



CITY OF WASILLA

290 E. HERNING AVE.
WASILLA, ALASKA 99687
PHONE: (907) 373-9050
FAX: (907) 373-0788

COUNCIL MEMORANDUM NO. 91-91

FROM: Deputy Administrator

DATE: November 21, 1991

RE: Engineering Services

In July 1991, Council authorized \$5,000 for Gilfilian Engineering to perform the testing and prepare the reports requested by Norm Sievertson of Region X, EPA. That report was recently presented to Council and forwarded to Mr. Sievertson in Seattle. Concurrently, Gilfilian continued to work on obtaining a DEC permit for subsurface and surface discharge from the treatment plant and the proposed Recirculating Granular Media Filter. The conditions of the permit were finalized in a meeting with DEC last week. One of the conditions is that the City prepare a quality assurance and quality control plan. The engineer will have to prepare a large portion of that plan. Additionally, Gilfilian worked for several hours providing information to consulting engineer Jack Felton.

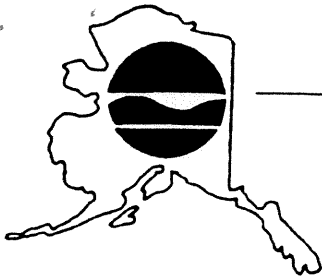
As a result of the above activities, we are under budgeted by about \$3,000 for Gilfilian's services. Recommend that Council introduce and approve Ordinance Serial No. 91-47 for engineering services as described above.

Robert E. Harris
Deputy Administrator

Gilfilian Engineering, Inc.

Professional Environmental Consultants

Main Office: 255 E. Fireweed Lane, Suite 102, Anchorage, Alaska 99503
(907) 277-2021 • Fax (907) 274-8683
Mat-Su Office: 5751 Mayflower Court, Wasilla, Alaska 99654-7880
(907) 376-3005 • Fax (907) 373-5686



November 15, 1991

Mr. Robert Dolan
ADEC Southcentral Regional Office
3601 "C" St., Suite 300
Anchorage, Alaska 99503

RE: Wasilla Sewage Treatment Facility
Proposed Waste Disposal Permit
ADEC Permit No. 8422-DB003
Work Order No. WO88-14

COPY

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NOV 20 1991

City of Wasilla, Alaska

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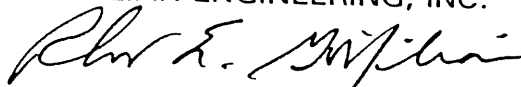
Dear Mr. Dolan:

This letter is in response to your memorandum dated November 14, 1991 sent to Mr. Bob Harris and myself regarding the above referenced permit. We have completed our review of the proposed permit requirements and find them to be acceptable. Our acceptance of the permit conditions is based on an understanding that the permit requirements are compliant with regard to the type of sewage disposal system used by the City.

It is our understanding that the requirement for a QA/QC be submitted to the Department by January 1, 1992. We intend to submit a QA/QC that will allow personnel from the City to conduct the field monitoring program. This QA/QC will include laboratory testing requirements.

We wish to express our appreciation to you and the Mat-Su District office staff for the assistance in working cooperatively with the City in the development of the subject permit.

Sincerely,
GILFILIAN ENGINEERING, INC.


Robert E. Gilfilian, P.E.
President

cc: Mike Kreiber, ADEC Mat-Su District Office
Bob Harris, City of Wasilla ✓

DRAFT

SOUTHCENTRAL REGIONAL OFFICE
3601 C ST., SUITE 1334
ANCHORAGE, AK 99503

563-6529

CERTIFIED MAIL
RETURN RECEIPT
REQUESTED
November 7, 1991

Robert E. Gilfilian
City Engineer
City of Wasilla
290 E. Herning Avenue
Wasilla, Alaska 99687

Dear Mr. Gilfilian:

RE: Waste Disposal Permit Application
ADEC File No. 9122-DB003

The Department of Environmental Conservation has reviewed your Waste Disposal Permit Application for the Wasilla Sewage Treatment Plant. Based on our evaluation, Permit No. 9122-DB003 is hereby granted and found to be consistent with the Standards of the Alaskan Coastal Management Program, 6 AAC 80.

Please note the conditions in Appendices A, B, and C. This permit expires November 1, 1993 and must be renewed by that date for continued operation of the facility. Department regulations require that renewal requests be received at least 30 days prior to expiration of a wastewater disposal permit. Requests not received prior to this date can not be renewed and must be reissued as a new permit, this process takes a minimum of 60 days during which time the facility may be prohibited from operation. Appendix C is the form to be used when reporting discharge monitoring results; copies should be made from the original.

