

Environmental Surveillance Report

on the
U.S. Department of Energy

Rocky Flats Environmental Technology Site

Information Exchange

SECOND QUARTER 2000



**Colorado Department
of Public Health
and Environment**

This is a numerical summary of environmental surveillance measurements performed by the Department during the past quarter. Also included are additional data for earlier periods that have not been reported previously.

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Introduction

The purpose of this Environmental Surveillance Report (ESR) is to provide a quarterly update on Colorado Department of Public Health and Environment (CDPHE) air and surface water monitoring data at the Rocky Flats Environmental Technology Site (RFETS).

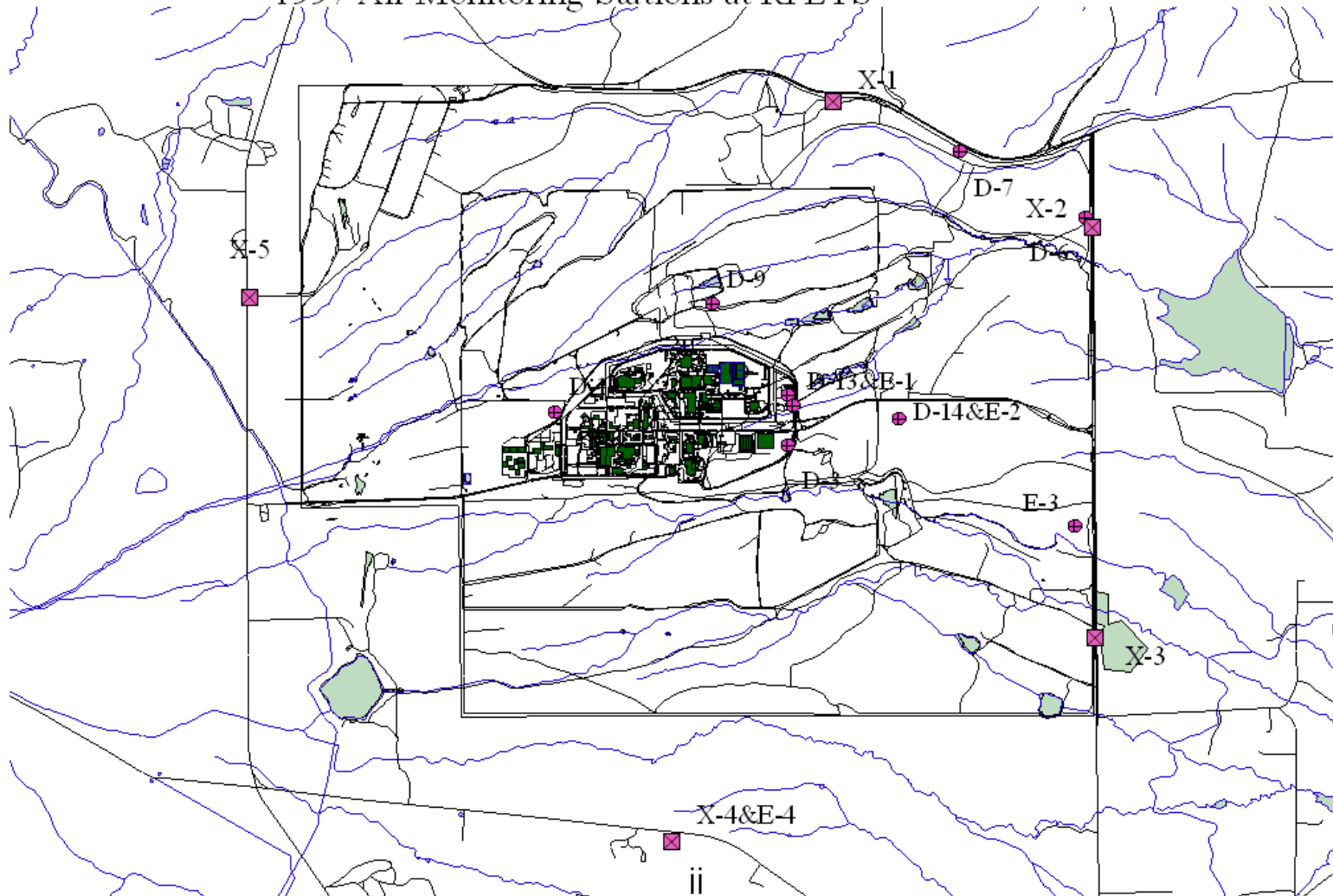
CDPHE currently has three Divisions that conduct monitoring at RFETS including the Air Pollution Control Division (APCD), the Hazardous Materials Waste Management Division, and the Laboratory and Radiation Services Division (LARS). APCD monitors air for contaminants such as particulates, oxides of nitrogen, ozone, volatile organic compounds (VOCs), radionuclides beryllium. The Hazardous Materials Waste Management Division conducts surface water monitoring for many parameters, including metals, inorganics and radionuclides. The Radiation Control Division performs radiological monitoring in air, and precipitation.

Under normal conditions, groundwater and soils are not monitored by Colorado Department of Public Health and Environment (CDPHE), but are monitored by DOE.

Sampling and data analysis is performed by CDPHE according to the Rocky Flats Integrated Monitoring Plan (IMP), which describes not only the monitoring done by CDPHE, but also that done by the Site and surrounding communities. It is possible that CDPHE may do some additional sampling as part of a special study or for some unusual circumstances. This report describes the results of both types of CDPHE monitoring.

MONITORING STATIONS

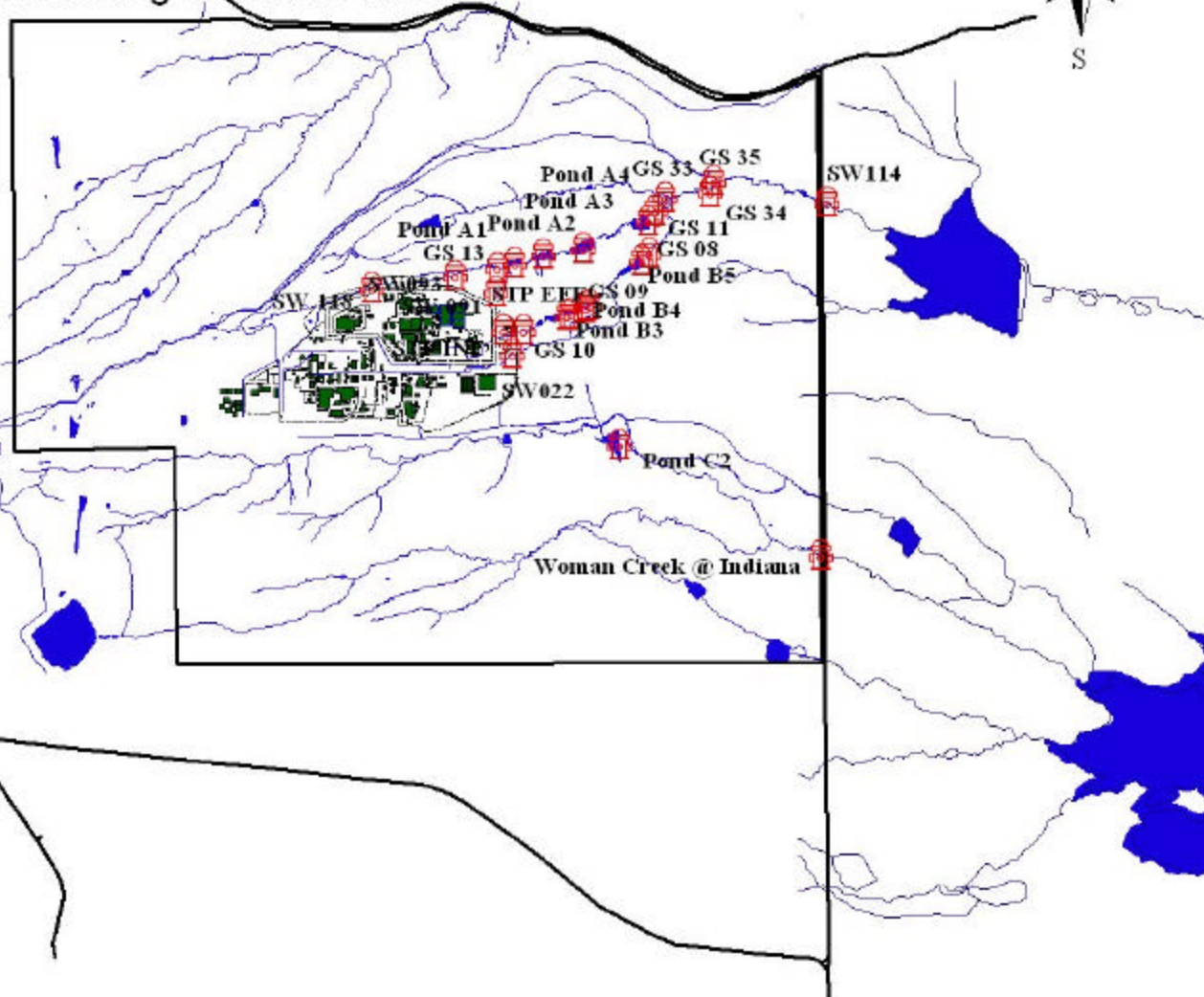
Colorado Department of Public Health and Environment
1997 Air Monitoring Stations at RFETS



D & E(elevated) - Continuous Particulate Sampling Stations for Radionuclides Analysis
X - Periodic Sampling Stations For Particulate, Inorganic, Metals and VOCs Analysis

Colorado Department of Public Health and Environment

Surface Water Monitoring Locations 2000



Colorado Department
of Public Health
and Environment

JM Lore

May 11, 2000

DECISION RULES

Decision Rules

The data acquired for each quarter is examined using standard methods of evaluation that are described in the Integrated Monitoring Plan (IMP). The methods use a series of decision rules to effectively analyze the data that has been collected, and make determinations about what actions need to be taken.

Decision rules are if-then statements pertaining to data quality objectives. The decision rules define, quantitatively and qualitatively, the point at which a decision should be made or action should be taken.

The decisions could involve many different actions including, but not limited to, further analysis of data, implementation of new monitoring stations for source detection, management decisions, or evaluation of remediation alternatives. Any exceedence of an action level for a surface water or air contaminant during the quarter are summarized in this report, along with any actions taken or follow up investigations that are required.

The primary decision rules that pertain to each media are outlined below:

A. Air Monitoring

1. Ambient Air Quality Monitoring: Nitrogen Dioxide (NO₂), Ozone (O₃) and particulate monitoring is performed by APCD. Particulate monitoring includes monitoring of both fine particulates (PM₁₀) and total suspended solids (TSP).

IF: A perimeter monitor detects an NO₂ (annual arithmetic mean) concentration of 0.053 parts per million (ppm), an O₃ (1 hr av. time) concentration of 0.12 ppm, a TSP measurement of 75 µg/m³ averaged over a 1 year time period or 150 µg/m³ over a 24-hour time period, or a PM₁₀ concentration of 50 µg/m³ annually or 150 µg/m³ in a 24-hour period (Include these values in a table in the report, too confusing this way)

THEN: The Site's operating permit may potentially be revised to mitigate the exceedence.

2. Beryllium (Be) Monitoring: Emission points (stacks) are monitored for Be.
 - IF: Be emissions from a source exceed 10 g in a 24-hour period
 - THEN: CDPHE may take enforcement action.
 - IF: Ambient Be concentrations at monitoring sites exceed 0.01 $\mu\text{g}/\text{m}^3$ over a 30-day Period
 - THEN: CDPHE may take action to identify the source.

3. Volatile Organic Compound (VOCs) Monitoring: Various VOC monitoring stations exist around the perimeter of the site and are maintained by APCD. It is possible that remediation processes could release significant levels of VOCs. VOC data does not tend to vary and the measured concentrations are generally very low. A significant increase from normal levels of any VOC at any monitoring site could indicate a potential problem.
 - IF: A measured value of any VOC exceeds trends in historical data
 - THEN: An investigation will be enacted to determine the source of the elevated VOC concentration.

4. Radiological Ambient Air Quality Monitoring: Laboratory and Radiation Services Division (LARS) and Air Pollution Control Division (APCD) air sampling locations are monitored for radiological contaminants, PM_{10} and total suspended particulates (TSP).
 - IF: Measured values of radionuclides exceed typical trends existing in historical data
 - THEN: Any number of actions may be taken including, but not limited to, analysis of samples for verification, comparison of samples from nearest DOE monitoring sites, ComRad Program samplers, and/or APCD monitoring sites, request for investigation or explanation of elevated results from DOE, calculation of public dose/risk and/or a presentation to CDPHE management.

