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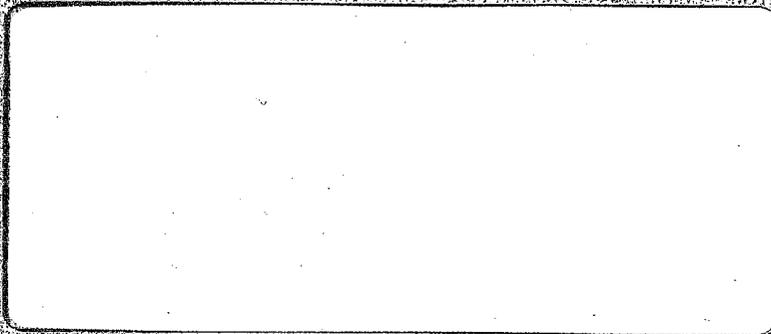
FINAL TREATMENT OF WATER SUPPLY WELLS PHASE 1 INTERIM SOLUTION NAS
WHITING FIELD FL
3/1/1987
HENDON ENGINEERING



Hendon Engineering Associates, INC.

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1025 Montgomery Highway • Birmingham, Alabama 35216

Asheville, North Carolina

Nashville, Tennessee

00774

FINAL REPORT
CONTRACT N62467-86-D-0222, AMENDMENT NUMBER 2
TREATMENT OF WATER SUPPLY WELLS
PHASE I - INTERIM SOLUTION
NAS WHITING FIELD, MILTON, FLORIDA

FINAL REPORT
CONTRACT N62467-86-D-0222
AMENDMENT NUMBER 2
TREATMENT OF WATER SUPPLY WELLS
PHASE I - INTERIM SOLUTION

NAS, WHITING FIELD

MILTON, FLORIDA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

PREPARED BY

HENDON ENGINEERING ASSOCIATES, INC.
BIRMINGHAM, ALABAMA

PROJECT NUMBER 808

MARCH, 1987

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I. INTRODUCTION

A. Background

The south and west water supply wells serving Naval Air Station, Whiting Field, Milton, Florida have been shut down because of organic contamination. NAS Whiting Field is currently operating with service from only the north water supply well. The location of NAS Whiting Field is indicated in Figure A and the locations of the water supply wells are shown in Figure B.

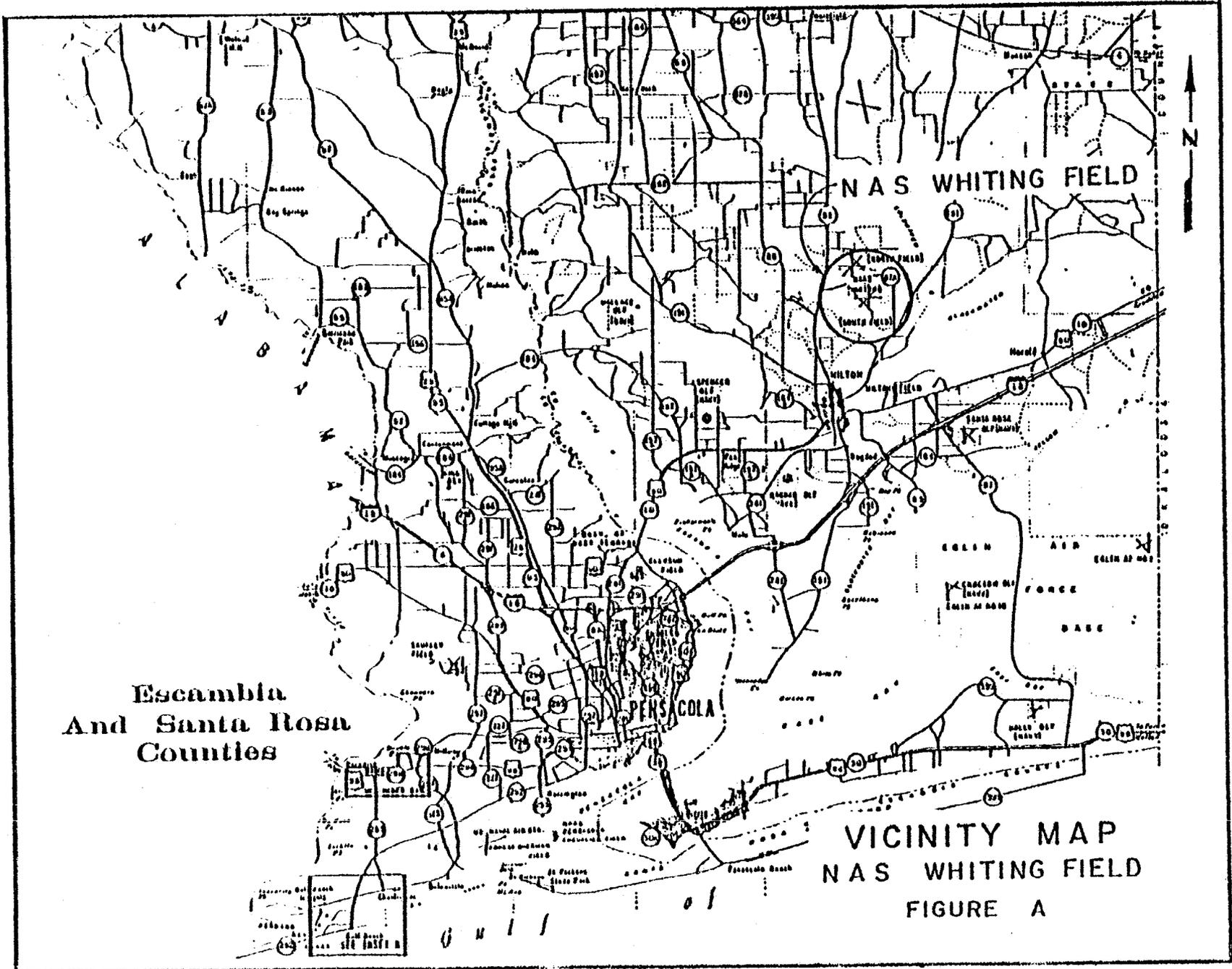
B. Description of Project

The purpose of this project is to evaluate alternatives to insure a continuing supply of potable water to meet the needs of NAS Whiting Field. The project has been divided into two phases; the first to determine an interim solution and the second to determine a long-term or permanent solution to insuring a continuing supply of potable water. The Plan of Work for both phases is presented in Appendix I.

C. Purposes of Phase I

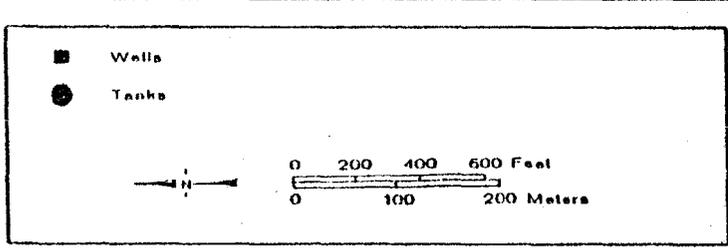
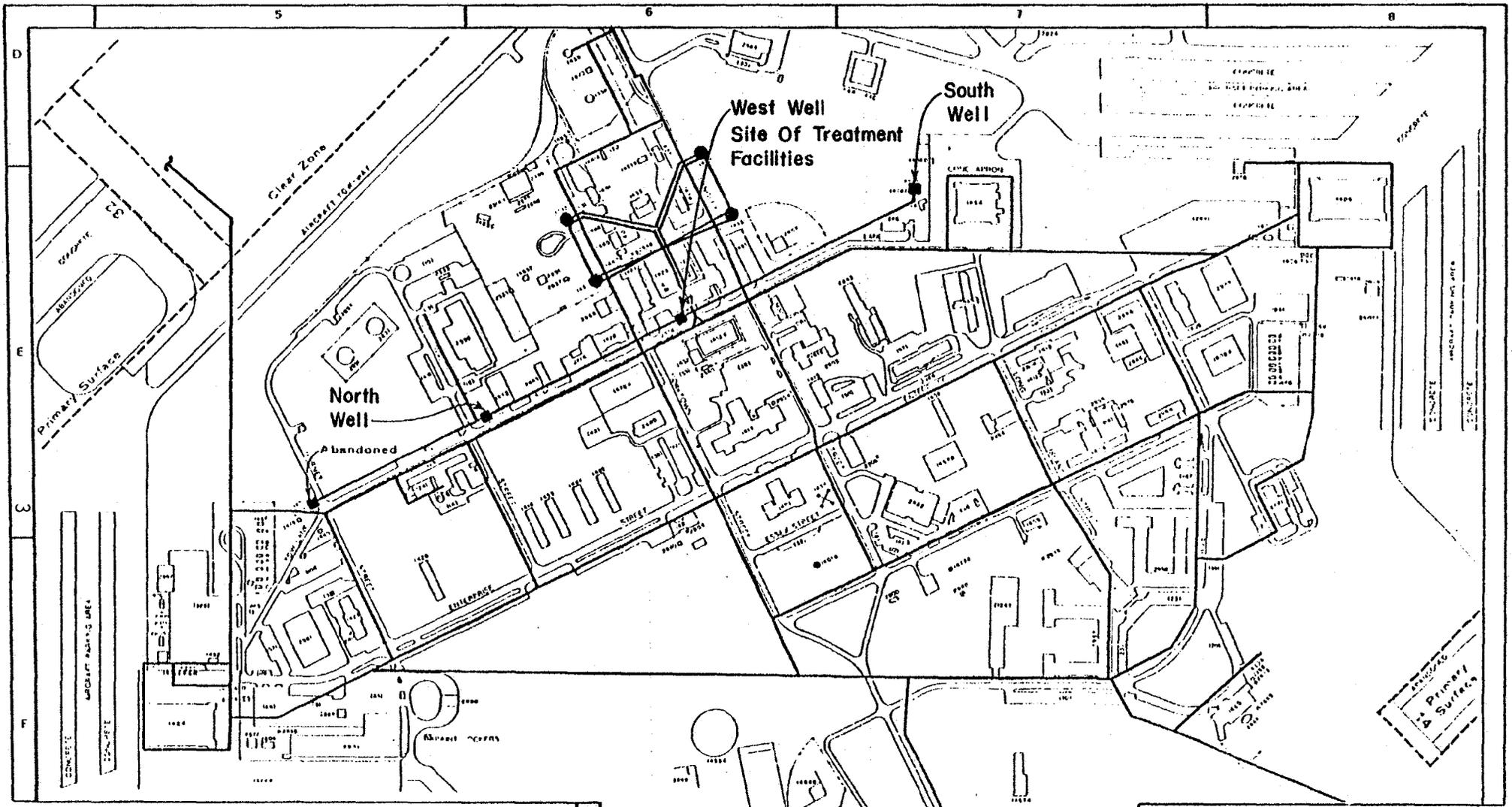
The purposes of Phase I are to define and evaluate alternatives to insure a backup supply of potable water to supplement the potable water supply provided to NAS Whiting Field by the north water supply well. These actions will include:

1. An investigation to determine the most cost effective and immediate solution for treating water from the west water supply well to meet applicable state and federal requirements.
2. An evaluation of leasing the applicable equipment and the provision of bottled or tanked-in potable water.
3. An evaluation of obtaining permanent treatment facilities for the west well.



Escambia
And Santa Rosa
Counties

VICINITY MAP
N.A.S. WHITING FIELD
FIGURE A



Department of the Navy
 Naval Facilities Engineering Command
 Southern Division Charleston, S.C.
 NAS Whiting Field, Milton, Fla.
 Master Plan - Figure 2-III-13
 Utilities, Water Supply
Figure B

4. A comparison of viable alternatives including:
 - a. Cost Estimates.
 - b. Applicable project documentation.
 - c. A recommended Plan of Action.
5. Leasing alternatives considered assume provision by the supplier of total services for:
 - a. Installation.
 - b. Operation.
 - c. Maintenance.
6. Purchase alternatives considered assume provision by the supplier for:
 - a. Turn-key supply and installation.
 - b. Sealed engineering plans for proposed installation.

D. Final Phase I Report

The purpose of this Final Phase I Report is to present a findings, recommendations and the technical specifications necessary to provide a backup potable water supply for NAS Whiting Field. Included in this report are:

1. A synopsis of regulatory agency requirements.
2. Determinations of water quality and water supply requirements.
3. Evaluations of viable treatment and water supply alternatives.
4. Technical specifications for the alternative recommended.

E. Synopsis of Regulatory Agency Compliance Requirements

Potable or drinking water quality requirements have been based on the following:

1. Federal Law and Regulations

- a. "The Safe Drinking Water Act Amendments of 1986," PL 99-339.
- b. "National Primary Drinking Water Regulations: Volatile Synthetic Organic Chemicals," Final Rule, 40 CFR Part 141, November 13, 1985.
- c. "National Primary Drinking Water Regulations: Volatile Synthetic Organic Chemicals," Proposed Rulemaking, 40 CFR Parts 141 and 142, November 13, 1985.
- d. "Regulating Organics," Michael Cook, Director, Office of Drinking Water, U.S. Environmental Protection Agency in Discussion with Nancy Zeilig, Editor, Journal American Works Association, November 7, 1986, Jour. AWWA, 79, 1, 10, January 1, 1987.

2. Navy Publications

- a. "Economic Analysis Handbook," NACFAC P-442, July, 1980.

3. Florida Administrative Code (F.A.C.)

- a. "Public Drinking Water Systems," F.A.C., Chapter 17-22.
- b. "Florida Air Stripping Policy Guidelines" pending as per Conversation with Clair Fancy, Bureau of Air Quality Management, January 27, 1987.

4. Groundwater Quality Assessment

- a. "Verification Study, Assessment of Potential Groundwater Pollution at Naval Air Station Whiting Field, Florida," Geraghty and Miller, Inc., December, 1986.

II. WATER QUALITY AND WATER SUPPLY REQUIREMENTS

A. Quality of Water from Water Supply Wells at NAS Whiting Field

1. The Santa Rosa County Health Unit of the Florida Department of Health and Rehabilitation Services and the NAS Public Works Department have repeatedly sampled the water supply wells at NAS Whiting Field for organic contamination. Results of analyses of these samples are presented in Table 1. These analyses indicate the following concentrations of organic contaminants:

- a. South Well - 4 ug/L Trichloroethylene (TCE).
2 to 29 ug/L Benzene.
Trace total Xylenes.
- b. West Well - Trace to 11 ug/L TCE.
- c. North Well - No organics detected to a tract of Toluene
and a trace of total Xylenes.

2. Florida Standards

The Florida Administrative Code, Chapter 17-22, "Public Drinking Water Systems," Section 17-22.104,(1),(g), Appendix II to this Report, establishes the following maximum concentrations:

- a. Trichloroethylene - 3 ug/L.
- b. Benzene - 1 ug/L.
- c. Toluene - no maximum concentration established.
- d. Total Xylenes - no maximum concentration established.

3. Federal Requirements

Section 1412.(a)(2) of the Safe Drinking Water Act included herein as Appendix III states:

After the enactment of the Safe Drinking

TABLE 1

Analyses of Samples from Water Supply Wells
NAS Whiting Field, Milton, Florida

| <u>Date of Sample</u> | <u>Contaminant</u> | <u>Analyst</u> |
|----------------------------|--|-------------------|
| <u>South Well (W-S2)</u> | | |
| November 1, 1985 | 4 ug/L ¹ Trichloroethylene ² | Pioneer Lab |
| March 21, 1986 | 4 ug/L Benzene | Pioneer Lab |
| April 21, 1986 | 2 ug/L Benzene | Pioneer Lab |
| September 14, 1986 | 29 ug/L Benzene | DHRS ³ |
| October 1, 1986 | 14 ug/L Benzene | Pioneer Lab |
| October 1, 1986 | 17 ug/L Benzene | Compu Chem |
| October 1, 1986 | 6 ug/L Benzene ⁴ | Pioneer Lab |
| October 1, 1986 | 7.4 ug/L Benzene ⁴ | Compu Chem |
| October 6, 1986 | 11.9 ug/L Benzene | DHRS |
| October 6, 1986 | Trace Total Xylenes | DHRS |
| December 9, 1986 | 4.96 ug/L Benzene | DHRS |
| January 5, 1987 | 7.82 ug/L Benzene | DHRS |
| <u>West Well (W-W3)</u> | | |
| September 14, 1986 | 7.9 ug/L Trichloroethylene | DHRS |
| October 1, 1986 | 10 ug/L Trichloroethylene ⁴ | Pioneer Lab |
| October 1, 1986 | 6 ug/L Trichloroethylene ⁴ | Pioneer Lab |
| October 1, 1986 | 10.5 ug/L Trichloroethylene | DHRS |
| December 9, 1986 | Trace Trichloroethylene | DHRS |
| January 5, 1987 | Trace Trichloroethylene | DHRS |
| January 9, 1987 | Trace Trichloroethylene | DHRS |
| <u>North Well (W-N4)</u> | | |
| September 14, 1986 | Trace toluene | DHRS |
| October 1, 1986 | No organics detected | Pioneer Lab |
| October 6, 1986 | No organics detected | DHRS |
| December 9, 1986 | No organics detected | DHRS |
| January 5, 1987 | No organics detected | DHRS |
| <u>Distribution System</u> | | |
| October 6, 1986 | Trace Total Xylenes | DHRS |
| December 9, 1986 | No organics detected | DHRS |
| January 5, 1987 | Trace chlorodibromomethane | DHRS |

- Notes:
1. ug/L = micrograms per liter, ppb or parts per billion.
 2. Trichloroethylene = Trichloroethene or TCE.
 3. DHRS = Florida Department of Health and Rehabilitation Services.
 4. Samples taken after treatment by chlorination and stability control.

Water Act Amendments of 1986 each recommended maximum contaminant level published before the enactment of such amendments shall be treated as a maximum contaminant level goal.

Recommended maximum contaminant levels (RMCL's) and maximum contaminant levels (MCL's) for eight volatile organic compounds (VOC's) were established and reported in the Federal Register on November 13, 1985. Of concern here are:

- a. Benzene - 0 ug/K RMCL.
5 ug/L MCL.
- b. Trichloroethylene - 0 ug/L RMCL.
5 ug/L MCL.

Proposed interim primary drinking water regulations contain RMCLs for several synthetic organic chemicals (SOC's). Of concern here are:

- c. Toluene - 2.0 mg/L RMCL.
- d. Xylene - 0.44 mg.L RMCL.

4. Treatment Requirements

In order to meet state and federal water quality requirements, the well supply at NAS Whiting Field would require treatment as indicated in Table 2.

B. Water Supply Requirements

1. Well Supply

Water well capacities and water usage are presented in Table 3. The south well would not meet the anticipated water demand and it is not mentioned for possible use as a water supply well in the Scope of Work. Therefore, the south well will not be considered further in the Phase I Report. With adequate treatment, the west well would meet

TABLE 2
Water Treatment Requirements
NAS Whiting Field, Milton, Florida

| <u>Well</u> | <u>Contaminant</u> | <u>State MCL</u> | <u>Federal MCL</u> | <u>Design MCL</u> |
|-------------|--------------------|------------------|---------------------|------------------------|
| South | 4 ug/L TCE | 3 ug/L | 5 ug/L ¹ | 1 ug/L |
| | 29 ug/L Benzene | 1 ug/L | 5 ug/L ¹ | 0.5 ug/L |
| West | 11 ug/L TCE | 3 ug/L | 5 ug/L | 1 ug/L |
| North | Trace Toluene | --- | 2.0 mg/L | 1.0 mg/L ² |
| | Trace Xylene | --- | 0.44 mg/L | 0.22 mg/L ² |

- Notes:
1. Federal recommended maximum contaminant levels (RMCL's) of 0 are unattainable.
 2. Contaminant levels are well below design maximum contaminant levels (MCL's) and no treatment would be required.

TABLE 3

Water Supply and Demand
NAS Whiting Field, Milton, Florida

Water Well Capacities

| | | | |
|------------|---------|-----------|----------------|
| South Well | 450 gpm | 0.648 MGD | 19.44 MG/Month |
| West Well | 700 gpm | 1.008 MGD | 30.24 MG/Month |
| North Well | 600 gpm | 0.864 MGD | 25.92 MG/Month |

Water Usage or Demand

| | <u>Average Flow</u> | <u>Average Flow</u> | <u>Peak Flow</u> | <u>Peak Flow</u> |
|------------------|---------------------|---------------------|------------------|------------------|
| July, 1985 | 14 MG/Month | 314 gpm | 0.831 MGD | 577 gpm |
| August, 1985 | 16 MG/Month | 358 gpm | 0.775 MGD | 538 gpm |
| September, 1985* | 17 MG/Month | 394 gpm | 0.792 MGD | 550 gpm |
| October, 1985* | 17 MG/Month | 381 gpm | 0.874 MGD | 607 gpm |
| November, 1985* | 18 MG/Month | 417 gpm | 0.911 MGD | 633 gpm |
| December, 1985* | 19 MG/Month | 426 gpm | 0.768 MGD | 533 gpm |
| July, 1986 | 19 MG/Month | 426 gpm | 1.079 MGD | 749 gpm |
| August, 1986 | 15 MG/Month | 336 gpm | 0.772 MGD | 536 gpm |
| September, 1986 | 13 MG/Month | 301 gpm | 0.660 MGD | 458 gpm |
| October, 1986 | 14 MG/Month | 314 gpm | 0.766 MGD | 543 gpm |
| November, 1986 | 9.5 MG/Month | 220 gpm | 0.435 MGD | 302 gpm |
| December, 1986 | 10.5 MG/month | 235 gpm | 0.517 MGD | 359 gpm |

* Broken water main

the present monthly water demand of NAS Whiting Field as an alternate to the north well.

2. Standby Bottled Water Supply

As an interim alternative to providing facilities to treat the water from the west well, use of bottled water for potable water at such times as supply from the north well should be interrupted has been evaluated. Potable water requirements are developed in Table 4. The requirements have been estimated based on the following assumptions:

- a. Work spaces and sleeping quarters will require four 6 ounce glasses of water per person per day.
- b. Residences will require eight 6 ounce glasses of water per person per day.
- c. Residences will average four persons per house.
- d. Restaurants will require one 6 ounce glass of water per patron.
- e. Restaurant kitchens will require two 6 ounce glasses of water per meal served.
- f. A maximum of 10 gallons of water can be dispensed per dispenser per day.

III. WATER SUPPLY ALTERNATIVES - One-Year Lease Contract

A. Bottled Water - Emergency Standby Water Supply

1. Description of Scheme

Bottled potable water and room-temperature dispensers would be leased and stored on the NAS for distribution throughout the NAS for use at such times as the north well

TABLE 4

Bottled Water
Emergency Standby Water Supply
NAS Whiting Field, Milton, Florida

| <u>Type Service</u> | <u>No. of Locations</u> | <u>No. of Dispensers</u> | <u>Persons per Dispenser</u> | <u>6oz. Glasses Per Day Per Per.</u> | <u>Cups per Month</u> | <u>GPM Per Person</u> | <u>GPM Per Dispenser</u> | <u>Total GPM</u> |
|-----------------------|-------------------------|--------------------------|------------------------------|--------------------------------------|-----------------------|-----------------------|--------------------------|------------------|
| Homes | 82 | 82 | 4 | 8 | 39,400 | 11.2 | 44.8 | 3,674 |
| BOQ | 3 Floors | 12 | 42 | 4 | 60,500 | 5.6 | 236.3 | 2,835 |
| Buildings | 50 | 100 | 35 | 4 | 308,000 | 4.1 | 143.5 | 14,350 |
| Restaurants | 4 | 12 | 167 | 1 | 44,000 | 1.0 | 166.7 | 2,000 |
| <u>Rest. Kitchens</u> | <u>4</u> | <u>16</u> | <u>125</u> | <u>2</u> | <u>---</u> | <u>2.0</u> | <u>250.0</u> | <u>4,000</u> |
| Totals | --- | 222 | --- | --- | 451,900 | --- | --- | 26,859 |

- Notes: 1. GPM = Gallons per Month
2. 26,859 gallons per month = 5,372 5-gallon bottles per month.
3. 451,900 is approximately 500,000 cups per month.

would go out of service. The west well would be placed in service to provide water for all purposes except for drinking and cooking. Dispensers would be placed in each residence on the NAS, on each floor of the BOQ, in all regularly occupied buildings, in all restaurant dining rooms and in restaurant kitchens in accordance with the scheme indicated in Table 4. The bottled water supplier would supply bottled water, dispensers and cups. Contract labor would distribute bottles from a central location to points of dispensing and then return empties to the central location.

2. Cost for Bottled Water Supply

A supplier's budget price quote and a Cost Estimate Form for supplying bottled water are given in Appendix IV. The quantities presented in Table 4 have been revised somewhat from those in the appended quote. The estimated costs are as follows:

a. Cost for initial reserve supply

| | |
|-----------------------------|---------------|
| with 2,000 bottles | \$23,328 |
| Less bottle refund | <u>12,000</u> |
| Net cost for reserve supply | \$11,328 |

b. Cost per additional month of

| | |
|----------------|--------|
| reserve supply | \$ 833 |
|----------------|--------|

| | |
|--------------------------|----------|
| c. Cost per month of use | \$47,555 |
|--------------------------|----------|

3. Advantages of Bottled Water Supply

An emergency bottled water supply offers the following advantages:

- a. Immediately available (Less than 48 hours).
- b. Low cost when not in use.

4. Disadvantages of Bottled Water Supply

An emergency bottled water supply presents the following disadvantages:

- a. Erodes confidence in reliability and safety of potable water supply.
- b. Difficult to police improper use of non-potable water when non-contaminated well is out of service.
- c. More costly than air stripping during periods of use.
- d. Does not readily allow for periods of recovery of the draw-down of the non-contaminated north well.
- e. May create problem of contamination of the entire water distribution system according to legal definition.

B. Air Stripping

1. Description of Scheme

Volatile organic compounds (VOC's) such as trichloroethylene (TCE) can be removed from water by purging the water with air. Such a system is described in Appendix V. The description is based on a 6'6" diameter by 12' tall tower which would require a minimum of six to eight weeks for delivery. A subsequent phone call produced an alternate of three towers at 3' diameter by 15' tall which could be delivered in less than four weeks.

2. Cost of Air Stripping

The supplier's budget quote for the three stripping towers has been written on the quote included in Appendix V.

Also included in Appendix V is a Cost Estimate Form. The estimated costs for air stripping are as follows:

| | |
|------------------------------------|--------------|
| a. Equipment installation lease | \$10,000 |
| b. Monthly rental | <u>6,900</u> |
| c. Cost for first month | \$16,900 |
| d. Cost for subsequent months | \$ 6,900 |
| e. Direct purchase price installed | \$55,000 |

3. Advantages of Air Stripping Towers

Treatment of the west well with air stripping towers offers the following advantages:

- a. Available within four weeks.
- b. Lowest cost when in use.
- c. Mr. Berry Andrews of the Bureau of Air Quality Management indicated on January 28, 1987, that air stripping would create no air quality problems based on the following:

- (1) Maximum TCE concentration of 11 ug/L.
- (2) Pumping 700 gpm.
- (3) 100% removal.
- (4) Total of (1), (2) and (3) would be 0.092 #/D.
- (5) Discharge from a 15' tower.
- (6) Anticipated TCE discharge concentration 2.7×10^{-3} ug/m³.
- (7) Florida Guideline - 0.64 ug/m³ acceptable.

4. Disadvantages of Air Stripping Towers

Treatment of the west well with air stripping towers presents the following disadvantages:

- a. Double pumping is required.
- b. Single unit at 6'6" diameter by 12' tall cheaper but delivery time is approximately twice as long.
- c. Should synthetic organic chemicals (SOC's) appear in the groundwater, activated carbon adsorption would be the treatment method of choice. The Safe Drinking Water Act, Section 1412.(b)(0)(5) states:

For the purposes of this subsection, the term "feasible" means feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under laboratory conditions, are available (taking cost into consideration). For the purpose of paragraph (4), granular activated carbon is feasible for the control of synthetic organic chemicals, and any technology, treatment technique, or other means found to be the best available for the control of synthetic organic chemicals must be at least as effective in controlling synthetic organic chemicals as granular activated carbon.

Mr. Michael Cook, Director, Office of Drinking Water,
U. S. EPA in the reference cited in Section I.E.1.d.

above further elaborated as follows:

The amendments name granular activated carbon as the best available technology for controlling synthetic organic chemicals. What other treatment techniques are likely to be considered best available technologies?

Aeration, certainly, for volatile organics or radon. For water supplies containing metals that can't be removed by granulated activated carbon, we're probably looking at some kind of softening process, like lime. Basically, what we hope to do is to identify the processes that are typically used and have proved to be effective against the contaminant in question. We certainly have in mind allowing utilities to use other kinds of technologies as long as they meet the MCLs.

C. Activated Carbon Adsorption

1. Description of Scheme

VOC's such as TCE and SOC's can be removed from water by pumping the water through an activated carbon filter. Such a system is described in Appendix VI. The system would consist of two 10' diameter vessels each containing 20,000 pounds of activated carbon. The west well would pump directly through the two vessels in parallel into the water distribution system.

2. Cost of Activated Carbon Adsorption

Appendix VI includes a supplier's budget quote and a Cost Estimate form. The estimated costs for activated carbon adsorption are:

| | |
|--|----------|
| a. Equipment Setup and Removal | \$70,000 |
| b. Replacement and Removal of Carbon | \$41,000 |
| c. Monthly Service Fee (After First Month) | \$ 5,000 |

3. Advantages of Activated Carbon Adsorption

Treatment of the west well with activated carbon adsorption offers the following advantages:

- a. No additional pumping required.
- b. Specifically mentioned in the Safe Drinking Water Act for use with SOC's.

4. Disadvantages of Activated Carbon Adsorption

Treatment of the west well with activated carbon adsorption presents the following disadvantages:

- a. Most costly system.
- b. Spent carbon could possibly be classified as a hazardous waste. Disposal would then require the

formalities and expense of hazardous waste disposal. This is not likely, however, as the maximum concentration of TCE on the carbon would not exceed 0.5 mg/Kg after normal use for one year.

- c. Cost could be reduced somewhat for a 500 gpm well as only one vessel would then be required. However, this would not be adequate to match capacity of the north well.

D. Comparison of Systems

1. Summary of Costs

The costs of providing interim treatment or supply of potable water by the three methods evaluated are summarized in Table 5. The following assumptions have been made in preparing the table:

- a. The system will remain in service for twelve months.
- b. The bottled water system would be in use for two months.
- c. Activated Carbon would be replaced once and would not require handling and disposal as a hazardous waste.

2. Evaluation

As air stripping is approximately 79 percent less expensive than activated carbon adsorption and 11 percent less expensive and more desirable than bottled water, an interim solution providing for air stripping of the 700 gpm flow from the west would be the system of choice for an interim one-year lease solution.

TABLE 5

Comparison of Cost Alternatives for Leasing
NAS Whiting Field, Milton, Florida

| <u>Type Costs</u> | <u>Monthly Costs</u> | <u>Total Costs</u> |
|---|----------------------|--------------------|
| <u>Bottled Water</u> | | |
| Monthly Cost - Reserve Supply | \$ 833 | \$ 8,330 |
| Monthly Cost - In Use | \$47,555 | <u>\$ 95,110</u> |
| Cost Per Year | | \$103,440 |
| <u>Air Stripping</u> | | |
| Lease | --- | \$ 10,000 |
| Monthly Charge | \$ 6,900 | <u>82,800</u> |
| Cost Per Year | | \$ 92,800 |
| <u>Activated Carbon Adsorption</u> | | |
| Equipment Setup and Removal | --- | \$ 70,000 |
| Carbon Replacement | --- | 41,000 |
| Monthly Service Fee (After First Month) | \$ 5,000 | <u>55,000</u> |
| Cost Per Year | | \$166,000 |

3. Technical Specifications

Draft technical specifications for the total services of installation and maintenance of an air stripping facility are presented in Appendix VII.

IV. INTERIM SOLUTION

A. Basis for Interim Solution

1. Requirements

In a letter from the Florida Department of Environmental Regulation dated September 26, 1986, Appendix VIII to this Report, NAS was notified that water from the south and west wells were found to contain excessive concentrations of volatile organic compounds. These wells were removed from service and are to remain out of service until it can be demonstrated that all parameters meet requirements of Florida Administrative Code, Chapter 17-22.104(1)(g) including the maximum contaminant level (MCL) for trichloroethylene (TCE) of 3 ug/L and benzene of 1 ug/L.

2. Present Status of West Well

Analyses of samples from the west well on December 9, 1986, January 5, 1987 and January 9, 1987, all identified only trace amounts of TCE. These results appear to indicate that rains ending the dry period of 1986 had diluted the concentration of TCE to an acceptable level in the groundwater supplying the west well.

B. Recommended Interim Solution

1. Recommendation

As three consecutive samples from the west well have shown acceptable levels of TCE and as interim one-year lease

alternatives are more costly than the purchase and installation of treatment facilities for the west well, it was decided at the 100 Percent Review Meeting to seek approval from the Florida Department of Environmental Regulation for utilization of the west well with close monitoring until permanent treatment facilities can be installed.

2. Action

The decision of the 100 Percent Review Meeting has been implemented through preparation of a letter requesting permission to reactivate the west well and detailing proposed monitoring procedures and submission of this letter to the Florida Department of Environmental Regulation. This letter, dated March 3, 1987, is presented in Appendix VIII.

V. PERMANENT WATER TREATMENT ALTERNATIVES

A. Scope Change to Phase I - Interim Solution

The evaluation of interim leasing alternatives discussed in Section III indicated that immediate purchase of facilities to treat water from the west well would apparently be less expensive than a one-year lease. Therefore, during the 100 Percent Review Meeting, it was agreed that the Final Interim Solution Report would evaluate purchase and installation of permanent treatment facilities on a turn-key basis. Included are an evaluation of life cycle costing and the technical portion of construction specifications for the alternative selected.

B. Evaluation of Viable Alternatives

1. Performance Parameters

a. Treatment requirements:

- (1) Maximum anticipated TCE concentration of raw water - 11 ug/L.

(2) Design capability for maximum TCE concentration of raw water - 22 ug/L.

(3) Required maximum concentration level (MCL) of treated water - 1 ug/L.

b. Hydraulic capacity:

(1) Nominal flow - 600 gallons per minute (gpm) or 0.864 million gallons per day (MGD).

(2) Maximum head loss through treatment facilities and ancillary piping at 600 gpm - 23 feet.

c. Discharge conditions:

(1) Static head - 123 feet.

(2) Pressure of discharge from treatment facilities - 52 to 55 psi

2. Air Stripping Facilities

a. Description of scheme:

Volatile organic compounds (VOC's) such as TCE can be removed from water by purging the water with air. Such a system is described in Appendicies V and IX.

b. Cost of air stripping facilities:

A cost estimate for the purchase and operation of an air stripping facility is presented in Appendix IX. The estimated costs for air stripping are as follows:

| | |
|-------------------------------|----------|
| (1) Capital cost | \$64,500 |
| (2) Operation and Maintenance | |
| (a) Year 1 | \$24,700 |
| (b) Year 20 | \$33,700 |

3. Activated Carbon Adsorption Facility

a. Description of scheme:

VOC's such as TCE and synthetic organic compounds (SOC's) can be removed from water by pumping the water through an activated carbon filter. Such a system is described in Appendices VI and X.

b. Cost of activated carbon adsorption facility:

A cost estimate for the purchase and operation of an activated carbon adsorption facility is presented in Appendix X. The estimated costs for activated carbon adsorption are as follows:

| | |
|-------------------------------|----------|
| (1) Capital cost | \$75,000 |
| (2) Operation and Maintenance | |
| (a) Year 1 | \$15,100 |
| (b) Year 20 | \$15,100 |

C. Life Cycle Costs

1. Costing Parameters

Discount rate parameters are presented in Appendix XI. Life cycle costs have been based on the following parameters:

- a. USN discount rate - 10 percent.
- b. Life cycle - 20 years.
- c. Well operation:
 - (1) Year 1 - 2,000 hours.
 - (2) Year 20 - 5,000 hours.
- d. Replacement of air stripping media every 2 years and exhausted at end of 20th year.

- e. Replacement of activated carbon every 2 years with cost of additional replacement at end of 20th year to provide payment for disposal.

2. Life Cycle Costs

A comparison of costs is presented in Table 6 for viable alternatives for direct purchase of treatment facilities for the west well. These indicate that activated carbon adsorption with an average annual equivalent cost of \$26,400 would save approximately 34 percent when compared to air stripping with an average annual equivalent cost of \$40,200.

VI. RECOMMENDATIONS

A. Interim Solution

It is recommended that permission from the Florida Department of Environmental Regulation be sought to reactivate the west well on an interim basis as described in Section IV and Appendix VIII. At the same time, provision of a permanent treatment facility should be expedited.

B. Permanent Treatment Solution for West Well

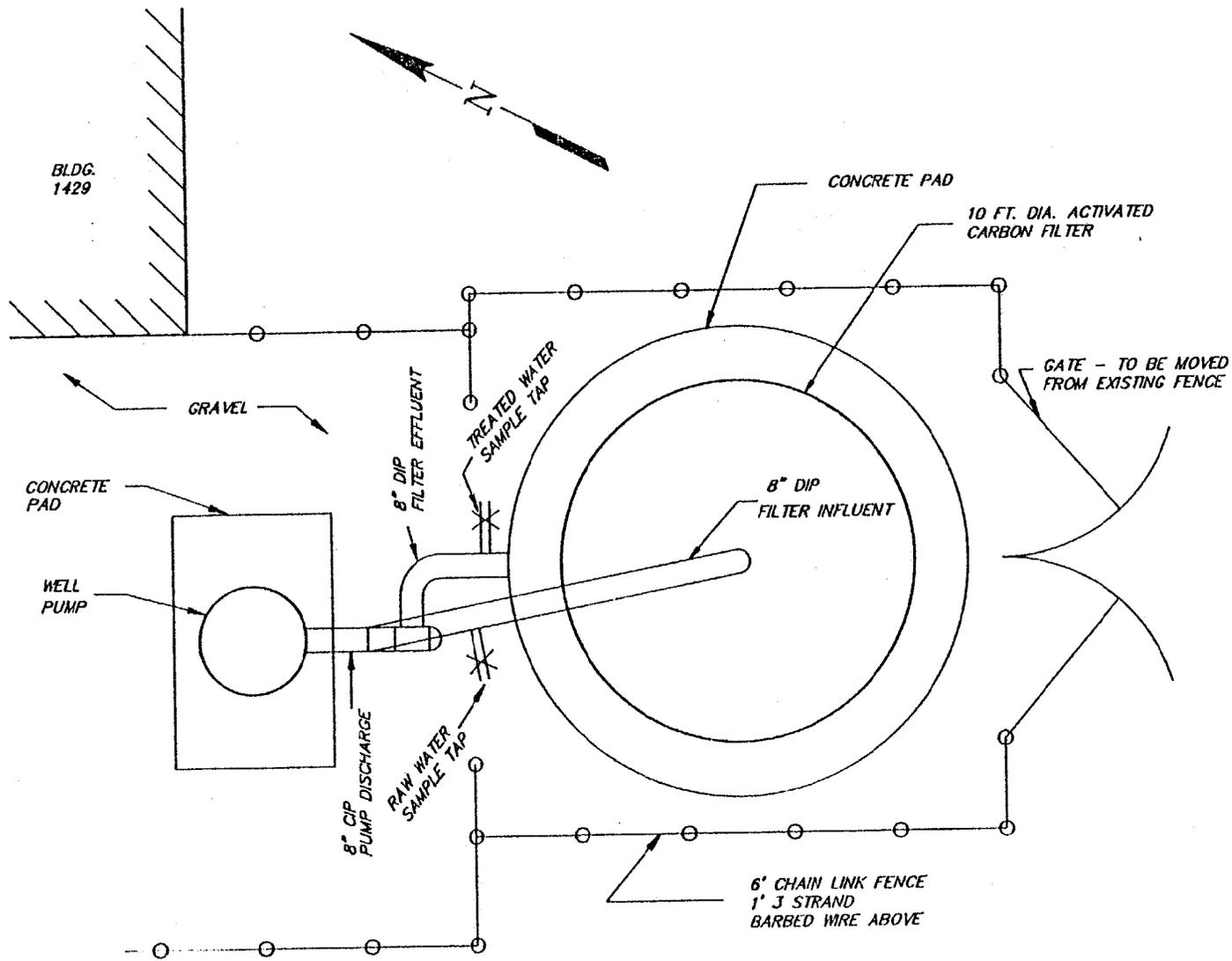
In accordance with findings of this Report and with the consensus of those present at the Phase I 100 Percent Review Meeting, it is recommended that emergency funding be provided and that an activated carbon adsorption filter facility be provided for removal of TCE from water from the west well. The estimated capital cost for these facilities is \$75,000 and annual operating and maintenance costs are estimated to average \$15,100. A cost estimate summary and Special Project Request forms are presented in Appendix XII.

TABLE 6

Comparison of Life Cycle Costs
Treatment Alternatives for West Well
NAS Whiting Field, Milton, Florida

| <u>Cost</u> | <u>Air Stripping</u> | <u>Activated Carbon Adsorption</u> |
|--------------------------------|----------------------|--|
| Total Capital Cost | \$ 64,500 | \$ 75,000 |
| O & M Cost - Year 1 | \$ 24,700 | \$ 15,100 |
| O & M Cost - Year 20 | \$ 33,700 | \$ 15,100 |
| Present Worth of Alternative | \$342,100 | \$224,900 |
| Average Annual Equivalent Cost | \$ 40,200 | \$ 26,400 |

Technical specifications for turn-key purchase and installation of these facilities are presented in Appendix XIII. A tentative layout is shown in Figure C.



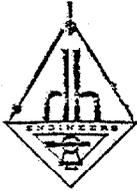
**PROPOSED ACTIVATED
CARBON ABSORPTION SYSTEM**

WEST WELL
NAS WHITING FIELD
MILTON, FLORIDA

FIGURE C

APPENDIX I

Plan of Work



Hendon Engineering Associates

INCORPORATED

TELEPHONE (205) 823-7480

ADDRESS REPLY TO P. O. BOX 20348

SOUTHCREST BUILDING, VESTAVIA HILLS • BIRMINGHAM, ALABAMA 35216

HARRY H. HENDON
(1904-1973)
P. L. BENTLEY
H. D. HUBER
M. G. BUCKLEY, JR.
R. F. HOLBROOK

January 20, 1987

R. P. BINNINGS
J. O. BREWER
W. H. DUKE
H. S. KAHN
G. S. RAJAN
G. H. RHODES
L. R. ROBINSON, JR.
W. C. TALLON
D. F. WARNAT
A. E. WILLARD, JR.

Commanding Officer
Southern Division
Naval Facilities Engineering Command
Attention: 5090, Code 1141
2155 Eagle Drive
P. O. Box 10068
Charleston, South Carolina 29411

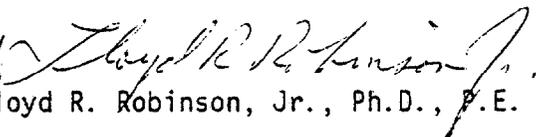
Subject: Contract N62467-86-D-0222, Open-End Contract for Engineering Services to Conduct Utility Technical Studies (UTS) at Various Activities in the Southern Division, Naval Facilities Engineering Command Geographical Region; Amendment #2, NAS Whiting Field, Milton, Florida, Treatment of Water Supply Wells.

Dear Sir:

Enclosed herewith are two (2) copies of the Plan of Work for the subject project. Phase I is well under way and project completion will be expedited.

Very truly yours,

HENDON ENGINEERING ASSOCIATES, INC.

By 
Lloyd R. Robinson, Jr., Ph.D., P.E.

LRR:b
Enclosures (2)
WK27/X1

cc: CDR. R. A. Kechter, w/enclosures
Public Works Officer
Building 1418
Public Works Center
Naval Air Station
Whiting Field
Milton, Florida 32570

Commanding Officer
Southern Division
Naval Facilities Engineering Command
Page Two

January 20, 1987

cc: Mr. Ludwig H. Opager, w/enclosures
Public Works Planning Supervisor
Building 1418
Public Works Center
Naval Air Station
Whiting Field
Milton, Florida 32570

Mr. Danny Locklear, w/enclosures
Building 1418
Public Works Center
Naval Air Station
Whiting Field
Milton, Florida 32570

Mr. Mike Goldston
Southern Division
Naval Facilities Engineering Command
Attention: 5090, Code 1141
P. O. Box 10068
Charleston, South Carolina 29411

Plan of Work
Treatment of Water Supply Wells
NAS Whiting Field, Milton, Florida
Contract N62467-86-D-0222
Amendment # 2
January, 1987

Phase I

| | |
|--------------------|---|
| 1/5/87 to 1/9/87 | Initial meeting at NAS Whiting Field Assemble basic data (Maps, Flow Requirements, Chemical Analyses, etc.) |
| 1/12/87 to 1/23/87 | Assimilation of cost data estimates for interim solution alternatives. |
| 1/26/87 to 1/30/87 | Preparation of draft service contract, draft cost estimates, recommendations and 100% Report. |
| 2/2/87 to 2/15/87 | Discussion of 100% Report |
| 2/15/87 to 3/15/87 | Review of 100% Report |
| 3/16/87 to 3/30/87 | Preparation of Final Report |

Phase II

| | |
|--------------------|---|
| 1/5/87 to 1/9/87 | Initial meeting at NAS Whiting Field Assemble basic data (Maps, Flow Requirements, Chemical Analyses, etc.) |
| 1/12/87 to 2/27/87 | Evaluation of treatment alternatives and alternate water sources |
| 3/2/87 to 3/20/87 | Preparation of 35% Report |
| 3/23/87 to 4/17/87 | Review of 35% Report |
| 3/23/87 to 4/17/87 | Identification and evaluation of air emission requirements and water quality requirements. |
| 4/20/87 to 6/1/87 | Final evaluation of alternatives, preparation of cost estimates, recommendations and 100% Report |
| 6/1/87 to 7/2/87 | Review of 100% Report |
| 7/2/87 to 7/17/87 | Preparation of Final Report |

WK27/T1

Project Schedule and Work Plan
 Treatment of Water Supply Wells
 NAS Whiting Field, Hilton, Florida
 Contract N63467-86-D-0222
 Amendment # 2

| Task | Jan 87 | | | Feb 87 | | | Mar 87 | | | Apr 87 | | | May 87 | | | June 87 | | | July 87 | | | | | | | | | |
|---------------------------------------|--------|----------|----|--------|------------------------|-------------|--------|---------|---------------|---------------|----|----|----------------------|---|----|---------|----|---------------|---------|----|----|---|---|----|----|---------|---|----|
| | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 | 2 | 9 | 16 | 23 | 30 | 6 | 13 | 20 | 27 | 4 | 11 | 18 | 25 | 1 | 8 | 15 | 22 | 29 | 6 | 13 |
| <u>Phase I</u> | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Initial Meeting | : | X | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Assemble Basic Data | : | X | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Assimilation of Cost Data | : | XXXXXXXX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Preparation of 100% Report | : | | | XX:XX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Discussion of 100% Report | : | | | | XXXXXX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Review of 100% Report | : | | | | | XXXX:XXXXXX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Preparation of Final Report | : | | | | | | | XXXXXX: | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| <u>Phase II</u> | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Initial Meeting | : | X | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Assemble Basic Data | : | X | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Evaluation of Alternatives | : | | | | XXXXXXXX:XXXXXXXXXX:XX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Preparation of 35% Report | : | | | | | | XXXXXX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Review of 35% Report | : | | | | | | | | XXXX:XXXXXXXX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Evaluation of Regulatory Requirements | : | | | | | | | | | XXXX:XXXXXXXX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Final Evaluation of Alternatives | : | | | | | | | | | | | | XXXX:XXXXXXXXXXXX:XX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Preparation of 100% Report | : | | | | | | | | | | | | XXXX:XXXXXXXXXXXX:XX | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Review of 100% Report | : | | | | | | | | | | | | | | | | | XXXXXXXXXXXX: | : | : | : | : | : | : | : | : | : | : |
| Preparation of Final Report | : | | | | | | | | | | | | | | | | | | | | | | | | | XXXXXX: | : | : |

APPENDIX II

Public Drinking Water Systems
(Florida Drinking Water Regulations)

CHAPTER 17-22

PUBLIC DRINKING WATER SYSTEMS
(Formerly 10D-4)

- 17-22.01 Definitions.
- 17-22.02 Water Supply-General.
- 17-22.03 Potable Water-Standards.
- 17-22.04 Public Water Supply Systems-Approval.
- 17-22.05 Public Water Supply Systems-Application.
- 17-22.06 Public Water Supply Systems-Plans-Alterations.
- 17-22.07 Public Water Supply Systems-Cleaning & Disinfection.
- 17-22.08 Public Water Supply Systems-Operation-Fluoridation.
- 17-22.09 Public Water Supply Systems-Cross Connection & Use of Dual Supplies.
- 17-22.10 Water Supply Wells-Drilling Permit, Application.
- 17-22.11 Water Supply Wells-Location, Construction.
- 17-22.12 Water Supply Wells-Cleanup and Disinfection Use.
- 17-22.13 Water Supply Wells-Submission of Logs & Drilling Samples.
- 17-22.14 Water Supply Wells-Abandonment.
- 17-22.15 Potable Water in Places Serving the Public.
- 17-22.16 General.

PART I
GENERAL

- 17-22.101 Authority, Intent & Policy.
- 17-22.102 Coverage.
- 17-22.103 Definitions.

PART II
QUALITY STANDARDS, ANALYTICAL METHODS, SAMPLING

- 17-22.104 Quality Standards: Maximum Contaminant Levels and Treatment Techniques.
- 17-22.105 Sampling and Analytical Methods.

PART III
CONSTRUCTION, OPERATION AND MAINTENANCE

- 17-22.106 Construction.
- 17-22.107 Operation and Maintenance.

PART IV
PERMITTING, VARIANCES, EXEMPTIONS, WAIVERS

- 17-22.108 Permitting.
- 17-22.109 Variances, Exemptions and Waivers.

PART V
SURVEILLANCE, RECORDS AND REPORTING

- 17-22.110 Surveillance.
17-22.111 Records and Reporting.

PART VI
PUBLIC NOTIFICATION, IMMINENT HAZARDS, VIOLATIONS

- 17-22.112 Public Notification.
17-22.113 Imminent Hazards.
17-22.114 Violations.
17-22.115 Fee Schedule.

PART VII
FORMS

(Amended and Transferred to 17-1.1221; 2-18-79)

17-22.01 Definitions.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8) F.S.
Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(9),
381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293,
381.311, 381.351, 381.411(1)(2)(3), 386, F.S.
History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.02 Water Supply-General.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.
Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9),
381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293,
381.311, 381.351, 381.411(1)(2)(3), 386, F.S.
History: Revised 1-1-75, Repealed 3-9-78.

