FENOC
FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077-0004

L. William Pearce
Vice President

724-682-5234
Fax: 724-643-8069

April 27, 2005
L-05-072

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Annual Radioactive Effluent Release Report for 2004, and
Annual Radiological Environmental Operating Report for 2004

This submittal of annual reports includes, as Enclosure 1, an Executive Summary of the Radioactive Effluent Control Program and the Radiological Environmental Monitoring Program at Beaver Valley Power Station (BVPS). These programs, as outlined in the BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual, were followed throughout 2004. The program results demonstrate the proficiency of radioactive effluent control at BVPS, and that the operations of Unit 1 and Unit 2 did not adversely affect the surrounding environment.

Enclosure 2 contains the 2004 Annual Radioactive Effluent Release Report (ARERR) for BVPS Unit 1 and Unit 2, submitted in accordance with the requirements of Unit 1 and Unit 2 Technical Specification 6.9.3. The report contains the information required by NRC Regulatory Guide 1.21, along with site-specific information required by Unit 1 and Unit 2 Offsite Dose Calculation Manual procedure 1/2-ODC-3.03, Attachment U, Report 6.9.3. The report format is summarized in the ARERR index.

- The ARERR is considered a single submittal for the two-unit site.
- The ARERR combines those sections that are common to both units at the site. Therefore, since Unit 1 and Unit 2 have shared radwaste systems for elevated level gaseous effluents and shared radwaste systems for all liquid effluents, then the ARERR combines those sections.
- The ARERR segregates those sections that are specific to each unit. Therefore, since Unit 1 and Unit 2 have independent radwaste systems for ground level gaseous effluents, then the ARERR segregates those sections.

IE48
IE25
A009

Enclosure 3 contains the BVPS 2004 Annual Radiological Environmental Operating Report (AREOR) submitted in accordance with Unit 1 and Unit 2 Technical Specification 6.9.2. The report also contains site-specific information required by Unit 1 and Unit 2 Offsite Dose Calculation Manual Procedure 1/2-ODC-3.03, Attachment T, Report 6.9.2. The report format is summarized in the AREOR index.

There are no regulatory commitments identified in this document. If you have any questions regarding this submittal, please contact Mr. Larry R. Freeland, Manager, Regulatory Compliance at 724-682-4284.

Sincerely,

L. William Pearce

Enclosures:
1) Executive Summary for Year 2004 Annual Effluent and Environmental Report
2) Annual Radioactive Effluent Release Report for 2004
3) Annual Radiological Environmental Operating Report for 2004

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator

c: American Nuclear Insurers
95 Glastonbury Boulevard
Glastonbury, CT 06033

Department of Environmental Protection (5 copies)
Bureau of Radiation Protection & Toxicology
P.O. Box 2063
Harrisburg, PA 17120

