

**APPENDIX 4-1  
PERMITS, REGISTRATIONS, AND CERTIFICATIONS**

This appendix provides information about different types of permits, what must be done to obtain them, how long it takes to obtain a permit, and required fees. This appendix is taken directly from the ADEQ document titled "REQUIREMENTS FOR PERMITS AND APPROVALS."

**I. STATE OF ARIZONA PERMITS**

**Aquifer Protection Permits (A.R.S. §49-241 et seq)**

**Individual Permit.** An Aquifer Protection Permit is required for a facility that could discharge pollutants to groundwater. The permit is issued for the operational life of the facility.

Application forms and instructions are provided by ADEQ. Applications should be completed by a professional such as a geologist or an engineer, although this is not required. Processing time for this permit is approximately 180 days; however, an incomplete application may result in delays.

Application fees for this permit begin at \$1,350 and are based on the type of facility and number of separate discharges per facility. A final billing or refund will be made to the applicant following issuance of the permit. This billing is based on the time spent by ADEQ to process and review the application.

A maximum fee of \$16,500 per site is established by law. There is a review process for resolving billing disputes.

The following are considered to be "discharging" facilities and shall be operated pursuant to the provisions of either an individual permit or a general permit:

- a. Surface impoundments including holding, storage, settling, treatment or disposal pits, ponds and lagoons.
- b. Solid waste disposal facilities.
- c. Injection wells.
- d. Land treatment facilities.
- e. Facilities which add a pollutant to a salt dome formation, salt bed formation, dry well or underground cave or mine.
- f. Mine tailings, piles, and ponds.
- g. Mine leaching operations.
- h. Septic tank systems with a capacity of greater than 2,000 gallons per day.
- i. Groundwater recharge projects and underground storage and recovery projects. (Contact the Arizona Department of Water Resources for other possible permitting requirements.)
- j. Point source discharges to navigable waters.
- k. Sewage or sludge ponds and Wastewater Treatment Facilities.

**General Permit.** General permits for classes of facilities or activities are included in the Aquifer Protection Permit regulations. There is no formal permit application fee. The activities must adhere to conditions written in the regulations in order to qualify for a general permit.

Activities covered by general permits are:

- a. Residential and some commercial sewage disposal systems (e.g., septic tank systems with less than 2,000 gallons flow per day). Also, other sewage disposal systems with flows between 2,000 and 20,000 gallons per day if they comply with nitrogen density limitations and vertical water table separation requirements.
- b. Recharge and underground storage and recovery pilot projects.
- c. Agricultural application of wastewater sludge.
- d. Sand and gravel and placer mining operations where only physical processes and no chemicals are utilized.
- e. Discharges from hydrostatic testing of drinking water distribution systems and other pipelines.
- f. Lined evapotranspiration (ET) beds receiving sewage.
- g. Disposal of material containing only uncontaminated soil, cement, bricks, or other similar inert material.
- h. Certain water transportation facilities that receive effluent from any Wastewater Treatment Facility.
- i. Injection wells, surface impoundments and leach lines receiving discharge from only filtered backwash or other return water systems.

Best Management Practices. A general permit category has been developed for state regulated agricultural activities such as the application of nitrogen fertilizer or operation of concentrated animal feeding activities.

Exemptions. The following classes are exempt by statute from Aquifer Protection Permit requirements:

- a. Household and domestic activities.
- b. Household gardening, lawn watering, lawn care, landscape maintenance, and related activities.
- c. Noncommercial use of consumer products used by the public.
- d. Ponds used for watering livestock and wildlife.
- e. Mining overburden returned to the excavation site, including any common material which has been excavated and removed from the site and has not been subjected to any chemical or leaching agent or process of any kind.
- f. Facilities used solely for surface transportation or storage of surface water for beneficial use, or groundwater. This exemption does not apply if effluent from any Waste Treatment Facility that is regulated pursuant to sections §49-361 and §49-362 is added to the water after leaving its original point of diversion.
- g. Discharge to a community sewer system.
- h. Facilities which are defined and required to obtain a permit to reuse reclaimed wastewater.
- i. Leachate resulting from the direct, natural infiltration of precipitation through undisturbed regolith or bedrock if pollutants are not added to the leachate as a result of any material or activity on the ground surface.
- j. Surface impoundments used solely to contain storm runoff.
- k. Closed facilities. (However, if the facility ever resumes operation, it must obtain an Aquifer Protection Permit, and it shall be treated as a new facility for purposes of §49-243).

- l. Indirect groundwater storage and recovery projects permitted under A.R.S. Title 45, Chapter 3, Article 2. Also, underground storage and recovery projects which use Central Arizona Project water; and recharge or underground storage and recovery projects, which do not use wastewater effluent.
- m. Discharges to a facility that is exempt pursuant to paragraph f. of this subsection if those discharges are regulated pursuant to a NPDES Permit (33 United States Code Section 1342).

#### Wastewater Reuse Permits (A.R.S. §49-104(B)(13)).

Reuse permits are required for reuse or irrigation utilizing reclaimed effluent from Wastewater Treatment Facilities. These permits are issued for five years, with permit conditions based upon current effluent standards for the particular type of reuse involved. No fee is required. The ADEQ Wastewater Reuse Program is available for further information.

Questions commonly asked regarding Reuse Permits.

Q: Who needs a reuse permit?

A: Operators of Wastewater Treatment Plants who plan to use treated effluent for irrigation flow other than natural vegetation. Also, treated effluent may be permitted for livestock watering.

Q: What type of effluent analysis is required?

A: Chemical and biological analysis are graded from simple to complex depending on the quality of effluent and its use.

Q: Is there a fee for a reuse permit?

A: No.

Q: What is the permit tenure?

A: The permit will be in force for five years from the date of the Assistant Director's signature.

Q: What other permits are required?

A: That depends on the use or disposal of the treated effluent; you may require a NPDES Permit or APP (Aquifer Protection Permit).

Hazardous Waste Treatment, Storage and Disposal Permit [Resource Conservation and Recovery Act (RCRA) (A.R.S. §49-921 et seq and rules A.A.C R18-8-260 et seq)].

Arizona has EPA primacy and authorization for most activities regulated by RCRA. With minor exceptions, Arizona has adopted the technical and administrative requirements from the federal regulations for generators, transporters, and interim and permitted treatment, storage, and disposal facilities. In addition to the federal regulations, Arizona has adopted rules assessing permit fees and rules requiring background checks for owners and operators of permitted facilities. Permits may be denied to an applicant who fails to demonstrate sufficient reliability, expertise and integrity, or who has been convicted of a felony within the past five years.

Permit fees are based on the number of hours required to process the permit plus the costs of public notices and hearings. Permit processing time is 13 months or longer, based upon the size and complexity of the project.

The EPA identification numbers are required for all large quantity, small quantity, and conditionally exempt generators and for all treatment, storage, and disposal facilities. The forms for "Notification of Regulated Waste Activity" and information concerning the notification requirements or the hazardous waste facility data base may be obtained from ADEQ.

The ADEQ also maintains a data base of transporters, generators, and permitted facilities which may be consulted for site investigations of past disposal practices or due diligence searches by property owners.

Industrial processes are too diverse and the RCRA regulations are too complex to allow a more detailed discussion in this booklet. Specific questions concerning the need for a permit, the manifesting and transportation of hazardous wastes, generator requirements, or the applicability of RCRA rules to recycling and reclamation of hazardous wastes should be directed to the ADEQ Hazardous Waste Section (207-4153).

## **II. ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) APPROVAL OF FEDERAL PERMITS, LICENSES AND OTHER ACTIONS**

Section 401 of the federal Clean Water Act authorizes review of federal permits and licenses by state water pollution control agencies for compliance with water quality standards. Other provisions of law provide for ADEQ review of federal actions for consistency with state adopted plans and rules, or to accept environmental analyses. Each review is specific to the proposed project, the site and the action by ADEQ.

It is important that ADEQ be contacted early in project planning to ensure appropriate environmental data collection and evaluations are performed.

Definitions that are important to these programs are found in the state and federal laws and court decisions and are summarized below:

**Pollution (Water)** - Any material which affects the biological, chemical, or physical characteristics of a waterbody or impairs the potential uses of the water.

**Dredged and Fill Materials** - Any material obtained from within or outside the waters of the United States. This includes natural materials (i.e. silt, sand, gravel, rock, and wood) and manufactured materials, such as concrete, plastic, steel, and treated wood.)

**Waters of the United States** - Primarily surface waters under programs of the federal Clean Water Act, including streams, streambeds, rivers, lakes, reservoirs, arroyos, washes, other ephemeral watercourses, and wetlands.

**Discharge** - When used in connection with the pollution of the waters of the United States, the term means any physical release (of pollution), such as a direct release from the end of a pipe, a physical placement, an indirect release from diffused sources, or the exposure of a source to water that is normally not exposed.

The following are the most common approvals issued through ADEQ's Certification Review:

### **NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS**

These permits are issued by the U.S. Environmental Protection Agency (EPA) under Section 402 of the federal Clean Water Act (33 United States Code, Section 1342). Permits are required for facilities which discharge treated wastewater and other pollutants into the waters of the United States.

Prior to issuance by EPA, ADEQ must review the proposed permit for compliance with all applicable state laws and rules. If compliance is demonstrated, ADEQ issues a Water Quality Certification.

Application forms are available at ADEQ. Applications must be submitted six months prior to discharging. Typical applicants are public and privately owned water and Wastewater Treatment Facilities.

### **Questions frequently asked about a NPDES Permit.**

Q: Who needs a NPDES permit?

A: A NPDES permit is required whenever there is a discharge of a pollutant to a water of the United States through a point source.

Q: Are dry washes considered waters of the United States?

A: The definition of waters of the United States is very broad. It includes dry washes,

canals, dry stream beds, dry lakes, rivers, streams and tributaries. The legal definition is contained in 40 CFR Part 122 (Code of Federal Regulations).

Q: Does the state issue NPDES permits?

A: The state does not have the authority to issue NPDES permits. However, we work very closely with the U.S. Environmental Protection Agency, Region 9 (EPA). We receive applications and draft permits and forward permit requests to EPA for issuance.

Q: Is there a fee for a NPDES permit?

A: At the present time there is no fee for a NPDES permit.

Q: Are NPDES permits issued for the life of the facility, or are they issued for a certain period of time?

A: Normally, NPDES permits are issued for a period of five years. In some cases they are issued for shorter periods, but five years is the maximum.

## **DREDGE AND FILL PERMITS**

These permits are issued by the U.S. Army Corps of Engineers under Section 404 of the federal Clean Water Act (33 United States Code, Section 1344). Section 404 Permits are required for activities which will discharge dredged or fill material into the waters of the United States. These materials can result in the pollution of water by physical and chemical alterations.

Because of the broad definitions of "waters" and "pollutant" in federal and state laws, most construction and land disturbing activities in floodplains are regulated under Section 404. Prior to issuance by the Corps of Engineers, ADEQ must review the proposed permit for compliance with water quality standards.

If compliance is demonstrated, ADEQ issues a Water Quality Certification Letter. If compliance is not demonstrated, additional information or project redesign will be required before ADEQ can issue its Certification.

Coordination with ADEQ and the U.S. Army Corps of Engineers is recommended early in the project planning phase. The ADEQ Pamphlet 404-007 is available for further information about ADEQ's role and requirements for this program.

Questions frequently asked regarding Dredge and Fill Permits.

Q: When do I need ADEQ 401 Water Quality Certification Review?

A: When a 404 permit is required from the Corps of Engineers that is not pre-certified by ADEQ.

Q: How do I know if I need a Section 404 permit?

A: Arrange for a pre-application meeting with the Corps to determine the applicability of Section 404 requirements and, if necessary, perform a jurisdictional determination on the project site.

Q: How long does it take to get a 401 Certification?

A: This depends on the completeness of the information provided to ADEQ, the complexity of the proposed activity, and the sensitivity of the impacted watercourse. Minimum processing time is approximately 20 days.

Q: How long is a certification valid?

A: Construction should begin within two years of permit issuance, or before the termination date of the current Nationwide Permit rules. Currently, this is January 1997.

Q: What can I do to expedite the certification and permitting process?

A: Contacting the Corps and ADEQ early in the initial project planning process will help speed the certification and permitting process.

## **AIRPORT CONSTRUCTION AND EXPANSION PROJECTS**

The federal Airport and Airway Improvement Act of 1982 requires that state certification for air quality and water quality be submitted to the Federal Aviation Administration. The ADEQ Certification Letter is based on environmental reports, analyses, and documentation prepared during project planning.

Contacts with ADEQ's offices of air quality and water quality during project scoping are necessary to identify needed information and analyses that will be considered under ADEQ's Certification Review. The ADEQ Pamphlet FAA-004 is available for further information about ADEQ's role in this program.

## **CONSISTENCY REVIEWS BY THE STATE NONPOINT SOURCE POLLUTION CONTROL AGENCY UNDER EXECUTIVE ORDER NO. 12372**

The ADEQ is designated as the state nonpoint source agency and has prepared a plan to manage nonpoint sources of pollution within the framework of Section 319 of the federal Clean Water Act. The plan has been approved by ADEQ and the U.S. Environmental Protection Agency.

Consistency reviews for water quality are performed to help improve the coordination and integration of federal and state programs regulating nonpoint source pollution. The ADEQ Certification Letter is based on environmental reports and documentation prepared during project planning.

Contacts with ADEQ's offices of air quality and water quality during project scoping are necessary to identify needed information and analyses. The ADEQ Nonpoint Source Management Plan Summary is available for further information.

## **OTHER CERTIFICATION REVIEWS**

The ADEQ responds to requests from agencies and organizations to review environmental planning documentation to help them obtain public assistance, gain access to public lands or plan for a commercial, industrial or municipal development. The ADEQ Certification Letter is based upon environmental data, reports, analyses and other documentation prepared during initial project planning. Contacts with ADEQ Offices of Air Quality, Waste Programs and Water Quality during project scoping may be necessary to identify needed information and analyses.

## **III. APPROVALS TO CONSTRUCT AND OPERATE WATER AND WASTEWATER FACILITIES (A.R.S. §49-361 et seq)**

A Certificate of Approval to construct is required before construction.

Application forms are provided by ADEQ and must be submitted with design plans. Four complete sets of final construction plans are required for approval. No fees are charged for approval at the present time.

To receive a certificate of approval to construct, the plant's design must meet effluent limits if it is a wastewater facility or have adequate supply and pressure of potable water if it is a water system.

A Certificate of Approval to construct is issued for one year. A written request for a time extension must be received and granted by ADEQ if construction has not commenced within one year of issuance of the certificate, or if there has been a lapse in construction of more than one year. Average completion time for approval is 90 days, depending upon completeness of the application.