17-22.03 Potable Water-Standards.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.
Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9),
381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293,
381.311, 381.351, 381.411(1)(2)(3), 386, F.S.
History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.04 Public Water Supply Systems-Approval.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.
Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9),
381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293,
381.311, 381.351, 381.411(1)(2)(3), 386, F.S.
History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.05 Public Water Supply Systems-Applications.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.
Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9),
381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293,
381.311, 381.351, 381.411(1)(2)(3), 386, F.S.
History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.01 -- 17-22.05(History)

10-1-85

17-22.06 Public Water Supply System Plans-Alterations.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.07 Public Water Supply Systems-Cleaning & Disinfection.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.08 Public Water Supply Systems-Operation.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Revised 1-1-75, Repealed 3-9-78.

17-22.09 Public Water Supply Systems-Cross-Connections & Use of Dual Supplies.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.10 Water Supply Wells-Drilling Permit, Application.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.11 Water Supply Wells-Location, Construction.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.06 -- 17-22.11(History)

10-1-85

17-22.12 Water Supply Wells--Cleanup and Disinfection, Use.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.13 Water Supply Wells--Submission of Logs & Drilling Samples.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(1)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.14 Water Supply Wells--Abandonment.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.15 Potable Water in Places Serving the Public.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.311, 381.351, 381.411(1)(2)(3), 386, F.S.

History: Repromulgated 1-1-75, Repealed 3-9-78.

17-22.16 General.

Specific Authority: 381.031(1)(g)3, 381.271, 381.061(8), F.S.

Law Implemented: 381.031(1)(a)(b)(c)(d)(e)(f), 381.061(2)(3)(4)(5)(6)(9), 381.071, 381.101, 381.111, 381.121, 381.271, 381.281, 381.291, 381.293, 381.411(1)(2)(3), 386, F.S.

History: New 1-1-75, Repealed 3-9-78.

17-22.12 -- 17-22.16(History)

10-1-85

**PART I
GENERAL**

17-22.101 Authority, Intent and Policy. To assure that public water systems supply drinking water which meets minimum requirements, the Federal government enacted PL 93-523, the "Safe Drinking Water Act". The scheme of PL 93-523 was to impart primary responsibility for public water system programs to those states capable of and actually implementing an acceptable public water system program. To this end the legislature of the State of Florida enacted the "Florida Safe Drinking Water Act", Sections 403.850--403.864, Florida Statutes.

These regulations are promulgated to implement the requirements of the Florida Safe Drinking Water Act as well as acquire primacy for the State of Florida under the Federal Act. These regulations adopt the national primary and secondary drinking water regulations of the federal government where possible and otherwise create additional regulations fulfilling state and federal requirements.

Specific Authority: 403.861(1), F.S.

Law Implemented: 403.851, F.S.

History: New 11-9-77.

17-22.102 Coverage.

(1) The Safe Drinking Water Act and the Florida Safe Drinking Water Act exclude certain public water systems from coverage by those acts. The drinking water regulations contained in Chapter 17-22, Florida Administrative Code, apply to all public water systems except those which meet all of the following criteria:

(a) Consists of distribution and storage facilities only and does not have any collection or treatment facilities;

(b) Obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply;

(c) Does not sell water to any person; and

(d) Is not a carrier which conveys passengers in interstate commerce.

Specific Authority: 403.861(8), F.S.

Law Implemented: 403.851, 403.853(2), F.S.

History: New 11-9-77, Amended 1-13-81.

NOTE: Section 381.261, F.S., gives general supervision and control over all private water systems and public water systems not covered or included in the Florida Safe Drinking Water Act to the Department of Health and Rehabilitative Services (DHRS). The Department interprets this as meaning that DHRS is given supervision and control of all water systems which meet all of the four exception criteria and which also have at least 15 service connections or which regularly serve at least 25 individuals daily at least 60 days out of the year. The Department also interprets Section 381.261, F.S., as meaning that DHRS is given supervision and control of all water systems that have less than 15 service connections or which regularly serve less than 25 individuals daily at least 60 days out of the year, or at least 25 individuals daily less than 60 days out of the year.

17-22.103 Definitions. For the purpose of this rule the following words, phrases or terms shall have the following meaning:

(1) "CONTAMINANT" means any physical, chemical, biological or radiological substance or matter in water.

(2) "MAXIMUM CONTAMINANT LEVEL" (MCL) means the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of a public water system except in the case of turbidity where the maximum permissible level is measured at the point of entry to the distribution system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from the definition.

(3) "PERSON" means an individual, public or private corporation, company, association, partnership, municipality, agency of the state, district, Federal agency, or any other legal entity, or its legal representative, agent or assigns.

(4) "PUBLIC WATER SYSTEM" means a system for the provision to the public of piped water for human consumption, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals daily at least 60 days out of the year. Such terms include 1) any collection, treatment, storage and distribution facilities under control of the operator of such system and used primarily in connection with such system and 2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a "community water system" or a "non-community water system".

(5) "COMMUNITY WATER SYSTEM" means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

(6) "NON-COMMUNITY WATER SYSTEM" means a public water system for provision to the public of piped water for human consumption that serves at least 25 individuals daily at least 60 days out of the year but that is not a community water system.

NOTE: Community water systems serve at least 25 year-round residents. Non-community water systems serve at least 25 individuals daily. The difference between the two is that the former addresses inhabitants whereas the latter addresses transients or persons who otherwise do not inhabit a building, etc., non-residents.

(7) "SANITARY SURVEY" means an on-site review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water.

(8) "STANDARD BACTERIA SAMPLE" means the aliquot of raw or unfinished drinking water that is examined for the presence of coliform bacteria, and shall consist of: a. For the bacteriological fermentation tube test, five (5) standard portions of either: 1. Ten milliliters (10 ml); 2. One hundred milliliters (100 ml); b. For the membrane filter technique, not less than one hundred milliliters (100 ml).

(9) "DEPARTMENT" means the Department of Environmental Regulation and, where the context is appropriate, its employees or the employees of DHRS or the County Health Departments.

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(10) "SUPPLIER OF WATER" means any person who owns or operates a public water system.

(11) "DRINKING WATER" means water satisfactory for drinking, culinary and domestic purposes meeting the quality standards of the Department of Environmental Regulation.

(12) "ADEQUATE PROTECTION BY TREATMENT" means any one or any combination of the controlled processes of coagulation, sedimentation, absorption, filtration, or other processes in addition to disinfection which produce a water consistently meeting the requirements of the Standards in Section 17-22.104 including processes which are appropriate to the source of supply; systems which are of adequate capacity to meet maximum demands without creating health hazards, and which are located, designed and constructed to eliminate or prevent violations of these rules; and conscientious operation by well-trained and competent personnel who meet the requirements of Chapter 17-16, Florida Administrative Code.

(13) "HEALTH HAZARDS" mean any conditions, devices, or practices in a water supply system or its operation which create or may create an imminent and substantial danger to the health and well-being of the water consumer.

(14) "CROSS-CONNECTION" means any physical arrangement whereby a public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains or may contain contaminated water, sewage or other waste or liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water supply as the result of backflow. By-pass arrangements, jumper connections, removable sections, swivel or changeable devices and other temporary or permanent devices through which or because of which backflow could occur are considered to be cross connections.

(15) "WELL" means any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed when the intended use of such excavation is to conduct groundwater from a source bed to the surface, by pumping or natural flow, when groundwater from such excavation is used or is to be used for a public water supply system.

(16) "SOURCE BED" means an underground water-bearing formation sufficiently permeable to yield quantities of water to wells.

(17) "CASING" means the tubular material utilized to shut off or exclude a stratum or strata other than the source bed and conduct water from only the source bed to the surface.

(18) "ANNULAR SPACE" means the space between two casings or between the outer casing and the wall of the well hole.

(19) "LINER" means the tubular material utilized to seal off casing materials which may be encountered below the bottom end of the well casing. A liner shall not be allowed to over lap or telescope into any portion of the well casing.

(20) "INDIVIDUAL WATER SUPPLY" means a source of water, and pump and piping if any, located on the premises and which serves to supply only a single home of a family.

(21) "DOSE EQUIVALENT" means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological

effectiveness due to the type of radiation and its distribution in the body, specified by International Commission on Radiological Units and Measurements. (ICRU).

(22) "REM" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem (mrem)" is 1/1000 of a rem.

(23) "PICOCURIE (pCi)" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

(24) "GROSS ALPHA PARTICLE ACTIVITY" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

(25) "MAN-MADE BETA PARTICLE AND PHOTON EMITTERS" means all radionuclides emitting beta particles and/or photons listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69, except the daughter products of thorium 232, uranium-235 and uranium-238.

(26) "GROSS BETA PARTICLE ACTIVITY" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

(27) "VARIANCE" means sanction from the Department affording a public water system an extended time for compliance with an MCL or treatment technique contained in a primary drinking water regulation. A variance pertains to non-compliance with an MCL due to the inability to meet the MCL even when a treatment method generally available at reasonable cost to a larger system has been applied to the raw water source. The non-compliance is due to the quality of the raw water.

(28) "EXEMPTION" means sanction from the Department affording a public water system existing as of the effective date of these rules an extended time for compliance with an MCL or treatment technique contained in a primary drinking water regulation. An exemption pertains to non-compliance with an MCL due to inability for reasons other than that instance where application of a treatment method generally available fails to adequately treat the raw water source.

(29) "TREATMENT TECHNIQUE" shall have the same meaning as in the federal "Safe Drinking Water Act", PL 93-523, and implementing federal regulations.

(30) "HALOGEN" as used in the present context of this rule means one of the chemical elements chlorine or bromine.

(31) "TRIHALOMETHANE" (THM) means one of the family of organic compounds named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

(32) "TOTAL TRIHALOMETHANES" (TTHM) means the sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane and tribromomethane [bromoform]), rounded to two significant figures.

(33) "MAXIMUM TOTAL TRIHALOMETHANE POTENTIAL" (MTP) means the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after 7 days at a temperature of 25°C or above.

(34) "DISINFECTANT" means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

(35) "SANITARY HAZARD" means an existing physical condition as determined by an employee of the Department or other appropriate regulatory agency which may involve or affect any part of a drinking water system, and that may create an imminent or future adverse effect on the health of any person consuming water from that system.

(36) "WAIVER" means sanction from the Department for reduction of chlorination and retention of certified water plant operator requirements. A waiver applies only to chlorination and certified operator requirements for non-community water systems.

Specific Authority: 403.861(8), F.S.

Law Implemented: 403.853, 403.863, F.S.

History: New 11-9-77, Amended 1-13-81.

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PART II

QUALITY STANDARDS, ANALYTICAL METHODS, SAMPLING

General--The ultimate concern of a public drinking water program is the quality of the water when the water reaches the citizens. The following regulations establish the maximum contaminant levels or the treatment technique as well as sampling and analysis requirements for the water within public water systems. All samples must be collected from locations representative of the distribution system, unless otherwise specified.

17-22.104 Quality Standards: Maximum Contaminant Levels or Treatment Techniques.

(i) PRIMARY DRINKING WATER REGULATIONS--maximum contaminant levels.

(a) INORGANICS

1. The following are maximum contaminant levels applicable to community water systems.

| Contaminant | Level, milligrams per liter |
|----------------|-----------------------------|
| Arsenic | 0.05 |
| Barium | 1. |
| Cadmium | 0.010 |
| Chromium | 0.05 |
| Lead | 0.05 |
| Mercury | 0.002 |
| Nitrate (as N) | 10. |
| Selenium | 0.01 |
| Silver | 0.05 |
| Sodium | 160 |

2. The maximum contaminant level for nitrate (as N) applicable to non-community water systems is 10 milligrams per liter unless all of the following conditions are met, in which case the Department or designated county health unit can allow a maximum contaminant level for nitrate (as N) of up to 20 milligrams per liter.

a. The water distributed by the water system is not available to children under 6 months of age.

b. There is continuous posting of the fact that nitrate levels exceed 10 milligrams per liter and the potential health effects of exposure.

c. Local and state public health authorities are notified annually of nitrate levels that exceed 10 milligrams per liter.

d. No adverse health effects shall result from the increased nitrate level.

e. Monitoring is increased to once per quarter for the first year 10 milligrams per liter is exceeded, semiannually for the second year, and once per year thereafter.

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3. When the annual average of the maximum daily air temperatures for the location in which the community water system is situated is the following, the maximum contaminant levels for fluoride are:

| Temperature | | Level, milligrams per liter |
|--------------------|-----------------|-----------------------------|
| Degrees Fahrenheit | Degrees Celsius | |
| 53.7 and below | 12.0 and below | 2.4 |
| 53.8 to 58.3 | 12.1 to 14.6 | 2.2 |
| 58.4 to 63.8 | 14.7 to 17.6 | 2.0 |
| 63.9 to 70.6 | 17.7 to 21.4 | 1.8 |
| 70.7 to 79.2 | 21.5 to 26.2 | 1.6 |
| 79.3 to 90.5 | 26.3 to 32.5 | 1.4 |

(b) ORGANICS-The following are maximum contaminant levels applicable to community water systems.

| Contaminant | Level, milligrams per liter. |
|---|------------------------------|
| 1. Chlorinated hydrocarbons: | |
| Endrin (1,2,3,4,10,10-hexachloro-6,7-epoxy--1,4,4a,5,6,7,8,8a-octa-hydro-endo, endo--1,4:5,8--dimethano naphthalene). | 0.0002 |
| Lindane (1,2,3,4,5,6,-hexachloro-cyclohexane, gamma isomer). | 0.004 |
| Methoxychlor (1,1,1,-Trichloro-2,2-bis (p-methoxyphenyl) ethane. | 0.1 |
| Toxaphene (C ₁₀ H ₁₀ C ₈ -Technical chlorinated camphene, 67-69 percent chlorine). | 0.005 |
| 2. Chlorophenoxy: | |
| 2,4,--D, (2,4,--Dichlorophenoxyacetic acid). | 0.1 |
| 2,4,5,-TP, Silvex (2,4,5-Trichloro-phenoxypropionic acid). | 0.01 |

(c) TURBIDITY-The maximum contaminant levels for turbidity are applicable to both community water systems and non-community water systems using surface water sources in whole or in part. The maximum contaminant level for turbidity also applies to community water supply systems utilizing groundwater source(s). The maximum contaminant levels for turbidity in drinking water, measured at a representative entry point(s) to this distribution system or at other points on each system as may be significant to such as post-precipitation conditions or iron precipitate build up and release, are:

1. One turbidity unit, as determined by a monthly average for surface water systems or a single triennial analysis for groundwater systems, except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the Department that the higher turbidity does not do any of the following:

a. Interfere with disinfection;
b. Prevent maintenance of an effective disinfectant agent throughout the distribution system; or

c. Interfere with microbiological determinations.

2. Five turbidity units based on average for two consecutive days.

(d) MICROBIOLOGICAL-The maximum contaminant levels for coliform bacteria, applicable to community water systems and non-community water systems, are as follows:

1. When the membrane filter technique is used, the number of coliform bacteria shall not exceed any of the following:

a. One per 100 milliliters as the arithmetic means of all samples examined per month;

b. Four per 100 milliliters in more than one sample when less than 20 are examined per month; or

c. Four per 100 milliliters in more than five percent of the samples when 20 or more are examined per month.

2. When the fermentation tube method and 10 milliliter standard portions are used, coliform bacteria shall not be present in any of the following:

a. more than 10 percent of the portions in any month;

b. three or more portions in more than one sample when less than 20 samples are examined per month; or

c. three or more portions in more than five percent of the samples when 20 or more samples are examined per month;

3. When the fermentation tube method and 100 milliliter standard portions are used, coliform bacteria shall not be present in any of the following:

a. more than 60 percent of the portions in any month;

b. five portions in more than one sample when less than five samples are examined per month; or

c. five portions in more than 20 percent of the samples when five or more samples are examined per month.

4. At the Department's discretion, community systems required to take 10 or fewer samples per month may be authorized to exclude one positive membrane filter routine sample (+1 or greater) per month or one positive routine sample per month consisting of one or more positive tubes from the monthly or quarterly average calculation if all of the following conditions are met.

a. As approved on a case-by-case basis, the Department determines and indicates in writing to the public water system that no unreasonable risk to health existed under the conditions of this modification. This determination should be based upon a number of factors including but not limited to the following:

(i) the system provided and had maintained an active disinfectant residual in the distribution system,

(ii) a minimal potential for contamination as indicated by a sanitary survey, and,

(iii) the history of the water quality at the public water system.

b. The supplier shall initiate a check sample on each of two consecutive days from the same sampling point within 24 hours after notification that the routine sample is positive, and each of these check samples must be negative.

c. The original positive routine sample is reported and recorded by the supplier pursuant to 17-22.111(1)(a) and 17-22.111(2)(a). The supplier shall report to the Department its compliance with the conditions specified in this paragraph and a summary of the corrective action taken to resolve the prior positive sample result. If a positive routine sample is not used for the monthly calculation, another routine sample must be analyzed for compliance purposes. This provision may be used only once during two consecutive compliance periods.

5. For community or non-community systems that are required to sample at a rate of less than 4 per month, compliance with Sections (1)(d)1., 2., or 3. shall be based upon sampling during a 3-month period. The Department may upon request authorize compliance to be based upon sampling during a one-month period.

6. If an average MCL violation is caused by a single sample MCL violation as described in 17-22.104(1)(d)1.b., then the case shall be treated as one violation with respect to the public notification requirements of 17-22.112.

(e) RADIONUCLIDES--The following are maximum contaminant levels applicable to community water system:

1. Radium-226, radium-228, and gross alpha particle radioactivity.

a. Combined radium-226 and radium-228 - 5 pCi/l.

b. Gross alpha particle activity (including radium-226, but excluding radon and uranium) - 15 pCi/l.

2. Beta particle and photon radioactivity from man-made radionuclides.

a. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

b. Except for the radionuclide listed in Table A, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168-hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual

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dose equivalent to the total body or to any organ shall not exceed 4 millirem/year.

| Table A-Average Annual Concentration Assumed to Produce a Total Body or Organ Dose of 4 mrem/year. | | |
|--|-----------------------|----------------------|
| <u>Radionuclide</u> | <u>Critical organ</u> | <u>pCi per liter</u> |
| Tritium | Total body | 20,000 |
| Strontium-90 | Bone marrow | 8 |

(f) TRIHALOMETHANE-The following maximum contaminant levels are for trihalomethanes (THM's) and are applicable to all community water supply systems serving a population of 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process:

1. Total Trihalomethanes (TTHM) shall include the sum of the concentrations bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform)-0.10 mg/l (MCL).

(g) VOLATILE ORGANICS - The following maximum contaminant levels (MCLs) for volatile organics are applicable to all community water systems. These concentrations are based on present "state of the art" analytical detection limits as applied to routine sampling, risk analysis, carcinogenicity and chronic toxicity, and may be altered in the future, commensurate with increasing laboratory capability or further data indicating adverse effects on human health.

| <u>Contaminant</u> | <u>Level, Micrograms Per Liter</u> |
|-----------------------|------------------------------------|
| Trichloroethylene | 3 |
| Tetrachloroethylene | 3 |
| Carbon Tetrachloride | 3 |
| Vinyl Chloride | 1 |
| 1,1,1-Trichloroethane | 200 |
| 1,2-Dichloroethane | 3 |
| Benzene | 1 |
| Ethylene Dibromide | 0.02 |

(2) SECONDARY DRINKING WATER REGULATIONS-maximum contaminant levels. These levels shall not be exceeded in community water systems. If an MCL is exceeded, appropriate action, acceptable to the Department, including water treatment plant additions and modifications, shall be taken to provide water in which the MCL is not exceeded. Results of secondary contaminant analyses performed by a certified laboratory prior to the effective date of these revised regulations shall be considered for acceptance by the Department. The following are maximum contaminant levels applicable to community water systems:

| Contaminant | Levels, Milligrams Per Liter* |
|--------------------------|--|
| Chloride | 250 |
| Color | 15 color units |
| Copper | 1 |
| Corrosivity | **neither corrosive nor scale forming. |
| Foaming agents | 0.5 |
| Iron | 0.3 |
| Manganese | 0.05 |
| Odor | 3 (threshold odor number) |
| pH (at collection point) | 6.5 (min. allowable - no max.) |
| Sulfate | 250 |
| TDS | 500 (may be greater if no other MCL is exceeded) |
| Zinc | 5 |

*except color, odor, corrosivity and pH.
 **Assessment of degree of corrosion or scale forming tendencies must be based on historical water characteristics of the system. A Langelier Index range of -0.2 to +0.2 should be used as a guideline toward obtaining water stability if calcium carbonate is present. If stabilizers are used, the -0.2 to +0.2 range may not be applicable.

(3) OTHER CONTAMINANTS WITHOUT A STANDARD-It is prohibited to introduce into a public water system any contaminant which creates or has the potential to create an imminent and substantial danger to the public.

(4) RELATIONSHIP BETWEEN 17-22.104 & 17-22.105, FLORIDA ADMINISTRATIVE CODE-All contaminants having an MCL established by Section 17-22.104, Florida Administrative Code, are required to be sampled and analyzed as established by Section 17-22.105, Florida Administrative Code. Specific Authority: 403.861(8), F.S. Law Implemented: 403.852(12)(13), 403.853(1), F.S. History: New 11-9-77, Amended 1-13-81, 3-30-82, 5-23-84.

17-22.105 Sampling and Analytical Methods.

(1) SAMPLING AND ANALYTICAL REQUIREMENTS FOR PRIMARY CONTAMINANTS

(a) INORGANIC chemical sampling and analytical requirements.

1. Analyses for the purpose of determining compliance with 17-22.104(1)(a) are required as follows:

a. Analyses for all community water systems utilizing surface water sources shall be completed by June 24, 1978. These analyses shall be repeated at yearly intervals.

b. Analyses for all community water systems utilizing only ground water sources, shall be completed by June 24, 1979. These analyses shall be repeated at three-year intervals.

c. For non-community water systems, whether supplied by surface or ground water sources, analyses for nitrate shall be completed by June 24, 1979. These analyses shall be repeated at five-year intervals.

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2. If the result of an analysis made pursuant to paragraph 17-22.105(1)(a)1. indicates that the level of any contaminant listed in 17-22.104(1)(a) exceeds the maximum contaminant level, the supplier of water shall report said fact to the Department within 7 days and initiate and complete three additional analyses for the suspect contaminant at the same sampling point within one month.

3. When the average of four analyses made pursuant to paragraph 17-22.105(1)(a)1. and 2. of this Section, rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level, the supplier of water shall notify the Department pursuant to 17-22.111(2). Monitoring after public notification shall be at a frequency designated by the Department and shall continue until the maximum contaminant level has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

4. The provisions of paragraphs (1)(a)2. and 3. of this section notwithstanding, compliance with the maximum contaminant level for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the maximum contaminant level for nitrate is found, a second analysis shall be initiated within 24 hours, and if the mean of the two analyses exceeds the maximum contaminant level, the supplier of water shall report his findings to the Department pursuant to 17-22.111(2) and shall notify the public pursuant to 17-22.112.

5. For the initial analyses required by paragraph 17-22.105(1)(a)1.a., b., or c. of this section, data for surface waters acquired within one year prior to June 24, 1977 and data for groundwaters acquired within 3 years prior to June 24, 1977 may be substituted at the discretion of the Department.

6. Analyses conducted to determine compliance with Section 17-22.104(1)(a) shall be made in accordance with the following methods:

a. Arsenic-Method¹ 206.2, Atomic Absorption Furnace Technique; or Method¹ 206.3, or Method⁴ D2972-78B, or Method² 301.A VII, pp. 159-162, or Method³ 1-1062-78B, pp. 61-63, Atomic Absorption-Gaseous Hydride; or Method¹ 206.4, or Method⁴ D-2972-78A, or Method² 404-A and 404-B(4), Spectrophotometric, Silver Diethyldithiocarbamate.

b. Barium-Method¹ 208.1, or Method² 301-A IV, pp. 152-155, Atomic Absorption-Direct Aspiration; or Method¹ 208.2, Atomic Absorption Furnace Technique.

c. Cadmium-Method¹ 213.1, or Method⁴ D3557-78A or B, or Method² 301-A II or III, pp. 148-152, Atomic Absorption-Direct Aspiration; or Method¹ 213.2, Atomic Absorption Furnace Technique.

d. Chromium-Method¹ 218.1, or Method⁴ D-1687-77D, or Method² 301-A II or III, pp. 148-152, Atomic Absorption-Direct Aspiration; or Chromium-Method¹ 218.2, Atomic Absorption Furnace Technique.

e. Lead-Method¹ 239.1, or Method⁴ D-3559-78A or B, or Method² 301-A II or III, pp. 148-152, Atomic Absorption-Direct Aspiration; or Method¹ 239.2, Atomic Absorption Furnace Technique.

f. Mercury-Method¹ 245.1, or Method⁴ D-3223-79, or Method² 301-A VI, pp. 156-159, Manual Cold Vapor Technique; or Method¹ 245.2, Automated Cold Vapor Technique.

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g. Nitrate-Method¹ 352.1, or Method⁴ D-992-71 (1978), or Method² 419-D, pp. 427-429, Colorimetric Brucine; or Method¹ 353.3, or Method⁴ D-3867-79B, or Method² 419-C, pp. 423-427, Spectrometric, Cadmium Reduction; Method¹ 353.1, Automated Hydrazine Reduction; or Method¹ 353.2, or Method⁴ D-3867-79A, or Method² 605, pp. 620-624, Automated Cadmium Reduction.

h. Selenium-Method¹ 270.2, Atomic Absorption Furnace Technique, or Method¹ 270.3; or Method³ 1-1667-78, pp. 237-239, or Method⁴ D-3859-79, or Method² 301-A VII, pp. 159-162, Hydride Generation-Atomic Absorption Spectrophotometry.

i. Silver-Method¹ 272.1, or Method² 301-A II, pp. 148-151, Atomic Absorption-Direct Aspiration; or Method¹ 272.2, Atomic Absorption Furnace Techniques.

j. Fluoride-Electrode Method, or SPADNS Method, Method² 414-A and C, pp. 391-394, or Method¹ 340.1 or ASTM Method⁴ D1179-72A (1978), "Colorimetric SPADNS with Bellack Distillation", or Method¹ 340.2, "Potentiometric Ion Selective Electrode," or ASTM Method⁴ D1179-72B (1978); or Colorimetric Method with Preliminary Distillation, Method² 603, Automated Complexone Method (alizarin Fluoride Blue) pp. 614-616; or Automated Electrode Method, "Fluoride in Water and Wastewater," Industrial Method No. 380-75WE, Technicon Industrial Systems, Tarrytown, New York 10591, February 1976, or "Fluoride in Water and Wastewater Industrial Method No. 129-71WE," Technicon Industrial Systems, Tarryton, New York 10591, December 1972; or Fluoride, Total Colorimetric, Zirconium-Eriochrome Cyanine R Method³ 1-3325-78, pp. 365-367.

k. Sodium-Method² pp 250-253, Flame Photometric Method; or Method¹ 273.1, Atomic Absorption-Direct Aspiration or Method¹ 273.2 Atomic Absorption-Graphite Furnace; or Method⁴ D1428-64(a).

¹ "Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45258 (EPA-600/4-79-020), March 1979. Available from ORD Publications, CERL, EPA, Cincinnati, Ohio 45268. For approved Analytical procedures for metals, the technique applicable to total metals must be used.

² "Standard Methods for the Examination of Water and Wastewater," 14th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1976.

³ "Techniques of Water-Resources Investigation of the United States Geological Survey, Chapter A-1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," Book 5, 1979, Stock No. 024-001-03177-9. Available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

⁴ "Annual Book of ASTM Standards, part 31, Water, American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

⁵ "Techniques of Water-Resources Investigation of the United States Geological Survey, Chapter A-3, "Methods for Analysis of Organic Substances in Water," Book 5, 1972, Stock No. 2401-1227. Available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

(b) ORGANIC chemical sampling and analytical requirements.

1. An analysis of substances for the purpose of determining compliance with 17-22.104(1)(b) shall be made as follows:

a. For all community water systems utilizing surface water sources, analyses shall be completed by June 24, 1978. Samples analyzed shall be collected during the period of the year designated by the Department as the period when contamination by pesticides is most likely to occur. These analyses shall be repeated at one year intervals thereafter.

b. For community water systems utilizing only groundwater sources, analyses shall be completed by June 24, 1979 and repeated at intervals as deemed necessary by the Department based upon evaluation of initial analysis or as conditions warrant.

2. If the result of an analysis made pursuant to paragraph (b)1. of this section indicates that the level of any contaminant listed in 17-22.104(1)(b) exceeds the maximum contaminant level, the supplier of water shall report said fact to the Department within 7 days and initiate and complete three additional analyses for the suspect contaminant within one month.

3. When the average of four analyses made pursuant to paragraph (b)1. and 2. of this section, rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level, the supplier of water shall report to the Department pursuant to 17-22.111(2) and give notice to the public pursuant to 17-22.112. Monitoring after public notification shall be at a frequency designated by the Department and shall continue until the maximum contaminant level has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

4. For the initial analysis required by paragraph (b)1. of this section, data for surface water acquired within one year prior to June 24, 1977 and data for ground water acquired within three years prior to June 24, 1977 may be substituted at the discretion of the Department.

5. Analysis made to determine compliance with 17-22.104(1)(b)1. shall be made in accordance with "Methods for Organochlorine Pesticides and Chlorophenoxy Acid Herbicides in Drinking Water and Raw Source Water," available from ORD Publications, CERL, EPA, Cincinnati, Ohio 45268; or "Organochlorine Pesticides in Water," Annual Book of ASTM Standards, part 31, Water, Method D3086-79; or Method 509-A, pp. 555-565;² or Gas Chromatographic Methods for Analysis of Organic Substances in Water,⁵ USGS, Book 5, Chapter A-5, pp. 24-39.

6. Analysis made to determine compliance with 17-22.104(1)(b)2 shall be conducted in accordance with "Methods for Organochlorine Pesticides and Chlorophenoxy Acid Herbicides in Drinking Water and Raw Source Water," available from ORD Publications, CERL, EPA, Cincinnati, Ohio 45268; or "Chlorinated Phenoxy Acid Herbicides in Water," Annual Book of ASTM Standards, part 31, Method D3478-79; or Method 509-B, pp. 555-569;² or Gas Chromatographic Methods for Analysis of Organic Substances in Water,⁵ USGS, Book 5, Chapter A-3, pp. 24-39.

(c) TURBIDITY sampling and analytical requirements.

1. Samples shall be taken by suppliers of water for both community water systems and non-community water systems that obtain raw water from a surface

17-22.105(1)(b) -- 17-22.105(1)(c)1.

source at a representative entry point(s) to the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with Section 17-22.104(1)(c). Community water systems utilizing ground water sources shall analyze for turbidity at the same frequency as required for inorganic contaminants, or at such other frequency and location as deemed appropriate by the Department. If the Department determines that a reduced sampling frequency in a non-community system will not pose a risk to public health, it can reduce the required sampling frequency. The option of reducing the turbidity frequency shall be permitted only in those public water systems that practice disinfection and which maintain an active residual disinfectant in the distribution system, and in those cases where the Department has indicated in writing that no unreasonable risk to health existed under the circumstances of this option. The measurement shall be made by the Nephelometric Method in accordance with the recommendations set forth in "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, 14th Edition, pp. 132-134 or "Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency, Office of Technology Transfer, Washington, D.C. 20460, 1979.

2. If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement shall be confirmed by resampling as soon as practicable and preferably within one hour. If the repeat sample confirms that the maximum allowable limit has been exceeded, the supplier of water shall report to the Department within 48 hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum allowable limit, or if the average of two samples taken on consecutive days exceeds 5 TU, the supplier of water shall report to the Department and as directed in Sections 17-22.111(2) and 17-22.112.

3. Sampling for non-community water systems shall begin by June 24, 1979. Sampling for community water systems should have begun on June 24, 1977 per PL 93-523.

(d) MICROBIOLOGICAL-Monitoring and Analytical Requirements.

1. Suppliers of water for community water systems and non-community water systems shall analyze for coliform bacteria for the purpose of determining compliance with Section 17-22.104(1)(d). Analyses shall be conducted in accordance with analytical recommendations set forth in "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, 14th Edition, pp. 916-935, except that a standard sample size shall be employed. The standard sample used in the membrane filter procedure shall be 100 milliliters. The standard sample used in the 5 tube most probable number (MPN) procedure (fermentation tube method) shall be 5 times the standard portion. The standard portion is either 10 milliliters or 100 milliliters as described in Section 17-22.104(1)(d)2. and 3. The samples shall be taken at points which are representative of the drinking water delivered to the user.

2. The supplier of water for a community water system shall take coliform density samples at regular time intervals, and in number proportionate to the population served by the system. In addition, a minimum of 1 representative

17-22.105(1)(c)1. -- 17-22.105(1)(d)2.

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raw water sample per month shall be taken. In no event shall the frequency be less than as set forth below:

| Population Served | Minimum number of samples per month |
|-------------------|-------------------------------------|
| 25 to 2,500 | 2 |
| 2,501 to 3,300 | 3 |
| 3,301 to 4,100 | 4 |
| 4,101 to 4,900 | 5 |
| 4,901 to 5,800 | 6 |
| 5,801 to 6,700 | 7 |
| 6,701 to 7,600 | 8 |
| 7,601 to 8,500 | 9 |
| 8,501 to 9,400 | 10 |
| 9,401 to 10,300 | 11 |
| 10,301 to 11,100 | 12 |
| 11,101 to 12,000 | 13 |
| 12,001 to 12,900 | 14 |
| 12,901 to 13,700 | 15 |
| 13,701 to 14,600 | 16 |
| 14,601 to 15,500 | 17 |
| 15,501 to 16,300 | 18 |
| 16,301 to 17,200 | 19 |
| 17,201 to 18,100 | 20 |
| 18,101 to 18,900 | 21 |
| 18,901 to 19,800 | 22 |
| 19,801 to 20,700 | 23 |
| 20,701 to 21,500 | 24 |
| 21,501 to 22,300 | 25 |
| 22,301 to 23,200 | 26 |
| 23,201 to 24,000 | 27 |
| 24,001 to 24,900 | 28 |
| 24,901 to 25,000 | 29 |
| 25,001 to 28,000 | 30 |
| 28,001 to 33,000 | 35 |
| 33,001 to 37,000 | 40 |
| 37,001 to 41,000 | 45 |
| 41,001 to 46,000 | 50 |
| 46,001 to 50,000 | 55 |
| 50,001 to 54,000 | 60 |
| 54,001 to 59,000 | 65 |
| 59,001 to 64,000 | 70 |
| 64,001 to 70,000 | 75 |
| 70,001 to 76,000 | 80 |
| 76,001 to 83,000 | 85 |
| 83,001 to 90,000 | 90 |
| 90,001 to 96,000 | 95 |
| 96,001 to 111,000 | 100 |

17-22.105(1)(d)2. -- 17-22.105(1)(d)2.

| | |
|------------------------|-----|
| 111,001 to 130,000 | 110 |
| 130,001 to 160,000 | 120 |
| 160,001 to 190,000 | 130 |
| 190,001 to 220,000 | 140 |
| 220,001 to 250,000 | 150 |
| 250,001 to 290,000 | 160 |
| 290,001 to 320,000 | 170 |
| 320,001 to 360,000 | 180 |
| 360,001 to 410,000 | 190 |
| 410,001 to 450,000 | 200 |
| 450,001 to 500,000 | 210 |
| 500,001 to 550,000 | 220 |
| 550,001 to 600,000 | 230 |
| 600,001 to 660,000 | 240 |
| 660,001 to 720,000 | 250 |
| 720,001 to 780,000 | 260 |
| 780,001 to 840,000 | 270 |
| 840,001 to 910,000 | 280 |
| 910,001 to 970,000 | 290 |
| 970,001 to 1,050,000 | 300 |
| 1,050,001 to 1,140,000 | 310 |
| 1,140,001 to 1,230,000 | 320 |
| 1,230,001 to 1,320,000 | 330 |
| 1,320,001 to 1,420,000 | 340 |
| 1,420,001 to 1,520,000 | 350 |
| 1,520,001 to 1,630,000 | 360 |
| 1,630,001 to 1,730,000 | 370 |
| 1,730,001 to 1,850,000 | 380 |
| 1,850,001 to 1,970,000 | 390 |
| 1,970,001 to 2,060,000 | 400 |
| 2,060,001 to 2,270,000 | 410 |
| 2,270,001 to 2,510,000 | 420 |
| 2,510,001 to 2,750,000 | 430 |
| 2,750,001 to 3,020,000 | 440 |
| 3,020,001 to 3,320,000 | 450 |
| 3,320,001 to 3,620,000 | 460 |
| 3,620,001 to 3,960,000 | 470 |
| 3,960,001 to 4,310,000 | 480 |
| 4,310,001 to 4,690,000 | 490 |
| 4,690,001 or more | 500 |

3. The supplier of water for a non-community water system shall sample for coliform bacteria in each calendar quarter during which the system provides water to the public. Sampling shall consist of a minimum of 1 raw water and 1 representative distribution sample per quarter. When more than one structure is supplied by a non-community distribution line, quarterly sampling based on the number of persons per day using the system shall be in accordance with the preceding bacteriological sampling table. Such sampling shall begin

17-22.105(1)(d)2. -- 17-22.105(1)(d)3.

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within two years after June 24, 1977. If the State, on the basis of a sanitary survey, determines that some other frequency is more appropriate, that frequency shall be the frequency required under these regulations. Such frequency shall be confirmed or changed on the basis of subsequent surveys. The frequency shall not be reduced until the non-community water system has performed at least one coliform analysis of its drinking water and is shown to be in compliance with 17-22.104(1)(d).

4.a. A supplier of water of a community water system or a non-community water system may, with the approval of the Department and based upon a sanitary survey, substitute the use of chlorine residual monitoring for not more than 75 percent of the samples required to be taken by paragraph (1)(d)2. of this section, PROVIDED, that the supplier of water takes chlorine residual samples at points which are representative of the conditions within the distribution system at the frequency of at least four for each substituted microbiological sample. There shall be at least daily determinations of chlorine residual.

b. When the supplier of water exercises the option provided for in Section 4.a. above, he shall maintain no less than 0.2 mg/l free chlorine residual throughout the water distribution system. When a particular sampling point has been shown to have a free chlorine residual less than 0.2 mg/l, the water at that location shall be retested as soon as practicable and in any event within one hour. If the original analysis is confirmed, this fact shall be reported to the Department within 48 hours. Also, if the analysis is confirmed, another sample for coliform bacterial analysis must be collected from that sampling point as soon as practicable and preferably within one hour, and the results of such analysis reported to the State within 48 hours after the results are known to the supplier of water.

c. Chlorine residual analysis shall be made in accordance with the 13th Edition, pp. 129-132, of "Standard Methods for the Examination of Water and Wastewater." Compliance with the maximum contaminant levels for coliform bacteria shall be determined on the monthly mean basis specified in Section 17-22. 104(1)(d) including those samples taken as a result of failure to maintain the required chlorine residual level. The Department may withdraw its overall approval of the use of chlorine residual substitution by written public notice in the Florida Administrative Weekly, or to a given public water system by actual notice.

5.a. When the coliform bacteria in a single sample exceed four per 100 milliliters using the membrane filter technique, at least two consecutive daily check samples shall be collected and examined from the same sampling point. Additional check samples shall be collected daily, or at a frequency established by the Department, until the results obtained from at least two consecutive check samples show less than one coliform bacterium per 100 milliliters.

b. When coliform bacteria occur in three or more 10 ml portions of a single sample using the fermentation tube method, at least two consecutive daily check samples shall be collected and examined from the same sampling point. Additional check samples shall be collected daily or at a frequency

17-22.105(1)(d)3. -- 17-22.105(1)(d)5.b.

established by the Department until the results obtained from at least two consecutive check samples show no positive tubes.

c. When coliform bacteria occur in all five of the 100 ml portions of a single sample using the fermentation tube method, at least two daily check samples shall be collected and examined from the same sampling point. Additional check samples shall be collected daily, or at a frequency established by the Department, until the results obtained from at least two consecutive check samples show no positive tubes.

d. The location at which the check samples were taken pursuant to paragraph 5a., b., or c. of this section shall not be eliminated from future sampling without approval of the Department. The results from all coliform bacterial analyses performed pursuant to this subsection except those obtained from check samples and special purpose samples, shall be used to determine compliance with the maximum contaminant level for coliform bacteria as established in Section 17-22.104(1)(d). Check samples shall not be included in calculating the total number of samples taken each month to determine compliance with Section 17-22.105(1)(d)2. or 3.

6. When the presence of coliform bacteria in water taken from a particular sampling point has been confirmed by any check samples examined as directed in paragraphs 5a., b. or c. of this section, the supplier of water shall report to the Department within 48 hours.

7. When a maximum contaminant level set forth in Section 17-22.104(1)(d)1., 2. or 3. is exceeded, the supplier of water shall report to the Department and notify the public as prescribed in Sections 17-22.111(2) and 17-22.112.

8. Special purpose samples, such as those taken to determine whether disinfection practices following pipe placement, replacement, or repair have been sufficient, shall not be used to determine compliance with Section 17-22.104(1)(d)4. or Section 17-22.105(1)(d)2.

(e) RADIONUCLIDES

1. Monitoring Frequency for Radioactivity in Community Water Systems.

a. Monitoring requirements for gross alpha particle activity, radium-226 and radium-228.

(i) Initial sampling to determine compliance with Section 17-22.104(1)(e) shall begin by June 24, 1979, and the analysis shall be completed by June 24, 1980. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

a. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis, PROVIDED, that the measured gross alpha particle activity does not exceed 5 pCi/l at a confidence level of 95 percent [1.65 (sigma) where (sigma) is the standard deviation of the net counting rate of the sample]. In localities where radium-228 is known to be present or may reasonably be expected to be present in drinking water, radium-226 and/or radium-228 analyses shall be provided when the gross alpha particle activity exceeds 2 pCi/l.

b. When the gross alpha particle activity exceeds 5 pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of

17-22.105(1)(d)5.b. -- 17-22.105(1)(e)1.a.(i)b.

radium-226 exceeds 3 pCi/l the same or an equivalent sample shall be analyzed for radium-228.

(ii) For the initial analysis required by paragraph 1.a.(i), data acquired within one year prior to June 24, 1977, may be substituted.

(iii) Suppliers of water shall monitor at least once every four years following the procedure required by paragraph 1.a.(i). When an annual record taken in conformance with paragraph 1.a.(i) has established that the average annual concentration is less than half the maximum contaminant levels established by 17-22.104(1)(e), analysis of a single sample may be substituted for the quarterly sampling procedure required by paragraph 1.a.(i).

a. More frequent monitoring shall be conducted when ordered by the Department in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water.

b. A supplier of water shall monitor in conformance with paragraph 1.a.(i). within one year of the introduction of a new water source for a community water system. More frequent monitoring shall be conducted when ordered by the Department in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

c. A community water system using two or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from a free-flowing tap, when ordered by the Department.

d. Monitoring for compliance with Section 17-22.104(1)(e) after the initial period need not include radium-228 except when required by the Department, PROVIDED, that the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by paragraph 1.a.(i).

e. Suppliers of water shall conduct annual monitoring of any community water system in which the radium-226 concentration exceeds 3 pCi/l, when ordered by the Department.

(iv) If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in Section 17-22.104(1)(e)1, is exceeded, the supplier of a community water system shall give notice to the Department pursuant to Section 17-22.11(2) and notify the public as required by Section 17-22.112. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

a. Reserved.

b. Monitoring requirements for man-made radioactivity in community water systems-beta particle and photon radioactivity.

(i) By June 24, 1979, systems using surface water sources and serving more than 100,000 persons, and such other community water systems as are designated by the Department, shall be monitored for compliance with Section 17-22.104(1)(e)2. by analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. Compliance with Section 17-22.104(1)(e)2. may be assumed without further analysis if the average

17-22.105(1)(e)1.a.(i)b. -- 17-22.105(1)(e)1.b.(i)

annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed on Table A, PROVIDED, that if both radionuclides are present the sum of their annual dose equivalents to bone marrow shall not exceed 4 millirem/year.

a. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with Section 17-22.104(1)(e)2.

b. Suppliers of water shall conduct additional monitoring, as ordered by the Department, to determine the concentration of man-made radioactivity in principal watersheds designated by the Department.

c. At the discretion of the Department suppliers of water utilizing only groundwaters may be required to monitor for man-made radioactivity.

(ii) For the initial analysis required by paragraph 1.b.(i), data acquired within one year prior to June 14, 1977, may be substituted.

(iii) After the initial analysis required by paragraph 1.b.(i), suppliers of water shall monitor at least every four years following the procedure given in paragraph 1.b.(i).

(iv) By June 24, 1979, the supplier of any community water system designated by the Department as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

a. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with Section 17-22.104(1)(e)2.

b. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Department, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

c. Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

d. The Department will allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the supplier of water where the Department determines such data is applicable to a particular community water system.

(v) If the average annual maximum contaminant level for man-made radioactivity set forth in Section 17-22.104(1)(e)2. is exceeded, the operator of a community water system shall give notice to the Department pursuant to Section 17-22.111(2) and to the public as required by Section 17-22.112. Monitoring at monthly intervals shall be continued until the concentration no longer

17-22.105(1)(e)1.b.(i) -- 17-22.105(1)(e)1.b.(v)

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exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

2. Analytical Methods for Radioactivity

a. The methods specified in "Interim Radiochemical Methodology for Drinking Water", Environmental Monitoring and Support Laboratory, EPA-600.4-75-008, USEPA, Cincinnati, Ohio 45268, or those listed below, are to be used to determine compliance with Section 17-22.104(1)(e)1. and Section 17-22.104(1)(e)2. (radioactivity) except in cases where alternative methods have been approved in accordance with Section 17-22.105(3).

(i) Gross Alpha and Beta--Method 302 "Gross Alpha and Beta Radioactivity in Water" Standard Methods for the Examination of Water and Wastewater, 13th Edition, 1971, American Public Health Association, New York, N.Y.

(ii) Total Radium--Method 304 "Radium in Water by Precipitation" Ibid.

(iii) Radium-226--Method 305 "Radium-226 by Radon in Water" Ibid.

(iv) Strontium-89, 90--Method 303 "Total Strontium and Strontium-90 in Water" Ibid.

(v) Tritium--Method 306 "Tritium in Water" Ibid.

(vi) Cesium-134--ASTM D-2459 "Gamma Spectrometry in Water", 1975 Annual Book of ASTM Standards, Water and Atmospheric Analysis, Part 31, American Society for Testing and Materials, Philadelphia, PA (1975).

(vii) Uranium--ASTM D-2907 "Micro-quantities of Uranium in Water by Fluorometry", Ibid.

b. When the identification and measurement of radionuclides other than those listed in paragraph 17-22.105(1)(e)2.a. is required, the following reference are to be used, except in cases where alternative methods have been approved in accordance with 17-22.105(3).

(i) Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions, H.L. Krieger and S. Gold, EPA-R4-73-O14, USEPA, Cincinnati, Ohio, May 1973.

(ii) HASL Procedure Manual, Edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, N.Y. 1973.

c. For the purpose of Monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level [1.96 (σ) where (σ) is the standard deviation of the net counting rate of the sample].

(i) To determine compliance with Section 17-11.204(1)(e)1.a., the detection limit shall not exceed 1 pCi/l. To determine compliance with Section 17-22.104(1)(e)1.b., the detection limit shall not exceed 3 pCi/l.

(ii) To determine compliance with Section 17-22.104(1)(e)2., the detection limits shall not exceed the concentrations listed in Table B.

17-22.105(1)(e)1.b.(v) -- 17-22.105(1)(e)2.c.(ii)

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| <u>Radionuclide</u> | <u>Detection Limit</u> |
|---------------------|------------------------------|
| Tritium | 1,000 pCi/l |
| Strontium-89 | 10 pCi/l |
| Strontium-90 | 2 pCi/l |
| Iodine-131 | 1 pCi/l |
| Cesium-134 | 10 pCi/l |
| Gross beta | 4 pCi/l |
| Other radionuclides | 1/10 of the applicable limit |

d. To judge compliance with the maximum contaminant levels listed in Section 17-22.104(2)(e)1, and 17-22.104(1)(e)2., averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

(f) TRIHALOMETHANE-sampling and analytical requirements.

1. The regulations for total trihalomethanes as set forth in 17-22.104(1)(f) shall take effect on November 29, 1981 for community water systems serving 75,000 or more individuals and on November 29, 1983 for communities serving 10,000 to 74,999 individuals. Commencement of monitoring for total trihalomethanes shall begin not later than January 1, 1981 for systems serving 75,000 or more individuals and not later than November 29, 1982 for systems serving from 10,000 to 74,999 individuals. For the purpose of this section, the minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with the Department's approval be considered one treatment plant for determining the minimum number of samples. All samples taken at an established frequency shall be collected within a 24 hour period. Free and/or combined chlorine residual shall be taken and recorded concurrently with all trihalomethane samples.

2.a. For all community water systems utilizing surface water sources in whole or in part and for all community water systems utilizing only ground-water sources that have not been determined by the Department to qualify for the monitoring requirements of subparagraph 3. of this subsection, analyses for total trihalomethanes shall be performed at quarterly intervals on at least four water distribution system samples for each treatment plant used by the system. At least 25 percent of the samples shall be taken on locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the Department within 30 days of the system's receipt of such results. All samples collected shall be used in the computation of the average unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in subparagraph 5. of this subsection.

b. Total Trihalomethane content as a basis to lessen monitoring requirements. Upon the written request of a community water system, the monitoring frequency required by subparagraph 2.a. of this subsection may be reduced by the Department to a minimum of one sample analyzed for TTHM's per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon written determination by the Department that the data from at least 1 year of monitoring in accordance with subparagraph 2.a. of this subsection and local conditions demonstrate that trihalomethane concentrations will be consistently below the maximum contaminant level.

c. If at any time during which the reduced monitoring frequency prescribed under this paragraph applies, the results from any analysis exceed 0.10 mg/l of TTHM's and such results are confirmed by at least one check sample taken promptly after such results are received, or if the system makes any significant change to its source of water or treatment program, the system shall immediately begin monitoring in accordance with the requirements of subparagraph 2.a. of this subsection, which monitoring shall continue for at least 1 year before the frequency may be reduced again. The Department may require an increase in monitoring frequency above the minimum established by these rules where necessary to detect variations of TTHM levels within the distribution system.