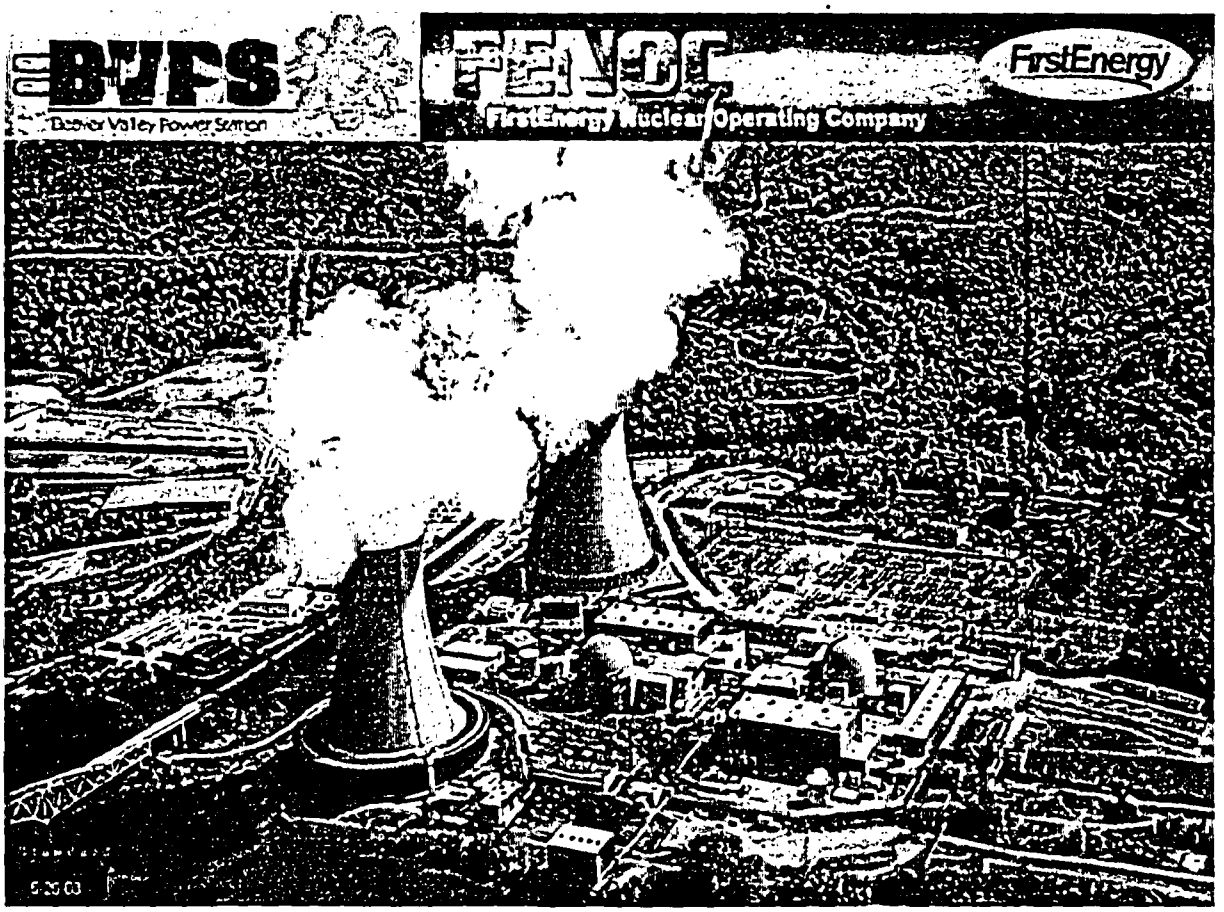
INPO (Attn: Bill Nestel)
700 Galleria Parkway SE
Suite 100
Atlanta, GA 30339-5957

J. Lee Miller, Beaver County Extension Director
Daniel V. Steen, FirstEnergy Environmental Department
John P. Jones, Hancock County Office of Emergency Services
Roger L. Suppes, Ohio Department of Health
Carol O'Claire, Ohio Emergency Management Agency
Keith Clark, East Liverpool Water Authority
Jerry Schulte, ORSANCO
B. F. Jones Memorial Library
Bronia Grob, Environmental, Inc.

RTL# A9.690E

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION



2004 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

AND

2004 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

UNITS NO. 1 AND 2

LICENSES DPR-66 AND NPF-73

FENOC
FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077-0004

L. William Pearce
Vice President

724-682-5234
Fax: 724-643-8069

April 27, 2005
L-05-072

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Annual Radioactive Effluent Release Report for 2004, and
Annual Radiological Environmental Operating Report for 2004

This submittal of annual reports includes, as Enclosure 1, an Executive Summary of the Radioactive Effluent Control Program and the Radiological Environmental Monitoring Program at Beaver Valley Power Station (BVPS). These programs, as outlined in the BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual, were followed throughout 2004. The program results demonstrate the proficiency of radioactive effluent control at BVPS, and that the operations of Unit 1 and Unit 2 did not adversely affect the surrounding environment.

Enclosure 2 contains the 2004 Annual Radioactive Effluent Release Report (ARERR) for BVPS Unit 1 and Unit 2, submitted in accordance with the requirements of Unit 1 and Unit 2 Technical Specification 6.9.3. The report contains the information required by NRC Regulatory Guide 1.21, along with site-specific information required by Unit 1 and Unit 2 Offsite Dose Calculation Manual procedure 1/2-ODC-3.03, Attachment U, Report 6.9.3. The report format is summarized in the ARERR index.

- The ARERR is considered a single submittal for the two-unit site.

- The ARERR combines those sections that are common to both units at the site. Therefore, since Unit 1 and Unit 2 have shared radwaste systems for elevated level gaseous effluents and shared radwaste systems for all liquid effluents, then the ARERR combines those sections.

- The ARERR segregates those sections that are specific to each unit. Therefore, since Unit 1 and Unit 2 have independent radwaste systems for ground level gaseous effluents, then the ARERR segregates those sections.