An approval of construction (approval to operate) must be obtained from ADEQ's regional office after construction, and prior to placing the facility in operation. Once the facility has received this approval, it will be subject to periodic ADEQ inspections.

## **SUBDIVISIONS (A.R.S. § 49-104.B.11)**

A Certificate of Approval of sanitary facilities is required of housing subdivisions to verify that adequate service will be available to residents. Approval forms are provided by ADEQ and must be submitted with subdivision plats.

Two final plats are required for approval, which is granted after water and/or wastewater approvals are issued for the project.

Once approval has been granted, it becomes a part of the public report required by the Arizona Department of Real Estate, which must be obtained prior to lot sales. Normal processing time is approximately 90 days, and no fee is required.

If subdivision plans call for individual wastewater treatment, those plans become a part of the application and must include sufficient information for a decision about the project's feasibility. Soil reports and percolation tests are required.

#### **PUBLIC AND SEMI-PUBLIC SWIMMING POOLS (A.R.S. §49-104.B.12)**

An approval to construct must be obtained before beginning construction. The ADEQ forms must be completed and submitted with plans. There is no fee for this approval at present and it is issued within 30 days of receipt of the submittal.

Approvals may be delegated to individual counties. Delegations have been granted in Maricopa, Pima, and Yavapai Counties. Individuals requiring one of these approvals should contact their county officials to determine if the county has the delegated responsibility for approval.

#### **HOME SEPTIC TANKS**

Home septic tank approvals are delegated to individual counties throughout the state. Septic tanks must meet ADEQ standards.

For guidance on specific requirements, ADEQ Engineering Bulletins No. 8, 10, 11 and 12 are available from the ADEQ Information Center, (602) 207-2217.

Questions often asked of Technical Review Engineers.

Q: Can a non-professional engineer submit plans for approval to ADEQ?

A: A non-registrant may design a water or wastewater treatment plant or extensions, additions, modifications or revisions, or extensions to water distribution or collection systems, if the total cost of the project (as verified by a cost estimate) is less than \$12,500.

- Q: Does ADEQ have engineering guidance manuals?  
 A: Yes, Engineering Bulletin No. 8 (disinfection of water systems), Engineering Bulletin No. 10 (water systems), Engineering Bulletin No. 11 (sewage treatment and collection) and Engineering Bulletin No. 12 (design and installation of septic systems and alternative on-site wastewater systems), are available for a fee from the departmental information center.
- Q: How is a submitted project processed?  
 A: Once a project is received, a file is created, numbered and labeled. The name of the file is somewhat arbitrary and often reflects the description given on the Application for Approval to Construct. Each file is given a unique number. Files are then queued and reviewed in reverse chronological order by engineers as time allows. Project status can be checked by calling the Technical Review Unit secretary.
- Q: May I construct my water or wastewater project before an "Approval to Construct" is granted?  
 A: No. Any water or wastewater project subject to the approval process must have the "Approval to Construct" prior to beginning of construction.
- Q: How long are files kept on record in your office, and are they available for public review?  
 A: Once a project has been issued an "Approval of Construction" by the regional office, it can be archived with the state Library of Archives. It can be retrieved from Archives when requested by contacting the Technical Review Unit Secretary. Please allow a few days for the file to be available for review.

#### **LANDFILL FACILITIES (A.R.S. §49-762)**

An approval to construct or operate is required for solid waste landfill facilities. This requirement addresses modifications, expansions, or changes in operating procedures in accordance with the federal Subtitle D and state regulations. If a complete and accurate plan is submitted to ADEQ, approval time is approximately 90 days. After October 9, 1993 the approval time will be longer if the project plan requires an Aquifer Protection Permit (APP).

A reasonable fee, based on the state's total costs in processing the plan, will be collected upon approval. All applicants are required to demonstrate compliance with any applicable city and county laws prior to submitting an application to the Solid Waste Unit. Landfill siting, operational and closure guidelines are available upon request.

#### **TRANSFER STATIONS**

An approval is required to build or operate a solid waste transfer station. Submit to ADEQ an applicable site plan and maps and an engineering report. Certain containers and small capacity facilities are exempt from the transfer station guidelines. Transfer station guidelines are available upon request.

#### **COMPOSTING**

An approval is required to build or operate a solid waste composting facility. Submit to ADEQ an applicable site plan and description of the facility, including how it will be maintained and monitored after closure. Additionally, you should help ADEQ to ascertain the environmental impact. Certain small capacity and volume reduction composting facilities are exempt from the guidelines. Composting guidelines are available upon request.

#### **RECYCLING FACILITIES**

An approval is required to build or operate a recycling facility. Submit to ADEQ an applicable site plan and maps and engineering report. Certain containers and small capacity facilities are exempt from the

guidelines.

### **PETROLEUM CONTAMINATED SOIL (PCS) REMEDIATION**

Petroleum contaminated soils may be treated either onsite or offsite. Approval and registration is required for construction and operation of a remedial facility. Submit to ADEQ an applicable site plan, a description of the facility, an analytical sampling plan and a closure plan.

An air quality permit may also be required for soil remediation. This permit is processed as other air quality permits outlined in Section I:4, Air Quality. There is a fee charged for this permit.

### **SLUDGE REUSE (A.R.S. §49-761)**

A solid waste approval also is required for land application of sludge. A sludge management plan demonstrating compliance with federal and state requirements must be submitted for each source of sludge. A site-specific plan must be approved for each parcel of land where the sludge will be applied. For a site where groundwater is less than 40 feet beneath the surface, an Aquifer Protection Permit also must be obtained.

### **SPECIAL WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES (A.R.S. §49-857-857.01)**

A facility operator who plans to manage special waste for treatment, storage or disposal must submit an application and a complete solid waste facility plan, including a special waste management plan component that complies with Best Management Practices adopted pursuant to A.R.S. §49-855. The operator must pay a reasonable fee based on the state's total cost in processing the plan.

Completion time for approval will be within 90 days of receipt of a complete plan from the applicant. If the plan or any portion of it is denied, the applicant will be notified in writing of the specific reasons for denial within 10 days.

If such denial occurs, the applicant then will have 90 additional days from receipt of the written denial to modify the plan, addressing the specific deficiencies. Modified plans will be approved or disapproved in writing within 90 days of receipt, and if ADEQ fails to approve or disapprove a plan within these timelines, the plan is approved. Any major modifications on an approved plan are subject to approval by ADEQ before implementation.

### **WASTE TIRE COLLECTION SITES AND PROCESSING FACILITIES (A.R.S. §49-762)**

Waste tires are solid waste, and waste tire collection sites and processing facilities are classified as solid waste facilities. The requirements for solid waste processing and disposal apply to these facilities. Waste tire collection site guidelines are available upon request.

## **IV. REGISTRATIONS**

### **DRY WELLS (A.R.S. §49-331-336)**

A dry well is a type of injection well built specifically for the disposal of storm water. Other types of injection wells or dry wells which receive fluids other than storm water are not considered dry wells, and are required to have Aquifer Protection Permits.

New dry wells must be registered with ADEQ within 30 days of starting operation. A \$10 filing fee is required, and up to 10 dry wells may be registered on a single form.

All dry wells which drain areas (such as loading docks) where hazardous and toxic substances are handled or stored require an individual Aquifer Protection Permit. When these particular dry wells require abandonment, an APP application for closure must be submitted. An ADEQ Drywells brochure is available for further information.

### **UNDERGROUND STORAGE TANKS (A.R.S. §49-1001-1073)**

Owners of new Underground Storage Tanks (UST) are required to notify ADEQ within 30 days of installation of the tank system. Owners of existing tanks who have not already notified the department are also required to notify ADEQ of their existence.

Forms for filing notification of existence of an Underground Storage Tank may be obtained from ADEQ. No notification fee is required. ADEQ assesses a \$100 annual tank fee for each UST in operation.

## **TEMPORARY SOIL REMEDIATION SITES**

The ADEQ allows the establishment of a temporary site to aerate or bioremediate petroleum contaminated soil. The applicant must certify that the project will be built and operated in accordance with ADEQ guidelines. The department then will register the site within 30 days. The registration is not renewable and is good for only one year. No fee is charged.

An air quality permit may also be required for soil remediation. This permit is processed as other air quality permits outlined in Section 1:4, Air Quality. There is a fee charged for this permit.

## **V. CERTIFICATIONS**

### **WATER, DISTRIBUTION, WASTEWATER, AND COLLECTION OPERATOR CERTIFICATION**

Q: Who needs certification?

A: Owners and/or operators of public water supply systems, potable water distribution systems, wastewater treatment systems and wastewater collection systems need certification.

Q: How does a person become certified?

A: A person becomes certified by filling out an application, passing a written exam, and paying the necessary fees.

Q: How many operator grade levels are there?

A: There are four grade levels of water, distribution, wastewater, and collection certification. The qualifications for each grade level are based on the experience and education of the operator, time-in-grade at the previous grade level, and passage of the appropriate written exam. Grade four is the highest level.

Q: When does an operator's certificate expire?

A: Certification is for three years, and is renewable every three years thereafter by filling out a renewal form and paying the necessary fees.

Q: Are there any other water related certifications in addition to water treatment, distribution, wastewater treatment or collection?

A: Yes. Back-flow prevention tester certification—as issued by the California/Nevada American Water Works Association, the Arizona State Environmental Technical Training Center or any other certifying authority approved by ADEQ—is accepted to meet the back-flow prevention tester requirements as stated in R18-4-232. There is no certification for industrial waste pretreatment, reuse water distribution, or any other water related process.

Q: How much are operator fees?

A: Fee Schedule:

	Grade 1	Grade 2	Grade 3	Grade 4
Application for Examination	10.00	10.00	25.00	25.00
Reciprocity	15.00	15.00	15.00	15.00
3-Year Certification	15.00	15.00	15.00	15.00
Renewal of 3-Year Certification	15.00	15.00	15.00	15.00
Additional Charge for Late Renewal	10.00	10.00	10.00	10.00

### **POLLUTION PREVENTION PLANS (A.R.S. §49-963)**

Certain hazardous waste generators and toxic substance users are required to submit a pollution prevention plan. Review time is 90 days.

Certified facilities with approved pollution prevention plans may pay only one-half of the required hazardous waste fee (A.R.S. §49-931.A.4.). A person who is not required to prepare a pollution prevention plan may voluntarily comply in order to receive the hazardous waste fee discount.

By December 31, 1992, a facility operator must prepare and implement a pollution prevention plan:

1. If the facility was required to file a Form R (toxic release inventory); or
2. If the facility shipped off-site, for purposes other than recycling, the lesser of:
  - a. An average of 1,000 kilograms or more cumulative total of hazardous waste in calendar year 1991;
  - b. An average of one kilogram or more per month cumulative total of acutely hazardous waste in calendar year 1991.

By December 31, 1995, a facility that shipped off-site for purposes other than recycling between 10,000 and 12,000 kilograms cumulative total of hazardous waste in calendar year 1994 must file a plan.

From and after December 31, 1994, a facility that uses in excess of 10,000 pounds of a toxic substance in a calendar year must file a pollution prevention plan by December 31 of the following year.

A format, guidance document, training, and technical assistance are offered by ADEQ. The agency does not charge a fee for pollution prevention certification.

### **TOXIC DATA REPORT (A.R.S. §49-962)**

Certain hazardous waste generators and toxic substance users are required to submit an annual toxic data report, which includes Form R and a pollution prevention progress report. Review time is 90 days.

The toxic data report is required for annual renewal of the pollution prevention planning certification. Certified facilities with approved pollution prevention planning may pay only one-half of the hazardous waste fee (A.R.S. §49-931.A.4.).

A facility operator must file a toxic data report on July 1 for the preceding calendar year if the facility was

required to file a Form R, or if during the preceding calendar year the facility generated:

1. An average of one kilogram per month of acutely hazardous waste or
2. An average of 1,000 kilograms per month of hazardous waste exclusive of an episodic, accidental, or remediation-related release.

The Form R, instruction manual, training and assistance are offered by ADEQ.

## APPENDIX 4-2

### MUNICIPAL WASTEWATER TREATMENT SYSTEMS IN THE SEAGO REGION

#### Benson, SYS ID 32001

Benson is a small incorporated city of approximately 3,900 people whose economic stability largely depends on agriculture and agricultural services and employment at two small nearby industrial sites.

All the present incorporated limits of the city are developed and sewered. The sewage collection system was initially constructed in 1948 and later expanded as the city has developed. The collection system is kept in good condition through a budgeted inspection and maintenance program. No infiltration problems have been encountered in the system.

The nature of the sewage is primarily domestic with contributions from light commercial businesses, including several retail stores and cafes, 11 service stations, 11 motels and 2 laundromats and 1,470 service connections.

The Benson sewage treatment facilities now consist of one plant. Treatment facilities were upgraded in 1991 to .600 MGD and consists of four facultative lagoons, two of which are aerated. All effluent is used to irrigate approximately 100 acres of alfalfa. Operation and maintenance are provided by a certified operator on a full-time basis.

#### Bisbee, SYS ID 320002, 320003, and 320008

Bisbee is the county seat of Cochise County and has a population of approximately 6,500 with an incorporated area of 5.4 square miles. The city's economy has undergone a transition from dependence on local mining related industries to tourism and services.

Eighty-five percent of the area is developed and approximately two-thirds of the developed area is sewered. The San Jose area has approximately one-third of its residents on individual septic tanks and leach fields, with the other two-thirds hooked up to the municipal sewer lines. In general, soil conditions in the San Jose area are not suitable for on-site disposal due to the shallowness of the top soils and the great amount of caliche conglomerates in the underlying soils.

The sewage is primarily domestic in nature with small quantities from light commercial contributors, including retail businesses, hotels and motels, cafes, schools, service stations, a car wash and two laundromats.

The first construction on the collection system was in 1905 and later additions have been made as the city expanded. The system is of cast iron and vitrified clay pipe and is in fair condition. Maintenance problems have necessitated reconstruction in some areas, and during rainstorm periods, a significant increase in flow is noted at the treatment plant. This suggests system infiltration. The San Jose district was completed in 1984.

The city is divided into three sewage districts (Bisbee Mule Gulch-Plant No. 1, the Warren District- Plant No. 2, and the San Jose District-Plant No. 3).

The Bisbee Mule Gulch Plant (32-002) consists of: two primary sedimentation tanks, dosing tank, trickling filter, two secondary sedimentation tanks, chlorination chamber, anaerobic digester, and four sludge drying beds. The discharge is to Mule Gulch and the facility has a NPDES permit for this discharge. The Bisbee/Warren facility (32-003) consists of three lagoons, followed by a rancher's holding pond for reuse of the effluent through livestock watering or irrigation. Disposal is by evaporation and reuse. The Bisbee/San Jose facility (32-008) consists of; two facultative lagoons followed by a rancher's holding pond. Disposal is by evaporation and/or reuse.