3.a. Total Trihalomethane Potential as a basis to lessen monitoring requirements. Upon written request to the Department, a community water system utilizing only groundwater sources may seek to have the monitoring frequency required by subparagraph 2.a. of this subsection reduced to a minimum of one sample for maximum TTHM potential per year for each treatment plant used by the system taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system shall submit to the Department the result of at least one sample analyzed for maximum TTHM potential for each treatment plant used by the system taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a written determination by the Department that the system has a maximum TTHM potential of less than 0.10 mg/l and that, based upon an assessment of the system and local conditions affecting it the system is not likely to approach or exceed the maximum contaminant level for TTHM's. The results of all analyses shall be reported to the Department within 30 days of the system's receipt of such results. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of subparagraph 2. of this subsection, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in subparagraph 5. of this subsection.

b. If at any time during which the reduced monitoring frequency prescribed under subparagraph 3.a. of this subsection applies, the results from any analysis taken by the system for maximum TTHM potential are equal to or greater than 0.10 mg/l, and such results are confirmed by at least one check sample taken promptly after such results are received, the system shall immediately begin monitoring in accordance with the requirements of

17-22.105(1)(f)2.b. -- 17-22.105(1)(f)3.b.

paragraph 2. of the subsection and such monitoring shall continue for at least 1 year before the frequency may be reduced again. In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirements of subparagraph 2. of this subsection. The Department may require an increase in monitoring frequency above the minimum established by these rules where necessary to detect variations of TTHM levels within the distribution system.

4. Compliance with 17-22.104(1)(f) shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in a. or b. of subparagraph 2. of this subsection. If the average of samples covering any 12 month period exceeds the Maximum Contaminant Level, the supplier of water shall report to the Department pursuant to 17-22.111(2) and notify the public pursuant to 17-22.112. Monitoring after public notification shall be at a frequency designated by the Department and shall continue unless a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

5. Sampling and analyses made pursuant to this section shall be conducted by one of the following EPA approved methods:

a. "The Analysis of Trihalomethanes in Drinking Waters by the Purge and Trap Method", Method 501.1, EMSL, EPA Cincinnati, Ohio.

b. "The Analysis of Trihalomethanes in Drinking Water by Liquid/Liquid Extraction", Method 501.2, EMSL, EPA Cincinnati, Ohio.

Samples for TTHM shall be dechlorinated upon collection to prevent further production of Trihalomethanes, according to the procedures described in the above two methods. Samples for maximum TTHM potential should not be dechlorinated, and should be held for seven days at 25°C prior to analysis, according to the procedure described in the above two methods. Since lack of a disinfectant residual in the TTHM potential samples at the end of seven days invalidates the sample results, 1 drop of a 1% to 5% chlorine solution must be added to the initial 40 milliliter sample.

(g) VOLATILE ORGANICS - Sampling and Analytical Requirements:

1. Regulations for volatile organic MCLs as set forth in 17-22.104(1)(g) shall take effect June 1, 1985 for systems serving more than 1,000 persons, and January 1, 1987 for systems serving less than 1,000 persons. Analyses for contaminants shall be performed at three-year intervals. Sampling shall be performed on finished water leaving the water treatment plant except for ethylene dibromide which shall be sampled before chlorination. When a system is provided water from multiple treatment plants a sample(s) representative of the distribution system's water will be sufficient. If a sample analysis exceeding the MCL occurs, two additional samples shall be collected and confirmed by GC/MS within one month. If the average value of the three sample results exceeds the MCL, quarterly sampling will be required until two consecutive sample results do not exceed the MCL value.

17-22.105(1)(f)3.b. -- 17-22.105(1)(g)1.

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2. Analyses conducted to determine compliance with 17-22.104(1)(g) shall be made in accordance with the following methods further identified at the end of 17-22.105(1)(h)4.

Trichloroethylene, Tetrachloroethylene, Carbon Tetrachloride, Vinyl Chloride, 1,1,1-Trichloroethane, and 1,2-Dichloroethane - Methods 501.1, 501.2, 501.3, 502.1, 503.1, 601, 602, and 624.

Benzene - Methods 501.1, 501.2, 501.3, 502.1, 503.1, 601, 602, and 624.

Ethylene Dibromide - "Analysis of 1,2-Dibromoethane in Drinking Water", Florida Department of Health and Rehabilitative Services, Jacksonville Central Laboratory, 1217 Pearl Street, Post Office Box 210, Jacksonville, Florida 32231-0042.

(h) SYNTHETIC ORGANIC CONTAMINANTS MONITORING - Analyses for synthetic organic contaminants (SOCs) shall be submitted to the department by January 1, 1985 for all community systems serving 1,000 or more persons, and by April 1, 1986 for all community systems serving less than 1,000 persons. Analyses for the following list of SOC's shall be performed every three years on finished water except when results or conditions warrant more frequent monitoring as determined by the department. After the first round of sampling, this list may be modified to include the addition or deletion of certain SOC's based on their actual or potential occurrence in Florida waters.

1. PURGEABLES - Methods 501.1, 501.2, 501.3, 502.1, 503.1, 601, 602, 603, and 624. Identification of methods is listed at the end of 17-22.105(1)(h)4.

Acrolein
 Acrylonitrile
 Bromodichloromethane
 Bromoform
 Bromomethane
 Chlorobenzene
 Chloroethane
 2-Chloroethylvinyl ether
 Chloroform
 Chloromethane
 Dibromochloromethane
 Dichlorodifluoromethane
 1,1-Dichloroethane
 1,1-Dichloroethene
 trans-1,3-Dichloropropene
 1,2-Dichloroethene
 1,2-Dichloropropane
 cis-1,3-Dichloropropene
 Ethylbenzene
 Methylene chloride
 1,1,2-Trichloroethane
 Trichlorofluoromethane
 *Toluene
 *Xylene
 Styrene
 Dichlorobenzene

1,2-Dibromo-3-Chloropropane
1,1,2,2-Tetrachloroethane

*Can be analyzed using Methods 602 and 624, though not specifically indicated in these methods.

2. PESTICIDES - Methods 509-A, 606, 608, 612, 614, 617, 625, and HPLC. Identification of methods is listed at the end of 17-22.105(1)(h)4.

Aldrin
a-BHC
b-BHC
g-BHC
d-BHC
Chlordane
4,4'-DDD
4,4'-DDE
4,4'-DDT
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan Sulfate
Ethion
Trithion
o,p-DDT, DDE and DDD
Tedion
Endrin Aldehyde
Heptachlor
Heptachlor Epoxide
Toxaphene
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260
Aldicarb (non-extractable)
Diazinon
Malathion
Parathion
Guthion
Kelthane (Dicofal)

3. BASE NEUTRAL EXTRACTABLES - Methods 605, 606, 607, 609, 610, 612, 613, and 625. Identification of methods is listed at the end of 17-22.105(1)(h)4.

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17-22.105(1)(h)1. -- 17-22.105(1)(h)3.

Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(a)pyrene
Benzo(g,h,i)perylene
Benzidine
Bis(2-chloroethyl)ether
Bis(2-chloroethoxy)methane
Bis(2-ethylhexyl)phthalate
Bis(2-chloroisopropyl)ether
4-Bromophenyl phenyl ether
Butyl benzyl phthalate
2-Chloronaphthalene
4-Chlorophenyl phenyl ether
Chrysene
Dibenzo(a,h)anthracene
Di-n-butylphthalate
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
3,3-Dichlorobenzidine
Diethylphthalate
Dimethylphthalate
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Dioctylphthalate
1,2-Diphenylhydrazine
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Hexachlorocyclopentadiene
Indeno(1,2,3-cd)pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodi-n-propylamine
N-Nitrosodiphenylamine
Phenanthrene
Pyrene
2,3,7,8-Tetrachlorodibenzo-
p-dioxin (Dioxin)
1,2,4-Trichlorobenzene

4. ACID EXTRACTABLES - Methods 604 and 625. Identification of methods is listed at the end of 17-22.105(1)(h)4.

| | |
|----------------------------|-----------------------|
| 2-Chlorophenol | 4-Nitrophenol |
| 2,4-Dichlorophenol | Pentachlorophenol |
| 2,4-Dimethylphenol | Phenol |
| 2,4-Dinitrophenol | 2,4,6-Trichlorophenol |
| 2-Methyl-4,6-Dinitrophenol | |

Methods 501.1 and 501.2 - "Analysis of Trihalomethanes in Drinking Water", Federal Register, Vol. 44, number 231, Thursday, November 29, 1979/ Rules and Regulations, and Correction to Federal Register Thursday, November 29, 1979, Part III, Appendix C; "Analysis of Trihalomethanes in Drinking Water", Federal Register, Vol. 45, Number 49, Tuesday, March 11, 1980.

Method 501.3 - "Measurement of Trihalomethanes in Drinking Water with Gas Chromatography and Selected Ion Monitoring", U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Method 502.1 - "The Determination of Halogenated Chemical Indicators of Industrial Contamination in Water by the Purge and Trap Method", Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

Method 503.1 - "The Analysis of Aromatic Chemicals in Water by the Purge and Trap Method", Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

Method 509-A - "Standard Methods for the Examination of Water and Wastewater", 15th Edition, 1980.

Methods 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 624, and 625 - "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater", Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

Method 614 - "The Determination of Organophosphorus Pesticides in Industrial and Municipal Wastewater", National Technical Information Services, 5285 Port Royal Road, Springfield, Virginia 22165.

Method 617 - "The Determination of Organic Pesticides and PCB's in Industrial and Municipal Wastewater", National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22165.

HPLC Method - Journal of Chromatography, Vol. 185, 1979, pp 615-624. Resolution, Sensitivity, and Selectivity of a High-Performance Liquid Chromatographic Post-Column Fluorometric Labeling Technique for Determination of Carbamate Insecticides, by Richard T. Krause.

(2) SAMPLING AND ANALYTICAL REQUIREMENTS FOR SECONDARY CONTAMINANTS- Secondary contaminant sampling and analytical requirements are as follows:

(a) Analysis for the purpose of determining compliance with 17-22.104(2) shall be completed by November 1, 1981, and shall be repeated at three year intervals.

17-22.105(1)(h)4. -- 17-22.105(2)(a)

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(b) If the results of an analysis made pursuant to 17-22.105(2)(a) indicates that the level of any secondary contaminant listed in 17-22.104(2) exceeds the maximum contaminant level, the supplier of water shall report said fact to the Department within 7 days and initiate and complete 3 additional analyses for the suspect contaminant at the same sampling point within one month.

(c) When the average of four analyses made pursuant to paragraph 17-22.105(a) and (b) of this section, rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level the supplier of water shall notify the Department pursuant to 17-22.111(2).

(d) Analyses conducted to determine compliance with Section 17-22.104(2) shall be made in accordance with the following methods:

1. Chloride-Potentiometric Method, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 306; or Argentometric Method, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 303; or Ferricyanide Method (automated), "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 613; "Methods for Chemical Analysis of Water and Wastes," p. 325.1 and 325.2, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979; or Mercuric Nitrate Method, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 304, Methods for Chemical Analysis of Water and Wastes," p. 325.3, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979.

2. Color-Platinum-Cobalt Method, "Methods for Chemical Analysis of Water and Wastes," p. 110.2, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979; or Visual Comparison Method, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 64; or Spectrophotometric Method, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 66, or "Methods for Chemical Analysis of Water and Wastes," p. 110.3, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979; or Tristimulus Filter Method (ADMI Method), "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 68, or "Methods for Chemical Analysis of Water and Wastes," p. 110.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979.

3. Corrosivity-Calcium Carbonate Saturation, "Standard Methods for the Examination of Water and Wastewater," 14th Edition pp. 61-63.

4. Copper-Atomic Absorption Spectrophotometric Flame Method, "Methods for Chemical Analysis of Water and Wastes," p. 220.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 144; or Atomic Absorption Spectrophotometric Furnace Method, "Methods for Chemical Analysis of Water and Wastes," p. 220.2, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979.

5. Foaming Agents-Methylene Blue Method, "Methods for Chemical Analysis of Water and Wastes," p. 425.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 600.

6. Iron-Atomic Absorption Spectrophotometric Flame Method, "Methods for Chemical Analysis of Water and Wastes," p. 236.1, EPA, Office of Technology

Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 144; or Atomic Absorption Spectrophotometric Furnace Method, "Methods for Chemical Analysis of Water and Wastes," p. 236.2, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979.

7. Manganese-Atomic Absorption Spectrophotometric Flame Method, "Methods for Chemical Analysis of Water and Wastes," p.243.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 144; or Atomic Absorption Spectrophotometric Furnace Method, "Methods for Chemical Analysis of Water and Wastes," p. 243.2, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979.

8. Odor-Consistent Series Method, "Methods for Chemical Analysis of Water and Wastes," p. 140.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, pp. 75-82.

9. pH-Electrometric Method, "Methods for Chemical Analysis of Water and Wastes," p. 150.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Annual Book of ASTM Standards," Method D1293-78A or B, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, pp. 460-465.

10. Sulfate-Turbidimetric Method, "Methods for Chemical Analysis of Water and Wastes," p. 375.4, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 496; or Gravimetric Method, "Methods for Chemical Analysis of Water and Wastes," p. 375.3, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 495; or Methylthymol Blue Method (automated) "Methods for Chemical Analysis of Water and Wastes," p. 375.2' EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 628; or Chloranilate Method (automated), "Methods for Chemical Analysis of Water and Wastes," p. 375.1, EPA, Office of Technology Transfer' Washington, D.C., 20460, 1979.

11. Total Dissolved Solids-Total Filterable Residue Dried at 180°C Method' "Methods for Chemical Analysis of Water and Wastes," p. 160.1, EPA, Office of Technolgy Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 92.

12. Zinc-Atomic Absorption Spectrophotometric Flame Method, "Methods for Chemical Analysis of Water and Wastes," p. 289.1, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979, or "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 144; or Atomic Absorption Spectrophotometric Furnace Method, "Methods for Chemical Analysis of Water and Wastes," p. 289.2, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1979.

13. Aggressiveness Index-"AWWA Standard for Asbestos-Cement Pipe, 4 in. through 24 in. for Water and Other Liquids," AWWA C400-77, Revision of C400-75, AWWA, Denver, Colorado.

14. Temperature-"Standard Methods for the Examination of Water and Wastewater," 14th Edition, Method 212 pp. 125-126.

17-22.105(2)(d)6. -- 17-22.105(2)(d)14.

15. Calcium Hardness-EDTA Titrimetric Method "Standard Methods for the Examination of Water and Wastewater," 14th Edition, Method 309B, pp. 202-206; or "Annual Book ASTM Standards," Method D1126-67(B).

16. Alkalinity-Methyl Orange end point pH 4.5. "Standard Methods for the Examination of Water and Wastewater," 14th Edition, Method 403, pp. 278-281; or "Annual Book of ASTM Standards," Method D1067-70B; or "Methods for Chemical Analysis of Water and Wastes," Method 310.1.

17. Carbon Dioxide-"Standard Methods for the Examination of Water and Wastewater," 15th Edition, pp. 262-269.

18. Dissolved Oxygen-"Standard Methods for the Examination of Water and Wastewater," 15th Edition, pp. 388-398.

19. Conductivity-"Standard Methods for the Examination of Water and Wastewater," 15th Edition, pp. 70-73.

(3) SPECIAL MONITORING REQUIREMENTS FOR SODIUM AND CORROSIVITY CHARACTERISTICS. Sodium monitoring requirements are effective April 1, 1982. First round monitoring for sodium shall be completed by February 27, 1983. Since completion of first round sampling was required by November 1981, completion of second round sampling for corrosivity characteristics must be accomplished by November 1982 for surface water systems and November 1984 for groundwater systems. Sampling for sodium and corrosivity characteristics shall continue on an annual and triennial basis for surface water and groundwater systems, respectively, thereafter.

(a) Sodium.

1. Suppliers of water for community public water systems shall collect and analyze one sample per plant at the entry point of the distribution system for the determination of sodium concentration levels; samples must be collected and analyzed annually for systems utilizing surface water sources in whole or in part, and at least every three years for systems utilizing solely groundwater sources. The minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with the Department's approval, be considered one treatment plant for determining the minimum number of samples. The supplier of water may be required by the Department to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.

2. The supplier of water shall report to the Department the results of the analyses for sodium within the first 10 days of the month following the month in which the sample results were received or within the first 10 days following the end of the required monitoring period as stipulated by the State, whichever of these is first. If more than annual sampling is required the supplier shall report the average sodium concentration within 10 days of the month following the month in which the analytical results of the last sample used for the annual average were received.

3. The supplier of water shall notify appropriate local county health unit public health officials of the sodium levels by written notice by direct mail within three months. A copy of each notice required to be provided by this paragraph shall be sent to the Department within 10 days of its issuance.

(b) Corrosivity Characteristics.

17-22.105(2)(d)15. -- 17-22.105(3)(b)

1. Suppliers of water for community public water systems shall collect samples from a representative entry point to the water distribution system for the purpose of analysis to determine the corrosivity characteristics of the water.

a. The supplier shall collect two samples per plant for analysis for each plant using surface water sources wholly or in part; one during midwinter and one during midsummer. The supplier of the water shall collect one sample per plant for analysis for each plant using groundwater sources. More samples shall be collected by the supplier utilizing either surface or groundwater sources, if required by the Department. The minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with the Department's approval, be considered one treatment plant for determining the minimum number of samples.

b. Determination of the corrosivity characteristics of the water shall include measurement of pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue), chloride, sulfate, carbon dioxide, dissolved oxygen, conductivity and calculation of the Langelier Index in accordance with paragraph 3. below. The determination of corrosivity characteristics shall include sampling at three year intervals for groundwater supplies and one year intervals for surface water supplies. In certain cases, the Aggressiveness Index, as described in paragraph 3. below, can be used instead of the Langelier Index. The supplier shall request permission to use the Aggressive Index in writing, to the Department.

2. The supplier of water shall report to the Department the results of the analyses for the corrosivity characteristics in accordance with Section 17-22.111(2).

3. Analysis conducted to determine the corrosivity of the water shall be made in accordance with the following methods as listed in 17-22.105(2):

- a. Langelier Index
- b. Aggressiveness Index
- c. Total Filterable Residue (TDS)
- d. Temperature
- e. Calcium Hardness
- f. Alkalinity
- g. pH (at sample point)
- h. Chloride
- i. Sulfate
- j. Carbon Dioxide
- k. Dissolved Oxygen
- l. Conductivity

(4) ALTERNATIVE ANALYTICAL TECHNIQUE-With the written permission of the Department concurred in by the Administrator of the U.S. Environmental Protection Agency, an alternative analytical technique may be employed. An alternative technique shall be acceptable only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any maximum contaminant level. The use

17-22.105(3)(b)1. -- 17-22.105(4)

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of the alternative analytical technique shall not decrease the frequency of monitoring required by this part.

(5) APPROVED LABORATORIES-For the purpose of determining compliance with Section 17-22.105(1)(2)(3)(4), samples for compliance monitoring of MCLs may be considered only if they have been analyzed by a laboratory approved by the Department of Health and Rehabilitative Services, except that measurements for turbidity, free chlorine residual, temperature, and pH may be performed by any person acceptable to the Department. Nothing in this Part shall be construed to preclude the State or any duly designated representative of the Department from taking samples or from using the results from such samples to determine compliance by a supplier of water with the applicable requirements of this Part.

(6) MONITORING OF CONSECUTIVE PUBLIC SYSTEMS-When one public water system receives water from another public water system, the recipient public water system is the consecutive public water system. The consecutive public water system shall provide microbiological and chlorine residual monitoring in a manner complying with Section 17-22.105(1)(d). At the discretion of the Department, additional monitoring of primary and secondary contaminants may be required for some consecutive systems which, due to their size or other factors, merit such additional monitoring.

Specific Authority: 403.861(8)(15)(16), F.S.

Law Implemented: 403.852(12)(13), 403.853(1)(3), F.S.

History: New 1-8-77, Amended 1-8-77, 1-13-81, 3-30-82, 5-23-84.

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**PART III
CONSTRUCTION, OPERATION AND MAINTENANCE**

General-The quality of drinking water when it reaches the citizens depends on the construction, the operation, and maintenance of a public water system. The following regulations establish requirements for construction and operation and maintenance of a public water system and cover all aspects of a public water system from collection through treatment, storage and distribution.

17-22.106 Construction.

(1) **SOURCE AND PLANT SITE**-Raw water should be obtained from the most desirable source that is available, and effort should be made to prevent or control contamination of the source. The plant site area should not be subject to a significant risk from earthquakes, floods, fires or other disasters which could cause a breakdown of the public water system or a portion thereof.

(2) **DRINKING WATER SUPPLY WELLS OR TEST WELLS THAT MAY LATER BE USED FOR DRINKING WATER SUPPLY**-Number, Location, Construction, Clearing, Drilling Samples and Abandonment. In addition to the regulations set forth in Chapter 17-21, Florida Administrative Code, Part II--Minimum Water Well Construction Standards, the requirements of this subsection apply to drinking water supply wells or test wells that may later be used for drinking water supply. The exception provision of 17-21.10(2)(d) regarding grout is applicable hereto.

(a) **Number of wells required**-A minimum of two drinking water supply wells shall be provided for all community water systems that will serve 350 or more persons upon completion of construction.

(b) **Location**-Well sites shall be located on ground least subject to localized flooding, and as far as is practical when the direction of ground water slope or movement is known, wells shall be located on the upstream side of sanitary hazards and as far from these hazards as practical. Wells serving systems having total sewage flows greater than 2,000 gallons per day shall be placed no closer than 200 feet from an on-site sewage disposal system and 100 feet from other sanitary hazards. Wells serving systems with a total sewage flow of less than or equal to 2,000 gallons per day shall be placed no closer than 100 feet from an on-site sewage disposal system or other sanitary hazards. The Department may decrease or increase these distances if justified by the presence or absence of natural barriers such as impermeable geological strata, adequate protection by water treatment or proper construction practices. The Department may increase these distances to the calculated one foot drawdown boundary of the cone of depression in shallow unconfined aquifers. For level areas, well tamped or puddled earth shall be placed around the well so as to elevate the concrete platform or apron. The apron must be a minimum size of 6' x 6'.

(c) **Well construction.**

1. **Access**-Every well shall be accessible for such attention as may be necessary.

2. **Casing Materials and Grouting Requirements.**

a. **Casing and pipe** other than as specified in Chapter 17-21.110(1) must be approved by the Department prior to installation and use.

17-22.106(1) -- 17-22.106(2)(c)2.a.

b. Where telescoped casing is utilized, the casings shall be overlapped by not less than twenty (20) feet where increases or reductions occur in casing size. Not less than two (2) centralizing spacers shall be used in the overlapped sections and the annular space existing in the overlapped sections shall be completely sealed with cement grout. A liner as defined in the Rule is not allowed to be overlapped or telescoped into the well casing and, therefore, a cement grout seal is not required for liner installation.

c. Casing for wells which obtain their water from a rock layer or other such consolidated formation, shall, as a minimum be seated firmly into it and sealed with cement grout by an approved method.

d. For well construction with driven casing, the minimum acceptable seal shall be accomplished by undercutting or under reaming the last five (5) feet of the hole before seating the casing. A minimum of one (1) foot of such enlarged hole must be into the consolidated formation in which the casing will be seated. The entire enlarged portion shall be filled with cement grout and then the casing driven through the grout to refusal. The upper twenty (20) feet of casing shall be sealed with not less than a two-inch nominal thickness of cement grout. No other minimum seal shall be acceptable unless approved in advance by the water management district or the Department. Any part of a well which is constructed by setting the casing in a previously constructed borehole which is of larger diameter than the outside diameter of the casing, shall be sealed by filling the annular space, from bottom to top, with cement grout. Grouting methods and minimum standards shall at all times conform to those stated in Chapter 17-21. A minimum set time of twelve (12) hours is required.

e. The top of the casing shall be so constructed as to exclude any influent.

f. Prior to emplacing the pumps at the wells, wells shall be protected at all times by sanitary seal, threaded caps or welded flange so as to prevent entrance of contaminating material.

3. Pump Pits-Where a pump pit is planned, it must be provided with gravity drainage.

4. Housing of well pump-Both well and pump shall be protected by a housing of adequate size having an impervious floor and weatherproof walls and roof, however, completely weatherproof or submersible installations need only be protected from tampering and vandalism.

5. Well vent-Where provided, well vents shall be adequately protected.

6. Sampling tap-A conveniently accessible, down-opening sampling tap located a minimum distance of 12 to 18 inches above the ground surface shall be provided on the discharge side of each well pump, so that samples of raw water may be obtained from the well.

7. Dynamiting of wells-The use of dynamite or other explosives in the construction or maintenance of wells is hereby prohibited.

8. Infiltration galleries, etc.-Dug wells, infiltration galleries and other such sources of water supply requiring rearrangements of natural features are hereby prohibited as a source of public water supply unless water is treated in a manner approved by the Department.

17-22.106(2)(c)2.b. -- 17-22.106(2)(c)8.

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(d) Cleaning—The following procedure shall be followed for the cleaning of water supply wells. Water supply wells are to be cleaned of any microbiological or other contaminant due to well drilling activities so that the true microbiological character of the well water can be ascertained and so that the public water system may draw upon well water free of contamination from well construction activities.

1. Cleaning—Every well shall be equipped with an opening in the casing which will allow introduction of disinfection agents and the measurement of static water level, drawdown, or artesian pressure. Before a new well, or one suspected to be contaminated, or one which has been repaired, is placed in use, it shall be pumped clean with the permanent pump and it shall then be disinfected in accordance with an applicable method of "American Water Works Association Standards" or a method acceptable to the Department, followed by a bacteriological survey. Samples of raw water from the well must be submitted to the Laboratories of the Department of Health and Rehabilitative Services or other laboratory certified by the Department of Health and Rehabilitative Services for bacterial analysis as outlined in Section 17-22.106(2)(d)2. and use of the well will not be allowed until completion of survey and satisfactory interpretation of the results by the Department.

2. Bacteriological survey.

a. After thoroughly pumping the well until no trace of the disinfecting agent can be found, daily samples for 20 or more consecutive workdays shall be collected after pumping the well for 20 to 30 minutes at the rated capacity of the permanent pump each consecutive day. The daily samples shall be handled according to acceptable methods as stated in "Standard Methods for the Examination of Water and Wastewater", 13th Edition, 1971. The daily samples shall be submitted to a DHRS laboratory or other laboratory certified by DHRS for bacteriological analyses. When the Department determines that circumstances warrant it, the required number of samples and/or collection interval may be modified. In no case, however, is the daily collection of more than duplicate samples acceptable.

b. Interpretation of laboratory results in the well survey will be made in appropriate relationship with details of the well construction, the presence or absence of surface protection, the age of the well relative to the possible condition of the casing, the well log, or other pertinent information or conditions. However, where chlorination is the only treatment proposed, samples with mean coliform densities greater than four (4) per 100 ml shall not exceed 10 percent of the total number analyzed.

c. Evaluation of the survey results shall be made in consideration of potential sources of contamination, well construction and treatment to be provided.

(e) Drilling Samples—A log completion report showing various strata pierced by the well and a detailed drawing of the well construction shall be forwarded by the well contractor to the appropriate local Department office and local water management district within thirty days after the completion of the drilling operation. Cutting samples at regular intervals not greater than 25 feet apart and at every change in formation together with a log and other data as required by the Department and well completion reports shall be

submitted by the driller to the appropriate Water Management District when drilling is complete. Samples must show material in which the casing is seated. Blank well completion report forms shall be secured by written application to the Department of Environmental Regulation, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, or the appropriate Water Management District. Sample bags shall be secured from the samples delivered to the Bureau of Geology of the Department of Natural Resources, 903 West Tennessee Street, Tallahassee, Florida 32304 or appropriate Water Management District.

(f) Abandonment-Wells shall be closed utilizing an acceptable engineering practice approved in advance by the appropriate local Department office. Request for approval and granting of approval may be done by letter exchange. The person requesting approval shall as a minimum contain the following information in the letter requesting approval:

1. Location and size of well
2. Length of casing of well
3. Total depth of well
4. Water level in well

5. Methods and materials used for plugging the well. Capping the casing top is not an approved engineering practice and therefore unapprovable.

(3) TREATMENT PLANTS, STORAGE AND DISTRIBUTION FACILITIES- Water treatment facilities shall be designed, constructed and operated to provide adequate drinking water of a quality that will not adversely affect the health and welfare of the consumer and which will meet secondary standards (for community systems) as described in these regulations. In consideration of water treatment and distribution facilities design, construction and operation, the following criteria shall be complied with:

(a) Water Treatment Plant-In addition to disinfection as required by Section 17-22.106(3)c. below, the water treatment plant shall be designed and located according to acceptable sanitary engineering practices so as to provide drinking water complying with Section 17-22.104, Florida Administrative Code standards.

1. Before a community water system makes any significant modifications to its existing treatment process for the purpose of achieving compliance with trihalomethane MCL's, such system must submit and obtain Department approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modification. Each system shall comply with the provisions set forth in the Department approved plan. At a minimum, the Department approved plan shall require the system modifying its disinfection practice to:

a. Evaluate the water system for sanitary defects and evaluate the source water for biological quality.

b. Evaluate its existing treatment practices and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system.

c. Provide baseline water quality survey data of the distribution system. Such data should include the results from monitoring for coliform bacteria and performing standard plate counts at 35°C and 20°C.

17-22.106(2)(e) -- 17.22.106(3)(a)1.c.

d. Conduct additional monitoring to assure continued maintenance of optimal biological quality of finished water, for example, when chloramines are introduced as disinfectants or when pre-chlorination is being discontinued. Additional monitoring will also be required by the Department for chlorate, chlorite and chlorine dioxide if chlorine dioxide is used as a disinfectant. Standard plate count analyses are required by the Department, as appropriate, before and after any modification.

e. Demonstrate an active disinfectant residual throughout the distribution system at all times during and after the modification.

(b) Treatment, Coating and Appurtenance Chemicals—Chemicals needed for the treatment of drinking water or that are contained in coatings or are otherwise on equipment surfaces that come into contact with the water shall have been demonstrated through extensive toxicological studies or through some other procedure acceptable to the Department, that no immediate or cumulative adverse physiological effects to the consumer will occur.

(c) Disinfection—All public water systems shall continually have effective disinfection measures employed on the water which the system distributes. The necessary apparatus shall be designed according to acceptable engineering practices based on substantive data regarding, but not limited to, the proposed disinfection measure, the source water and a sanitary survey, so as to maintain throughout the distribution system a minimum continuous and effective free chlorine residual of 0.2 mg/l or its equivalent if other than chlorination is used as the disinfection measure. When utilizing chlorine in combination with ammonia, a minimum combined residual of 0.6 mg/l shall be maintained.

(d) Dual Chlorination Facilities.

1. Gas chlorination—A single gas chlorinator may be provided on systems with an equivalent gas chlorine demand of less than ten pounds per 24 hours. When raw water quality warrants, as determined by the Department, a chlorine residual recorder may be required. All gas chlorination facilities shall be installed in a separate above grade room provided with floor level cross ventilation along with adequate weighing devices and safety equipment. Dual gas chlorination facilities including but not limited to one standby chlorinator and booster pump for every five (5) chlorinators or fraction thereof, repair parts for chlorinators, and automatic cylinder switchover devices shall be provided on all water supply systems with an equivalent gas chlorine demand equal to or exceeding ten pounds per 24 hours. In all cases, upon the loss of chlorination capability a signal to sound an alarm installed on the outside of the chlorine room or in the office or laboratory of the plant shall be provided. Possible exceptions to dual gas chlorination facility requirements will be considered by the Department for a water system provided that both of the following conditions are met:

a. There is supervision on a 24 hour per day, 7 day per week basis or, in the absence of such supervision, there is installed a system which will sound an alarm indicating the loss of chlorine capability or chlorine residual at the police or fire station or other facilities maintained on a 24 hour, 7 day per week basis.

17-22.106(3)(a)1.d. -- 17-22.106(3)(d)1.a.

b. Sufficient spare parts are retained to allow expeditious repair in case of failure.

2. Hypochlorination-Hypochlorination facilities may be installed on public water systems with equivalent gas chlorine demands of less than 10 pounds per day and when used on multiple supplies they shall be installed on each source. Average daily system demand shall be used to determine if the amount of chlorine needed is equal to or exceeds 10 lbs/day requiring the use of gas chlorination. Maximum hourly system demand shall be used to determine the chlorinator capacity, whether gas or hypochlorite.

(e) Auxiliary power-All community systems serving 350 or more persons shall be equipped with sufficient finished water storage in combination with standby pumping capability to provide one-half maximum daily system demand or with a source of adequate auxiliary power (equipped with an automatic start up device, except where 24 hour per day, 7 day per week operation is provided) to allow operation of the water treatment units and provide pumping capability of approximately one half maximum daily system demand. The auxiliary power source shall be operated briefly at least once per month for 4 hours under load to insure dependability. For demineralization type systems such as reverse osmosis, electro dialysis, etc., source, distribution, pumping and disinfection capability requirement only applies.

(f) High Service Pumps-High service pumping and distribution facilities shall be designed to provide maximum hourly system demand without development of distribution pressure lower than 20 psi or other health hazards. Elevated storage with appropriate hydraulic characteristics may be combined with service pumping units or distribution components in meeting this system demand.

(g) Meters-All community water systems shall be equipped with a metering device that accurately indicates pumpage of finished water to distribution. Non-community systems shall be equipped with at least an elapsed time clock or other device in conjunction with field calibration of the pump, that will permit determination of flow.

(h) Piping-All pump intake lines located outside of water treatment plant building shall be located above grade or otherwise be protected from infiltration by demonstration that the lines will have a positive head greater than the pump inlets at their volutes under all operating conditions.

(i) Fluoridation-Inasmuch as present evidence indicates that fluoridation of public water supplies, under adequate control, will result in a significant reduction in tooth decay among children in communities utilizing this water treatment process, and that no harmful effects from this treatment have been demonstrated, the Department approves the application of fluoride to public water supplies deficient in this element, provided that the following requirements shall be complied with:

1. Conditions-Prior to the installation and placing into service of the treatment facilities which apply fluoride compounds to a public water system, an expression in writing shall be provided to the Department by the owner of the system or designated official requesting permission to apply fluorides to the system under supervision of the Department and in compliance with Section 17-22.108. Fluoride compounds as used herein may include NaF, Na_2SiF_6 and H_2SiF_6 .

17-22.106(3)(d)1.b. -- 17-22.106(3)(i)1.

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2. Fluoride levels in drinking water shall not exceed those as set forth in 17-22.104(1)(a). The optimum fluoride level should be maintained at approximately 1.0 mg/l.

3. Equipment and Installation

a. Fluoridation equipment for use with hydrofluosilicic acid shall be housed in an adequately ventilated separate structure or room provided with floor level cross ventilation.

b. A Department-approved means to determine daily fluoride chemical dosage shall be provided. When weighing scales are used to determine the amount of chemical fed, in order to facilitate loading and to avoid unnecessary lifting of large containers, the scales should be installed flush with the loading platform at floor level.

c. Solution feed lines shall be installed as close to floor level as practical.

d. At the discretion of the Department, chemicals in powdered or granular form used for fluoridation shall be color-coded when required to distinguish from other water treatment chemicals.

e. Analytical equipment capable of accurate determination of the fluoride ion concentration in the treated water is required at each plant utilizing fluoridation equipment. Analysis of the plant effluent (treated water) for fluoride content shall be performed daily and reported to the Department monthly, along with fluoride dosage and quantity of chemical fed, on a daily basis.

4. Quality Assurance.

a. At monthly intervals, each plant practicing fluoridation shall collect a raw, an effluent and four distribution system samples, and "split" them with a laboratory of DHRS or other certified laboratory for analysis. The results of analysis by the plant and the other laboratory shall be submitted to the Department, on the form used for daily reporting of dosage. Comparisons of the split sample results shall be used in the Department's assessment of the adequacy of dosing and monitoring the process by the plant.

b. Each plant practicing fluoride treatment shall be inspected twice a year, with the emphasis on adequacy, safety and consistency with the operation of the fluoride aspects of the facility.

c. If the Department finds that fluoridation is not being carried out in compliance with these rules, it may order corrective action.

(4) ENGINEERING REFERENCES-In addition to the above requirements the technical standards and criteria contained in the following standard water works manuals and technical publications and those referenced throughout this chapter are hereby incorporated by reference and shall be applied in determining whether applications to construct or alter a public water supply system shall be issued or denied.

17-22.106(3)(i)2. -- 17.22.106(4)

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| Technical Volume | Author, Publisher and Address |
|---|--|
| "Manual for Evaluating Public Drinking Water Supplies" 1971 Edition | U.S. Environmental Protection Agency, Published by: Superintendent of Documents, U.S. Governmental Printing Office, Washington, D.C. 20402 |
| "Water Treatment Plant Design" 3rd Edition, 1971 | American Society of Civil Engineers, American Water Works Assoc., and Conference of State Sanitary Engineers, Published by: American Water Works Assoc., Inc., 6666 W. Quincy Ave., Denver, Colorado 80235 |
| "Recommended Standards for Water Works" 1976 Edition | Great Lakes - Upper Mississippi River Board of State Sanitary Engineers, Published by: Health Education Service, P.O. Box 7283, Albany, N.Y. 12224 |
| "Water Quality Treatment" American 3rd Edition, 1971 | Prepared and Published: by American Water Works Association, 6666 W. Quincy Avenue, Denver, Colorado 80235 |
| Standards of the American Water Works Association, in effect on September 6, 1977 | American Water Works Association, 6666 W. Quincy Avenue, Denver, Col. 80235 |
| "Manual of Treatment Techniques for Meeting the Interim Primary Drinking Water Regulations" EPA | U.S. Environmental Protection Agency, Office of Research and Development, Municipal Environmental Research 600/8-77-005, Published May, 1977 Laboratory Water Supply Division, Cincinnati, Ohio |

Members of the public may request and obtain copies of the technical volume by contacting the appropriate publisher at the address indicated.

Specific Authority: 403.861(8)(9), F.S.

Law Implemented: 381.272(6), 403.852(12)(13), 403.853(1)(2)(3)(4)(5), F.S.

History: New 11-9-77, Amended 1-13-81, 3-30-82, 12-13-83, 10-1-85.

17-22.107 Operation and Maintenance.

(1) CLEANING AND DISINFECTION-No supplier of water shall put into service any new plant, pumping station, main standpipe, reservoir, tank or other pipe or structure through which water is delivered to consumers for drinking and household purposes, nor resume the use of any such structure, facilities, or main after it has been cleaned, until such structure, facilities or main has been effectively disinfected. Provided, that this may not necessarily apply to mains, reservoirs, tanks, or other structures, the waters from which are subsequently treated and/or disinfected.

(2) CERTIFICATION LETTER AND CLEARANCE-Upon completion of construction, the engineer of record shall submit a certification of completion letter to the Department or designated county health unit. When a letter of certification and a copy of satisfactory bacteriological results (with a coliform density of less than one in two consecutive daily water samples) are received, a letter of clearance from placing of facilities into service will be issued.

(3) OPERATION AND MAINTENANCE OF EQUIPMENT-

(a) Operation of public water systems according to regulations and approved plans-Upon construction of the public water system the supplier of water shall maintain in good operating condition and keep in operation all equipment designed for the purification of the water supply, or its protection from contamination. The supplier shall maintain a minimum free chlorine residual of 0.2 mg/l or its equivalent, as determined by the Department, throughout the distribution system at all times. The capacity of treatment plant and distribution facilities including pumps and pipes shall be increased commensurately with system demand, and a minimum pressure of 20 psi shall be maintained continuously throughout the distribution system except in extenuating circumstances. The system shall be maintained and operated in accordance with the regulations of the Department and approved plans.

(b) Operation personnel-The supplier of water shall provide responsible operation personnel so that the public water system will comply with Chapter 17-16, Florida Administrative Code. Compliance with Chapter 17-16, Florida Administrative Code, is a requirement of this rule Chapter.

(c) Water samples for laboratory test-Suppliers of water have to comply with 17-22.105, Florida Administrative Code, and therefore suppliers of water are responsible for the collection and delivery of water samples to a Department of Health and Rehabilitative Services laboratory or other certified analytical laboratory. Local county health units may routinely collect and deliver water samples for analysis. However, the supplier of water remains responsible for collecting and delivering the difference between the required number of samples and the number collected and delivered by the local health unit, and for collecting and delivering the required number of samples should

17-22.106(4) -- 17-22.107(3)(c)

the local health unit fail to collect samples in any month. Should there be a failure to comply with Sections 17-22.104 or 17-22.105, Florida Administrative Code, the supplier of water will have to go through the public notification process, Section 17-22.112, Florida Administrative Code.

(d) Abnormal occurrences—No new source of water supply shall be introduced into the system, and no purification process or protection provision shall be altered or discontinued, except where the treatment plant operator notifies the Department and secures written approval therefrom. In case of a breakdown in purification or protective works, breaks in main transmission lines causing major interruptions in service or where any suspicious circumstances or abnormal taste or odor occurs in connection with a public water supply, it shall be the duty of the person responsible for the operation of the works or the treatment plant operator to notify within 24 hours the Department by wire or telephone. It shall be the duty of the Department to notify the appropriate local health unit(s). Provided, however, that where there is a designated local health unit the local health officer shall be notified and it shall be his duty to notify the Department.

(e) Maintenance logs—An on-site maintenance log of all water plant equipment which directly affects the quality of treatment shall be maintained by the plant's lead operator and available at all times at all water treatment plants that treat water for a community water system. Log information shall include, as a minimum, all maintenance performed, date performed, and problems encountered with equipment.

(4) CROSS CONNECTION CONTROL

(a) Cross-connection, which is the physical connection of a water system or other substances of unknown, questionable or unsafe water quality to a public water system, is prohibited. However, a person owning or managing a public water system may inter-connect to the public water system another water system if such other system is regularly examined as to its quality by those persons owning or managing the public water system and the other water system meets all requirements contained in Chapter 17-22, Florida Administrative Code. This provision shall apply to all water distribution systems which are either inside or outside of any building or buildings.

(b) Control program and required action after detection—Community Water systems are required to establish a routine cross-connection control program for the purpose of detecting and preventing cross-connections that create or have the potential to create an imminent and substantial danger to public health by and from contamination due to cross-connection. Upon detection of a prohibited cross-connection, both community and non-community water systems shall either eliminate the cross-connection by installation of an appropriate backflow prevention device acceptable to the Department or discontinue service until the contaminant source is eliminated. Such program shall be developed utilizing accepted practices of the American Water Works Association guidelines as set forth in AWWA manuals m14, "Backflow Prevention and Cross Connection Control," and "Cross Connections and Backflow Prevention", 2nd Edition.

(c) Backflow prevention—Only the following are considered to be backflow prevention devices. They shall be installed in agreement with and under the

17-22.107(3)(c) -- 17-22.107(4)(c)

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supervision of the supplier of water or his designated representative (plumbing inspector, etc.) at the consumer's meter, at the property line of the consumer when a meter is not used, or at a location designated by the supplier of water or the Department. The devices are:

1. Air gap separation—A physical separation between the free-flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel. An "approved airgap separation" shall be at least double the diameter of the supply pipe measured vertically above the top of the rim of the vessel—in no case less than 1 inch.

2. Reduced pressure backflow preventer—A device containing within its structure a minimum of two independently acting approved check valves, together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve reduces the supply pressure a predetermined amount so that during normal flow and at cessation of normal flow the pressure between the checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to atmosphere, shall operate to maintain the pressure between the checks less than the supply pressure. The unit shall include tightly closing shutoff valves located at each end of the device, and each device shall be fitted with properly located test cocks.

3. Atmospheric vacuum breaker—A backflow prevention device which is operated by atmospheric pressure in combination with the force of gravity. The unit is designed to work on a vertical plane only. The one moving part consists of a poppet valve which must be carefully sized to slide in a guided chamber and effectively shut off the reverse flow of water when a negative pressure exists.

4. Pressure vacuum breaker—A pressure vacuum breaker is similar to an atmospheric vacuum breaker except that the checking unit "poppet valve" is activated by a spring. This type of vacuum breaker does not require a negative pressure to react and can be used on a pressure side of a valve.

5. Double check valve assembly—An assembly composed of two single, independently acting, check valves*, including tightly closing shutoff valves located at each end of the assembly and suitable connections for testing the water tightness of each check valve. *A valve that is drip-tight in the normal direction of flow when the inlet pressure is one p.s.i. and the outlet pressure is zero. The check valve shall permit no leakage in a direction reverse to the normal flow. The closure element (e.g. clapper) shall be internally weighted or otherwise internally loaded to promote rapid and positive closure.

(5) Reporting—See Section 17-22.111 which follows.
Specific Authority: 403.861(8)(9), F.S. Law Implemented: 403.852(12)(13), 403.853(1)(3), F.S. History: New 11-9-77, Amended 1-13-81.

17-22.107(4)(c) -- 17-22.107(History)

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**PART IV
PERMITTING, VARIANCES, EXEMPTIONS, WAIVERS**

17-22.108 Permitting.

(1) APPLICATIONS-This subsection sets forth the various type drinking water permit applications as well as the minimum information and fee which must be supplied to the Department as a permit application. Information must be submitted on each item.

(a) Public Water Supply Well Construction Permit.

1. Prohibition-It is prohibited to construct a public water supply well without a signed and validated permit issued by the department or the appropriate water management district created under Chapter 373, Florida Statutes, by the following water management districts:

- a. Northwest Florida Water Management District
- b. Suwannee River Water Management District
- c. St. Johns River Water Management District
- d. Southwest Florida Water Management District

e. In the area encompassed by the South Florida Water Management District, permits to construct public water supply wells are issued pursuant to Part III, Chapter 373, Florida Statutes, by the appropriate department, district or subdistrict office.

2. Application-Prior to commencing construction of a public water supply well, the licensed water well contractor should apply to the department or the appropriate water management district listed above for a permit to construct the well in accordance with Chapter 17-21, Florida Administrative Code, Part III, Chapter 373, Florida Statutes, and Section 17-22.106(2), Florida Administrative Code.

3. Prohibition-It is prohibited to construct or use a water supply well until a signed, validated permit is obtained from the Department or the appropriate water management district, and received by the licensed water well drilling contractor and the owner of the well.

4. Application-Before commencing the construction of a well, the licensed well drilling contractor shall make application to the Department or the appropriate water management district for a water supply well drilling permit. The application form may be obtained from any of the offices of the appropriate water management district or the Department's offices. The application shall be signed by the licensed well drilling contractor as well as the person, or authorized agent of the person, who will own the well. Application shall be made in triplicate to the appropriate local office of the Department or appropriate water management district.

5. Information-The permit application form sets forth the minimum information which is to be supplied. Additional information may be required for any given permit application. The information which is required by the permit application is as follows:

a. Type of construction, casing material, proposed depth and diameter, proposed type of casing seat, required yield, and nature of the place to be supplied by the well water.

17-22.108(1) -- 17-22.108(1)(a)5.a.

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b. A plat showing the location of the proposed well relative to existing physical features. The location of known possible sources of contamination must be shown as well as proposed physical features and proposed sources of contamination.

(b) Drinking Water System Plant Permit.

1. Prohibition-No person shall construct a new or alter an existing drinking water system plant without having first applied for and obtained a signed validated permit from the Department or designated County Health Unit.

2. Coverage-A drinking water system plant includes jointly and severally the collection, treatment, storage and distribution segments of a public water system. Construction or alteration of any one or more segments will require application for and obtaining of a permit approving the construction or alteration. Those persons who create a consecutive public water system by adding a water conditioning device to a public water system are not required to obtain permits, but must submit a sketch of the consecutive public water system and a complete technical description of the water conditioning device to the appropriate department or designated county health unit. A decision concerning monitoring will be made in accordance with 17-22.105(5), Florida Administrative Code, and said decision will be made known by written notice to the person who had the water conditioning device installed.

3. Application-Before commencing construction or alteration, a person or authorized agent of the person shall make application to the Department using DER Form 17-1.122(9) [Application for Construction Permit--Public Drinking Water System] or, for distribution system extensions pursuant to the General Permit provisions of Fla. Admin. Code Rule 17-4.63 using DER Form 17-1.122(43). The application shall be executed in full and made in quadruplicate to the appropriate local office of the Department or the Local County Health Unit if designated by Rule 17-22.108.

4. Engineer of record-All drawings, specifications and data required with the application shall be prepared by an engineer licensed in the state under the provision of Chapter 471, Florida Statutes, and shall fulfill the requirements of Section 471.30, Florida Statutes. The engineer of record or other qualified professional engineer shall be retained to observe project construction and to assure conformance with approved engineering plans and specifications, and to perform the subsequent certification as to completion and conformance of project construction.

5. Information-The permit application form sets forth the minimum information which is to be supplied to the Department or designated County Health Unit. Additional information may be required by the Department for any given permit application. The information which is required by the application is as follows:

a. Certificate that the plans for the project have been approved by the governing body of the applicant (city commissioners, corporation, board, etc.)

b. Comprehensive engineer's report describing the project, basis of design, including design data and such pertinent data within the scope of the project and requirements of Chapter 17-22 to give an accurate understanding of work to be undertaken and reasons therefore.

17-22.108(1)(a)5.b. -- 17-22.108(1)(b)5.b.

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c. Prints of drawings of the work project which contain sufficient detail to clearly appraise the Department of the work to be undertaken. All prints shall be minimum 18 x 24 inch size, and a maximum size of 36 x 42 inches, and the scale of details contained shall be satisfactory for microfilm reproduction. (Reduced size photographic reproduction of drawings for submission may be authorized.)

d. Complete specifications of the project necessary to supplement the prints submitted.

e. A certificate authorizing the applicant to provide service if such certificate is required by Chapter 367, Florida Statutes.

f. Such additional data as may be requested by the Department after initial application for purpose of clarification, anticipated use, or to support any changes in the scope of the project, actual or anticipated.

6. Designated Local Health Units—Those County Health Units with a qualified engineering staff shall be designated to do the following:

a. Review and evaluate each application for the construction, modification, or expansion of a public water system to determine compliance with federal, state, and local requirements.

b. Review, evaluate, and approve or disapprove applications for the expansion of distribution systems and drinking water system plants for non-community systems. The Department's District and Subdistrict offices should be contacted for the names of those County Health Units which have been designated to approve or disapprove.

(c) Fees—A non-refundable fee of twenty (20) dollars payable to the order of the agency taking final action must accompany each application. However, no processing fee will be required for applications filed with the Department pursuant to the General Permit provisions of Fla. Admin. Code Rule 17-4.63.

(2) APPROVAL—This subsection sets forth the evaluation criteria the Department uses, the showing an applicant must make on each of the evaluation criteria, and the manner of decision on the application, duration, suspension and revocation of permits. For applications to construct an extension to a public water supply distribution system under the provisions of the General Permit, the procedures, general conditions, and specific conditions of Fla. Admin. Code Rules 17-4.53, 17-4.54 and 17-4.63 shall also apply.

