followed in policy.

Priorities--It is a program objective to respond to all significant violations. Guidance for determining whether a violation is significant is provided in the "Categories of Violations and Range and Type of Response" section. In determining priorities for enforcement actions, consideration will be given to the nature of the violation. Imminent or acute threats to public health will be given the highest priority. Chronic or potential threats to public health and significant or irreversible impacts upon environmental resources will also be given priority attention. Program priorities, which provide a framework for enforcement priorities, are indicated in Ecology program plans, including strategic and annual plans, and the State/EPA Agreement. However, program priorities do not provide a basis for excusing violations or allowing evasion of Ecology enforcement action.

Escalation--An initial enforcement action should create the foundation for escalated response if needed for continuing or repeated violations. The potential for continuing violations should be considered in determining initial enforcement response. Failure of a violator to take necessary action to correct the violation or to prevent recurring violations will result in escalated enforcement response (i.e., formal action, higher penalties, and/or other sanctions). Enforcement personnel should inform violators of Ecology's commitment to escalated enforcement response.

Compliance Monitoring--Adequate and reliable compliance monitoring, through inspections, self-monitoring reports, and other reports, is a part of each Ecology program and provides documentation of compliance and noncompliance. This documentation also provides a basis for taking enforcement action.

Documentation--Documentation of all circumstances and activities relating to a violation and subsequent enforcement action is essential. Every regulatory action requiring compliance has the potential for being appealed to an administrative review board or the courts. Ecology's ability to support its actions depends upon complete documentation showing that reasonable, logical, and procedurally correct actions are taken.

Documentation must provide complete information on: the violator (i.e., name, address, location, and type of operation), nature of the violation (including correct statutory and regulatory citations), how and when the violation was detected, circumstances relating to the violation (i.e., location, cause, estimated duration, effects), a judgment as to the awareness and degree of negligence of the violator, and any history of similar or related violations. If there is a history of department contact with the violator regarding compliance problems or specific violations, the contacts, nature of the problems, and department response to them should be documented. A violator's history may also include previous violations of environmental laws and regulations which indicate a pattern of disregard or neglect. Documentation should include: telephone logs; memoranda confirming conversations, instructions, or meetings; sample records; inspection reports; photographs; sworn statements; and relevant correspondence.

Case files, with complete documentation, will be maintained by the unit responsible for initiating the response to an incident or situation. When formal enforcement action is recommended, summaries of supporting documentation will be referenced.

In all cases, enforcement recommendations and resulting enforcement actions will be written in unambiguous language which clearly describes the violation, relevant circumstances, and the specific action(s) which the department is requiring the violator to take. Compliance dates will be specified for each action required of a violator. Every effort will be made to incorporate specific requirements within formal enforcement actions and also to indicate the potential consequences of continued noncompliance.

Timely and Streamlined Procedures--All enforcement actions should be timely. Enforcement procedures will be streamlined to the maximum practicable extent. The specific definition of timely enforcement is included in the Safety section. Once initiated, enforcement actions will be expeditiously pursued by Ecology until compliance is achieved. Responsibility for review, approval, and signature of formal enforcement actions will be as delegated by the Ecology Director to appropriate individuals. Review and approval of specific enforcement recommendations and actions will normally be limited to the chain-of-command of the initiating personnel and the Director's designee. The Attorney General's Office may be asked to review and comment upon any enforcement recommendation.

General Procedures

The following steps indicate the general chronology of procedures to be followed when a violation of Ecology administered statutes or rules is detected.

- A violation is detected.

- A determination of the significance of the violation is made in accordance with guidance contained in the Inspection Preparation section.

- If the violation is not significant, a determination is made regarding the utility of informal enforcement action.

  If the violation is procedural or superficial in nature, does not lead to a more significant violation, and there is no substantial threat to environmental resources, enforcement action may or may not be taken. Compliance monitoring should be maintained to detect any additional violations.

  If an informal enforcement action is warranted, the violator is notified of the violation, the consequences of noncompliance, and the immediate steps necessary to forestall formal enforcement action. This action will normally be in writing and may be through use of a standard form at the scene of the violation. This action is the responsibility of the involved staff but must be reviewed with at least the immediate supervisor. If compliance is not achieved through informal action, the priority for formal action will be established.

- When significant violations are detected, priority for formal enforcement action will be established. In accordance with the priority determination, formal enforcement action(s)

will be prepared. In such cases the violator should normally be informed by responsible staff that formal enforcement is being recommended.