B. Surface Water Monitoring

1. Source Location: Current surface water monitoring sites monitor for Analytes of Interest (AoIs) and indicator parameters for AoIs. Contaminant levels that exceed historical trends at a certain site could indicate the presence of a new contaminant source. When a new contaminant source is identified by a current monitoring location, it may be necessary to implement additional monitoring sites to identify the exact location of the new source.

IF: A new contaminant source is identified by any monitoring station
THEN: Action should be taken to locate and quantify the source. Mitigation action will be taken pursuant to the Rocky Flats Cleanup Agreement (RFCA) Action Level Framework (ALF).

2. Wastewater Treatment Plant (WWTP) Influent Radiological Monitoring: The Site has made an effort to eliminate any possible connections between waste streams containing radionuclides and WWTP influent. Therefore, it is assumed that radiologic loads will not significantly increase from baseline values. Radiologic parameters include total plutonium, total americium, total uranium, tritium, as well as alpha and beta activity. Decontamination and decommissioning (D&D) activities could potentially introduce radiologic loads to WWTP influent. The influent is monitored to track sources of contaminants that may be introduced during the cleanup process.

IF: Influent loading for any of the radiologic parameters exceeds baseline values determined from historical data

THEN: Evaluation will be performed to determine the source of contamination.

3. Pond Predischarge Monitoring: AOlS and some volatile organic compounds (VOCs) are monitored in the ponds previous to pond discharge so that discharge will not result in exceedence of stream standards.

IF: Predischarge monitoring shows exceedence of stream standards

THEN: CDPHE will notify the Site. At this point the Site may evaluate alternative options which avoid immediate discharge including, but not limited to, treatment, storage or disposal.

4. Precipitation Sampling: LARS is involved with sampling precipitation for gross alpha/beta, Pu-239/240, Am-241 and Tritium.

IF: Any measurement of radionuclides in precipitation exceeds the normal variation occurring in historical and baseline measurements

THEN: A series of actions may be taken including, but not limited to, reanalysis of the samples, analysis of individual ambient air filters from the same quarter, request for analysis of nearby filters from DOE, ComRad, or APCD sample sites, request for investigation, request for CDPHE and DOE modeling to determine environmental effects.

ANALYTES OF INTEREST

Analytes of Interest

Analytes		Air	Water	Purpose of Monitoring
Radionuclide:	Pu	X	X	High level of public concern. Known carcinogen. Known past releases (within the past 8 years) have exceeded RFCA stream standards and action levels. This provides reasonable cause to expect future releases in excess of RFCA Action Levels.
	U	X	X	Known renal toxicity. Past exceedances provide reasonable cause to expect future releases in excess of RFCA stream standards and action levels.
	Am	X	X	Known carcinogen. Known past exceedances provide reasonable cause to expect future releases in excess of RFCA stream standards and action levels.
	Tritium		X	Is an AOI due to past releases to drinking water supplies
Metals:	Be	X	X	Known to cause berylliosis in susceptible individuals when exposed in inhalation. May also cause contact dermatitis. Will be monitored as an indicator of releases from process and waste storage areas.
	Cr		X	Physiological and dermal toxicity. High level of regulatory concern due, in part to the chromic acid of incident of 1989. Low levels can cause significant ecological damage.
	Ag		X	Highly toxic to fish at low levels, if chronic. State of Colorado has temporarily removed its stream standard for silver, while under study. The study has been completed, and the standard will be reinstated at the next triennial review of South Platte stream standards, if not before. Used at RFETS only for photographic development. Routinely accepted by POTWs as municipal waste, but discharge is regulated. May be removed from this list later if data do not support concern.

	Cd		X	Highly toxic to fish at low levels, if chronic. Known human carcinogen (prostate cancer) and depletes physiologic calcium. Used at RFETS in plating processes. Monitoring data for the Interceptor Trench System (ITS) and the proposed discharge of untreated ITS waters into Walnut Creek provide reasonable cause to expect future releases in excess of RFCA Action Levels
	Hardness		X	Required to evaluate metals analyses, due to its effect on solubility to these metals.
Particulates:	Total suspended particulates	X		Monitored to provide information on total airborne particulate levels. Filters also used for metals and radionuclides analyses.
	PM ₁₀ particulates	X		Monitored to provide information on fine airborne particulate levels. Filters also used for metals and radionuclides analyses.
Volatile Organic Compounds:	VOCs	X	X	A variety of volatile organic compounds, some of which are toxic to humans and ecology. Known discharges to air and water as well as groundwater infiltration.
Real Time Monitoring of Physical and Indicator Parameters: (These parameters provide real-time indication for a wide variety of regulated contaminants, and are also required component for monitoring for AolS. They require no laboratory analysis and are the RFETS most cost effective defensive monitoring.)	pH		X	Toxicity to humans and ecology. Regulatory concern due to chromic acid incident. Real-time monitoring is an inexpensive and effective method of detecting acid spills such as (chromic acid or plutonium nitrate) or failure of treatment systems.
	Conductivity		X	Conductivity is an indicator of total dissolved solids, metals, anions, and pH. Real-time monitoring of conductivity is an inexpensive indicator of overall water quality.
	Turbidity		X	Turbidity is a general indicator of elevated contaminant levels, and may be correlated with Pu.
	NO ₃		X	Past releases near RFCA stream standards and action levels upstream of ponds provide reasonable cause to expect future releases in excess of RFCA stream standards and action levels. ITS discharges are often high in nitrate, and may challenge RFCA action levels.
	Flow		X	Required to detect flow events, evaluate contaminant loads and plan pond operations and discharges. Affects nearly every decision rule, and is the most commonly discussed attribute of RFETS surface waters.

Oxides of Nitrogen	X		Monitored due to RFETS historical use of nitric acid.
Ozone	X		Monitored as part of the CDPHE network. Not required or part of monitoring for RFETS.
Wind speed	X		Monitored to provide emergency response modeling information.
Wind direction	X		Monitored to provide emergency response modeling information.
Temperature	X		Monitored to provide emergency response modeling information.

AIR STANDARDS

NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	AVERAGING TIME	STANDARD
Carbon Monoxide (CO)		
Primary Standard	1 Hour ^(a)	35 ppm
Primary Standard	8 Hour ^(a)	9 ppm
Ozone (O ₃)		
Primary and Secondary Standards (up to 1997)	1 Hour ^(b)	0.12 ppm
Primary and Secondary Standards (as of July 1997)	8 Hour ^(c)	0.08 ppm
Nitrogen Dioxide (NO ₂)		
Primary and Secondary Standards	Annual Arithmetic Mean	0.053 ppm
Sulfur Dioxide (SO ₂)		
Primary Standard	Annual Arithmetic Mean	0.030 ppm
Primary Standard	24 Hour ^(a)	0.14 ppm
Secondary Standard	3 Hour ^(a)	0.5 ppm
Particulates (PM ₁₀)		
Primary and Secondary Standards	Annual Arithmetic Mean ^(d)	50 µg/m ³
Primary and Secondary Standards	24 Hour ^(b) prior to July 1997, ^(e) as of July 1997	150 µg/m ³
Fine Particulates (PM _{2.5}) (as of July 1997)		
Primary and Secondary Standards	Annual Arithmetic Mean ^(d)	15.0 µg/m ³
Primary and Secondary Standards	24 Hour ^(f)	65 µg/m ³
Lead (Pb)		
Primary and Secondary Standards	Calendar Quarter Average	1.5 µg/m ³
Total Suspended Particulates (TSP)		
Primary Standard	Annual Geometric Mean ^(g)	75 µg/m ³
Primary Standard	24 Hour ^(g)	260 µg/m ³
Secondary Standard	Annual Geometric Mean ^(g)	60 µg/m ³
Secondary Standard	24 Hour ^(g)	150 µg/m ³

^(a) Not to be exceeded more than once per year.

^(b) Statistically estimated number of days with concentrations above this level averaged over a three year period, is not to be more than 1 per year.

^(c) The three year average of the fourth maximum value for each year is not to exceed this level.

^(d) The average of three years of annual averages (based on quarterly averages) is not to exceed this level.

^(e) The three year average of the 99th percentile for each year is not to exceed this level.

^(f) The three year average of the 98th percentile for each year is not to exceed this level.

^(g) The TSP standard was replaced by the PM₁₀ standard on July 1, 1987. TSP is now a State standard only and was temporarily suspended from 30 August 1993 to 30 October 1995 by the AQCC.

WATER STANDARDS

Colorado Water Quality Control Commission Standards for
Radioactive Materials at and around RFETS

	SEGMENT 2 Standley Lake	SEGMENT 3 Great Western Reservoir	SEGMENTS 4a and 5 Woman Creek	SEGMENTS 4a, 4b and 5 Walnut Creek
Gross Alpha (pCi/L)	6	5	7	11
Gross Beta (pCi/L)	9	12	8	19
Plutonium (pCi/l)	0.03	0.03	0.15	0.15 *
Americium (pCi/l)	0.03	0.03	0.15	0.15 *
Tritium (pCi/l)	500	500	500	500
Uranium (pCi/L)	3	4	11	10

* Temporary modifications apply until December 31, 2000. The modification is a narrative standard requiring that the concentration of americium and plutonium be consistent with attaining the numerical water quality standard in Segment 4(b) of Big Dry Creek

Standards for Inorganics and Metals

Inorganic/Metal	SEGMENTS 4a & 4b	SEGMENT 5
	Standards (mg/L)	Action Levels (mg/L)
Ammonia	*	*
Beryllium, total recoverable	0.0040	0.0040
Cadmium, dissolved **	0.0015	0.002
Chloride	0.011	0.011
Chromium, total	50	50
Copper**	16	16
Iron, dissolved	300	300
Iron, total	1000	1000
Manganese, dissolved	50	50
Manganese, total	1000	1000
Nitrate	10000	10000
Nitrite	500	500
Phosphate, ortho	?	?
Phosphate, total	?	?
Selenium, total	10	10
Silver, dissolved**	0.59	0.59
Sulfate	250000	250000
Sulfide	20	20

*There is no unionized ammonia standard for Segment 5 or Segment 4b. A standard of 0.1 mg/L applies to Segment 4a.

**The standards for these metals were calculated using a formula based on hardness. A hardness value of 143 mg/L was used because this is the average hardness found in these waters.

EPA Method 502.2 for VOCs in Surface Waters

VOCs	MCL ($\mu\text{g/L}$)	MDL ($\mu\text{g/L}$)	PQL ($\mu\text{g/L}$)	VOCs	MCL ($\mu\text{g/L}$)	MDL ($\mu\text{g/L}$)	PQL ($\mu\text{g/L}$)
1,1,2-Tetrachloroethane	none	0.5	1	Chloroform	none	0.5	1
1,1,1-Trichloroethane	200	0.5	1	Chloromethane	none	0.5	1
1,1,2,2-Tetrachloroethane	none	0.5	1	Dibromochloromethane	none	0.5	1
1,1,2-Trichloroethane	5	0.5	1	Dibromomethane	none	0.5	1
1,1-Dichloroethane	none	0.5	1	Dichlorodifluoromethane	none	0.5	1
1,1-Dichloroethene	7	0.5	1	Dichloromethane	5	0.5	1
1,1-Dichloropropene	none	0.5	1	Ethylbenzene	700	0.5	1
1,2,3-Trichlorobenzene	none	0.5	1	Fluorotrichloromethane	none	0.5	1
1,2,3-Trichloropropane	none	0.5	1	Hexachlorobutadiene	none	0.5	1
1,2,4-Trichlorobenzene	70	0.5	1	Isopropylbenzene	none	0.5	1
1,2,4-Trimethylbenzene	none	0.5	1	Naphthalene	none	0.5	1
1,2-Dichlorobenzene	600	0.5	1	Propylbenzene	none	0.5	1
1,2-Dichloroethane	5	0.5	1	Styrene	100	0.5	1
1,2-Dichloropropane	5	0.5	1	Tetrachloroethene	5	0.5	1
1,3,5-Trimethylbenzene	none	0.5	1	Toluene	1000	0.5	1
1,3-Dichlorobenzene	none	0.5	1	Trichloroethene	5	0.5	1
1,3-Dichloropropane	none	0.5	1	Vinyl chloride	2	0.5	1
1,4-Dichlorobenzene	75	0.5	1	Xylene, (total)	10,000	0.5	1
2,2-Dichloropropane	none	0.5	1	cis-1,2-Dichloroethene	70	0.5	1
2-Chlorotoluene	none	0.5	1	cis-1,3-Dichloropropene	none	0.5	1
4-Chlorotoluene	none	0.5	1	n-Butylbenzene	none	0.5	1
4-Isopropyltoluene	none	0.5	1	sec-Butylbenzene	none	0.5	1
Benzene	5	0.5	1	tert-Butylbenzene	none	0.5	1
Bromobenzene	none	0.5	1	trans-1,2-Dichloroethene	100	0.5	1
Chloroethane	none	0.5	1	trans-1,3-Dichloroethene	none	0.5	1