#### Douglas, SYS ID 320004

The City of Douglas is an American port-of-entry on the United States/Mexico border and has a diversified economy in mining, manufacturing, international commerce, service to agriculture, and tourism.

Ninety percent of the incorporated area is developed and served by a central collection system and sewage treatment plant facilities. The original sewage collection system was constructed in 1906 and has had subsequent additions as the city's growth dictated. The city's sewage is primarily domestic in nature, plus wastes from light commercial businesses.

The current served population is approximately 17,500 and the community foresees future population growth to parallel predicted economic advances.

The sewage treatment plant, constructed in 1946 and updated in 1964 and 1979, is of the secondary treatment, trickling filter type. The plant includes the following:

- 1 - 18-inch bypass to the Agua Prieta, Sonora, Mexico facultative lagoon system
- 1 - Mechanical bar screen (link belt)
- 2 - 14' x 62' Primary clarifiers
- 1 - 13' x 18 1/2' Dosing chamber
- 1 - 140' Diameter trickling filter (standard rate) with a 6' rock media
- 2 - 14' x 46 1/2' Secondary clarifiers
- 1 - 50' Diameter by 21' deep anaerobic digester (heated) with floating roof
- 2 - 12" Inf/Eff Parshall flumes w/EIT ultrasonic recorders
- 1 - 12" Influent Parshall flume w/Fischer-Porter recorder
- 1 - 28' X 93' Chlorine contact chamber
- 10 - Sludge drying beds

Two EIT ultrasonic recording flowmeters were installed in August 1990, a new floating cover was installed on the existing anaerobic digester in May 1992, and a new heat exchanger and vertical pedestal sludge recirculation unit were installed in June 1992.

The plant is designed to provide secondary treatment using the extended aeration activated sludge process. At the present time the plant is treating approximately 1.35 MGD.

Profiles for the plant call for an average flow of 2.6 MGD. All lines are sized to provide for the second plant phase down to the overflow weir of the new chlorine contact chamber. The 12-inch line leaving the contact chamber and crossing the international boundary into Mexico is not large enough to take the average daily flow of 2.6 MGD, but there is no current problem for the first phase work since the line appears adequate for first phase peak flows. As the flow increases and additional phases are initiated, the problem of effluent disposal will have to be resolved. Since the addition to the plant in 1979-1980, there has been little increase in the effluent flow when Douglas began providing service to the Pirtleville area.

#### Huachuca City, SYS ID 320005

Huachuca City, located north of Sierra Vista on SR 90, has a population of 1,880 all of which are connected to the sewer system. The sewage from the community is predominantly domestic, although some light commercial development exists.

The area within the incorporated limits is developed and sewered except approximately 300 acres, There are 250 residents in a contiguous area who are at the present time (1993) still on individual septic tanks. The collection system utilizing transit pipe; was constructed in 1969 and is in good condition. There haven't been any reports of infiltration-inflow problems.

The treatment facility consists of three facultative lagoons which have the following sizes and construction dates:

Lagoon No. 1 - 6.8 acres, built in 1974  
Lagoon No. 2 - 2.2 acres, built in 1969  
Lagoon No. 3 - 3.9 acres, built in 1974  
Lagoon No. 4 - 3.9 acres, built in 1974.

The No. 1 and No. 3 lagoons are operated in parallel and are in series with the No. 4 lagoon which is the polishing pond. The No. 2 lagoon is out of service. The No. 1 lagoon has been lined, using a plastic material, while the No. 3 and No. 4 lagoons remain unlined.

#### Naco Sanitary District SYS ID 320010

Naco is located along the south bank of Greenbush Draw, a tributary of the San Pedro River, in extreme south central Cochise County. The community of Naco is currently unincorporated. The Naco Sanitary District was organized in 1971 and represents the community of Naco in all matters related to wastewater management. There is no current description available from the sanitary district, but the 1978 facility plan called for a facultative lagoon, or stabilization pond and disposal of effluent through irrigation. The sanitary district has never acquired a NPDES or reuse permit so it is currently not discharging effluent. Eventually, the Naco Sanitary District will have to acquire an Aquifer Protection Permit.

#### Sierra Vista SYS ID 320006

The City of Sierra Vista is the largest city in Cochise County, with a population in 1992 estimated at 33,725. The City has within its limits Fort Huachuca, a military installation with a daytime population of approximately 16,000 that has its own integral system to serve its daytime and resident population.

The community's economy is dependant largely upon housing and services to the military and a substantial number of retirees. Additionally, tourism, construction, and some service industries provide employment to help boost the local economy.

In 1957, following incorporation, the first sewage collection system was constructed and since that time nine major additions have been made. Industry in the area is practically non-existent, and the threat of excessive hydraulic or organic loads to the system is minimal. The sewage is 90 percent domestic in nature with the addition of light commercial wastes from retail businesses, restaurants, motels, commercial car washes, and six laundries within the city limits. Several areas within the city limits, notably the "Fry" district and portions of "Town and Country," rely on individual septic tanks and leach fields for sewage disposal.

In 1968 sewage facilities consisting of three lagoons totaling 19.3 acres was constructed. Two of the lagoons had mechanical floating aerators and the third was a facultative lagoon. In 1974 additional lagoons totaling 19.3 acres were added to the three existing ponds. The most recent facility was completed in 1980 and is connected to the previously mentioned plant by two miles of transmission lines. It consists of ten ponds totaling 84 acres with one pond that serves as a constructed wetland. Three polishing ponds hold effluent which is used for irrigation of 310 acres of livestock feed.

#### Tombstone, SYS ID 320009

Tombstone, with a population of 1,240, is characterized by both residential and commercial development. The major industry is tourism because the city, known for its "Old West history," attracts many visitors to see the historic sites.

The current method of sanitary disposal for the City of Tombstone is by use of an oxidation ditch, which provides 255,000 GPD secondary treatment for the city sewers. The sewage is first screened for grit/grease before it goes into the oxidation ditch, after which it goes into a secondary clarifier, a chlorine contact chamber, and is discharged into Walnut Gulch, for which the facility has a NPDES permit.

#### Willcox, SYS ID 320007

Willcox is a small incorporated agricultural community of 3,200 located on the edge of an undrained desert basin and has a history of damage due to water runoff.

The City of Willcox owns and operates a wastewater collection and treatment system consisting of 6, 8, 10, and 15-inch diameter sewers laid at general grades of 0.12 percent. These lines drain the incorporated area through 8 and 10 inch diameter outfall sewers in Highway 86 and also through a recently installed 15 inch main on East Grant Street to the Wastewater Treatment Facility which is approximately one mile from the central business district.

The treatment facility consists of 2 facultative ponds of 5.3 and 7.5 acres each and with water depths of 10 and 11 feet respectively. A triplex lift station with 6-inch pumps conveys flow from the sewers to the ponds, then a smaller lift station with 2, 4-inch submersible pumps transfers the treated effluent after chlorination to the ornamental lakes at Twin Lakes Golf Course approximately 5,200 feet to the southwest. The effluent is later used for golf course irrigation. Excess flows are pumped to the forty acre Cochise Lake where evaporation takes place.

The community's sewage is primarily domestic in nature with small contributions from light commercial businesses including several restaurants, motels, service stations, and retailers and a car wash and two laundromats.

The existing facultative lagoon facilities staged construction beginning in 1959, with the construction of pond number 1. This pond was enlarged in 1967 and pond number 2 was added in 1969.

The plan consists of the following:

- 1 - Bar screen
- 2 - Flow recorders
- 1 - Triplex lift-station with 3, 6 inch pumps
- 1 - 5.3 Acre facultative lagoon - pond number 1
- 1 - 7.3 Acre facultative lagoon - pond number 2

Plant bypass.

Pond number 1 flows into pond number 2, but sewage from the lift station may be directed to either or both ponds.

#### Pima, SYS ID 250003

Pima is an incorporated community of approximately 1,800. The area surrounding Pima is predominately agricultural. The community is essentially residential with some light commercial enterprises, including three service stations, two cafes, and a motel.

The treatment facility for the Town of Pima was constructed in 1982, and consists of one, five acre facultative stabilization lagoon followed by chlorination and discharge into an evaporation pond directly below the stabilization lagoon. The system has a capacity of .18 MGD. The potential also exists for reuse of effluent by irrigation of agricultural crops which are not for human consumption, but Pima does not currently possess a reuse permit.

The sewer system consists of a network of gravity flow pipelines and manhole structures which are constructed at each junction of sewer lines of a change in grade. The sewers collect the wastewater from the residential, commercial, and institutional dwellings connected to the system.

#### Safford, SYS ID 350001

Safford, the county seat of Graham County, has a population of approximately 7,600 people served by the collection and treatment facility. There are currently 2,676 household connections. The domestic and commercial wastes generated are discharged to an aerated lagoon followed by polishing pond. There are

approximately 38 miles of sewer mains, and 4 lift stations in the system.

The area within the corporate limits is 70 percent developed and of this developed area approximately 95 percent is served by the sewer system. The first sewer construction took place in 1929 with additional construction in 1950, 1957 and 1971. Subsequent sewer main construction took place in 1990, 1991, 1992, and 1993. The current WWTP was constructed in 1968. The condition of the collection system is good with no infiltration-inflow problems being reported.

The treatment facility is located in the floodplain as delineated by the U.S. Geological Survey. Precautions have been taken by the city to protect the earth banks surrounding the plant by placing surplus military landing mats on the slopes to prevent erosion. There are also railroad rails driven into the north side with landing mat retainers to further protect these slopes from erosion. The plant is inspected daily by the plant's Grade II Operator.

The facility is comprised of a 7 acre lagoon with 4 floating aerators which run on alternating cycles. The aerated effluent flows into an adjacent 1.5 acre polishing pond. Chlorine gas is then injected into the treated effluent and the effluent is pumped to the City of Safford for use in golf course irrigation. There is an 8-inch flow meter on the effluent line to record effluent flows.

#### Thatcher, SYS ID 350004,350002

##### REAY LANE WWTP DESCRIPTION

The Town of Thatcher WWTP on Reay Lane (35-002) consists of four (4) aerobic evaporative lagoons, all four of which are currently in service.

##### THATCHER/DALEY ESTATES DESCRIPTION

The Town of Thatcher Daley Estates' system is comprised of three evaporation lagoons, only two of which are in service.

#### Clifton SYS ID 360001

Clifton is the county seat of Greenlee County and has a current population of 2,870 people served by the sewer system. The community's economy is largely dependent on local mining and mining related activities. All the area in the incorporated limits is developed with 90 percent of the community sewered.

The community's sewage is primarily domestic in nature, plus wastes from one laundromat, four restaurants and two motels. Ten percent of the community relies on individual septic tanks and leach fields for sanitary disposal. These tanks are pumped periodically by the town and the septage is added to the treatment plant head works.

The sewage collection system was initially constructed in the 1920s and is reported to be in good condition with very little inflow problems. The sewage treatment plant facilities were constructed in 1954 and \$360,000 worth of major improvements were completed in 1981. The sewer system is generally considered to be in fair condition, and consists of a bar screen, a 6-inch Parshall flume, a 40-foot diameter clarigester and a 33 1/2 foot diameter deep rock media trickling filter. Three sand bottom sludge beds and an effluent chlorinator complete the current operating facilities. The plant has a design capacity of .5 MGD. The Phelps Dodge Corporation has installed a pump station and force main at the plant and have installed effluent pumps which transfer the total plant output to the Phelps Dodge leaching works at Morenci.

#### Duncan, SYS ID 360002

The Town of Duncan WWTP is located northwest of the townsite off of Highway 75. The Wastewater Treatment Plant consists of one influent pump station, five aerated treatment lagoons, and one storage pond with an effluent pump station which discharges into agricultural areas. The design capacity of the

Duncan plant is .35 MGD. and no expansion is planned in the near future. Duncan possesses a reuse permit from ADEQ, No. R0003-06.

#### Patagonia, SYS ID 420002

Patagonia is a community of approximately 900 people, situated 15 miles north of the International Border at an elevation of 4,044 feet. The town lies in a narrow valley, surrounded by mountains, the Santa Ritas to the north and the Patagonias to the south. The plant consists of the following:

- 1 - Communicator
- 1 - Bar screen
- 1 - Emergency bypass lagoon
- 2 - Aeration tanks
- 1 - Clarifier
- 1 - Digester
- 2 - Sludge drying beds
- 1 - Chlorinator

The plant is an 80,000 gallon per day extended aeration unit of circular design. Two aeration units are in an outer ring, as is the aerobic sludge digester. The secondary clarifier is in the inner ring. The treated effluent is chlorinated before discharge to Sonoita Creek, to the west of town but above stream from the Sonoita Creek Bird Sanctuary. An emergency holding/overflow pond is adjacent to the treatment unit. Patagonia possesses a NPDES permit for discharge.

#### Nogales, SYS ID 420001

Nogales, Arizona and its twin city, Nogales, Sonora, Mexico are situated on the international border separating the United States and Mexico. The Arizona city serves as both the economic capital and the county seat of Santa Cruz County.

Nogales' proximity to Mexico makes it a natural export center for manufactured goods in the United States entering Mexico and Mexican agricultural products entering the United States. Fifty-eight produce firms operate in Nogales and as many as 30,000 truck loads of produce may be brought into the United States yearly. The twin plant concept, Maquiladoras, in which an American manufacturer operates a plant in the United States and another in Mexico to realize the advantages of relatively low cost Mexican assembly personnel, has enabled Nogales to increase its manufacturing activity significantly in recent years.

The Nogales International Wastewater Treatment System serves both Nogales, Arizona and Nogales, Sonora, Mexico. Approximately 62 percent of the influent to the system is from Nogales, Sonora, Mexico. Located 8.8 miles north of the international boundary adjacent to Potrero Creek and the Santa Cruz River, this aerated stabilization lagoon sewage treatment plant is one of the largest facilities of this type in the Southwest and was jointly financed and constructed by the International Boundary and Water Commission (IBWC) United States and Mexico, the City of Nogales, Arizona and the Environmental Protection Agency.

The Nogales International Wastewater Treatment Plant (IWWTP) has a design capacity of 17.2 MGD. A joint expansion project costing \$12 million between the Nogales, Arizona and the IBWC increased the plant capacity from 8.2 to 17.2 million gallons by the addition of aerators to the complete-mix lagoons.

The plant provides secondary treatment to annual average flow of 15.75 million gallons per day (MGD) and a peak flow of 28 MGD before it is discharged to the Santa Cruz River. The peak flow is currently limited to 28 MGD by the capacity of the plant influent interceptor.