Department of Environmental Conservation regulations provide that any person who disagrees with any portion of this decision, may request an adjudicatory hearing in accordance with 18 AAC 15.200-920. The request should be mailed to the Commissioner of the Alaska Department of Environmental Conservation, Pouch O, Juneau, Alaska 99811-1800, or delivered to his office at 3220 Hospital Drive, Juneau. Please send a copy of any such request to the undersigned. You are reminded that, even if an adjudicatory hearing has been requested and granted, all permit conditions remain in full force and

City of Wasilla
Permit No. 9122-DB003

-2-

November 7, 1991

effect. Failure to submit a hearing request within thirty (30) days of receipt of this letter shall constitute a waiver of that person's right to judicial review of this decision.

Sincerely,

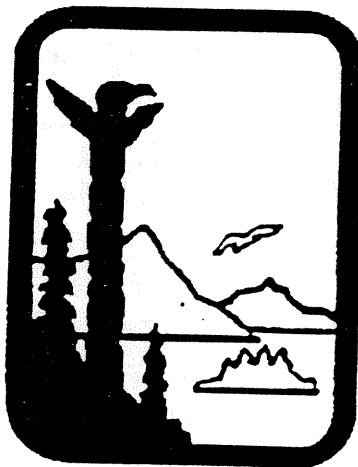
Svend Brandt-Erichsen
Regional Administrator

SBE:RD:rs

ENCLOSURES

cc: (w/ENCLOSURES)
Mat-Su District Office, ADEC
Valerie Haney, EPA, Anchorage

GUIDELINES FOR PREPARING QUALITY ASSURANCE PROJECT PLANS



**STATE OF ALASKA DEPARTMENT ENVIRONMENTAL CONSERVATION
ENVIRONMENTAL QUALITY MONITORING AND LABORATORY OPERATIONS**

**ADEC-QA-006/88
Revision 3
September 20, 1990**

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SOUTHCENTRAL REGIONAL OFFICE
3601 C STREET, SUITE 1334
ANCHORAGE, ALASKA 99503

City of Wasilla
290 East Herning Avenue
Wasilla, AK 99687

PERMIT NO. 9122-DB003

DATE ISSUED: November 7, 1991

This permit is issued to the City of Wasilla for the surface and subsurface discharge of a maximum of 200,000 gallons per day of treated domestic wastewater at Wasilla, Alaska, in the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 13, T17N, R1W, Seward Meridian. This permit is subject to the conditions contained in Appendices A, B, and C which are incorporated herein by reference.

This permit is issued under provisions of Alaska Statutes 46.03, the Alaska Administrative Code as amended or revised, and other applicable State laws and regulations.

This permit is effective on issuance and expires November 1, 1993 unless superseded before that time by State Certified NPDES permit. It may be terminated or modified in accordance with AS 46.03.120.

Date Issued

Svend Brandt-Erichsen
Regional Administrator

APPENDIX A - OPERATIONA. APPLICATION COMPLIANCE

The Permittee shall comply with all parts of their permit application submitted May 24, 1991 except as specified otherwise in this permit.

B. SITE PREPARATION

1. Engineering plan approval for system upgrades shall be obtained prior to construction of system modifications. This includes, but is not limited to, conversion of the existing 100,000 gallon clarifier into a recirculation tank and construction of the Recirculating Granular Media Filter (RGMF).
2. Upon completion of the RGMF system and review by this Department of system upgrades this permit may be reopened and modified upon request of the permittee to reflect and address the increased capacity of the system to handle wastewater flows.
3. A quality assurance/quality control (QA/QC) plan for the sampling program shall be submitted to Mat-Su District Office for review and approval no later than December 1, 1991. *

C. SITE OPERATION

1. The discharge shall be limited to treated domestic wastewater and shall not exceed a maximum of 200,000 gallons/day. The wastewater shall be discharged to the subsurface and/or an unnamed stream located on the southern boundary of the property.
2. There shall be no discharge of floating solids, garbage, grease, foam, oily waste or wastewater containing a visible sheen or which may produce a film, sheen or coloration on surface waters.
3. The discharge shall not cause contamination of surface or groundwaters, and shall not cause a violation of the Alaska Water Quality Standards (18 AAC 70).
4. The disposal shall not cause adverse effects on aquatic or terrestrial plant or animal life, their reproduction, or habitat.

D. SITE MAINTENANCE

1. The permittee will conduct inspections of the status of the outfall line three times per year if the surface discharge mode of operation is used. These inspections shall be conducted just after breakup (April or May) when

APPENDIX A - OPERATION

exposed portions of the outfall are visible, during mid summer (July) and prior to freeze up (September or October). If breaks or leaks are found the Department shall be notified within 24 hours of discovery and immediate steps shall be taken to repair the damages.

2. Regular maintenance of the RGMF system shall be performed to insure the proper treatment of the wastewater. This maintenance shall be in accordance with the designer or manufactures recommendations.
- o. ~~The owner or operator shall keep equipment maintenance logs of any~~ scheduled or non-scheduled maintenance. These logs shall be kept at the facility and be made available to inspectors at their request. These logs shall include the time, date, scope of work performed, and name(s) of persons performing the work.