EPA Method 515.1 for Chlorinated Acid Herbicides

Contaminant	MDL ($\mu\text{g/L}$)	PQL ($\mu\text{g/L}$)	Contaminant	MDL ($\mu\text{g/L}$)	PQL ($\mu\text{g/L}$)
Acifluorfen	0.3	3	3,5-Dichlorobenzoic acid	0.8	8
Bentazon	0.4	4	Dichlorprop	0.3	3
Cloramben	1.2	12	Dinoseb	0.6	6
2,4-D	0.3	3	4-Nitrophenol	0.8	8
Dalapon	0.7	7	Pentachlorophenol	0.6	6
2,4-DB	0.5	5	Picloram	0.5	5
DCPA	0.4	4	2,4,5-T	0.3	3
Dicamba	0.3	3	2,4,5-TP	0.3	3

EPA Method 525.2 for SVOCs in Surface Waters

SVOCs	MCL (mg/L)	MDL (mg/L)	PQL (mg/L)	SVOCs	MCL (mg/L)	MDL (mg/L)	PQL (mg/L)
1,2,4-Trichlorobenzene	none	5	10	Benzo(a)anthracene	none	5	10
1,2-Dichlorobenzene	none	5	10	Benzo(a)anthracene	0.2	5	10
1,3-Dichlorobenzene	none	5	10	Benzo(b)fluoranthene	none	5	10
1,4-Dichlorobenzene	none	5	10	Benzo(ghi)perylene	none	5	10
2,4,5-Trichlorophenol	none	5	10	Benzo(k)fluoranthene	none	5	10
2,4,6-Trichlorophenol	none	5	10	Butyl benzyl phthalate	none	5	10
2,4-Dichlorophenol	none	5	10	Chrysene	none	5	10
2,4-Dimethylphenol	none	5	10	Di-n-butylphthalate	none	5	10
2,4-Dinitrophenol	none	25	10	Di-n-octylphthalate	none	5	10
2,4-Dinitrotoluene	none	5	10	Dibenz(a,h)anthracene	none	5	10
2-Chloronaphthalene	none	5	10	Dibenzofuran	none	5	10
2-Methyl-4,6-dinitrophenol	none	25	50	Diethyl phthalate	none	5	10
2-Chlorophenol	none	5	10	Dimethyl phthalate	none	5	10
2-Methylnaphthalene	none	5	10	Hexachlorobutadine	none	5	10
2-Methylphenol	none	5	10	Hexachlorocyclopentadiene	50	5	10
2-Nitroaniline	none	5	10	Hexachloroethane	none	5	10
2-Nitrophenol	none	5	10	Indeno(1,2,3-cd)pyrene	none	5	10
3,3-Dichlorobenzidine	none	5	10	Isophorone	none	5	10
3-Nitroaniline	none	25	50	N-Nitosodi-n-propylamine	none	5	10
4-Bromophenylphenylether	none	5	10	N-Nitrosodiphenylamine	none	5	10
4-Chloro-3-methylphenol	none	10	20	Naphthalene	none	5	10
4-Chloroaniline	none	10	20	Nitrobenzene	none	5	10
4-Chlorophenylphenylether	none	5	10	Pentachlorophenol	1	25	10
4-Methylphenol	none	5	10	Phenanthrene	none	5	10
4-Nitroaniline	none	25	50	Phenol	none	5	10
4-Nitrophenol	none	25	50	Pyrene	none	5	10
Acenaphthene	none	5	10	bis(2-Chloroethoxy)methane	none	5	10
Acenaphthylene	none	5	10	bis(2-Chloroethyl) ether	none	5	10
Anthracene	none	5	10	bis(2-Ethylhexyl) phthalate	6	5	10

AIR RESULTS

Description of Air Sampling this Quarter

Table A contains the complete gross alpha /gross beta results for the second quarter of 2000. Data from the second quarter of 2000 show no obvious anomalies, compared to historical data. No new alpha spectrometric analyses (Table B) are currently available.

As a special addition in this report are plutonium and americium measurements from the week of January 25 through February 1, the week of unusually high gross alpha/gross beta measurements, and for April 4-11, 2000, the week of the controlled buffer zone test burn. These results, presented in the plutonium and americium special table below, show no obvious anomalies, relative to historical data.

Also appearing in this report are gross alpha/gross beta results from the weeks of April 4-11, 2000 and July 4-11, 2000. These samples were counted in order to determine whether any significant alpha activity was released by either the controlled buffer zone burn on April 6th or the buffer zone fire of July 10th. These results, presented in the buffer zone burn data table below, show no obvious anomalies compared to historical data. Selected air filters, as well as soil and ash samples collected on July 14th are currently being analyzed for plutonium and americium. These results should be available in the next report.

Oxides of nitrogen and ozone data for the second quarter of 2000 are presented in Table D. Average oxides of nitrogen levels are slightly higher than typical historical values for the period, though still very low. Ozone concentrations for the quarter have increased to typical summertime levels. Particulate concentrations for the second quarter of 2000 are presented in Table E. Both PM10 and TSP levels are typical for the period.

No new beryllium and uranium data (Table F) are available at this time. Volatile organic compound analyses (Table G) for the second quarter of 2000 are not yet complete and will be presented in next quarter's report.

Plutonium and Americium Special Data

Week of January 25 – February 1, 2000

Location	Sampler Type	²³⁹⁺²⁴⁰ Pu pCi/m ³	²⁴¹ Am pCi/m ³	²³⁹⁺²⁴⁰ Pu / ²⁴¹ Am pCi/m ³	Gross Alpha pCi/m ³
D-1	TSP / Continuous	< 0.000015	< 0.000023	---	0.0111
D-3	TSP / Continuous	0.000112 " 0.000020	0.000032 " 0.000016	3.5 " 1.9	0.0094
D-6	TSP / Continuous	< 0.000027	< 0.000026	---	0.0133
D-7	TSP / Continuous	< 0.000016		---	0.0109
D-10	TSP / Continuous	< 0.000015		---	0.0095
D-13	TSP / Continuous	< 0.000013	< 0.000025	---	0.0120
D-14	TSP / Continuous	0.000013 " 0.000007	< 0.000016	---	0.0096
E-1-T	TSP / Continuous	< 0.000015	< 0.000016	---	0.0113
E-2-T	TSP / Continuous	< 0.000012	< 0.000020	---	0.0159
E-3-T	TSP / Continuous	< 0.000013		---	0.0121
E-4-T	TSP / Continuous	< 0.000014	< 0.000068	---	0.0126

Week of April 4-11, 2000

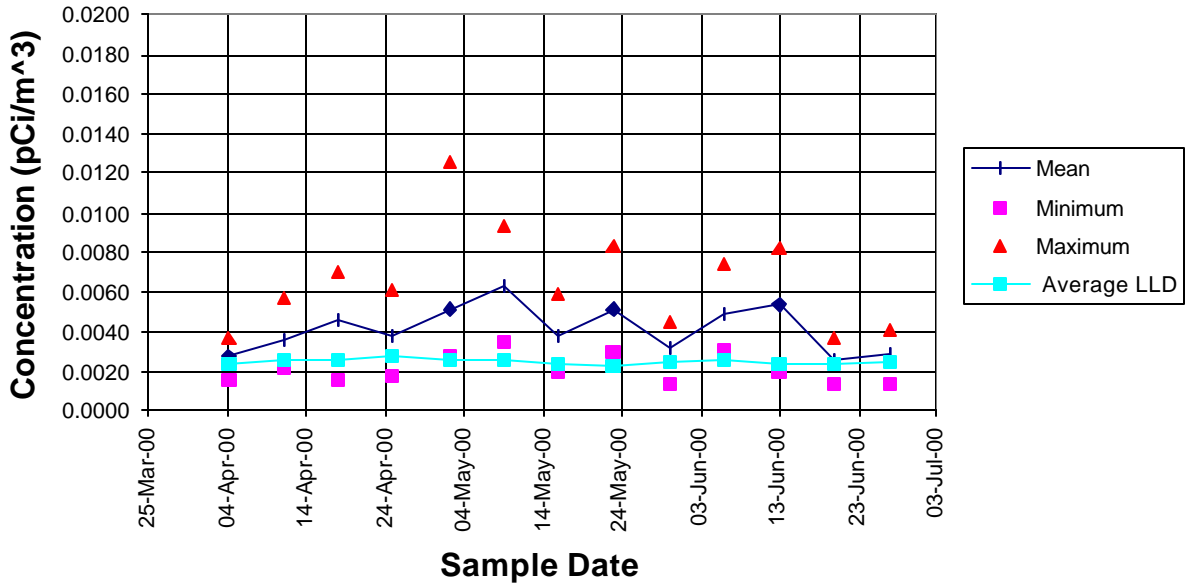
Location	Sampler Type	²³⁹⁺²⁴⁰ Pu pCi/m ³	²⁴¹ Am pCi/m ³	²³⁹⁺²⁴⁰ Pu / ²⁴¹ Am pCi/m ³	Gross Alpha pCi/m ³
D-1	TSP / Continuous	< 0.000018	< 0.000028	---	< 0.0029
D-3	TSP / Continuous	0.000075 " 0.000017	0.000024 " 0.000011	3.1 " 1.6	0.0049
D-6	TSP / Continuous	< 0.000012	< 0.000019	---	0.0051
D-7	TSP / Continuous	< 0.000012	< 0.000025	---	0.0039
D-10	TSP / Continuous	< 0.000011	< 0.000012	---	0.0040
D-13	TSP / Continuous	< 0.000008	< 0.000017	---	0.0042
D-14	TSP / Continuous	0.000016 " 0.000008	< 0.000015	---	0.0031
E-1-T	TSP / Continuous	0.000009 " 0.000005	< 0.000018	---	0.0056
E-2-T	TSP / Continuous	0.000015 " 0.000008	0.000017 " 0.000009	0.9 " 0.7	0.0028
E-3-T	TSP / Continuous	< 0.000011	< 0.000018	---	< 0.0026
E-4-T	TSP / Continuous	< 0.000017	< 0.000016	---	0.0031

Buffer Zone Fire Data
April 6, 2000 and July 10, 2000

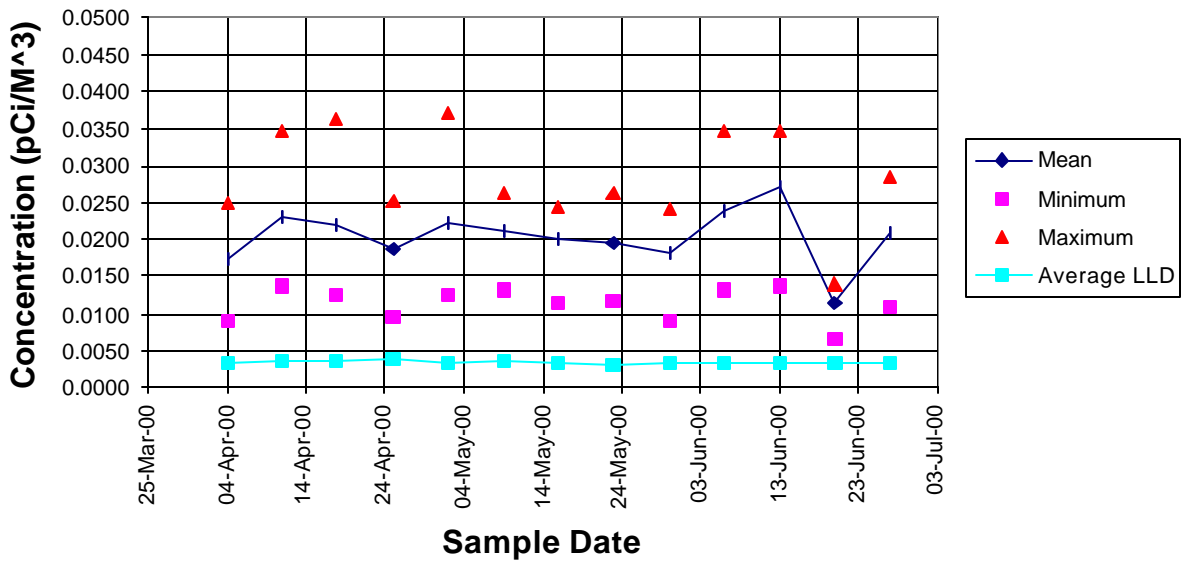
Site	Week of April 4 – 11, 2000		Week of July 4 – 11, 2000	
	Gross alpha pCi/m ³	Gross beta pCi/m ³	Gross alpha pCi/m ³	Gross beta pCi/m ³
Ground level, Security area				
D-1 TSP	0.0018	0.0263	< 0.0033	0.0250
D-3 TSP	0.0048	0.0226	0.0044	0.0213
Ground level, Buffer zone				
D-9 TSP	0.0039	0.0240	0.0028	0.0208
D-10 TSP	0.0041	0.0277	0.0039	0.0226
D-13 TSP	0.0030	0.0222	0.0037	0.0231
D-14 TSP	0.0055	0.0343	0.0027	0.0213
Ground level, Perimeter				
D-6 TSP	0.0050	0.0248	< 0.0032	0.0276
D-7 TSP	0.0038	0.0253	< 0.0029	0.0244
Elevated, Buffer zone				
E-1-T TSP	0.0028	0.0215	0.0026	0.0215
E-2-T TSP	---	---	0.0025	0.0202
E-1-P PM10	---	---	< 0.0014	0.0097
E-2-P PM10	0.0027	0.0174	0.0027	0.0146
Elevated, Perimeter				
E-3-T TSP	0.0018	0.0218	---	---
E-3-P PM10	0.0021	0.0136	< 0.0014	0.0108
E-4-T TSP	0.0030	0.0166	---	---