Wastewater flows into the plant influent structure on the south side of the site through a 42 inch interceptor. The wastewater flows by gravity into the preliminary treatment facility, consisting of bar screens and the grit removal system. The wastewater then flows through the secondary treatment facility which consists of complete-mix and partial-mix lagoons. Secondary effluent is filtered through automatic backwash, dual media filters and then receives ultraviolet disinfection. Grit and screening from the preliminary treatment

processes are disposed of daily in a sanitary landfill.

Presently the system is discharging into the Santa Cruz River. The facility possesses a NPDES permit for this discharge. There has also been some discussion about establishing a constructed wetland project.

The system is operated by a state certified Grade III Operator and assisted by an Environmental Engineer from the IBWC. The City of Nogales and the IBWC are co-permittees for purpose of the NPDES and Groundwater Protection Permits.

Nogales Plant 1 - Kino Springs AKA Yerba Buena Plant SYS ID 420104

Nogales Plant 3 - Kino Springs SYS ID 420110

Kino Springs is a planned development five miles northeast of Nogales. The development consists of 5,000 acres of land and presently provides services for 75 families. There is an 18-hole golf course and club house, 2 tennis courts, and a riding stable.

Sanitary wastewater disposal is provided by two separate systems. Approximately 25 families (100 people) are served by an extended aeration system built in 1971 and consisting of five aeration tanks, two settling tanks, one sludge holding tank, and an evaporative (facultative) lagoon. The second system serves approximately 50 families (200 people) and consists of 2, 1 acre facultative lagoons constructed in 1971.

Both systems are operated and maintained by a certified operator, and there is no surface discharge from either system. Both Plant 2 and 3 were inspected by ADEQ in March 1993 and was found to be in compliance.

**WASTEWATER TREATMENT FACILITIES IN THE SEAGO REGION  
MAXIMUM CAPACITIES**

AREA SERVED	1993 TOTAL POP.	1993 POP. SERVED	CAPACITY (mgd)	CAPACITY PER PERSON
COCHISE COUNTY	101,175			
BENSON	3,920	3,700	0.6	162.16
BISBEE	6,500			
SAN JOSE	1,500	900	0.137	152.22
MULE GULCH	2,500	2,500	0.326	130.40
WARREN	2,500	2,500	0.7	280.00
BISBEE TOTAL	6,500	5,900	1.163	562.62
DOUGLAS	13,000	17,000	2.5	147.06
HUACHUCA CITY	1,880	1,900	0.17	89.47
NACO SD	900	900	.35	388.89
SIERRA VISTA	33,725	20,000	2.9	145.00
TOMBSTONE	1,240	800	0.255	318.75
WILLCOX	3,205	3,200	0.8	250.00
GRAHAM COUNTY	27,700			
PIMA	1,790	1,400	0.18	128.57
SAFFORD	7,620	7,620	1	131.23
THATCHER	3,950	5,000	0.5	100.00
GREENLEE COUNTY	8,350			
CLIFTON	2,970	2,970	0.5	168.35
DUNCAN	695	750	0.35	466.67
SANTA CRUZ COUNTY	31,050			
PATAGONIA	925	925	0.08	86.49
NOGALES	19,745	19,754	17.2	870.71

**APPENDIX 4-3**

## **PRIVATE AND INSTITUTIONAL SYSTEMS IN THE SEAGO REGION**

The following is a listing of the institutional/private Wastewater Treatment Facilities by county. Some of the data is very dated, but it is a compilation of the best information available using ADEQ Southern Regional Office database.

### Cochise County

ADOT - Texas Canyon Rest Area, West - SYS ID 320702

ADOT - Texas Canyon Rest Area, East - SYS ID 320701

The ADOT Texas Canyon I-10 facilities each consist of: two septic tanks in series, followed by three aerated lagoons, only two of which are operated. Disposal is via septic hauler to Willcox. These facilities were last inspected by ADEQ on February 19, 1992 and found to be in full compliance.

Arizona Electric Power Co-op - SYS ID 320203

This water treatment facility does not treat sanitary wastewater, and could almost be classified as an "industrial discharger." This operation generates wastewater during the creation of electric power, primarily in cooling the equipment. Water is used to remove sulfur dioxide and the resulting wastewater or lime slurry is sent to an evaporative pond onsite. Arizona Electric Power Coop is in the process of obtaining an APP and has a NPDES permit for its operation.

Arizona Sunsites, (AKA Clear Springs Utility) SYS ID 320101

This is an unincorporated community of approximately 1,090 people and is located in central Cochise County in the Sulphur Spring Valley. Approximately 47 percent of the community is served by a collection and a facultative lagoon Wastewater Treatment System. The remainder (575 people) rely on individual septic tanks and leach fields.

The facultative lagoon system was constructed in 1972 and consists of the following:

- 1 - 0.68 Acre lagoon
- 1 - 1.14 Acre lagoon
- 1 - 1.88 Acre lagoon with removable dike
- 1 - 2.68 Acre lagoon (not in use)
- 1 - Sprinkler system

The system is operated and maintained by a Grade II Certified Operator. The facility was last inspected by ADEQ on August 1, 1990 and was found to be out of compliance for operator certification.

Bisbee-Douglas International Airport SYS ID 320800

There are two separate Wastewater Treatment Systems at the Bisbee/Douglas International Airport. One system utilizes 30 acres of series lagoons for processing wastewater from a cannery operation. All other wastes, including wastes from the 600 bed Douglas Prison, are treated in an Imhoff tank and then conveyed to 2, 0.25 acre lagoons, chlorinated, and discharged to an unnamed tributary of Whitewater Draw. The facility has a NPDES permit for this discharge. The system was inspected on March 21, 1991, and was found to be out of compliance for operator certification, limit exceedance, and reports submittal. A reinspection of the facility on June 21, 1992 found them to be in substantial compliance.

Bonita Hog Farm SYS ID 320400

This system is listed on the ADEQ database, but all attempts to contact the operators by either telephone or mail have been unsuccessful, and no description of the facility is available on the data base. The phone

number listed by ADEQ is incorrect. The system was last inspected by ADEQ in December of 1987 and was found to be in substantial compliance.

Cochise Junior College SYS ID 320700

Cochise Junior College, located near Douglas, is administered by the Cochise County Governing Board. During the 1992 fall semester the college served 2,829 full and part-time students, of which only 171 students live on campus. The sewage discharged to the system is all domestic, while the material from the science labs is collected by traps. The facultative lagoon facilities consist of two small lagoons, each 0.1 hectares (0.3 acres), and a larger lagoon, 0.4 hectares (0.9 acres). The lagoons were constructed as the needs dictated. In 1962 the first small lagoon was built, with the second lagoon added in 1966 and both are in service at this time. The larger lagoon, built in 1972, is currently not being used.

The collection system which serves all the developed area was installed in 1962 and has had no problems. The infiltration-inflow problems are minor. The system was last inspected by ADEQ on June 19, 1992 and found to be in compliance.

Double Adobe Trailer Park SYS ID 320102

There is no descriptive data available on this system, although ADEQ did inspect the system on June 18, 1992 and found it to be in non-compliance for operator certification.

Palominas Development Company SYS ID 320112

The Wastewater Treatment System for the Palominas Development Company serves a population of about 30 people and utilizes a 0.9 acre lagoon constructed in 1960. There is no discharge from the lagoon.

The most recent inspection by ADEQ personnel on August 19, 1991 found the system to be out of compliance for Operations and Maintenance (O & M) violations, and Cochise County Health Department officials have expressed concern about the way the plant is being operated.

Thing and Dairy Queen SYS ID 320126

There is no information available on this system. ADEQ last inspected the system on January 13, 1993 and found it to be in compliance.

Holy Trinity Monastery SYS ID 320125

The Holy Trinity Monastery property consists of approximately 90 acres and is located 2 miles south of the unincorporated community of St. David, in Cochise County. Wastewater treatment and disposal was provided by 6 septic tanks in various locations on the eastern 20 acres of the property. Occupancy averages between 20-30 individuals, with a periodic peak occupancy of up to 80 individuals. Due to planned growth for the monastery facilities, a centralized Wastewater Treatment Facility was constructed for the property and use of septic tanks was discontinued. The new system has 1 lagoon or oxidation pond, and 1 polishing pond. Eventual plans call for the construction of an additional lagoon and reuse of effluent for irrigation of alfalfa. The system was last inspected on January 15, 1993, and found to be in full compliance.

#### San Jose Lodge SYS ID 320123

No information on this facility other than ADEQ database. The treatment method is facultative lagoon. Last inspection by ADEQ was in October 1989, and the facility was found to be in noncompliance for O & M.

#### Sierra Ready Mix SYS ID 320201

Sierra Ready Mix is a sand, gravel, and ready mix concrete operation on the north side of Sierra Vista. An "industrial" facility, the plant generates wastewater primarily as a function of the washing activities. Wastewater from their operation is high in suspended solids and is contained in 2, 0.2 acre lagoons. The lagoons were built in 1954 and 1977 to contain the wastewater on the property and store it for reuse. The system was last inspected and found to be in September 1989 and found to be in full compliance.

#### Southeast Arizona Medical Center SYS ID 320801

The Southeast Arizona Medical Center is located off of SR 80 between Bisbee and Douglas. The hospital's facultative lagoon system was constructed in 1967 and serves a population of approximately 400. The system consists of 3, 0.8 acre lagoons and was found to comply with ADEQ standards during a February 1988 inspection. The system is operated by a Grade II Certified Operator.

#### Southern Arizona Bible College (AKA Assembly of God, Latin American District) SYS ID 320110

Southern Arizona Bible College is located west of Palominas on State Highway 92 and is in the Miracle Valley subdivision. Only the southern portion of the development is sewerred, while the northern portion is on individual septic systems. The sewerage system serves a winter population of about 80 and a summer population somewhat lower than that.

The condition of the collection system is good with no maintenance problems being encountered. There is some question about infiltration-inflow problems because the lagoons tend to fill up during periods of rain. The treatment facility consists of 3 facultative lagoons, the first of which was built in 1958, the other 2 were completed by 1967. The lagoon sizes are: 1, 0.05 acre lagoon; 1, 0.1 acre lagoon; and 1, 0.3 acre lagoon. The system is operated and maintained by a Grade I Operator. The ADEQ last inspected the system in September 1989 and found it to be in noncompliance for a Certified Operator and O & M violations.

#### Southland Properties (Golden Acres) SYS ID 320109

Golden Acres is a privately owned mobile home community located southeast of Sierra Vista. Sewage treatment consists of 2, 0.2 acre facultative lagoons operated in series. The population served is approximately 400. The ADEQ last inspected the system on March 5, 1990, and found it to be out of compliance for operator certification.

#### U.S. Army - Fort Huachuca SYS ID 320600

Fort Huachuca is a Department of the Army installation utilized as a training center and an electronic equipment testing center. The Fort is located within the city limits of the City of Sierra Vista and has an estimated daytime population of 16,000. The permanent population of includes military personnel quartered in barracks and personnel with dependents in family housing.

The nature of the sewage entering the treatment facilities is domestic with some light commercial contributors. The post laundry wastes are sent directly to a facultative pond, bypassing the primary and secondary facilities. The Fort Huachuca Wastewater Treatment System consists of: headwork with barminutor, primary clarifier, trickling filter, final clarifier, and an anaerobic and aerobic digester. Some of the effluent is used on the golf course and parade ground while the excess is sent into a series of 5 evaporation ponds. The first construction of the collection system was in 1942 followed by several periods of expansion resulting in the two separate collection systems that exist today. Vitrified clay pipe was used extensively, and is in good condition with no inflow problems.

Each collection system has a secondary treatment plant, and the final effluent from both plants is sent to a facultative lagoon (approximately) 6.1 hectares (15 acres) in size capable of holding 492,000 m<sup>3</sup> (130 x 10 gallons) known as the East Range Lagoon.

Plant No. 1 consists of the following:

- 1 - Bar screen
- 1 - Aerated grit chamber
- 1 - Comminutor
- 1 - 22.9 cm. (9 in.) Parshall flume and flow recorder.
- 1 - 9.3 m. x 21.6 m. (30' x 70') Primary clarifier with pre-aeration
- 1 - 15.4 m. diameter (50') Trickling filter (high rate) with a 1.0 M. (6') deep rock media).
- 1 - 13.9 m. dia. (45') Secondary clarifier
- 1 - 2,650 m<sup>3</sup> (0.7 x 10<sup>6</sup> gallon) Effluent holding pond
- 1 - 10.8 dia. (35') Primary anaerobic digester (heated)
- 1 - 10.8 dia. (35') Secondary anaerobic digester (heated)
- 12 - Sludge drying beds
- 1 - Pump station for golf course irrigation
- 1 - Chlorinator for irrigation effluent

Plant No. 2 contains the following:

- 1 - Bar screen and grit chamber.
- 1 - 22.9 cm. (9 in.) Parshall flume and flow recorder.
- 1 - Barminutor
- 1 - 6.3 m. x 6.5 m. (20.5' x 21') Aerated flocculation chamber
- 1 - 30.9 m. dia. (100') Trickle filter (High Rate), with a 1.9 m. (6') deep rock media
- 1 - 17.0 m. dia. (55') Secondary clarifier
- 1 - 6,800 m<sup>3</sup> (1.8 x 10<sup>6</sup> gallon) Effluent holding pond
- 1 - 14.2 m. dia. (46') Primary anaerobic digester (heated)
- 1 - 14.2 m. dia. (46') Secondary Anaerobic Digester (unheated)
- 20 - Sludge drying beds
- 1 - Pump station for parade field irrigation
- 1 - Chlorinator for irrigation effluent.

The plants are operated and maintained continuously 24 hours per day, seven days per week, by several qualified operators. A laboratory is located at Plant No. 1 and is staffed with two professional chemists. The system was last inspected by ADEQ on April 12, 1991 and found to be in compliance.

Graham County

Phelps Dodge Corporation - Safford SYS ID 350200

There is no data available on this system. The ADEQ last inspected this system in December 1989 and it was found to be in compliance.

Arizona Department of Corrections - Fort Grant SYS ID 350700

The Fort Grant Industrial School is located on the west side of the Pinaleno Mountains adjacent to the Coronado National Forest boundary. The aerated lagoon Wastewater Treatment System serves a population of approximately 550 people. The system was constructed in 1967 and consists of 2, 0.4 acre aerated lagoons. The Fort Grant Wastewater System consists of 2 mechanically aerated lagoons which can only be operated in series. A third lagoon exists just to the east but is not used due to infiltration. There is no pretreatment. The effluent from the secondary treatment pond is not disinfected. The effluent flows approximately 1.5 miles overland in an open, unlined ditch to an unlined evaporation pond. Cattle graze in this area and drink the effluent. No effluent leaves the prison property. The ADEQ last inspected this facility in June 1991 and it was found to be in noncompliance.

