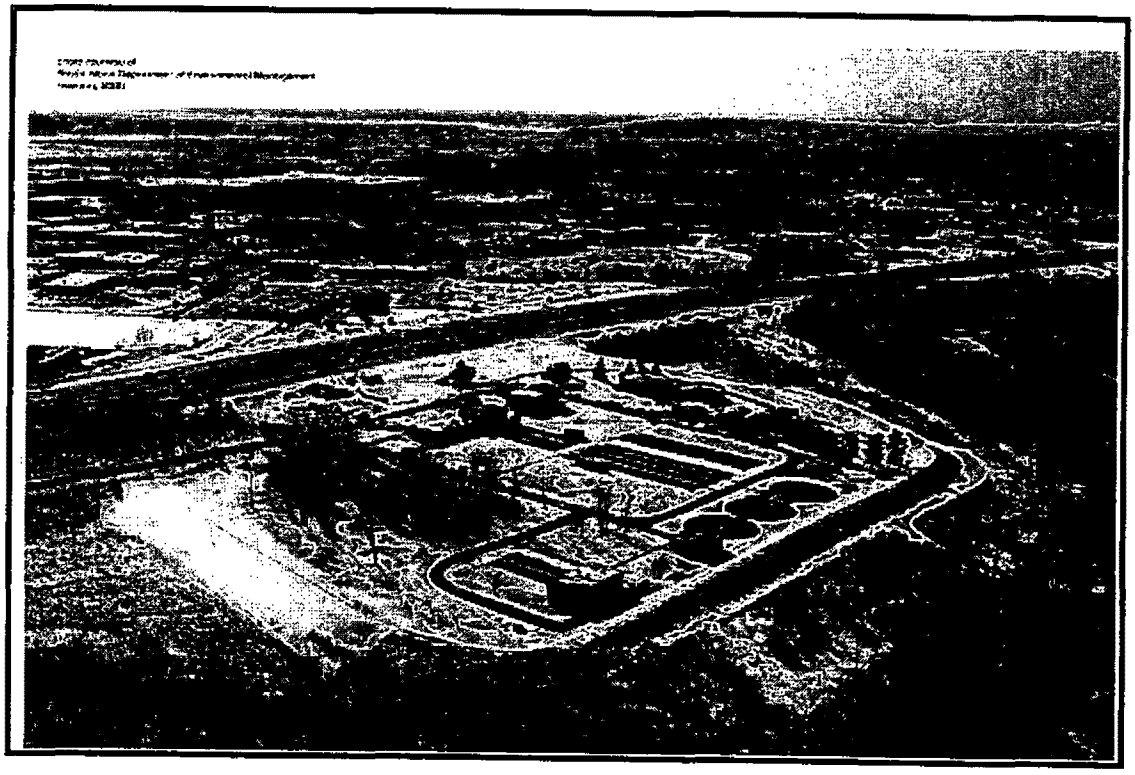
United States
Environmental Protection
Agency

Office Of
Water
(4204-M)

EPA-832-R-01-001
March 2001

Wastewater Treatment Plant Operator On-Site Technical Assistance Training Program - 104(g)(1)

End of Year 2000 Accomplishment Report



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WASTEWATER OPERATOR TRAINING PROGRAM - 104(g)

Section 104(g)(1) of the Clean Water Act, added in 1982, authorizes funding for the Wastewater Treatment Plant Operator On-Site Technical Assistance Training Program. Assistance is provide to small, publicly-owned wastewater treatment facilities with effluent discharges of less than 5 million gallons per day. The program was implemented to provide on-site technical assistance to wastewater treatment plants struggling with compliance and performance issues. The assistance efforts of the program helps to protect human health, improves water quality, and safeguards capital expenditure investments and upgrades at these treatment plants. Federal funding for the program is administered through grants to 47 states and one interstate agency, often in cooperation with educational institutions or nonprofit agencies. In most cases, assistance is administered by an environmental training center.