Graphical Presentation

Average Gross Alpha Concentration in Air Second Quarter 2000

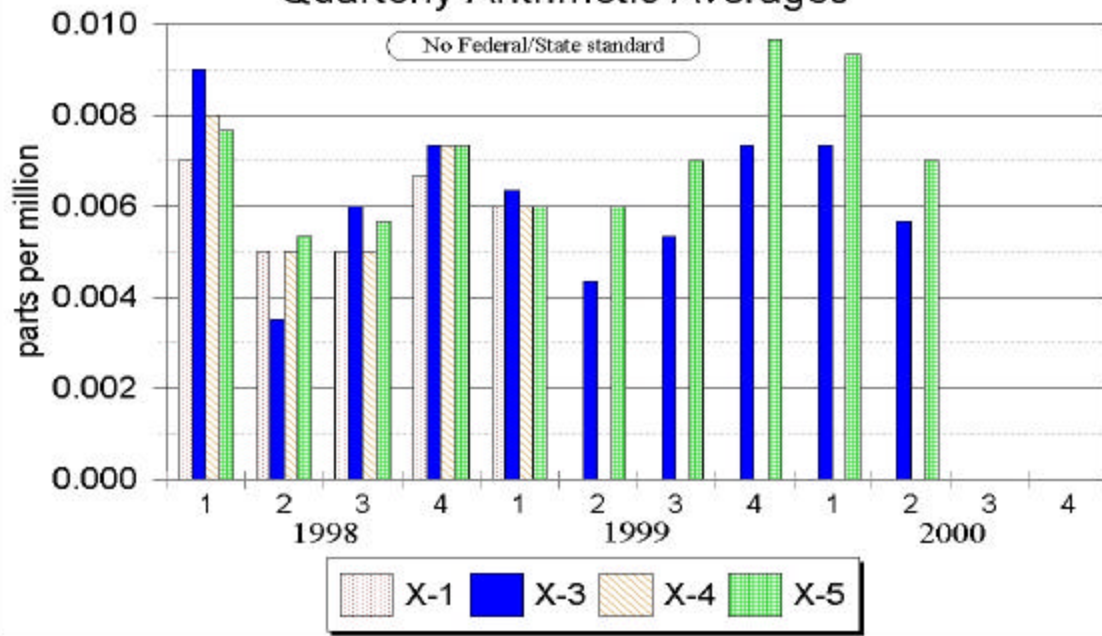


Average Gross Beta Concentration in Air Second Quarter 2000



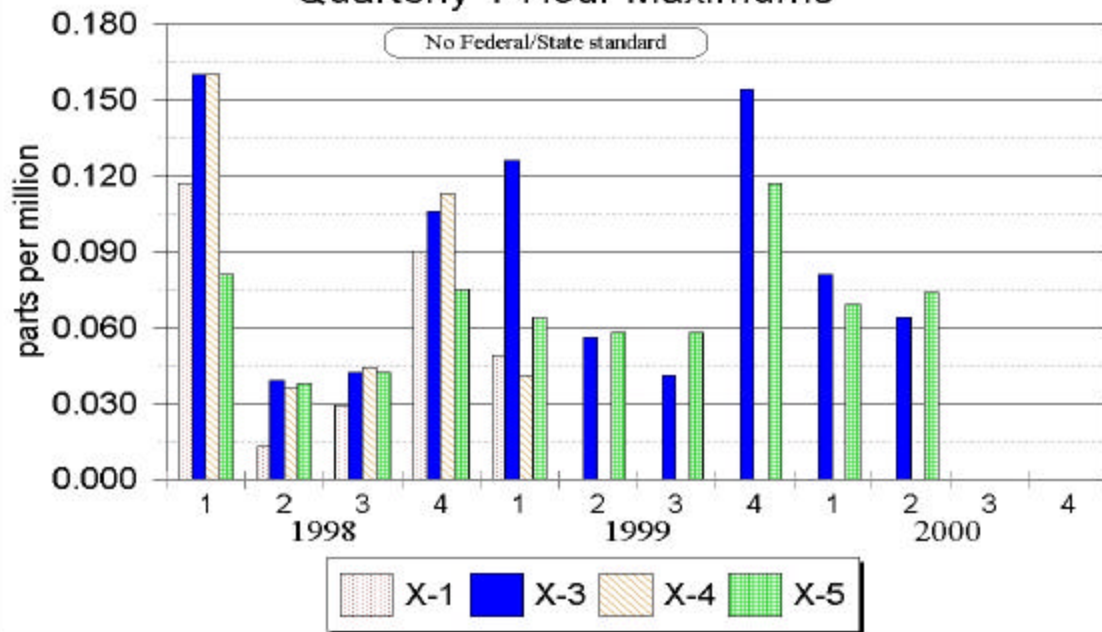
Nitric Oxide (NO)

Quarterly Arithmetic Averages



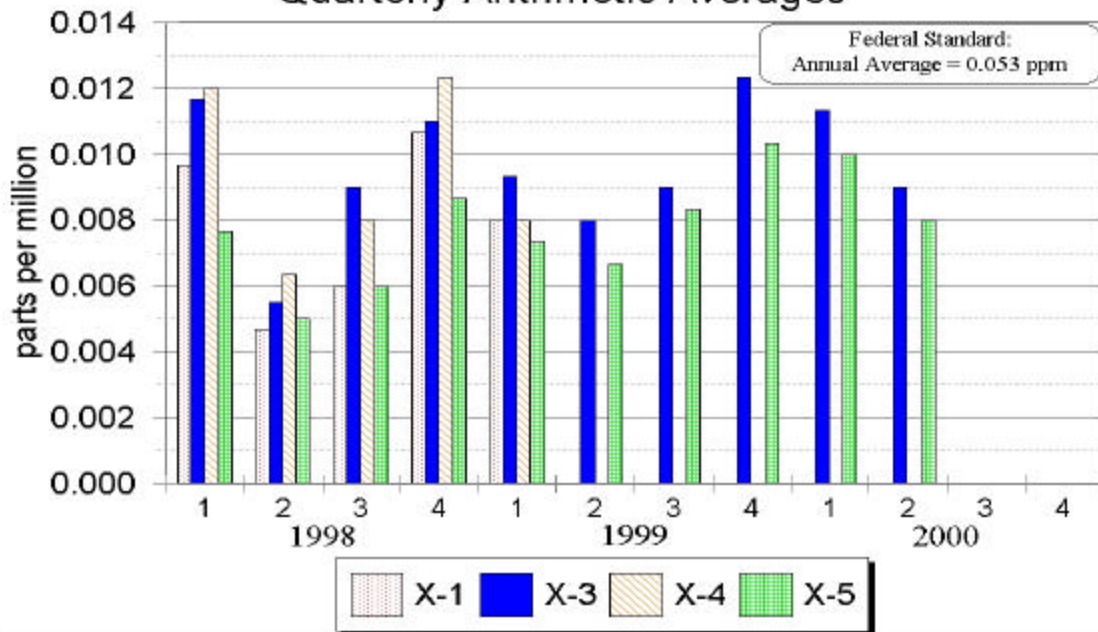
Nitric Oxide (NO)

Quarterly 1-Hour Maximums



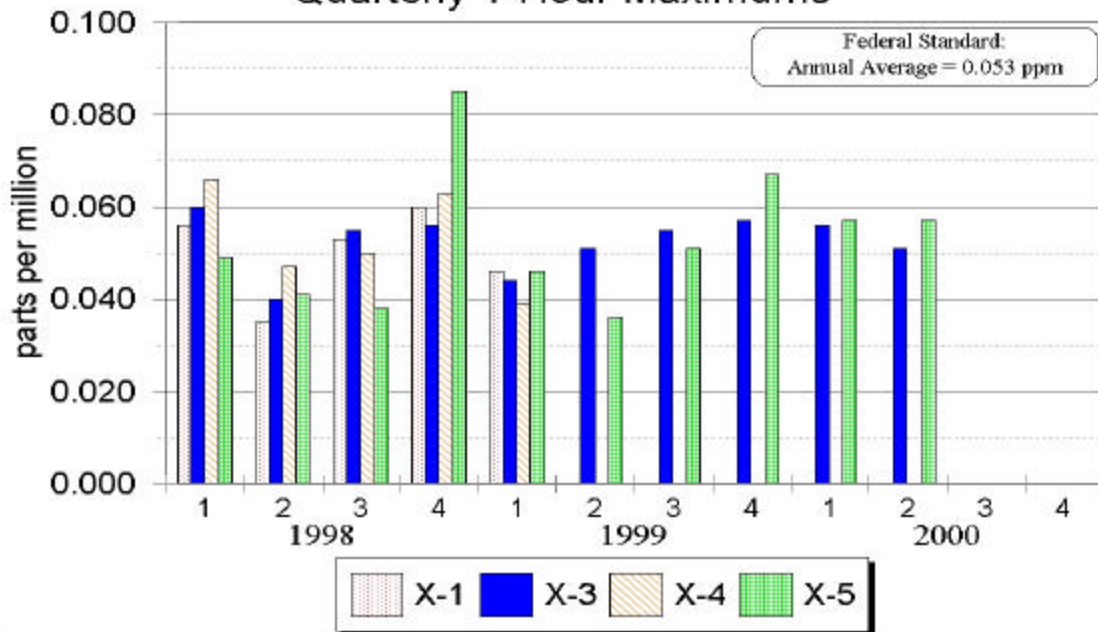
Nitrogen Dioxide (NO₂)

Quarterly Arithmetic Averages



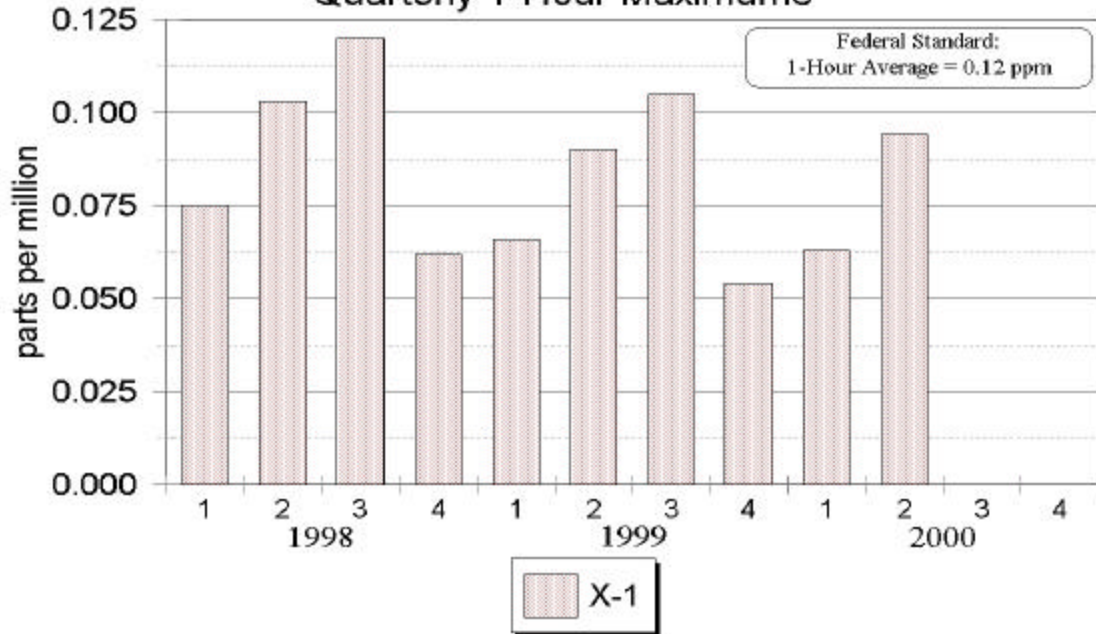
Nitrogen Dioxide (NO₂)