Enclosure 3 contains the BVPS 2004 Annual Radiological Environmental Operating Report (AREOR) submitted in accordance with Unit 1 and Unit 2 Technical Specification 6.9.2. The report also contains site-specific information required by Unit 1 and Unit 2 Offsite Dose Calculation Manual Procedure 1/2-ODC-3.03, Attachment T, Report 6.9.2. The report format is summarized in the AREOR index.

There are no regulatory commitments identified in this document. If you have any questions regarding this submittal, please contact Mr. Larry R. Freeland, Manager, Regulatory Compliance at 724-682-4284.

Sincerely,

L. William Pearce

Enclosures:
1) Executive Summary for Year 2004 Annual Effluent and Environmental Report
2) Annual Radioactive Effluent Release Report for 2004
3) Annual Radiological Environmental Operating Report for 2004

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator

c: American Nuclear Insurers
95 Glastonbury Boulevard
Glastonbury, CT 06033

Department of Environmental Protection (5 copies)
Bureau of Radiation Protection & Toxicology
P.O. Box 2063
Harrisburg, PA 17120

INPO (Attn: Bill Nestel)
700 Galleria Parkway SE
Suite 100
Atlanta, GA 30339-5957

J. Lee Miller, Beaver County Extension Director
Daniel V. Steen, FirstEnergy Environmental Department
John P. Jones, Hancock County Office of Emergency Services
Roger L. Suppes, Ohio Department of Health
Carol O'Claire, Ohio Emergency Management Agency
Keith Clark, East Liverpool Water Authority
Jerry Schulte, ORSANCO
B. F. Jones Memorial Library
Bronia Grob, Environmental, Inc.

Enclosure 1

Executive Summary for Year 2004 Annual Effluent and Annual Environmental Report

I. Overall Summary of BVPS Effluent and Environmental Programs:

Report Submittal: The attached documents represent a combined submittal comprised of the Annual Radioactive Effluent Release Report (ARERR), and the Annual Radiological Environmental Operating Report (AREOR). The ARERR (also referred to as the Annual RETS Report) is provided as Enclosure 2. The AREOR (also referred to as the Annual REMP Report) is provided as Enclosure 3.

This report is comprised of results from the RETS and REMP programs that are described in the BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual (ODCM) and are summarized as follows:

- **RETS Program and Report Results:** The Controls for the Radiological Effluent Technical Specification (RETS) Program are outlined in ODCM procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*. The RETS Controls were followed throughout year 2004. Adherence to the RETS Controls (e.g.; sampling, analysis and offsite dose projection requirements), along with adherence to more restrictive Administrative Controls delineated in site implementing procedures, demonstrate the proficiency of radioactive effluent control at BVPS. Also, results of the sample analyses, coupled with the offsite dose projections demonstrate that BVPS operations should not produce any adverse affect on the surrounding environment.

- **REMP Program and Report Results:** The Controls for the Radiological Environmental Monitoring Program (REMP) are outlined in ODCM procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*. The REMP Controls were followed throughout year 2004. Adherence to the REMP Controls (e.g.; sampling and analysis requirements) demonstrated the proficiency of radiological environmental monitoring. Also, results of the various environmental sample media validate the offsite dose projections made in accordance with the RETS Controls. In summary, the results demonstrate that BVPS operations did not adversely affect the surrounding environment.

Enclosure 1

Executive Summary for Year 2004 Annual Effluent and Environmental Report

II: Detailed Summary of Enclosure 2 - Annual RETS Report (ARERR) for 2004:

Report Submittal and Requirements: The ARERR was prepared and submitted in accordance with the requirements contained in the following documents:

- BVPS Unit 1 Technical Specifications, Administrative Control 6.9.3
- BVPS Unit 2 Technical Specifications, Administrative Control 6.9.3
- NUREG-1301, *Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors, Generic Letter 89-01, Supplement No.1, April 1991*
- Regulatory Guide 1.21, *Measuring Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Material in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants, Revision 1, June 1974*
- ODCM procedure 1/2-ODC-3.03, Attachment U, Control 6.9.3, *Controls for RETS and REMP Programs*
- BVPS procedure 1/2-ENV-01.05, *Compliance with Regulatory Guide 1.21 and Technical Specifications*

The following summarizes the 2004 BVPS Liquid and Gaseous Effluent Control Program:

- **Trends of Offsite Dose:** Graphs 1, 2 and 3 provide a comparison of ODCM dose projections for the last several years to show compliance with Members of the Public dose limits from 10 CFR Part 50. Also, Graph 4 provides a comparison of the ODCM dose projections from all facility releases and direct radiation exposures to show compliance with Member of the Public dose limits from 10 CFR 20.1302 and 40 CFR Part 190. The graphs reflect the results of the efforts to stabilize and reduce offsite dose.