The facilities the program assists each fiscal year fall into two different categories: those that have completed training, and those at which training is continuing. Completed training is defined as the assistance work at the facility has produced the desired result, and assistance is longer needed at that time. A few facilities (less than ten percent) choose to drop out of the Program and try to achieve compliance through alternative methods. Continued training is defined as the facility requires further aid, and support will continue until the fulfillment of the desired result. In fiscal year 2000, at an average federal cost of less than $1,950.00 per facility, the program accomplished the following:

- **Assisted 875 facilities;**
- **Achieved or maintained compliance, or improved performance at 772 of these facilities, an 87% success rate;**
- ★ **Completed training at 425 of these facilities; and**
- ★ **Achieved or maintained compliance, or improved performance at 380 of the 425 above-mentioned facilities, a 90% success rate.**

Program Background:

The need for individualized technical assistance is real. There are over 15,000 municipal wastewater treatment plants in the U.S., of those 15,000, almost 14,000 (>90%) discharge less than 5 million gallons per day. Over half of these plants have sophisticated activated sludge treatment technologies which require highly-developed operating skills. Operator turn-over rates at small wastewater treatment plants are high, budgets and salaries are low, and community support may be lacking. These are the ingredients for wastewater treatment plant non-compliance. These types of small community wastewater treatment plants are candidates for the Wastewater Treatment Plant Operator On-Site Technical Assistance Training Program.

The goal of the program is to provide direct on-site assistance to operators at small community wastewater treatment facilities, to help the facility achieve and maintain consistent permit compliance. Consistent permit compliance maximizes the community's investment in improved water quality. The program is a cooperative effort with EPA regional office coordinators, states, state training centers, municipalities, tribes, and operators. Assistance focuses on issues such as wastewater treatment plant capacity, operation training, maintenance, administrative management, financial management, trouble-shooting, and laboratory operations. These organizations work in tandem with compliance and enforcement programs to improve water quality throughout the United States. There is no cost incurred by the facility in need of assistance. The only requirement of the program is the willingness to work with a trainer to correct the facility's problems.

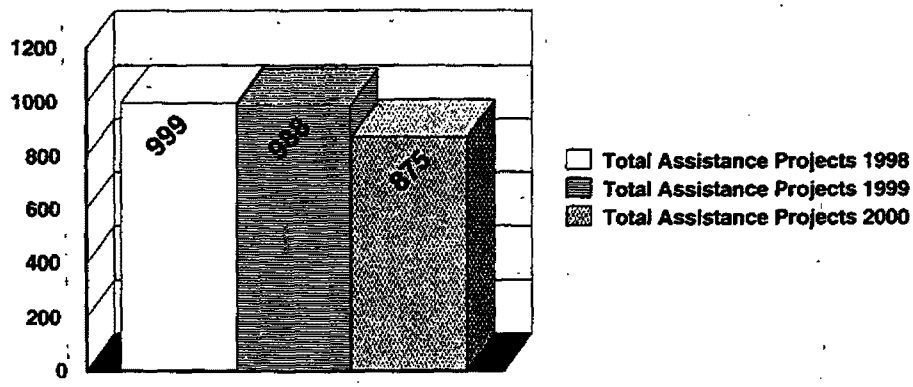
The program also helps identify any need to repair or build new facilities to meet existing or future permit limits, assists the town during the process of selecting consultants and design review, recommends ways to improve preventive maintenance of equipment and structures, and often reduces energy and chemical costs and usage through more efficient operation techniques. Most importantly, the program gets plant operating staff and local elected officials working together on the problems at the treatment plant, to improve water quality through efficient use of treatment equipment for maximum environmental benefit.

Congress added on $1.425 million for the Operator Training Program in fiscal year 2000. EPA budgeted $274,000.00 for this Program in fiscal year 2000, as it has historically over the years. In some cases, federal funds act as "seed money" for the program training centers to access additional funds for providing assistance. However, in other instances the only addition to the 104(g) allotment is the required 25% match from the grantee. Funding levels for this program have remained relatively constant over the past ten years.

Recent Programmatic Achievements:

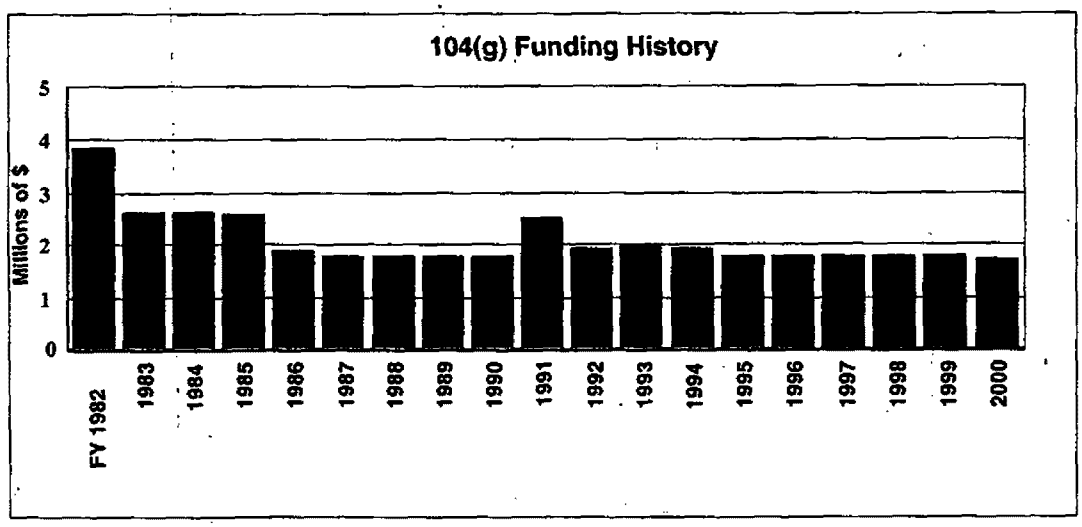
The Wastewater Treatment Plant Operator On-Site Technical Assistance Training Program, through the EPA Regional Offices and state partners, assisted 875 facilities in fiscal year 2000. Of these 875 projects, nine tribal and nine U.S./Mexico border systems were assisted. Compliance was achieved or maintained, or performance was improved at 772 (87%) of these facilities. A summary of achievements by EPA Region is detailed in Tables A, B, and C on pages 5 and 11 respectively.

NUMBER OF 104(g) PROJECTS NATION-WIDE
1998 through 2000



There was a 14% decline in assistance projects from fiscal years 1998 to 2000. Not only did the number of assistance projects diminish over the past year, but the Program's success rate was reduced by six percent.

The majority of the work that was conducted in the program for fiscal year 2000 consisted of assisting facilities to achieve compliance and improve performance. Facilities that completed training activities in fiscal year 2000 needed the most assistance in achieving compliance at the treatment plant site. The facilities that are continuing training activities from fiscal year 2000 into fiscal year 2001 need assistance mainly in the area of improving performance at the treatment plant location. See Tables B and C on page 11 for more details. This pattern is the same as in fiscal years 1998 and 1999.



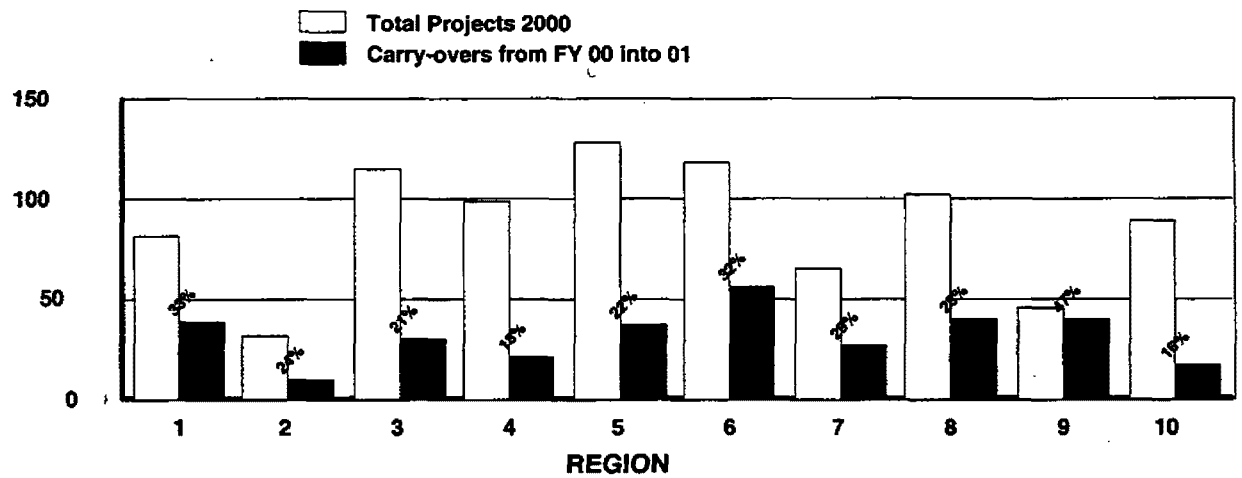
Total Number of Facilities Assisted in Each Region for Fiscal Year 2000
"TABLE A"

REGION	1	2	3	4	5	6	7	8	9	10	TOTAL
NO. OF FACILITIES ASSISTED FY-2000	81	32	115	99	128	118	65	102	46	90	875

A total of 425 facilities completed training in fiscal year 2000, 380 of which achieved or maintained compliance, or improved performance, a 90% success rate. One hundred and fifty two of these facilities have achieved compliance, 112 maintained compliance, and 116 facilities improved plant performance (including preventative maintenance). Forty-five facilities had no improvement, and have decided to try and achieve compliance at their wastewater treatment plants through alternative methods. For a more detailed explanation see Table B on page 11.