Quarterly 1-Hour Maximums



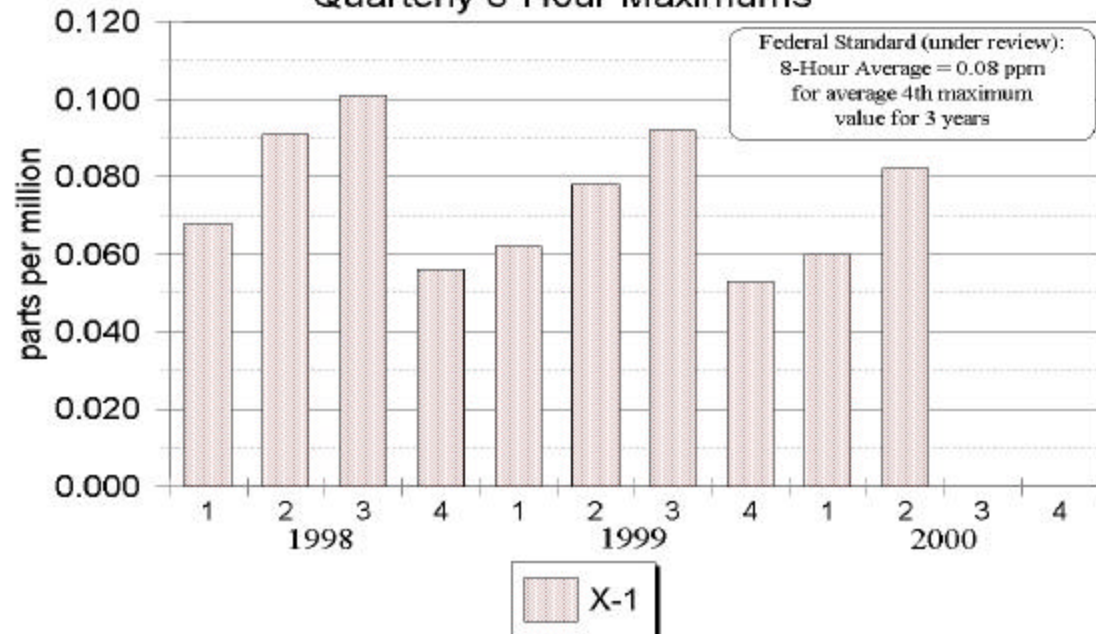
Ozone (O3)

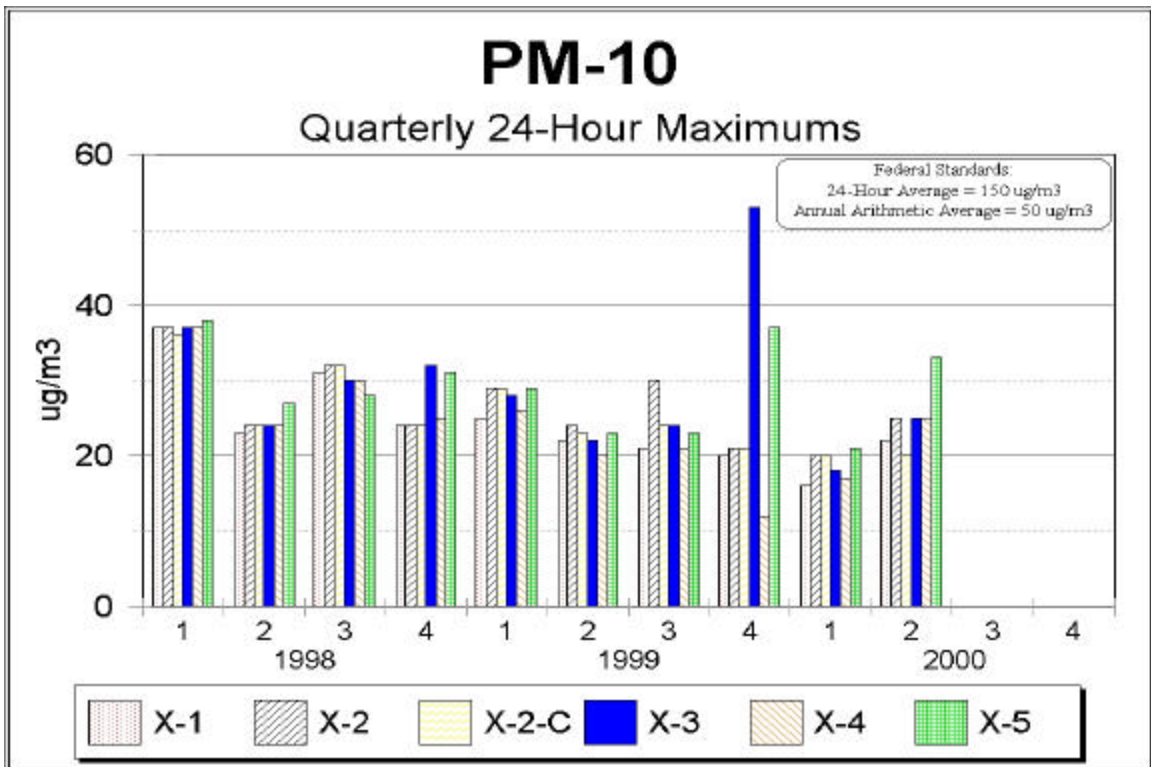
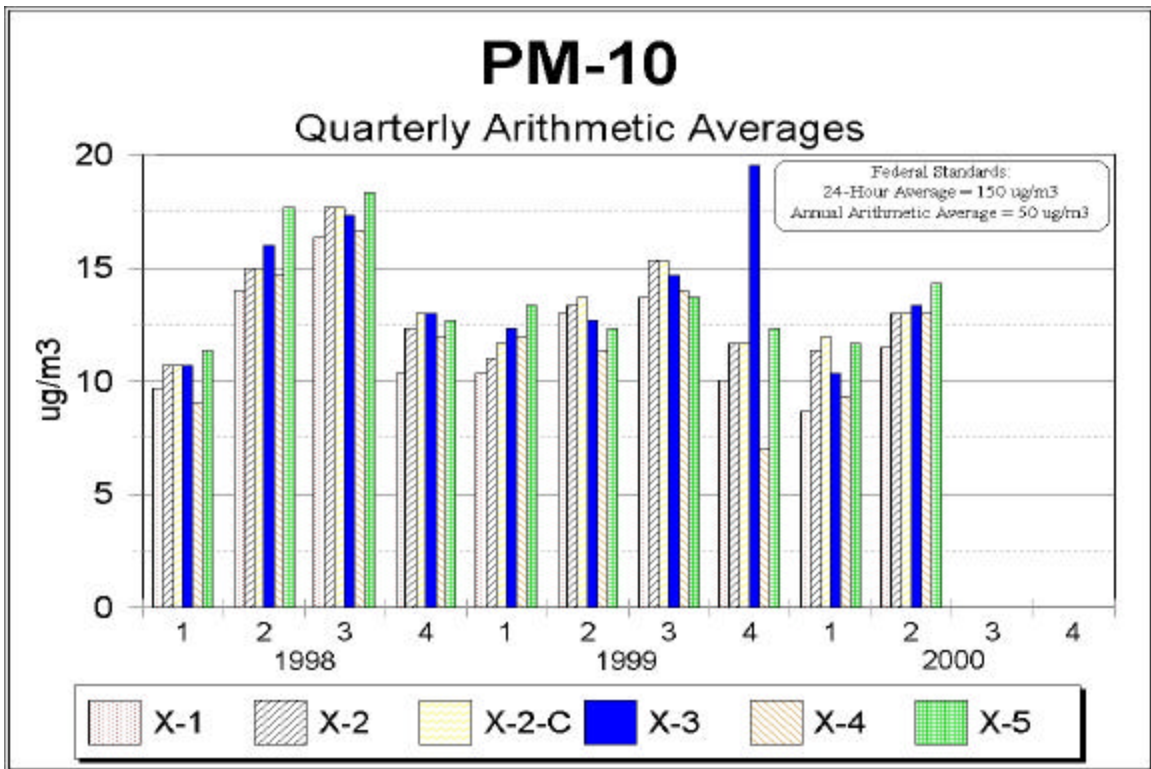
Quarterly 1-Hour Maximums

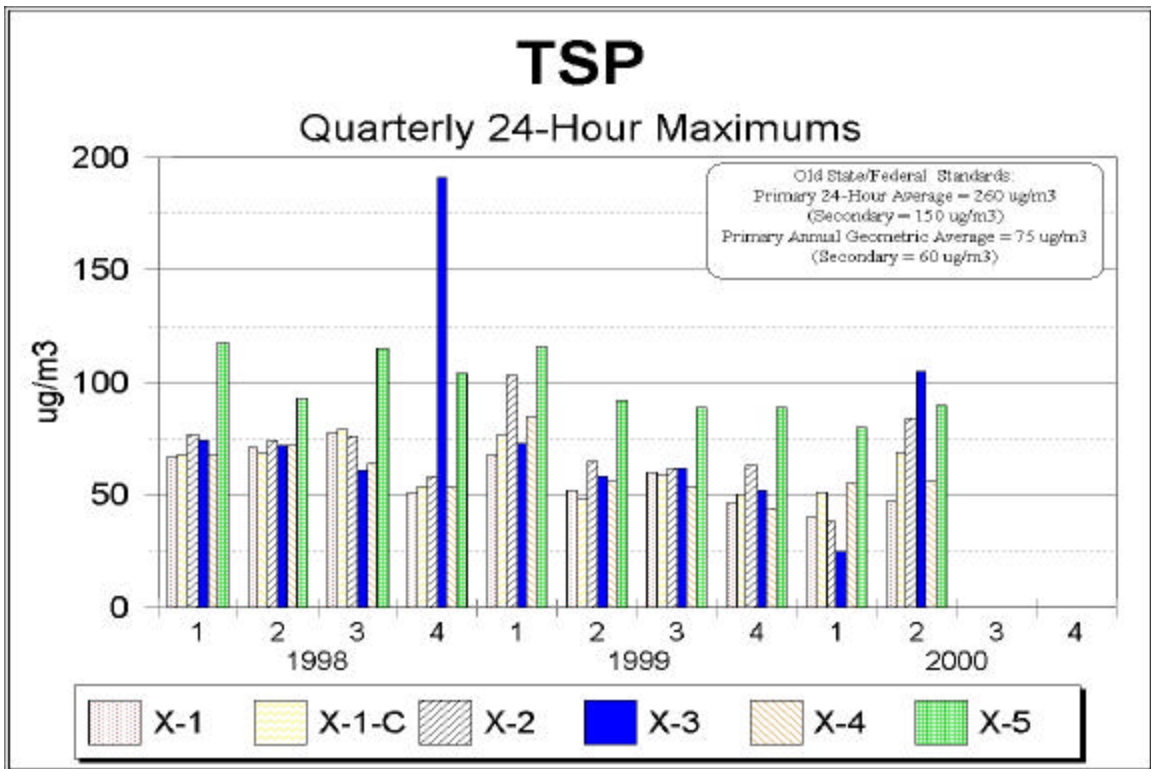
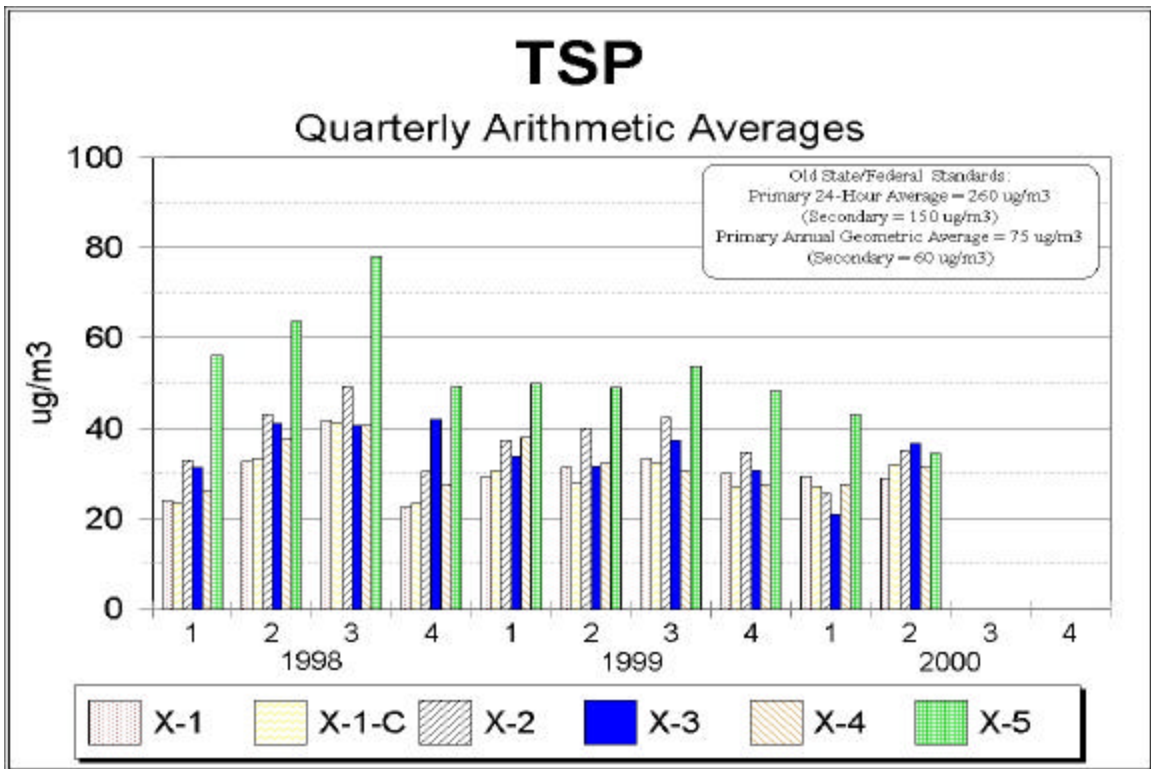