- **Total Population Dose vs Natural Background:** The 0-50 mile total and average population doses were calculated using liquid and gaseous release quantities and real time meteorology. The average population dose is based on 4 million people within 0-50 miles of the BVPS site. The following comparison to natural background radiation demonstrates that BVPS operations did not adversely affect the surrounding environment:

  2020 man-mrem =BVPS Total Population Dose for the year

  0.000505 mrem = BVPS Average Individual Population Dose for the year

  296 mrem = Natural Background Individual Dose for the year. This dose value is documented as natural background radiation exposure for an individual in a year from the 1990 BEIR V Report.

Enclosure 1

Executive Summary for Year 2004 Annual Effluent and Environmental Report

- **Liquid Release Volume and Activity:** Unit 1 and Unit 2 discharged 3,870,000 liters of liquid waste (undiluted volume). The total radioactivity discharged from the site was 0.122 Curies of fission and activation products, 1770 Curies of tritium, 0.00498 Curies of dissolved and entrained gas, and no detectable gross alpha.

- **Liquid Release Offsite Dose Projections:** The following offsite dose projections were calculated to the maximum individual using ODCM default flow rates for the receiving water (Ohio River). The projections were performed prior to release authorization, and are summarized as follows:

  0.0195 mrem = Unit 1 Total Body Dose, or 0.651% of the 3 mrem annual limit

  0.0233 mrem = Unit 1 Highest Organ Dose, or 0.233% of the 10 mrem annual limit

  0.0195 mrem = Unit 2 Total Body Dose, or 0.651% of the 3 mrem annual limit

  0.0233 mrem = Unit 2 Highest Organ Dose, or 0.233% of the 10 mrem annual limit

- **Liquid Radwaste Treatment Sytstem:** The BVPS site operates with the concept of a shared Liquid Radwaste Treatment System, even though each Unit has its own system of ion-exchange vessels. Using this concept allowed either Unit to process liquid waste at the Unit of origin, or at the other Unit. Typically, when Unit 1 or Unit 2 high level liquid waste was processed (e.g.; coolant recovery waste) it was performed at Unit 1, because that system has an additional 50 cuft carbon pre-conditioning filter.

- **Abnormal Liquid Releases:** There was 1 abnormal liquid release during the report period. A total of 428 gallons of water leaked to the plant environs and was comprised of 0.975 Curies of tritium plus 0.000729 Curies of fission and activation products. The Offsite Dose consequence for this release was negligible in comparison to ODCM Limits. The Total Body Dose was 0.000189 mrem, and the Highest Organ (Liver) Dose was 0.000272 mrem. This condition and associated Corrective Actions are documented in Condition Report CR04-03642.

- **Gaseous Release Volume and Activity:** Unit 1 and Unit 2 discharged 6,956 cuft of stored gaseous waste. The total radioactivity discharged from all site gaseous releases was 7.75 Curies of fission and activation gases, 0.000363 Curies of iodine-131, 0.0000454 Curies of particulates with half-lives >8 days, no detectable gross alpha, and 88.1 Curies of tritium.

- **Gaseous Radwaste Treatment System:** The BVPS site operates with the concept of a shared Gaseous Radwaste Treatment System, even though each Unit has its own system of charcoal delay beds and storage/decay tanks. Using this concept allowed either Unit to process gaseous waste at the Unit of origin, or at the other Unit. Typically, when Unit 1 or Unit 2 went to a shutdown condition, the gaseous waste was sent for storage and decay at Unit 2 because that system has 4 additional storage tanks.

Enclosure 1

Executive Summary for Year 2004 Annual Effluent and Environmental Report

- **Gaseous Release Offsite Dose Projections:** The following offsite dose projections were calculated to the maximum individual using the meteorological parameters delineated in the ODCM. The offsite dose projections were performed prior to release authorization, and are summarized as follows:

  0.00174 mrad = Unit 1 Gamma Air Dose, or 0.0174% of the 10 mrad annual limit

  0.00423 mrad = Unit 1 Beta Air Dose, or 0.0212% of the 20 mrad annual limit

  0.882 mrem = Unit 1 Highest Organ Dose, or 5.88% of the 15 mrem annual limit

  0.000039 mrad = Unit 2 Gamma Air Dose, or 0.0004% of the 10 mrad annual limit

  0.000128 mrad = Unit 2 Beta Air Dose, or 0.0006% of the 20 mrad annual limit

  0.0655 mrem = Unit 2 Highest Organ Dose, or 0.437% of the 15 mrem annual limit

- **Abnormal Gaseous Releases:** There were no abnormal gaseous releases during the report period.