Informal enforcement actions may be used as the primary enforcement response to address significant violations only where priorities for formal action do not allow for a timely or effective response.

At this point, if not before, a case-specific enforcement strategy should be developed to obtain compliance in the most expeditious manner. Formal enforcement may be pursued using a variety of tools and options, including direct recourse to the courts. Alternatives should be discussed with responsible supervisors/managers, the enforcement officer, and/or an assistant attorney general.

- If sufficient corrective actions are taken to achieve compliance while formal enforcement actions are pending, this should be noted in the case file.

  If compliance is not achieved on the timetable specified in a formal enforcement action, a further course of enforcement action will be determined.

  The potential effectiveness of further administrative enforcement actions should be evaluated by responsible staff in consultation with the enforcement officer and/or an assistant attorney general.

  If it is determined that further administrative enforcement action will be effective in achieving compliance, further formal enforcement action will be taken. The further action should represent an escalation over previous action.

  When further administrative actions by Ecology will be ineffective in achieving compliance, the matter will be referred by the responsible Assistant Director to the Attorney General's Office by a memorandum prepared by the enforcement officer and/or the responsible staff. The memorandum will include:

  -A chronology of circumstances and conditions causing the original enforcement response, description of conditions, nature of the violation(s), and corrective action required.

  -A summary of, or copies of correspondence, memoranda of record, inspection reports, monitoring reports, and any other documentation relating to the situation.

- Agricultural Enforcement

  Agricultural water quality complaint response and initiation of enforcement actions are governed by the Agricultural Compliance Memorandum of Agreement (Ag MOA), as executed between Ecology, the Washington Conservation Commission, and the local

conservation district. Ecology actions are further defined in the Ag MOA through the specific compliance level selected by the local conservation district.

Generally, the Ag MOA provides an opportunity for initial voluntary compliance unless immediate corrective action is required by Ecology. Technical assistance to achieve compliance is provided by the local conservation district. If voluntary compliance is not forthcoming, initiated within the Ag MOA timelines, or if a chronic problem exists, then formal enforcement action will be initiated.

Task

Compliance Monitoring--The responsibilities of implementing staff to conduct both compliance monitoring activities and enforcement will be integrated, so that violations detected through compliance monitoring efforts are followed by appropriate enforcement actions. In addition, summaries of compliance and noncompliance status should be prepared on a regular and routine basis by responsible staff. Among other uses, these summaries will be provided to the enforcement officer for assessment of implications for formal enforcement action.

Categories of Violations and Range and Type of Response

Determining the appropriate enforcement response is dependent on evaluating the category of the violation. Three basic categories are recognized: (1) critical violations that involve an actual or imminent threat to public health or the environment; (2) serious violations that involve a potential threat to public health or impacts on significant surface or ground water resources; and (3) general violations such as illegal discharges which do not significantly threaten water quality, public health, or aquatic resources, effluent violations which marginally exceed permit limitations, or other minor permit violations. Repetition or continuation of violations or noncompliance with formal enforcement actions will generally warrant escalation to a higher category and escalated enforcement response. Ecology's permit compliance tracking system will incorporate numerical limits for exceedances which will highlight critical or serious violations.

Violations in the critical and serious categories are considered significant violations and formal enforcement action, including penalty action, will be taken unless there are mitigating circumstances.

Formal enforcement response may include a notice of violation, administrative order, civil penalty, resource damage assessment, referral for court action, and/or action to revoke pollution control tax credits. Innovative approaches, such as mediation, environmental audits, mandatory education programs, consent orders/decrees, and compensatory actions shall be considered as appropriate.

Notices of Violation--A Notice of Violation (NOV) can be used to build case documentation and should be used when the circumstances of the violation are unclear or additional information is needed from the violator prior to formalizing compliance requirements or other enforcement responses. Use of a NOV is optional. Once issued, subsequent issuance of an order is required.

Administrative Orders--An Order should be used to formalize specific compliance requirements and may be preceded by a NOV. Examples include compliance schedules, sewer bans, interim effluent limitations, and specific actions required to be taken by the violator to come into compliance. Orders will also generally be used to formalize permit-type requirements that address noncompliance with a statutory deadline (such as interim limitations and compliance schedules for Best Available Technology (BAT) compliance). In this context, these permit-related "companion" orders are not modifications to permits, but are regulatory actions taken in response to noncompliance with permits. Orders need not specify technical solutions, but should require specific actions or solutions from the violator. Any continuing significant noncomplying situation should result in an order requiring corrective measures unless previous actions have explicitly and enforceably set out required measures (such as previous orders, permits, etc.).