A total of 450 facilities are continuing training from fiscal year 2000 into fiscal year 2001. These facilities are still in need of assistance in order to improve performance and maintain long-term compliance. One hundred and six of these facilities have achieved compliance, 84 maintained compliance, and 202 facilities improved performance. Fifty-eight facilities have had no improved performance, but are still being trained by a program technical person. These facilities have decided to continue to work with the program to achieve compliance at their wastewater treatment plant. For a more detailed explanation see Table C on page 11.

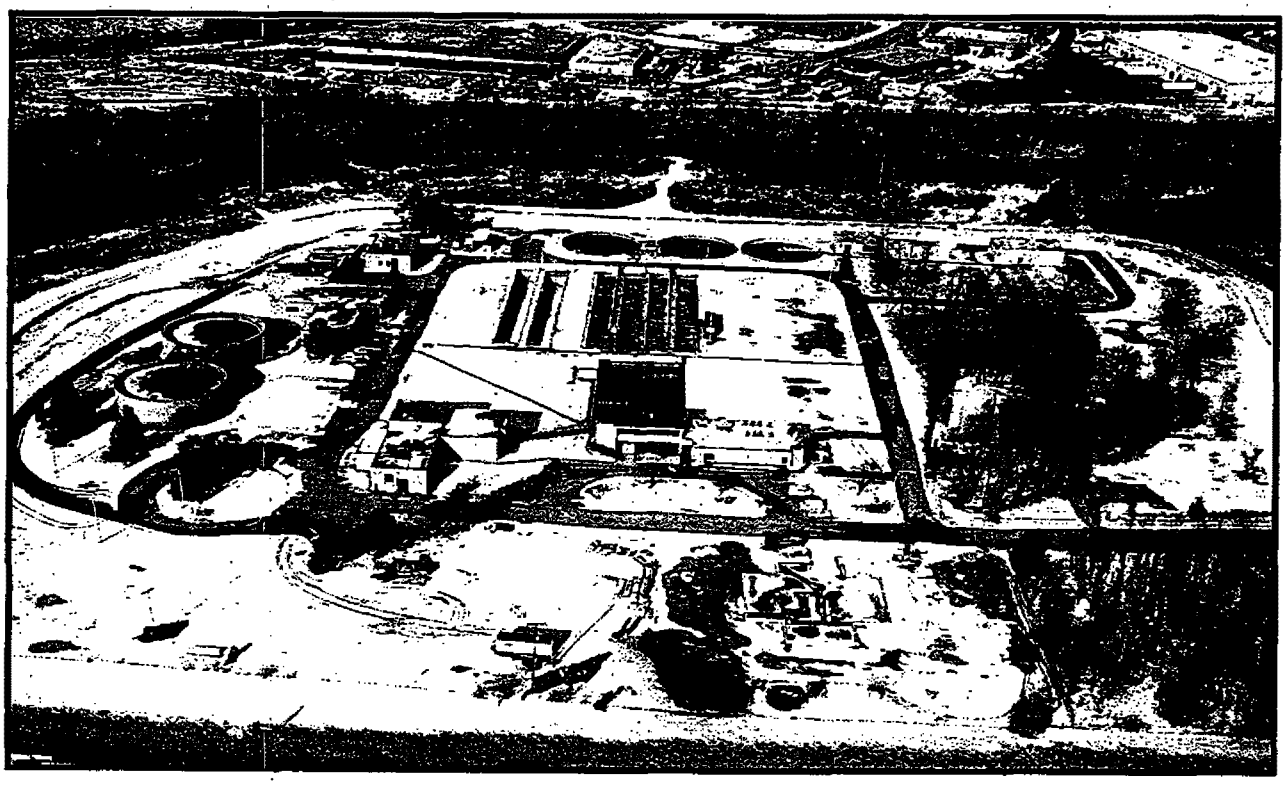
Total Projects (vs.) Carry-Overs for FY 2000



Of the 875 facilities assisted in fiscal year 2000, 558 of them were new starts and 317 of them were "carry-overs" from the previous fiscal year.