E. LIMITATIONS AND MONITORING

1. Unless otherwise specified in this permit, during the period beginning on the effective date to the expiration date, the Permittee is authorized to discharge in accordance with the following limitations and monitoring requirements below:

APPENDIX A - OPERATION

SURFACE DISCHARGE - EFFLUENT

Effluent Characteristics	Effluent Limitation			Monitoring Frequency	Sample Type
	Monthly Avg	Weekly Avg	Daily Max		
Flow	130,000 gpd		200,000 gpd	Monthly ¹	Meter
TSS	30 mg/l	45 mg/l	60 mg/l	Monthly	Grab
BOD ₅	30 mg/l	45 mg/l	60 mg/l	Monthly	Grab
Fecal Coliform			40FC/100ml	Monthly	Grab
Chlorine	Non-Detectable using DPD Method ²			Monthly	Grab
Temperature			N/A	Monthly	Grab
pH			6.5 to 8.5	Monthly	Grab
Conductivity	N/A	N/A	N/A	Monthly	Grab
Oil and Grease	N/A	N/A	N/A	Monthly	Grab
Ammonia	N/A	N/A	N/A	Monthly	Grab
Nitrate as Nitrogen			N/A	Monthly	Grab

¹ Monthly monitoring for surface discharges shall only be conducted during months when the RGMF filter is in use or a surface discharge occurs.

² The DPD(N,N-diethyl-p-phenylene-diamine) Method used shall be either of the two methods listed in Standard Methods for the Examination of Water & Wastewater, American Public Health Association. Chlorine residual shall be measured in the effluent discharge prior to entering the creek, if chlorine is detected at this point another sample will be taken 10 feet down stream of the effluent discharge. Chlorine residual measured in the receiving water shall be non-detectable as specified in the limitations.

APPENDIX A - OPERATION

METALS MONITORING

Effluent Characteristics	Effluent Limitation			Monitoring Frequency	Sample Type
	Monthly Avg	Weekly Avg	Daily Max		
Lead			N/A	Annual/Semi-annual ³	Grab
Chromium			N/A	Annual/Semi-annual ³	Grab
Cadmium			N/A	Annual/Semi-annual ³	Grab
Mercury			N/A	Annual/Semi-annual ³	Grab
Silver			N/A	Annual/Semi-annual ³	Grab

**GROUND WATER MONITORING
LEACH BED MONITORING**

Sampling is required in the monitoring wells numbered 7, 17A and 18A in the upper aquifer and in monitoring well #19 in the lower aquifer.

Effluent Characteristics	Effluent Limitation			Monitoring Frequency	Sample Type
	Monthly Avg	Weekly Avg	Daily Max		
Fecal Coliform			1 FC/100ml	Quarterly/Annually ⁴	Grab
Nitrate as Nitrogen			10 mg/l	Quarterly/Annually ⁴	Grab
Conductivity			N/A	Quarterly/Annually ⁴	Grab
pH			6.5 to 8.5	Quarterly/Annually ⁴	Grab

- If the Permittee monitors any effluent characteristic identified in this permit more frequently than required, the results of such monitoring shall be included in the calculation and reporting of the values required in the monitoring report (Part F). Such increased frequency shall also be indicated.

³In the immediate future as the facility is operated in its traditional mode as a drainfield this annual sampling will take place during the Month of June, at the monitoring wells specified in footnote #4. When the RGMF unit is incorporated into the facility the sampling schedule for metals will become semi-annual with groundwater sampling taking place in June as specified in this footnote and sampling of the surface discharge, if there is such discharge taking place in December. The annual sampling for metals may be increased to a more frequent schedule if sample results indicate elevated levels of these metals.

⁴ Samples shall be taken during the months of March, June, September and December for the upper aquifer (monitoring wells #7, 17A and 18A) and samples will be taken in June for the lower aquifer (monitoring well #19).

APPENDIX A - OPERATION

4. All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, recordings from continuous monitoring instrumentation, and any addition or modification of the facility, shall be retained at the facility for observation by the Department for three years. Upon request from the Department, the Permittee shall submit certified copies of such records.