- **Effluent Monitoring Channels Inoperable >30 Days:** There were three Effluent Monitoring Instrumentation Channels not returned to Operable status within 30 days during this report period. The 1st instrument [FT-1CW-101-1] is used to record dilution flow rate during discharge of Liquid Waste from Unit 1 and Unit 2. The 2nd and 3rd instruments, [RM-1GW-109] and [RM-1VS-110] are used for monitoring the noble gas portion of gaseous effluent releases from the Unit 1 and Unit 2 Gaseous Waste/Process Vent System and from the Unit 1 SLCRS Vent System, respectively. The details of these conditions are shown in Table 6 of the report (see Enclosure 2).

- **ODCM Surveillance Deficiencies:** There were ODCM Surveillance Deficiencies during the report period. The deficiencies were associated with the inoperable periods of [RM-1VS-110] described in Table 6 of the report (see Enclosure 2).

Enclosure 1

Executive Summary for Year 2004 Annual Effluent and Environmental Report

III. Detailed Summary of Enclosure 3 - Annual REMP Report (AREOR) for 2004:

Report Submittal and Requirements: The AREOR was prepared and submitted in accordance with the requirements contained in the following documents:

- Unit 1 Technical Specifications, Administrative Control 6.9.2
- Unit 2 Technical Specifications, Administrative Control 6.9.2
- NUREG-1301, *Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors, Generic Letter 89-01, Supplement No.1, April 1991*
- Regulatory Guide 1.21, *Measuring Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Material in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants, Revision 1, June 1974*
- ODCM procedure 1/2-ODC-3.03, Attachment T, Control 6.9.2, *Controls for RETS and REMP Programs*
- BVPS procedure 1/2-ENV-01.05, *Compliance with Regulatory Guide 1.21 and Technical Specifications*

The following summarizes the 2004 BVPS Radiological Environmental Monitoring Program:

- **Sample Media:** Results for precipitation, ground water, sediment, food, fish, TLDs, feed, air particulate and air iodine media remained consistent from 2003 to 2004. A decrease in iodine-131 was noted in drinking water (73/106 – 54/104) and surface water (43/52 – 37/52). A decrease in iodine-131 was noted in milk (18/163 – 9/155). The following should also be noted:

  1) Key to values in parentheses in the above paragraph...(2003 positive results / total analyses – 2004 positive results / total analyses).

  2) The iodine-131 detected at surface water control location Upstream Side of Montgomery Dam (Site #49) was also detected at the same frequency and magnitude at drinking water locations Midland Water Treatment Plant (Site #4) and East Liverpool Water Treatment Plant (Site #5). Therefore, since the positive indication of iodine-131 was the same as that obtained at the control location, then the positive indication of iodine was from an upstream source, and not due from BVPS operations.

- **Population Dose - Liquid Releases:** The calculated Total Body Population Dose was 1704 man-mrem. The dose from tritium (1702 man-mrem) represents 99.9% of the Total Body Population Dose. Also, the calculated Highest Organ Population Dose from Liquid Releases was 1704 man-mrem to the Liver. The dose from tritium (1702 man-mrem) represents 99.9% of the Highest Organ Population Dose.

Enclosure 1

Executive Summary for Year 2004 Annual Effluent and Environmental Report

- **Population Dose - Gaseous Releases:** The calculated 50 mile Total Body Population Dose was 316 man-mrem. Also, the 50 mile Highest Organ Population Dose was 316 man-mrem to the Thyroid.

- **Land Use Census Changes:** A Global Positioning Satellite System was used to update survey points in the Annual Land Use Census. Highlights from the most recent Land Use Census are as follows:

  1) For all sectors, there was one change in the nearest residence. The range of the nearest resident is encompassed between 0.37 miles (NE sector), and 2.75 miles (WNW sector).