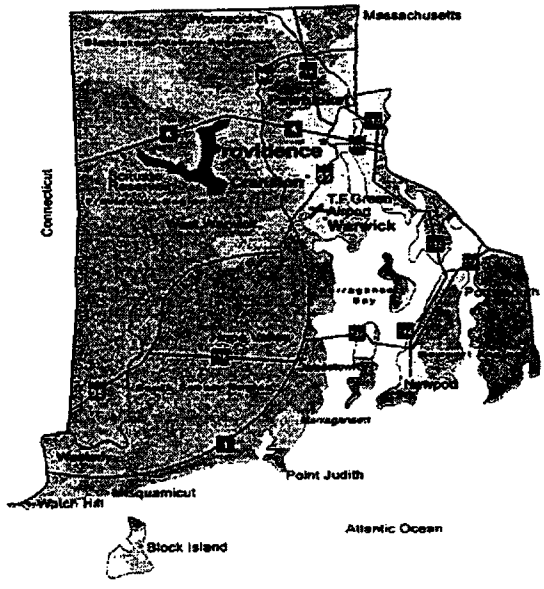
Success Stories:

WARWICK, RHODE ISLAND



The **Rhode Island Department of Environmental Management (RIDEM)**, with the assistance of the **New England Interstate Water Pollution Control Commission**, initiated biological nutrient removal (BNR) training for a number of communities during the Spring of 2000. Selected as one of five communities for this assistance, Warwick, Rhode Island built its first wastewater treatment facility in 1965. Presently, the city with a population of 41,000 people, is spending $110 million dollars to upgrade and expand its system, increase flow capacity, as well as to meet new discharge limits for nutrients. Warwick discharges at a rate of 3.9 million gallons per day to the Pawtuxet River, which eventually empties into Narragansett Bay. With 13 operators and mechanics, the operations and maintenance staff oversees the wastewater facility and 30 pump stations. Based on current projections, the staff will be responsible for maintaining an additional 20 pump stations as the collection system expands to the outlying areas of the city.

As part of this upgrade, a dechlorination system is being constructed, along with pre-discharge aeration. Warwick, along with a number of other Rhode Island communities were issued NPDES permits in 1989 that required reductions in ammonia, total suspended solids, and biological oxygen demand to improve oxygen levels in the Pawtuxet River. As required by the existing consent decree, Warwick has completed 50% of the design of the required facility modifications as of April of 2000. The RIDEM reissued a NPDES permit to the facility this past summer, with included seasonal nitrogen limits, seasonal phosphorous limits, and year round ammonia limits. The plans submitted by Warwick include the modifications necessary to achieve the proposed total nitrogen and phosphorous limits.



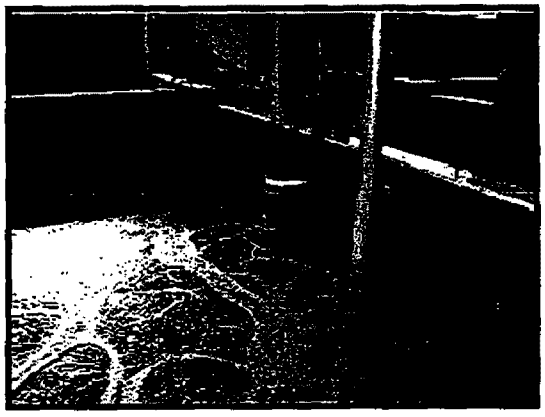
Warwick's Wastewater Treatment Facility began removing ammonia and some of its nitrogen this past summer, implementing the information obtained through its BNR training. The facility has seen dramatic drops in ammonia and nitrogen levels in its effluent discharge. The plant is operating just below future permit limits for these parameters. With ammonia and nitrogen levels once in the 20-30 mg/L range, the plant is achieving levels of 2 mg/L and below. Furthermore, these improved BNR levels are attributed to merely modifying the existing facility infrastructure, this work provided information to the design engineers to construct a better treatment facility. Hopefully, the information will translate to a cost savings for the community in the near future. Without the invaluable on-site BNR training provided, Warwick would have been able to improve upon the proposed design, or face the possibility of saving a substantial amount on design and construction costs in the future. In addition to cost considerations, there have already been reduced nutrient loadings to the Pawtuxet River.

OLD FORGE, NEW YORK

New York State Department of Environmental Conservation

The Old Forge Wastewater Treatment Plant generally produces an effluent quality well within permit discharge limits. However, in 1997 the plant experienced sporadic problems with high effluent settleable solids. The New York State Department of Environmental Conservation's (NYSDEC) Operator Training Program trainers worked with the chief operator of the Old Forge facility, to identify the cause of high settleable solids and correct the problem.