F. REPORTING

1. Monitoring results as required in Part E shall be summarized each month and submitted to the following offices no later than 45 days following the monthly sampling or 15 days after receipt of the laboratory results:

Alaska Department of Environmental Conservation
Southcentral Regional Office
3601 C Street, Suite 1334
Anchorage, AK 99503
(907) 563-8529

Alaska Department of Environmental Conservation
Mat-Su District Office
P.O. Box 871064
Wasilla, Alaska 99687
(907) 376-5038

2. If for any reason the Permittee does not comply with or will be unable to comply with any effluent limitations specified in this permit, the Permittee shall report the noncompliance to the Department within 24 hours of becoming aware of such condition by telephone, telegraph, or in the absence of both, by mail. A written follow-up report shall be submitted to the Department within 10 days of the non-compliance. The report shall contain, but not be limited to:
 - a. Times and dates on which the event occurred and, if not corrected, the anticipated time the non-compliance is expected to continue;
 - b. A detailed description of the event including quantities and types of materials involved;
 - c. details of any damage to the receiving environment;

APPENDIX A - OPERATION

- d. details of actions taken or to be taken to correct the causes of the event; and
 - e. details of actions taken or to be taken to correct any damage resulting from the event.
3. For purposes of this permit, a violation of this permit, or contamination of surface or groundwaters shall be defined as any of the following:
- a. Discharging waste other than authorized.
 - b. Discharging waste to an area other than authorized.
 - c. Surface or groundwater levels exceeding levels specified in 18 AAC 70 (Water Quality Standards).

APPENDIX B - GENERAL

A. Access and Inspection

The department's representatives shall be allowed access to the permittee's facilities to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit and State laws and regulations.

B. Availability of Records

Except for information related to confidential processes or methods of manufacture, all application materials and records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the department's Southcentral Regional Office.

C. Location of Permit and Application

The permittee shall maintain a copy of this permit and facility plans at the disposal facility or, if that is not feasible, at the permittee's or operator's place of business.

D. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond his control, including but not limited to accidents, equipment breakdowns, or labor dispute.

E. Adverse Impacts

The permittee shall take all necessary means to minimize any adverse impact to the receiving waters or lands resulting from a violation or noncompliance with any limitations specified in this permit, including any additional monitoring needed to determine the nature and impact of the activity in noncompliance. The permittee shall clean-up and restore all areas adversely impacted by the noncompliance.

F. Cultural or Paleontological Resources

Should cultural or paleontological resources be discovered as a result of this activity, work which would disturb such resources are to be stopped, and the Office of History and Archaeology, Division of Parks and Outdoor Recreation, Department of Natural Resources, is to be notified immediately (907)561-2020.

APPENDIX B - GENERAL

G. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, nor does it authorize any damage to private property.

H. Modifications or Changes

This permit authorizes only that operation specified in the application and permit. Any alteration, installation, expansion or modification which was not submitted as component of the permitted facility plan will require a written plan approval or permit amendment prior to implementation. Any expansion, modification, or other change in a facility process or operation which may result in an increase in emissions or discharges or may cause other detrimental environmental impacts from the permittee's facility requires a new permit.

I. Applications for Permit Renewal, Amendment or Plan Approval

Application for a renewal of or amendment to a permit will be treated in the same manner as the initial application, except that public notice or hearing will not be required for applications for renewal or amendment. Application for renewal or amendment or plan approval must be made no later than 30 days before the expiration of the permit or the planned effective date of the amendment or change.

J. Transfers

Should operation of the facility be contracted or a change in contractors be made, the new contractor shall be notified of the existence of the permit and its conditions. The permittee may request to transfer this permit to another proposed permittee. The written request must include a certified signed affidavit from the proposed new permittee stating that they accept this permit in its entirety. This department reserves the sole discretion to transfer this permit.

K. Termination

This permit terminates upon the expiration date. The department has the authority to terminate a permit upon 30 days written notice if the department finds that there has been a violation of the conditions of the permit.

DISCHARGE MONITORING REPORT - SURFACE DISCHARGE

Permittee Name/Address

Monitoring Period

Name: City of Wasilla
 Address: 290 E. Herning Ave.
 Wasilla, AK. 99687

From: ___/___/___
 Yr. Mo. Day
 To: ___/___/___
 Yr. Mo. Day

Location: Wasilla, AK

PARAMETER		CONCENTRATION			UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM			
Flow	Sample Measurement						
	Permit Requirement		150,000	200,000	gpd	daily	meter
BOD ₅	Sample Measurement						
	Permit Requirement		30		mg/l	monthly	grab
TSS	Sample Measurement						
	Permit Requirement		30		mg/l	monthly	grab
Fecal Coliforms	Sample Measurement				FC/100ml		
	Permit Requirement			40		monthly	grab
Chlorine Residual	Sample Measurement						
	Permit Requirement			non-detect	mg/l	monthly	grab
Temperature	Sample Measurement						
	Permit Requirement			report	F	monthly	grab
pH	Sample Measurement						
	Permit Requirement	6.5		8.5	nd	monthly	grab
Conductivity	Sample Measurement				µmhos		
	Permit Requirement			N/A	/cm	monthly	grab

Comment and Explanation of any violation:

Type or Print Name and Title of Principal Executive or Authorized Agent:

DATE:

SIGNATURE:

DISCHARGE MONITORING REPORT - SURFACE DISCHARGE

PARAMETER		CONCENTRATION			UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM			
Oil and Grease	Sample Measurement						
	Permit Requirement			N/A	mg/l	monthly	grab
Ammonia	Sample Measurement						
	Permit Requirement			N/A	mg/l	monthly	grab
Nitrate as Nitrogen	Sample Measurement						
	Permit Requirement			N/A	mg/l	monthly	grab
Lead	Sample Measurement						
	Permit Requirement			N/A	ug/l	annual	grab
Chromium	Sample Measurement						
	Permit Requirement			N/A	ug/l	annual	grab
Cadmium	Sample Measurement						
	Permit Requirement			N/A	ug/l	annual	grab
Mercury	Sample Measurement						
	Permit Requirement			N/A	ug/l	annual	grab
Silver	Sample Measurement						
	Permit Requirement			N/A	ug/l	annual	grab
Comment and Explanation of any violation:							
Type or Print Name and Title of Principal Executive or Authorized Agent:							
DATE:				SIGNATURE:			

[Handwritten signatures and notes]

DISCHARGE MONITORING REPORT -SUBSURFACE DISCHARGE

Permittee Name/Address

Monitoring Period

Name: City of Wasilla
 Address: 290 E. Herning Ave.
 Wasilla, AK. 99687

From: ___/___/___
 Yr. Mo. Day
 To: ___/___/___
 Yr. Mo. Day

Location: Wasilla, AK.

PARAMETER		CONCENTRATION			UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM			
Fecal Coliforms	Sample Measurement				FC/		
	Permit Requirement				100ml	quarterly	grab
Nitrate as Nitrogen	Sample Measurement						
	Permit Requirement			10	mg/l	quarterly	grab
Conductivity	Sample Measurement				µmhos		
	Permit Requirement			N/A	/cm	quarterly	grab
pH	Sample Measurement						
	Permit Requirement	8.5		8.5	8.5	quarterly	grab
Fecal Coliforms	Sample Measurement				FC/		
	Permit Requirement				100ml	annual	grab
Nitrate as Nitrogen	Sample Measurement						
	Permit Requirement			10	mg/l	annual	grab
Conductivity	Sample Measurement				µmhos		
	Permit Requirement			N/A	/cm	annual	grab
pH	Sample Measurement						
	Permit Requirement	8.5		8.5	8.5	annual	grab

Comment and Explanation of any violation:

Type or Print Name and Title of Principal Executive or Authorized Agent:

DATE: SIGNATURE:

FOREWORD

Quality Assurance/Quality Control. What Is it?

Quality control (or QC) procedures are specific steps used to insure the quality of any process. For a factory this might include the testing of a percentage of the products from the assembly line. For environmental data gathering, quality control procedures include analyzing blank samples, analyzing certified check samples measuring the precision of the process by analyzing duplicate samples, etc.

Quality assurance (or QA) is a larger system that oversees a project from beginning to end. This is done by prescribing approved standard operating procedures, setting objectives for the quality of the data and dictating the proper QC procedures to measure the quality. All of this information can be collected in a document called the Quality Assurance Project Plan (QAPJP).

Why Write a QAPJP ?

Writing a QAPJP can require a substantial investment of time. In the long run, however, time and money should be saved by having a comprehensive plan which, if followed, insures that all data generated is meaningful and of high quality. The USEPA (United States Environmental Protection Agency) has adopted a policy requiring that all projects performed for or funded by EPA must have a written QA Program Plan. EPA's requirements for QA Program Plan was specified in the Federal Register, Vol. 48, No. 191, September 30, 1983. In Alaska the Department of Environmental Conservation (ADEC) has an approved QA Program Plan. This plan states that each project which generates environmental data must have a written and approved Quality Assurance Project Plan.

Some Hints for Preparing QAPJP

The amount of work required to collect the information for a QAPJP can vary greatly depending on the size and complexity of the project. The job can be much easier if the writer has access to existing documents that contain some of the needed information. For most types of sampling activities, there is an EPA or ASTM (American Society for Testing and Materials) approved standard operating procedure. If these procedures are followed, the QA project plan writer can make references instead of writing out all the information. Many of these documents are available from ADEC QA Specialists located within each regional office.

ADEC also encourages laboratories and those performing field analyses to use EPA approved analytical techniques. EPA methods specify the analytical procedures to follow, the traceability of the standards in calibration of instruments and the minimum quality control procedures required. Also, most established laboratories have written QA policies that can be referenced to fill in other requirements in the QA project plan. If the QA project plan writer makes reference to any document, it must be on file with ADEC or attached as an appendix.

Following these guidelines, is Appendix A which contains a bibliography of references for sampling, analytical methods and data validation.