  2) One garden location moved closer, and one moved further away. The range of the nearest garden is encompassed between 0.98 miles (ENE sector), and 2.85 miles (WSW sector). There are no gardens located in the NNE, W and WNW sectors. Of the one-hundred gardens considered, forty-seven did not meet the minimum five-hundred sqft criteria, and sixteen did not produce green leafy vegetables.

  3) One milch animal location was dropped, and one was added. The range of the nearest milch animal is encompassed between 1.93 miles (SSW sector), and 4.90 miles (NW sector). There are no milch animals located in the N, NNE, NE, ENE, ESE, S, and W sectors.

- **Split Sample Program:** BVPS shared split sample data with the Pennsylvania Department of Environmental Protection (PADEP) in support of the nuclear power plant monitoring program. The shared media and number of locations are comprised of; milk (1), surface water (3), sediment (1), fish (1), food crops (2), co-located air particulate/air iodine (4), and TLD (24).

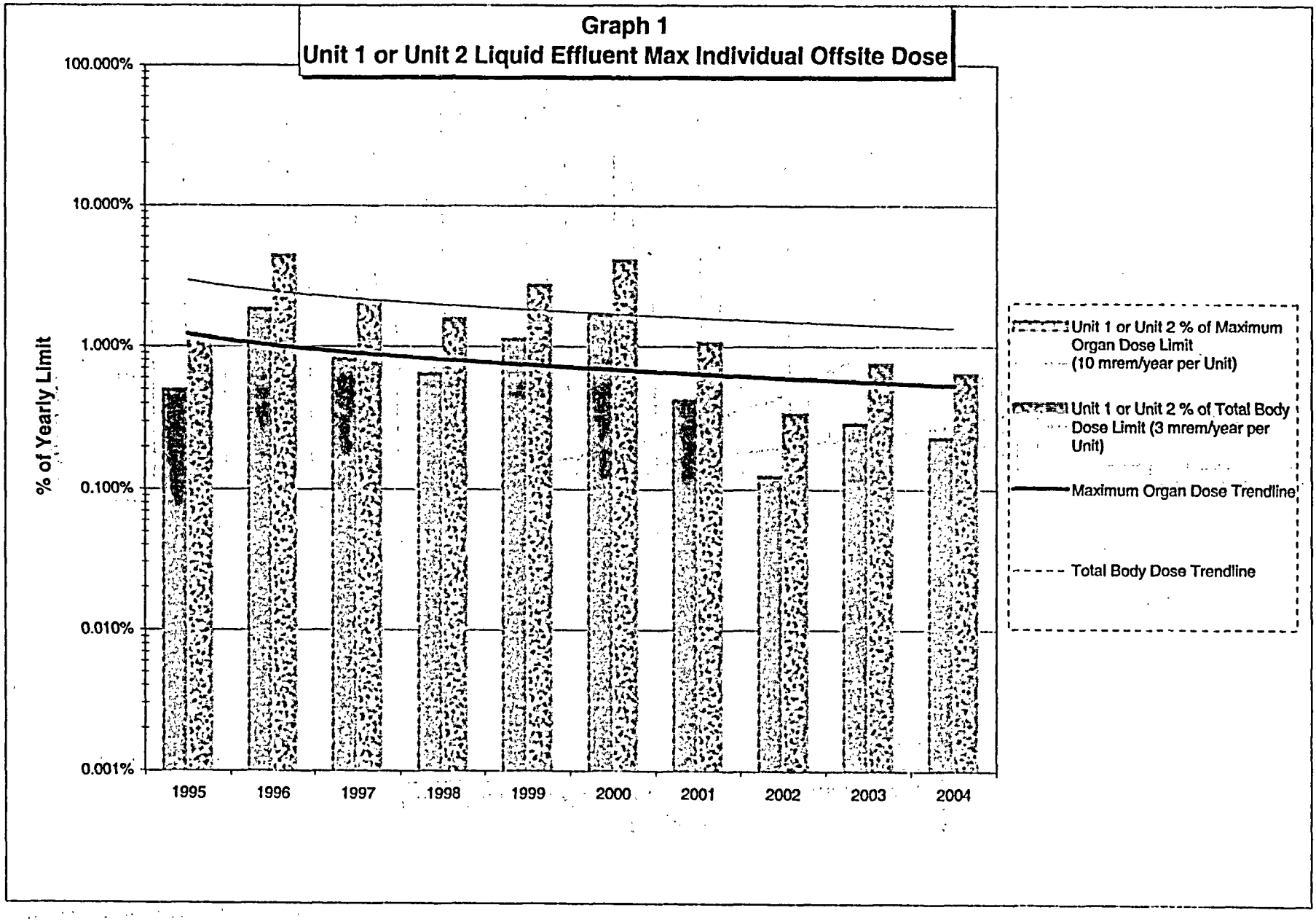
- **Spike Sample Program:** Spiked samples included water, milk, air charcoal, and air particulate media. All 102 spiked samples met the NRC comparison criteria.