The Program technical assistance trainer identified two potential causes for the problem: escaping Nocardia foam and denitrification. Since the plant design does not include a chlorine contact tank, any floating solids leaving the clarifier were ending up in the plant effluent. Therefore, the operator had no safety factor to polish the secondary effluent. A work-group consisting of the plant staff and the NYSDEC inspectors and Program trainers was assembled to address the plant's Nocardia foaming and denitrification problems.



35 gallon drum in the aeration tank: hoist provides drum height adjustment.

To combat Nocardia foaming, a low cost foam collection and pumping system was implemented. When a Nocardia bloom occurs, the drum is lowered into position, the water spray turned on, and the sump pump moves the foam to the aerobic digester. Removing the foam provides positive Nocardia control without affecting the treatment process.

Installed elbow in clarifier #1 to divert flow to clarifier #2.

Next the workgroup developed a method to solve the denitrification problems by running the plant's secondary clarifiers in a series. The effluent line from clarifier #1 passes through clarifier #2, by valving this line, the plant staff can open the valve and run the clarifiers in series when needed. This remedy provides additional clarification time to treat any denitrification or additional foaming problems that might occur in clarifier #1. All work was done in-house by the plant's staff. As a result of this cooperative effort, the plant's effluent quality has been greatly enhanced, thereby protecting human health and the environment.

EFFLUENT QUALITY IMPROVEMENT OVER THE ASSISTANCE PERIOD

Time Period	Monthly Avg. Effluent BOD in mg/L *	Monthly Avg. Effluent TSS in mg/L *	Monthly Avg. Effluent Settleable Solids in ml/L **
Before Assistance Program			
June 1997 - May 1999	13	12	0.8
After Assistance Program			
June 1999 - May 2000	9	8	0.1
Percent Improvement	**31 %**	**33 %**	**88 %**

* Permit Limits for BOD and TSS are 30 mg/L daily maximum and 45 mg/L monthly average.

** Permit Limit for Settleable Solids is 0.3 ml/L daily maximum.

Because of the work done by Program trainers, the above-mentioned treatment facilities were able to realize a tremendous cost savings. Furthermore, the pollution discharges from these facilities have been reduced and future pollution discharges have been prevented. These are just two examples of the value of the Wastewater Treatment Plant Operator On-Site Technical Assistance Training Program -104(g)(1).

Plans for the Future:

- Continue to work with EPA Regional Offices and state partners to improve water quality through the Wastewater Operator Training Program's assistance efforts;

- Work with EPA's Regional Offices to track pollutant reduction amounts through the creation of a national assistance Microsoft Access database, to exhibit outcome based environmental benefits of the Program's assistance efforts; and

- The Office of Water's Indian Strategy, which was issued in December of 1998, states several program objectives regarding wastewater issues: 1) EPA has committed to reduce the number of homes in Indian country with inadequate wastewater sanitation systems by twenty-five percent (25%) by the year 2005. 2) The strategy also discusses the need to increase coordination with other Federal and State agencies and organizations to provide support to tribes to develop their financial management and operational capacity to operate wastewater systems successfully. Through section 104(g) of the CWA, a pilot tribal training center is being established at Northern Arizona University located in Flagstaff, Arizona. This center will provide no-cost, direct, on-site training and technical assistance to tribal wastewater treatment facilities, and act as a clearinghouse for environmentally related information.

If you have any questions or comments, or require more information on this subject matter please do not hesitate to contact Curt Baranowski at 202-564-0636. You may also access the Program's Internet web-page at www.epa.gov/owm/tomm.htm.

U.S. EPA Regional Program Coordinators:

- **David Chin**
  REGION I {CT, ME, MA, NH, RI, and VT}
  John F. Kennedy Federal Building
  1 Congress Street
  Boston, MA 02114
  Office of Ecosystem Protection /
  Municipal Assistance Unit
  Telephone: 617-918-1764
  Fax: 617-918-2064
  E-mail: chin.david@epa.gov

- **John Mello**
  REGION II {NJ, NY, PR, AND VI}
  290 Broadway
  New York, NY 10007-1866
  Division of Environmental Planning & Protection
  Telephone: 212-637-3836
  Fax: 212-637-3891
  E-mail: mello.john@epa.gov