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APPENDIX A (Bibliography References for Sampling, Analytical Methods and Data Validation

ELEMENTS OF A QUALITY ASSURANCE PROJECT PLAN

Each of the elements listed below must be considered for inclusion in a Quality Assurance Project Plan (QAPjP)

1 PROJECT OVERVIEW

1.1 Title Page / Approvals

The title page must include the title of the project and the name(s) of the principle investigator(s). This page should be signed and dated by the principle investigator and the person in charge of data quality assurance. This approval will verify that the plan is technically and scientifically acceptable and that data of known quality will be obtained if the performance criteria in the plan are observed.

1.2 Table of Contents of Project Plan

If the length of the QA plan is more than 10 or so pages, a table of contents should be included.

1.3 Project Description

This section should be divided into three sections: site history, project objectives, and the approach used to meet project objectives. Each is discussed briefly below.

Site History: The site history should address what the problem is, how did it become a problem, why it is a problem, and when did it occur. The site location should include latitude and longitude to the nearest minute if resolution to the nearest second is not possible. This section can make reference to existing documents for historical information and data if those documents are readily available to the CIA plan reader. Those existing documents can be attached as appendices.

Project Objectives: This section should contain concise statements of objectives. These statements should include the parameters to be measured either by name or method number, and what media (air, water, solvents, soil, rock or sludge) will be sampled. The purpose for each set of data should also be clearly stated.

A statement for a pond containing benzene might read:

"Water samples from pond X are to be analyzed for benzene to determine if the drinking water quality standard of 5 ppb of benzene is exceeded."

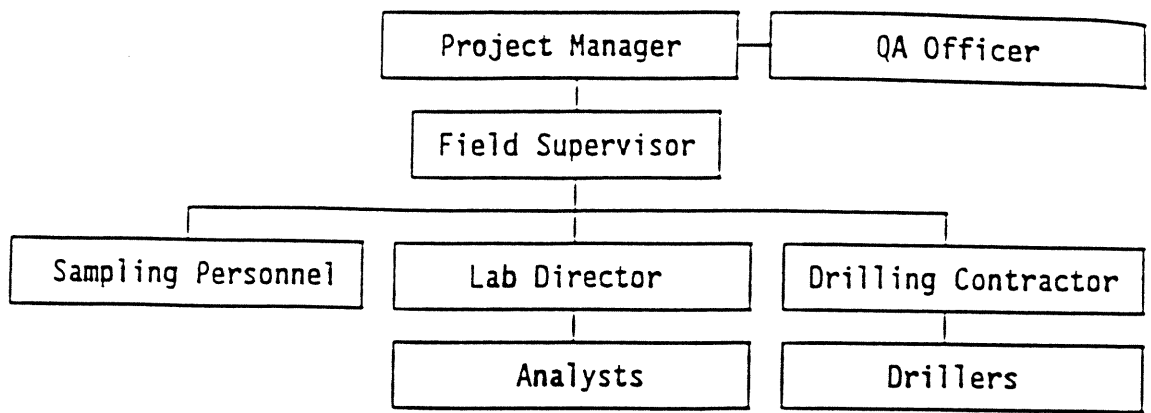
Approach: This section should state how the project is to be conducted. It should give detailed information about the sampling locations as well as outlining the sampling and analytical procedures given in detail later in the QA plan.

A statement for soil samples to be collected might read:

"Soil samples will be collected on June 7, 1992 from the 16 locations shown on map 'A'. One sample will be taken at 14 of the sites and 2 samples will be collected at sites number 12 and 13. Samples will be collected by moving soil into a glass jar with a stainless steel scoop as detailed on pages 14 to 16. Samples will be analyzed for total petroleum hydrocarbons using EPA method 418.1 (modified for soils) by laboratory 'Z'."

1.4 Project Organization and Responsibilities

This section can be displayed as an project organizational chart with the appropriate names added to the boxes that illustrate the line of authority. Name all key individuals in charge of every major activity in your project. Describe each persons responsibility as it relates to the project duties and quality assurance on the project.



A description of a persons responsibility might read:

** Project Manager : Ensures that the QAPjP is prepared and adhered to: by proper handling of sample receipts, custody records and all other required documentation; through careful instrument calibration and maintenance; that internal quality control measures are implemented; that corrective action is taken; and reports are produced in a timely manner. **

2 SAMPLING PROCEDURES:

2.1 **Sampling Techniques and Apparatus**

The sampling technique must either be written out in detail or referenced in an attachment. The procedures and methods used for decontamination and cleaning of the sampling apparatus must be specified or referenced.

2.2 **Sample Containers**

The material of construction and volume of the sample containers must be stated. Also, methods used for assuring the sample containers are clean must be specified or referenced.

2.3 **Sample Holding Conditions**

The maximum allowable holding time between collection of the sample and analysis must be given. The QA plan must specify if samples need to be refrigerated at a certain temperature or stored with a preservative.