- **Sample Location Changes:** A Global Positioning Satellite System was used to update all REMP sample locations. Highlights of Sample Location Changes are as follows:

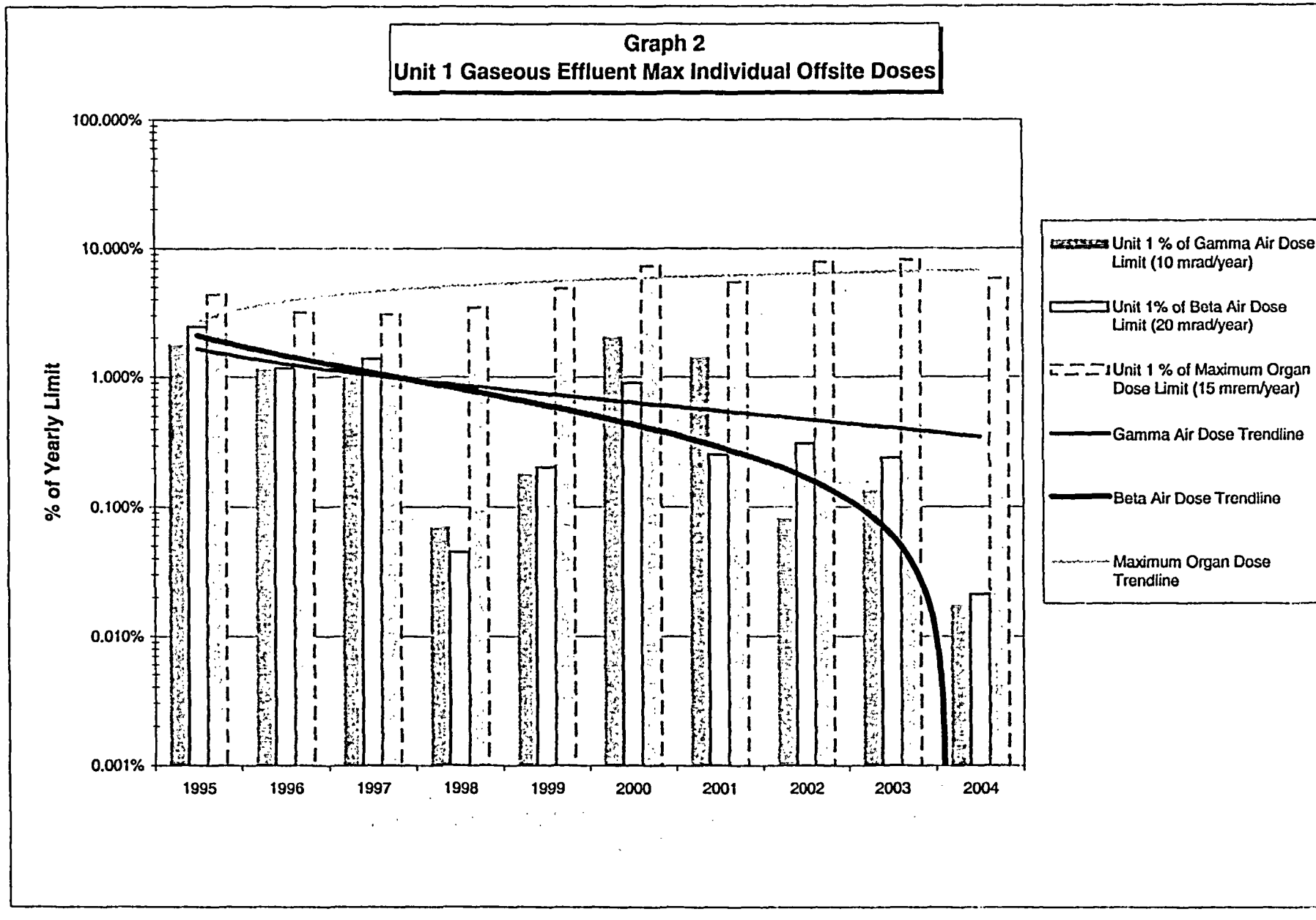
  1) There were no changes to any sample point locations during the report period.