(a) Showing—The applicant must provide the Department with reasonable assurance that no aspects of the design and proposed and completed construction create or have the potential to create an imminent and substantial danger to health and that all applicable primary and secondary drinking water regulations will be complied with.

(b) Evaluation Criteria for Water Supply Well Drilling Permit—the appropriate water management district or the Department will evaluate each application for a water supply well drilling permit for compliance with 17-22.106(2), Florida Administrative Code.

(c) Evaluation Criteria for Public Water Supply Permits—The Department will evaluate each application for the following:

1. Compliance with each and every quality standard contained in 17-22.104, Florida Administrative Code.

17-22.108(1)(b)5.c. -- 17-22.108(2)(c)1.

2. Adequate engineering design complying with acceptable engineering principles as established in 17-22.106, Florida Administrative Code.

3. Any additional criteria not previously named, if used, will be made known to the applicant when a decision on the application is made known to the applicant.

(d) Decisions-The Department's appropriate local office will either grant or deny a permit within the time prescribed by Chapter 120, Florida Statutes. Should an adverse decision be reached, the applicant will be informed of that decision and the reasons therefor. Additionally, if a favorable decision is reached, a complete set of the approved plans, specifications, application, and other data shall be returned to the applicant. Provided, the Department may at its discretion return such complete set of approved plans and related material to the registered professional engineer or licensed well drilling contractor authorized to represent the applicant. Any and all construction, alteration or extension of public water supply systems shall be in accordance with such Department approved plans. Provided, appropriate changes in a specific project may be made only on prior written approval and consent of the Department.

(e) Duration, Suspension, Revocation-Unless stated differently on the face of the permit, the permit shall be valid for one year from the date of issuance. Reapproval of expired permits will be considered by the Department upon written request accompanied by a 20 dollar renewal fee to the office that issued the original permit. Suspensions and revocation will be done as stated in Section 17-4.110, Florida Administrative Code and Section 28-6.09, Florida Administrative Code.

Specific Authority: 373.016(3), 373.046, 373.309(2), 403.861(2)(6)(8), F.S.
Law Implemented: 367.031, 373.016(3), 373.046, 373.309(2), 403.852(12),
403.853(1)(3), 403.861(2)(6)(8)(9), F.S.

History: New 11-9-77, Amended 5-25-78, 1-13-81, 3-30-82, 7-8-82.

17-22.109 Variances, Exemptions and Waivers.

(1) APPLICATION-This sub-section sets forth the information which must be contained in an application for a variance, or exemption or waiver. Information must be submitted on each item. Until information on each item is received, the Department has not received a completed application for either a variance, exemption or waiver. If adequate information is submitted on each item, the Department will process the application on its merits. Applications shall be submitted in quadruplicate to the local Department office which shall forward a single copy to the Department's office in Tallahassee.

(a) Variance Request-A supplier of water may request the granting of a variance for a public water system by submitting a request for a variance in writing to the Department. Suppliers of water may submit a joint request for variance when they seek similar variance or variances under similar circumstances. Any written request for a variance shall include the following information:

1. The nature and duration of variance requested.

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2. Relevant analytical results of water quality sampling of the system, including results of relevant tests conducted pursuant to the requirements of the state primary drinking water regulations.

3. For any request for variance from a maximum contaminant level:

a. Explanation in full and evidence of the best available treatment technology and techniques.

b. Economic and legal factors relevant to ability to comply.

c. Analytical results of raw water quality relevant to the variance request.

d. A proposed compliance schedule, including the date each step toward compliance will be achieved. Such schedule shall include as a minimum the following dates:

(i) Date by which arrangement for alternative raw water source or improvement of existing raw water source will be completed.

(ii) Date of initiation of the connection of the alternative raw water source or improvement of existing raw water source.

(iii) Date by which final compliance is to be achieved.

e. A plan for the provision of safe drinking water in the case of an excessive rise in the contaminant level for which the variance is requested.

f. A plan for interim control measures during the effective period of variance.

4. For any request for variance from a treatment technique, statement that the system will perform monitoring and other reasonable requirements prescribed by the Department as a condition to the variance.

5. Other information, if any, believed to be pertinent by the applicant.

6. Such other information as the Department may require.

(b) Exemption Request—A supplier of water may request the granting of an exemption for a public water system by submitting a request for exemption in writing to the Department. Suppliers of water may submit a joint request for exemption when they seek similar exemptions under similar circumstances. Any written request for an exemption or exemptions shall include the following information:

1. The nature and duration of exemption requested.

2. Relevant analytical results of water quality sampling of the system, including results of relevant tests conducted pursuant to the requirements of the state primary drinking water regulations.

3. Explanation of the compelling factors such as time or economic factors which prevent such system from achieving compliance.

4. Other information, if any, believed by the applicant to be pertinent to the application.

5. A proposed compliance schedule, including the date when each step toward compliance will be achieved.

6. Such other information as the Department may require.

(c) Request for waiver of chlorination requirement—A supplier of water may request the waiver of any chlorination requirement for a non-community water system in existence on July 18, 1980 by submitting a request for a waiver in writing to the Department. Any written request shall include the following information:

1. Documentation of the history of the quality of water provided by the system and monitoring tests for bacteriological contamination for at least the three years preceding the request.

2. A detailed description of the well and the site on which it is located, including geology, depth of well, casing, grouting and other relevant factors which have an impact on the quality of water supplied. The supplier of water shall provide plans, drawings or test data in support of the description or otherwise establish the reliability of the description.

3. The number of connections and size of the distribution system, its age and the materials of which it is constructed.

(d) Request for waiver of certified operator requirement--A supplier of water may request the waiver of any certified operator requirement for a non-community water system having design flow of less than 10,000 gallons per day by submitting a request for a waiver in writing to the Department. Any request shall include the following information:

1. Operation and maintenance records for the year preceding an application for waiver, including bacteriological monitoring test results.

2. A description of and results of monitoring procedures for maximum contaminant levels included in Primary Drinking Water Regulations.

3. An explanation of why it is not feasible for the supplier of water to become a certified operator or to retain the services of a certified operator.

4. Provisions that will be made for inspection of the water system from time to time for defects or to assess the condition and need for repair of the water system.

(2) APPROVAL--This subsection sets forth the evaluation criteria the Department uses, the showing an applicant must make, and the manner of decision on the application. Variances or exemptions cannot be obtained from operation, maintenance, monitoring and reporting requirements.

(a) Showing--The applicant must provide the Department with the information that will enable the Department to make the following findings:

1. Variance from maximum contaminant level--find that granting a variance will not result in an unreasonable risk to health, the application to the raw water source of the best technology and treatment techniques, which are generally available to a larger water system at reasonable cost, has not resulted in compliance with an MCL, all other reasonable technological, economic and legal efforts have been made.

2. Variance from a treatment technique--such treatment technique is not necessary to protect the health of persons because of the nature of the raw water source of such system.

3. Exemptions from maximum contaminant level or treatment technique--find that due to compelling factors the public system is unable to comply, the public water system was in operation on the effective date of the contaminant level or treatment technique, or both from which exemption is sought, and granting will not result in an unreasonable risk to health.

4. Waiver of chlorination requirement--find that no hazard to health will result.

17-22.109(1)(c)1. -- 17-22.109(2)(a)4.

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5. Waiver of certified operator requirement—find that the system can be properly maintained without a certified operator and that no hazard to public health will result from non-attendance of the system by a certified operator.

(b) Evaluation Criteria—The Department will evaluate the submitted information as well as any other available information for each item required for application.

1. In its consideration of whether the public water system is unable to comply with a contaminant level required by the primary drinking water regulations because of the nature of the raw water source, the Department shall consider such factors as, but not limited to:

a. The availability and effectiveness of treatment methods for the contaminant for which the variance is requested.

b. Cost and other economic considerations such as implementing treatment, improving the quality of the source water or using an alternate source.

2. In its consideration of whether a public water system should be granted a variance to a required treatment technique because such treatment is unnecessary to protect the public health, the Department shall consider such factors as, but not limited to:

a. Quality of the water source including water quality data and pertinent sources of pollution.

b. Source protection measures employed by the public water system.

3. In its consideration of whether the public water system is unable to comply due to compelling factors, the Department shall consider such factors as, but not limited to:

a. Construction, installation, or modification of treatment equipment or systems.

b. The time needed to put into operation a new treatment facility to replace an existing system which is not in compliance.

c. Economic feasibility of compliance.

4. In consideration of whether a non-community water system should be granted a waiver of the chlorination requirement, the Department shall consider the results of a sanitary survey. The supplier of water for any non-community water system granted a waiver of the chlorination requirement shall monitor for microbiological contamination on at least a monthly basis or as otherwise specified by the Department and shall report the results to the Department. A sanitary survey is not mandatory before a waiver of the certified operator requirement but may be performed and considered by the Department.

(c) Manner of Decision—Within 90 days of receipt of a completed application or a timely request for additional information in connection with the application, the Department will make a decision on the application. The applicant will be notified of the Department's intended decision by a written notice which states with particularity the grounds for the decision. The notice will also contain an intended schedule for compliance with that from which a variance or exemption is sought. A hearing may be requested on the Department's intended decision in accordance with Chapter 120, Florida Statutes. Whenever the Department issues a letter of intent to grant or deny a variance or exemption, the Department will give all affected persons

constructive notice of the compliance schedule by publication in the Florida Administrative Weekly and a newspaper of general circulation in the area affected by the variance or exemption. Should any person wish a public hearing, the person must submit a request for a public hearing within thirty (30) days of publication of the notice. The Department will only act upon hearing requests from persons whose substantial interests are affected. Should a hearing not be requested within the allotted time, the right to an administrative hearing will be deemed waived and the Department's intended decision will be final.

(d) Times-A variance or exemption cannot extend the time for compliance with a treatment technique or MCL requirement prescribed by Section 17-22.104 in excess of the following limitations:

1. variance-compliance as expeditiously as practicable.
2. exemption-compliance as expeditiously as practicable, but not later than January 1, 1984, for an MCL or treatment technique, which is denoted as an interim national primary drinking water regulation under the Federal Act, and not later than seven years after an MCL or treatment technique, which is denoted as a revised national primary drinking water regulation under the Federal Act, comes into effect; provided, however, if a public water system has entered into an enforceable agreement to become a part of a regional public water system the times shall be for an interim or revised requirement, respectively, January 1, 1986, and nine years.

(e) Duration of waiver-A waiver shall be granted for a period of three years and shall be renewable upon application to the Department pursuant to Section 403.854, F.S. and Section 17-22.109, Florida Administrative Code.

(f) Revocation of waiver-The Department may revoke any waiver to protect the public health, provided that such revocation is necessary to achieve compliance with state quality standards for safe drinking water, or the supplier of water fails to comply with any conditions of the waiver.

Specific Authority: 403.861(8), F.S.

Law Implemented: 403.852(12)(13), 403.853(1)(3), 403.854(1)(2)(3)(4)(5), F.S.

History: New 11-9-77, Amended 12-22-77, 1-18-81, 3-30-82.

17-22.109(2)(c) -- 17-22.109(History)

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**PART V
SURVEILLANCE, RECORDS AND REPORTING**

General—The Department is charged with the duty to create and implement a drinking water program. Federal and State laws require the State to report to EPA as well as collect and periodically verify reports, etc. from suppliers of water.

17-22.110 Surveillance. The legislature has conferred upon the Department and the Department of Health and Rehabilitative Services and their authorized employees the authority and power to enter and inspect and sample public water systems. All employees of the Department and the Department of Health and Rehabilitative Services whose job responsibilities call for them to enter and sample and/or inspect a public water system are authorized to enter and sample and/or inspect, and conduct sanitary surveys upon identification. Specific Authority: 403.861(8), F.S.
Law Implemented: 403.852(12)(13), 403.853(3), 403.855, 403.858, F.S.
History: New 11-9-77.

17-22.111 Records and Reporting.

(1) **RECORD MAINTENANCE**—Any supplier of water shall retain on the premises of the public water system treatment plant or at a convenient location near the premises the following records:

(a) Records of bacteriological analyses made pursuant to this part shall be kept for not less than 5 years. Records of chemical analyses made pursuant to this part shall be kept for not less than 10 years. Actual laboratory reports may be kept, or data transferred to tabular summaries, provided that the following information is included:

1. The date, place and time of sampling, and the name of the person who collected the sample;
2. Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or processed water sample, or other special purpose sample;
3. Date of analysis;
4. Laboratory and person responsible for performing analysis;
5. The analytical technique/method used; and
6. The results of the analysis.

(b) Records of action taken by the system to correct violation of primary drinking water regulations shall be kept for a period not less than 3 years after the last action taken with respect to the particular violation involved.

(c) Copies of any written reports, summaries or communications relating to cross connection control programs or sanitary surveys of the system conducted by the system itself, by a private consultant, or by any local, State or Federal agency, shall be kept for a period not less than 10 years after completion of the sanitary survey involved.

(d) Records concerning a variance or exemption granted to the system shall be kept for a period ending not less than 5 years following the expiration of such variance and exemption.

(e) Water plant operation reports shall be kept for a period of not less than 5 years.

(2) REPORTING REQUIREMENTS—Suppliers of Water shall report as follows:

(a) Except where a shorter reporting period is specified in this Rule, the suppliers of water shall report to the district or sub-district offices of the Department or appropriate County Health Unit the results of the test, measurement or analysis required by this Rule within the first ten days following the end of the required monitoring period as designated by the Department, or the first ten days following the month in which the sample results were received, whichever time is shortest.

(b) The monthly operation reports for a public water system shall be submitted by the plant's certified lead operator to the appropriate office of the Department and the appropriate designated County Health Unit within 15 days after the month of operation.

(c) The suppliers of water shall report to the appropriate district or subdistrict office of the Department within 48 hours the failure to comply with any drinking water regulation contained in Section 17-22.104 or 17-22.105. When the last measure is accomplished, the measures taken to correct the non-compliance shall be reported to that office.

(d) The supplier of water is not required to report analytical results to the Department in cases where a Department of Health and Rehabilitative Services laboratory performs the analysis and reports the results to the Department.

(e) Copies of any written reports, summaries or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by any local or Federal agency, shall be submitted to the Department's district or sub-district office and the appropriate designated County Health Department within 15 days of receipt by the supplier of water of the information.

(f) The supplier of water, within ten days of completion of each public notification requirement pursuant to 17-22.112, shall submit to the Department a representative copy of each type of notice distributed, published, posted, and made available to the persons served by the system and the media.

(g) Upon request, the supplier of water shall submit to the Department within the time stated in the request, copies of any records required to be maintained under 17-22.111(1) or copies of any document which the Department is entitled to inspect.

(3) LOCATION OF RECORDS—Pursuant to the Public Records statute, Chapter 119, Florida Statutes, the above records and the records of enforcement cases, permit, variance and exemption applications shall be maintained on file by the department as follows:

(a) All results of chemical analyses shall be retained by the district, sub-district and central offices of the Department.

(b) All results of bacteriological analyses shall be retained by the district and sub-district offices of the Department.

(c) Copies of any written reports, summaries or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by any local, State or Federal agency, shall be kept on file at the district, sub-district and central offices of the Department.

(d) Records concerning a variance exemption, or permit granted to the system and enforcement actions instituted against the system shall be kept on file at the district, subdistrict, and central offices of the Department.

17-22.111(2) -- 17-22.111(3)(d)

(e) Water plant operation reports shall be kept on file at the plant site and at the district and sub-district office.

Specific Authority: 403.961(8)(15)(16), F.S.

Law Implemented: 403.853(3)(4), 403.101, F.S.

History: New 11-9-77, Amended 1-13-81, 3-30-82.

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**PART VI
PUBLIC NOTIFICATION, IMMINENT HAZARDS, VIOLATIONS**

General-In order to carry out the duties of the Department as well as to assure adequate protection of the public, requirements and procedures are needed to systematize and standardize response and actions in such situations.

17-22.112 Public Notification. This section shall apply to primary contaminants only.

(1) If a community water system fails to comply with an applicable maximum contaminant level established in 17-22.104, fails to comply with an applicable testing procedure established in 17-22.105, is granted a variance, or an exemption from an applicable maximum contaminant level, fails to comply with the requirements of any schedule prescribed pursuant to a variance or exemption, or fails to perform any monitoring required in 17-22.105, the supplier of water shall notify persons served by the system of such failure or granting of an exemption or variance by giving notice of such fact in the first set of water bills of the system issued after the failure or variance or exemption grant and in any event by written notice within three months. Such notice shall be repeated at least once every three months so long as the system's failure continues or the variance or exemption remains in effect. If the system issues water bills less frequently than quarterly, or does not issue water bills, the notice shall be made by or supplemented by another form of direct mail.

(2) If a community water system has failed to comply with an applicable maximum contaminant level, the supplier of water shall notify the public of such failure, in addition to the notification required by paragraph (1) of this section, as follows:

(a) By publication on not less than three consecutive days in a newspaper of general circulation in the area served by the system. Such notice shall be completed within fourteen days after the supplier of water learns of the failure.

(b) By furnishing a copy of the notice to the radio and television stations serving the area served by the system. Such notice shall be furnished within seven days after the supplier of water learns of the failure.

(3) The requirements of subsection (2) may be waived by the Department if it determines that the violation has been corrected promptly after discovery, the cause of the violation has been eliminated, and there is no longer a risk to public health.

(4) If the area served by a community water system is not served by a daily newspaper of general circulation, notification by newspaper required by paragraph (2) of this section shall instead be given by publication on three consecutive weeks in a weekly newspaper of general circulation serving the area. If no weekly or daily newspaper of general circulation serves the area, notice shall be given by posting the notice in post offices within the area served by the system.

(5) If a non-community water system fails to comply with an applicable maximum contaminant level established in 17-22.104, fails to comply with an

applicable testing procedure established in 17-22.105, is granted a variance or exemption from an applicable maximum contaminant level, fails to comply with the requirement of any schedule prescribed pursuant to a variance or exemption or fails to perform any monitoring required in 17-22.105, the supplier of water shall give notice of such failure or variance or exemption grant to the persons served by the system by fixed sign located at all potable water outlets or connections.

(6) Notices given pursuant to this section shall be written in a manner reasonably designed to inform fully the users of the system. The notice shall be conspicuous and shall not use unduly technical language, unduly small print or other methods which would frustrate the purpose of the notice. The notice shall disclose all material facts regarding the subject including the nature of the problem, and when appropriate, a clear statement that a drinking water regulation contained in Section 17-22.104 and/or 17-22.105, Florida Administrative Code has been violated and any preventive measures that should be taken by the public. Where appropriate, or where designated by the the Department, bilingual notice shall be given. Notice may include a balanced explanation of the significance or seriousness to the public health of the subject of the notice, a fair explanation of steps taken by the system to correct any problem and the results of any additional sampling.

(7) Notice to the public required by this section may be given by the Department on behalf of the supplier of water.

(8) In any instance in which notification by mail is required by paragraph (1) of this section but notification by newspaper or to radio or television stations is not required by paragraph (2) of this section, the Department may order the supplier of water to provide notification by newspaper and to radio and television stations when circumstances make more immediate or broader notice appropriate to protect the public health.

Specific Authority: 403.861(8), F.S. Law Implemented: 403.857, F.S. History: New 11-9-77, Amended 1-13-81, 3-30-82.

17-22.113 Imminent Hazards. Before the Department can invoke the powers conferred upon it by Section 403.855, Florida Statutes, the Department will as a minimum need the following information:

(1) Name and address of the responsible person;

(2) Identification of the contaminant which is present in or likely to enter a public water system;

(3) An explanation of how and why the contaminant presents an imminent and substantial danger; and

(4) The name and location of the public water system and its owner, if different from Number 1. Upon receipt of sufficient information and after investigation of that information the Department will take action which is appropriate to the situation. Taking action pursuant to Section 17-22.113, Florida Administrative Code, and Section 403.855 does not exclude taking simultaneous action pursuant to Section 403.856, Florida Statutes.

Specific Authority: 403.861(8), F.S.

Law Implemented: 403.855, F.S.

History: New 11-9-77.

17-22.112(5) -- 17-22.113(History)

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17-22.114 Violations.

(1) Prohibited acts-The following acts and the causing thereof are prohibited and are violations of the Act:

(a) Failure by a supplier of water to comply with the requirements of Section 403.857, or dissemination by such supplier of any false or misleading information with respect to notices required pursuant to Section 403.857 or with respect to remedial actions being undertaken to achieve compliance with state primary and secondary drinking water regulations.

(b) Failure by a supplier of water to comply with regulations adopted pursuant to Section 403.853, or any rule adopted by the Department pursuant to the Act, or with conditions for variances or exemptions authorized under Section 403.854.

(c) Failure by any person to comply with any order issued by the Department pursuant to Florida Safe Drinking Water Act (the Act).

(d) Failure by a supplier of water to allow any duly authorized representative of the Department or of the Department of Health and Rehabilitative Services to conduct inspections pursuant to Section 403.858.

(e) Submission by any person of any false statement or representation in any application, record, report, plan or other document filed, or required to be filed by this act, or rules adopted by the Department pursuant to its lawful authority.

(f) Failure by a supplier of water to comply with any approval or condition to the approval of plans and specifications issued by the Department pursuant to this act.

(g) No owner or supplier of a public water system treatment plant shall knowingly allow or encourage any operator in his employ to violate any rule, regulation, or law related to treatment plant operation.

(2) Penalties

(a) A fine, not to exceed \$5,000 for each day in which such violation occurs or failure to comply continues, may be imposed by a court of competent jurisdiction upon any person who violates, or fails or refuses to comply with any order issued by the Department pursuant to this act.

(b) A fine, not to exceed \$5,000 for each day in which a violation occurs, may be imposed by a court of competent jurisdiction on any person who violates sections (a), (b), (d), (e) and (f) above.

Specific Authority: 403.861, F.S.

Law Implemented: 403.850, 403.864, F.S.

History: New 11-9-77.

17-22.115 Fee Schedule. A fee shall be paid to the Department of Health and Rehabilitative Services for its analysis of a water sample taken from a public water supply system for the contaminants listed below in the performance of the monitoring functions required of the Department pursuant to the Florida Safe Drinking Water Act. The tests offered by the Office of Laboratory Services and the fee which is to be paid in advance are as follows:

(1) Chemistry:

(a) Herbicides (2,4-D and 2,4-5 TP

Silvex).....\$60.00

| | |
|--|---------|
| (b) Pesticides (Endrin, Lindane, Methoxychlor, Toxaphene)..... | 30.00 |
| (c) Trihalomethanes..... | 30.00 |
| (d) Arsenic..... | 4.50 |
| (e) Barium..... | 4.50 |
| (f) Cadmium..... | 4.50 |
| (g) Chromium..... | 4.50 |
| (h) Lead..... | 4.50 |
| (i) Mercury..... | 4.50 |
| (j) Selenium..... | 4.50 |
| (k) Silver..... | 4.50 |
| (l) Turbidity..... | 2.00 |
| (m) Chloride..... | 2.00 |
| (n) Copper..... | 2.00 |
| (o) Foaming Agents..... | 2.00 |
| (p) H ₂ S..... | 2.00 |
| (q) Iron..... | 2.00 |
| (r) Manganese..... | 2.00 |
| (s) Odor..... | 2.00 |
| (t) pH..... | 2.00 |
| (u) Sulfate..... | 2.00 |
| (v) Total Dissolved Solids..... | 2.00 |
| (w) Zinc..... | 2.00 |
| (x) Total Alkalinity..... | 2.00 |
| (y) Calcium..... | 2.00 |
| (z) Magnesium..... | 2.00 |
| (za) Sodium..... | 2.00 |
| (2) Radiochemistry: | |
| (a) Gross Alpha..... | \$20.00 |
| (b) Gross Beta..... | 20.00 |
| (c) Radium 226..... | 110.00 |
| (d) Radium 228..... | 110.00 |
| (e) Iodine 131..... | 110.00 |
| (f) Strontium 89 and 90..... | 95.00 |
| (g) Tritium..... | 25.00 |
| (h) Uranium..... | 110.00 |
| (i) Other Radionuclides (photon emitters)..... | 30.00 |

Fees shall be paid to the appropriate state laboratory(ies) except when it is stated in writing by the county health department, the Department of Health and Rehabilitative Services or the Department of Environmental Regulation district, sub-district or branch office manager that a suspected imminent and substantial danger to public health requires that the analysis be performed at once.

Specific Authority: 403.861(8)(14), F.S.

Law Implemented: 403.861(14), 403.862(1)(a)(e), F.S.

History: New 9-10-79.

17-22.115(1)(b) -- 17-22.115(History)

10-1-85

PART VII
FORMS

Amended and Transferred to 17-1.1221; 2-18-79.

APPENDIX III

Safe Drinking Water Act

SAFE DRINKING WATER ACT

(Enacted by PL 93-523, December 16, 1974, 88 Stat. 1660; 42 U.S.C. 300f et seq.;
Amended by PL 94-317, June 23, 1976; PL 94-484, October 12, 1976; PL 95-190, No-
vember 16, 1977; PL 96-63, September 6, 1979; PL 96-502, December 5, 1980; PL
98-620, November 11, 1984; PL 99-339, June 19, 1986)

Short Title

Section 1. This Act may be cited as the "Safe Drinking Water Act".

Public Water Systems

Sec. 2. [Omitted]

"TITLE XIV — SAFETY OF PUBLIC WATER SYSTEMS

"PART A — DEFINITIONS

"Definitions

"Sec. 1401. For purposes of this title:

"(1) The term 'primary drinking water regulation' means a regulation which —

"(A) applies to public water systems;

"(B) specifies contaminants which, in the judgment of the Administrator, may have any adverse effect on the health of persons;

"(C) specifies for each such contaminant either —

"(i) a maximum contaminant level, if, in the judgment of the Administrator, it is economically and technologically feasible to ascertain the level of such contaminant in water in public water systems, or

"(ii) if, in the judgment of the Administrator, it is not economically or technologically feasible to so ascertain the level of such contaminant, each treatment technique known to the Administrator which leads to a reduction in the level of such

contaminant sufficient to satisfy the requirements of section 1412; and

"(D) contains criteria and procedures to assure a supply of drinking water which dependably complies with such maximum contaminant levels; including quality control and testing procedures to insure compliance with such levels and to insure proper operation and maintenance of the system, and requirements as to (i) the minimum quality of water which may be taken into the system and (ii) siting for new facilities for public water systems.

"(2) The term 'secondary drinking water regulation' means a regulation which applies to public water systems and which specifies the maximum contaminant levels which, in the judgment of the Administrator, are requisite to protect the public welfare. Such regulations may apply to any contaminant in drinking water (A) which may adversely affect the odor or appearance of such water and consequently may cause a substantial number of the persons served by the public water system providing such water to discontinue its use, or (B) which may otherwise adversely affect the public welfare. Such regulations may vary according to geographic and other circumstances.

"(3) The term 'maximum contaminant level' means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

"(4) The term 'public water system' means a system for the provision to the public of piped water for human consumption, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals. Such term includes (A) any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system, and (B) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system.

"(5) The term 'supplier of water' means any person who owns or operates a public water system.

"(6) The term 'contaminant' means any physical, chemical, biological, or radiological substance or matter in water.

"(7) The term 'Administrator' means the Administrator of the Environmental Protection Agency.

"(8) The term 'Agency' means the Environmental Protection Agency.

"(9) The term 'Council' means the National Drinking Water Advisory Council established under section 1446.

"(10) The term 'municipality' means a city, town, or other public body created by or pursuant to State law, or an Indian Tribe.

[1401(10) amended by PL 99-339]

"(11) The term 'Federal agency' means any department agency, or instrumentality of the United States.

"(12) The term 'person' means an individual, corporation, company, association, partnership, State, municipality, or Federal agency (and includes officers, employees, and agents of any corporation, company, association, State, municipality, or Federal agency).

[1401(12) amended by PL 95-190]

"(13) The term 'State' includes, in addition to the several States, only the District of Columbia, Guam, and Commonwealth of Puerto Rico, the Northern Mariana Islands, the Virgin Islands, American Samoa, and the Trust Territory of the Pacific Islands.

[1401(13) added by PL 94-317; amended by PL 94-434]

"(14) The term 'Indian Tribe' means any Indian tribe having a Federally recognized governing body carrying out substantial governmental duties and powers over any area.

[1401(14) added by PL 99-339]

*PART B — PUBLIC WATER SYSTEMS

"Coverage

"Sec. 1411. Subject to sections 1415 and 1416, national primary drinking water regulations under this part shall apply to each public water system in each State; except that such regulations shall not apply to a public water system —

"(1) which consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

"(2) which obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply;

"(3) which does not sell water to any person; and

"(4) which is not a carrier which conveys passengers in interstate commerce.

"National Drinking Water Regulations

"Sec. 1412. "(a)(1) Effective on the enactment of the Safe Drinking Water Act Amendments of 1986, each national interim or revised primary drinking water regulation promulgated under this section before such enactment shall be deemed to be a national primary drinking water regulation under subsection (b). No such regula-

tion shall be required to comply with the standards set forth in subsection (b)(4) unless such regulation is amended to establish a different maximum contaminant level after the enactment of such amendments.

"(2) After the enactment of the Safe Drinking Water Act Amendments of 1986 each recommended maximum contaminant level published before the enactment of such amendments shall be treated as a maximum contaminant level goal.

"(3) Whenever a national primary drinking water regulation is proposed under paragraph (1), (2), or (3) of subsection (b) for any contaminant, the maximum contaminant level goal for such contaminant shall be proposed simultaneously. Whenever a national primary drinking water regulation is promulgated under paragraph (1), (2), or (3) of subsection (b) for any contaminant, the maximum contaminant level goal for such contaminant shall be published simultaneously.

"(4) Paragraph (3) shall not apply to any recommended maximum contaminant level published before the enactment of the Safe Drinking Water Act Amendments of 1986.

[1412(a) revised by PL 99-339]

[1412(b)(1) — (3) revised by PL 99-339]

"(b)(1) In the case of those contaminants listed in the Advance Notice of Proposed Rulemaking published in volume 47, Federal Register, page 9352, and in volume 43, Federal Register, page 45502, the Administrator shall publish maximum contaminant level goals and promulgate national primary drinking water regulations —

"(A) not later than 12 months after the enactment of the Safe Drinking Water Act Amendments of 1986 for not less than 9 of those listed contaminants;

"(B) not later than 24 months after such enactment for not less than 40 of those listed contaminants; and

"(C) not later than 36 months after such enactment for the remainder of such listed contaminants.

"(2)(A) If the Administrator identifies a drinking water contaminant the regulation of which, in the judgment of the Administrator, is more likely to be protective of public health (taking into account the schedule for regulation under paragraph (1)) than a contaminant referred to

in paragraph (1), the Administrator may publish a maximum contaminant level goal and promulgate a national primary drinking water regulation for such identified contaminant in lieu of regulating the contaminant referred to in such paragraph. There may be no more than 7 contaminants in paragraph (1) for which substitutions may be made. Regulation of a contaminant identified under this paragraph shall be in accordance with the schedule applicable to the contaminant for which the substitution is made.

"(B) If the Administrator identifies one or more contaminants for substitution under this paragraph, the Administrator shall publish in the Federal Register not later than one year after the enactment of the Safe Drinking Water Act Amendments of 1986 a list of contaminants proposed for substitution, the contaminants referred to in paragraph (1) for which substitutions are to be made, and the basis for the judgment that regulation of such proposed substitute contaminants is more likely to be protective of public health (taking into account the schedule for regulation under such paragraph). Following a period of 60 days for public comment, the Administrator shall publish in the Federal Register a final list of contaminants to be substituted and contaminants referred to in paragraph (1) for which substitutions are to be made, together with responses to significant comments.

"(C) Any contaminant referred to in paragraph (1) for which a substitution is made, pursuant to subparagraph (A) of this paragraph, shall be included on the priority list to be published by the Administrator not later than January 1, 1988, pursuant to paragraph (3)(A).

"(D) The Administrator's decision to regulate a contaminant identified pursuant to this paragraph in lieu of a contaminant referred to in paragraph (1) shall not be subject to judicial review.

"(3)(A) The Administrator shall publish maximum contaminant level goals and promulgate national primary drinking water regulations for each contaminant (other than a contaminant referred to in paragraph (1) or (2) for which a national primary drinking water regulation was promulgated) which, in the judgment of the Administrator, may have any adverse effect on the health of persons and which is known or anticipated to occur in public

water systems. Not later than January 1, 1988, and at 3 year intervals thereafter, the Administrator shall publish a list of contaminants which are known or anticipated to occur in public water systems and which may require regulation under this Act.

“(B) For the purpose of establishing the list under subparagraph (A), the Administrator shall form an advisory working group including members from the National Toxicology Program and the Environmental Protection Agency's Offices of Drinking Water, Pesticides, Toxic Substances, Ground Water, Solid Waste and Emergency Response and any others the Administrator deems appropriate. The Administrator's consideration of priorities shall include, but not be limited to, substances referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and substances registered as pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act.

“(C) Not later than 24 months after the listing of contaminants under subparagraph (A), the Administrator shall publish proposed maximum contaminant level goals and national primary drinking water regulations for not less than 25 contaminants from the list established under subparagraph (A).

“(D) Not later than 36 months after the listing of contaminants under subparagraph (A), the Administrator shall publish a maximum contaminant goal and promulgate a national primary drinking water regulation for those contaminants for which proposed maximum contaminant level goals and proposed national primary drinking water regulations were published under subparagraph (C).

[New 1412(b)(4) — (8) added by PL 99-339]

“(4) Each maximum contaminant level goal established under this subsection shall be set at the level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety. Each national primary drinking water regulation for a contaminant for which a maximum contaminant level goal is established under this subsection shall specify a maximum level for such contaminant which is as close to the maximum contaminant level goal as is feasible.

“(5) For the purposes of this subsection, the term ‘feasible’ means feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration). For the purpose of paragraph (4), granular activated carbon is feasible for the control of synthetic organic chemicals, and any technology, treatment technique, or other means found to be the best available for the control of synthetic organic chemicals must be at least as effective in controlling synthetic organic chemicals as granular activated carbon.

“(6) Each national primary drinking water regulation which establishes a maximum contaminant level shall list the technology, treatment techniques, and other means which the Administrator finds to be feasible for purposes of meeting such maximum contaminant level, but a regulation under this paragraph shall not require that any specified technology, treatment technique, or other means be used for purposes of meeting such maximum contaminant level.

“(7)(A) The Administrator is authorized to promulgate a national primary drinking water regulation that requires the use of a treatment technique in lieu of establishing a maximum contaminant level, if the Administrator makes a finding that it is not economically or technologically feasible to ascertain the level of the contaminant. In such case, the Administrator shall identify those treatment techniques which, in the Administrator's judgment, would prevent known or anticipated adverse effects on the health of persons to the extent feasible. Such regulations shall specify each treatment technique known to the Administrator which meets the requirements of this paragraph, but the Administrator may grant a variance from any specified treatment technique in accordance with section 1415(a)(3).

“(B) Any schedule referred to in this subsection for the promulgation of a national primary drinking water regulation for any contaminant shall apply in the same manner if the regulation requires a treatment technique in lieu of establishing a maximum contaminant level.

“(C)(i) Not later than 18 months after the enactment of the Safe Drinking Water

Act Amendments of 1986, the Administrator shall propose and promulgate national primary drinking water regulations specifying criteria under which filtration (including coagulation and sedimentation as appropriate) is required as a treatment technique for public water systems supplied by surface water sources. In promulgating such rules, the Administrator shall consider the quality of source waters, protection afforded by watershed management, treatment practices (such as disinfection and length of water storage) and other factors relevant to protection of health.

“(ii) In lieu of the provisions of section 1415 the Administrator shall specify procedures by which the State determines which public water systems within its jurisdiction shall adopt filtration under the criteria of clause (i). The State may require the public water system to provide studies or other information to assist in this determination. The procedures shall provide notice and opportunity for public hearing on this determination. If the State determines that filtration is required, the State shall prescribe a schedule for compliance by the public water system with the filtration requirement. A schedule shall require compliance within 18 months of a determination made under clause (iii).

“(iii) Within 18 months from the time that the Administrator establishes the criteria and procedures under this subparagraph, a State with primary enforcement responsibility shall adopt any necessary regulations to implement this subparagraph. Within 12 months of adoption of such regulations the State shall make determinations regarding filtration for all the public water systems within its jurisdiction supplied by surface waters.

“(iv) If a State does not have primary enforcement responsibility for public water systems, the Administrator shall have the same authority to make the determination in clause (ii) in such State as the State would have under that clause. Any filtration requirement or schedule under this subparagraph shall be treated as if it were a requirement of a national primary drinking water regulation.

“(8) Not later than 36 months after the enactment of the Safe Drinking Water Act Amendments of 1986, the Adminis-

trator shall propose and promulgate national primary drinking water regulations requiring disinfection as a treatment technique for all public water systems. The Administrator shall simultaneously promulgate a rule specifying criteria that will be used by the Administrator (or delegated State authorities) to grant variances from this requirement according to the provisions of sections 1415(a)(1)(B) and 1415(a)(3). In implementing section 1442(g) the Administrator or the delegated State authority shall, where appropriate, give special consideration to providing technical assistance to small public water systems in complying with the regulations promulgated under this paragraph.

"(9) National primary drinking water regulations shall be amended whenever changes in technology, treatment techniques, and other means permit greater protection of the health of persons, but in any event such regulations shall be reviewed at least once every 3 years. Such review shall include an analysis of innovations or changes in technology, treatment techniques or other activities that have occurred over the previous 3-year period and that may provide for greater protection of the health of persons. The findings of such review shall be published in the Federal Register. If, after opportunity for public comment, the Administrator concludes that the technology, treatment techniques, or other means resulting from such innovations or changes are not feasible within the meaning of paragraph (5), an explanation of such conclusion shall be published in the Federal Register.

[Former 1412(b)(4) and (5) amended and redesignated as (9) and (10) by PL 99-339]

"(10) National primary drinking water regulations promulgated under this subsection (and amendments thereto) shall take effect eighteen months after the date of their promulgation. Regulations under subsection (a) shall be superseded by regulations under this subsection to the extent provided by the regulations under this subsection.

"(11) No national primary drinking water regulation may require the addition of any substance for preventive health care purposes unrelated to contamination of drinking water.

[Former 1412(b)(6) redesignated as (11) by PL 99-339]

"(c) The Administrator shall publish proposed national secondary drinking water regulations within 270 days after the date of enactment of this title. Within 90 days after publication of any such regulation, he shall promulgate such regulation with such modifications as he deems appropriate. Regulations under this subsection may be amended from time to time.

"(d) Regulations under this section shall be prescribed in accordance with section 553 of title 5, United States Code (relating to rulemaking), except that the Administrator shall provide opportunity for public hearing prior to promulgation of such regulations. In proposing and promulgating regulations under this section, the Administrator shall consult with the Secretary and the National Drinking Water Advisory Council.

"(e) The Administrator shall request comments from the Science Advisory Board (established under the Environmental Research, Development, and Demonstration Act of 1978) prior to proposal of a maximum contaminant level goal and national primary drinking water regulation. The Board shall respond, as it deems appropriate, within the time period applicable for promulgation of the national primary drinking water standard concerned. This subsection shall, under no circumstances, be used to delay final promulgation of any national primary drinking water standard.

[1412(e) revised by PL 99-339]

"State Primary Enforcement Responsibility

"Sec. 1413. (a) For purposes of this title, a State has primary enforcement responsibility for public water systems during any period for which the Administrator determines (pursuant to regulations prescribed under subsection (b) that such State —

"(1) has adopted drinking water regulations which are no less stringent than the national primary drinking water regulations in effect under sections 1412(a) and 1412(b);

[1413(a)(1) revised by PL 99-339]

"(2) has adopted and is implementing adequate procedures for the enforcement of such State regulations, including conducting such monitoring and making such inspections as the Administrator may require by regulation;

"(3) will keep such records and make such reports with respect to its activities under paragraphs (1) and (2) as the Administrator may require by regulation;

"(4) if it permits variances or exemptions, or both, from the requirements of its drinking water regulations which meet the requirements of paragraph (1), permits such variances and exemptions under conditions and in a manner which is not less stringent than the conditions under, and the manner in, which variances and exemptions may be granted under sections 1415 and 1416; and

"(5) has adopted and can implement an adequate plan for the provision of safe drinking water under emergency circumstances.

"(b)(1) The Administrator shall, by regulation (proposed within 180 days of the date of the enactment of this title), prescribe the manner in which a State may apply to the Administrator for a determination that the requirements of paragraphs (1), (2), (3), and (4) of subsection (a) are satisfied with respect to the State, the manner in which the determination is made, the period for which the determination will be effective, and the manner in which the Administrator may determine that such requirements are no longer met. Such regulations shall require that before a determination of the Administrator that such requirements are met are no longer met with respect to a State may become effective, the Administrator shall notify such State of the determination and the reasons therefor and shall provide an opportunity for public hearing on the determination. Such regulations shall be promulgated (with such modifications as the Administrator deems appropriate) within 90 days of the publication of the proposed regulations in the Federal Register. The Administrator shall promptly notify in writing the chief executive officer of each State of the promulgation of regulations under this paragraph. Such notice shall contain a copy of the regulations and shall specify a State's authority under this title when it is determined to have primary enforcement responsibility for public water systems.

"(2) When an application is submitted in accordance with the Administrator's regulations under paragraph (1), the Administrator shall within 90 days of the date on which such application is submit-

ted (A) make the determination applied for, or (B) deny the application and notify the applicant in writing of the reasons for his denial.

Enforcement of Drinking Water Regulations

[1414 head amended by PL 99-339]

Sec. 1414. (a)(1)(A) Whenever the Administrator finds during a period during which a State has primary enforcement responsibility for public water systems (within the meaning of section 1413(a)) that any public water system —

“(i) for which a variance under section 1415 or an exemption under section 1416 is not in effect, does not comply with any national primary drinking water regulation in effect under section 1412, or

“(ii) for which a variance under section 1415 or an exemption under section 1416 is in effect, does not comply with any schedule, or other requirement imposed pursuant thereto, he shall so notify the State and such public water system and provide such advice and technical assistance to such State and public water system as may be appropriate to bring the system into compliance with such regulation or requirement by the earliest feasible time.

[1414(a)(1)(A) revised by PL 99-339]

“(B) If, beyond the thirtieth day after the Administrator's notification under subparagraph (A), the State has not commenced appropriate enforcement action, the Administrator shall issue an order under subsection (g) requiring the public water system to comply with such regulation or requirement or the Administrator shall commence a civil action under subsection (b).

[1414(a)(1)(B) revised by PL 99-339]

“(2) Whenever, on the basis of information available to him, the Administrator finds during a period during which a State does not have primary enforcement responsibility for public water systems that a public water system in such State —

“(A) for which a variance under section 1415(a)(2) or an exemption under section 1416(f) is not in effect, does not comply with any national primary drinking water regulation in effect under section 1412, or

“(B) for which a variance under section 1415(a)(2) or an exemption under section 1416(f) is in effect, does not comply with

any schedule or other requirement imposed pursuant thereto.

The Administrator shall issue an order under subsection (g) requiring the public water system to comply with such regulation or requirement or the Administrator shall commence a civil action under subsection (b).

[1414(a)(2) amended by PL 99-339]

“(b) The Administrator may bring a civil action in the appropriate United States district court to require compliance with a national primary drinking water regulation, with an order issued under subsection (g), or with any schedule or other requirement imposed pursuant to a variance or exemption granted under section 1415 or 1416 if —

“(1) authorized under paragraph (1) or (2) of subsection (a), or

“(2) if requested by (A) the chief executive officer of the State in which is located the public water system which is not in compliance with such regulation or requirement, or (B) the agency of such State which has jurisdiction over compliance by public water systems in the State with national primary drinking water regulations or State drinking water regulations.

The court may enter, in an action brought under this subsection, such judgment as protection of public health may require, taking into consideration the time necessary to comply and the availability of alternative water supplies; and, if the court determines that there has been a violation of the regulation or schedule or other requirement with respect which the action was brought, the court may, taking into account the seriousness of the violation, the population at risk, and other appropriate factors, impose on the violator a civil penalty of not to exceed \$25,000 for each day in which such violation occurs.

[1414(b) amended by PL 99-339]

“(c) Each owner or operator of a public water system shall give notice to the persons served by it —

“(1) of any failure on the part of the public water system to —

“(A) comply with an applicable maximum contaminant level or treatment technique requirement of, or a testing procedure prescribed by, a national primary drinking water regulation, or

“(B) perform monitoring required by section 1445(a), and

“(2) if the public water system is subject to a variance granted under section 1415(a)(1)(A) or 1415(a)(2) for an inability to meet a maximum contaminant level requirement or is subject to an exemption granted under section 1416, of —

“(A) the existence of such variance or exemption, and

“(B) any failure to comply with the requirements of any schedule prescribed pursuant to the variance or exemption.

The Administrator shall by regulation prescribe the form, manner, and frequency for giving notice under this subsection. Within 15 months after the enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall amend such regulations to provide for different types and frequencies of notice based on the differences between violations which are intermittent or infrequent and violations which are continuous or frequent. Such regulations shall also take into account the seriousness of any potential adverse health effects which may be involved. Notice of any violation of a maximum contaminant level or any other violation designated by the Administrator as posing a serious potential adverse health effect shall be given as soon as possible, but in no case later than 14 days after the violation. Notice of a continuous violation of a regulation other than a maximum contaminant level shall be given no less frequently than every 3 months. Notice of violations judged to be less serious shall be given no less frequently than annually. The Administrator shall specify the types of notice to be used to provide information as promptly and effectively as possible taking into account both the seriousness of any potential adverse health effects and the likelihood of reaching all affected persons. Notification of violations shall include notice by general circulation newspaper serving the area and, whenever appropriate, shall also include a press release to electronic media and individual mailings. Notice under this subsection shall provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the steps that the system is taking to correct such violation, and the necessity for seeking alternative water supplies, if any, until the violation is corrected. Until such amended regulations are promulgated, the regulations in effect on the date of the enact-

ment of the Safe Drinking Water Act Amendments of 1986 shall remain in effect. The Administrator may also require the owner or operator of a public water system to give notice to the persons served by it of contaminant levels of any unregulated contaminant required to be monitored under section 1445(a). Any person who violates this subsection or regulations issued under this subsection shall be subject to a civil penalty of not to exceed \$25,000.

[1414(c) amended by PL 95-190; PL 99-339]

"(d) Whenever, on the basis of information available to him, the Administrator finds that within a reasonable time after national secondary drinking water regulations have been promulgated, one or more public water systems in a State do not comply with such secondary regulations, and that such noncompliance appears to result from a failure of such State to take reasonable action to assure that public water systems throughout such State meet such secondary regulations, he shall so notify the State.

"(e) Nothing in this title shall diminish any authority of a State or political subdivision to adopt or enforce any law or regulation respecting drinking water regulations or public water systems, but no such law or regulation shall relieve any person of any requirement otherwise applicable under this title.

"(f) If the Administrator makes a finding of noncompliance (described in subparagraph (A) or (B) of subsection (a)(1)) with respect to a public water system in a State which has primary enforcement responsibility, the Administrator may, for the purpose of assisting that State in carrying out such responsibility and upon the petition of such State or public water system or persons served by such system, hold, after appropriate notice, public hearings for the purpose of gathering information from technical or other experts, Federal, State, or other public officials, representatives of such public water system, persons served by such system, and other interested persons on —

"(1) the ways in which such system can within the earliest feasible time be brought into compliance with the regulation or requirement with respect to which such finding was made, and

"(2) the means for the maximum feasible protection of the public health during

any period in which such system is not in compliance with a national primary drinking water regulation or requirement applicable to a variance or exemption.

On the basis of such hearings the Administrator shall issue recommendations which shall be sent to such State and public water system and shall be made available to the public and communications media.

[1414(g) added by PL 99-339]

"(g)(1) In any case in which the Administrator is authorized to bring a civil action under this section or under section 1445 with respect to any regulation, schedule, or other requirement, the Administrator also may issue an order to require compliance with such regulation, schedule, or other requirement.

"(2) An order issued under this subsection shall not take effect until after notice and opportunity for public hearing and, in the case of a State having primary enforcement responsibility for public water systems in that State, until after the Administrator has provided the State with an opportunity to confer with the Administrator regarding the proposed order. A copy of any order proposed to be issued under this subsection shall be sent to the appropriate State agency of the State involved if the State has primary enforcement responsibility for public water systems in that State. Any order issued under this subsection shall state with reasonable specificity the nature of the violation. In any case in which an order under this subsection is issued to a corporation, a copy of such order shall be issued to appropriate corporate officers.

"(3)(A) Any person who violates, or fails or refuses to comply with, an order under this subsection shall be liable to the United States for a civil penalty of not more than \$25,000 per day of violation.

"(B) Whenever any civil penalty sought by the Administrator under this paragraph does not exceed a total of \$5,000, the penalty shall be assessed by the Administrator after notice and opportunity for a hearing on the record in accordance with section 554 of title 5 of the United States Code.

"(C) Whenever any civil penalty sought by the Administrator under this paragraph exceeds \$5,000, the penalty shall be assessed by a civil action brought by the Administrator in the appropriate United States district court (as determined under

the provisions of title 28 of the United States Code).

"(D) If any person fails to pay an assessment of a civil penalty after it has become a final and unappealable order, or after the appropriate court of appeals has entered final judgment in favor of the Administrator, the Attorney General shall recover the amount for which such person is liable in any appropriate district court of the United States. In any such action, the validity and appropriateness of the final order imposing the civil penalty shall not be subject to review.

"Variances

[Note: PL 96-502 again added the head "Variances" to this section]

"Sec. 1415. (a) Notwithstanding any other provision of this part, variances from national primary drinking water regulations may be granted as follows:

"(1)(A) A State which has primary enforcement responsibility for public water systems may grant one or more variances from an applicable national primary drinking water regulation to one or more public water systems within its jurisdiction which, because of characteristics of the raw water sources which are reasonably available to the systems, cannot meet the requirements respecting the maximum contaminant levels of such drinking water regulation. A variance may only be issued to system after the system's application of the best technology, treatment techniques, or other means, which the Administrator finds are available (taking costs into consideration). The Administrator shall propose and promulgate his finding of the best available technology, treatment techniques or other means available for each contaminant for purposes of this subsection at the time he proposes and promulgates a maximum contaminant level for each such contaminant. The Administrator's finding of best available technology, treatment techniques or other means for purposes of this subsection may vary depending on the number of persons served by the system or for other physical conditions related to engineering feasibility and costs of compliance with maximum contaminant levels as considered appropriate by the Administrator. Before a State may grant a variance under this subparagraph, the State must find that the variance will not result in an unreasonable risk to health. If a State grants a public water

system a variance under this subparagraph, the State shall prescribe at the time the variance is granted, a schedule for —

“(i) compliance (including increments of progress) by the public water system with each contaminant level requirement with respect to which the variance was granted, and

“(ii) implementation by the public water system of such additional control measures as the State may require for each contaminant, subject to such contaminant level requirement, during the period ending on the date compliance with such requirement is required.