2.4 **Sample Custody**

The U.S. Environmental Protection Agency (EPA) has defined sample custody as:

* A sample is under custody if,

- 1] The sample is in your possession; OR
- 2] The sample is in your view, after being in your possession; OR
- 3] The sample was in your possession and then you locked it up to prevent tampering;
OR
- 4] The sample is in a designated secure area. *

Chain-of-custody procedures should insure that one or more of those 4 requirements are met for the sample container from the time it is verified clean and distributed by the laboratory until the sample is discarded by the laboratory after analyses have been completed.

A complete description of the specific custody procedures being followed during sample collection and shipment to maintain proper chain-of-custody as defined above should be described in detail.

Examples of custody transfer forms, custody seals and laboratory sample tracking forms should be included. Include or reference the laboratories standard operating procedures (SOPs) to fulfill the above custody requirements.

2.5 Field Quality Control Samples

For most projects, quality control (QC) samples will constitute 10% or more of the total sample load. The QA plan must specify the type and number of QC samples to be collected. Types of QC samples include:

- ◆ Trip Blank - A sample of analyte-free media taken from the laboratory to the sampling site along with each batch of samples and returned to the laboratory unopened. A trip blank is used to document contamination attributable to shipping and field handling procedures. This type of blank is useful in documenting contamination when trace volatile organic compounds are being investigated.
- ◆ Decontamination Blank (Equipment Blank) - A sample of analyte-free media used to rinse sampling equipment. It is collected after completion of decontamination procedures and prior to sampling. This blank is useful in documenting adequate decontamination of sampling equipment.
- ◆ Background Sample - A sample collected in an area judged to be free of a site contaminant. The background sample is taken to document and assess analyte baseline or historical information.
- ◆ Field Duplicate Samples - Independent samples which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. These duplicates are useful in documenting the precision (variability) of the sampling and analytical process.

3 ANALYTICAL PROCEDURES

This section applies to both laboratory analysis and field analytical procedures such as determining pH or conductivity.

3.1 Reference to Approved Analytical Method

EPA-approved or other validated standard methods should be used. A summary table can be used to illustrate the analytical method for samples to be collected. Non-standard or modified analytical procedures made to standard methods must be referenced and be submitted in detail to ADEC for review.

3.2 Calibration Procedures, Frequency and Traceability of Standards

Reference EPA-approved or other validated, standard methods whenever possible.

If the calibration procedure is not included in the referenced method a written description should be provided to include;

- ◆ Append instrument-specific calibration SOPs as needed to support the use of non-standard or modified methods, or methods that do not include detailed calibration procedures.
- ◆ Describe the frequency of calibration (initial or continuing calibration checks).
- ◆ List standards to include their source, traceability, and purity. Whenever possible, standards should be traceable to EPA or NIST (National Institute of Standards and Technology), meaning that the concentration of the standard is certified by one of these agencies.
- ◆ Define acceptance criteria for all calibration measurements.

3.3 Laboratory Quality Control Samples

Most published analytical methods specify the minimum quality control samples and procedures to accompany the analysis of samples. If not, or if additional QC is to be done, it should be detailed in this section. Some typical analytical QC procedures include the analysis of:

- ◆ EPA Quality Control Samples - QC samples are certified known concentrations of specific analytes in distilled water.
- ◆ Standard Reference Samples - SRM samples are certified concentrations of specific analytes in the same matrix type as the sample.
- ◆ Split Samples - Aliquots of sample taken from the same container and analyzed independently. Split samples measure the variability in measurement of the analysis.
- ◆ Method Blanks - A method blank is an analyte-free media to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank must be carried through the complete sample preparation (extraction, digestion) and analytical (analysis) procedure. The method blank is used to document contamination resulting from the analytical process.
- ◆ Matrix Spike (MS) / Matrix Spike Duplicate (MSD) - Matrix spiked samples are environmental samples spiked with known concentrations of the target analytes of interest. The spiking occurs prior to sample preparation and analysis. They help to assess and document the precision and bias of a method in a given sample matrix.

3.4 Data Reduction

Data reduction occurs after all standards, samples, blanks and QC samples have been analyzed. Topics to discuss or referenced in the analytical laboratory standard operating procedures include;

- ◆ Names of individuals responsible for data reduction.
- ◆ List all equations and calculations used to determine concentrations.
- ◆ Description of how results on blanks will be treated in the calculations.
- ◆ Examples of data sheets.

4 QUALITY ASSURANCE PROCEDURES

4.1 Quality Assurance Objectives for Measurement Data

Data Quality Objectives (DQOs) are quantitative and qualitative statements (goals) describing the quality of data needed for planned environmental monitoring projects to support a specific environmental decision or regulatory action.