Arizona Department of Corrections - Safford SYS ID 350701

The Arizona Department of Correction's treatment facilities in Safford consist of a headwork with automatic barscreen; two lagoons in series, a chlorination basin; and eventual discharge to Bennett Wash, a tributary of the Gila River. The ADEQ last inspected the complex on March 7, 1991 and it was found to be in non-compliance for quality and monitoring violations.

U.S. Bureau of Prisons - Federal Work Camp - SYS ID 350600

The Federal Prison Camp is located on the east side of the Pinaleno Mountains within the Coronado National Forest boundary. The aerated and facultative lagoon system serves approximately 400 people and consists of 2, 2.9 acre aerated lagoons; 2, 2.5 acre facultative lagoons; and 2, 5 acre facultative lagoons. Construction of the system was completed in 1973 and there is no discharge. Operation and maintenance of the system is supervised by a Grade III Operator. The ADEQ last inspected this facility on January 10, 1991 and it was found to be in substantial compliance.

Greenlee County

Duncan Elementary School SYS ID 360800

The Duncan Elementary School has a recently constructed (1975) extended aeration Wastewater Treatment System to serve 300 people during the school year. The system consists of five aeration tanks, one settling tank, and a leach field to contain the effluent discharge. Operation and maintenance is performed by a Grade II Operator. ADEQ inspected the system on October 3, 1990 and it was found to be in compliance.

Phelps Dodge - Plantsite and Stargo SYS ID 360101 and 360102

The community of Morenci is an unincorporated mining community owned and operated by Phelps Dodge Corporation. The sewage from the community is disposed of at the treatment plants of Plantsite and Stargo. Both plants are mechanical trickling filter units preceded by primary sedimentation in conjunction with a gravity fed unheated digester known as a clarigester (a modified Imhoff tank).

The Stargo facility, built in 1956, consists of the following equipment:

- 1 - Bar screen
- 1 - 9.1 m. dia. (30') Clarigester consisting of a circular clarifier above a 7.9 m. (26') deep anaerobic digester
- 1 - 13.1 m. dia. (43') Trickling filter with a 1.2 m. (4') deep rock media. The media is retained by a wire mesh fence
- 1 - 15.1 l/s (240 gpm.) Recirculation pump
- 3 - Sludge Beds, 12.2 m. x 12.2 m. x 1.8 m. (40' x 40' x 6')

The Plantsite facility, built in 1953 and remodeled in 1956 and 1965 consists of:

- 1 - Bar screen
- 1 - Burner for screening disposal
- 1 - Influent division box
  
- 1 - 12.2 m. dia. (40') Clarigester consisting of a circular clarifier above a 8.7 m. (27') deep anaerobic digester
- 1 - 7.3 m. dia. (24') Clarigester consisting of a circular clarifier above a 7.3 (24') deep anaerobic digester
- 1 - Filter influent division box
- 1 - 16.5 m. dia. (54') Trickling filter
- 1 - 13.1 m. dia. (43') Trickling filter a 1.2 M. (4') deep rock media. The media is retained by a wire mesh fence.

- 1 - 34.3 1/s (544 gpm.) Recirculation pump
- 1 - 34.3 1/s (544 gpm.) Effluent pump
- 1 - Sludge distribution box
- 5 - Sludge beds, 15,2 m. x 15.2 m. x 0.9 m. (50' x 50' x 3')

Both plants are operated and maintained by certified operators.

Precautions have been taken on the various washes to contain any effluent that may be discharged because of effluent pump failure. These precautions include a series of dams constructed to prevent any effluent from reaching any flowing surface waters such as the San Francisco or Gila Rivers. These measures protect against the possibility of the sewage disposal plants discharging effluent to the waters of the San Francisco and Gila Rivers. However, the effluent from both plants is recycled into the process systems one to the concentrator circuit and the other to the leaching circuit. ADEQ inspected the Plantsite facility in December 1991 and the Stargo facility in August of 1989. Both facilities were found to be in full compliance.

Phelps Dodge Corporation, Metcalf Machine Shop SYS ID 360100

The system consists of: one oxygen clarifier/digester. The treated effluent flows to a leach pad, which in turn is recovered in the solvent extraction (SX) plant. This treatment unit is located in the mine pit adjacent to the heavy duty machine shop. The system number belonged to the tent city site, which has been removed from service and is due to be dismantled. The ADEQ inspected this system in August 1989 and it was determined to be in full compliance.

Phelps Dodge Corporation - Morenci SYS ID 360999

The Phelps Dodge Corporation with sites in Morenci/Chase Creek and Gold Gulch are NPDES and groundwater permitted sites only, and there is no wastewater treatment of any sort involved. The NPDES sites are: 001 - Lower Chase Creek Dam spillway; 002-Gold Gulch Dam spillway. The ADEQ inspected this system in November 1992 and it was determined to be in full compliance.

Santa Cruz County

Mountain View Campground SYS ID 420100

The Amado KOA is a campground providing services to campers and recreational vehicles. Approximately 150 people are served daily (yearly average) by an extended aeration Wastewater Treatment System. The system was installed in 1973 and consists of two aeration tanks, one settling tank, one sludge holding tank, a chlorinator, and an evaporative lagoon. There is no discharge from the system and operation and maintenance is performed by a certified operator. The system was inspected by ADEQ in December of 1992 and found to be in full compliance.

UMI - Artley- Coin Art SYS ID 420102

Very little data is available from ADEQ on this system. Artley and Coin Art have both now been taken over by United Musical Instruments (UMI). The UMI generates wastewater containing heavy concentrations of metals during its electroplating operations, and must pretreat the wastewater before discharging it into the Nogales wastewater system. No sanitary wastewater is treated at this facility. Metals are removed from the wastewater on-site and disposed of as hazardous waste. The facultative lagoon once used for treatment was discontinued in 1986. Operation and maintenance are performed by a certified operator. The ADEQ inspected the system in April 1989 and found it to be in noncompliance for certified operator and reporting requirements.

Citizens Utilities - Rio Rico SYS ID 420107

Rio Rico is a planned community 12 miles north of Nogales that is in the initial stages of development. The development opened in 1969. This development is one of the fastest growing communities in the region,

and the Free Trade Agreement can only serve to increase the growth in this area. Currently, the core community consists of 280 homes, a 201 room hotel, an adjacent industrial park, a shopping center, a full recreational park, and an 18-hole golf course. The industrial park primarily consists of industries utilizing the twin city concept where the major manufacturing occurs in Mexico and the final product is assembled in the United States. The facultative lagoons once in use have been abandoned, and this system is now a lift station operation only. Sewage is collected and transported to the IBWC in Nogales. The system was last inspected by ADEQ in December 1987 and was found to be in compliance.

#### Citizens Utilities - Peck Canyon SYS ID 420115

This operation is an evaporative lagoon treatment operation in the Rio Rico area. The system is composed of two sets of lagoons, each about seven acres in area, in Peck Canyon and Josephine Canyon. The system was Inspected by ADEQ in March 1993 and was found to be in compliance.

#### Buena Vista Public Service SYS ID 420114

No information available on this facility. The system was inspected by ADEQ in July 1988 and was found to be in compliance.

#### Patagonia Lake State Park SYS ID 420700

The Arizona State Parks Board manages Patagonia Lake State Park. The park is located between Patagonia and Nogales approximately five miles northwest of Arizona 82. The park provides water based recreation for a yearly average population of approximately 1,500 people.

Sanitary wastewater disposal is provided by an extended aeration wastewater system constructed in 1970. The system consists of one aeration tank, one settling tank, one clarifier, and a chlorinator. Effluent discharge to the lake is covered by NPDES permit number AZ0021793. The lake is fed by Sonoita Creek and overflow is to the Santa Cruz River by way of Sonoita Creek. The system was inspected by ADEQ in June 1992 and was found to be in noncompliance for submittal requirements.

#### Pena Blanca Lodge SYS ID 420112

Pena Blanca Lodge, operated by the U.S. Forest Service - Coronado National Forest, is located northwest of Nogales on Arizona 289 at Pena Blanca Lake. Facilities at the lodge include cabins, a restaurant, and bar and provide services for approximately 50 people. Wastewater treatment is provided by a septic tank with overflow to a facultative lagoon. There is no certified operator for this system. The system was inspected by ADEQ in November 1992 and was found to be in a noncompliance status for a certified operator.

**APPENDIX 4-4  
INDUSTRIAL DISCHARGERS IN THE SEAGO REGION**

Apache Nitrogen Products Inc. formerly Apache Powder Co., is located near St. David and the San Pedro River. Apache manufactures nitrogen based fertilizers and explosives. Their primary effluent is wastewater containing nitrates and is collected and contained in a series of three holding ponds. The ponds vary in size from 0.15 acres to 1.72 acres and were constructed between 1973-1978. The high nitrate content of the effluent makes it an ideal fertilizer and the water is used to irrigate permanent pasture for cattle. All of the effluent is contained on Apache Nitrogen property. Although these ponds have no associated surface discharge, Apache applied last year for a NPDES permit as required by law. Apache has started engineering for an effluent treatment system which will achieve zero-discharge to the environment. At the time this system becomes operational, the ponds will be closed in accordance with all applicable laws and regulations. As no municipal wastewater treatment system is available in the vicinity of Apache Powder, connection to such is not an option.

United Musical Instruments (UMI) is an industrial system located in Nogales. The UMI pretreats its effluent and delivers it to the Nogales International Wastewater Treatment Facility for disposal.

Fuggitti Electroplating also located in Nogales, replates electrical fixtures and pretreats the resulting wastewater on-site before discharging into the Nogales treatment facility.

Phelps Dodge located at various plants in Graham and Cochise Counties, is an "industrial" operation but has an excellent record of monitoring any discharge and protecting the environment.

Phelps Dodge - Plantsite and Stargo SYS ID 360101 AND 360102

The community of Morenci is an unincorporated mining community owned and operated by Phelps Dodge Corporation. The sewage from the community is disposed of at the treatment plants of Plantsite and Stargo. Both plants are mechanical trickling filter units preceded by primary sedimentation in conjunction with a gravity fed unheated digester known as a clarigester and a modified Imhoff tank).

The Stargo facility, built in 1956, consists of the following equipment:

- 1 - Bar screen
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- 1 - 13.1 m. dia. (43') trickling filter with a 1.2 m. (4') deep rock media. The media is retained by a wire mesh fence
- 1 - 15.1 1/s (240 gpm.) recirculation pump
- 3 - Sludge beds, 12.2 m. x 12.2 m. x 1.8 m. (40' x 40' x 6')

The Plantsite facility, built in 1953 and remodeled in 1956 and 1965 consists of:

- 1 - Bar screen
- 1 - Burner for screening disposal
- 1 - Influent division box
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- 1 - 7.3 m. dia. (24') clarigester consisting of a circular clarifier above a 7.3 (24') deep anaerobic digester
- 1 - Filter influent division box
- 1 - 16.5 m. dia. (54') trickling filter)
- 1 - 13.1 m. dia. (43') trickling filter a 1.2 M. (4') deep rock media. The media is retained by a wire mesh fence.
- 1 - 34.3 1/s (544 gpm.) recirculation pump
- 1 - 34.3 1/s (544 gpm.) effluent pump
- 1 - Sludge distribution box

5 - Sludge beds, 15,2 m. x 15.2 m. x 0.9 m. (50' x 50' x 3')

Both plants are operated and maintained by certified operators. Precautions have been taken on the various washes to contain any effluent that may be discharged because of effluent pump failure. These precautions include a series of dams constructed to prevent any effluent from reaching any flowing surface waters such as the San Francisco or Gila Rivers. These measures protect against the possibility of the sewage disposal plants discharging effluent to the waters of the San Francisco and Gila Rivers. However, the effluent from both plants is recycled into the process systems one to the concentrator circuit and the other to the leaching circuit. The ADEQ inspected the Plantsite facility in December 1991 and the Stargo facility in August of 1989. Both facilities were found to be in full compliance.

Phelps Dodge Corporation, Metcalf Machine Shop SYS ID 360100

The system consists of: one oxygen clarifier/digester. The treated effluent flows to a leach pad, which in turn is recovered in the solvent extraction (SX) plant. This treatment unit is located in the mine pit adjacent to the heavy duty machine shop. The system number belonged to the city site, which has been removed from service and is due to be dismantled. The ADEQ inspected this system in August 1989 and it was determined to be in full compliance.

Phelps Dodge Corporation - Morenci SYS ID 360999

The Phelps Dodge Corporation with the Morenci/Chase Creek and Gold Gulch sites are NPDES and groundwater permitted sites only, and there is no wastewater treatment of any sort involved. The NPDES sites are: 001 - Lower Chase Creek Dam spillway; 002-Gold Gulch Dam spillway. The ADEQ inspected this system in November 1992 and it was determined to be in full compliance.

Other quasi-industrial dischargers are:

Arizona Electric Power Co-op - SYS ID 320203

Arizona Electric Power Coop produces wastewater containing dissolved minerals as a byproduct of its cooling process. This water treatment facility does not treat sanitary wastewater and could almost be classified as an "industrial discharger." This operation generates wastewater during the creation of electric power, primarily in cooling the equipment. Water is used to remove sulfur dioxide and the resulting wastewater or lime slurry is sent to an evaporative pond on-site. Arizona Electric Coop is in the process of obtaining an APP and has an NPDES permit for its operation.

Sierra Ready Mix SYS ID 320201

Sierra Ready Mix is a sand, gravel, and ready mix concrete supplier located near Sierra Vista and produces a particulate, sand and gravel effluent from its crusher operation. The effluent is contained in two lagoons. An "industrial" facility, the plant generates wastewater primarily as a function of the washing activities. Wastewater from their operations is high in suspended solids and is contained in 2, 0.2 acre lagoons. The lagoons were built in 1954 and 1977 to contain the wastewater on the property and store it for reuse. The system was last inspected in September 1989 and found to be in full compliance.

## APPENDIX 4-5

### NATIONAL SLUDGE RULES SUMMARY OF 40 CFR PART 503 STANDARDS FOR THE USE OR DISPOSAL OF SEWAGE SLUDGE

The United States Environmental Protection Agency (EPA) has been in the process of developing comprehensive federal sewage sludge (biosolids) use and disposal regulations for many years. The proposed regulation was published for public comment on February 6, 1989 and in final form in the Federal Register on February 19, 1993.

The regulation is organized into the following subparts: general provisions; land application; surface disposal; pathogens and vector attraction reduction; and incineration.

Subparts addressing standards for land application, surface disposal and incineration practices consist of sections covering: applicability and special definitions; general requirements; pollutant limits; operational requirements; management practices; monitoring, recordkeeping, and reporting requirements.