Civil Penalties--No civil penalty assessment of less than $250 will be issued for a Water Quality Program violation. Civil penalties will be assessed from a minimum of $250 to a maximum of $10,000 per violation per day in accordance with the categories of violation and ranges of response contained in Table 5-1. The occurrence of damage to aquatic resources will weigh heavily in favor of issuance of civil penalties, in addition to any applicable Resource Damage Assessment, and also in favor of a larger penalty amount than might be assessed in the absence of aquatic resource damages.

An amendment to RCW 90.487, effective July 28, 1985, authorizes issuance of civil penalties for violation of any provision of RCW 90.48 and any provision of regulations or administrative orders issued pursuant to RCW 90-48.

Resource Damage Assessments--A pollution incident resulting in quantifiable damages to aquatic resources or beneficial water uses will result in a Resource Damage Assessment. The Spill Response Section should be called in to determine the extent and value of resource damages. Assessments will be collected through demand letters and court action, if necessary.

Cost Recovery--Action will be taken to recover costs incurred by Ecology to investigate and clean up oil spills. Actions to recover costs include demand letters, administrative orders, and court action if due and payable costs have not been paid.

Court Action--Recommendations for referrals to the Attorney General's Office for court action should be made if administrative actions have failed to produce the desired results or when direct court action is determined appropriate in response to a critical or serious violation.

Table 5-1 outlines the three categories of violations, examples of each, and the range of appropriate responses to each category.

Tax Credit Revocation--An enforcement tool which may be used in applicable cases is the revocation of pollution control tax credits. This is accomplished through a revision of Ecology's finding that a facility is adequate for pollution control purposes. Such a revised finding by

Ecology will result in revocation of the pollution control tax credit by the Department of Revenue.

Time Frame for Enforcement Response

As a general objective and guideline, informal enforcement actions should be taken in 45 days or less from the date of detection of the, violation. Initial formal enforcement actions should be taken as soon as possible, but not later than 90 days from the date of detection of the violation, unless adequate justification for delay exists. Critical violations should result in formal enforcement response as expeditiously as possible, but not later than 30 days from date of detection.

Inter-Program Coordination of Water Quality Enforcement Actions

Due to the relationships between water pollution control measures and other environmental programs, coordinated and comprehensive enforcement response is essential. Coordination of enforcement response must occur prior to issuance of an enforcement action, as it may affect compliance with other program requirements of Ecology or other agencies. For example, control of wastewater discharges may result in dangerous wastes or air emissions which require further environmental controls. Proper coordination will require consideration of integrated or multiple enforcement actions to ensure a comprehensive approach. Integrated enforcement actions which incorporate water quality and other program requirements in one comprehensive action are encouraged unless such integration would jeopardize effective enforcement.

Some examples of water quality enforcement situations requiring coordination are:

- Actions to control industrial discharges which result in redirection of pollutants to air or land
- Actions requiring comprehensive spill control plans applying to storage of dangerous wastes or bulk quantities of toxic chemical products or petroleum products
- Actions directed toward wastewater discharges from solid waste disposal facilities, and
- Actions to control or clean up water contamination due to dangerous wastes

Enforcement actions must also be coordinated with other state and federal agencies and tribes.

Specific needs and methods for coordination of actions should be discussed with supervisors, Regional Directors, the Enforcement Officer, and/or Assistant Attorney Generals.

Table 5-1. Water Quality Violations. Categories, Examples, and Range of Response

A. Critical Category

Class I Examples of Violations

- Discharge creating actual or imminent threat to public health
- Permit violations creating actual or imminent threat to public health
- Spills creating actual or imminent threat to public health
- Repetition or continuation of serious violations or noncompliance with formal action in response to serious violations

Range of Response

- Court action
- NOV*/Order and Penalty ($2,000 minimum)**
- Penalty

B. Serious Category

Class II Examples of Violations

- Discharge having potential to impact public health or impacting surface or ground water resources
- Permit violations with potential impacts on public health or impacting surface or ground water resources
- Spills of a measurable quantity and impacting surface or ground water resources
- Repetition or continuation of Category C (General) violations or noncompliance with formal enforcement action in response to general violations Court action

Range of Response

- NOV*/Order and Penalty ($1,000 minimum)"
- Penalty

Table 5-1. Continued.