Ozone (O3)

Quarterly 8-Hour Maximums







Environmental Surveillance Report

**TABLE A: GROSS ALPHA AND GROSS BETA RADIOACTIVITY CONCENTRATIONS
IN SUSPENDED AIRBORNE PARTICULATE MATERIAL**

SECOND QUARTER 2000

Location		Sampler Type	Number of Samples	Gross Alpha			Gross Beta		
				Mean pCi/m ³	Max pCi/m ³	Min pCi/m ³	Mean pCi/m ³	Max pCi/m ³	Min pCi/m ³
GROUND LEVEL SAMPLERS									
Security area:	D-1	TSP	12	< 0.0046	0.0070	0.0017	0.0230	0.0346	0.0138
	D-3	TSP	12	< 0.0039	0.0062	0.0006	0.0215	0.0281	0.0128
Buffer zone:	D-9	TSP	6	< 0.0048	0.0079	0.0028	0.0242	0.0322	0.0189
	D-10	TSP	13	< 0.0043	0.0064	0.0026	0.0240	0.0347	0.0131
	D-13	TSP	13	< 0.0042	0.0083	0.0013	0.0223	0.0322	0.0115
	D-14	TSP	13	< 0.0043	0.0064	0.0002	0.0218	0.0346	0.0108
Perimeter:	D-6	TSP	10	0.0048	0.0075	0.0031	0.0224	0.0274	0.0154
	D-7	TSP	11	< 0.0045	0.0090	0.0023	0.0205	0.0292	0.0116
ELEVATED SAMPLERS									
Buffer zone:	E-1-T	TSP	11	0.0044	0.0066	0.0028	0.0204	0.0264	0.0126
	E-2-T	TSP	12	< 0.0040	0.0074	0.0016	0.0227	0.0300	0.0130
	E-1-P	PM10	9	< 0.0024	0.0046	0.0010	0.0133	0.0170	0.0066
	E-2-P	PM10	13	< 0.0030	0.0044	0.0010	0.0158	0.0210	0.0090
Perimeter:	E-3-T	TSP	10	< 0.0038	0.0072	0.0019	0.0209	0.0272	0.0130
	E-3-P	PM10	13	< 0.0021	0.0035	0.0009	< 0.0116	0.0137	0.0076
	E-4-T	TSP	12	< 0.0054	0.0125	0.0010	< 0.0247	0.0372	0.0139

pCi/m³ = Picocuries per cubic meter

TSP = Total Suspended Particulates
PM10 = Particulate Material < 10 microns in diameter

Environmental Surveillance Report

TABLE B: ALPHA SPECTROMETRIC ANALYSIS AND LONG-LIVED GROSS ALPHA RADIOACTIVITY
CONCENTRATIONS IN SUSPENDED AIRBORNE PARTICULATE MATERIAL

FOURTH QUARTER 1999 – SECOND QUARTER 2000

Location	Sampler Type	²³⁹⁺²⁴⁰ Pu pCi/m ³	²⁴¹ Am pCi/m ³	²³⁹⁺²⁴⁰ Pu / ²⁴¹ Am pCi/m ³	²³⁴ U / ²³⁸ U pCi/m ³	Long-Lived Gross Alpha pCi/m ³
D-1	TSP / Continuous					
D-3	TSP / Continuous					
D-6	TSP / Continuous					
D-7	TSP / Continuous					
D-13	TSP / Continuous					
E-1-T	TSP / Continuous					
E-1-P	PM10 / Continuous					
E-3-T	TSP / Continuous					
E-3-P	PM10 / Continuous					
E-4-T	TSP / Continuous					

DATA NOT YET AVAILABLE

pCi/m³ = Picocuries per cubic meter
TSP = Total Suspended Particulates
PM10 = Particulate Material < 10 microns in diameter
TSP – CL = Collocated Sampler – Total Suspended Particulates
PM10 – CL = Collocated Sampler - Particulate Material < 10 microns in diameter

Environmental Surveillance Report

TABLE D: INORGANIC GASEOUS COMPOUNDS IN AIR

SECOND QUARTER 2000

Compound	North Site (X-1) (Hourly values)			Southeast Site (X-3) (Hourly values)			West Site (X-5) (Hourly values)		
	Avg ppm	Max ppm	# Hours	Avg ppm	Max ppm	# Hours	Avg ppm	Max ppm	# Hours
	<u>APRIL 2000</u>								
Nitric Oxide (NO)	---	---	---	0.005	0.064	683	0.007	0.053	686
Nitrogen Dioxide (NO ₂)	---	---	---	0.009	0.051	683	0.008	0.032	686
Ozone (O ₃)	0.041	0.066	708	---	---	---	---	---	---
	<u>MAY 2000</u>								
Nitric Oxide (NO)	---	---	---	0.006	0.046	698	0.007	0.074	699
Nitrogen Dioxide (NO ₂)	---	---	---	0.009	0.035	698	0.008	0.056	699
Ozone (O ₃)	0.044	0.094	742	---	---	---	---	---	---
	<u>JUNE 2000</u>								
Nitric Oxide (NO)	---	---	---	0.006	0.032	687	0.007	0.036	683
Nitrogen Dioxide (NO ₂)	---	---	---	0.009	0.036	687	0.008	0.057	683
Ozone (O ₃)	0.046	0.090	718	---	---	---	---	---	---

ppm = Parts per million
N/A = Not available

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TABLE E: SUSPENDED PARTICULATE MATERIAL IN AIR

SECOND QUARTER 2000

Item	North Site (X-1) (Daily values)			Northeast Site (X-2) (Daily values)			Southeast Site (X-3) (Daily values)			South Site (X-4) (Daily values)			West Site (X-5) (Daily values)		
	Avg ug/m ³	Max ug/m ³	#	Avg ug/m ³	Max ug/m ³	#	Avg ug/m ³	Max ug/m ³	#	Avg ug/m ³	Max ug/m ³	#	Avg ug/m ³	Max ug/m ³	#
APRIL 2000															
TSP-P	26	33	3	28	46	4	28	40	4	29	45	4	28	31	3
PM10-P	N/A	N/A	0	10	14	4	11	15	5	11	14	5	7	14	3
TSP-CL	25	31	3												
PM10-CL				11	15	5									
MAY 2000															
TSP-P	32	47	3	36	63	5	44	105	5	34	56	5	19	19	1
PM10-P	8	13	3	13	18	5	13	21	5	12	18	5	16	24	5
TSP-CL	36	51	4												
PM10-CL				13	18	5									
JUNE 2000															
TSP-P	N/A	N/A	0	41	84	5	38	80	5	31	31	1	56	90	4
PM10-P	15	22	4	16	25	5	16	25	5	16	25	5	20	33	5
TSP-CL	35	69	4												
PM10-CL				15	20	5									

ug/m³ = Micrograms per cubic meter
N/A = Not available

TSP = Total Suspended Particulates (P = primary, CL = collocated)
PM10 = Particulate Matter < 10 microns in diameter (P = primary, CL = collocated)

Environmental Surveillance Report

TABLE F: METALS IN AIR

SECOND QUARTER 2000

Metal	North Site (X-1) (Quarterly composites) ug/m ³	Northeast Site (X-2) (Quarterly composites) ug/m ³	Southeast Site (X-3) (Quarterly composites) ug/m ³	South Site (X-4) (Quarterly composites) ug/m ³	West Site (X-5) (Quarterly composites) ug/m ³
Beryllium -- TSP-P					
Beryllium -- PM10-P					
Beryllium -- TSP-CL					
Beryllium -- PM10-CL					
Uranium -- TSP					
Uranium -- PM10					
Uranium -- TSP-CL					
Uranium -- PM10-CL					

DATA NOT YET AVAILABLE

ug/m³ = Micrograms per cubic meter

N/A = Not available

TSP = Total Suspended Particulates (P = primary, CL = collocated)

PM10 = Particulate Matter < 10 microns in diameter (P = primary, CL = collocated)

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TABLE G: VOLATILE ORGANIC COMPOUNDS IN AIR

SECOND QUARTER 2000

Compound	CAS #	TLV ppm	North site (X-1) (Daily averages)		Northeast site (X-2) (Daily averages)		Southeast site (X-3) (Daily averages)		South site (X-4) (Daily averages)		West site (X-5) (Daily averages)	
			Avg ppb	Max ppb	Avg ppb	Max ppb	Avg ppb	Max ppb	Avg ppb	Max ppb	Avg ppb	Max ppb
Freon 134a	811-97-2											
Freon 22	75-45-6	1000										
Freon 112	75-71-8	1000										
Chloromethane	74-87-3	50										
Freon 114	76-14-2	1000										
Vinyl chloride	75-01-4	5										
1,3-Butadiene	106-99-0	2										
Chloroethane	75-00-3	100										
Freon 123	306-83-2											
Freon 11	75-69-4	1000										
Vinylidene chloride	75-35-4	5										
Dichloromethane	75-09-2	50										
Freon 113	76-13-1	1000										
Methyl tert-butyl ether	1634-04-	40										
1,1-Dichloroethane	75-34-3	100										

DATA NOT YET AVAILABLE

ppb = Parts per billion
 ppm = Parts per million
 nd = Not detected

N/A = Not available
 TLV = ACGIH Threshold Limit Value
 CAS # = Chemical Abstracts Service number

Environmental Surveillance Report

TABLE G: VOLATILE ORGANIC COMPOUNDS IN AIR (continued)

SECOND QUARTER 2000

Compound	CAS #	TLV Ppm	North site (X-1) (Daily averages)		Northeast site (X-2) (Daily averages)		Southeast site (X-3) (Daily averages)		South site (X-4) (Daily averages)		West site (X-5) (Daily averages)	
			Avg ppb	Max ppb	Avg ppb	Max ppb	Avg ppb	Max ppb	Avg ppb	Max ppb	Avg ppb	Max Ppb
Chloroform	67-66-3	10										
1,2-Dichloroethane	107-06-2	10										
1,1,1-Trichloroethane	71-55-6	350										
Carbon tetrachloride	56-23-5	5										
Benzene	71-43-2	0.1										
Trichloroethene	79-01-6	50										
1,1,2-Trichloroethane	79-00-5	10										
Toluene	108-88-3	50										
Tetrachloroethene	127-18-4	25										
Chlorobenzene	108-90-7	10										
Ehtyl benzene	100-41-4	100										
m- + p-Xylene	N/A	100										
Styrene	100-42-5	50										
1,1,2,2-	79-34-5	1										
o-Xylene	95-47-6	100										

DATA NOT YET AVAILABLE

ppb = Parts per billion
 ppm = Parts per million
 nd = Not detected

N/A = Not available
 TLV = ACGIH Threshold Limit Value
 CAS # = Chemical Abstracts Service number

WATER RESULTS

Description of Precipitation and Surface Water Sampling Done This Quarter

Precipitation

Results for the 1st quarter 2000 samples are presented below. Results for the 2nd quarter 2000 samples will appear in the next report.