Before a schedule prescribed by a State pursuant to this subparagraph may take effect, the State shall provide notice and opportunity for a public hearing on the schedule. A notice given pursuant to the preceding sentence may cover the prescribing of more than one such schedule and a hearing held pursuant to such notice shall include each of the schedules covered by the notice. A schedule prescribed pursuant to this subparagraph for a public water system granted a variance shall require compliance by the system with each contaminant level requirement with respect to which the variance was granted as expeditiously as practicable (as the State may reasonably determine).

[1415(a)(1)(A) amended by PL 99-339]

“(B) A State which has primary enforcement responsibility for public water systems may grant to one or more public water systems within its jurisdiction one or more variances from any provision of a national primary drinking water regulation which requires the use of a specified treatment technique with respect to a contaminant if the public water system applying for the variance demonstrates to the satisfaction of the State that such treatment technique is not necessary to protect the health of persons because of the nature of the raw water source of such system. A variance granted under this subparagraph shall be conditioned on such monitoring and other requirements as the Administrator may prescribe.

“(C) Before a variance proposed to be granted by a State under subparagraph (A) or (B) may take effect, such State shall provide notice and opportunity for public hearing on the proposed variance. A notice given pursuant to the preceding sentence may cover the granting of more than one variance and a hearing held pur-

suant to such notice shall include each of the variances covered by the notice. The State shall promptly notify the Administrator of all variances granted by it. Such notification shall contain the reason for the variance (and in the case of a variance under subparagraph (A), the basis for the finding required by that subparagraph before the granting of the variance) and documentation of the need for the variance.

“(D) Each public water system's variance granted by a State under subparagraph (A) shall be conditioned by the State upon compliance by the public water system with the schedule prescribed by the State pursuant to that subparagraph. The requirements of each schedule prescribed by a State pursuant to that subparagraph shall be enforceable by the State under its laws. Any requirement of a schedule on which a variance granted under that subparagraph is conditioned may be enforced under section 1414 as if such requirement was part of a national primary drinking water regulation.

“(E) Each schedule prescribed by a State pursuant to subparagraph (A) shall be deemed approved by the Administrator unless the variance for which it was prescribed is revoked by the Administrator under subparagraph (G) or the schedule is revised by the Administrator under such subparagraph.

“(F) Not later than 18 months after the effective date of the interim national primary drinking water regulations the Administrator shall complete a comprehensive review of the variances granted under subparagraph (A) (and schedules prescribed pursuant thereto) and under subparagraph (B) by the States during the one-year period beginning on such effective date. The Administrator shall conduct such subsequent reviews of variances and schedules as he deems necessary to carry out the purposes of this title, but each subsequent review shall be completed within each 3-year period following the completion of the first review under this subparagraph. Before conducting any review under this subparagraph, the Administrator shall publish notice of the proposed review in the Federal Register. Such notice shall (i) provide information respecting the location of data and other information respecting the variances to be reviewed (including data and other information concerning new scientific matters

bearing on such variances), and (ii) advise of the opportunity to submit comments on the variances reviewed and on the need for continuing them. Upon completion of any such review, the Administrator shall publish in the Federal Register the results of his review together with findings responsive to comments submitted in connection with such review.

“(G)(i) If the Administrator finds that a State has, in a substantial number of instances, abused its discretion in granting variances under subparagraph (A) or (B) or that in a substantial number of cases the State has failed to prescribe schedules in accordance with subparagraph (A), the Administrator shall notify the State of his findings. In determining if a State has abused its discretion in granting variances in a substantial number of instances, the Administrator shall consider the number of persons who are affected by the variances and if the requirements applicable to the granting of the variances were complied with. A notice under this clause shall—

“(I) identify each public water system with respect to which the finding was made,

“(II) specify the reasons for the finding, and

“(III) as appropriate, propose revocations of specific variances or propose revised schedules or other requirements for specific public water systems granted variances, or both.

“(ii) The Administrator shall provide reasonable notice and public hearing on the provisions of each notice given pursuant to clause (i) of this subparagraph. After a hearing on a notice pursuant to such clause, the Administrator shall (I) rescind the finding for which the notice was given and promptly notify the State of such rescission, or (II) promulgate (with such modifications as he deems appropriate) such variance revocations and revised schedules or other requirements proposed in such notice as he deems appropriate. Not later than 180 days after the date a notice is given pursuant to clause (i) of this subparagraph, the Administrator shall complete the hearing on the notice and take the action required by the preceding sentence.

“(iii) If a State is notified under clause (i) of this subparagraph of a finding of the Administrator made with respect to a variance granted a public water system within

that State or to a schedule or other requirement for a variance and if, before a revocation of such variance or a revision of such schedule or other requirement promulgated by the Administrator takes effect, the State takes corrective action with respect to such variance or schedule or other requirement which the Administrator determines makes his finding inapplicable to such variance or schedule or other requirement, the Administrator shall rescind the application of his finding to that variance or schedule or other requirement. No variance revocation or revised schedule or other requirement may take effect before the expiration of 90 days following the date of the notice in which the revocation or revised schedule or other requirement was proposed.

"(2) If a State does not have primary enforcement responsibility for public water systems, the Administrator shall have the same authority to grant variances in such State as the State would have under paragraph (1) if it had primary enforcement responsibility.

"(3) The Administrator may grant a variance from any treatment technique requirement of a national primary drinking water regulation upon a showing by any person that an alternative treatment technique not included in such requirement is at least as efficient in lowering the level of the contaminant with respect to which such requirement was prescribed. A variance under this paragraph shall be conditioned on the use of the alternative treatment technique which is the basis of the variance.

"(b) Any schedule or other requirement on which a variance granted under paragraph (1)(B) or (2) of subsection (a) is conditioned may be enforced under section 1414 as if such schedule or other requirement was part of a national primary drinking water regulation.

"(c) If an application for a variance under subsection (a) is made, the State receiving the application or the Administrator, as the case may be, shall act upon such application within a reasonable period (as determined under regulations prescribed by the Administrator) after the date of its submission.

"(d) For purposes of this section, the term 'treatment technique requirement' means requirement in a national primary drinking water regulation which specifies for a contaminant (in accordance with

section 1401 (1)(C)(ii)) each treatment technique known to the Administrator which leads to a reduction in the level of such contaminant sufficient to satisfy the requirements of section 1412(b)(3).

"Exemptions

"Sec. 1416. (a) A State which has primary enforcement responsibility may exempt any public water system within the State's jurisdiction from any requirement respecting a maximum contaminant level or any treatment technique requirement, or from both, of an applicable national primary drinking water regulation upon a finding that —

"(1) due to compelling factors (which may include economic factors), the public water system is unable to comply with such contaminant level or treatment technique requirement,

"(2) the public water system was in operation on the effective date of such contaminant level or treatment technique requirement, or, for a system that was not in operation by that date, only if no reasonable alternative source of drinking water is available to such new system, and [1416(a)(2) amended by PL 96-502]

"(3) the granting of the exemption will not result in an unreasonable risk to health.

"(b)(1) If a State grants a public water system an exemption under subsection (a), the State shall prescribe, at the time the exemption is granted, a schedule for —

"(A) compliance (including increments of progress) by the public water system with each contaminant level requirement and treatment technique requirement with respect to which the exemption was granted, and

"(B) implementation by the public water system of such control measures as the State may require for each contaminant, subject to such contaminant level requirement or treatment technique requirement, during the period ending on the date compliance with such requirement is required.

Before a schedule prescribed by a State pursuant to this subsection may take effect, the State shall provide notice and opportunity for a public hearing on the schedule. A notice given pursuant to the preceding sentence may cover the prescribing of more than one such schedule and a hearing held pursuant to such notice

shall include each of the schedules covered by the notice.

[1416(b)(1) amended by PL 95-190; PL 99-339]

"(2)(A) A schedule prescribed pursuant to this subsection for a public water system granted an exemption under subsection (a) shall require compliance by the system with each contaminant level and treatment technique requirement with respect to which the exemption was granted as expeditiously as practicable (as the State may reasonably determine) but (except as provided in subparagraph (B)) —

"(i) in the case of an exemption granted with respect to a contaminant level or treatment technique requirement prescribed by the national primary drinking water regulations promulgated under section 1412(a), not later than 12 months after enactment of the Safe Drinking Water Act Amendments of 1986; and [1416(b)(2)(A)(i) amended by PL 96-502; PL 99-339].

"(ii) in the case of an exemption granted with respect to a contaminant level or treatment technique requirement prescribed by national primary drinking water regulations, other than a regulation referred to in section 1412(a), 12 months after the date of the issuance of the exemption.

"(B) The final date for compliance provided in any schedule in the case of any exemption may be extended by the State (in the case of a State which has primary enforcement responsibility) or by the Administrator (in any other case) for a period not to exceed 3 years after the date of the issuance of the exemption if the public water system establishes that —

"(i) the system cannot meet the standard without capital improvements which cannot be completed within the period of such exemption;

"(ii) in the case of a system which needs financial assistance for the necessary improvements, the system has entered into an agreement to obtain such financial assistance; or

"(iii) the system has entered into an enforceable agreement to become a part of a regional public water system; and the system is taking all practicable steps to meet the standard.

[1416(b)(2)(B) amended by PL 96-502; revised by PL 99-339]

"(C) In the case of a system which does not serve more than 500 service connections and which needs financial assistance for the necessary improvements, an exemption granted under clause (i) or (ii) of subparagraph (B) may be renewed for one or more additional 2-year periods if the system establishes that it is taking all practicable steps to meet the requirements of subparagraph (B).

[1416(b)(2)(C) added by PL 99-339]

"(3) Each public water system's exemption granted by a State under subsection (a) shall be conditioned by the State upon compliance by the public water system with the schedule prescribed by the State pursuant to this subsection. The requirements of each schedule prescribed by a State pursuant to this subsection shall be enforceable by the State under its laws. Any requirement of a schedule on which an exemption granted under this section is conditioned may be enforced under section 1414 as if such requirement was part of a national primary drinking water regulation.

"(4) Each schedule prescribed by a State pursuant to this subsection shall be deemed approved by the Administrator unless the exemption for which it was prescribed is revoked by the Administrator under subsection (d)(2) or the schedule is revised by the Administrator under such subsection.

"(c) Each State which grants an exemption under subsection (a) shall promptly notify the Administrator of the granting of such exemption. Such notification shall contain the reasons for the exemption (including the basis of the finding required by subsection (a)(3) before the exemption may be granted) and document the need for the exemption.

"(d)(1) Not later than 18 months after the effective date of the interim national primary drinking water regulations the Administrator shall complete a comprehensive review of the exemptions granted (and schedules prescribed pursuant thereto) by the States during the one-year period beginning on such effective date. The Administrator shall conduct such subsequent reviews of exemptions and schedules as he deems necessary to carry out the purposes of this title, but each subsequent review shall be completed within each 3-year period following the completion of the first review under this subparagraph.

Before conducting any review under this subparagraph, the Administrator shall publish notice of the proposed review in the Federal Register. Such notice shall (A) provide information respecting the location of data and other information respecting the exemptions to be reviewed (including data and other information concerning new scientific matters bearing on such exemptions), and (B) advise of the opportunity to submit comments on the exemptions reviewed and on the need for continuing them. Upon completion of any such review, the Administrator shall publish in the Federal Register the results of his review together with findings responsive to comments submitted in connection with such review.

"(2)(A) If the Administrator finds that a State has, in a substantial number of instances, abused its discretion in granting exemptions under subsection (a) or failed to prescribe schedules in accordance with subsection (b), the Administrator shall notify the State of his finding. In determining if a State has abused its discretion in granting exemptions in a substantial number of instances, the Administrator shall consider the number of persons who are affected by the exemptions and if the requirements applicable to the granting of the exemptions were complied with. A notice under this subparagraph shall —

"(i) identify each exempt public water system with respect to which the finding was made,

"(ii) specify the reasons for the finding, and

"(iii) as appropriate, propose revocations of specific exemptions or propose revised schedules for specific exempt public water systems, or both.

"(B) The Administrator shall provide reasonable notice and public hearing on the provisions of each notice given pursuant to subparagraph (A). After a hearing on a notice pursuant to subparagraph (A), the Administrator shall (i) rescind the finding for which the notice was given and promptly notify the State of such rescission, or (ii) promulgate (with such modifications as he deems appropriate) such exemption revocations and revised schedules proposed in such notice as he deems appropriate. Not later than 180 days after the date a notice is given pursuant to subparagraph (A), the Administrator shall complete the hearing on the notice

and take the action required by the preceding sentence.

"(C) If a State is notified under subparagraph (A) of a finding of the Administrator made with respect to an exemption granted a public water system within that State or to a schedule prescribed pursuant to such an exemption and if before a revocation of such exemption or a revision of such schedule promulgated by the Administrator takes effect the State takes corrective action with respect to such exemption or schedule which the Administrator determines makes his finding inapplicable to such exemption or schedule, the Administrator shall rescind the application of his finding to that exemption or schedule. No exemption revocation or revised schedule may take effect before the expiration of 90 days following the date of the notice in which the revocation or revised schedule was proposed.

"(e) For purposes of this section, the term 'treatment technique requirement' means a requirement in a national primary drinking water regulation which specifies for a contaminant (in accordance with section 1401(1)(C)(ii)) each treatment technique known to the Administrator which leads to a reduction in the level of such contaminant sufficient to satisfy the requirements of section 1412(b).

[1416(e) amended by PL 99-339]

"(f) If a State does not have primary enforcement responsibility for public water systems, the Administrator shall have the same authority to exempt public water systems in such state from maximum contaminant level requirements and treatment technique requirements under the same conditions and in the same manner as the State would be authorized to grant exemptions under this section if it had primary enforcement responsibility.

"(g) If an application for an exemption under this section is made, the State receiving the application or the Administrator, as the case may be, shall act upon such application within a reasonable period (as determined under regulations prescribed by the Administrator) after the date of its submission.

"Sec. 1417. Prohibition On Use of Lead Pipes, Solder, and Flux

"(a) IN GENERAL. —

"(1) PROHIBITION. — Any pipe, solder, or flux, which is used after the enact-

ment of the Safe Drinking Water Act Amendments of 1986, in the installation or repair of —

“(A) any public water system, or

“(B) any plumbing in a residential or nonresidential facility providing water for human consumption which is connected to a public water system, shall be lead free (within the meaning of subsection (d)). This paragraph shall not apply to leaded joints necessary for the repair of cast iron pipes.

“(2) PUBLIC NOTICE REQUIREMENTS.—

“(A) IN GENERAL. — Each public water system shall identify and provide notice to persons that may be affected by lead contamination of their drinking water where such contamination results from either or both of the following:

“(i) The lead content in the construction materials of the public water distribution system.

“(ii) Corrosivity of the water supply sufficient to cause leaching of lead.

The notice shall be provided in such manner and form as may be reasonably required by the Administrator. Notice under this paragraph shall be provided notwithstanding the absence of a violation of any national drinking water standard.

“(B) CONTENTS OF NOTICE. — Notice under this paragraph shall provide a clear and readily understandable explanation of —

“(i) the potential sources of lead in the drinking water.

“(ii) potential adverse health effects.

“(iii) reasonably available methods of mitigating known or potential lead content in drinking water.

“(iv) any steps the system is taking to mitigate lead content in drinking water, and

“(v) the necessity for seeking alternative water supplies, if any.

“(b) STATE ENFORCEMENT. —

“(1) ENFORCEMENT OF PROHIBITION. — The requirements of subsection (a)(1) shall be enforced in all States effective 24 months after the enactment of this section. States shall enforce such requirements through State or local plumbing codes, or such other means of enforcement as the State may determine to be appropriate.

“(2) ENFORCEMENT OF PUBLIC NOTICE REQUIREMENTS. — The requirements of subsection (a)(2) shall ap-

ply in all States effective 24 months after the enactment of this section.

“(c) PENALTIES. — If the Administrator determines that a State is not enforcing the requirements of subsection (a) as required pursuant to subsection (b), the Administrator may withhold up to 5 percent of Federal funds available to that State for State program grants under section 1443(a).

“(d) DEFINITION OF LEAD FREE. — For purposes of this section, the term ‘lead free’—

“(1) when used with respect to solders and flux refers to solders and flux containing not more than 0.2 percent lead, and

“(2) when used with respect to pipes and pipe fittings refers to pipes and pipe fittings containing not more than 8.0 percent lead.

[Editor's note: Section 109(b) and (c) of PL 99-339 provides the following concerning responsibilities of EPA, HUD, and the VA:

“(b) NOTIFICATION TO STATES.— The Administrator of the Environmental Protection Agency shall notify all States with respect to the requirements of section 1417 of the Public Health Service Act within 90 days after the enactment of this Act.

(c) BAN ON LEAD WATER PIPES, SOLDER, AND FLUX IN VA AND HUD INSURED OR ASSISTED PROPERTY. —

(1) PROHIBITION — The Secretary of Housing and Urban Development and the Administrator of the Veterans' Administration may not insure or guarantee a mortgage or furnish assistance with respect to newly constructed residential property which contains a potable water system unless such system uses only lead free pipe, solder, and flux.

(2) DEFINITION OF LEAD FREE.— For purposes of paragraph (1) the term ‘lead free’ —

(A) when used with respect to solders and flux refers to solders and flux containing not more than 0.2 percent lead, and

(B) when used with respect to pipes and pipe fittings refers to pipes and pipe fittings containing not more than 8.0 percent lead.

(3) EFFECTIVE DATE. — Paragraph (1) shall become effective 24 months after the enactment of this Act.”]

“PART C — PROTECTION OF UNDERGROUND SOURCES OF DRINKING WATER.

“Regulations For State Programs

“Sec. 1421. (a)(1) The Administrator shall publish proposed regulations for State underground injection control programs within 180 days after the date of enactment of this title. Within 180 days after publication of such proposed regulations, he shall promulgate such regulations with such modifications as he deems appropriate. Any regulation under this subsection may be amended from time to time.

“(2) Any regulation under this section shall be proposed and promulgated in accordance with section 553 of title 5, United States Code (relating to rulemaking), except that the Administrator shall provide opportunity for public hearing prior to promulgation of such regulations. In proposing and promulgating regulations under this section, the Administrator shall consult with the Secretary, the National Drinking Water Advisory Council, and other appropriate Federal entities and with interested State entities.

“(b)(1) Regulations under subsection (a) for State underground injection programs shall contain minimum requirements for effective programs to prevent underground injection which endangers drinking water sources within the meaning of subsection (d)(2). Such regulations shall require that a State program, in order to be approved under section 1422—

“(A) shall prohibit, effective on the date on which the applicable underground injection control program takes effect, any underground injection in such State which is not authorized by a permit issued by the State (except that the regulations may permit a State to authorize underground injection by rule);

[1421(b)(1)(A) amended by PL 96-302]

“(B) shall require (i) in the case of a program which provides for authorization of underground injection by permit, that the applicant for the permit to inject must satisfy the State that the underground injection will not endanger drinking water sources, and (ii) in the case of program which provides for such an authorization by rule, that no rule may be promulgated which authorizes any underground injection which endangers drinking water sources;

"(C) shall include inspection, monitoring, recordkeeping, and reporting requirements; and

"(D) shall apply (i) as prescribed by section 1447(b), to underground injections by Federal agencies, and (ii) to underground injections by any other person whether or not occurring on property owned or leased by the United States.

"(2) Regulations of the Administrator under this section for State underground injection control programs may not prescribe requirements which interfere with or impede —

"(A) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production or natural gas storage operations, or

[1421(b)(2)(A) amended by PL 99-339]

"(B) any underground injection for the secondary or tertiary recovery of oil or natural gas, unless such requirements are essential to assure that underground sources of drinking water will not be endangered by such injection.

"(3)(A) The regulations of the Administrator under this section shall permit or provide for consideration of varying geologic, hydrological, or historical conditions in different States and in different areas within a State.

[1421(b)(3) added by PL 95-190]

"(B)(i) In prescribing regulations under this section the Administrator shall, to the extent feasible, avoid promulgation of requirements which would unnecessarily disrupt State underground injection control programs which are in effect and being enforced in a substantial number of States.

"(ii) For the purpose of this subparagraph, a regulation prescribed by the Administrator under this section shall be deemed to disrupt a State underground injection control program only if it would be infeasible to comply with both such regulation and the State underground injection control program.

"(iii) For the purpose of this subparagraph, a regulation prescribed by the Administrator under this section shall be deemed unnecessary only if, without such regulation, underground sources of drinking water will not be endangered by any underground injection.

"(C) Nothing in this section shall be construed to alter or affect the duty to

assure that underground sources of drinking water will not be endangered by any underground injection.

"(c)(1) The Administrator may, upon application of the Governor of a State which authorizes underground injection by means of permits, authorize such State to issue (without regard to subsection (b)(1)(B)(i)) temporary permits for underground injection which may be effective until the expiration of four years after the date of enactment of this title, if —

"(A) the Administrator finds that the State has demonstrated that it is unable and could not reasonably have been able to process all permit applications within the time available;

"(B) the Administrator determines the adverse effect on the environment of such temporary permits is not unwarranted;

"(C) such temporary permits will be issued only with respect to injection wells in operation on the date on which such State's permit program approved under this part first takes effect and for which there was inadequate time to process its permit application; and

"(D) the Administrator determines the temporary permits require the use of adequate safeguards established by rules adopted by him.

"(2) The Administrator may, upon application of the Governor of a State which authorizes underground injection by means of permits, authorize such State to issue (without regard to subsection (b)(1)(B)(i)), but after reasonable notice and hearing, one or more temporary permits each of which is applicable to a particular injection well and to the underground injection of a particular fluid and which may be effective until the expiration of four years after the date of enactment of this title, if the State finds, on the record of such hearing —

"(A) that technology (or other means) to permit safe injection of the fluid in accordance with the applicable underground injection control program is not generally available (taking costs into consideration);

"(B) that injection of the fluid would be less harmful to health than the use of other available means of disposing of waste or producing the desired product; and

"(C) that available technology or other means have been employed (and will be employed) to reduce the volume and toxic-

ity of the fluid and to minimize the potentially adverse effect of the injection on the public health.

"(d) For purposes of this part:

"(1) The term 'underground injection' means the subsurface emplacement of fluids by well injection. Such term does not include the underground injection of natural gas for purposes of storage.

[1421(d)(1) amended by PL 96-502]

"(2) Underground injection endangers drinking water sources if such injection may result in the presence in underground water which supplies or can reasonably be expected to supply any public water system of any contaminant, and if the presence of such contaminant may result in such system's not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons.

"State Primary Enforcement Responsibility

"Sec. 1422. (a) Within 180 days after the date of enactment of this title, the Administrator shall list in the Federal Register each State for which in his judgment a State underground injection control program may be necessary to assure that underground injection will not endanger drinking water sources. Such list may be amended from time to time.

"(b)(1)(A) Each State listed under subsection (a) shall within 270 days after the date of promulgation of any regulation under section 1421 (or, if later, within 270 days after such State is first listed under subsection (a)) submit to the Administrator an application which contains a showing satisfactory to the Administrator that the State —

"(i) has adopted after reasonable notice and public hearings, and will implement, an underground injection control program which meets the requirements of regulations in effect under section 1421; and

"(ii) will keep such records and make such report with respect to its activities under its underground injection control program as the Administrator may require by regulation.

The Administrator may, for good cause, extend the date for submission of an application by any State under this subparagraph for a period not to exceed an additional 270 days.

[1422(b)(1)(A) amended by PL 95-190]

"(B) Within 270 days of any amendment of a regulation under section 1421 revising or adding any requirement respecting State underground injection control programs, each State listed under subsection (a) shall submit (in such form and manner as the Administrator may require) a notice to the Administrator containing a showing satisfactory to him that the State underground injection control program meets the revised or added requirement.

"(2) Within ninety days after the State's application under paragraph (1)(A) or notice under paragraph (1)(B) and after reasonable opportunity for presentation of views, the Administrator shall by rule either approve, disapprove, or approve in part and disapprove in part, the State's underground injection control program.

"(3) If the Administrator approves the State's program under paragraph (2), the State shall have primary enforcement responsibility for underground water sources until such time as the Administrator determines, by rule, that such State no longer meets the requirements of clause (i) or (ii) of paragraph (1)(A) of this subsection.

"(4) Before promulgating any rule under paragraph (2) or (3) of this subsection, the Administrator shall provide opportunity for public hearing respecting such rule.

"(c) If the Administrator disapproves a State's program (or part thereof) under subsection (b)(2), if the Administrator determines under subsection (b)(3) that a State no longer meets the requirements of clause (i) or (ii) of subsection (b)(1)(A), or if a State fails to submit an application or notice before the date of expiration of the period specified in subsection (b)(1), the Administrator shall by regulation within 90 days after the date of such disapproval, determination, or expiration (as the case may be) prescribe (and may from time to time by regulation revise) a program applicable to such State meeting the requirements of section 1421(b). Such program may not include requirements which interfere with or impede—

"(1) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production or natural gas storage operations, or

[1422(c)(1) amended by PL 99-339]

"(2) any underground injection for the secondary or tertiary recovery of oil or natural gas,

unless such requirements are essential to assure that underground sources of drinking water will not be endangered by such injection. Such program shall apply in such State to the extent that a program adopted by such State which the Administrator determines meets such requirements is not in effect. Before promulgating any regulation under this section, the Administrator shall provide opportunity for public hearing respecting such regulation.

"(d) For purposes of this title, the term 'applicable underground injection control program' with respect to a State means the program (or most recent amendment thereof) (1) which has been adopted by the State and which has been approved under subsection (b), or (2) which has been prescribed by the Administrator under subsection (c).

"(e) An Indian Tribe may assume primary enforcement responsibility for underground injection control under this section consistent with such regulations as the Administrator has prescribed pursuant to Part C and section 1451 of this Act. The area over which such Indian Tribe exercises governmental jurisdiction need not have been listed under subsection (a) of this section, and such Tribe need not submit an application to assume primary enforcement responsibility within the 270-day deadline noted in subsection (b)(1)(A) of this section. Until an Indian Tribe assumes primary enforcement responsibility, the currently applicable underground injection control program shall continue to apply. If an applicable underground injection control program does not exist for an Indian Tribe, the Administrator shall prescribe such a program pursuant to subsection (c) of this section, and consistent with section 1421(b), within 270 days after the enactment of the Safe Drinking Water Act Amendments of 1986, unless an Indian Tribe first obtains approval to assume primary enforcement responsibility for underground injection control.

[1422(e) added by PL 99-339]

Enforcement Of Program

[1423 head amended by PL 99-339]

"Sec. 1423. (a)(1) Whenever the Administrator finds during a period during which a State has primary enforcement

responsibility for underground water sources (within the meaning of section 1422(b)(3) or section 1425(c)) that any person who is subject to a requirement of an applicable underground injection control program in such State is violating such requirement, he shall so notify the State and the person violating such requirement. If beyond the thirtieth day after the Administrator's notification the State has not commenced appropriate enforcement action, the Administrator shall issue an order under subsection (c) requiring the person to comply with such requirement or the Administrator shall commence a civil action under subsection (b). [1423(a)(1) amended by PL 96-502; revised by PL 99-339]

"(2) Whenever the Administrator finds during a period during which a State does not have primary enforcement responsibility for underground water sources that any person subject to any requirement of any applicable underground injection control program in such State is violating such requirement, the Administrator shall issue an order under subsection (c) requiring the person to comply with such requirement or the Administrator shall commence a civil action under subsection (b). [1423(a)(2) amended by PL 99-339]

"(b) CIVIL AND CRIMINAL ACTIONS. — Civil actions referred to in paragraphs (1) and (2) of subsection (a) shall be brought in the appropriate United States district court. Such court shall have jurisdiction to require compliance with any requirement of an applicable underground injection program or with an order issued under subsection (c). The court may enter such judgment as protection of public health may require. Any person who violates any requirement of an applicable underground injection control program or an order requiring compliance under subsection (c) —

"(1) shall be subject to a civil penalty of not more than \$25,000 for each day of such violation, and

"(2) if such violation is willful, such person may, in addition to or in lieu of the civil penalty authorized by paragraph (1), be imprisoned for not more than 3 years, or fined in accordance with title 18 of the United States Code, or both.

[1423(b) revised and new (c) added by PL 99-339]

"(c) ADMINISTRATIVE ORDERS.—(1) In any case in which the

Administrator is authorized to bring a civil action under this section with respect to any regulation or other requirement of this part other than those relating to —

“(A) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production, or

“(B) any underground injection for the secondary or tertiary recovery of oil or natural gas,

the Administrator may also issue an order under this subsection either assessing a civil penalty of not more than \$10,000 for each day of violation for any past or current violation, up to a maximum administrative penalty of \$125,000, or requiring compliance with such regulation or other requirement, or both.

“(2) In any case in which the Administrator is authorized to bring a civil action under this section with respect to any regulation, or other requirement of this part relating to —

“(A) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production, or

“(B) any underground injection for the secondary or tertiary recovery of oil or natural gas,

the Administrator may also issue an order under this subsection either assessing a civil penalty of not more than \$5,000 for each day of violation for any past or current violation, up to a maximum administrative penalty of \$125,000, or requiring compliance with such regulation or other requirement, or both.

“(3)(A) An order under this subsection shall be issued by the Administrator after opportunity (provided in accordance with this subparagraph) for a hearing. Before issuing the order, the Administrator shall give to the person to whom it is directed written notice of the Administrator's proposal to issue such order and the opportunity to request, within 30 days of the date the notice is received by such person, a hearing on the order. Such hearing shall not be subject to section 534 or 556 of title 5, United States Code, but shall provide a reasonable opportunity to be heard and to present evidence.

“(B) The Administrator shall provide public notice of, and reasonable opportunity to comment on, any proposed order.

“(C) Any citizen who comments on any proposed order under subparagraph (B)

shall be given notice of any hearing under this subsection and of any order. In any hearing held under subparagraph (A), such citizen shall have a reasonable opportunity to be heard and to present evidence.

“(D) Any order issued under this subsection shall become effective 30 days following its issuance unless an appeal is taken pursuant to paragraph (6).

“(4)(A) Any order issued under this subsection shall state with reasonable specificity the nature of the violation and may specify a reasonable time for compliance.

“(B) In assessing any civil penalty under this subsection, the Administrator shall take into account appropriate factors, including (i) the seriousness of the violation; (ii) the economic benefit (if any) resulting from the violation; (iii) any history of such violations; (iv) any good-faith efforts to comply with the applicable requirements; (v) the economic impact of the penalty on the violator; and (vi) such other matters as justice may require.

“(5) Any violation with respect to which the Administrator has commenced and is diligently prosecuting an action, or has issued an order under this subsection assessing a penalty, shall not be subject to an action under subsection (b) of this section or section 1424(c) or 1449, except that the foregoing limitation on civil actions under section 1449 of this Act shall not apply with respect to any violation for which —

“(A) a civil action under section 1449(a)(1) has been filed prior to commencement of an action under this subsection, or

“(B) a notice of violation under section 1449(b)(1) has been given before commencement of an action under this subsection and an action under section 1449(a)(1) of this Act is filed before 120 days after such notice is given.

“(6) Any person against whom an order is issued or who commented on a proposed order pursuant to paragraph (3) may file an appeal of such order with the United States District Court for the District of Columbia or the district in which the violation is alleged to have occurred. Such an appeal may only be filed within the 30-day period beginning on the date the order is issued. Appellant shall simultaneously send a copy of the appeal by certified mail to the Administrator and to the Attorney General. The Administrator shall promptly

file in such court a certified copy of the record on which such order was imposed. The district court shall not set aside or remand such order unless there is not substantial evidence on the record, taken as a whole, to support the finding of a violation or, unless the Administrator's assessment of penalty or requirement for compliance constitutes an abuse of discretion. The district court shall not impose additional civil penalties for the same violation unless the Administrator's assessment of a penalty constitutes an abuse of discretion. Notwithstanding section 1448(a)(2), any order issued under paragraph (3) shall be subject to judicial review exclusively under this paragraph.

“(7) If any person fails to pay an assessment of a civil penalty —

“(A) after the order becomes effective under paragraph (3), or

“(B) after a court, in an action brought under paragraph (6), has entered a final judgment in favor of the Administrator, the Administrator may request the Attorney General to bring a civil action in an appropriate district court to recover the amount assessed (plus costs, attorneys' fees, and interest at currently prevailing rates from the date the order is effective or the date of such final judgment, as the case may be). In such an action, the validity, amount, and appropriateness of such penalty shall not be subject to review.

“(8) The Administrator may, in connection with administrative proceedings under this subsection, issue subpoenas compelling the attendance and testimony of witnesses and subpoenas duces tecum, and may request the Attorney General to bring an action to enforce any subpoena under this section. The district courts shall have jurisdiction to enforce such subpoenas and impose sanction.

“(d) Nothing in this title shall diminish any authority of a State or political subdivision to adopt or enforce any law or regulation respecting underground injection but no such law or regulation shall relieve any person of any requirement otherwise applicable under this title.

[Former 1423(c) redesignated as (d) by PL 99-339]

“Interim Regulation Of Underground Injections

“Sec. 1424. (a)(1) Any person may petition the Administrator to have an area of a State (or States) designated as an area

in which no new underground injection well may be operated during the period beginning on the date of the designation and ending on the date on which the applicable underground injection control program covering such area takes effect unless a permit for the operation of such well has been issued by the Administrator under subsection (b). The Administrator may so designate an area within a State if he finds that the area has one aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health.

"(2) Upon receipt of a petition under paragraph (1) of this subsection, the Administrator shall publish it in the Federal Register and shall provide an opportunity to interested persons to submit written data, views, or arguments thereon. Not later than the 30th day following the date of the publication of a petition under this paragraph in the Federal Register, the Administrator shall either make the designation for which the petition is submitted or deny the petition.

"(b)(1) During the period beginning on the date an area is designated under subsection (a) and ending on the date the applicable underground injection control program covering such area takes effect, no new underground injection well may be operated in such area unless the Administrator has issued a permit for such operation.

"(2) Any person may petition the Administrator for the issuance of a permit for the operation of such a well in such an area. A petition submitted under this paragraph shall be submitted in such manner and contain such information as the Administrator may require by regulation. Upon receipt of such a petition, the Administrator shall publish it in the Federal Register. The Administrator shall give notice of any proceeding on a petition and shall provide opportunity for agency hearing. The Administrator shall act upon such petition on the record of any hearing held pursuant to the preceding sentence respecting such petition. Within 120 days of the publication in the Federal Register of a petition submitted under this paragraph, the Administrator shall either issue the permit for which the petition was submitted or shall deny its issuance.

"(3) The Administrator may issue a permit for the operation of a new under-

ground injection well in an area designated under subsection (a) only if he finds that the operation of such well will not cause contamination of the aquifer of such area so as to create a significant hazard to public health. The Administrator may condition the issuance of such a permit upon the use of such control measures in connection with the operation of such well, for which the permit is to be issued, as he deems necessary to assure that the operation of the well will not contaminate the aquifer of the designated area in which the well is located so as to create a significant hazard to public health.

"(c) Any person who operates a new underground injection well in violation of subsection (b), (1) shall be subject to a civil penalty of not more than \$5,000 for each day in which such violation occurs, or (2) if such violation is willful, such person may, in lieu of the civil penalty authorized by clause (1) be fined not more than \$10,000 for each day in which such violation occurs. If the Administrator has reason to believe that any person is violating or will violate subsection (b), he may petition the United States district court to issue a temporary restraining order or injunction (including a mandatory injunction) to enforce such subsection.

"(d) For purposes of this section, the term 'new underground injection well' means an underground injection well whose operation was not approved by appropriate State and Federal agencies before the date of the enactment of this title.

"(e) If the Administrator determines, on his own initiative or upon petition, that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of that determination in the Federal Register. After the publication of any such notice, no commitment for Federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health, but a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.

"Optional Demonstration By States
Relating To Oil Or Natural Gas
[1425 added by PL 96-502]

"Sec. 1425. (a) For purposes of the Administrator's approval or disapproval under section 1422 of that portion of any State underground injection control program which relates to—

"(1) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production or natural gas storage operations, or

[1425(a)(1) amended by PL 99-339]

"(2) any underground injection for the secondary or tertiary recovery of oil or natural gas.

in lieu of the showing required under subparagraph (A) of section 1422(b)(1) the State may demonstrate that such portion of the State program meets the requirements of subparagraphs (A) through (D) of section 1421(b)(1) and represents an effective program (including adequate recordkeeping and reporting) to prevent underground injection which endangers drinking water sources.

"(b) If the Administrator revises or amends any requirement of a regulation under section 1421 relating to any aspect of the underground injection referred to in subsection (a), in the case of that portion of a State underground injection control program for which the demonstration referred to in subsection (a) has been made, in lieu of the showing required under section 1422(b)(1)(B) the State may demonstrate that, with respect to that aspect of such underground injection, the State program meets the requirements of subparagraphs (A) through (D) of section 1421(b)(1) and represents an effective program (including adequate recordkeeping and reporting) to prevent underground injection which endangers drinking water sources.

"(c)(1) Section 1422(b)(1) shall not apply to that portion of any State underground injection control program approved by the Administrator pursuant to a demonstration under subsection (a) of this section (and under subsection (b) of this section where applicable).

"(2) If pursuant to such a demonstration, the Administrator approves such portion of the State program, the State shall have primary enforcement responsibility with respect to that portion until such time as the Administrator determines, by rule,

that such demonstration is no longer valid. Following such a determination, the Administrator may exercise the authority of subsection (c) of section 1422 in the same manner as provided in such subsection with respect to a determination described in such subsection.

"(3) Before promulgating any rule under paragraph (2), the Administrator shall provide opportunity for public hearing respecting such rule.

"Sec. 1426. Regulation Of State Programs.

[1426 added by PL 99-339]

"(a) Monitoring Methods. — Not later than 18 months after enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall modify regulations issued under this Act for Class I injection wells to identify monitoring methods, in addition to those in effect on November 1, 1985, including groundwater monitoring. In accordance with such regulations, the Administrator, or delegated State authority, shall determine the applicability of such monitoring methods, wherever appropriate, at locations and in such a manner as to provide the earliest possible detection of fluid migration into, or in the direction of, underground sources of drinking water from such wells, based on its assessment of the potential for fluid migration from the injection zone that may be harmful to human health or the environment. For purposes of this subsection, a class I injection well is defined in accordance with 40 CFR 146.05 as in effect on November 1, 1985.

"(b) Report. — The Administrator shall submit a report to Congress, no later than September 1987, summarizing the results of State surveys required by the Administrator under this section. The report shall include each of the following items of information:

"(1) The numbers and categories of class V wells which discharge nonhazardous waste into or above an underground source of drinking water.

"(2) The primary contamination problems associated with different categories of these disposal wells.

"(3) Recommendations for minimum design, construction, installation, and siting requirements that should be applied to protect underground sources of drinking water from such contamination wherever necessary.

"Sec. 1427. Sole Source Aquifer Demonstration Program.

[1427 added by PL 99-339]

"(a) Purpose. — The purpose of this section is to establish procedures for development, implementation, and assessment of demonstration programs designed to protect critical aquifer protection areas located within areas designated as sole or principal source aquifers under section 1424(e) of this Act.

"(b) Definition. — For purposes of this section, the term 'critical aquifer protection area' means either of the following:

"(1) All or part of an area located within an area for which an application or designation as a sole or principal source aquifer pursuant to section 1424(e), has been submitted and approved by the Administrator not later than 24 months after the enactment of the Safe Drinking Water Act Amendments of 1986 and which satisfies the criteria established by the Administrator under subsection (d).

"(2) All or part of an area which is within an aquifer designated as a sole source aquifer as of the enactment of the Safe Drinking Water Act Amendments of 1986 and for which an areawide ground water quality protection plan has been approved under section 208 of the Clean Water Act prior to such enactment.

"(c) Application. — Any State, municipal or local government or political subdivision thereof or any planning entity (including any interstate regional planning entity) that identifies a critical aquifer protection area over which it has authority or jurisdiction may apply to the Administrator for the selection of such area for a demonstration program under this section. Any applicant shall consult with other government or planning entities with authority or jurisdiction in such area prior to application. Applicants, other than the Governor, shall submit the application for a demonstration program jointly with the Governor.

"(d) Criteria. — Not later than 1 year after the enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall, by rule, establish criteria for identifying critical aquifer protection areas under this section. In establishing such criteria, the Administrator shall consider each of the following:

"(1) The vulnerability of the aquifer to contamination due to hydrogeologic characteristics.

"(2) The number of persons or the proportion of population using the ground water as a drinking water source.

"(3) The economic, social and environmental benefits that would result to the area from maintenance of ground water of high quality.

"(4) The economic, social and environmental costs that would result from degradation of the quality of the ground water.

"(e) Contents of Application. — An application submitted to the Administrator by any applicant for a demonstration program under this section shall meet each of the following requirements:

"(1) The application shall propose boundaries for the critical aquifer protection area within its jurisdiction.

"(2) The application shall designate or, if necessary, establish a planning entity (which shall be a public agency and which shall include representation of elected local and State governmental officials) to develop a comprehensive management plan (hereinafter in this section referred to as the 'plan') for the critical protection area. Where a local government planning agency exists with adequate authority to carry out this section with respect to any proposed critical protection area, such agency shall be designated as the planning entity.

"(3) The application shall establish procedures for public participation in the development of the plan, for review, approval, and adoption of the plan, and for assistance to municipalities and other public agencies with authority under State law to implement the plan.

"(4) The application shall include a hydrogeologic assessment of surface and ground water resources within the critical protection area.

"(5) The application shall include a comprehensive management plan for the proposed protection area.

"(6) The application shall include the measures and schedule proposed for implementation of such plan.

"(f) Comprehensive Plan. —

"(1) The objective of a comprehensive management plan submitted by an applicant under this section shall be to maintain the quality of the ground water in the critical protection area in a manner reasonably expected to protect human health, the environment and ground water resources. In order to achieve such objective, the plan may be designed to maintain, to

the maximum extent possible, the natural vegetative and hydrogeological conditions. Each of the following elements shall be included in such a protection plan:

"(A) A map showing the detailed boundary of the critical protection area.

"(B) An identification of existing and potential point and nonpoint sources of ground water degradation.

"(C) An assessment of the relationship between activities on the land surface and ground water quality.

"(D) Specific actions and management practices to be implemented in the critical protection area to prevent adverse impacts on ground water quality.

"(E) Identification of authority adequate to implement the plan, estimates of program costs, and sources of State matching funds.

"(2) Such plan may also include the following:

"(A) A determination of the quality of the existing ground water recharged through the special protection area and the natural recharge capabilities of the special protection area watershed.

"(B) Requirements designed to maintain existing underground drinking water quality or improve underground drinking water quality if prevailing conditions fail to meet drinking water standards, pursuant to this Act and State law.

"(C) Limits on Federal, State, and local government, financially assisted activities and projects which may contribute to degradation of such ground water or any loss of natural surface and subsurface infiltration of purification capability of the special protection watershed.

"(D) A comprehensive statement of land use management including emergency contingency planning as it pertains to the maintenance of the quality of underground sources of drinking water or to the improvement of such sources if necessary to meet drinking water standards pursuant to this Act and State law.

"(E) Actions in the special protection area which would avoid adverse impacts on water quality, recharge capabilities, or both.

"(F) Consideration of specific techniques, which may include clustering, transfer of development rights, and other innovative measures sufficient to achieve the objectives of this section.

"(G) Consideration of the establishment of a State institution to facilitate and

assist funding a development transfer credit system.

"(H) A program for State and local implementation of the plan described in this subsection in a manner that will insure the continued, uniform, consistent protection of the critical protection area in accord with the purposes of this section.

"(I) Pollution abatement measures, if appropriate.

"(g) Plans Under Section 208 of the Clean Water Act. — A plan approved before the enactment of the Safe Drinking Water Act Amendments of 1986 under section 208 of the Clean Water Act to protect a sole source aquifer designated under section 1424(e) of this Act shall be considered a comprehensive management plan for the purposes of this section.

"(h) Consultation and Hearings. — During the development of a comprehensive management plan under this section, the planning entity shall consult with, and consider the comments of, appropriate officials of any municipality and State or Federal agency which has jurisdiction over lands and waters within the special protection area, other concerned organizations and technical and citizen advisory committees. The planning entity shall conduct public hearings at places within the special protection area for the purpose of providing the opportunity to comment on any aspect of the plan.

"(i) Approval or Disapproval. — Within 120 days after receipt of an application under this section, the Administrator shall approve or disapprove the application. The approval or disapproval shall be based on a determination that the critical protection area satisfies the criteria established under subsection (d) and that a demonstration program for the area would provide protection for ground water quality consistent with the objectives stated in subsection (f). The Administrator shall provide to the Governor a written explanation of the reasons for the disapproval of any such application. Any petitioner may modify and resubmit any application which is not approved. Upon approval of an application, the Administrator may enter into a cooperative agreement with the applicant to establish a demonstration program under this section.

"(j) Grants and Reimbursement. — Upon entering a cooperative agreement under subsection (i), the Administrator may provide to the applicant, on a match-

ing basis, a grant of 50 per centum of the costs of implementing the plan established under this section. The Administrator may also reimburse the applicant of an approved plan up to 50 per centum of the costs of developing such plan, except for plans approved under section 208 of the Clean Water Act. The total amount of grants under this section for any one aquifer, designated under section 1424(e), shall not exceed \$4,000,000 in any one fiscal year.

"(k) Activities Funded Under Other Law. — No funds authorized under this subsection may be used to fund activities funded under other sections of this Act or the Clean Water Act, the Solid Waste Disposal Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 or other environmental laws.

"(l) Report. — Not later than December 31, 1989, each State shall submit to the Administrator a report assessing the impact of the program on ground water quality and identifying those measures found to be effective in protecting ground water resources. No later than September 30, 1990, the Administrator shall submit to Congress a report summarizing the State reports, and assessing the accomplishments of the sole source aquifer demonstration program including an identification of protection methods found to be most effective and recommendations for their application to protect ground water resources from contamination whenever necessary.

"(m) Savings Provision. — Nothing under this section shall be construed to amend, supersede or abrogate rights to quantities of water which have been established by interstate water compacts, Supreme Court decrees, or State water laws; or any requirement imposed or right provided under any Federal or State environmental or public health statute.

"(n) Authorization. — There are authorized to be appropriated to carry out this section not more than the following amounts:

| Fiscal year: | Amount |
|--------------|--------------|
| 1987..... | \$10,000,000 |
| 1988..... | 15,000,000 |
| 1989..... | 17,500,000 |
| 1990..... | 17,500,000 |
| 1991..... | 17,500,000 |

Matching grants under this section may also be used to implement or update any water quality management plan for a sole or principal source aquifer approved (before the date of the enactment of this section) by the Administrator under section 208 of the Federal Water Pollution Control Act.

"Sec. 1428. State Programs To Establish Wellhead Protection Areas.
[1428 added by PL 99-339]

"(a) State Programs. — The Governor or Governor's designee of each State shall, within 3 years of the date of enactment of the Safe Drinking Water Act Amendments of 1986, adopt and submit to the Administrator a State program to protect wellhead areas within their jurisdiction from contaminants which may have any adverse effect on the health of persons. Each State program under this section shall, at a minimum —

"(1) specify the duties of State agencies, local governmental entities, and public water supply systems with respect to the development and implementation of programs required by this section;

"(2) for each wellhead, determine the wellhead protection area as defined in subsection (e) based on all reasonably available hydrogeologic information on ground water flow, recharge and discharge and other information the State deems necessary to adequately determine the wellhead protection area;

"(3) identify within each wellhead protection area all potential anthropogenic sources of contaminants which may have any adverse effect on the health of persons;

"(4) describe a program that contains, as appropriate, technical assistance, financial assistance, implementation of control measures, education, training, and demonstration projects to protect the water supply within wellhead protection areas from such contaminants;

"(5) include contingency plans for the location and provision of alternate drinking water supplies for each public water system in the event of well or wellfield contamination by such contaminants; and

"(6) include a requirement that consideration be given to all potential sources of such contaminants within the expected wellhead area of a new water well which serves a public water supply system.

"(b) Public Participation. — To the maximum extent possible, each State shall establish procedures, including but not limited to the establishment of technical and citizens' advisory committees, to encourage the public to participate in developing the protection program for wellhead areas. Such procedures shall include notice and opportunity for public hearing on the State program before it is submitted to the Administrator.

"(c) Disapproval. —

"(1) In General. — If, in the judgment of the Administrator a State program (or portion thereof, including the definition of a wellhead protection area), is not adequate to protect public water systems as required by this section, the Administrator shall disapprove such program (or portion thereof). A State program developed pursuant to subsection (a) shall be deemed to be adequate unless the Administrator determines, within 9 months of the receipt of a State program, that such program (or portion thereof) is inadequate for the purpose of protecting public water systems as required by this section from contaminants that may have any adverse effect on the health of persons. If the Administrator determines that a proposed State program (or any portion thereof) is inadequate, the Administrator shall submit a written statement of the reasons for such determination to the Governor of the State.

"(2) Modification and Resubmission. — Within 6 months after receipt of the Administrator's written notice under paragraph (1) that any proposed State program (or portion thereof) is inadequate, the Governor or Governor's designee, shall modify the program based upon the recommendations of the Administrator and resubmit the modified program to the Administrator.

"(d) Federal Assistance. — After the date 3 years after the enactment of this section, no State shall receive funds authorized to be appropriated under this section except for the purpose of implementing the program and requirements of paragraphs (4) and (6) of subsection (a).

"(e) Definition of Wellhead Protection Area. — As used in this section, the term 'wellhead protection area' means the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward

and reach such water well or wellfield. The extent of a wellhead protection area, within a State, necessary to provide protection from contaminants which may have any adverse effect on the health of persons is to be determined by the State in the program submitted under subsection (a). Not later than one year after the enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall issue technical guidance which States may use in making such determinations. Such guidance may reflect such factors as the radius of influence around a well or wellfield, the depth of drawdown of the water table by such well or wellfield at any given point, the time or rate of travel of various contaminants in various hydrologic conditions, distance from the well or wellfield, or other factors affecting the likelihood of contaminants reaching the well or wellfield, taking into account available engineering pump tests or comparable data, field reconnaissance, topographic information, and the geology of the formation in which the well or wellfield is located.

"(f) Prohibitions. —

"(1) Activities under other laws. — No funds authorized to be appropriated under this section may be used to support activities authorized by the Federal Water Pollution Control Act, the Solid Waste Disposal Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, or other sections of this Act.