C. General Category

Class III Examples of Violations

- Any violation of applicable regulatory requirements which does not create an actual or imminent threat to public health or to surface or ground water resources

Range of Response

NOV*/Order and Penalty ($250 minimum)
NOV*/Order, Penalty, Warning Letter

* Note that an NOV is an optional procedure
** Note that civil penalties in these categories of violation against public entities and in no-fault situations (i.e., accidental spills) may be deferred and then issued if other enforcement action has not resulted in compliance.

Mandatory Penalties

Issuance of civil penalties is mandatory in each of the violation situations noted below, unless; 1) a deviation from these guidelines has been justified in writing by responsible staff and approved by their immediate supervisor, 2) insufficient evidence of violation exists or is obtainable to justify penalty action, 3) penalty action would jeopardize an ongoing criminal investigation or prosecution, or 4) staff resources, as allocated to enforcement through annual program plans, to document and defend the penalty action are unavailable due to pursuit of higher priority enforcement actions and the priority for enforcement action has been approved by the manager having signature authority for the penalty action.

Civil penalties may also be issued for any other violation where the penalty may serve to deter future violations or to reduce any inequitable advantage gained through noncompliance.

Issuance of civil penalties, pursuant to Chapter 90.48 RCW, is mandatory in the following instances:

- Any critical or serious violation as defined in Table 5-1
- Violation(s) of any provision of an applicable administrative order related to any critical or serious violation, unless compliance with the order is imminent or anticipated within an accepted timeframe
- A general violation is repeated within two (2) years of issuance of a discretionary penalty, notice of violation, or administrative order
- Failure to submit a report required pursuant to a notice of violation and where a penalty for the violation has not already been issued (note that the penalty would be issued for the violation which precipitated the notice of violation)
- Willful violations, such as falsification of required records

Minimum Penalty Levels

Minimum penalty levels have been established for first time violations for each category of violation in each program area. In making a penalty recommendation, the category of each violation subject to a penalty should be explicitly stated. The minimum penalty is determined by the minimum level of penalty for the most significant category of violation involved in the penalty action. The maximum penalty is established by applicable statute and by the evidence of specific violations and days of violation.

The amount of penalty recommended for issuance should be the amount between the minimum and maximum which corresponds to a reasonable consideration of the factors listed on page 9 of *Enforcement Manual: Guidelines and Procedures*. Factors which indicate an aggravated violation based upon available evidence should result in an increase in the recommended penalty above the minimum up to the statutory maximum. Factors which indicate mitigation of the

violation should result in a decrease in the recommended penalty toward the established minimum. The basis for calculating the penalty level should be documented in the recommendation for enforcement action. The minimum penalties are:

Critical violation - $2000 minimum penalty
Serious violation - $1000 minimum penalty
General violation - $250 minimum penalty

NOTE: Maximum penalty is $10,000 per violation per day.

Penalties for Public Entities

Public entities are subject to issuance of civil penalties to the same extent as any other individual or organization unless specifically exempted from such authority by law. However, public entities that are experiencing chronic (as opposed to one-time incident) violations (e.g., repeated permit violations due to overloading at a publicly-owned wastewater treatment plant), must be provided formal or informal written notice of their potential liability for civil penalties prior to the initiation of penalty action.

This provision does not apply to willful or negligent acts which result in incidents of violation.

Settlement of Appeals

This section establishes criteria and procedures for Ecology review of proposals to settle pending appeals or cases before the Pollution Control Hearings Board or state or federal courts.

Criteria--Legitimate bases for accepting a settlement proposal, whether initiated by the Attorney General's office or by a responsible party, include:

- The responsible assistant attorney general recommends settlement due to adverse evidentiary or legal issues affecting the case or due to the likelihood of adverse precedents from the case.

- The settlement represents the interest of Ecology in terms of the priority of the case and the use of Attorney General's Office or Ecology resources and does not undermine Ecology enforcement policy and guidelines.

- The settlement advances Ecology's interests in achieving and maintaining compliance with applicable requirements.

- The settlement incorporates a suitable alternative remedy(ies), such as commitment to publish advertisements or undertake environmental compliance auditing, which may justify settlement, provided satisfactory measures to assure future compliance have been taken and, where the case includes a monetary penalty, any amount of penalty reduction is commensurate with the cost to the responsible party of the alternative remedy(ies).