Results of Precipitation Sample Analysis

1st Quarter, 2000

LOCATION	239+240Pu pCi/L	241Am pCi/L	239+240Pu/241Am Ratio	234U/238U Ratio	Gross Alpha pCi/L	Gross Beta pCi/L	3H pCi/L
D-3 Precipitation	2.346 + 0.185	0.536 + 0.063	4.4 + 0.6	---	<4	8 + 4	<140
E-1 Precipitation	< 0.037	0.027 + 0.014	---	---	< 4	< 7	<140
E-3 Precipitation	< 0.013	< 0.014	---	---	< 4	< 7	<140
CDPHE	< 0.004	< 0.008	---	---	14 + 5	19 + 5	<140

Surface Water

For surface water, sampling for the 2nd quarter of 2000 was done as follows:

3 samples of the Sewage Treatment Plant Influent were collected, on 4/19/2000, 5/10/2000, and 6/22/2000. The results for the 6/22/2000 sample have been delayed, and are not presented in this report.

1 Sewage Treatment Plant Effluent sample was collected, on 5/1/2000;

1 pre-discharge sample was collected from Pond A-4 - on 5/22/2000;

2 pre-discharge samples were collected from Pond B-5 - on 4/10/2000 and 5/25/2000;

2 samples were collected from Walnut Creek at Indiana Street, on 5/03/2000 and 6/16/2000;

The results of these sampling events are shown in Table H (all but organic results) and Table I (organic results). In general, the results were all below levels of concern.

In addition to the above routine sampling, special nitrate sampling continued in the Walnut Creek drainage. A summary of the data that has been collected during this special study - from March 1999 through June 2000, is presented in Table J.

Notable Surface Water Results

None of the results presented in Table H. exceed water quality standards or are of immediate concern. Results for the most critical parameters - americium and plutonium, are presented along with historical values in the following graphs for the stations monitored this quarter (note that no Am or Pu analyses are performed by CDPHE for Indiana Street stations).

With respect to organic chemicals, Table I shows that there were only 3 chemicals detected this quarter - chloroform, pentachlorophenol and atrazine.

The measured level of atrazine was 0.1 ug/l - an order of magnitude lower than the water quality standard of 3 ug/l.

The pentachlorophenol result was below the level of quantitation, and the chloroform results were 3 orders of magnitude below the water quality standard of 100 ug/l for total trihalomethanes.

In relation to the special nitrate study, Table J shows that there were no instances where nitrate concentrations exceeded the temporary modification stream standard of 100 mg/l. However, there were several stations where nitrate concentrations equaled or exceeded the underlying nitrate standard of 10 mg/l - at GS13, the sewage treatment plant effluent (designated as SW023), Pond A3 and Pond B3.

There was only one station where the 85th percentile of all values exceeded the 10 mg/l standard - at GS13, which is downstream and in close proximity to the Solar Ponds Plume treatment system discharge. The RFETS is tracking the performance of this system closely.

In general, the nitrate sampling indicates that currently, the only significant sources of nitrate in the Walnut Creek drainage are the Sewage Treatment Plant (in South Walnut Creek) and the Solar Ponds Plume/Solar Ponds Plume Treatment System (in North Walnut Creek).

Also, concentrations at the most upstream station monitored in the North Walnut Creek - SW118, were negligible, with a median of 0.1 mg/l. While concentrations at the most upstream station in South Walnut Creek - GS10, were low, with a median of 2.4 mg/l, this may be an important factor in any system wide loading analysis for Walnut Creek, and may indicate some contribution from the southern lobe of the Solar Ponds Plume.

The sampling done in this study provides a fairly detailed and reliable baseline of information. There does not appear to be a need to continue the sampling at as many stations or as frequent as what has been done in the past. Still, in order to insure that no long term increase in concentrations is occurring, quarterly sampling will continue at a limited number of stations. This sampling will be described in more detail in the 2000/2001 Integrated Monitoring Plan.

Graphs of nitrate data are provided below for several stations - GS13, Pond A4, GS10, the STP effluent and Pond B5.