"(2) Individual sources. — No funds authorized to be appropriated under this section may be used to bring individual sources of contamination into compliance.

"(g) Implementation. — Each State shall make every reasonable effort to implement the State wellhead area protection program under this section within 2 years of submitting the program to the Administrator. Each State shall submit to the Administrator a biennial status report describing the State's progress in implementing the program. Such report shall include amendments to the State program for water wells sited during the biennial period.

"(h) Federal Agencies. — Each department, agency, and instrumentality of the executive, legislative, and judicial branches of the Federal Government having jurisdiction over any potential source

of contaminants identified by a State program pursuant to the provisions of subsection (a)(3) shall be subject to and comply with all requirements of the State program developed according to subsection (a)(4) applicable to such potential source of contaminants, both substantive and procedural, in the same manner and to the same extent as any other person is subject to such requirements, including payment of reasonable charges and fees. The President may exempt any potential source under the jurisdiction of any department, agency, or instrumentality in the executive branch if the President determines it to be in the paramount interest of the United States to do so. No such exemption shall be granted due to the lack of an appropriation unless the President shall have specifically requested such appropriation as part of the budgetary process and the Congress shall have failed to make available such requested appropriations.

"(i) Additional Requirement. —

"(1) In General. — In addition to the provisions of subsection (a) of this section, States in which there are more than 2,500 active wells at which annular injection is used as of January 1, 1986, shall include in their State program a certification that a State program exists and is being adequately enforced that provides protection from contaminants which may have any adverse effect on the health of persons and which are associated with the annual injection or surface disposal of brines associated with oil and gas production.

"(2) Definition. — For purposes of this subsection, the term 'annular injection' means the reinjection of brines associated with the production of oil or gas between the production and surface casings of a conventional oil or gas producing well.

"(3) Review. — The Administrator shall conduct a review of each program certified under this subsection.

"(4) Disapproval. — If a State fails to include the certification required by this subsection or if in the judgment of the Administrator the State program certified under this subsection is not being adequately enforced, the Administrator shall disapprove the State program submitted under subsection (a) of this section.

"(j) Coordination With Other Laws. — Nothing in this section shall authorize or require any department, agency, or other instrumentality of the Federal Government or State or local government to ap-

portion, allocate or otherwise regulate the withdrawal or beneficial use of ground or surface waters, so as to abrogate or modify any existing rights to water established pursuant to State or Federal law, including interstate compacts.

"(k) Authorization of Appropriations. — Unless the State program is disapproved under this section, the Administrator shall make grants to the State for not less than 50 or more than 90 percent of the costs incurred by a State (as determined by the Administrator) in developing and implementing each State program under this section. For purposes of making such grants there is authorized to be appropriated not more than the following amounts:

| Fiscal year: | Amount |
|--------------|--------------|
| 1987..... | \$20,000,000 |
| 1988..... | 20,000,000 |
| 1989..... | 35,000,000 |
| 1990..... | 35,000,000 |
| 1991..... | 35,000,000 |

"PART D — EMERGENCY POWERS

"Emergency Powers

"Sec. 1431. (a) Notwithstanding any other provision of this title, the Administrator, upon receipt of information that a contaminant which is present in or is likely to enter a public water system or an underground source of drinking water may present an imminent and substantial endangerment to the health of persons, and that appropriate State and local authorities have not acted to protect the health of such persons, may take such actions as he may deem necessary in order to protect the health of such persons. To the extent he determines it to be practicable in light of such imminent endangerment, he shall consult with the State and local authorities in order to confirm the correctness of the information on which action proposed to be taken under this subsection is based and to ascertain the action which such authorities are or will be taking. The action which the Administrator may take may include (but shall not be limited to) (1) issuing such orders as may be necessary to protect the health of persons who are or may be users of such system (including travelers), including orders requiring the provision of alternative water supplies by persons who caused or contributed

to the endangerment, and (2) commencing a civil action for appropriate relief, including a restraining order or permanent or temporary injunction.

[1431(a) amended by PL 99-339]

"(b) Any person who violates or fails or refuses to comply with any order issued by the Administrator under subsection (a)(1) may, in an action brought in the appropriate United States district court to enforce such order, be subject to a civil penalty of not to exceed \$5,000 for each day in which such violation occurs or failure to comply continues.

[1431(b) amended by PL 99-339]

"Sec. 1432. Tampering With Public Water Systems.

[1432 added by PL 99-339]

"(a) Tampering. — Any person who tampers with a public water system shall be imprisoned for not more than 5 years, or fined in accordance with title 18 of the United States Code, or both.

"(b) Attempt or Threat. — Any person who attempts to tamper, or makes a threat to tamper, with a public drinking water system be imprisoned for not more than 3 years, or fined in accordance with title 18 of the United States Code, or both.

"(c) Civil Penalty. — The Administrator may bring a civil action in the appropriate United States district court (as determined under the provisions of title 28 of the United States Code) against any person who tampers, attempts to tamper, or makes a threat to tamper with a public water system. The court may impose on such person a civil penalty of not more than \$50,000 for such tampering or not more than \$20,000 for such attempt or threat.

"(d) Definition of 'Tamper'. — For purposes of this section, the term 'tamper' means —

"(1) to introduce a contaminant into a public water system with the intention of harming persons; or

"(2) to otherwise interfere with the operation of a public water system with the intention of harming persons.

"PART E — GENERAL PROVISIONS

"Assurance of Availability of Adequate Supplies of Chemicals Necessary for Treatment of Water.

"Sec. 1441. (a) If any person who uses chlorine, activated carbon, lime, ammonia,

soda ash, potassium permanganate, caustic soda, or other chemical or substance for the purpose of treating water in any public water system or in any public treatment works determines that the amount of such chemical or substance necessary to effectively treat such water is not reasonably available to him or will not be so available to him when required for the effective treatment of such water, such person may apply to the Administrator for a certification (hereinafter in this section referred to as a "certification of need") that the amount of such chemical or substance which such person requires to effectively treat such water is not reasonably available to him or will not be so available when required for the effective treatment of such water.

"(b)(1) An application for a certification of need shall be in such form and submitted in such manner as the Administrator may require and shall (A) specify the persons the applicant determines are able to provide the chemical or substance with respect to which the application is submitted, (B) specify the persons from whom the applicant has sought such chemical or substance, and (C) contain such other information as the Administrator may require.

"(2) Upon receipt of an application under this section, the Administrator shall (A) publish in the Federal Register a notice of the receipt of the application and a brief summary of it, (B) notify in writing each person whom the President or his delegate (after consultation with the Administrator) determines could be made subject to an order required to be issued upon the issuance of the certification of need applied for in such application, and (C) provide an opportunity for the submission of written comments on such application. The requirements of the preceding sentence of this paragraph shall not apply when the Administrator for good cause finds (and incorporates the finding with a brief statement of reasons therefor in the order issued) that waiver of such requirements is necessary in order to protect the public health.

"(3) Within 30 days after—

"(A) the date a notice is published under paragraph (2) in the Federal Register with respect to an application submitted under this section for the issuance of a certification of need, or

"(B) the date on which such application is received if as authorized by the second sentence of such paragraph no notice is published with respect to such application, the Administrator shall take action either to issue or deny the issuance of a certification of need.

"(c)(1) If the Administrator finds that the amount of a chemical or substance necessary for an applicant under an application submitted under this section to effectively treat water in a public water system or in a public treatment works is not reasonably available to the applicant or will not be so available to him when required for the effective treatment of such water, the Administrator shall issue a certification of need. Not later than seven days following the issuance of such certification, the President or his delegate shall issue an order requiring the provision to such person of such amounts of such chemical or substance as the Administrator deems necessary in the certification of need issued for such person. Such order shall apply to such manufacturers, producers, processors, distributors, and repackagers of such chemical or substance as the President or his delegate deems necessary and appropriate, except that such order may not apply to any manufacturer, producer, or processor of such chemical or substance who manufactures, produces, or processes (as the case may be) such chemical or substance solely for its own use. Persons subject to an order issued under this section shall be given a reasonable opportunity to consult with the President or his delegate with respect to the implementation of the order.

"(2) Orders which are to be issued under paragraph (1) to manufacturers, producers, and processors of a chemical or substance shall be equitably apportioned, as far as practicable, among all manufacturers, producers, and processors of such chemical or substance; and orders which are to be issued under paragraph (1) to distributors and repackagers of a chemical or substance shall be equitably apportioned, as far as practicable, among all distributors and repackagers of such chemical or substance. In apportioning orders issued under paragraph (1) to manufacturers, producers, processors, distributors, and repackagers of chlorine, the President or his delegate shall, in carrying out the requirements of the preceding sentence, consider.—

"(A) the geographical relationships and established commercial relationships between such manufacturers, producers, processors, distributors, and repackagers and the persons for whom the orders are issued;

"(B) in the case of orders to be issued to producers of chlorine, the (i) amount of chlorine historically supplied by each such producer to treat water in public water systems and public treatment works, and (ii) share of each such producer of the total annual production of chlorine in the United States; and

"(C) such other factors as the President or his delegate may determine are relevant to the apportionment of orders in accordance with the requirements of the preceding sentence.

"(3) Subject to subsection (f), any person for whom a certification of need has been issued under this subsection may upon the expiration of the order issued under paragraph (1) upon such certification apply under this section for additional certifications.

"(d) There shall be available as a defense to any action brought for breach of contract in a Federal or State court arising out of delay or failure to provide, sell, or offer for sale or exchange a chemical or substance subject to an order issued pursuant to subsection (c)(1), that such delay or failure was caused solely by compliance with such order.

"(e)(1) Whoever knowingly fails to comply with any order issued pursuant to subsection (c)(1) shall be fined not more than \$5,000 for each such failure to comply.

"(2) Whoever fails to comply with any order issued pursuant to subsection (c)(1) shall be subject to a civil penalty of not more than \$2,500 for each such failure to comply.

"(3) Whenever the Administrator or the President or his delegate has reason to believe that any person is violating or will violate any order issued pursuant to subsection (c)(1), he may petition a United States district court to issue a temporary restraining order or preliminary or permanent injunction (including a mandatory injunction) to enforce the provision of such order.

"(f) No certification of need or order issued under this section may remain in effect for more than one year.

[144](f) amended by PL 95-190; PL 96-63; PL 99-339]

Research, Technical Assistance,
Information, Training Of Personnel

"Sec. 1442. (a)(1) The Administrator may conduct research, studies, and demonstrations relating to the causes, diagnosis, treatment, control, and prevention of physical and mental diseases and other impairments of man resulting directly or indirectly from contaminants in water, or to the provision of a dependably safe supply of drinking water, including—

"(A) improved methods (i) to identify and measure the existence of contaminants in drinking water (including methods which may be used by State and local health and water officials), and (ii) to identify the source of such contaminants;

"(B) improved methods to identify and measure the health effects of contaminants in drinking water;

"(C) new methods of treating raw water to prepare it for drinking, so as to improve the efficiency of water treatment and to remove contaminants from water;

"(D) improved methods for providing a dependably safe supply of drinking water, including improvements in water purification and distribution, and methods of assessing the health related hazards of drinking water; and

"(E) improved methods of protecting underground water sources of public water systems from contamination.

[Editor's note: Section 304(b) of Public Law 99-339 provides:

"(b) Comparative Health Effects Assessment. — The Administrator of the Environmental Protection Agency shall conduct a comparative health effects assessment, using available data, to compare the public health effects (both positive and negative) associated with water treatment chemicals and their byproducts to the public health effects associated with contaminants found in public water supplies. Not later than 18 months after the date of the enactment of this Act, the Administrator shall submit a report to the Congress setting forth the results of such assessment."]

"(2)(A) The Administrator shall, to the maximum extent feasible, provide technical assistance to the States and municipalities in the establishment and administration of public water system supervision programs (as defined in section 1443(c)(1)).

[1442(a)(2)(A) designated and (B) added and amended by PL 95-190]

"(B) The Administrator is authorized to provide technical assistance and to make grants to States, or publicly owned water systems to assist in responding to and alleviating any emergency situation affecting public water systems (including sources of water for such systems) which the Administrator determines to present substantial danger to the public health. Grants provided under this subparagraph shall be used only to support those actions which (i) are necessary for preventing, limiting or mitigating danger to the public health in such emergency situation and (ii) would not, in the judgment of the Administrator, be taken without such emergency assistance. The Administrator may carry out the program authorized under this subparagraph as part of, and in accordance with the terms and conditions of, any other program of assistance for environmental emergencies which the Administrator is authorized to carry out under any other provision of law. No limitation on appropriations for any such other program shall apply to amounts appropriated under this subparagraph.

"(3)(A) The Administrator shall conduct studies, and make periodic reports to Congress, on the costs of carrying out regulations prescribed under section 1412. [1442(a)(3)(A) designated and (B) added by PL 95-190]

(B) Not later than eighteen months after the date of enactment of this subparagraph, the Administrator shall submit a report to Congress which identifies and analyzes—

(i) the anticipated costs of compliance with interim and revised national primary drinking water regulations and the anticipated costs to States and units of local governments in implementing such regulations;

(ii) alternative methods of (including alternative treatment techniques for) compliance with such regulations;

(iii) methods of paying the costs of compliance by public water systems with national primary drinking water regulations, including user charges, State or local taxes or subsidies, Federal grants (including planning or construction grants, or both), loans, and loan guarantees, and other methods of assisting in paying the costs of such compliance;

(iv) the advantages and disadvantages of each of the methods referred to in clauses (ii) and (iii);

(v) the sources of revenue presently available (and projected to be available) to public water systems to meet current and future expenses; and

(vi) the costs of drinking water paid by residential and industrial consumers in a sample of large, medium, and small public water systems and of individually owned wells, and the reasons for any differences in such costs.

The report required by this subparagraph shall identify and analyze the items required in clauses (i) through (v) separately with respect to public water systems serving small communities. The report required by this subparagraph shall include such recommendations as the Administrator deems appropriate.

"(4) The Administrator shall conduct a survey and study of—

"(A) disposal of waste (including residential waste) which may endanger underground water which supplies, or can reasonably be expected to supply, any public water systems, and

"(B) means of control of such waste disposal.

Not later than one year after the date of enactment of this title, he shall transmit to the Congress the results of such survey and study, together with such recommendations as he deems appropriate.

"(5) The Administrator shall carry out a study of methods of underground injection which do not result in the degradation of underground drinking water sources.

"(6) The Administrator shall carry out a study of methods of preventing, detecting, and dealing with surface spills of contaminants which may degrade underground water sources for public water systems.

"(7) The Administrator shall carry out a study of virus contamination of drinking water sources and means of control of such contamination.

"(8) The Administrator shall carry out a study of the nature and extent of the impact on underground water which supplies or can reasonably be expected to supply public water systems of (A) abandoned injection or extraction wells; (B) intensive application of pesticides and fertilizers in underground water recharge areas; and (C) ponds, peats, lagoons, pits, or other surface disposal of contaminants in underground water recharge areas.

"(9) The Administrator shall conduct a comprehensive study of public water sup-

plies and drinking water sources to determine the nature, extent, sources of and means of control of contamination by chemicals or other substances suspected of being carcinogenic. Not later than six months after the date of enactment of this title, he shall transmit to the Congress the initial results of such study, together with such recommendations for further review and corrective action as he deems appropriate.

"(10) The Administrator shall carry out a study of the reaction of chlorine and humic acids and the effects of the contaminants which result from such reaction on public health and on the safety of drinking water, including any carcinogenic effect. [1442(a)(10), (11) added by PL 95-190]

"(11) The Administrator shall carry out a study of polychlorinated biphenyl contamination of actual or potential sources of drinking water, contamination of such sources by other substances known or suspected to be harmful to public health, the effects of such contamination, and means of removing, treating, or otherwise controlling such contamination. To assist in carrying out this paragraph, the Administrator is authorized to make grants to public agencies and private nonprofit institutions.

"(b) In carrying out this title, the Administrator is authorized to —

"(1) collect and make available information pertaining to research, investigations, and demonstrations with respect to providing a dependably safe supply of drinking water together with appropriate recommendations in connection therewith;

"(2) make available research facilities of the Agency to appropriate public authorities, institutions, and individuals engaged in studies and research relating to the purposes of this title;

"(3) make grants to, and enter into contracts with, any public agency, educational institution, and any other organization, in accordance with procedures prescribed by the Administrator, under which he may pay all or a part of the costs (as may be determined by the Administrator) of any project or activity which is designed—

"(A) to develop, expand, or carry out a program (which may combine training education and employment) for training persons for occupations involving the public health aspects of providing safe drinking water;

"(B) to train inspectors and supervisory personnel to train or supervise persons in occupations involving the public health aspects of providing safe drinking water; or

"(C) to develop and expand the capabilities of programs of States and municipalities to carry out the purposes of this title (other than by carrying out State programs of public water system supervision or underground water source protection (as defined in section 1443(c))).

[1442(b)(3)(C) amended by PL 95-190]

"(c) Not later than eighteen months after the date of enactment of this subsection, the Administrator shall submit a report to Congress on the present and projected future availability of an adequate and dependable supply of safe drinking water to meet present and projected future need. Such report shall include an analysis of the future demand for drinking water and other competing uses of water, the availability and use of methods to conserve water or reduce demand, the adequacy of present measures to assure adequate and dependable supplies of safe drinking water, and the problems (financial, legal, or other) which need to be resolved in order to assure the availability of such supplies for the future. Existing information and data compiled by the National Water Commission and others shall be utilized to the extent possible.

"(d) The Administrator shall—

"(1) provide training for, and make grants for training (including postgraduate training) of (A) personnel of State agencies which have primary enforcement responsibility and of agencies or units of local government to which enforcement responsibilities have been delegated by the State, and (B) personnel who manage or operate public water systems, and

"(2) make grants for postgraduate training of individuals (including grants to educational institutions for traineeships) for purposes of qualifying such individuals to work as personnel referred to in paragraph (1).

Reasonable fees may be charged for training provided under paragraph (1)(B) to persons other than personnel of State or local agencies but such training shall be provided to personnel of State or local agencies without charge.

[1442(d) added by PL 95-190]

"(e) [Repealed]

[1442(e) added by PL 96-502; repealed by PL 99-339]

"(f) There are authorized to be appropriated to carry out the provisions of this section other than subsection (a)(2)(B) and provisions relating to research \$15,000,000 for the fiscal year ending June 30, 1975; \$25,000,000 for the fiscal year ending June 30, 1976; \$35,000,000 for the fiscal year ending June 30, 1977; \$17,000,000 for each of the fiscal years 1978 and 1979; \$21,405,000 for the fiscal year ending September 30, 1980; \$30,000,000 for the fiscal year ending September 30, 1981; and \$35,000,000 for the fiscal year ending September 30, 1982. There are authorized to be appropriated to carry out subsection (a)(2)(B) \$8,000,000 for each of the fiscal years 1978 through 1982. There are authorized to be appropriated to carry out subsection (a)(2)(B) not more than the following amounts:

| Fiscal year: | Amount |
|--------------|-------------|
| 1987 | \$7,630,000 |
| 1988 | 7,650,000 |
| 1989 | 8,050,000 |
| 1990 | 8,050,000 |
| 1991 | 8,050,000 |

There are authorized to be appropriated to carry out the provisions of this section (other than subsection (g), subsection (a)(2)(B), and provisions relating to research), not more than the following amounts:

| Fiscal year: | Amount |
|--------------|--------------|
| 1987 | \$35,600,000 |
| 1988 | 35,600,000 |
| 1989 | 38,020,000 |
| 1990 | 38,020,000 |
| 1991 | 38,020,000 |

[Former 1442(c) redesignated as (e) by PL 95-190; amended by PL 96-63; redesignated as (f) by PL 96-502; amended by PL 99-339]

"(g) The Administrator is authorized to provide technical assistance to small public water systems to enable such systems to achieve and maintain compliance with national drinking water regulations. Such assistance may include "circuit-rider" programs, training, and preliminary engineering studies. There are authorized to be appropriated to carry out this subsection \$10,000,000 for each of the fiscal years 1987 through 1991. Not less than the greater of —

"(1) 3 percent of the amounts appropriated under this subsection, or

"(2) \$280,000

shall be utilized for technical assistance to public water systems owned or operated by Indian tribes.

[1442(g) added and amended by PL 99-339]

Grants For State Programs

"Sec. 1443. (a)(1) From allotments made pursuant to paragraph (4), the Administrator may make grants to States to carry out public water system supervision programs.

"(2) No grant may be made under paragraph (1) unless an application therefor has been submitted to the Administrator in such form and manner as he may require. The Administrator may not approve an application of a State for its first grant under paragraph (1) unless he determines that the State—

"(A) has established or will establish within one year from the date of such grant a public water system supervision program, and

"(B) will, within that one year, assume primary enforcement responsibility for public water systems within the State.

No grant may be made to a State under paragraph (1) for any period beginning more than one year after the date of the State's first grant unless the State has assumed and maintains primary enforcement responsibility for public water systems within the State. The prohibitions contained in the preceding two sentences shall not apply to such grants when made to Indian Tribes.

[1443(a)(2) amended by PL 99-339]

"(3) A grant under paragraph (1) shall be made to cover not more than 75 per centum of the grant recipient's costs (as determined under regulations of the Administrator) in carrying out, during the one-year period beginning on the date the grant is made, a public water system supervision program.

"(4) In each fiscal year the Administrator shall, in accordance with regulations, allot the sums appropriated for such year under paragraph (3) among the States on the basis of population, geographical area, number of public water systems, and other relevant factors.

No State shall receive less than 1 per centum of the annual appropriation for

grants under paragraph (1): *Provided*, That the Administrator may, by regulation, reduce such percentage in accordance with the criteria specified in this paragraph: *And provide further*, That such percentage shall not apply to grants allotted to Guam, American Samoa, or the Virgin Islands. "(5) The prohibition contained in the last sentence of paragraph (2) may be waived by the Administrator with respect to a grant to a State through fiscal year 1979 but such prohibition may only be waived if, in the judgment of the Administrator—

"(A) the state is making a diligent effort to assume and maintain primary enforcement responsibility for public water systems within the state;

"(B) the State has made significant progress toward assuming and maintaining such primary enforcement responsibility; and

"(C) there is reason to believe the State will assume such primary enforcement responsibility by October 1, 1979.

The amount of any grant awarded for the fiscal years 1978 and 1979 pursuant to a waiver under this paragraph may not exceed 75 per centum of the allotment which the State would have received for such fiscal year if it had assumed and maintained such primary enforcement responsibility. The remaining 25 per centum of the amount allotted to such State for such fiscal year shall be retained by the Administrator, and the Administrator may award such amount to such State at such time as the State assumes such responsibility before the beginning of fiscal year 1980. At the beginning of each fiscal years 1979 and 1980 the amounts retained by the Administrator for any preceding fiscal year and not awarded by the beginning of fiscal year 1979 or 1980 to the states to which such amounts were originally allotted may be removed from the original allotment and reallocated for fiscal year 1979 or 1980 (as the case may be) to States which have assumed primary enforcement responsibility by the beginning of such fiscal year.

"(5) The Administrator shall notify the State of the approval or disapproval of any application for a grant under this section—

"(A) within ninety days after receipt of such application, or

"(B) not later than the first day of the fiscal year for which the grant application is made, whichever is later.

"(7) For purposes of making grants under paragraph (1) there are authorized to be appropriated \$15,000,000 for the fiscal year ending June 30, 1976, \$25,000,000 for the fiscal year ending June 30, 1977, \$35,000,000 for fiscal year 1978, \$45,000,000 for fiscal year 1979; \$29,450,000 for the fiscal year ending September 30, 1980, \$32,000,000 for the fiscal year ending September 30, 1981, and \$34,000,000 for the fiscal year ending September 30, 1982. For the purposes of making grants under paragraph (1) there are authorized to be appropriated not more than the following amounts:

| Fiscal year: | Amount |
|--------------|--------------|
| 1987..... | \$37,200,000 |
| 1988..... | 37,200,000 |
| 1989..... | 40,150,000 |
| 1990..... | 40,150,000 |
| 1991..... | 40,150,000 |

[1443(a)(7) amended by PL 96-63; PL 99-339]

"(b)(1) From allotments made pursuant to paragraph (4), the Administrator may make grants to States to carry out underground water source protection programs.

"(2) No grant may be made under paragraph (1) unless an application therefor has been submitted to the Administrator in such form and manner as he may require. No grant may be made to any State under paragraph (1) unless the State has assumed primary enforcement responsibility within two years after the date the Administrator promulgates regulations for State underground injection control programs under section 1421. The prohibition contained in the preceding sentence shall not apply to such grants when made to Indian Tribes.

[1443(b)(2) revised by PL 96-502; amended by PL 99-339]

"(3) A grant under paragraph (1) shall be made to cover not more than 75 per centum of the grant recipient's costs (as determined under regulations of the Administrator) in carrying out, during the one-year period beginning on the date the grant is made, an underground water source protection program.

"(4) In each fiscal year the Administrator shall, in accordance with

regulations, allot the sums appropriated for such year under paragraph (3) among the States on the basis of population, geographical area, and other relevant factors.

"(5) For purposes of making grants under paragraph (1) there are authorized to be appropriated \$5,000,000 for the fiscal year ending June 30, 1976, \$7,500,000 for the fiscal year ending June 30, 1977, \$10,000,000 for each of the fiscal years 1978 and 1979, \$7,795,000 for the fiscal year ending September 30, 1980, \$18,000,000 for the fiscal year ending September 30, 1981, and \$21,000,000 for the fiscal year ending September 30, 1982. For the purpose of making grants under paragraph (1) there are authorized to be appropriated not more than the following amounts:

| Fiscal year | Amount |
|-------------|--------------|
| 1987..... | \$19,700,000 |
| 1988..... | 19,700,000 |
| 1989..... | 20,850,000 |
| 1990..... | 20,850,000 |
| 1991..... | 20,850,000 |

[1443(b)(5) amended by PL 95-63; PL 99-339]

"(c) For purposes of this section:
 "(1) The term 'public water system supervision program' means a program for the adoption and enforcement of drinking water regulations (with such variances and exemptions from such regulations under conditions and in a manner which is not less stringent than the conditions under, and the manner in, which variances and exemptions may be granted under sections 1415 and 1416) which are no less stringent than the national primary drinking water regulations under section 1412, and for keeping records and making reports required by section 1413(a)(3).

"(2) The term 'underground water source protection program' means a program for the adoption and enforcement of a program which meets the requirements of regulations under section 1421 and for keeping records and making reports required by section 1422(b)(1)(A)(ii). Such term includes, where applicable, a program which meets the requirements of section 1425.

[1443(c)(2) amended by PL 96-502]

**Special Study And
 Demonstration Project
 Grants; Guaranteed Loans**

"Sec. 1444. (a) The Administrator may make grants to any person for the purposes of—

"(1) assisting in the development and demonstration (including construction) of any project which will demonstrate a new or improved method, approach, or technology for providing a dependably safe supply of drinking water to the public; and

"(2) assisting in the development and demonstration (including construction) of any project which will investigate and demonstrate health implications involved in the reclamation, recycling, and reuse of waste waters for drinking and the processes and methods for the preparation of safe and acceptable drinking water.

"(b) Grants made by the Administrator under this section shall be subject to the following limitations:

"(1) Grants under this section shall not exceed 66½ per centum of the total cost of construction of any facility and 75 per centum of any other costs, as determined by the Administrator.

"(2) Grants under this section shall not be made for any project involving the construction or modification of any facilities for any public water system in a State unless such project has been approved by the State agency charged with the responsibility for safety of drinking water (or if there is no such agency in a State, by the State health authority).

"(3) Grants under this section shall not be made for any project unless the Administrator determines, after consulting the National Drinking Water Advisory Council, that such project will serve a useful purpose relating to the development and demonstration of new or improved techniques, methods, or technologies for the provision of safe water to the public for drinking.

"(4) Priority for grants under this section shall be given where there are known or potential public health hazards which require advanced technology for the removal of particles which are too small to be removed by ordinary treatment technology.

"(c) For the purposes of making grants under subsections (a) and (b) of this section there are authorized to be appropriated \$7,500,000 for the fiscal year ending June 30, 1975; and \$7,500,000 for the

fiscal year ending June 30, 1976; and \$10,000,000 for the fiscal year ending June 30, 1977.

"(d) The Administrator during the fiscal years ending June 30, 1975, and June 30, 1976, shall carry out a program of guaranteeing loans made by private lenders to small public water systems for the purpose of enabling such systems to meet national primary drinking water regulations prescribed under section 1412. No such guarantee may be made with respect to a system unless (1) such system cannot reasonably obtain financial assistance necessary to comply with such regulations from any other source, and (2) the Administrator determines that any facilities constructed with a loan guaranteed under this subsection is not likely to be made obsolete by subsequent changes in primary regulations. The aggregate amount of indebtedness guaranteed with respect to any system may not exceed \$50,000. The aggregate amount of indebtedness guaranteed under this subsection may not exceed \$50,000,000. The Administrator shall prescribe regulations to carry out this subsection.

[1444(d) amended by PL 99-339]

Records And Inspections

"Sec. 1445. (a)(1) Every person who is a supplier of water, who is or may be otherwise subject to a primary drinking water regulation prescribed under section 1412 or to an applicable underground injection control program (as defined in section 1422(c)), who is or may be subject to the permit requirement of section 1424 or to an order issued under section 1441, or who is a grantee, shall establish and maintain such records, make such reports, conduct such monitoring, and provide such information as the Administrator may reasonably require by regulation to assist him in establishing regulations under this title, in determining whether such person has acted or is acting in compliance with this title, in administering any program of financial assistance under this title in evaluating the health risks of unregulated contaminants, or in advising the public of such risks. In requiring a public water system to monitor under this subsection, the Administrator may take into consideration the system size and the contami-

nants likely to be found in the system's drinking water.

[1445(a) amended by PL 95-190; (a)(1) designated and amended by PL 99-339]

"(2) Not later than 18 months after enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall promulgate regulations requiring every public water system to conduct a monitoring program for unregulated contaminants. The regulations shall require monitoring of drinking water supplied by the system and shall vary the frequency and schedule of monitoring requirements for systems based on the number of persons served by the system, the source of supply, and the contaminants likely to be found. Each system shall be required to monitor at least once every 5 years after the effective date of the Administrator's regulations unless the Administrator requires more frequent monitoring.

[1445(a)(2)-(3) added by PL 99-339]

"(3) Regulations under paragraph (2) shall list unregulated contaminants for which systems may be required to monitor, and shall include criteria by which the primary enforcement authority in each State could show cause for addition or deletion of contaminants from the designated list. The primary State enforcement authority may delete contaminants for an individual system, in accordance with these criteria, after obtaining approval of assessment of the contaminants potentially to be found in the system. The Administrator shall approve or disapprove such an assessment submitted by a State within 60 days. A State may add contaminants, in accordance with these criteria, without making an assessment, but in no event shall such additions increase Federal expenditures authorized by this section.

"(4) Public water systems conducting monitoring of unregulated contaminants pursuant to this section shall provide the results of such monitoring to the primary enforcement authority.

"(5) Notification of the availability of the results of the monitoring programs required under paragraph (2), and notification of the availability of the results of the monitoring program referred to in paragraph (6), shall be given to the persons served by the system and the Administrator.

"(6) The Administrator may waive the monitoring requirement under paragraph (2) for a system which has conducted a monitoring program after January 1, 1983, if the Administrator determines the program to have been consistent with the regulations promulgated under this section.

"(7) Any system supplying less than 150 service connections shall be treated as complying with this subsection if such system provides water samples or the opportunity for sampling according to rules established by the Administrator.

"(8) There are authorized to be appropriated \$30,000,000 in the fiscal year ending September 30, 1987 to remain available until expended to carry out the provisions of this subsection.

"(b)(1) Except as provided in paragraph (2), the Administrator, or representatives of the Administrator duly designated by him, upon presenting appropriate credentials and a written notice to any supplier of water or other person subject to (A) a national primary drinking water regulation prescribed under section 1412(B), an applicable underground injection control program or (C) any requirement to monitor an unregulated contaminant pursuant to subsection (a), or person in charge of any of the property of such supplier or other person referred to in clause (A), (B), or (C), is authorized to enter any establishment, facility, or other property of such supplier or other person in order to determine whether such supplier or other person has acted or is acting in compliance with this title, including for this purpose, inspection, at reasonable times, of records, files, papers, processes, controls, and facilities, or in order to test any feature of a public water system, including its raw water source. The Administrator or the Comptroller General (or any representative designated by either) shall have access for the purpose of audit and examination to any records, reports, or information of a grantee which are required to be maintained under subsection (a) or which are pertinent to any financial assistance under this title.

[1445(b)(1) amended by PL 95-190]

"(2) No entry may be made under the first sentence of paragraph (1) in an establishment, facility, or other property of a supplier of water or other person subject

to a national primary drinking water regulation if the establishment, facility, or other property is located in a State which has primary enforcement responsibility for public water systems unless, before written notice of such entry is made, the Administrator (or his representative) notifies the State agency charged with responsibility for safe drinking water of the reasons for such entry. The Administrator shall, upon a showing by the State agency that such an entry will be detrimental to the administration of the State's program of primary enforcement responsibility, take such showing into consideration in determining whether to make such entry. No State agency which receives notice under this paragraph of an entry proposed to be made under paragraph (1) may use the information contained in the notice to inform the person whose property is proposed to be entered of the proposed entry; and if a State agency so uses such information, notice to the agency under this paragraph is not required until such time as the Administrator determines the agency has provided him satisfactory assurances that it will no longer so use information contained in a notice under this paragraph.

"(c) Whoever fails or refuses to comply with any requirement of subsection (a) or to allow the Administrator, the Comptroller General, or representatives of either, to enter and conduct any audit or inspection authorized by subsection (b) shall be subject to a civil penalty of not to exceed \$25,000.

[1445(c) amended by PL 99-339]

"(d)(1) Subject to paragraph (2), upon a showing satisfactory to the Administrator by any person that any information required under this section from such person, if made public, would divulge trade secrets or secret processes of such person, the Administrator shall consider such information confidential in accordance with the purposes of section 1905 of title 18 of the United States Code. If the applicant fails to make a showing satisfactory to the Administrator, the Administrator shall give such applicant thirty days' notice before releasing the information to which the application relates (unless the public health or safety requires an earlier release of such information).

"(2) Any information required under this section (A) may be disclosed to other

officers, employees, or authorized representatives of the United States concerned with carrying out this title or to committees of the Congress, or when relevant in any proceeding under this title, and (B) shall be disclosed to the extent it deals with the level of contaminants in drinking water. For purposes of this subsection the term 'information required under this section' means any papers, books, documents, or information, or any particular part thereof, reported to or otherwise obtained by the Administrator under this section.

"(e) For purposes of this section, (1) the term 'grantee' means any person who applies for or receives financial assistance, by grant, contract, or loan guarantee under this title, and (2) the term 'person' includes a Federal agency.

"National Drinking Water Advisory Council

"Sec. 1446. (a) There is established a National Drinking Water Advisory Council which shall consist of fifteen members appointed by the Administrator after consultation with the Secretary. Five members shall be appointed from the general public: five members shall be appointed from appropriate State and local agencies concerned with water hygiene and public water supply; and five members shall be appointed from representatives of private organizations or groups demonstrating an active interest in the field of water hygiene and public water supply. Each member of the Council shall hold office for a term of three years, except that—

"(1) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term; and

"(2) the terms of the members first taking office shall expire as follows: Five shall expire three years after the date of enactment of this title, five shall expire two years after such date, and five shall expire one year after such date, as designated by the Administrator at the time of appointment.

The members of the Council shall be eligible for reappointment.

"(b) The Council shall advise, consult with, and make recommendations to, the Administrator on matters relating to activities, functions, and policies of the Agency under this title.

"(c) Members of the Council appointed under this section shall, while attending meetings or conferences of the Council or otherwise engaged in business of the Council, receive compensation and allowances at a rate to be fixed by the Administrator, but not exceeding the daily equivalent of the annual rate of basic pay in effect for grade GS-18 of the General Schedule for each day (including travel-time) during which they are engaged in the actual performance of duties vested in the Council. While away from their homes or regular places of business in the performance of services for the Council, members of the Council shall be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in the Government service are allowed expenses under sections 5703(b) of title 5 of the United States Code.

"(d) Section 14(a) of the Federal Advisory Committee Act (relating to termination) shall not apply to the Council.

"Federal Agencies

"Sec. 1447. (a) Each Federal agency (1) having jurisdiction over any federally owned or maintained public water system or (2) engaged in any activity resulting, or which may result in, underground injection which endangers drinking water (within the meaning of section 1421(d)(2) shall be subject to and comply with, all Federal, State, and local requirements, administrative authorities, and process and sanctions respecting the provision of safe drinking water and respecting any underground injection program in the same manner, and to the same extent, as any nongovernmental entity. The preceding sentence shall apply (A) to any requirement whether substantive or procedural (including any recordkeeping or reporting requirement, any requirement respecting permits, and any other requirement whatsoever), (B) to the exercise of any Federal, State, or local administrative authority, and (C) to any process or sanction, whether enforced in Federal, State, or local courts or in any other manner. This subsection shall apply, not withstanding any immunity of such agencies, under any law or rule of law. No officer, agent, or employee of the United States shall be personally liable for any civil penalty under this title with respect

to any act or omission within the scope of his official duties.

[1447(a) amended by PL 95-190]

"(b) The Administrator shall waive compliance with subsection (a) upon request of the Secretary of Defense and upon a determination by the President that the requested waiver is necessary in the interest of national security. The Administrator shall maintain a written record of the basis upon which such waiver was granted and make such record available for in camera examination when relevant in a judicial proceeding under this title. Upon the issuance of such a waiver, the Administrator shall publish in the Federal Register a notice that the waiver was granted for national security purposes, unless, upon the request of the Secretary of Defense, the Administrator determines to omit such publication because the publication itself would be contrary to the interests of national security, in which event the Administrator shall submit notice to the Armed Services Committee of the Senate and House of Representatives.

"(c)(1) Nothing in the Safe Drinking Water Amendments of 1977 shall be construed to alter or affect the status of American Indian lands or water rights nor to waive any sovereignty over Indian lands guaranteed by treaty or statute.

"(2) For the purposes of this Act, the term 'Federal agency' shall not be construed to refer to or include any American Indian tribe, nor to the Secretary of the Interior in his capacity as trustee of Indian lands.

"Judicial Review

"Sec. 1448. (a) A petition for review of— "(1) actions pertaining to the establishment of national primary drinking water regulations (including maximum contaminant level goals) may be filed only in the United States Court of Appeals for the District of Columbia circuit; and

[1448(a)(1), (2) revised by PL 99-339]

"(2) any other action of the Administrator under this Act may be filed in the circuit in which the petitioner resides or transacts business which is directly affected by the action.

Any such petition shall be filed within the 45-day period beginning on the date of the promulgation of the regulation or issuance of the order with respect to which

review is sought or on the date of the determination with respect to which review is sought, and may be filed after the expiration of such 45-day period if the petition is based solely on grounds arising after the expiration of such period. Action of the Administrator with respect to which review could have been obtained under this subsection shall not be subject to judicial review in any civil or criminal proceeding for enforcement or in any civil action to enjoin enforcement.

"(b) The United States district courts shall have jurisdiction of actions brought to review (1) the granting of, or the refusing to grant, a variance or exemption under section 1415 or 1416 or (2) the requirements of any schedule prescribed for a variance or exemption under such section or the failure to prescribe such a schedule. Such an action may only be brought upon a petition for review filed with the court within the 45-day period beginning on the date the action sought to be reviewed is taken or, in the case of a petition to review the refusal to grant a variance or exemption or the failure to prescribe a schedule, within the 45-day period beginning on the date action is required to be taken on the variance, exemption, or schedule, as the case may be. A petition for such review may be filed after the expiration of such period if the petition is based solely on grounds arising after the expiration of such period. Action with respect to which review could have been obtained under this subsection shall not be subject to judicial review in any civil or criminal proceeding for enforcement or in any civil action to enjoin enforcement.

"(c) In any judicial proceeding in which review is sought of a determination under this title required to be made on the record after notice and opportunity for hearing, if any party applies to the court for leave to adduce additional evidence and shows to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the proceeding before the Administrator, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Administrator, in such manner and upon such terms and conditions as to the court may deem proper. The Administrator may modify his findings as to the facts, or make new

findings, by reason of the additional evidence so taken, and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

"Citizen's Civil Action

"Sec. 1449. (a) Except as provided in subsection (b) of this section, any person may commence a civil action on his own behalf —

"(1) against any person (including (A) the United States, and (B) any other governmental instrumentality or agency to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of any requirement prescribed by or under this title, or

"(2) against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this title which is not discretionary with the Administrator.

No action may be brought under paragraph (1) against a public water system for a violation of a requirement prescribed by or under this title which occurred within the 27-month period beginning on the first day of the month in which this title is enacted. The United States district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce in an action brought under this subsection any requirement prescribed by or under this title or to order the Administrator to perform an act or duty described in paragraph (2), as the case may be.

"(b) No civil action may be commenced—

"(1) under subsection (a)(1) of this section respecting violation of a requirement prescribed by or under this title —

"(A) prior to sixty days after the plaintiff has given notice of such violation (i) to the Administrator, (ii) to any alleged violator of such requirement and (iii) to the State in which the violation occurs, or

"(B) if the Administrator, the Attorney General, or the State has commenced and is diligently prosecuting a civil action in a court of the United States to require compliance with such requirement, but in any such action in a court of the United States any person may intervene as a matter of right; or

"(2) under subsection (a)(2) of this section prior to sixty days after the plaintiff has given notice of such action to the Administrator.

Notice required by this subsection shall be given in such manner as the Administrator shall prescribe by regulation. No person may commence a civil action under subsection (a) to require a State to prescribe a schedule under section 1415 or 1416 for a variance or exemption, unless such person shows to the satisfaction of the court that the State has in a substantial number of cases failed to prescribe such schedules.

"(c) In any action under this section, the Administrator or the Attorney General, if not a party, may intervene as a matter of right.

"(d) The court, in issuing any final order in any action brought under subsection (a) of this section, may award costs of litigation (including reasonable attorney and expert witness fees) to any party whenever the court determines such an award is appropriate. The court may, if a temporary restraining order or preliminary injunction is sought, require the filing of a bond or equivalent security in accordance with the Federal Rules of Civil Procedure.

"(e) Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any requirement prescribed by or under this title or to seek any other relief. Nothing in this section or in any other law of the United States shall be construed to prohibit, exclude, or restrict any State or local government from —

(1) bringing any action or obtaining any remedy or sanction in any State or local court, or

(2) bringing any administrative action or obtaining any administrative remedy or sanction,

against any agency of the United States under State or local law to enforce any requirement respecting the provision of safe drinking water or respecting any underground injection control program. Nothing in this section shall be construed to authorize judicial review of regulations or orders of the Administrator under this title, except as provided in section 1448. For provisions providing for application of certain requirements to such agencies in the same manner as to nongovernmental entities, see section 1447.

[1449(e) amended by PL 95-190]

"General Provisions

"Sec. 1450. (a)(1) The Administrator is authorized to prescribe such regulations as are necessary or appropriate to carry out his functions under this title.

"(2) The Administrator may delegate any of his functions under this title (other than prescribing regulations) to any officer or employee of the Agency.

"(b) The Administrator, with the consent of the head of any other agency of the United States, may utilize such officers and employees of such agency as he deems necessary to assist him in carrying out the purposes of this title.

"(c) Upon the request of a State or interstate agency, the Administrator may assign personnel of the Agency to such State or interstate agency for the purposes of carrying out the provisions of this title.

"(d)(1) The Administrator may make payments of grants under this title (after necessary adjustment on account of previously made underpayments or overpayments) in advance or by way of reimbursement, and in such installments and on such conditions as he may determine.

"(2) Financial assistance may be made available in the form of grants only to individuals and nonprofit agencies or institutions. For purposes of this paragraph, the term 'nonprofit agency or institution' means an agency or institution no part of the net earnings of which inure, or may lawfully inure, to the benefit of any private shareholder or individual.

"(e) The Administrator shall take such action as may be necessary to assure compliance with provisions of the Act of March 3, 1931 (known as the Davis-Bacon Act; 40 U.S.C. 276a-276a(5)). The Secretary of Labor shall have, with respect to the labor standards specified in this subsection, the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 F.R. 3176; 64 Stat. 1267) and section 2 of the Act of June 13, 1934 (40 U.S.C. 276c).

"(f) The Administrator shall request the Attorney General to appear and represent him in any civil action instituted under this title to which the Administrator is a party. Unless, within a reasonable time, the Attorney General notifies the Administrator that he will appear in such action, attorneys appointed by the Administrator shall appear and represent him.

"(g) The provisions of this title shall not be construed as affecting any authority of

the Administrator under part G of title III of this Act.

"(h) Not later than April 1 of each year, the Administrator shall submit to the Committee on Commerce of the Senate and the Committee on Interstate and Foreign Commerce of the House of Representatives a report respecting the activities of the Agency under this title and containing such recommendations for legislation as he considers necessary. The report of the Administrator under this subsection which is due not later than April 1, 1975, and each subsequent report of the Administrator under this subsection shall include a statement on the actual and anticipated cost to public water systems in each State of compliance with the requirements of this title. The Office of Management and Budget may review any report required by this subsection before its submission to such committees of Congress, but the Office may not revise any such report, require any revision in any such report, or delay its submission beyond the day prescribed for its submission, and may submit to such committees of Congress its comments respecting any such report.

"(i)(1) No employer may discharge any employee or otherwise discriminate against any employee with respect to his compensation, terms, conditions, or privileges of employment because the employee (or any person acting pursuant to a request of the employee) has —

"(A) commenced, caused to be commenced, or is about to commence or cause to be commenced a proceeding under this title or a proceeding for the administration or enforcement of drinking water regulations or underground injection control programs of a State,

"(B) testified or is about to testify in any such proceeding, or

"(C) assisted or participated or is about to assist or participate in any manner in such a proceeding or in any other action to carry out the purposes of this title.

"(2)(A) Any employee who believes that he has been discharged or otherwise discriminated against by any person in violation of paragraph (1) may, within 30 days after such violation occurs, file (or have any person file on his behalf) a complaint with the Secretary of Labor (hereinafter in this subsection referred to as the 'Secretary') alleging such discharge or discrimination. Upon receipt of such a complaint, the Secretary shall notify the per-

son named in the complaint of the filing of the complaint.

"(B)(i) Upon receipt of a complaint filed under subparagraph (A), the Secretary shall conduct an investigation of the violation alleged in the complaint. Within 30 days of the receipt of such complaint, the Secretary shall complete such investigation and shall notify in writing the complainant (any person acting in his behalf) and the person alleged to have committed such violation of the results of the investigation conducted pursuant to this subparagraph. Within 90 days of the receipt of such complaint the Secretary shall, unless the proceeding on the complaint is terminated by the Secretary on the basis of a settlement entered into by the Secretary and the person alleged to have committed such violation, issue an order either providing the relief prescribed by clause (ii) or denying the complaint. An order of the Secretary shall be made on the record after notice and opportunity for agency hearing. The Secretary may not enter into a settlement terminating a proceeding on a complaint without the participation and consent of the complainant.

(ii) If in response to a complaint filed under subparagraph (A) the Secretary determines that a violation of paragraph (1) has occurred, the Secretary shall order (I) the person who committed such violation to take the affirmative action to abate the violation, (II) such person to reinstate the complainant to his former position together with the compensation (including back pay), terms, conditions, and privileges of his employment, (III) compensatory damages, and (IV) where appropriate, exemplary damages. If such an order is issued, the Secretary, at the request of the complainant, shall assess against the person against whom the order is issued a sum equal to the aggregate amount of all costs and expenses (including attorneys' fees) reasonably incurred, as determined by the Secretary, by the complainant for, or in connection with, the bringing of the complaint upon which the order was issued.

"(3)(A) Any person adversely affected or aggrieved by an order issued under paragraph (2) may obtain review of the order in the United States Court of Appeals for the circuit in which the violation, with respect to which the order was issued, allegedly occurred. The petition for review must be filed within sixty days from the

issuance of the Secretary's order. Review shall conform to chapter 7 of title 5 of the United States Code. The commencement of proceedings under this subparagraph shall not, unless ordered by the court, operate as a stay of the Secretary's order.

"(B) An order of the Secretary with respect to which review could have been obtained under subparagraph (A) shall not be subject to judicial review in any criminal or other civil proceeding.

"(4) Whenever a person has failed to comply with an order issued under paragraph (2)(B), the Secretary shall file a civil action in the United States District Court for the district in which the violation was found to occur to enforce such order. In actions brought under this paragraph, the district courts shall have jurisdiction to grant all appropriate relief including, but not limited to, injunctive relief, compensatory, and exemplary damages.

[1450(i)(4) amended by PL 98-620]

"(5) Any nondiscretionary duty imposed by this section is enforceable in mandamus proceeding brought under section 1361 of title 28 of the United States Code.

"(6) Paragraph (1) shall not apply with respect to any employee who, acting without direction from his employer (or the employer's agent), deliberately causes a violation of any requirement of this title.

"Sec. 1451. Indian Tribes.

[1451 added by PL 99-339]

"(a) IN GENERAL. — Subject to the provisions of subsection (b), the Administrator —

"(1) is authorized to treat Indian Tribes as States under this title.

"(2) may delegate to such Tribes primary enforcement responsibility for public water systems and for underground injection control, and

"(3) may provide such Tribes grant and contract assistance to carry out functions provided by this title.

[Editor's note: Section 304(e) of PL 99-339 provides:

"(e) STUDY. — The Administrator of the Environmental Protection Agency, in cooperation with the Director of the Indian Health Service, shall, within 12 months after the enactment of this Act, conduct a survey of drinking water on Indian reservations, identifying drinking water prob-

lems and the need, if any, for alternative drinking water supplies."]

"(b) EPA REGULATIONS. —

"(1) Specific Provisions. — The Administrator shall, within 18 months after the enactment of the Safe Drinking Water Act Amendments of 1986, promulgate final regulations specifying those provisions of this title for which it is appropriate to treat Indian Tribes as States. Such treatment shall be authorized only if:

"(A) the Indian Tribe is recognized by the Secretary of the Interior and has a governing body carrying out substantial governmental duties and powers;

"(B) the functions to be exercised by the Indian Tribe are within the area of the Tribal Government's jurisdiction; and

"(C) the Indian Tribe is reasonably expected to be capable, in the Administrator's judgment, of carrying out the functions to be exercised in a manner consistent with the terms and purposes of this title and of all applicable regulations.