The following summary of the 40 CFR Part 503 regulations is based on the final regulation approved November 25, 1992, by the U.S. EPA. It is a simplified summary of the regulation and does not contain all details, requirements, or exceptions.

#### GENERAL PROVISIONS AND IMPLEMENTATION PLANS

The Part 503 rule applies to sewage sludge generated from the treatment of domestic sewage and includes domestic septage. Sewage sludge and other wastewater solids disposed of in municipal solid waste landfills for bulk disposal or used as landfill cover material is regulated by the 40 CFR Part 258 solid waste landfill regulation, which co-promulgated under the Clean Water Act and the Resource Conservation and Recovery Act.

Compliance with the Part 503 standards is required within 12 months of publication of the regulation. However, if new pollution control facilities need to be constructed to achieve compliance, then compliance is required within two years of publication. Compliance with monitoring, recordkeeping and reporting requirements are required within 150 days of publication of the rule in the Federal Register. Usually, the rule is written to be "self implementing," which means that citizen suits or EPA can enforce the regulation even before permits are issued.

The standards will be incorporated into National Pollution Discharge Elimination System (NPDES) permits issued by EPA or permits issued by states with approved sewage sludge management programs in accordance with 40 CFR Parts 122, 123, and 501 (promulgated in May 1989 and revised in February 1993). The EPA will work closely with the states to encourage their adoption of sewage sludge management programs that can be approved to carry out delegated programs and avoid the need for EPA to issue separate permits.

Under the revised 40 CFR Parts 122, 123, and 501 permit regulations, also published in the Federal Register on February 19, 1993, all Treatment Works Treating Domestic Sewage (TWTDS), including non-dischargers and sludge-only facilities, must apply for a permit. The definition of "TWTDS" includes facilities that generate, process or otherwise control the quality of sewage sludge or the manner in which it is used/disposed. However, commercial handlers that only distribute or land apply the sewage sludge without changing its quality are not automatically considered TWTDS and are not required to submit permit applications unless specifically requested to do so by the permitting authority - EPA or an approved state. The TWTDS do include owners or operators of disposal facilities such as sewage sludge incinerators, monofills and other surface disposal sites. While the definition of TWTDS does not extend automatically to land where sewage sludge is beneficially used, such as farm land and home gardens, under unusual situations even these areas could be designated a TWTDS by the permitting authority on a case by case

basis when necessary to protect public health and the environment. The permitting authority has the flexibility to cover both the generator and the treatment, use/disposal facility in one permit or separate permits (including covering one or both under general permits).

Due to the large number of potential permit applications that will be submitted under this program, EPA plans to focus initially on TWTDS required to have, or requesting, site-specific pollutant limits under Part 503. As a result:

- Existing TWTDS required to have, or requesting, site-specific pollutant limits under Part 503 (i.e., sewage sludge incinerators and certain surface disposal facilities) must apply for their permit within 180 days after publication of the Part 503 rule. In the future, proposed new facilities in this category must apply for a permit 180 days prior to beginning operation.
- Sludge-only TWTDS that do not have NPDES permits (and not required to have or requiring site-specific limits) must submit limited data within one year after publication of the Part 503 rule.
- Other TWTDS must submit permit applications in accordance with NPDES permit renewal procedures - at least 180 days before their NPDES permit is due to expire.

The permitting authority may request that permit applications be submitted earlier than the times noted above, with permit applications being due 180 days after such a request.

Annual reporting is required of all Class I sewage sludge management facilities (i.e., the ~1,600 pretreatment POTWs and ~400 other "designated" TWTDS) and other "major" POTWS - those with a design flow  $\geq$  1 MGD or serving a population of  $\geq$  10,000 people.

## LAND APPLICATION

Land application includes all forms of applying bulk or bagged sewage sludge to land for beneficial uses at agronomic rates (rates designed to provide the amount of nitrogen needed by the crop or vegetation grown on the land while minimizing the amount that passes below the root zone). These include application to: agricultural land such as fields used for the production of food, feed and fiber crops, pasture and range land; non-agricultural land such as forests; public contact sites such as parks and golf courses; disturbed lands such as mine spoils, construction sites and gravel pits; and home lawns and gardens. The sale or give away of sewage sludge products (such as composted or heat dried products) is addressed under land application, as is land application of domestic septage.

### General Requirements

The rule applies to the person who prepares sewage sludge for land application or applies sewage sludge to the land. These parties must obtain and provide the necessary information needed to comply with the rule. For example, the person who prepares bulk sewage sludge that are land applied must provide the person who applies it to land, with all information necessary to comply with the rule, including the total nitrogen concentration of the sewage sludge.

The regulation established two levels of sewage sludge quality with respect to heavy metal concentrations - pollutant Ceiling Concentrations and Pollutant Concentrations ("high quality" sewage sludge); and two levels of quality with respect to pathogen densities - Class A and Class B; and two types of approaches for meeting vector attraction reduction - sewage sludge processing or the use of physical barriers. Under the Part 503 regulation, fewer restrictions are imposed on the use of higher quality sewage sludge.

To qualify for land application, sewage sludge, or material derived from sewage sludge must meet at least the pollutant Ceiling Concentrations, Class B requirements for pathogens and vector attraction reduction requirements. Cumulative Pollutant Loading Rates are imposed on sewage sludge that meet the pollutant Ceiling Concentrations but not the Pollutant Concentrations. A number of general requirements and management practices apply sewage sludge that are land applied with the exception of "Exceptional

Quality" sewage sludge or derived material which meet three quality requirements - the Pollutant Concentration limits, Class A pathogen requirements, and vector attraction reduction sewage sludge processing. However, in all cases the minimum frequency of monitoring, recordkeeping, and reporting requirements must be met.

#### Pollutant Limits

Pollutant limits for land application are listed in the following table:

#### LAND APPLICATION POLLUTANT LIMITS

(All weights are on dry weight basis)

Table in 503 Rule	Table # 1	Table # 2	Table # 3	Table # 4
Pollutant	Ceiling Concentration Limits* (mg/kg)	Cumulative Pollutant Loading Rates (kg/ha)	"High Quality" Pollutant Concentration Limits** (mg/kg)	Annual Pollutant Loading Rates (kg/ha/yr)
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Chromium	3,000	3,000	1,200	150
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	18	18	0.90
Nickel	420	420	420	21
Selenium	100	100	36	5.0
Zinc	7,500	2,800	2,800	140

#### LEGEND:

\*Absolute Values      \*\*Monthly Averages      ha = hectare (10,000 square meters or 2.47 acres)

SOURCE: ADEQ, Arizona Water Quality Assessment 1992, State of Arizona Clean Water Act Section 305(b) Report.

To be land applied, bulk sewage sludge must meet the pollutant Ceiling Concentrations and Cumulative Pollutant Loading or Pollutant Concentration limits. Bulk sewage sludge applied to lawns and home gardens must meet the Pollutant Concentration limits. Sewage sludge sold or given away in bags must meet the Pollutant Concentration limits or annual sewage sludge product application rates that are based on the Annual Pollutant Loading Rates.

#### Pathogen and Vector Attraction Reduction

Sewage sludge is classified into two categories, Class A and Class B, based upon the pathogen reduction criteria described later in this article. Restrictions placed on end uses of sewage sludge are impacted by the pathogen reduction classification of the sewage sludge. Bulk sewage sludge applied to agricultural and

non-agricultural land (e.g. forest, public contact sites, and reclamation sites) must meet at least Class B requirements. Bulk sewage sludge applied to lawns and home gardens, and sewage sludge sold or given away in bags or other containers must meet the Class A criteria and one of the vector attraction reduction sewage sludge processing options. One of the ten vector attraction reduction options described later in the article also must be met when bulk sewage sludge is applied to the land.

#### Management Practices

The following management practices apply to land applied sewage sludge (other than "Exceptional Quality" sewage sludge products):

1. Bulk sewage sludge shall not be applied to flooded, frozen, or snow-covered ground so that the sewage sludge enters wetlands or other waters of the United States unless authorized by the permitting authority.
2. Bulk sewage sludge shall not be applied at rates above agronomic rates, with the exception of reclamation projects when authorized by the permitting authority.
3. Bulk sewage sludge shall not be applied if likely to adversely affect a threatened or endangered species.
4. Bulk sewage sludge shall not be applied less than 10 meters from waters of the United States, unless authorized by the permitting authority.
5. Sewage sludge sold or given away shall have either a label affixed to the bag or other container, or an information sheet shall be provided to the person who receives the sewage sludge for application to the land that provides information on proper use, including the annual whole sludge application rate that does not cause any of the annual pollutant loading rates to be exceeded.

Furthermore, when sewage sludge that meets Class B pathogen reduction requirements, but not Class A, is applied to the land, the following site restrictions have to be met:

1. Food crops with harvested parts that touch the sewage sludge/soil mixture (such as melons, cucumbers, squash, etc.) shall not be harvested for 14 months after application.
2. Food crops with harvested parts below the soil surface (root crops such as potatoes, carrots, radishes) shall not be harvested for 20 months after application if the sewage sludge is not incorporated for at least 4 months.
3. Food crops with harvested parts below the soil surface (root crops such as potatoes, carrots, radishes) shall not be harvested for 38 months after application if the sewage sludge is incorporated in less than 4 months.
4. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after sewage sludge application.
5. Animals shall not be grazed on a site for 30 days after sewage sludge application.
6. Turf shall not be harvested for 1 year after sewage sludge application if the turf is placed on land with a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.
7. Public access to land with high potential for public exposure shall be restricted for 1 year after sewage sludge application.
8. Public access to land with a low potential for public exposure shall be restricted for 30 days after sewage sludge application.

## Monitoring

Monitoring for pollutants, pathogen densities and vector attraction reduction requirements shall be at a minimum frequency based on annual sewage sludge amounts used or disposed as listed in the following table:

### MONITORING FREQUENCY

Sewage Sludge Amounts (dry metric tons* per year)	Monitoring Frequency
>0 to <290	Once per year
290 to <1,500	Once per quarter
1,500 to <15,000	Once per 60 days
≥15,000	Once per month

#### LEGEND:

\*Note: 1.0 metric ton = 1.1 English tons

The permitting authority may impose more frequent monitoring requirements on permittees. In addition, after two years of monitoring at these frequencies, the permitting authority may allow the monitoring frequencies to be reduced to no less than once per year.

## Recordkeeping

The recordkeeping requirements vary with the end use of the sewage sludge or sewage sludge derived material. Except as noted, records must be kept for five years. Each requirement is summarized below.

If the sewage sludge or resulting product meet the Pollutant Concentration limits, the Class A pathogen requirement, and one of the first 8 vector attraction reduction (process) requirements, the person preparing the "Exceptional Quality" sewage sludge must certify through periodic sampling that the material meets these criteria and keep records describing the methods used to meet the Class A pathogen reduction and vector attraction reduction requirements.

If the sewage sludge is to be applied to agricultural land, forest, public contract sites or reclamation sites and injection or surface application followed by incorporation are intended to be the method to meet the vector attraction reduction requirements, the person preparing the sewage sludge and the person applying the sewage sludge must also describe how each of the applicable management practices have been met for each site on which sewage sludge has been applied.

If a sewage sludge meets the Class B pathogen reduction requirements and the Pollutant Concentration limits, the person preparing the sewage sludge and the person applying the sewage sludge must certify that the material meets these criteria. The person applying the sewage sludge must also certify that in addition to the management practices, the site restrictions have also been met.

If a sewage sludge does not meet the Pollutant Concentration limits, but does meet the pollutant Ceiling Concentrations, the person preparing the sewage sludge must certify that the pathogen reduction and vector attraction reduction requirements have been met. In addition to the management practices and the site restrictions, the person applying the sewage sludge must keep a record of the cumulative amount of each pollutant applied to each site. The Cumulative Pollutant Loading Rates shall not be exceeded on each site. In addition, information on the location of each application site, its size, the date, and time of the sewage sludge application shall be recorded and kept indefinitely.

If a sewage sludge meets the Class A requirements and the Ceiling Concentrations, but not the Pollutant

Concentration limits, and is to be sold or given away in a bag or other container, the person who prepares the sewage sludge shall determine and record the annual whole sludge application rate that does not cause the material to exceed the Annual Pollutant Loading Rates (Table 4 values). The concentration of each pollutant listed in Table 4 shall also be recorded. Furthermore, the preparer shall keep a record describing how the Class A pathogen reduction and vector attraction reduction requirements have been met.

## Reporting

The information contained in the required records shall be submitted to the permitting authority annually for all Class I sludge management facilities and POTWs with a design flow rate  $\geq 1$  MGD or a service population of  $\geq 10,000$  people. In addition, for sites where recordkeeping is required, the same group of facilities shall report annually when any cumulative metal loading reaches 90 percent of the allowed Cumulative Pollutant Loading Rates (Table 2 values).

## Distributed and Marketed Products

The regulation of products that are distributed and marketed are addressed as a part of land application rather than as a separate practice under Part 503. As outlined above, the sale or give away of sewage sludge in bulk, bags, or other containers is regulated under land application in the final Part 503 rule. Bulk sewage sludge is frequently applied to farmland, forest, and reclamation sites in liquid or dewatered cake forms at little or no cost to the landowner. At a minimum these materials must meet the pollutant Ceiling Concentrations, Class B pathogen reduction and vector attraction reduction criteria, and can be applied using the Cumulative Pollutant Loading Rates if they do not meet the Pollutant Concentration Limits.

On the other hand, sewage sludge or material derived from sewage sludge that is considered suitable for distribution and marketing (D & M) for uses on lawns and home gardens, either in bulk or container form, must meet the Class A pathogen reduction requirements, a vector attraction reduction processing option, and the Pollutant Concentration limits (with the exception that sewage sludge which meets the pollutant Ceiling Concentrations, but not the Pollutant Concentration limits, can be sold in bags or other containers for use at sludge application rates prescribed on a label that are based on not exceeding the Annual Pollutant Loading Rates). The Class A pathogen reduction requirements must be met at the time the bulk or containerized products are "sold or given away."

If sewage sludges are of "Exceptional Quality" - meet the Pollutant Concentration limits, Class A pathogen reduction requirements and a vector attraction reduction processing option - they are usually exempt from the general requirements and management practices applicable to land application practices.

## Composted D & M Products

Composting can achieve compliance with Class A pathogen reduction requirements by operating under the Process to Further Pathogens (PFRP) conditions (including as Appendix B of Part 503, but originally issued under the Part 257 regulations) and monitoring for regrowth:

- With In-vessel Composting or Static Aerated Pile systems, the temperature of the sewage sludge is maintained at 55°C or higher for 3 days.
- With Windrow Composting, the temperature of the sewage sludge is maintained at 55°C or higher for 15 days or longer, during which the windrow will be turned a minimum of 5 times.