Procedures--Normally, the following procedures will be followed in review of settlement proposals:

- Settlement proposals will be discussed first by the responsible assistant attorney general with the staff person responsible for originating the subject action in order to identify and resolve any relevant issues. The Ecology staff person is responsible for communicating the settlement proposal and any unresolved issues to his or her immediate supervisor. The staff person or supervisor is also responsible for communicating any unresolved issues to the enforcement officer or the manager with responsibility for final approval of the proposal on behalf of Ecology.

- At the request of the responsible assistant attorney general, settlement proposals related to appeals of orders or permits may be reviewed and approved on behalf of Ecology by the manager with signature authority for the order or permit.

- Settlement proposals related to appeals of monetary penalties or court actions to collect penalties should be discussed by the responsible assistant attorney general with the enforcement officer for, review and recommendation prior to final review and approval on behalf of Ecology by the Central Programs Manager or the responsible Regional Director.

- Settlement proposals related to civil court cases should be discussed and reviewed with the enforcement officer prior to final review and approval or comment on behalf of Ecology by the Assistant Director, Central Programs.

- To the extent that Ecology is responsible for review of settlement proposals related to criminal court actions, such review will be the responsibility of the enforcement officer, Central Programs Program Manager, and Assistant Director for Central Programs.

- A copy of any final settlement agreement will be provided to the enforcement officer for distribution within the department.

- After final adoption of any settlement agreement, staff responsible for originating the subject action should review the adopted settlement and if necessary determine, in consultation with the enforcement officer or responsible assistant attorney general, what follow-through actions (e.g., rescission or amendment of administrative order), if any, must be taken.

In sensitive cases, the Attorney General's Office may elect to review proposed settlements with the Assistant Director, Central Programs.

Settlement proposals, recommendations, and approvals should be documented in writing. If necessary due to time constraints, verbal review and approval of settlements is acceptable, but should be followed up with written documentation.

Discretion

There are four broad areas where staff have and are expected to use professional discretion: 1) enforcement actions taken for non-significant violations (i.e., marginal permit exceedances or non-aggravated emissions); 2) the use and terms of administrative orders (consent or unilateral); 3) escalating penalties for multiple facilities contributing to a single discharge or emission point; and 4) justification of deviations from policy or guidelines.

Formal Enforcement Action for Non Significant Violators--Staff have discretion to *not* take formal enforcement action, including civil penalties, for violations that are considered not significant. Further guidance on "significance" is provided by the categorization of violations contained in each program specific guideline. In the air quality and water quality guidelines, the key terms in determining the category of violations (i.e., significance) are "non-aggravated emissions" and "marginal exceedances", respectively. These terms are not precisely defined in order to provide additional discretion to staff. In other words, if in staff's professional judgement an emission or discharge violation is non-aggravated or marginal, then no formal enforcement action need be taken.

However, if formal enforcement action is taken, then by definition a repetition of such a violation is significant and should be subject to enforcement action, including escalation of penalties. This is generally necessary to maintain the credibility of our enforcement efforts. This general rule is subject to the following provisos:

- The general guidelines provide that "any relevant extenuating circumstances should be considered and factored into the initial penalty recommendation"

- When issuing escalated penalties for repeated violations, it may be reasonable and easily justified to exclude *minimal* violations from computation of the penalty amount

- Staff may justify deviation from the guidelines where non-significant violations would otherwise be subject to an unreasonable level of enforcement

Use and Terms of Administrative Orders--Staff are expected to use their professional judgement in determining the usefulness of issuing an administrative order to require measures to correct or prevent violations. Such orders, whether consent orders or unilateral orders, are grounds for suspending escalation of penalties for related violations or for suspending penalties completely during the term of the order, if the violator is in continuing compliance with the order. As an alternative, staff may seek stipulated penalties as part of the terms of an order.

Staff also have broad professional discretion to determine what should be included in administrative orders in terms of both substantive requirements and compliance schedules. This discretion is only limited to applicable federal and state laws and regulations, by what is defensible as reasonable, and by the violators or our own ingenuity.

Multiple Facilities Contributing to Single Discharge or Emission Point--Regarding the applicability of escalation of civil penalties, the enforcement guidelines provide that similar

types of violations (e.g., NPDES permit, air emissions) by the same party at the same location shall be subject to penalty escalation unless the violations are due to completely unrelated causes. Staff have the discretion to cite this provision as a basis for not escalating penalties where violations at one discharge or emission point are due to different facilities that feed into the single discharge or emission point. This exception to escalation should not be applied where a history or pattern of violations due to poor operating practices or other related causes is evident.