"(2) Provisions where treatment as state inappropriate. — For any provision of this title where treatment of Indian Tribes as identical to States is inappropriate, administratively infeasible or otherwise inconsistent with the purposes of this title, the Administrator may include in the regulations promulgated under this section, other means for administering such provision in a manner that will achieve the purpose of the provision. Nothing in this section shall be construed to allow Indian Tribes to assume or maintain primary enforcement responsibility for public water systems or for underground injection control in a manner less protective of the health of persons than such responsibility may be assumed or maintained by a State. An Indian tribe shall not be required to exercise criminal enforcement jurisdiction for purposes of complying with the preceding sentence."

RURAL WATER SURVEY

Sec. 3. (a) The Administrator of the Environmental Protection Agency shall (after consultation with the Secretary of Agriculture and the several States) enter into arrangements with public or private entities as may be appropriate to conduct a survey of the quantity, quality, and availability of rural drinking water supplies. Such survey shall include, but not be limited to, the consideration of the number of residents in each rural area —

(1) presently being inadequately served by a public or private drinking water supply system, or by an individual home drinking water supply system;

(2) presently having limited or otherwise inadequate access to drinking water;

(3) who, due to the absence or inadequacy of a drinking water supply system, are exposed to an increased health hazard; and

(4) who have experienced incidents of chronic or acute illness, which may be attributed to the absence or inadequacy of a drinking water supply system.

(b) Such survey shall be completed within eighteen months of the date of enactment of this Act and a final report thereon submitted, not later than six months after the completion of such survey, to the President and to the Congress. Such report shall include recommendations for improving rural water supplies. [Sec. 3(b) and (c) amended by PL 95-190]

(c) There are authorized to be appropriated to carry out the provisions of this section \$1,000,000 for the fiscal year ending June 30, 1975; \$2,000,000 for the fiscal year ending June 30, 1976; \$1,000,000 for the fiscal year ending June 30, 1977; and \$1,000,000 for each of fiscal years 1978 and 1979.

BOTTLED DRINKING WATER

Sec. 4. Chapter IV of the Federal Food, Drug, and Cosmetic Act is amended by adding after section 409 the following new section:

"BOTTLED DRINKING WATER STANDARDS

"Sec. 410. Whenever the Administrator of the Environmental Protection Agency prescribes interim or revised national primary drinking water regulations under section 1412 of the Public Health Service Act, the Secretary shall consult with the Administrator and within 180 days after the promulgation of such drinking water regulations either promulgate amendments to regulations under this chapter applicable to bottled drinking water or publish in the Federal Register his reasons for not making such amendments."

[Editor's note: Sec. 2(e) of the Safe Drinking Water Amendments of 1977 (PL 95-190) states: "Nothing in this Act shall be construed to authorize the appropriation of any amount for research under title XIV of the Public Health Service Act (relating to safe drinking water)."

Sec. 3(e)(2) of the 1977 amendments states: "Nothing in this Act shall be construed to alter or affect the Administrator's authority or duty under title 14 of the

Public Health Service Act to promulgate regulations or take other action with respect to any contaminant."

Sec. 11(b) of PL 95-190 Provides:

"(b) To the extent that the Administrator of the Environmental Protection Agency deems such action necessary to the discharge of his functions under title XIV of the Public Health Service Act (relating to safe drinking water) and under other provisions of law, he may appointment

personnel to fill not more than thirty scientific, engineering, professional, legal, and administrative positions within the Environmental Protection Agency without regard to the civil service laws and may fix the compensation of such personnel not in excess of the maximum rate payable for GS-18 of the General Schedule under section 5332 of title 5, United States Code."

[See also editor's note at 1-442(a)(1)]

APPENDIX IV

Cost of Emergency Bottled Water Supply

Supplier's Budget Price Quote



January 15, 1987

Hendon Engineering
Box 20348
Birmingham, Al 35216
Att: Dr. Lloyd Robinson

Dear Dr. Robinson:

Thank you for your recent inquiry concerning water service for Whiting Field, Milton, Fl.

It is my understanding that we would be providing water for the following installations:

82 Single family residences
4 Restaurants
67 Buildings (Some not to have dispensers)
500 Officers, B O Q

SERVICES TO BE PRICED AS FOLLOWS:

| | |
|--|--|
| 5-Gallon water | 3.25 Ea. |
| 5-Gallon bottle deposit | 6.00 Ea. (non-glass) Refundable |
| 157 Room Temp dispensers | 2.50 Ea. per month rental |
| 157 Cup dispensers, plastic (Optional metal dispensers) | 1.00 Ea. per month rental 1.25 Ea. per month rental |
| Cups, #42R, Box of 5000 | 39.95 Ea. |

Water dispenser maintenance to be responsibility of Emerald Coast Spring Water Co. Estimated Water use 5370 5-gallon bottles per month. Cup use estimated to be 500,000 per month. (100 cases)

The above agreement is predicated on the following terms:

- a. Warehouse facilities to house water, empties, and other supplies to be furnished by USAF. All deliveries to be made to this central location.
- b. Disbursements of water, cups and other related supplies to be made by USAF.
- c. Empties to be returned to central warehouse facilities by USAF.
- d. Deposits on bottles to be determined at time of each delivery, i.e. we deliver 1000 bottles and pick up 800 empties the difference of 200 additional deposits to be charged. At end of project USAF will pay Emerald Coast Spring Water \$6.00 for each bottle not returned.

January 15, 1987

- e. All installations of water dispensers will be made by Emerald Coast Spring Water.

Response time will be as timely as at all possible. We would be able to respond within 36 hours as far as partial deliveries; however, since this project is only a possibility items such as large quantities of cups and dispensers for the cups would be ordered upon receipt of the order.

Water dispensers are in stock and ready for installation.

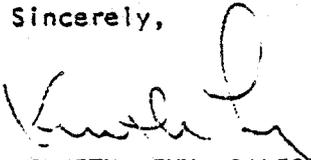
In order that our customers will always receive fresh water we do not keep large quantities of water available; however, we can easily bottle 2000 bottles a day.

It is obvious that the more lead time we have, the more efficiently we can handle this project.

Thank you for your interest in our company.

May I remind you at this time that we are the only approved spring water source in the State of Florida. Emerald Coast Spring Water Co., Inc. is a member of the Florida Bottled Water Association and the International Bottled Water Association.

Sincerely,



KENNETH LEVY, SALES MANAGER
EMERALD COAST SPRING WATER COMPANY, INC.

KL/s

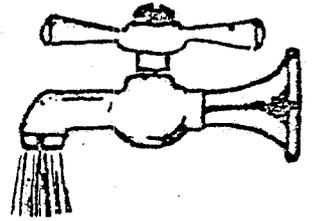
Enclosure: Water Analysis

Copies: File
A R Gibson, President
EMERALD COAST SPRING WATER CO., INC.

the water spigot

WATER AND WASTEWATER ANALYSIS

5806 HIGHWAY 22
 PANAMA CITY, FLORIDA 32404
 (904) 871-1900 - 871-1901
 Laboratory I.D. 81148



System Name: Emerald Springs Water

Address: Panama City, Fl.

Sample Site: Spring water

Date and Time Collected Oct. 11, 1985 10:31 a.m. Collector Peter Brouwer

Check One: 1. Community Public Water System 2. Non-Community Public Water System

Check One: 1. Ground Water 2. Surface Water

Check One: 1. Raw 2. Treated

| PARAMETER | RESULT | PARAMETER | RESULT | PARAMETER | RESULT |
|-----------------|--------|----------------------------|--------|---------------------------------------|--------|
| Arsenic as As | *0.001 | Chloride as Cl | 5.5 | Total Hardness as CaCO ₃ | 27 |
| Barium as Ba | *0.10 | Color* | 0 | Total Alkalinity as CaCO ₃ | 30 |
| Cadmium as Cd | *0.001 | Copper as Cu | 0.003 | N.C.H. as CaCO ₃ | 0 |
| Chromium as Cr | *0.002 | Corrosivity | -1.5 | Bicarbonate as HCO ₃ | 18 |
| Lead as Pb | *0.001 | Foaming Agents | *0.01 | Calcium as Ca | 16.4 |
| Mercury as Hg | *0.001 | Hydrogen Sulfide | - | Magnesium as Mg | 3.0 |
| Selenium as Se | *0.001 | Iron as Fe | 0.025 | Carbon Dioxide as CO ₂ | 11.5 |
| Silver as Ag | *0.001 | Manganese as Mn | 0.002 | Bicarbonate as CaCO ₃ | 30 |
| Nitrate as N | *0.01 | Odor* | 0 | Carbonate as CaCO ₃ | 0 |
| Fluoride as F | 0.14 | pH* | 7.2 | Hydroxide as CaCO ₃ | 0 |
| Turbidity, *NTU | 0.40 | Sulfate as SO ₄ | *5 | Sodium as Na | 1.5 |
| | | Total Solids | 69 | | |
| Endrin | ND | Zinc as Zn | 0.004 | pHs* | |
| Lindane | ND | | | Stability Index* 2pHs-pH | |
| Methoxychlor | ND | | | Saturation Index* pH-pHs | |
| Toxaphene | ND | | | | |
| 2,4-D | ND | | | | |
| 2,4,5 TP Silvex | ND | | | | |
| Trinalomethanes | | | | | |

*less than

ND none detected

NOTE: *All results in mg/l except those denoted.
 Analysis in accordance with Chapter 17-22 FAC,
 Section 104-105.
 Methods are those listed in Standard Methods For The
 Examination of Water and Wastewater, 14th Edition, 1975.

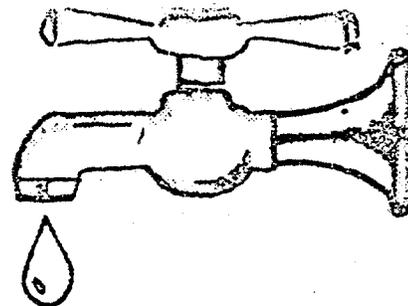
Date and Time Received Nov. 11, 1985 Date Reported

Trust Jackson

water spigot

WATER & WASTE WATER ANALYSIS

5806 HIGHWAY 22
PANAMA CITY, FLORIDA 32404
(904) 871-1900 • (904) 871-1901



LABORATORY CERTIFICATION #81148

System Name Emerald Springs Water Co.
Address Panama City, Fl.
Sample Location spring water
Sample Type grab System I.D. _____
Sample Date October 11, 1985 Sample Time 10:31 a.m.
Collector Peter Brouwer
Sample Received _____ Sample Set-Up _____

The results of analysis are given below:

| | | | | | |
|----------------------|--|-----------------|--|--|--|
| | | | | | |
| | | | | | |
| Chloroform | | *0.001 mg/L | | | |
| Bromodichloromethane | | *0.001 mg/L | | | |
| Dibromochloromethane | | *0.001 mg/L | | | |
| Bromoform | | *0.001 mg/L | | | |
| Total trihalomethane | | *0.003 mg/L | | | |
| Gross Alpha | | 0.3 ± 1.3 pCi/l | | | |
| Gross Beta | | 2.6 ± 1.5 pCi/l | | | |
| | | | | | |
| *less than | | | | | |
| | | | | | |
| | | | | | |

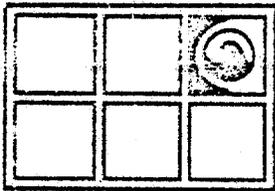
ALL TESTS PERFORMED ACCORDING TO STANDARD METHODS OR EPA APPROVED METHODS IN ACCORDANCE WITH REGULATIONS SET UP BY STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL REGULATION.

Irish Jackson

Cost Estimate

APPENDIX V
Sir Stripping Facility
Lease

Supplier's Description
and
Budget Price Quote



**GROUNDWATER
TECHNOLOGY INC.**

1514 1/2 8th Avenue, Tampa, Florida 33605 (813) 248-2248

16 January 1987

Dr. Lloyd Robinson, Jr.
Hendon Engineering Assoc.
P.O. Box 20348
Birmingham, AL 35216

RECEIVED
JAN 20 1987

RE: Air stripping tower for
Whiting Field, Pensacola
Proposal No: 50-137 Rev 1

HENDON ENGR. ASSOC.

Dear Dr. Robinson:

It was a pleasure talking to you this morning about water treatment system for a potable water well at Whiting field, Pensacola, Florida.

Groundwater Technology, Inc. is both a manufacturing as well as a service company. We design and manufacture air strippers and other water treatment equipment at our manufacturing facility in Greenville, Massachusetts., 1', 2' and 3' diameter stripping towers are standard shelf items that could be provided within short notice. Flow rate above 100 gpm dictates custom design of water treatment equipment and would require a minimum of 6-8 weeks of lead time.

Just over 4 weeks

A 6'-6" dia x 12' tall fiber glass tower is recommended to remove 11 ppb TCE to less than 1 ppb at 700 gpm. The tower will be equipped with a distributor and blower for effective operation of the treatment system.

The total cost of equipment and services to install the airstripping tower is \$48,000 FOB Pensacola, Florida. Delivery: 6-8 weeks after approval of drawings. Installation: 3-5 working days.

We are looking forward to working with you on this job and future water treatment applications.

3 each 3' x 15' tall towers

\$55,000 purchase with pump

lease 910,000

plus 82,300 per month, per tower

*x 3
\$6,400 per month*

cc: Paul F. Putzier

Yours very truly,
GROUNDWATER TECHNOLOGY, INC.

K Senapati

Kiron Senapati
SE Regional Engineer

Enc.

KS/rc

Offices in Massachusetts, Florida, Georgia, Ohio, Colorado, New York, California, Connecticut, Virginia, Michigan, Louisiana, New Hampshire, Texas, Pennsylvania, Canada and Chile

AIR STRIPPER DESIGN SUMMARY

A. TOWER HYDRAULIC INFORMATION:

Design Flow Rate: 700 gpm
Maximum Flow Rate: 1000 gpm
Required Water Pressure: _____ psig

B. EQUIPMENT SUMMARY

1. PACKED TOWER

Shell Diameter 6.5 ft.
Overall Tower Height 12 ft.
Packing Bed Depth 8 ft.
Shell Material FRP DION-IS 6631-T Resin
Sump Capacity 700 gallons
Demister Type and Material POLYPROPYLENE
Distributor Type and Material FRP
Media Support Type and Material FRP
Redistributor Type and Material -

2. PACKED TOWER MEDIA

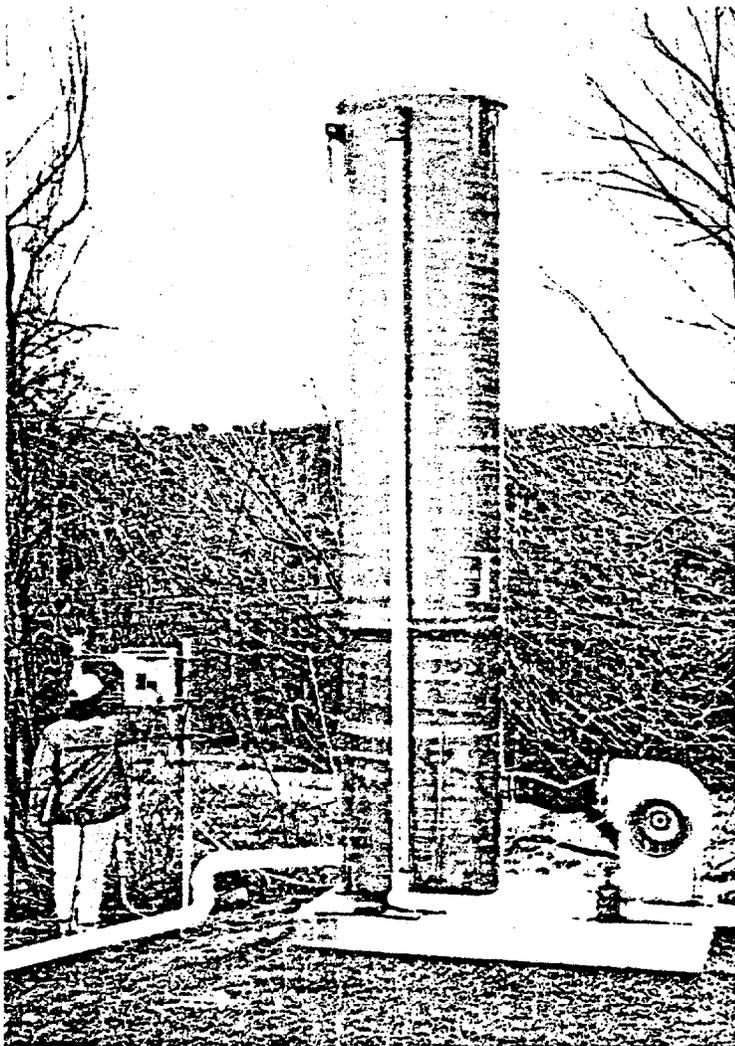
Media Type and Size TRIPAC/2"
Material POLYPROPYLENE
Manufacturer _____
Flooding (or pressure drop/ft.
at Design Conditions) _____

3. FORCED AIR BLOWER

Design Air Flow 17,000 cfm
Air to Water Ratio (vol:vol) 180
Static Pressure
(at Design Conditions) 4" H₂O
Blower Type BI Forced draft
Fan Speed 1015 rpm
Motor Type TEFC
Motor Horsepower 15
Motor Speed 1800 rpm
Motor Electrical
Service Required 460/3Ø/60 HZ

4. PIPING

Influent Piping Connection 8" in. diameter pi
Flanged connection
Effluent Piping Connection 8" in. diameter pi
Flanged connection



OIL RECOVERY SYSTEMS' AIR STRIPPER

Oil Recovery Systems' Air Strippers rapidly and effectively remove dissolved organics from water.

Our Air Strippers provide an economical solution to groundwater and surface water contamination. Continuously and automatically, they reduce dissolved concentrations from parts per million to as low as one part per billion.

Hydrocarbons such as benzene, toluene and xylene and chlorinated solvents such as trichloroethane, trichloroethylene and methylene chloride are slightly soluble in water at normal temperatures and pressures. To remove the dissolved contaminants, Air Strippers force countercurrent air flow against water cascading down through a unique packing material. The Air Stripper causes large surfaces of contaminated water to be exposed to rushing air thus vaporizing the volatile contaminants. The high velocity air flow carries away the contaminants and vents them through the top of the tower.

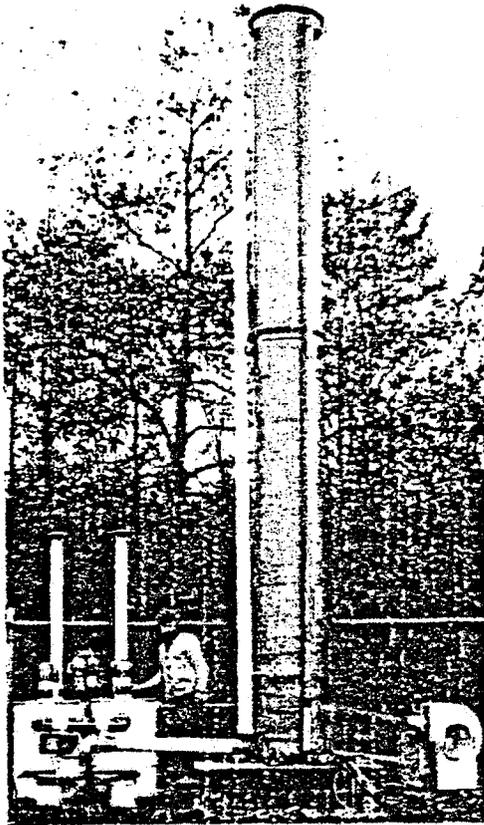
In cases where the vented air is objectionable, a vapor carbon adsorption unit can be supplied as optional equipment.

O.R.S. Air Strippers are used to treat contaminated groundwater, domestic water supplies and industrial process water. The effluent water is usually of a sufficient quality to meet local and state discharge requirements.

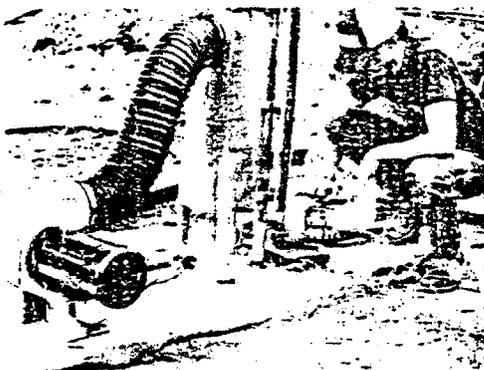


OIL RECOVERY SYSTEMS'

AIR STRIPPER



An O.R.S. Air Stripper with optional vapor treatment cleaning water contaminated by tetrachloroethylene.



O.R.S. stainless steel Air Strippers are used in pilot studies.

FEATURES

EFFICIENT OPERATION

- Controls:** Adjustable air to water ratio increases efficiency of removing contaminants.
- Installation:** Light weight, and easy to install. Air Strippers can be deployed either permanently or temporarily.
- Recirculation:** Optional package recycles water through tower for greater removal rates.
- Tower Extensions:** Optional flanged tower extensions for greater packing area and greater removal rates.

RELIABLE EQUIPMENT

- Safe, Automatic and Continuous Operation:** Explosion proof controls. Air Strippers operate continuously and are fully automatic.
- Corrosion Resistant:** Constructed of fiberglass reinforced plastic (FRP) or stainless steel. Withstands corrosion from acids, bases and most solvents.
- Integral Sump:** Built in to control water discharge and recirculation. Sight tube shows water level in sump.
- Wind Resistant:** Designed to withstand wind loads of up to 100 mph. Guy wire assemblies provide additional support for tower extensions.
- Automatic Shut Down Air Flow Monitor:** Optional feature to shut down influent pump in the event of a loss of air flow. Prevents discharge of untreated water.

STATE OF THE ART TECHNOLOGY

- Pilot Studies:** Include laboratory analyses and on-site feasibility studies prior to installing a full scale system.
- Heat Assisted Removal:** Optional heating system heats influent water to increase removal rates of less volatile compounds such as alcohols and ketones.
- Vapor Treatment:** Optional carbon adsorption units treat effluent air.
- Influent Water Pre-treatment:** Optional influent water treatment keeps packing material clean. Uses bacterial disinfection and mineral precipitation.

O.R.S. TYPICAL AIR STRIPPING EFFICIENCIES

| CONTAMINANT | INFLUENT (PPM) | EFFLUENT (PPM) | REMOVAL |
|----------------------|----------------|----------------|---------|
| Benzene | 0.420 | 0.003 | >99% |
| Toluene | 2.6 | 0.026 | 99% |
| Xylenes) | 0.25 | 0.007 | 97% |
| Trichloroethylene | 21.0 | 0.086 | >99% |
| 1,2 Dichloroethylene | 1.2 | 0.0074 | 99% |

SPECIFICATIONS

| MODEL | 1109004 | 1109005 | 1109001 | 1109002 | 1109003 |
|----------------------------------|----------|----------|-----------|------------|------------|
| Diameter | 1' | 1' | 2' | 3' | 4' |
| Height | 17' | 23' | 12.5' | 15' | 18.5' |
| Material | FRP | SSTL | FRP | FRP | FRP |
| Packing Height | 14' | 14' | 8.5' | 8.5' | 8.5' |
| Water Flow Range | 3-25 gpm | 3-25 gpm | 15-60 gpm | 30-175 gpm | 80-400 gpm |
| Influent/Effluent Plumbing (NPT) | 1"1/3" | 1"1/3" | 2"1/3" | 3"1/4" | 4"1/6" |
| Blower Hp | 1 Hp* | 1 Hp* | 1 Hp* | 1 Hp* | 3 Hp* |
| Typical Air Flow | 500 cfm | 600 cfm | 600 cfm | 1000 cfm | 2500 cfm |
| Voltage | 115/230 | 115/230 | 115/230 | 115/230 | 230/460 |

* Influent water quality may require different components.



OIL RECOVERY SYSTEMS
GROUNDWATER TECHNOLOGY, INC.

220 Norwood Park South, Norwood, MA 02062

Cost Estimate

APPENDIX VI
Activated Carbon Adsorption Facility
Lease

Supplier's Description
and
Budget Price Quote



CALGON CARBON CORPORATION BENCHMARK I BUILDING SUITE 804 13430 NORTHWEST FREEWAY HOUSTON, TX 77040-6071 (713) 690-2000

January 15, 1987

RECEIVED
JAN 20 1987

HENDON ENGR ASSOC.

Dr. Lloyd Robinson
HENDON ENGINEERING ASSOCIATES
P. O. Box 20348
1025 Montgomery Hwy
Vestavia Hills
Birmingham, Alabama 35216

RE: Budget Estimate for Calgon Temporary Service

Dear Dr. Robinson:

Based upon our recent telephone conversation, Calgon is pleased to provide Hendon Engineering with a budget estimate for temporary potable water treatment service. As we discussed, carbon is being considered for the removal of 11 ppb of trichloroethylene from a 700 gpm well water stream at NAS Whiting Field in Milton, Florida.

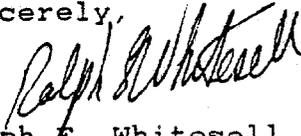
The attached Calgon Carbon Service Budget Estimate further describes equipment and services which would be required for this project. Estimated prices for the Calgon Carbon Service are included in this attached budget proposal.

Equipment described in the attached proposal could be on-site and operating within five days from notice to proceed. Calgon presently has suitable equipment in inventory to initiate this project immediately. However, it should be noted that this equipment is available on a first come, first serve basis only. Calgon can offer no guarantee that equipment will be available at a future time.

Dr. Lloyd Robinson
HENDON ENGINEERING ASSOCIATES
January 15, 1987

If there are any questions concerning this proposal,
please call at any time.

Sincerely,



Ralph E. Whitesell, P.E.
Technical Sales Representative

REW:lh
Attachment

cc: Mike Goldston
Naval Facilities Engineering Command
2155 Eagle Dr., Post Office Box 10068
Charleston, SC 29411

ITEM NO. 1

PROPOSAL NO. 87-001

CALGON SERVICE - BUDGET ESTIMATE
DUAL MODULE ADSORPTION SYSTEM

for

NAS WHITING FIELD
MILTON, FLORIDA

Prepared By

Ralph E. Whitesell, P.E.
Technical Sales Representative

CALGON CARBON CORPORATION
13430 NORTHWEST FREEWAY, SUITE 804
HOUSTON, TEXAS 77040

JANUARY 15, 1987

CALGON CARBON SERVICE BUDGET ESTIMATE

1. Calgon Carbon could supply products and services for the removal of trichloroethylene from a 700 gpm well water stream at NAS Whiting Field located in Milton, Florida. Calgon Carbon could provide for use by NAS Whiting Field, products, services, equipment, and transportation necessary to setup, make operable, and subsequently dismantle a granular carbon adsorption system.
2. Calgon Carbon's responsibilities are further defined in Exhibit I and NAS Whiting Field's responsibilities are further defined in Exhibit II.
3. The fees for the services and use of the equipment outlined in Exhibit I are estimated as follows:

| | | |
|--|-----------------|---|
| Set Up Fee | <u>\$65,000</u> | (payable in first month) |
| Removal Fee | <u>\$ 5,000</u> | (payable at project termination) |
| Monthly Service Fee | | |
| Dual Module | <u>\$ 5,000</u> | (payable after the first month) |
| (Extra) Carbon Fee/TL Delivered including Freight | <u>\$18,500</u> | (payable as carbon is delivered) |
| Spent Carbon Reactivation Fee (if RCRA manifested) | <u>\$ 2,000</u> | (per truckload - also applies to termination fee) |

4. Before Calgon Carbon would accept the Calgon Carbon spent activated carbon for reactivation, appropriate testing and review must be conducted. The costs of such testing are included in the set-up charges. If the spent carbon is not officially accepted for reactivation, disposal of the spent activated carbon would be the responsibility of NAS Whiting Field and the charges for Calgon Carbon spent carbon reactivation above will not be applicable. NAS Whiting Field will, however, provide any information required by Calgon Carbon relative to such carbon acceptance. Calgon Carbon reserves the right to reject any and all carbon if in its sole judgment it is unsuitable for reactivation.

EXHIBIT I

RESPONSIBILITIES OF CALGON CARBON CORPORATION:

1. Instructions for site preparation.
2. One Dual Module Adsorption System consisting of two 10 ft. diameter Skid Mounted Adsorption Vessels.
3. Initial carbon fill consisting of 40,000 pounds of Calgon Filtrasorb 300 activated carbon.
4. System delivery and removal transportation.
5. Supervision of system installation and removal.
6. Start-up assistance.
7. Operator training.
8. On-going carbon delivery.
9. On-going carbon removal if spent carbon is accepted by Calgon Carbon for reactivation.
10. Initial carbon handling and transfer.
11. Carbon acceptance testing.
12. Major maintenance of the Adsorption System.
13. Continuing technical consultation and assistance.

EXHIBIT II

RESPONSIBILITIES OF NAS Whiting Field

1. Crane as required for installation and removal of the Adsorption System.
2. Site preparation - concrete pad or 18 inch coarse gravel ballast with railroad ties to set carbon system.
3. Site space with truck access, transfer motive water and drainage point access.
4. Installation and removal labor.
5. Influent to Adsorption System - minimum 25 psig, maximum 70 psig at 700 gpm (parallel mode of operation, 350 gpm per vessel).
6. Influent and effluent piping or hose to and from battery limits, and flow control, as required.
7. Utilities to the battery limits and utility costs.
 - A. Air at 15 psig and 80 to 100 SCFM for each carbon transfer.
 - B. Water at approximately 100 gpm for about forty (40) minutes for each carbon transfer to and from Adsorption System to Calgon Carbon's trailer.
8. Day-to-day operation and minor maintenance of the Adsorption System.
9. Carbon handling and transfer assistance as required.
10. Filtration or other pretreatment, if required.
11. Winterization or housing of the Adsorption System, if required.
12. If in the opinion of Calgon Carbon, and/or if required by any governmental law, regulation or order, the Calgon Carbon Adsorption System is contaminated so as to require decontamination of the Adsorption System, such costs shall be to the account of the Subscriber. Further, if the contamination of the Adsorption System is of such nature as to render decontamination impractical, thus requiring disposal or destruction of the Adsorption System, NAS Whiting Field shall purchase the Adsorption System at a fair market value to be mutually agreed upon.

Cost Estimate

APPENDIX VII

Draft Technical Specifications
Lease of Air Stripping Facilities

SPECIFICATIONS
FOR
TOTAL SERVICES FOR SUPPLY, INSTALLATION,
MAINTENANCE AND TESTING
OF
AN AIR STRIPPING SYSTEM
FOR
THE WEST WATER SUPPLY WELL
AT
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

POSSIBLE BIDDERS

| | |
|--|--|
| Calgon Carbon Corp. | 13430 Northwest Freeway Suite 804 Houston, Texas 77040 |
| Croll-Reynolds | P. O. Box 668 Westfield, New Jersey 07091 |
| Delta Cooling Towers | 114 Clinton Road P. O. Box 952 Fairfield, New Jersey 07007 |
| Groundwater Technology, Inc. | 1514½ 8th Avenue Tampa, Florida 33605 |
| HCT | 325 Lennon Lane, Suite 200 Walnut Creek, California 94598 |
| IPC Systems, Inc. | 39 Riverside Avenue Westport, Connecticut 06880 |
| North East Environmental Products, Inc. | P. O. Box 2287 Concord, New Hampshire 03301 |
| R. E. Wright Associates, Inc. | 3240 Schoolhouse Road Middletown, Pennsylvania 17057 |

To perform the services requested will require:

1. Immediate availability of the equipment required.
2. Ability to install the equipment on short notice.
3. Availability to make routine operational inspection and perform routine maintenance on a monthly basis.
4. Available for emergency repair service within 24 hours.

SECTION 1 - DESCRIPTION AND GENERAL INFORMATION

1-01. Description

The Contractor shall provide, install, maintain and test all equipment necessary to treat and repump water from the west well at NAS Whiting Field, Milton, Florida for a period of twelve (12) calendar months from the date that the equipment is placed in full service. Option to extend for two (2) additional one (1) year periods. All equipment shall be installed and placed in full service within fifteen (15) days from the date of a resulting contract.

1-02. Scope

- (a) The Contractor shall provide and install all equipment necessary to treat and repump water for a period of twelve (12) calendar months.
- (b) The Contractor shall supply the necessary periodic inspections and maintenance services stipulated in these specifications to insure the effectiveness and performance of the contract facilities for a period of twelve (12) calendar months.
- (c) The Contractor shall provide certified analyses of trichloroethylene (TCE) concentrations on a monthly basis for:
 - 1. Water from the west well prior to treatment.
 - 2. Water after treatment in air stripping tower(s) prior to pumping into the water distribution system.

1-03. General Requirements

- (a) The Contractor shall supply as a minimum to insure sufficient treatment and adequate supply of water from the west well into the water distribution system the following:
 - 1. One or more air stripping towers with required ancillary blowers.
 - 2. Repumping facilities necessary to inject the treated water into the water distribution system.
 - 3. Piping, valves and electrical wiring and switch gear necessary to operate the air stripping and repumping facilities in concert with the west well pump and motor.
 - 4. Relocation of existing disinfection and water stabilization injection piping to a point after air stripping and prior to injection into the water distribution system.

5. Chain link fence around the air stripping and repumping facilities compatible with the chain link fence around the west well pump and motor.
- (b) The Contractor shall inspect and service the air stripping tower(s), blower(s), and repumping facilities as often as needed and at least one (1) time per calendar month.
- (c) The Contractor shall provide certified analyses for TCE at least one (1) time per calendar month for:
 1. Raw water from the west well.
 2. Treated water after air stripping and prior to disinfection and stabilization.
- (d) The Contractor's field engineer shall provide the Project Officer or NAS designated alternate with a handwritten report of his observations and actions taken during each inspection and service visit, including any required further actions, prior to his leaving the site.
- (e) Within thirty (30) calendar days after an inspection, the Contractor shall provide a formal report including certified reports of chemical analyses to the Project Officer with copies to designated additional NAS and Southern Division personnel.
- (f) In the event of equipment failure, the Contractor's field engineer shall visit the site within twenty-four (24) hours of notification by NAS and shall arrange to have the facilities back in full operation within a maximum of seven (7) calendar days.
- (g) In the event of equipment failure, the Contractor's field engineer prior to leaving the site shall provide a handwritten report to the Project Officer or NAS designated alternate detailing the problem, its cause and remedial and preventative measures taken.
- (h) Within thirty (30) calendar days of the correction of an equipment failure, the Contractor shall provide a formal report to the Project Officer with copies to designated additional NAS and Southern Division personnel detailing the problem, its cause and remedial and preventative measures taken.

SECTION 2 - TECHNICAL REQUIREMENTS FOR AIR STRIPPING AND REPUMPING FACILITIES

2-01. Description

This section of the specifications sets forth certain specific requirements required for the treatment and repumping of water from the west well at NAS Whiting Field. These specific requirements are considered as minimum requirements and are not intended to limit or restrict the Contractor in the performance of providing a complete treatment and repumping service.

2-02. Air Stripping Tower(s)

The Contractor shall furnish, install and maintain one or more air stripping towers and air blowers designed and sized to the Contractor's criteria with a capacity to continuously provide:

(a) Treatment requirements:

1. Maximum anticipated TCE concentration of raw water - 11 ug/L.
2. Design capability for maximum TCE concentration of raw water - 22 ug/L.
3. Required maximum concentration level (MCL) of water treated by air stripping prior to addition of disinfection and stability chemicals - 1 ug/L TCE.

(b) Water flow capacity:

1. 700 gallons per minute (gpm) or 1.008 million gallons per day (MGD).

2-03. Repumping Facilities

The Contractor shall furnish, install and maintain one (1) pump and its required ancillary equipment designed and sized to the Contractor's criteria with a capacity to continuously match the output of the west well and inject water pumped by the west well through the air stripping tower(s) into the water distribution system based on the following:

(a) Flow - 700 gpm nominal.

(b) Discharge pressure into the water distribution system based on the following:

1. Static head - 123 feet.
2. Pump discharge pressure - 52 to 55 psi.

2-04. Miscellaneous Requirements

The Contractor shall inspect the site available adjacent to the west well at NAS Whiting Field and, based on this inspection, will be responsible for provision, location, design, and installation of the following:

(a) General Equipment

1. Air stripping tower(s) and blower(s).
2. Repumping facilities.

(b) Ancillary Equipment

1. Piping and valves.
2. Electrical wiring and equipment.
3. Chain link fencing.
4. Sampling taps.

2-05. Rental Payments and Reliability

Monthly rental payments will be proportionally reduced for any continuous period or total period in any one (1) calendar month which exceeds seven (7) days.

2-06. Equipment Removal and Site Restoration

Upon termination of this contract, the Contractor shall remove all his equipment and return the site to its prior condition.

APPENDIX VIII

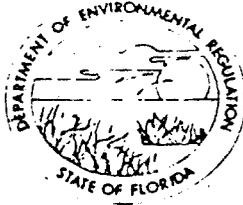
Correspondence Concerning West Well

Letter From
Florida Department of Environmental Regulation
Officially Notifying NAS of Well Contamination

DEPARTMENT OF ENVIRONMENTAL REGULATION

29
JLK
PWE P

NORTHWEST DISTRICT
160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501-5794



BOB GRAHAM
GOVERNOR
VICTORIA J. TSCHINKEL
SECRETARY
ROBERT V. KRIEGL
DISTRICT MANAGER

September 26, 1986

R. A. Kechter
Commander, CEC, USN
Public Works Officer
Naval Air Station
Whiting Field
Milton, Florida 32570

Dear Commander Kechter:

The Department received information by phone on September 25 regarding the recent sampling of the NAS Whiting Field water supply wells done by the Santa Rosa County Health Unit and analyzed by the DHRS Jacksonville Central Lab.

The results showed that benzene was found in the South well at a concentration of 29.6 ug/l and trichloroethylene (PCE) was found in the West well at a concentration of 7.9 ug/l. The maximum contaminant level (MCL) in Florida Administrative Code Rule 17-22.104(1)(g) for these volatile organics are 3 ug/l for benzene and 3 ug/l for PCE.

As discussed in our telephone conversation on September 25, the South well shall remain off line and the West well immediately removed from service. These wells shall remain out-of-service until it can be demonstrated that all parameters meet the requirements in Rule 17-22 and/or appropriate treatment is provided.

In our telephone conversation you mentioned your concern regarding adequate water supply for fire protection. I strongly recommend that you immediately develop and implement an extensive water conservation program.

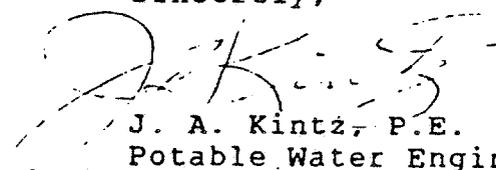
* note: Trichloroethylene is abbreviated TCE.
PCE is Tetrachloroethylene (Perchloroethylene).
** MCL for benzene is actually 1ug/l. JLR

In my letter of August 28, it was requested that you sample each of your potable water wells and take two samples from the distribution system (representative, after blending) for the volatile organics in Rule 17-22.104(1)(g), F.A.C. It was requested that this sampling and analysis be accomplished as soon as possible. In your letter of September 8, it was stated that Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina would be contacting me directly regarding the additional sampling and analysis. I was just contacted by Sonny Chestnut of Southern Division on September 26. It is extremely important that appropriate action be initiated and accomplished in an expeditious and timely manner.

We are extremely interested in the Navy developing plans for an alternate water supply source and/or providing treatment for the existing wells.

If you have any questions on the above, please do not hesitate to call me at 904/436-8380.

Sincerely,



J. A. Kintz, P.E.
Potable Water Engineer

JAK/jkc

cc: Helen Setchfield
Tracey Andreae
D. R. Spell, P.E.
Santa Rosa County Health Unit

Letter From NAS

Requesting Permission to Reactivate the West Well



DEPARTMENT OF THE NAVY

COMMANDING OFFICER
NAVAL AIR STATION
WHITING FIELD
MILTON FLORIDA 32570 5000



11300

Ser 18300/ 354

Mar 3, 87

Mr. John A. Kintz, P.E.
Potable Water Engineer
State of Florida
Department of Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Dear Mr. Kintz:

During a meeting on February 13, 1987 with Mr. Otto Prochaska of DER, Mr. Danny Locklear of NAS Whiting Field, Dr. Lloyd Robinson of Hendon Engineering Associates, Inc., and yourself, we indicated our desire to reactivate the west water well. This well has not been used for water supply since a phone call from your office on 25 September 1986 and a confirming letter dated 26 September 1986 indicated the presence of trichloroethylene in excess of the maximum contaminant level (MCL) of 3 micrograms per liter as specified in the Florida Administrative Code, Chapter 17-22, "Public Drinking Water Systems," Section 17-22.104(1)(g), "Volatile Organics."

Samples taken from the west well on 10 December 1986 after a 20-minute pumping period and on 9 January 1987 after a 45-minute pumping period were analyzed and found to contain only trace amounts of trichloroethylene. It is therefore requested that DER authorize reactivation of this well under the conditions outlined below. Conditional procedures numbers one through four as follows will begin on Monday, March 2, 1987.

1. The well will be pumped to waste daily for a period of 14 days on a pumping schedule approximating the time-of-operation and flow volume during the same time period of the in-service north potable water supply well.

2. At the end of the 14-day period, the west well water will be tested for trichloroethylene.

3. The well will continue pumping to waste for an additional 7 days on the same schedule.

4. The west well water will again be tested for trichloroethylene.

5. If the trichloroethylene concentration of the west well is found to be less than 1 microgram per liter in both samples, and as soon as authorization from DER is received, the well will be reactivated subject to the following conditions:

a. Operate the west well on a regular rotation schedule with the north well.

b. Analyze a sample for trichloroethylene after each 1,000,000 gallons of water is pumped into the water distribution system for a period of 30 days and obtain analytical results within 24 hours. Report findings to DER by phone followed by confirming letter.

c. After 30 days, analyze a sample for trichloroethylene every 2 weeks for a period of 60 days and report as above.

d. After 90 days, analyze a sample for trichloroethylene every 30 days and report as above.

e. Every 90 days, analyze a sample for all regulated organic chemicals and report to DER as soon as the analysis becomes available.

f. Should any sample be found to contain in excess of 2 micrograms per liter of trichloroethylene or exceed any organic chemical MCL, the well will be immediately removed from the distribution system and 1,000,000 gallons pumped to waste.

g. If a sample taken after the above pumping period is found to be within the above limits, the well will be returned to service but the sampling schedule will revert to the sequence described in (b) above.

h. If the sample taken in accordance with (g) above is found to exceed any of the limits set forth in (f), the well will be removed from service until appropriate treatment facilities are installed.

Should you have any questions concerning this request, please contact Mr. Danny Locklear at NAS Whiting Field, (904) 623-7181.

Sincerely,

R. A. KECHTER
Commander, U.S. Navy
By direction of the
Commanding Officer

APPENDIX IX

Air Stripping Facility
Purchase

Physical Description
of
Air Stripping Facility

Air Stripping Facility
Groundwater Technology, Inc.
17 March 1987

LRR

Project No. 808-15

Ltr 16 January 1987

6'6" dia x 12' tall fiberglass tower
Delivery: 6-8 Weeks
Installation: 3-5 Days
Installed Cost: \$48,000

Phone call from Kiron Senapati 16 March 1987 (Appendix V)

Blower: 20 HP, 17,000 scfm, 4" Static Pressure
Pump: 30 HP, 700 gpm, 40 psi
Packing: 265 cu.ft.
Change: 2 years Cost: \$3,000
Labor: \$500
Tank Material: Food Grade Fiber Glass, FDA approved, UV Protection
Incorporated

Phone call from Joseph W. Eshelman, Jr., Eshelman Southeastern
16 March 1987

Hypochlorinator System
Capacity: 3 gal/hr. Installed Cost: \$900 + \$600 = \$1,500
NaOCl: \$1.50/gallon

RPT10/U3

Estimated Cost
of
Air Stripping Facility

Air Stripping Facility
Cost Estimate
NAS Whiting Field, Milton, Florida
17 March 1987

LRR

Project No. 808-15

Capital Cost

| | |
|--|-----------------|
| Stripping Tower | \$48,000 |
| Pad, Fence, Electrical and Engineering | 15,000 |
| Hypochlorinator | 900 |
| Installation of Hypochlorinator | 600 |
| Total Capital Cost | <u>\$64,500</u> |

O & M Costs

Current well pumping time
3264 hrs/year

Time per year per well with two wells available - Year 1
 $3264 \div 2 = 1632$ 2,000 hrs/year - Year 1

Power for Blower and Repumping

20 HP + 30 HP = 50 HP = 37.3 KW

37.3 KW x 2,000 hrs. x \$0.05/KWH = \$3,700/year - Year 1

Estimated time per year per well with three wells available - Year 20

$365 \times 24 \div 2 = 4,380$ 5,000 hrs/year Year 20

37.3 KW x 5,000 hrs x \$0.05/KWH = \$9,300/yr - Year 20

Pump and Blower O & M

Labor - 500 MH/yr @ \$15.00/hr - \$7,500/year

Materials and Supplies - \$1,000/year

Hypochlorinator

Time of operation per year - Year 1

2,000 hrs/year $\div 4 = 500$ hrs/year - Year 1

Hypochlorite Feed

500 hrs/year at 3 gal/hr = 1,500 gal/yr - Year 1

Cost: 1,500 gal/yr x \$1.50/gal = \$2,300/year - Year 1

Time of operation per year - Year 20

5,000 hrs/year $\div 4 = 1,250$ hrs/year - Year 20

1,250 hrs/year at 3 gal/hr = 3,800 gal/year - Year 20

Cost: 3,800 gal/yr x \$1.50/gal = \$5,700/year - Year 20

Labor - 100 MH/yr @ \$15.00/hr = \$1,500/year

Stripping Tower O & M

General Labor - 100 MH/yr @ \$15.00/hr = \$1,500/year

Media Replacement

Required every 2 years

$20 \div 2 = 10$ times -1 = 9 replacements

Cost per replacement

\$3,000 material + \$ 500 - \$3,500/replacement

Cost: \$3,500 x 9 = \$31,500 - Total

$\$31,500 \div 20 =$ \$1,600/year Media Replacement

Chemical Analyses

Trichloroethylene (TCE)

Samples required - Raw water + treated water

Monthly: $(1+1) \times 12 = 24$ samples/year

Cost: $\$90/\text{sample} \times 24 = \underline{\$2,200/\text{year}}$

VOC's plus SOC's

Samples required - Raw water

Quarterly: $1 \times 4 = 4$ samples/year

Cost: $\$850/\text{sample} \times 4 = \underline{\$3,400/\text{year}}$

O & M Cost Summary

| <u>Item</u> | <u>Year 1</u> | <u>Year 20</u> |
|------------------------|---------------|----------------|
| Power | \$ 3,700 | \$ 9,300 |
| Pump and Blower O & M | | |
| Labor | 7,500 | 7,500 |
| Materials and Supplies | 1,000 | 1,000 |
| Hypochlorite | | |
| Chemicals | 2,300 | 5,700 |
| Labor | 1,500 | 1,500 |
| Stripping Tower | | |
| General Labor | 1,500 | 1,500 |
| Media Replacement | 1,600 | 1,600 |
| Chemical Analyses | | |
| TCE | 2,200 | 2,200 |
| VOC's and SOC's | <u>3,400</u> | <u>3,400</u> |
| Total | \$24,700 | \$33,700 |

APPENDIX X

Activated Carbon Adsorption Facility
Purchase

Physical Description
of
Activated Carbon Adsorption Facility

Activated Carbon Adsorption Facility
Calgon Carbon Corporation
17 March 1987

LRR

Project No. 808-15

Ltr 16 March 1987 (Attached)

Installed Cost: \$75,000

Phone Call to Ralph Whitesell 16 March 1987

Carbon Replacement Cost: \$16,000

Required: Every 2 years

Ltr 11 March 1987 (Attached)

10' Dia x 10' tall carbon steel vessel

Ltr 13 January 1987 to Escambia County Utilities Authority (Attached)

Delivery: 16 Weeks (Can be reduced)

Cost of Carbon Adsorber only: \$54,900



CALGON CARBON CORPORATION BENCHMARK I BUILDING SUITE 804 13430 NORTHWEST FREEWAY HOUSTON, TX 77040-6071 (713) 690-2000

March 16, 1987

RECEIVED

MAR 17 1987

Dr. Lloyd Robinson
HENDON ENGINEERING ASSOCIATES
1025 Montgomery Hwy.
Vestavia Hills
Birmingham, Alabama 35216

HENDON ENGR. ASSOC.

RE: Budget Estimate
NAS Whiting Field
Milton, Florida (Revised)

Dear Dr. Robinson:

As we discussed, we are revising the cost estimate previously provided in a letter dated March 11, 1987. The estimated cost for a fully installed adsorption system as described in this letter dated March 11 is Seventy-Five Thousand Dollars (\$75,000). This estimate has been revised downward after receiving a definitive quotation from our subcontractor located in Pensacola, Florida.

All other information contained in the March 11, 1987 letter remains unchanged. If I may be of further assistance, please do not hesitate to call.

Sincerely,

CALGON CARBON CORPORATION

Ralph Whitesell

Ralph E. Whitesell, P.E.
Technical Sales Representative

REW:lh

by LH



CALGON CARBON CORPORATION

CALGON CARBON CORPORATION BENCHMARK I BUILDING SUITE 804 13430 NORTHWEST FREEWAY HOUSTON, TX 77040-6071 (713) 690-2000

March 11, 1987

RECEIVED

MAR 13 1987

Dr. Lloyd Robinson
HENDON ENGINEERING ASSOCIATES
1025 Montgomery Hwy.
Vestavia Hills
Birmingham, Alabama 35216

HENDON ENGR. ASSOC.

RE: BUDGET ESTIMATE:NAS WHITING FIELD, MILTON, FL

Dear Dr. Robinson:

As we have discussed by telephone, Calgon is providing Hendon Engineering with a budget estimate for the treatment of a 600 gpm well water supply. The attached Exhibit A details services and equipment which could be provided by Calgon Carbon on a turn key basis. The well water is contaminated with approximately 11 ppb of trichloroethylene. The well is located at NAS Whiting Field in Milton, Florida.

We believe that installation of carbon adsorption equipment is the most cost effective solution for treatment of this well water. As you are aware, carbon has inherent advantages over air stripping technology. The carbon adsorption system will not require repumping of the treated effluent as will air stripping. Additionally, carbon adsorption is a passive treatment technology without the noise created in air stripping. Finally, carbon adsorption technology allows for thermal destruction of the adsorbed contaminants instead of discharge of the contaminants into the atmosphere as is the case with air stripping.

The estimated cost for a fully installed carbon adsorption system as described in Exhibit A is Ninety-five Thousand Dollars (\$95,000). Calgon is presently installing similar adsorption equipment for the Escambia County Utilities Authority in Pensacola, Florida.