- **James Kern**
  REGION III {DE, DC, MD, PA, VA, and WV}
  1650 Arch Street (3WP23)
  Philadelphia, PA 19106
  Water Management Division
  Telephone: 215-814-5788
  Fax: 215-814-2318
  E-mail: kern.jim@epa.gov

- **James Adcock**
  REGION IV {AL, FL, GA, KY, MS, NC, SC, and TN}
  61 Forsyth Street
  Atlanta, GA 30303
  Municipal Facilities Branch
  Telephone: 404-562-9248
  Fax: 404-562-9224
  E-mail: adcock.james@epa.gov

- **Russell Martin**
  REGION V {IL, IN, MI, MN, OH, and WI}
  77 West Jackson Boulevard (WN-16J)
  Chicago, IL 60604-3590
  NPDES Support/Technical Assistance Branch
  Telephone: 312-886-0268
  Fax: 312-886-0168
  E-mail: martin.russell@epa.gov

- **Catherine Scudieri**
  REGION V {IL, IN, MI, MN, OH, and WI}
  Telephone: 312-353-2098
  E-mail: scudieri.catherine@epa.gov

- **Bill Black**
  REGION VI {AR, LA, NM, OK, and TX}
  Fountain Place 12th Floor, Suite 1200
  1445 Ross Avenue
  Dallas, TX 75202-2733
  Water Management Division
  Telephone: 214-665-7168
  Fax: 214-665-6490
  E-mail: black.billy@epa.gov

- **Rao Surampalli**
  REGION VII {IA, KS, MO, and NE}
  901 North 5th Street
  Kansas City, KS 66101
  Wastewater Management Division
  Telephone: 913-551-7453
  Fax: 913-551-7765
  E-mail: surampalli.rao@epa.gov

- **Brian Friel**
  REGION VIII {CO, MT, ND, SD, UT, and WY}
  999 18th Street
  Denver, CO 80202-2466
  Office of Partnerships and Regulatory Assistance
  Telephone Number: 303-312-6277
  Fax: 303-312-6131
  E-mail: friel.brian@epa.gov

- **Helen McKinley**
  REGION IX {AZ, CA, HI, NV, AS, GU}
  75 Hawthorne Street WTR-6
  San Francisco, CA 94105
  Water Management Division
  Telephone: 415-744-1943
  Fax: 415-744-1078
  E-mail: mckinley.helen@epa.gov

- **Joann Cola**
  REGION IX {AZ, CA, HI, NV, AS, GU}
  75 Hawthorne Street WTR-6
  San Francisco, CA 94105
  Water Management Division
  Telephone: 415-744-2238
  Fax: 415-744-1078
  E-mail:cola.joann@epa.gov

- **Bryan Yim**
  REGION X {AK and WA}
  1200 Sixth Avenue
  Seattle, Washington 98101
  Telephone: 206-553-8575
  Fax: 206-553-0165
  E-mail: yim.bryan@epa.gov

- **Mike Silverman**
  REGION X {ID}
  EPA - Idaho Operations Office
  1435 North Orchard St.
  Boise, Idaho 83706
  Telephone: 208-378-5754
  Fax: 208-378-5744
  E-mail: silverman.mike@epa.gov

- **Will Olandria (Oregon)**
  REGION X {OR}
  EPA - Oregon Operations Office
  811 S.W. 6th Avenue
  Portland, Oregon 97204
  Telephone: 503-326-2653
  Fax: 503-326-3399
  E-mail: olandria.willie@epa.gov

Fiscal Year 2000, COMPLETED Training Assistance / "TABLE-B"

REGION	NUMBER OF FACILITIES THAT HAVE ACHIEVED COMPLIANCE(1)	NUMBER OF FACILITIES THAT HAVE MAINTAINED COMPLIANCE(2)	NUMBER OF FACILITIES THAT HAVE IMPROVED PERFORMANCE(3)	NUMBER OF FACILITIES THAT HAVE HAD NO IM-PROVEMENT(4)	*TOTALS*
1	9	7	6	7	*29*
2	3	3	4	1	*11*
3	28	6	14	12	*60*
4	23	9	22	3	*57*
5	27	21	25	6	*79*
6	16	14	18	7	*55*
7	11	5	10	1	*27*
8	3	46	4	5	*58*
9	5	0	2	0	*7*
10	27	1	11	3	*42*
TOTALS	*152*	*112*	*116*	*45*	*425*

See APPENDIX "A" for an explanation of foot notes 1 through 4.