Deviations From Guidelines--Both the general guidelines and the supplemental guidelines on civil penalties explicitly provide that professional staff may justify deviations from the guidelines at their discretion. The justification for such deviations should be written up as part of the documentation that goes with a recommendation for enforcement action.

If the deviation involves not taking an enforcement action that would otherwise be required, then such justification should be reviewed with the Assistant Director for approval and with the party with signature authority at the Assistant Director's discretion.

Staff should understand they are encouraged to exercise this discretion, but their justification will be carefully reviewed and may not be accepted. If the deviation from the guidelines is not accepted, the responsible staff will be so informed and Will be responsible for supporting the enforcement action that is taken.

CHAPTER 5

APPENDIX A

RECOMMENDATION FOR ENFORCEMENT BOILERPLATE

Recommendation for an Enforcement Action

I. Summary (Optional)

This section is used by some inspectors and engineers to provide a brief overview. This summary is then inserted by clerical staff directly into the enforcement action "boilerplate" under the statement of fact section. This saves time for both technical and clerical staff.

II. Background

A brief description of the facility, including type and place of business, and the following information relating to compliance history:

A. Problems associated with facility design, construction activities, on or off site operations, and maintenance.

B. Past enforcement actions and other significant compliance activities which are germane (e.g. grants and technical assistance). Attach copies of pertinent enforcement actions.

C. Description of any significant environmental or public health problems resulting from operations. For example, reduced stream flow or salt water intrusion caused by excess withdrawal of water; sediments contaminated from routine toxic discharges; groundwater contamination from frequent spills; pollution of stream by leachate from solid waste disposal; loss of wetlands from illegal dredge and fill activities; problems caused by excessive sulfur dioxide emissions.

III. Findings

This section is a chronological summary of facts which pertain to the alleged violations. To provide substantiation for enforcement recommendations, it is important to include the following information in the findings section:

A. Date, time, location, cause (to the extent known), type and number of violations.

B. Reference to all applicable statutes and regulations which govern the violation.

C. For those cases which involve violations of permits, authorized permit limits or conditions.

D. Synopsis of the technical problems causing the violation.

E. Discussion of technical data gathered in the field or from laboratory analysis of samples.

F. Description of only those efforts which were. immediately taken by the entity to control or eliminate the problem. (Note: Construction of new facilities or implementation of new procedures after the violation are not to be considered in making a determination of appropriate enforcement response.)

G. Record of factual information contained in past correspondence or telephone conversations. (Copies of letters and logs of telephone calls should be attached.)

IV. Discussion

Whereas the "Findings" section is reserved for strictly factual information, be it technical or legal, the "Discussion" section includes considerations which are more subjective in nature. The following items are among those which should be covered:

A. Our response to concerns and allegations raised by the entity.

B. The economic impact that could result from measures to assure compliance. (Note: Economic problems shall not be used to excuse noncompliance, but may be factored into the development of a compliance schedule.)

C. Any sensitivities which are evident. (Note: these should not be relied upon in making the staff enforcement recommendation.)

D. Workload implications of the action for the department.

E. Relationship of this action to other compliance initiatives underway proposed by other programs or other federal, state and local government agencies.

F. Allegations which require further investigation to provide substantiation.

G. Degree of cooperation.

V. Recommendation

The "Recommendations" section ties the enforcement action together. It includes a determination as to the significance of the violation. All "significant" violations are subject to formal enforcement action as prescribed in the program specific sections of the enforcement manual. For those violations which are not “significant”, informal enforcement action may be taken, i.e. a telephone call or a warning letter. The inspector then recommends the action he/she feels is appropriate given the history, facts relevant to the violation, the enforcement policy, decision factors identified in the enforcement manual, and the escalation policy. Any deviation from the manual guidance must be justified in this section.

VI. References

The following references are customary and advised:

A. Chronology (especially for complex actions or actions which qualify for escalation)

B. Inspection Reports - with attached:

1) photographs signed and dated with a brief description (a duplicate set should be kept in files) 2) laboratory data or technical reports
3) witness statements
4) field notes

C. Correspondence

D. Permit (relevant portions)

E. Prior Enforcement Actions

F. Discharge Monitoring Reports

G. Maps or Diagrams