Dr. Lloyd Robinson
HENDON ENGINEERING ASSOCIATES
March 11, 1987

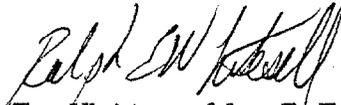
Page 2

Attached is a recommended specification (Exhibit B) for your review. Use of this specification will insure that the Navy will receive quotations only from qualified vendors.

If you have any questions, please do not hesitate to call.

Very truly yours,

CALGON CARBON CORPORATION



Ralph E. Whitesell, P.E.
Technical Sales Representative

REW:lh



CALGON CARBON CORPORATION P.O. BOX 717 PITTSBURGH, PA 15230-0717 (412) 787-6700 TELEX 671 1837 CCC PGH

Writer's Direct Dial Number
412-787-6738

Ludwig
Op

January 13, 1987

ESCAMBIA COUNTY UTILITIES AUTHORITY
401 West Government Street
Pensacola, FL 32501

Attn: Mr. Ken Evans

RE: GAC Filter Proj. W-0086-1011

Dear Ken:

In response to your letter dated 1/8/87 to our Mr. V.A. Brunotts concerning treatment facilities for one 500 GPM well, we offer the following:

- * One Model 10 adsorber vessel with internal cone; 10' Diam. by 14" straight side identical to vessels previously submitted on our Drawing No. 91-86-0226; complete with inlet deflector, Placite 7156 HAR lining, underdrain nozzles installed and initial charge of 20,000 lbs. of Calgon F-300 carbon. Freight to Pensacola is included.
- * Excluded are: off-loading and installation of vessel, all foundation and piping work, all instrumentation and controls, any bonding, insurance or sales tax, and analytical work.

Total Price Delivered: \$54,900
Delivery: 16 weeks from drawing approval

I trust this meets your needs and we look forward to being of service. Please call if you have any questions.

Sincerely,

CALGON CARBON CORPORATION

F. X. Stone

Francis X. Stone
Project Manager

RECEIVED
FEB 20 1987
HENDON ENGR. ASSOC.

EXHIBIT A
INSTALLED ADSORPTION SYSTEM
FOR
NAS WHITING FIELD
MILTON, FLORIDA

RESPONSIBILITIES OF CALGON CARBON CORPORATION

Adsorption Vessel

Deliver and install one free-standing 10' Diameter x 10' straight side carbon steel lined adsorption vessel ASME coded for 75 psig capable of treating 600 gpm. Also, included is 6" ductile iron pipe and influent and effluent valves. The adsorption equipment will be tied in to the existing piping. (See Exhibit B for description of the adsorption vessel).

Foundation

Design and pour a 15' x 15' concrete pad for installation of the adsorption vessel.

Fence

Provide and install a 6' high chain link fence around the pad with 7' posts and 3 strands of barbed wire on top. This fence will be tied into the existing chain link fence presently around the pump. The existing 10' gate will be relocated to the front of the adsorption system to allow entry of the Calgon trailer for loading and unloading carbon.

Carbon

Deliver and install 20,000 pounds of Filtrasorb 300 granular activated carbon into the adsorption vessel.

Technical Assistance

Provide operator training, an operating manual, and start-up assistance.

Estimated Cost
of
Activated Carbon Adsorption Facility

Activated Carbon Adsorption Facility

Cost Estimate

NAS Whiting Field, Milton, Florida

17 March 1987

LRR

Project No. 808-15

Capital Cost

| | |
|--|----------|
| 10' Dia. Carbon Adsorber Complete | \$54,900 |
| Installation, Pad, Fence and Engineering | 20,100 |
| Total Capital Cost | \$75,000 |

O & M Costs

Carbon Adsorber O & M

General Labor - 100 MH/yr @ \$15.00/hr - \$1,500/yr

Media Replacement

Required every 2 years

$20 \div 2 = 10$ times - 1 = 9 replacements

9 Replacements plus ultimate carbon disposal $9 + 1 = 10$

Cost per replacement - \$16,000

Cost: $\$16,000 \times 10 = \$160,000$ - Total

$\$160,000 \div 20 = \underline{\$8,000/\text{year Media Replacement}}$

Chemical Analyses

Trichloroethylene (TCE)

Samples required - Raw water + treated water

Monthly: $(1 + 1) \times 12 = 24$ samples/year

Cost: $\$90/\text{sample} \times 24 = \underline{\$2,200/\text{year}}$

VOC's plus SOC's

Samples required - Raw water

Quarterly: $1 \times 4 = 4$ samples/year

Cost $\$850/\text{sample} \times 4 = \underline{\$3,400/\text{year}}$

O & M Summary

| <u>Item</u> | <u>Year 1</u> | <u>Year 20</u> |
|-------------------|---------------|----------------|
| Carbon Adsorber | | |
| General Labor | \$ 1,500 | \$ 1,500 |
| Media Replacement | 8,000 | 8,000 |
| Chemical Analyses | | |
| TCE | 2,200 | 2,200 |
| VOC'a and SOC's | <u>3,400</u> | <u>3,400</u> |
| Total | \$15,100 | \$15,100 |

APPENDIX XI

Life Cycle Costs

USN Discount Rate

USN Discount Rate

F.R.R.

17 March 1987

Project No. 808-15

Discount Rate Parameters

USN Discount Rate (SowDir 16 March 1987) - 10.0%

Life Cycle - 20 years

Present Worth Factors

Single Payment: $PW = \frac{1}{(1+i)^n} = \frac{1}{(1+0.10)^{20}} = 0.1486$

Uniform Series: $PW = \left[\frac{(1+i)^n - 1}{i(1+i)^n} \right] = \left[\frac{(1+0.10)^{20} - 1}{0.10(1+0.10)^{20}} \right] = 10.0000$

Gradient Series: $PW = \frac{1}{i} \left[\frac{(1+i)^n}{i} - n \right] \left[\frac{1}{(1+i)^n} \right]$
 $= \frac{1}{0.10} \left[\frac{(1+0.10)^{20}}{0.10} - 20 \right] \left[\frac{1}{(1+0.10)^{20}} \right] = 70.2713$

Capital Recovery Factor

Uniform Series: $CR = \frac{i(1+i)^n}{(1+i)^n - 1} = \frac{0.10(1+0.10)^{20}}{(1+0.10)^{20} - 1} = 0.1175$

Life Cycle Cost Comparison

Life Cycle Cost Comparison
NAS Whiting Field, Milton, Florida
17 March 1987

LRR

Project No. 808-15

| | <u>Air Stripping</u> | <u>Carbon Adsorption</u> |
|---|----------------------|--------------------------|
| <u>CAPITAL COSTS</u> | | |
| Total Capital Cost | \$64,500 | \$75,000 |
| Salvage Value | 6,500 | 7,500 |
| Present Worth - Salvage Value | <u>-1,000</u> | <u>-1,000</u> |
| Present Worth of Facilities | \$63,500 | \$73,900 |
| <u>OPERATION & MAINTENANCE</u> | | |
| Year 1 O & M | \$ 24,700 | \$ 15,100 |
| Present Worth - Year 1 O & M | 247,000 | 151,000 |
| Year 20 O & M | 33,700 | 15,000 |
| Annual Increase | 450 | 0 |
| Present Worth - Annual Increase | 31,600 | 0 |
| PRESENT WORTH OF ALTERNATIVE | \$342,100 | \$224,900 |
| <u>AVERAGE ANNUAL EQUIVALENT COST</u> | | |
| | \$40,200 | \$ 26,400 |

Appendix XII

USN Cost Estimate

and

Special Project Request Forms

Cost Estimate

Special Project Request (Interim)

Step One Submission

PART I - SUBMISSION

1. FROM (Activity name and location): NAS Whiting Field, Milton, Florida 2. ACTIVITY NO. _____

3. TO _____

4. PROJECT NO. _____ TITLE Activated Carbon Adsorption System for West Well

5. TYPE
 a. MAINT./REPAIR b. MINOR CONSTRUCTION/ALTERATION c. AIR CONDITIONING d. EQUIPMENT INSTALLATION

6. DESCRIPTION AND FUNCTION OF FACILITY
Installation of Activated Carbon Adsorption System to remove tri-chloroethylene (TCE) from water pumped from West Well in order to meet Florida and Federal safe drinking water requirements.
 a. PROPERTY RECORD CARD NO. _____
 b. NAVY CATEGORY CODE _____
 c. BLOC. OR STRUCTURE NO. 1429

7. THE REQUIREMENT FOR THE FACILITY IS BASED ON:
 a. A CHANGE IN MISSION b. FULL-TIME CONTINUING NEED c. 3 TO 5 YEAR NEED d. LESS THAN 3 YEARS' NEED e. CURRENTLY REQUIRED LESS THAN 50% OF TIME f. RESERVED FOR FUTURE REQUIREMENTS

8. ESTIMATED PROJECT COST \$ 75,000 9. ESTIMATED PLANNING COST \$ _____

10. DESCRIPTION OF CONDITION TO BE CORRECTED, OR PROBLEM TO BE SOLVED WITH PROPOSED SOLUTION. Attach additional Description if necessary. ONE PAGE ONLY.
TCE has been found in water from west well in excess of 3 ug/L, the maximum contaminant level permitted by Florida Administrative Code, Chapter 17-22, Section 17-22.104,(1),(g). As the south well has also been found to be contaminated, only the north well is available to supply potable water to the NAS. The proposed activated carbon adsorption will permit the west well to be returned to service as a supplement to the north well.

11. CAN PROJECT BE FUNDED IN PHASES? How? How many?
 YES NO

12. SIGNATURE OF OFFICIAL WHO CAN CERTIFY THAT THE DATA PROVIDED IS VALID _____ TITLE _____ DATE _____

PART II - MAJOR CLAIMANT ACTION

1. FROM (Major claimant) _____

2. TO (Activity name and location) _____

3. ACTION TO BE TAKEN
 a. APPROVED FOR SECOND STEP SUBMISSION AND CONSIDERATION. FOR FUNDING IN FY _____ OR FY _____
 b. DEFERRED PENDING FURTHER STUDY. RECOMMEND UPDATE AND RESUBMISSION IN _____ MONTHS.
 c. OTHER: _____

SIGNATURE OF APPROVING OFFICIAL _____ TITLE _____ DATE _____

*NOT applicable to Minor Construction, Alterations, or Equipment Installation.

Special Project Request

Step Two Submission

STEP TWO SUBMISSION

| | | |
|--|--|-----------------------------|
| 1. ACTIVITY SNOL NO. | ACTIVITY NAME AND LOCATION NAS Whiting Field, Milton, Florida | DATE SUBMITTED |
| 2. PROJECT NO. | TITLE Activated Carbon Adsorption System for West Well | |
| 3. TYPE | | |
| <input type="checkbox"/> MAINT./REPAIR <input type="checkbox"/> MINOR CONSTRUCTION/ALTERATION <input type="checkbox"/> AIR CONDITIONING <input checked="" type="checkbox"/> EQUIPMENT INSTALLATION | | |
| 4. DESCRIBE AND STATE FUNCTION OF FACILITY | | a. PROPERTY RECORD CARD NO. |
| Installation of Activated Carbon-Adsorption System to remove tri-chloroethylene (TCE) from water pumped from West Well in order to meet Florida and Federal safe drinking water requirements. | | b. NAVY CATEGORY CODE |
| | | c. BLDG. OR STRUCTURE NO. |
| | | 1429 |

5. WHAT IS THE EFFECT OF THIS PROJECT ON THE MISSION OF THE ACTIVITY?
 This project is required to insure continued supply of potable water for all persons at NAS Whiting Field.

6. THE REQUIREMENT FOR THE FACILITY IS BASED ON:

| | | | | | |
|--|---|---|--|---|---|
| <input type="checkbox"/> A CHANGE IN MISSION | <input checked="" type="checkbox"/> FULL-TIME CONTINUING NEED | <input type="checkbox"/> 3 TO 5 YEAR NEED | <input type="checkbox"/> LESS THAN 3 YEARS' NEED | <input type="checkbox"/> CURRENTLY REQUIRED LESS THAN 50% OF TIME | <input type="checkbox"/> RESERVED FOR FUTURE REQUIREMENTS |
|--|---|---|--|---|---|

7a. EST. FUNDED COST: \$ 75,000
 7b. EST. PROJECT COST: \$ 75,000
 7c. EST. PLANNING COST: \$
 7d. TOTAL FUNDS REQUESTED: \$ 75,000
 7e. EST. FACIL. REPL. COST: \$

8. DATE FACILITY CONSTRUCTED: _____

9. IS FACILITY ON AN APPROVED BASIC FACILITY REQUIREMENTS LIST? If "NO," how was need determined?
 YES NO Emergency need to comply with safe drinking water requirements.

10. IS PROJECT LISTED ON ANNUAL INSPECTION SUMMARY? If answer is "NO," and AIS is applicable, explain exclusion.
 YES NO N.A.

11. DESCRIBE CONDITION TO BE CORRECTED, OR PROBLEM TO BE SOLVED WITH PROPOSED SOLUTION. Attach additional description if necessary, ONE PAGE ONLY.
 TCE has been found in water from the west well in excess of 3 ug/L, the maximum contaminant level permitted by Florida Administrative Code, Chapter 17-22, Section 17-22.104(1), (g). As the south well has also been found to be contaminated, only the north well is available to supply water to the NAS. The proposed Activated Carbon Adsorption System will permit the west well to be returned to service as a supplement to the north well.

12. WHY IS THE PROPOSED SOLUTION BEST - AND WHAT ALTERNATIVES WERE CONSIDERED?
 Purchase can be obtained almost as quickly as can an interim lease and at less cost. Life cycle costing indicates Activated Carbon Adsorption to be about 34 percent less expensive than air stripping the only other quickly available viable alternative.

13. WERE ANY NON-NAVY EXPERTS INVITED TO REVIEW THIS PROBLEM AND THIS SOLUTION? Explain effect on solution.
 YES NO Recommendation prepared by civilian contractor (environmental consulting engineers) in consultation with Southern Divisional NAS staff.

14. HAS EPD DESIGN DIVISION REVIEWED SOLUTION? a. YES b. NO
 15. CAN ANOTHER FACILITY BE ECONOMICALLY ADAPTED FOR THIS FUNCTION? a. YES b. NO

16. CAN PROJECT BE FUNDED IN PHASES? How? How many?
 a. YES b. NO

17. THIS PROJECT IS THE RESULT OF

| | | | | |
|---|---------------------------------------|--|---|--|
| <input type="checkbox"/> INADEQUATE MAINTENANCE | <input type="checkbox"/> FACILITY AGE | <input type="checkbox"/> DEFICIENT CONSTR. | <input type="checkbox"/> DEFICIENT DESIGN | <input checked="" type="checkbox"/> OTHER: Newly identified well contamination |
|---|---------------------------------------|--|---|--|

18. HAS THIS SPECIFIC PROBLEM BEEN CORRECTED PREVIOUSLY?
 a. YES b. NO When? _____

HOW LONG WILL PROPOSED CORRECTIVE ACTION LAST? 20 YEARS

19. ARE COMPONENTS BEING INCREASED IN SIZE OR CAPACITY? Explain the difference, including cost.

a. YES b. NO

20. ARE MATERIALS PROPOSED FOR USE THE SAME AS THOSE EXISTING? If "NO," explain the difference, including cost.

a. YES b. NO New treatment function. Piping is consistent with existing piping.

21. PROJECT IS PLANNED TO BE ACCOMPLISHED BY

a. STATION LABOR b. CONTRACT

22. HAS A PROJECT EVER BEEN SUBMITTED FOR THE REPLACEMENT OF THIS OR SIMILAR FACILITIES? Check and explain if "YES"

a. YES b. NO When?

23. ANTICIPATED SAVINGS IF PROJECT IS DONE THIS YEAR AS COMPARED TO A DEFERRAL OF ONE YEAR.

PROBABLE INCREASE IN PROJECT COST FOR ANY JUSTIFIABLE REASON

REDUCTION IN CURRENT MAINT. COST

REDUCTION IN CURRENT OPERATIONS COST

\$

\$

\$

JUSTIFY ANY SAVINGS INDICATED

WHAT IS PAY BACK PERIOD OF PROJECT? (In years)

Immediate action required for safety.

WILL ACCOMPLISHMENT GENERATE REQUIREMENTS FOR ADDITIONAL M&O FUNDS OR PERSONNEL?

a. NO b. YES Est. Ann. \$15,100

24. WHAT WOULD BE THE EFFECT OF DEFERRING THE PROJECT ONE YEAR?

If north well should fail, NAS would be without potable water.

25. IF THE PROJECT IS NOT ACCOMPLISHED NOW, IN HOW MANY YEARS WILL THERE BE SERIOUS DAMAGE TO THE FACILITY AND/OR ITS CONTENTS OR IMPAIRMENT TO ESSENTIAL OPERATIONS? Explain, include loss value to facility and/or contents.

YEARS BEFORE SERIOUS DAMAGE OCCURS _____ Only a matter of months.

26. HAS THE REDUCED UTILIZATION OF THIS SPECIFIC FACILITY AFFECTED A LARGE FACILITY SYSTEM OPERATION? Explain.

a. YES b. NO BY HOW MUCH? 100 % Tentatively

27. ARE THERE ANY OTHER FACTORS INVOLVED? Check and explain.

a. MORALE b. HEALTH c. PUBLIC RELATIONS d. SAFETY e. FIRE PROTECTION f. SECURITY g. OTHER

28. CERTIFICATION BY RESPONSIBLE OFFICER AT ACTIVITY: I am personally cognizant of the need for, the essentiality of, and the proposed method of accomplishment of this project and certify that the above information is correct, and that this project meets all criteria specified in OPNAVINST 11010.20 and subsequent changes thereto.

| | | |
|-----------|-------|------|
| SIGNATURE | TITLE | DATE |
| | | |

29. EPD TECHNICAL VALIDATION (if required) (see para 7303, OPNAVINST 11010.20C)

| | | |
|-----------|-------|------|
| SIGNATURE | TITLE | DATE |
| | | |

ENCLOSURES:

a. ENGINEERING EST. (NAVFAC 2417) b. LOCATION PLAN(S) c. DRAWINGS d. PHOTOGRAPHS

*NOT applicable to Minor Construction, Alterations, or Equipment Installation

APPENDIX XIII

Technical Specifications

For

Purchase of an Activated Carbon Adsorption System

TECHNICAL SPECIFICATIONS
FOR
DETAILED DESIGN, SUPPLY AND INSTALLATION
OF
AN ACTIVATED CARBON ADSORPTION FILTRATION SYSTEM
FOR
THE WEST WATER SUPPLY WELL
AT
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

POSSIBLE BIDDERS

| | |
|----------------------------------|---|
| Arrowhead Industrial Water, Inc. | 95 Lower Morrisville Road Fallsington, Pennsylvania 19054 |
| Calgon Carbon Corp. | 13430 Northwest Freeway Suite 804 Houston, Texas 77040 |
| CECA, Inc. | 4150 South 100th East Avenue Suite 300 Tulsa, Oklahoma 74147 |
| Continental Water Systems | 2300 N.W. 71st Place P. O. Box 5038 Gainesville, Florida 32606 |
| Groundwater Technology, Inc. | 1514½ 8th Avenue Tampa, Florida 33605 |
| Hungerford and Terry, Inc. | 226 Atlantic Avenue P. O. Box 45 Clayton, New Jersey 08312 |
| ICI Americas, Inc. | Wilmington, Delaware 19897 |
| Met-Pro Corporation | 252 Cassell Road P. O. Box 144 Harleysville, Pennsylvania 19438 |
| Westvaco Corporation | Covington, Virginia 24426 |

SECTION 1 - DESCRIPTION AND GENERAL INFORMATION

1-01. Description

The following specification describes all equipment, materials and services necessary to provide a completely installed Granular Activated Carbon Adsorption System to treat water from the west well at NAS Whiting Field, Milton, Florida and reinject it into the water supply system. The Adsorption System will consist of a single unit and all related appurtenances required for a completely installed and operational system. The total system must be designed for economical carbon usage and ease and completeness of Granular Activated Carbon changeout.

1-02. Scope

- (a) The Carbon Adsorption System supplier must take unit responsibility for the completely installed system. The supplier will be responsible for design, fabrication, installation and startup of all mechanical components including, but not limited to, vessels, piping, instrumentation and controls.
- (b) The Carbon Adsorption System supplier will also demonstrate the ability to supply, deliver, load and unload, and dispose of the spent carbon by an environmentally approved method. Removal and disposal of the spent carbon must be in accordance with all applicable local, state, and Federal regulations regarding solid waste materials.
- (c) The Carbon Adsorption System supplier shall be able to guarantee a supply of virgin grade Granular Activated Carbon and verify the quality of such material with lot analyses of all shipments. This quality shall be in full compliance with the specification herein for Granular Activated Carbon.
- (d) The Carbon Adsorption System supplier shall also be able to remove and transport spent Granular Activated Carbon classified as hazardous under RCRA regulations, so that it can be transported to a disposal site or reactivation facility as required.
- (e) The Adsorption System will be designed and supplied using materials of construction on the FDA approved list for food grade applications.

1-03. Work Included

- (a) The work covered by this specification includes the furnishing and installation of all equipment, materials, carbon and services to comprise a complete Granular Activated Carbon Adsorption System.
- (b) System limits for the Granular Activated Carbon Adsorption

System will be defined as beginning at the influent connection for the System and ending with the effluent connection for the System. All equipment between these two points will be provided as part of the complete design by the System supplier.

(c) Specified work items for the Granular Activated Carbon Adsorption System are:

1. One (1) downflow Adsorber including a water collection system and all internals.
2. Influent and effluent piping to the System (8" Ductile Iron) and connecting pipe to tie the adsorption system into the existing water line.
3. Granular activated carbon fill and discharge piping and valves.
4. Integral vent and safety relief piping, water piping and utility connections.
5. 20,000 pounds of Granular Activated Carbon, as specified.
6. Air distribution piping complete with all related appurtenances for properly functioning air system (i.e., filters, drip legs, shut-off valves, etc.), in order to receive air from a compressor and supply it at proper pressure and rate for carbon transfers.
7. Installation within described System limits.
8. Plans and specifications for the System sealed by a professional engineer registered in Florida.
9. Complete set of technical specifications and operating manual.
10. Experienced technical assistance as required.
11. Foundations.
12. Anchor bolts.
13. Temporary air compressor for initial carbon fill.
14. Chain link fence to enclose the Adsorption System.

d. The following work is not covered by this specification and is to be the responsibility of others:

1. Influent supply, effluent disposition and utility water supply.

2. Freeze protection.
3. Clean water for carbon transfer.
4. Flow indicator-totalizer.

SECTION 2 - BID SUBMITTALS

2-01. General Qualification Requirements

In order to insure the supply of a Granular Activated Carbon (GAC) Adsorption System that will be fully effective in meeting effluent requirements for a safe drinking water supply, potential suppliers of said System shall provide the following information with the bid. These submittals shall show the ability to design and supply a GAC Adsorption System in a timely manner, supply GAC media when required, provide safe and legal removal of spent GAC when required and provide ongoing technical support.

2-02. Experience Qualifications

The potential System supplier shall submit the following information on three (3) existing GAC Adsorption Systems which demonstrate the ability to design and supply an effective GAC Adsorption System and meet the qualifications noted above:

- (a) Provide GAC Adsorption System description including flow, contact time, System design (flow diagrams of general arrangement), Adsorber sizing.
- (b) Provide underdrain design showing ability to remove water across GAC cross-section for effective use of all GAC contained in unit. Water removal shall have a uniform velocity profile across the entire bed.
- (c) Provide Adsorption System flow diagram utilizing vessel in Item (a), showing actual flow rates treated.
- (d) Provide GAC Adsorption System general arrangement for this site, showing space utilized, influent and effluent locations.
- (e) Provide operating weight of GAC Adsorption System for this site.
- (f) Provide field tests on Adsorption vessel to verify at least ninety-nine percent (99%) removal of spent GAC so that spent media remaining will not contaminate effluent water. Vessel design shall incorporate the feature to remove carbon without requiring the tank to be opened or cleaned and hosed.

2-04. GAC Adsorption System Process Design

The potential System supplier shall submit the following information with the proposal to exhibit capability for the Adsorption System:

- (a) Provide pressure drop information across System.

- (b) Provide interpretation of carbon adsorption isotherms to show ability of GAC to remove contaminants and fix dynamic test parameters.
- (c) Provide capability to obtain a dynamic pilot simulation of field performance of the proposed System. This dynamic pilot simulation will include a pilot column study conducted on the actual groundwater from the treatment site. The column study will simulate the hydraulic loading rates to be encountered in the full-scale treatment operation. The column study will identify the mass transfer zone for contaminants in this application and identify the carbon utilization rate in a simulation of up to one year's field performance.
- (d) Provide analytical procedures used to support Items (b) and (c).

2-05.

GAC Supply

The potential System supplier shall demonstrate ability to supply acceptable GAC media, and, therefore, provide the following information with the proposal:

- (a) Supply specifications of GAC to be utilized in the System. Show that this GAC is in all respects equivalent to that used in testing (Section 2-04). Provide recent lot analysis that exhibit that GAC supplier is providing media according to published specifications.
- (b) Demonstrate ability to supply complete GAC fill in a timely manner upon System completion or notification by client. Demonstrate that inventory of GAC proposed is adequate to meet the initial fill requirements in a timely manner.
- (c) Demonstrate ability to transport GAC to site in a reasonable time frame and transfer GAC from delivery units into Adsorber in a safe and timely manner. Provide typical delivery trailer drawings, number of trailers, tractors and drivers currently available. Provide delivery trailer unloading procedures. Provide delivery trailer lining information showing that such lining is on the FDA approved list.

2-06.

GAC Reactivation

The potential System supplier shall demonstrate ability to arrange for spent GAC reactivation, so that spent GAC can be removed from the site and reactivated in an environmentally safe and legally approved manner. Landfill of spent GAC shall not be an approved manner of GAC disposition. The following information shall be required of reactivation capability, and submitted with the proposal:

- (a) Provide reactivation testing procedures showing that the spent GAC will be received at the facility and reactivated in an environmentally safe manner.
- (b) Spent GAC transportation equipment showing transport of spent GAC is enclosed, DOT approved equipment. Provide transportation equipment drawings and necessary permits to transport hazardous waste.
- (c) Ability to transport and receive RCRA manifested material. Provide facility RCRA identification numbers.
- (d) The supplier shall submit a health and safety plan for all personnel involved in handling spent carbon.
- (e) The supplier shall, to the extent of its negligence, indemnify and hold harmless the owner for any liability that may arise after the spent carbon is loaded into contractor's trailers and signed for by contractor at the owner's facility, provided that the spent carbon contains no PCB, dioxin, DBCP or any other compounds that, due to government regulation, precludes handling the spent carbon in a RCRA approved and permitted facility.
- (f) The supplier will provide a certificate of insurance evidencing sudden and accidental pollution liability of insurance in excess of 1 million dollars at the supplier's reactivation site.

2-07. Field Support and Operating Assistance Qualifications

The potential System supplier shall submit the following information exhibiting ability to provide on-going support to the client to insure effective operation of the GAC Adsorption System for the foreseeable future:

- (a) Provide resumes of key technical personnel who would be able to consult on process or operational problems, showing their experience on similar applications.
- (b) Provide typical analytical programs to assist on-going applications.
- (c) Demonstrate ability to provide on-site support to operations. Provide per diem rate for engineering (process) support and technical (operations) support. Provide organization chart showing technical (operations) support groups and resumes of key personnel in this department.

SECTION 3 - FACILITIES TO BE PROVIDED

3-01. Adsorption Vessel

The supplier shall deliver and install one free-standing 10' Diameter x 10' straight side carbon steel lined Adsorption vessel ASME coded for 75 psig capable of treating 600 gpm. Also, included are 8" concrete lined ductile iron pipe and influent and effluent valves. The Adsorption System will be tied in to the existing piping.

3-02. General Layout

A general layout of the proposed Adsorption System is appended to these specifications.

3-03. Foundation

The supplier shall design and pour a 15' x 15' concrete pad or concrete pad and gravel paving for installation of the Adsorption vessel.

3-04. Fence

The supplier shall provide and install a 6' high chain link fence around the pad with 7' posts and 3 strands of barbed wire on top. This fence will be tied into the existing chain link fence presently around the pump. The existing 10' gate will be re-located to the front of the Adsorption System to allow entry of a trailer for loading and unloading carbon.

3-05. Carbon

The supplier shall deliver and install 20,000 pounds of Filtrasorb 300 Granular Activated Carbon, or equal, into the Adsorption vessel.

3-06. Technical Assistance

The supplier shall provide:

- (a) Construction plans and specifications for the facilities to be provided. Said plans and specifications shall be sealed by a professional engineer registered in the State of Florida.
- (b) Operator training.
- (c) An operation and maintenance manual.
- (d) Start-up assistance.
- (e) Process verification testing.

3-07. Time of Completion

The supplier shall complete installation of all facilities and have them ready for use and testing within eight (8) weeks of contract award.

SECTION 4 - POST AWARD SUBMITTALS

Upon award of the contract, the GAC Adsorption System supplier shall submit the following information in the time and manner specified. Information provided by the supplier that is considered by the supplier to be confidential in nature must be clearly marked and so designated.

4-01. Initial Submittal

- (a) Project schedule indicating submittals, equipment delivery, installation and start-up.
- (b) Flow schematic drawing indicating line sizes, valving, utility lines sizes and connections.
- (c) Vessel shop or fabrication drawings.
- (d) Shop inspection procedure and schedule.
- (e) Equipment arrangement and weights - detailed drawing(s) and listing of all required anchor bolts and nuts and a dimensional setting plan to conform to the requirements of the furnished equipment.
- (f) Piping arrangement drawings and plans and elevations including detail and location of required interface connections sealed by a professional engineer registered in the State of Florida.
- (g) Bill of materials for all supplied equipment.
- (h) List of any extra materials or supplies supplied with equipment.
- (i) List of spare parts to be furnished.
- (j) List of any special tools required.
- (h) Equipment tagging and identification.

4-02. Intermediate Submittal

Four (4) weeks after return of approved first submittal, the following submittals shall be made:

- (a) Operating and maintenance manual incorporating all necessary information from previous submittal. Operating section shall include complete instruction on unloading spent carbon and loading fresh virgin grade carbon, including any auxiliary utilities required.
- (b) Names, functional titles, addresses and phone numbers of technical personnel available for on-going technical support.

4-03. Start-up

The facilities shall be ready for start-up and testing eight (8) weeks after contract award.

4-04. Final Submittal

Four (4) weeks after start-up and final system acceptance the following submittals shall be made:

- (a) Complete set of reproducible drawings and final bill of materials.
- (b) Manufacturer's data sheet for Adsorber vessel.

SECTION 5 - PROCESS DESCRIPTION

5-01. General Description of Process

The Adsorption System utilizes Granular Activated Carbon (GAC) for efficient removal of dissolved organic compounds from water intended for potable use. Adsorption is a physical process in which the compounds adhere to the surface of the carbon particle. The large surface area contained within the internal pore structure of the granular carbon particle provides the Carbon Adsorption System with a substantial capacity for the organic compounds to be removed. The Adsorption System provides effective exposure of the contaminated water to a quantity of Granular Activated Carbon.

5-02. Technical Requirements

The Contractor shall furnish and install one (1) GAC Adsorption System designed and sized with a capacity to continuously provide:

(a) Treatment requirements:

1. Maximum anticipated TCE concentration of raw water - 11 ug/L.
2. Design capability for maximum TCE concentration of raw water - 22 ug/L.
3. Required maximum concentration level (MCL) of water treated by GAC prior to addition of disinfection and stability chemicals - 1 ug/L TCE.

(b) Water flow capacity:

1. 600 gallons per minute (gpm) or 0.864 million gallons per day (MGD).
2. Maximum pressure drop across the entire Adsorption System shall not exceed 10 psig during normal operation.

5-03. Adsorber System Configuration

The Granular Activated Carbon Adsorption System will consist of one (1) process vessel (Adsorber) operated in a downflow mode. The Adsorber will contain twenty thousand pounds (20,000#) of Granular Activated Carbon (GAC). Water will be conveyed to the Adsorption System from the source, will enter the vessel at the top and flow downward through the carbon bed. An internal collector system shall be provided to collect the treated water and retain the granular media in the bed. The treated water will be discharged from the system through the effluent piping.

5-04. Carbon Contact Requirements

The Adsorption System design will provide for a contact time of eight and nine-tenths minutes (8.9) at a flow of 600 gpm through the Adsorber vessel. The contact time is calculated on a "superficial" or "empty bed contact time" basis. The pressure drop across the entire Adsorption System (within System Limits) is limited to 10 psig during normal operation.

5-05. Carbon Replacement

When the carbon vessel becomes saturated with contaminants adsorbed from the water, the vessel will be taken out of service to replace the spent Granular Activated Carbon with virgin grade Granular Activated Carbon. The vessel will be pressurized with compressed air and the spent carbon displaced into a transfer tank or receiving trailer. The bottom of the carbon bed shall be contained in a coned section, so that nearly complete removal of the spent carbon will be possible in a single step. Fresh carbon can be transferred as a slurry from a delivery container to the empty Adsorber utilizing air pressure. Carbon transfer shall be accomplished hydraulically in slurry form and without human contact, in a closed loop piping system, in order to minimize environmental exposure. Supplier must demonstrate that following removal of spent carbon there would be less than five (5) cubic feet of material remaining in the adsorber.

5-06. Disposal of Spent Carbon

Disposal of spent carbon must be performed in an environmentally safe manner. If the carbon is to be reactivated, it must be accomplished in a facility permitted to accept RCRA manifested material. If unsuitable for reactivation and reuse, the Carbon Adsorption System supplier shall assist the owner in the proper disposition. Therefore, a Procedure for Qualification of Materials to RCRA permitted TSDF, should be made available.

SECTION 6 - EQUIPMENT DESCRIPTION

6-01. Adsorber Vessel

(a) Vessel Configuration

The Adsorber shall be a vertical cylindrical pressure vessel with an elliptical top head. The Adsorber shall be designed such that the GAC is contained in a bottom cone (minimum 45°) such that it can be easily discharged when spent. The vessel shall be designed, constructed and stamped in accordance with the ASME Code, Section VIII for a design pressure rating of 75 psig at 150°F. The vessel shall be equipped with two (2) manways, one located on the top head and the other on the straight side. All nozzle connections must be flush on the inside of the shell and provided with 150 pound full face flanges on the outside.

(b) Vessel Surfaces

The Adsorber shall be constructed of carbon steel and shall have all welds and any other sharp edges ground smooth, and all imperfections such as skip welds, delaminations, scabs, slivers and slag corrected prior to abrasive blasting. The Adsorber internal surface shall be blasted to a white metal surface (SSPC-SP5) to provide an anchor pattern in the metal corresponding to approximately 20% to 25% of the film thickness of the coating. The exterior of the Adsorber shall be sandblasted to a commercial blast cleaning (SSPC-SP6).

(c) Vessel Lining

The interior of the Adsorber vessel shall be lined in order to prevent corrosion that will occur when wet GAC is in contact with carbon steel. This lining shall exhibit abrasion-resistant qualities to prevent erosion by movement of the granular media. A coating shall be used which exhibits excellent chemical resistance to a wide range of water solutions, and meets requirements of the U. S. Federal Register, Food and Drug Regulations Title 21, Chapter 1, Paragraph 175.300.

(d) Exterior Finish

Following sandblasting of the exterior, a rust inhibitive primer shall be applied to a dry film thickness of 3.0 mil before any rust can form. The finish exterior painting of an alkyd resin based paint for outside service must be applied to the exterior of the Adsorber before rust can form beneath the primer coat.

6-02. Underdrain Collection System

There shall be a collection system at or near the bottom of the carbon bed to collect treated water across the carbon bed cross section. The water velocity profile across the diameter of the bed shall be uniform in the downward direction at the underdrain location. The collection device(s) shall have slots of a determined width to retain the Granular Activated Carbon and allow free passage of treated water with a minimum of pressure drop. The treated water is to be collected by this system and discharged from the vessel to convey the treated water to the effluent pipe. In no case will material other than Granular Activated Carbon, i.e., sand or gravel, be installed inside the vessel to assist treated water collection.

6-03. Piping Network

A process piping network shall be provided for the Adsorption System that will enable the following functions to be performed:

- (a) Treatment - Under normal operation, the full flow of 600 gpm shall be accepted at the System limits and directed to the unit.
- (b) Carbon Exchange - During carbon exchange, the Adsorber being exchanged shall be isolated completely from the potable water system with valving on influent and effluent lines. The process flow shall be discontinued.

6-04. Process and Utility Piping

(a) Pipe Sizes

The process and utility piping to the Adsorption System shall be eight-inch (8") for both influent water to the System and treated water from the System. Adsorber vent lines shall be three inches (3") and Granular Activated Carbon supply and discharge piping shall be four-inch (4). The vessel shall have independent vent, carbon fill and discharge lines.

(b) Pipe Materials

1. In general, all metal pipe 4-inches in diameter and larger shall be ductile iron pipe and all pipe 3½-inches in diameter or smaller shall be galvanized steel pipe.
2. Ductile iron pipe with flanged joints shall conform to the requirements of ANSI Specification A21.15 and shall be suitable for a minimum working pressure of 250 psi. Flanges shall conform to the requirements of ANSI Specification A21.15.

3. Fittings for flanged ductile iron pipe shall be of ductile iron. Flanged fittings shall conform to the requirements of ANSI/AWWA Specifications C110 and shall be suitable for a working pressure of 250 psi. Flanges shall conform to the requirements of ANSI/AWWA Specification C110.
4. All ductile iron pipe and cast and ductile iron fittings shall have a cement-mortar lining of standard thickness conforming to the requirements of ANSI Specification A21.4.
5. Flanged joints on ductile iron pipe shall be joined with bolts and nuts conforming to the chemical and mechanical requirements of ASTM Specification A307, Grade B. Bolts and nuts shall be hexagonal. Bolts and nuts shall be threaded in accordance with American National Standard B1.1 for Screw Threads-Coarse Thread Series, Class 2A, external, and Class 2B, internal. Gaskets shall be full face, of first quality red rubber, 1/8-inch thick.
6. Steel pipe shall have screwed joints and shall be standard strength unless otherwise shown on the plans. Steel pipe shall be hot-dipped galvanized and shall conform to the requirements of ASTM Specification A120. Fittings for steel pipe shall be banded standard screwed fittings made of malleable iron or cast steel and shall be galvanized. Fittings shall conform to current ANSI specifications for 150 psi pressure.
7. GAC discharge piping to and including the shut-off valve and fittings shall be polypropylene lined steel per Dow Chemical Company's MORAF PPL brand, rated at 150 psig to 225°F. Piping shall be Schedule 40, ASTM A53 steel pipe with 125 pound ASTM A126, Class A cast iron flanges and fittings.
8. Compressed air piping (1½") shall be threaded, Schedule 80 galvanized carbon steel pipe per ASTM A120, rated for 125 psig at 350°F. for air service. Air supply to the GAC Adsorption System shall be via a single point connection.
9. The exterior of the piping shall be cleaned to a power tool grade (mechanical grade) and a rust inhibitive alkyd metal primer shall be applied before any rust can form. A finish exterior painting of an alkyd resin based paint for outside service must be applied to the exterior of the piping before rust can form beneath the primer coat. The interior of the water piping shall be thoroughly cleaned and disinfected prior to introduction of potable water through the system.

(c) Butterfly Valves

The process and utility piping, excluding GAC fill and discharge piping shall be equipped with butterfly valves for flow control purposes.

1. Butterfly valves shall be tight closing, stainless steel to rubber type with seal achieved by rubber seats which are bonded to or mechanically retained in the valve body, or rubber seats which are retained on the disc with an 18-8 stainless steel clamp ring and stainless steel bolting. Valves shall be bubble-tight at rated pressures with flow in either direction, and shall be satisfactory for applications involving throttling service and/or frequent operation and for application involving valve operation after long periods of inactivity. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. Butterfly valves shall meet the full requirements of AWWA Specification C504, Class 150B. Butterfly valves shall be as manufactured by the Henry Pratt Co., BIF Unit of General Signal Corp., American Valve & Mfg., or approved equal.
2. Valve bodies shall be constructed of cast iron ASTM A126, Class B, and shall have integrally cast mechanical joint ends or flanged ends. Unless otherwise shown on the plans, butterfly valves installed underground shall have mechanical joint ends and exposed valves shall have flanged ends. Mechanical joints shall conform to the requirements of ANSI Specification A21.11. Flanged joints shall conform to the requirements of ANSI/AWWA Specification C110. Two trunnions for shaft bearings shall be integral with each valve body. Where the rubber seat is mounted on the vane, the valve body shall be fitted with a 360 degree stainless steel seat offset from the shaft, mechanically retained.
3. Valve discs shall be constructed either of alloy cast iron ASTM A436, Type 1 (NiResist) or of ductile iron ASTM A536, Grade 65-45-12. Where the rubber seat is mounted in the body, the mating edge of the disc shall be 18-8 stainless steel, Type 304 or Type 316.
4. Valve shafts shall be turned, ground, and polished. Shafts shall be constructed of 18-8 Type 304 stainless steel and shall be either a one piece unit extending full size through the valve disc and valve bearing, or may be the stub shaft design where solid ductile iron disc is used.
5. Valve seats shall be of natural rubber or synthetic rubber compound. Seats may be installed on the valve disc or valve body. Seats installed in valve bodies

may be vulcanized to the body or mechanically retained. Seats vulcanized to the valve body shall be simultaneously molded in, vulcanized, and bonded to the valve body and seat bond shall withstand a 75-pound pull under test procedure ASTM D429, Method B. Valve seats which are mechanically retained shall be field adjustable and replaceable without dismounting the valve disc or shaft and without removing the valve from the line. Retaining segments and adjusting devices shall be of corrosion resistant materials and shall be capable of a 1/8-inch adjustment.

6. Valve bearings shall be of the sleeve type which are corrosion resistant and self-lubricating. Bearing load shall not exceed 1/5 that of the compressive strength of the bearing or shaft material and shall not exceed 2,500 psi.
7. Valve interior surfaces, except seating surfaces, shall be evenly coated with a suitable primer to inhibit rust or a black asphalt varnish.
8. Hydrostatic and leakage tests shall be conducted on butterfly valves in accordance with AWWA Specification C504, Section 13.
9. Valve operators shall be suitable for underground service and shall be fully gasketed, grease packed, watertight, and shall be provided with extension stem and operating nut, cast iron valve box, and tee wrench for opening and closing valves. Valves shall close in a clockwise rotation of the stem.

(d) Valves on GAC Lines

Valves on the GAC fill and discharge pipe shall be TFE lined, ductile iron body plug valve per Duriron Durco T-Line or equal.

- (e) Valving for the compressed air supply shall be bronze or forged brass or barstock brass body regular port ball valves, rated for 500 psig at 100°F.

(f) Transfer hose Connectors

The Granular Activated Carbon piping shall be fitted with hose connectors, such that carbon transfer to and from the Adsorber vessel can be facilitated with transfer hoses. These connectors shall be 4" Quick Disconnect Adapter constructed of 304 stainless steel as manufactured by OPW Division of Dover Corporation as Kamlock Part No. 633-F or equal.

(g) Flush Connections

Two flush connections shall be provided on each GAC fill or discharge line, one upstream and one downstream of the plug valve. Connections shall be welded into steel pipe or supplied in solid polypropylene "spacers" for lined pipe. Flush connections shall consist of a short section of 3/4" quick disconnect adapter to match with water hose.

(h) Pressure Relief

A pressure relief device shall be provided, with relief capacity as required by ASME Code and hydraulic system analysis. Relief venting shall be integral to Adsorption System piping and directed to a common collection point.

(i) Pressure Gauges

The process piping shall be equipped with pressure gauges to indicate the pressure of water entering and exiting the Adsorber to provide information on pressure drops across the Adsorber. The pressure indicating gauges shall be 4½" (face diameter size) with a stainless steel boudon tube in a glycerin filled housing. The gauges shall read 0-100 psig with an accuracy of 1% of full range, and shall be a Weksler AS44P - liquid fill or equal.

SECTION 7 - GRANULAR ACTIVATED CARBON

7-01. Quantity

Twenty thousand (20,000) pounds of Granular Activated Carbon shall be provided and installed within the Adsorber vessel.

7-02. Quality

The Activated Carbon shall be virgin, granular and manufactured from bituminous coal. The Activated Carbon shall be Calgon Filtrasorb 300 or equal and conform to the following specifications:

| | |
|---|--------------|
| (a) Iodine Number (minimum) | 900 |
| (b) Abrasion No. (minimum) | 75 |
| (c) Effective Size | 0.8 - 0.9 mm |
| (d) Screen Analysis | |
| on 8 mesh (maximum %) | 15 |
| through 30 mesh (maximum %) | 4 |
| (e) Water soluble Ash (maximum %) | 1 |
| (f) Total Ash (maximum %) | 8 |
| (g) Moisture, as packed (maximum %) | 2 |
| (h) Total Phosphate, as PO ₄ (maximum %) | 1 |

7-03. Analysis

The delivered GAC must be accompanied by an analysis sheet certifying compliance with the specifications.

SECTION 8 - SERVICES PROVIDED

8-01. Documents

- (a) The supplier shall provide a complete set of engineering drawings and equipment specifications sealed by a professional engineer registered in the State of Florida for installation and maintenance purposes.
- (b) The supplier shall also provide a System operating and maintenance manual.

8-02. Start-up Assistance

The supplier will provide the services of a field engineer who will be responsible for inspection of the GAC Adsorption System, mechanical trouble-shooting, system start-up and operator training.

8-03. Demonstration Testing

The supplier will provide the services of a monitoring coordinator during a two week demonstration period after System start-up.

(a) Testing Parameters:

The scheduling of the demonstration test will be as requested by the owner. The monitoring coordinator will be responsible for assuring the proper collection, storage, handling, packaging and shipment of the appropriate liquid samples as specified by the appropriate analytical methods, training of plant operators in completing these tasks, checking System flows and pressure readings, and aiding in the interpretation of operational and analytical data. The supplier will prepare a demonstration report which will include System flow rates, pressure readings, observations of operators, interpretation of laboratory results, and any other information pertinent for evaluating the Adsorption System.

(b) Testing:

The well will be operated at about 600 gpm for the demonstration test. System flows, pressures and totalizer readings will be checked daily over the two week test period by the supplier. At least 7 start up and shut down cycles will be made in the two week test period by the owner.* Grab samples will be collected according to EPA Method 601 with

* Methods for Organic Chemical Analysis of Municipal and Industrial Water, 40 CFR 136, Appendix A added by 49 FR 43250, October 26, 1984.

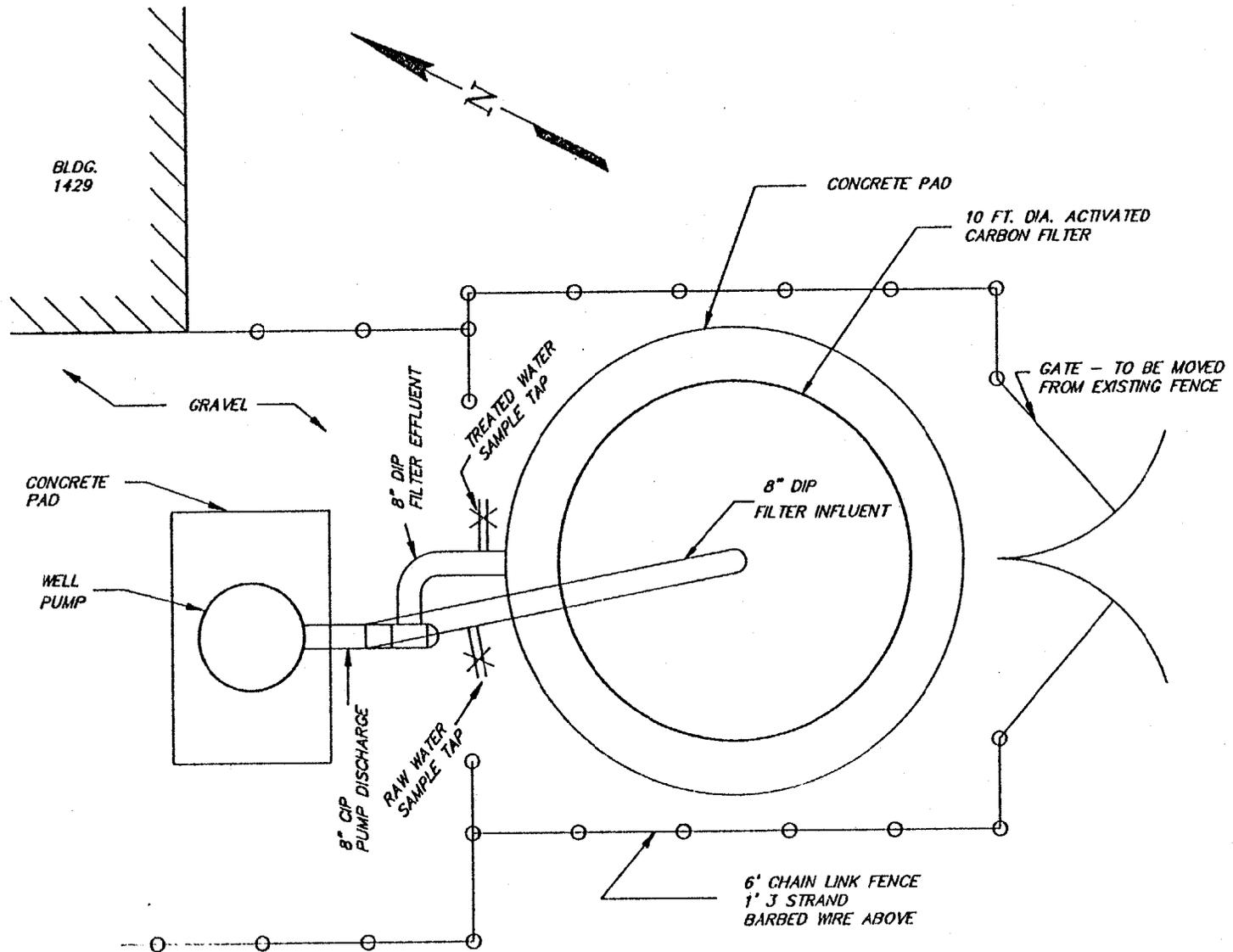
SECTION 9 - WARRANTIES

9-01. Equipment Warranty

The supplier will warrant the system to be free from defects in materials and workmanship for one (1) year from owner acceptance.

9-02. Performance Warranty

The supplier will warrant the system to meet the discharge criteria embodied in Section 6-03, Demonstration Testing, for the demonstration period.



PROPOSED ACTIVATED
CARBON ABSORPTION SYSTEM
WEST WELL
NAS WHITING FIELD
MILTON, FLORIDA