Other operating conditions may be able to meet Class A pathogen reduction requirements based on meeting temperature or pathogen testing requirements. Careful monitoring of process operations will be necessary to ensure the pathogen reduction requirements are achieved. For vector attraction reduction only, composting must achieve temperatures of greater than 40°C for 14 days and achieve an average temperature during that period of 45°C. These are well within the typical composting facility operating parameters and should be achievable by properly designed and operated facilities.

## Heat Dried D & M Products

There are few aspects of the new rule that will cause changes to established heat dried sewage sludge D&M programs. The temperatures used in sewage sludge drying systems which aim at producing a marketable product are typically in excess of 50°C, and retention times in the dryer are 30 minutes or longer. Using the equations provided and a nominal processing temperature of 80° C (the Process to Further Reduce Pathogens or PFRP definition for sewage sludge drying), the product residence time in the dryer required to meet the Class A pathogen reduction is in the order of magnitude of 7 seconds, while the rule requires a minimum residence time in the dryer of 15 seconds. Vector attraction reduction will similarly be easily met by dryers which produce a product for marketing. The degree of dryness required is >75 percent solids if the product does not contain unstabilized primary sewage sludge, and >90 percent solids if the product does contain unstabilized primary sewage sludge. The marketplace is typically looking for products of >90 percent solids so that the sewage sludge product is compatible with other bulk dry fertilizer products.

#### Alkaline Stabilized D & M Products

Certain alkaline stabilization practices comply with the Class A pathogen reduction requirements which include a combination of elevating pH to above 12 for 72 hours and temperature to above 52° C for 12 hours or longer during the period that pH is above 12, along with air drying to >50 percent solids. Other alkaline stabilization approaches may qualify for Class A stabilization based on meeting the elevated temperature criteria along or PFRP equivalency.

#### SURFACE DISPOSAL

##### Types of Disposal Operations

The Surface Disposal subpart of the regulation applies to the following types of sewage sludge and domestic septage disposal operations:

Monofills (sewage sludge-only landfills).... This could be a trench system, area-fill system, or similar bulk disposal operations, usually involving a cover material over the deposited sewage sludge.

Dedicated disposal surface application sites.... At some sites, sewage sludge pollutants are applied at higher than Cumulative Pollutant Loading Rates (Table 2 values) for disposal purposes even though there also may be beneficial use aspects. Potential pollutant leaching to groundwater or excessive plant uptake levels are controlled in a site-specific manner. Such sites are usually owned or leased by the wastewater authority and are highly controlled for access and operations.

Piles or mounds.... At many treatment plants, sewage sludges have been placed in piles or otherwise mounded on a portion of the property as final disposal.

Impoundments or lagoons.... At many treatment plants sewage sludge or domestic septage has been discharged to lagoons or impoundments as final disposal, with the excess liquid evaporated or recycled for treatment.

This subpart deals with surface disposal sites and sewage sludge placed on such sites for final disposal. Surface Disposal does not include sewage sludge placement for storage or treatment purposes.

The EPA does not intend to regulate under Part 503 wastewater treatment lagoons in which sewage sludge collect during treatment or lagoons in which sewage sludge collect during treatment or lagoons in which sewage sludge is being treated. However, when such sewage sludges are removed from wastewater treatment lagoons or sewage sludge treatment lagoons, their use or disposal will be regulated under Part 503, if applicable.

There are many sewage sludge lagoons or places where sewage sludges have been piled that no longer are receiving sewage sludge (i.e. they are no longer "active" units). These would probably not be regulated under Part 503, especially if they have been "closed" in a proper manner. However, if these sites or

operations are still active in 1993, the date they become inactive could be critical in determining whether they are regulated under Part 503. If sites that were inactive have sewage sludge removed from them in the future, the use or disposal of the sewage sludge at that time could fall within the jurisdiction of Part 503, depending on legal interpretation. Of course if previously closed sites become active again and receive sewage sludge after the Part 503 requirements became effective, such facilities would be subject to Part 503.

### Storage Versus Disposal

The Part 503 regulation allows sewage sludge to be stored for up to two years without any restrictions or control. However, if sewage sludges are stored beyond two years, EPA may consider this "disposal" and regulate it as a surface disposal site. If the wastewater authority can provide an adequate explanation concerning why the material is being stored for longer than two years, EPA will not regulate these operations as surface disposal sites. A common example would be a sewage sludge lagoon that has a four or five year cycle time between sludge cleanout operations. In this example, the lagoon may be considered "storage," not "disposal."

### General Requirements

There are a few general requirements that apply to surface disposal. These include the need for closure and post-closure plans at least 180 days prior to closing any surface disposal site. Also, site owners are required to provide written notification to the subsequent owner that sewage sludge was placed on the land.

### Pollutant Limits

Where surface disposal sites use liners and leachate collection systems, there are not pollutant concentration limits because pollutants leaching from the solids mass will be collected in the leachate and treated as necessary to avoid a pollution problem. For the site liner to qualify, it must have a hydraulic conductivity of  $\leq 1 \times 10^{-7}$  centimeters per second.

For surface disposal sites with no liner and leachate collection system, limits on three pollutants are established in the rule. While these vary based on the distance of the active disposal unit boundary from the site property line, the most extreme values allowed are listed in the following table:

MAXIMUM ALLOWABLE POLLUTANT CONCENTRATIONS IN SEWAGE SLUDGE  
(mg/kg dry weight)

Pollutant	If active disposal unit boundary is $\geq 150\text{m}$ from the surface disposal site property line	If active disposal unit boundary is 0 to $< 25\text{m}$ from the surface disposal site property line
Arsenic	73 mg/kg	30 mg/kg
Chromium	600 mg/kg	200 mg/kg
Nickel	420 mg/kg	210 mg/kg

SOURCE: ADEQ, Arizona Water Quality Assessment 1992, State of Arizona Clean Water Act

The three pollutants listed above present the greatest threat of leaching to groundwater and causing exceedances of the Maximum Contaminant Level (MCL) for that pollutant. The allowable concentrations of the 3 pollutants are reduced if the active disposal units are less than 150m from the site property line. The table shows the worst case limits if the site is located from 0 to  $< 25\text{m}$  from the disposal site property line. Different limits from these 3 pollutants can be developed through a site-specific assessment, as specified by the permitting authority, that shows the site has different parameters than the ones EPA used in establishing the maximum allowable concentration limits.

#### Nitrate Contamination

As a management practice, the rule requires that surface disposal operations not cause the groundwater MCL for nitrate to be exceeded or to cause the existing concentration to be exceeded if it already exceeds the MCL. Either results of groundwater monitoring or a statement from a qualified groundwater scientist must be used to demonstrate compliance.

#### Other Management Practices

There are several other management practices that must be met for surface disposal including but not limited to the following:

- Active disposal sites shall not be located within 60m of a Holocene-period fault or in a wetland unless authorized by the permitting authority.
- Surface runoff from a 24-hour, 25-year storm even shall be controlled according to a NPDES permit.
- Active disposal sites shall not restrict flow of a base flood, adversely affect threatened or endangered species, or be located in a structurally unstable area.
- If cover is placed on active units, methane gas concentrations must be monitored in all site structures and at the property line at the surface disposal site to avoid explosive conditions; if final cover is placed on the site, this monitoring continues for 3 years after site closure.
- Crops shall not be grown, nor animals grazed, on such sites unless the permitting authority specifically authorizes this based on site specific management practices to be implemented.
- Public access is restricted during operations and for 3 years following site closure.

## Pathogen and Vector Attraction Requirements

Surface disposal of sewage sludge requires one of the Class A or Class B pathogen control alternatives unless the sewage sludge is covered with soil or other material daily. One of the first 11 vector attraction reduction options is also required for surface disposal. While there are no specific pathogen reduction requirements for domestic septage disposed of in surface disposal units, it must be incorporated or injected into the soil, covered with material daily, or treated with alkaline materials to raise the pH to 12 or higher for at least 30 minutes to meet vector attraction requirements.

## Monitoring, Recordkeeping, and Reporting

Monitoring for the three pollutant concentrations, pathogen densities and vector attraction reduction is required on the same minimum frequency based on annual sewage sludge amounts involved as required for land application and incineration. Methane gas monitoring of air in any on-site structures and at the property site boundary is required continuously if the surface disposal site contains an active disposal unit which is covered and for three years after a disposal unit that is covered is closed.

Records must be kept for at least five years. Certification statements are required by the person who prepares the sewage sludge for disposal and/or by the site owner/operator. The statements certify that the various management practices have been met and that the monitoring data have been collected properly. Data, information, and certification need to be submitted annually to the permitting authority for all Class I sludge management facilities and POTWs with a design flow rate  $\geq 1$  MGD or that serve  $\geq 10,000$  population.

## PATHOGENS AND VECTOR ATTRACTION REDUCTION

The pathogen reduction requirements are operational standards for two classes of pathogen reduction: Class A and Class B. All sewage sludges that are to be sold or given away in a bag or other container, or applied to lawns or home gardens must meet Class A pathogen requirements. All sewage sludge intended for land application must meet at least the Class B pathogen requirements. The specific requirements for the two classes of pathogen reduction and the rationale for these requirements are noted in the following paragraphs.

### Requirements for Achieving Class "A" Pathogen Requirements

Class A sewage sludge must meet one of the following criteria:

1. A Fecal coliform density less than 1,000 Most Probable Number (MPN) per gram of total dry solids (1,000 MPN/g TS)

or

2. A Salmonella sp. density less than 3 Most Probable Number (MPN) per 4 grams of total dry solids (3 MPN/4g TS).

In addition: The requirements of one (1) of the following alternatives must be met:

1. Time/Temperature - An increased sewage sludge temperature should be maintained for a prescribed period of time according to the following guidelines:

**TIME AND TEMPERATURE GUIDELINES**

Total Solids	Temp. (t)	Time (D)	Equation	Notes
≥7%	≥50 <sup>5</sup> C	≥20 min.	$D = \frac{131,700,000}{10^{0.14t}}$	No heating of small particles by warmed gases or immiscible liquid.
≥7%	≥50 <sup>5</sup> C	≥15 sec.	$D = \frac{131,700,000}{10^{0.14t}}$	Small particles heated by warmed gases or immiscible liquid
<7%	>50 <sup>5</sup> C*	≥15 sec. to >30 min.	$D = \frac{131,700,000}{10^{0.14t}}$	
<7%	≥50 <sup>5</sup> C	≥30 min.	$D = \frac{50,070,000}{10^{0.14t}}$	

SOURCE: ADEQ, Arizona Water Quality Assessment 1992, State of Arizona Clean Water Act

\*In no case would temperatures calculated using the appropriate equation be less than 50° C

-or-

2. Alkaline Treatment - The pH of the sewage sludge is raised to greater than 12 for at least 72 hours. During this time, the temperature of the sewage sludge should be greater than 52<sup>0</sup>C for at least 12 hours. In addition, after the 72 hour period, the sewage sludge is to be air dried to at least 50 percent total solids.

-or-

3. Prior Testing for Enteric Virus/Viable Helminth Ova - The sewage sludge is analyzed for the presence of enteric viruses (plaque-forming units) and viable helminth ova. If the sewage sludge are analyzed before the pathogen reduction process and found to have densities of enteric virus <1 pfu/4 g TS and viable helminth ova <1/4 g TS, the sewage sludge is Class A with respect to enteric virus and viable helminth ova until the next monitoring episode. If the sewage sludge is analyzed before the pathogen reduction process and found to have densities of enteric virus ≥1 pfu/4 g TS or viable helminth ova ≥1/4 g TS, and tested again after processing and found to meet the enteric virus and viable helminth ova levels listed under 4) below, then the processed sewage sludge will be Class A with respect to enteric viruses and viable helminth ova when the operating parameters for the pathogen reduction process are monitored and shown to be consistent with the values or ranges of values documented.
4. No Prior Testing for Enteric Virus/Viable Helminth Ova - If the sewage sludge is not analyzed before pathogen reduction processing for enteric viruses and viable helminth ova, the sewage sludge must meet the enteric virus and viable helminth ova levels noted below to be Class A at the time the sewage sludge is used or disposed, prepared for sale or given away in a bag or container, or when the sewage sludge or derived material meets "exceptional quality" requirements - Pollutant

Concentration limits, Class A pathogen reduction and vector attraction reduction requirements:

- The density of enteric viruses must be less than 1 plaque-forming unit per 4 grams of total dry solids (1 PFU/4 g TS).
- The density of viable helminth ova must be less than 1 per 4 grams of total dry solids (1/4g TS).

-or-

5/6. The sewage sludge is treated by a PFRP or a PFRP equivalent process.

### **REQUIREMENTS FOR ACHIEVING CLASS "B" PATHOGEN REQUIREMENTS**

Sewage sludge that does not qualify as Class B cannot be land applied. Class B, sewage sludge must meet one of the following pathogen requirements:

1. The sewage sludge must be treated by a Process to Significantly Reduce Pathogens (PSRP) or PSRP equivalent process.

-or-

2. At least seven sewage sludge samples should be collected at the time of use or disposal and analyzed for Fecal coliforms during each monitoring period. The geometric mean of the densities of these samples will be calculated and should meet the following criteria:

- Less than 2,000,000 Most Probable Number per gram of total dry solids (2,000,000 MPN/g TS).
- Less than 2,000,000 Colony Forming Units per gram of total dry solids (2,000,000 CFU/g TS).

In addition, for any land applied sewage sludge that meets Class B pathogen reduction requirements, but not Class A, the site restrictions described earlier must be met.

### **PATHOGEN TREATMENT PROCESSES**

Processes to Significantly Reduce Pathogens (PSRP)

- 1) Aerobic digestion - Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a mean cell residence time and temperature between 40 days at 20°C and 60 days at 15°C.
- 2) Air Drying - Sewage sludge is dried on sand beds or on paved or unpaved basins for a Minimum of three months. During two of the three months, the ambient average daily temperature is above 0°C.
- 3) Anaerobic Digestion - Sewage sludge is treated in the absence of air for a mean cell residence time and temperatures between 15 days at 35 to 55°C and 60 days at 20°C.
- 4) Composting - Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge is raised to 40°C or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55°C.
- 5) Lime Stabilization - Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to 12 after 2 hours of contact.

### **PATHOGEN TREATMENT PROCESSES**

## Processes to Further Reduce Pathogens (PFRP)

1) Composting - Using either within-vessel or static aerated pile composting, the temperature of the sewage sludge is maintained at 55° C or higher for three days. Using windrow composting, the temperature of the sewage sludge is maintained at 55° C or higher for 15 days or longer. During this period, a minimum of five windrow turnings are required.