Fiscal Year 2000, CONTINUING Training Assistance / "TABLE-C"

REGION	NUMBER OF FACILITIES THAT HAVE ACHIEVED COMPLIANCE(5)	NUMBER OF FACILITIES THAT HAVE MAINTAINED COMPLIANCE(6)	NUMBER OF FACILITIES THAT HAVE IMPROVED PERFORMANCE(7)	NUMBER OF FACILITIES THAT HAVE HAD NO IM-PROVEMENT(8)	*TOTALS*
1	11	26	11	3	*51*
2	15	1	5	0	*21*
3	10	8	25	12	*55*
4	3	4	32	3	*42*
5	24	3	19	3	*49*
6	13	10	26	14	*63*
7	4	2	27	5	*38*
8	10	14	11	9	*44*
9	10	10	16	3	*39*
10	6	6	30	6	*48*
TOTALS	*106*	*84*	*202*	*58*	*450*

See APPENDIX "A" for an explanation of foot notes 5 through 8.

APPENDIX "A"

1. **Achieved Compliance** starts with the facility out of compliance with its NPDES permit at the beginning of the compliance assistance. After the facility has completed its assistance, the facility is in compliance with its NPDES permit. In order to be rated as achieved compliance at the end of assistance, the facility needs to be in compliance with all elements of its NPDES permit for three consecutive months.

2. **Maintained Compliance** starts with the facility in compliance with its NPDES permit at the beginning of the compliance assistance. However, the facility is demonstrating performance problems which could lead to non-compliance with its NPDES permit. After the facility has completed its assistance, has halted any further deterioration in performance, improved its performance, and continued to stay in compliance with its NPDES permit. The underlying theme with compliance maintenance facilities is that there is "something wrong" with performance, but it is not "wrong" enough to exceed NPDES permit levels.

- This type of assistance continues to increase as compliance levels progress, trainers become more skilled, and monitoring and communications improve between operators and trainers.

3. **Improved Performance** starts with the facility out of compliance with its NPDES permit at the beginning of the compliance assistance. However, compliance assistance has led the facility to better operation and maintenance. After the assistance has been completed at the facility, "total" compliance may have not been achieved on a consistent basis, but the facility is definitely operating better. The facility has reduced periods of non-compliance, reduced levels of pollutants discharged, or has had significant increases in efficiencies such as: lower energy usage, better (and often lower) chemical usage for proper operation, and adequate financial support enabling operators to better address problems in a more timely fashion. The facility may not be in "total" compliance with its NPDES permit, but it has "significantly" increased its performance. The facility has completed its compliance assistance training with the Program and may still be out of compliance, this is due to circumstances beyond the Program's control, such as the need for an upgrade to the treatment facility.

- Money saved by better operation can be utilized to finance needed improvements necessary for longer term compliance.

4. **No Improvement** starts with the facility out of compliance with its NPDES permit at the beginning of the compliance assistance training, and continues to be out of compliance with little or no improvement. The facility has opted to discontinue its participation in the Program.

5. **Achieved Compliance** starts with the facility out of compliance with its NPDES permit at the beginning of the compliance assistance. Even though the facility has achieved compliance, it is continuing its assistance to ensure a permanent compliance status.

6. **Maintained Compliance** starts with the facility in compliance with its NPDES permit at the beginning of the compliance assistance. However, the facility is demonstrating performance problems which could lead to non-compliance with its NPDES permit. After the facility has completed its assistance, the facility has halted any further deterioration in performance, improved its performance, and has continued to stay in compliance with its NPDES permit.

7. **Improved Performance** starts with the facility out of compliance with its NPDES permit at the beginning of the compliance assistance. However, the assistance is leading the facility to better operation and maintenance. After the assistance has been completed at the facility, "total" compliance may have not been achieved, but the facility is definitely operating better. The facility has reduced periods of non-compliance, reduced levels of pollutants discharged, or has had significant increases in efficiencies such as; lower energy usage, better (and often lower) chemical usage for proper operation, and adequate financial support, enabling operators to better address problems in a more timely fashion. The facility may not be in "total" compliance with its NPDES permit, but it has "significantly" increased its performance. The facility continuing its compliance assistance with the Program is working on bringing the facility into "total" compliance with its NPDES permit, but has not achieved this status on a consistent basis.

8. **No Improvement** starts with the facility out of compliance with its NPDES permit at the beginning of the compliance assistance training, and continues to be out of compliance with little or no improvement. The facility has decided to continue to work with the Program to solve its compliance problems.