  2) There were no changes in the required frequency of sampling during the report period.

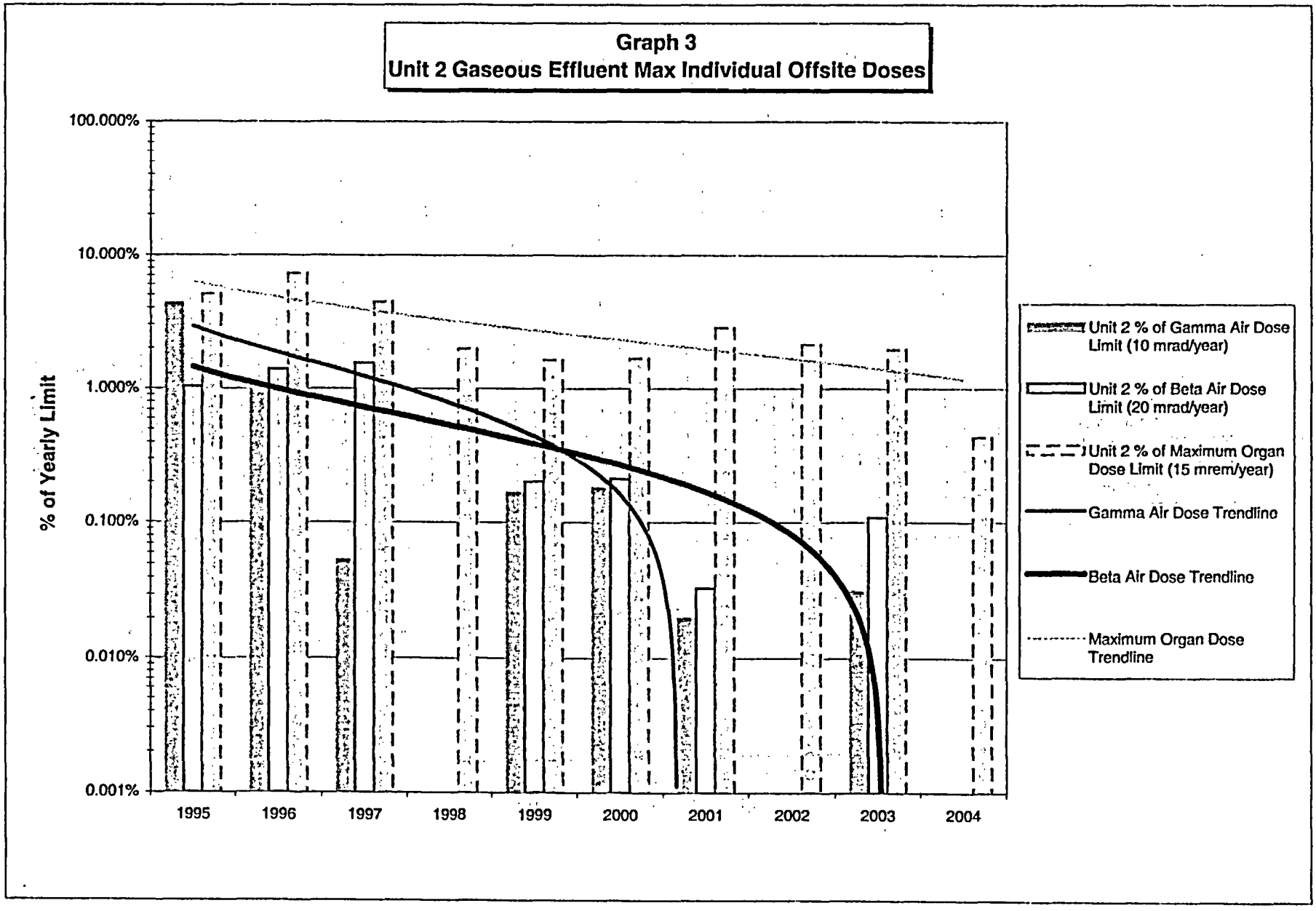
Enclosure 1
Executive Summary for Year 2004 Annual Effluent and Environmental Report



Enclosure 1
Executive Summary for Year 2004 Annual Effluent and Environmental Report



Enclosure 1
Executive Summary for Year 2004 Annual Effluent and Environmental Report



Enclosure 1
Executive Summary for Year 2004 Annual Effluent and Environmental Report