2) Heat Drying - Sewage sludge is dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge to 10 percent or lower. Either the temperature of the gas in contact with the sewage sludge exceeds 80° C or the wet bulb temperature of the gas in contact with the sewage sludge as the sewage sludge leaves the dryer exceeds 80° C.

3) Heat Treatment - Liquid sewage sludge is heated to a temperature of 180° C or higher for 30 minutes.

4) Thermophilic Aerobic Digestion - Liquid dewatered sewage sludge is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time for the sewage sludge is 10 days at 55 to 60° C.

5) Beta Ray Irradiation - Sewage sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20° C).

6) Gama Ray Irradiation - Sewage sludge is irradiated with gama rays from certain isotopes such as 60Co and <sup>137</sup>Ce, at dosages of at least 1.0 megarad at room temperature (ca. 20° C).

7) Pasteurization - The temperature of the sewage sludge is maintained at 70° C or higher for at least 30 minutes.

## Vector Attraction Reduction Requirements

Vector attraction reduction reduces the potential for spreading of infectious disease agents by vectors (i.e., flies, rodents, and birds). The alternative methods for meeting the vector attraction reduction requirement imposed by Part 503 include the following:

1. Aerobic or Anaerobic Digestion - Mass of Volatile Solids (VS) are reduced by 38 percent or more. Volatile Solids reduction is measured between the raw sewage sludge prior to stabilization and the sewage sludge ready for use or disposal. This criterion should be readily met by properly designed and operated anaerobic digesters, but not as readily by typical aerobic digesters. The POTWs with aerobic digesters may need to meet vector attraction reduction requirement through Alternative 3 or Alternative 4 below.
2. Anaerobic Digestion - If 38 percent VS cannot be achieved, vector attraction reduction can be demonstrated by further digesting a portion of the digested sewage sludge in a bench scale unit for an additional 40 days at 30 to 37° C or higher and achieving a further VS reduction of less than 17 percent.
3. Aerobic Digestion - If 38 percent VS cannot be achieved, vector attraction reduction can be demonstrated by further digesting a portion of the digested sewage sludge with a solids content of 2 percent or less in a bench scale unit for an additional 30 days at 20° C and achieving a further VS reduction of less than 15 percent.
4. Aerobic Digestion - Specific Oxygen Uptake Rate (SOUR) is less than or equal to 1.5 mg O<sub>2</sub>/hr-gram of Total Solids (TS) at 20° C. If unable to meet the SOUR criteria, POTWs may be able to satisfy Alternative 3.
5. Aerobic processes (e.g., composting) - Temperature is kept at greater than 40° C for at least 14

days and the average temperature during this period is greater than 45<sup>d</sup>C.

6. Alkaline Stabilization - pH is raised to at least 12 by alkali addition and, without the addition of more alkali, remains at 12 or higher for 2 hours and then at 11.5 or higher for an additional 22 hours.
- 7/8. Drying - TS is at least 75 percent when the sewage sludge do not contain unstabilized primary solids and at least 90 percent when unstabilized primary solids are included. Blending with other materials is not allowed to achieve the total solids percent.
9. Injection - Liquid sewage sludge (or domestic septage) is injected beneath the surface with no significant amount of sewage sludge present on the surface after 1 hour, except for sewage sludges that are Class A for pathogen reduction, which shall be injected within 8 hours of discharge from the pathogen reduction process. This alternative is applicable to bulk sewage sludge land applied to agricultural land, forest, public contact sites or reclamation sites; domestic septage land applied to agricultural land, forest or reclamation sites; and sewage sludge or domestic septage placed in a surface disposal site.
10. Incorporation - Sewage sludge (or domestic septage that is land applied or placed in a surface disposal site shall be incorporated into the soil within 6 hours of application, except for sewage sludge that is Class A for pathogen reduction which is land applied shall be incorporated within 8 hours of discharge from the pathogen reduction process. This alternative is applicable to bulk sewage sludge land applied to agricultural land, forest, public contact sites or reclamation sites; domestic septage land applied to agricultural land, forest or reclamation sites; and sewage sludge or domestic septage placed in a surface disposal site.
11. Surface Disposal Daily Cover - Sewage sludge or domestic septage placed in a surface disposal site shall be covered with soil or other material at the end of each operating day.
12. Domestic Septage Treatment - The pH of domestic septage is raised to 12 or higher for 30 minutes. This alternative is applicable to domestic septage applied to agricultural land, forest or reclamation sites or placed in a surface disposal site.

One of the vector attraction reduction alternatives 1-10 must be met when bulk sewage sludge is applied to agricultural land, forest, public contact, or reclamation sites. One of alternatives 1-8 must be met when bulk sewage sludge is applied to lawns or home gardens or sewage sludge is sold or given away in a bag or other container for land application. One of alternatives 1-11 must be met when sewage sludge is placed in a surface disposal site. Although domestic septage can also be treated the same as sewage sludge, when it is handled as "domestic septage" rather than sewage sludge, one of alternatives 9, 10 or 12 must be met when it is applied to agricultural land, forest or reclamation sites, and one of alternatives 9-12 must be met when it is placed in a surface disposal site.

## INCINERATION

The Part 503 regulation establishes requirements for sewage sludge-only incinerators. The rule covers the sewage sludge feed, the furnace itself, the operators and the exhaust gases from the stack. It does not apply to facilities incinerating hazardous wastewater solids (as defined by 40 CFR Part 261) or wastewater solids containing  $\geq 50$  ppm concentrations of PCBs. It also does not apply to facilities that co-fire sewage sludge with other wastes (although up to 30 percent MSW as auxiliary fuel is not considered "other wastes"). Furthermore, this rule does not apply to the ash produced by a sewage sludge incinerator.

The rule indirectly limits emissions of heavy metals and directly limits hydrocarbon emissions from sewage sludge incinerators, and establishes management practices, minimum frequency of monitoring, recordkeeping and reporting requirements. The rule contains equations to calculate the allowable concentration of metals in the sewage sludge fed to the incinerator, and contains a limit on Total Hydrocarbons (THC) in the emissions from a sewage sludge incinerator stack. Federal permits issued to sewage sludge incinerators will include site-specific pollutant limits based upon the results of performance

testing and air dispersion modeling. Permit applications for sewage sludge incinerators are due to EPA (or a delegated state) within 180 days of publication of the final Part 503 regulation. The monitoring, recordkeeping, and reporting for everything except THC become effective 150 days from the date of publication of the final rule. Notwithstanding the permitting process, sewage sludge incinerator facilities are required to be in compliance with all of the requirements of the rule within 1 year. Facilities that need to construct new pollution control facilities to comply with requirements will have 2 years to achieve compliance.

Preparation of permit applications require that sewage sludge incineration facilities conduct performance tests of their existing systems to determine pollution control efficiencies for heavy metals, and to conduct air dispersion modeling for site-specific conditions. New continuous emissions monitoring equipment will also need to be installed.

#### Pollutant Limits

Pollutant limits for sewage sludges to be incinerated are imposed for the following heavy metals: beryllium, mercury, lead, arsenic, cadmium, chromium, and nickel. The limits for beryllium and mercury are those that already exist under the National Emission Standards for Hazardous Air Pollutants (NESHAPS; 40 CFR Part 261). Pollutant limits for the remaining metals will be determined on site-specific performance characteristics and emission dispersion modeling.

Incinerators must also meet a monthly average limit of 100 ppm for total hydrocarbons (THC), corrected for moisture level (to 0 percent) and oxygen content (to 7 percent). This limit is intended as an indicator to control toxic organic compound emissions. The limit is based on the arithmetic mean of hourly readings for the month, is based on the arithmetic mean of hourly reading for the month, with a requirement for at least two readings during each hour of operation. The THC measuring device used must be a flame ionization detector with a heated sample line maintained at 150°C or higher at all times, and be calibrated at least once every 24 hour operating period using propane. Operating parameters, such as oxygen concentrations and information to determine moisture content, in the stack exhaust gases and furnace combustion temperature must be continuously monitored.

#### Management Practices

The rule specifically bans sewage sludge incineration "if it is likely to adversely affect a threatened or endangered species listed under the Endangered Species Act, or its designated critical habitat." If threatened or endangered species are known to be present in the vicinity of the incinerator, an ecological risk assessment may be needed to verify lack of likely impact.

#### Monitoring

Monitoring frequencies depend on the pollutant/parameter being monitored. Minimum monitoring frequencies for arsenic, beryllium, cadmium, chromium, lead, mercury, and nickel are the same for land application, based on the incinerator's throughput of sewage sludge.

The permitting authority may impose more frequent monitoring requirements on permittees. In addition, after two years of monitoring at these frequencies, the permitting authority may allow the monitoring frequencies for arsenic, beryllium, cadmium, lead, mercury and nickel to be reduced to no less than once per year. Continuous monitoring is required for THC, oxygen content, moisture level, and combustion temperature. Monitoring for Air Pollution Control Device (APCD) operating parameters ( i.e., scrubber pressure drop or afterburner operating temperature) will be required by the permitting authority.

#### Recordkeeping/Reporting

Sewage sludge incinerators must keep records of their operations for a five year period. Records will include: metal content in the sewage sludge feed, THC concentrations in the exhaust, verification of compliance with NESHAPS, results from the continuous emissions monitors and APCD monitors, results from the control efficiency tests and dispersion modeling, and the calibration and maintenance logs. These

records have to be reported to the permitting authority each year on the anniversary of the date of publication of the Part 503 rule if the permittee is a Class I sewage sludge management facility, has a design flow of 1 MGD or more, or it serves a population of at least 10,000.

## DOMESTIC SEPTAGE

The Part 503 regulation addresses management of septage generated from domestic sources only. If commercial or industrial wastes are combined with the domestic wastes, Part 503 does not apply to the use or disposal of the resulting septage. Domestic septage is defined as "liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device or similar system that receives only domestic (non-commercial) septage." Substances often referred to as septage, such as grease trap residues, as well as grit and screening, are not included in this definition.

The final Part 503 regulation provides a simplified regulatory scheme for the land application of domestic septage which is applicable only if the domestic septage application is to "non-public contact sites," where the potential for public exposure is minimal, such as agricultural fields, forests, and disturbed sites in need of reclamation. Allowable land application rates are based upon the nitrogen requirement of the crop grown and yield expected.

Management of domestic septage in other ways (i.e. land application to public contact sites, surface disposal or incineration) must be performed in accordance with the same provisions which govern management of sewage sludge through the various options, with a major exception - there is no requirement to analyze domestic septage for pollutant concentrations for land application or surface disposal.

### Land Application of Domestic Septage to Non-public Contact Sites

Under the Part 503 regulation, domestic septage appliers are required to:

1. Meet (and certify) applicable pathogen and vector attraction reduction requirements.
2. Follow specific management practices.
3. Apply domestic septage at rates based on nitrogen requirements of the crops.
4. Ensure that the septage is from domestic sources only.
5. Keep site application records.

Septage tank pumpers who land apply domestic septage to agricultural land, forest, or reclamation sites are generally required to obtain federal permits for these activities, but are not subject to the same enforcement actions as other "sewage sludge" use or disposal operators if they fail to comply with applicable Part 503 requirements. The Clean Water Act make the Part 503 regulations enforceable without a permit being issued.

### Pathogen Reduction

Pathogen reduction requirements applicable to land application of domestic septage can be achieved either through strict management practices or through stabilization of the domestic septage with alkaline materials and less limiting management practices. The management practices (including restrictions on crop harvesting, animal grazing and public access) vary depending on how pathogens are addressed. If domestic septage is not stabilized prior to application to agricultural land, forest, or reclamation sites, the same site restrictions as imposed on Class B septage sludge are required. If domestic septage is stabilized prior to application by mixing with enough alkaline material to raise its pH to at least 12 for at least 30 minutes, only the first four crop harvesting restrictions are applicable. No pathogen reduction requirements are imposed on surface disposal of domestic septage.

## Vector Attraction Reduction

As described earlier, three vector attraction reduction alternatives (No. 9 - Injection, No. 10 - Incorporation, or No. 12 - Septage Treatment) may be employed when domestic septage is applied to agricultural land, forest, or reclamation sites. Four vector attraction reduction alternatives (No. 9 - Injection, No. 10 - Incorporation, No. 11 - Daily Cover, or No. 12 - Domestic Septage Treatment) may be employed when domestic septage is placed in a surface disposal site. The treatment of domestic septage by pH adjustment to meet pathogen and vector attraction reduction requirements involves the same treatment process - mixing with enough alkaline material to raise its pH to at least 12 for at least 30 minutes to meet pathogen reduction and vector attraction reduction requirements.

### Application Rate

The maximum volume of domestic septage which can be applied to agricultural land, forest or reclamation sites in any year depends on the amount of nitrogen required by the crop grown and expected yield. The following equation is provided in the regulation to calculate annual septage application rates.

$$\begin{array}{rcl} \text{Annual Application Rate} & & \text{lbs. N Required by Crop} \\ \text{(gallons per acre year)} & = & \frac{\hspace{1.5cm}}{0.0026*} \end{array}$$

Based on estimated available N (in ml/1) in domestic septage times a conversion factor.

### Frequency of Monitoring/Recordkeeping/Reporting

When domestic septage pathogen reduction is achieved by pH adjustment with alkaline materials, pH levels in every container (truck load) must be monitored. Although there are not formal reporting requirements, the regulation does specify records that must be maintained by land appliers of domestic septage.

The following table lists the information which must be recorded and saved by the septage land applier. These records must be kept for five years following application. Sample forms for recordkeeping have been developed and are available from EPA. They are included in a guidance document entitled "Simplified Federal EPA Rules for Land Application of Domestic Septage to Non-Public Contact Sites."

For domestic septage placed in surface disposal sites, if vector attraction reduction is achieved by pH adjustment, monitoring of each container is required. Methane gas monitoring requirements placed on covered sites is the same as for surface disposal of sewage sludge. Also, records must be kept for at least five years concerning the surface disposal site management practices and vector attraction reduction practices employed.

### REQUIRED RECORDS

1. Location of the application site (either the street address, or the longitude and latitude of the site).
2. Number of acres to which domestic septage is applied at each site.
3. Date and time of each application.
4. Nitrogen requirement for the crop or vegetation grown on each site during a 365 day period.
5. Gallons of domestic septage applied to each site.
6. Required certification statement.
7. Description of pathogen reduction measures used.

8. Description of vector attraction measures used.

Compliance

As with other provisions of the regulation, domestic septage appliers must begin to maintain records of their activities within 150 days of publication of the rule in the Federal Register. Compliance with other provisions must be achieved within one year of publication of the rule in the Federal Register if no construction of new pollution control facilities is required.