Within this section the quantitative and qualitative DQOs can be described by:

- | | |
|---|---|
| ◆ Summary Table of the Quantitative QA Objectives | Method Detection Limit
Precision
Accuracy
Completeness |
| ◆ Narrative of the Qualitative QA Objectives | Representativeness
Comparability |

These data quality indicators are defined, calculated and assessed as follows:

Precision - Precision is the agreement between a set of replicate measurements without assumption of knowledge of the true value. It is a measure of the variability in repeated measurements of the sample compared to the average value. The precision assessment should represent the variability of sampling, sample handling, preservation and storage of the environmental measurement data.

The summary statistic's of relative percent difference (RPD) and/or relative standard deviation (RSD) are used to calculate the data quality indicator of precision.

If duplicate or split samples are analyzed, the precision can be found by calculating the relative percent difference (RPD) of the two results using the formula:

$$\diamond \quad \% \text{ RPD} = \frac{|D_2 - D_1|}{(D_1 + D_2) / 2} \times 100$$

Where: D_1 = First sample result
 D_2 = Second sample result

If calculated from three or more replicates, use relative standard deviation (RSD) rather than RPD.

$$\diamond \quad \% \text{ RSD} = (s / \bar{y}) \times 100$$

Where: \bar{y} = Mean of replicate analysis
 s = standard deviation

Accuracy - A measure of the closeness of an individual measurement or an average of a number of measurements to the true value.

The summary statistic of percent recovery of a matrix spike sample can be used as a data quality indicator of accuracy. Percent recovery (%R) for individual analytes is calculated by the formula:

$$\diamond \quad \% \text{ R} = \frac{(SSR - SR)}{SA} \times 100$$

Where: SSR = Spiked sample result
SR = Sample result
SA = Amount of spike added

Method Detection Limit - The method detection limit (MDL) is the minimum concentration that can be measured with 99% confidence that the true concentration is above zero. The MDL is defined as follows for all measurements:

$$\diamond \quad \text{MDL} = t \times S$$

Where: t = Students' t-value appropriate to a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom

S = standard deviation of the replicate analysis

Representativeness - Is the degree to which data accurately represent a particular characteristic of a population or environmental parameter. A statement how the choices of sampling locations and methods are appropriate for answering the questions that the project was set up to address.

Completeness - Completeness is the measure of how the amount of valid data obtained from a measurement system compare to the expected amount. Completeness is calculated after the study has been completed and is expressed as a decimal or percent usable data (usable data divided by total possible data).

Where: V = number of measurements judged valid

n = total number of measurements necessary to achieve a specified statistical level of confidence in decision making

Comparability - Comparability expresses the confidence with which one data set can be compared to another data set. A narrative statement might state that any data comparisons will be conducted between two or more data collected and analyzed using exactly the same methods and key quality control elements and reported in the same units of quantification.

4.2 Data Validation

This is the systematic process of reviewing a body of data against a set of criteria to provide assurance that the data is adequate for intended use. Data validation consists of data editing and checking the quality control and sample analytical data against the acceptance limits to verify that the analytical systems were in control and proper methods were used. Specify the individuals whom will be responsible for data validation and describe any procedures for determining outliers and qualifying (flagging) data.

4.3 Corrective Action for Out-of-Control Situations

Corrective action identifies the procedure, methods used and/or actions taken to correct unacceptable or unexpected deviations in sampling or analysis. Out-of-control situations are usually detected when quality control measurements indicate blank contamination, poor precision, low accuracy, low recoveries of a spike, or a temperature too high for sample storage. The QA plan must address what specific actions will be taken to correct out-of-control situations.

The following is an example of what this section of the QA plan could say:

'[E, during the data validation process, an out of control situation is found, THEN, one of the following will occur:

- 1) The affected samples will be reanalyzed,*
- 2) Sampling will be repeated and the new samples analyzed,*
- 3) Data will be reported with a note explaining the out of control situation.'*

Personnel responsible for initiating, approving, implementing, evaluating and reporting corrective action should be specified.

4.4 Preventative Maintenance

Preventative maintenance should list the routine and documented care of equipment and materials used in the sampling effort or in the analysis of the samples. For laboratory equipment, it is sufficient to reference the manufacturer's supplied manuals with recommendations for equipment maintenance.

For field equipment, additional procedures should be used to prevent equipment failure and thus ensure that all samples and data can be collected as planned. These could include items such as:

- ♦ Keeping a maintenance log so equipment status can be easily determined
- ♦ Making sure that pH and dissolved oxygen probes do not dry out
- ♦ Providing waterproof containers so that field electrical equipment does not get wet
- ♦ Providing extra supplies such as batteries, electrodes etc.

A schedule of important preventative maintenance tasks for critical measurement systems can be included.

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6.2 References

References can be cited in the body of the text or as footnotes. If any reference is not readily available, attach a photocopy to your QAPJP. Wherever you put the references, make sure they include the following information:

- ◆ Author
- ◆ Title
- ◆ Source, date, edition
- ◆ Volume, page, year
- ◆ Document number