Graphs of Selected Surface Water Results

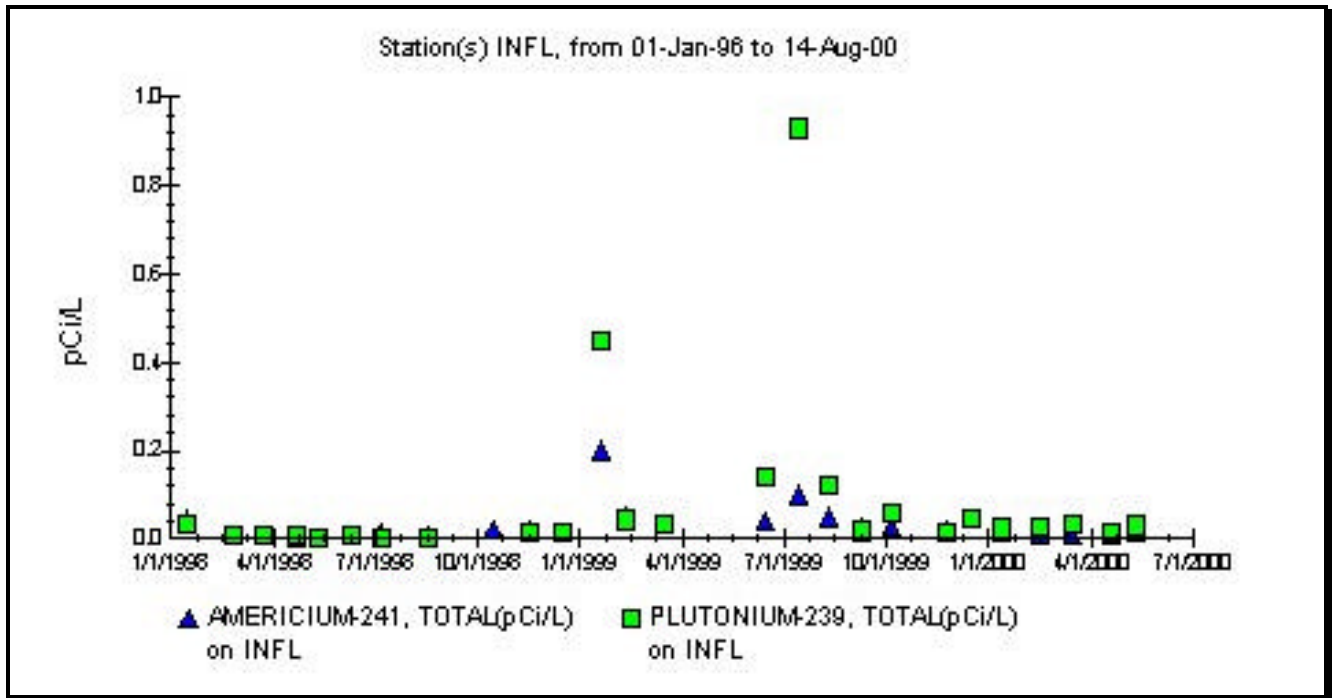


Figure SW1 - Am and Pu Concentrations in STP Influent

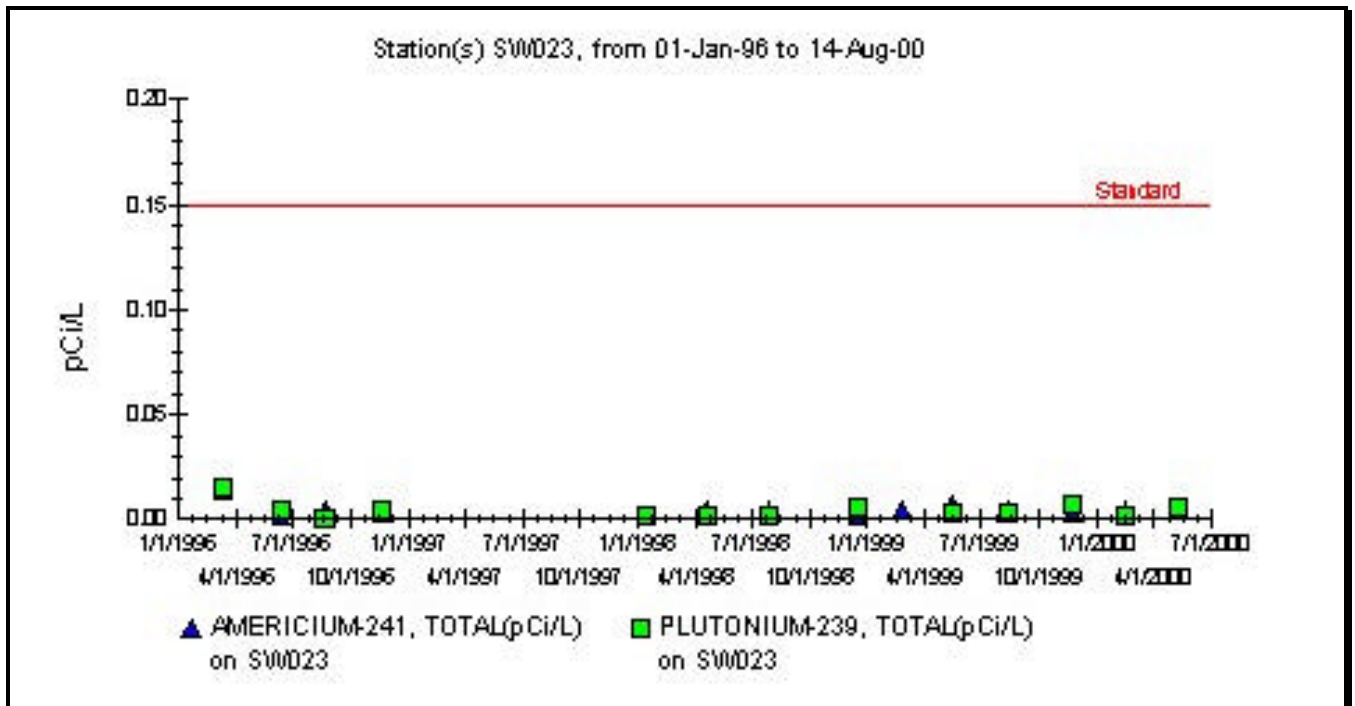


Figure SW2 - Am and Pu Concentrations in STP Effluent

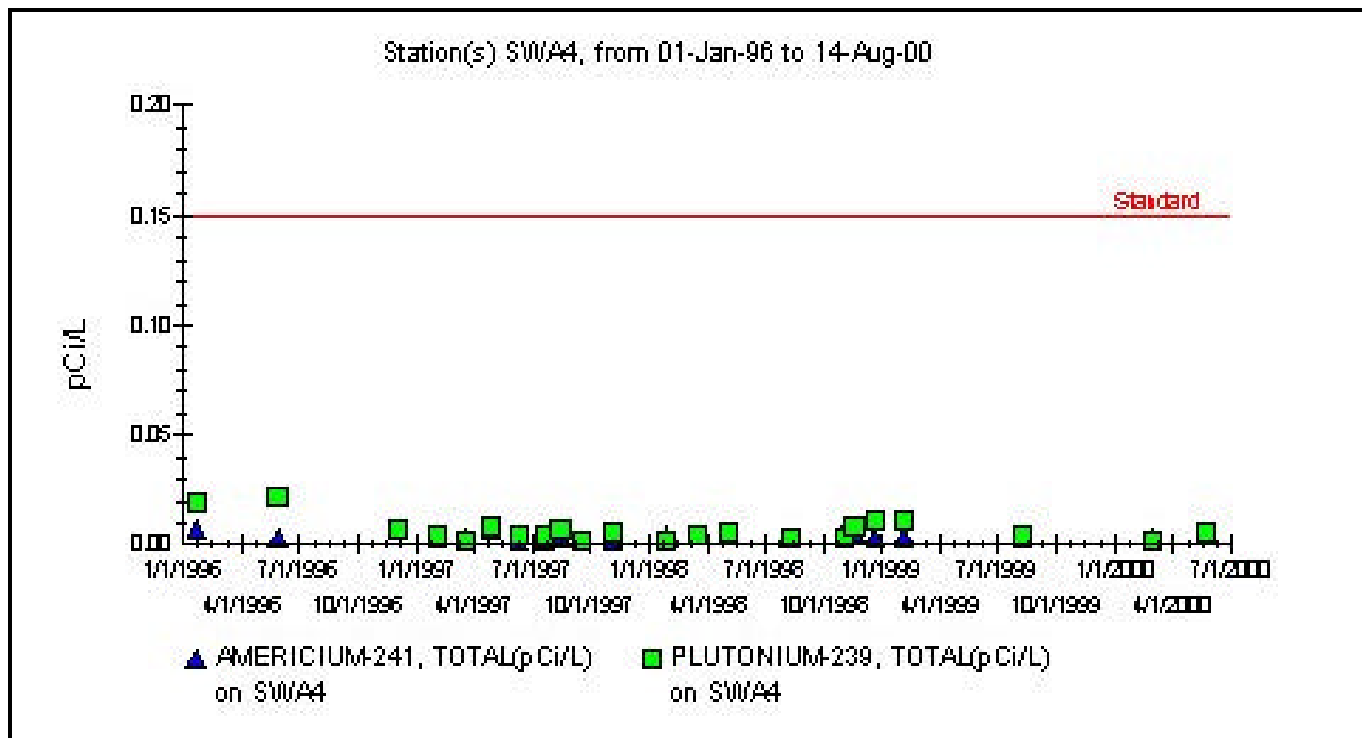


Figure SW3 - Am and Pu Concentrations in Pond A4

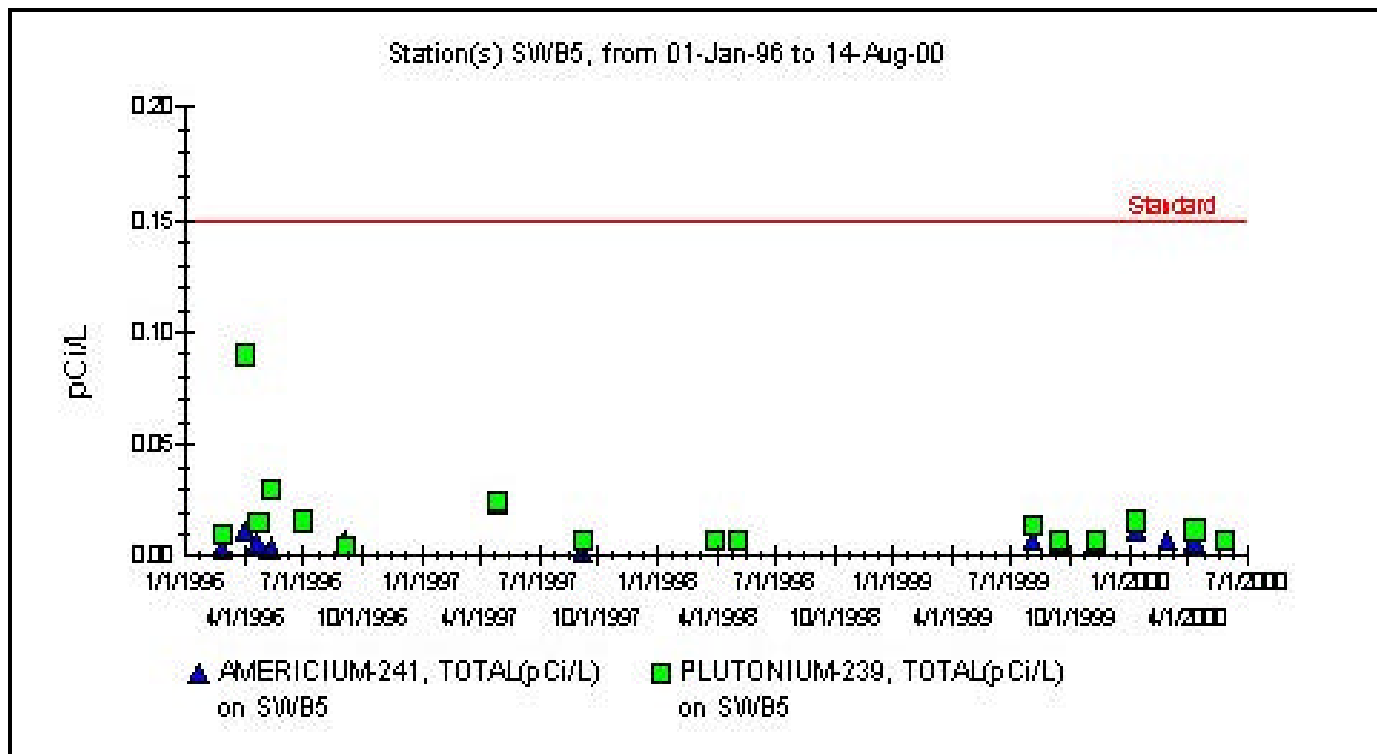
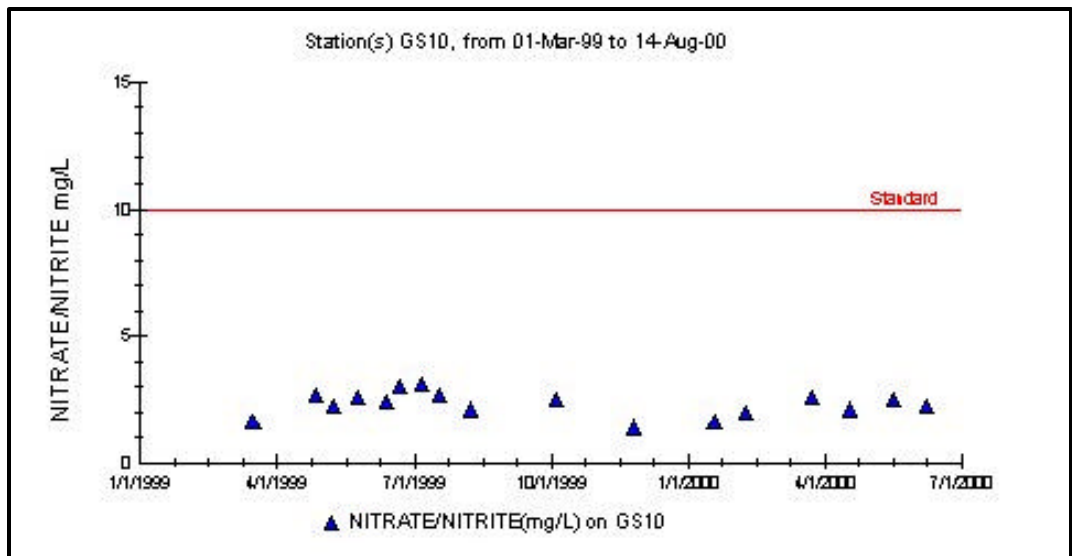
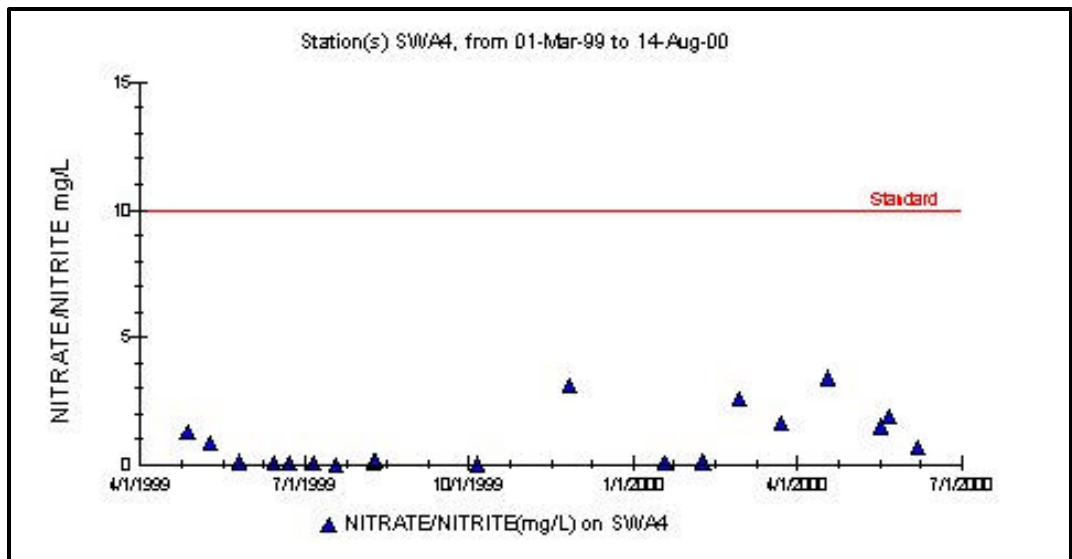
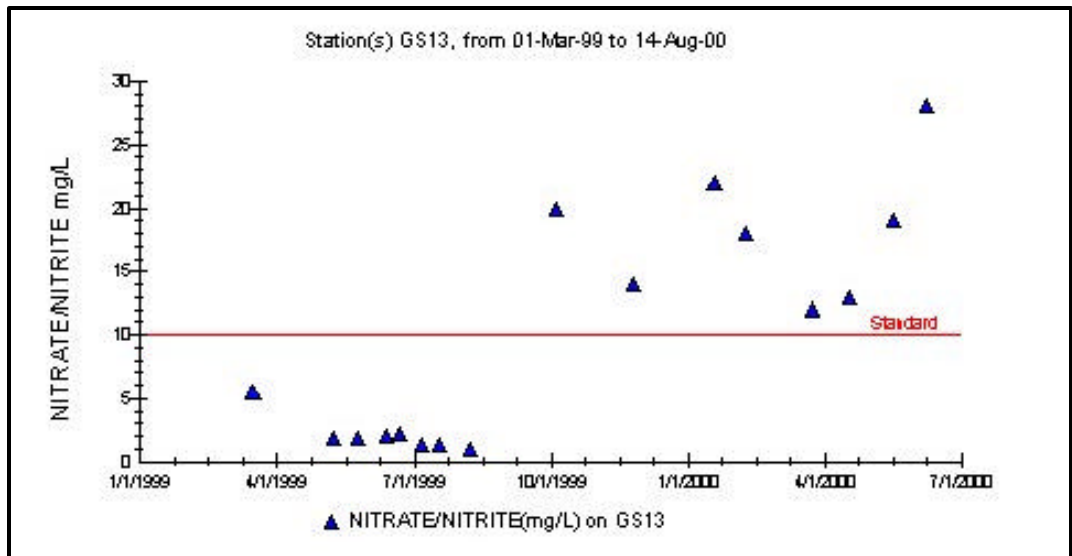
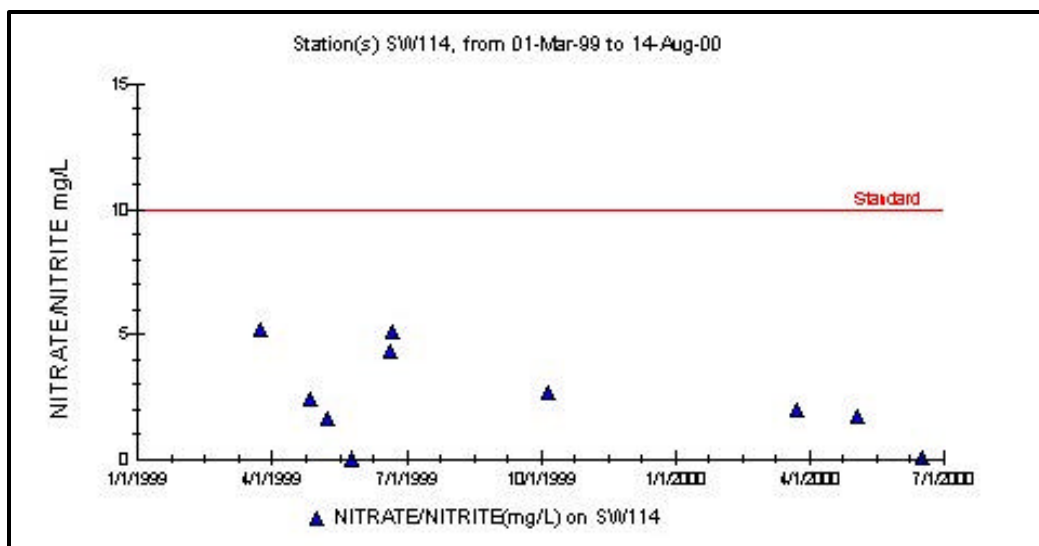
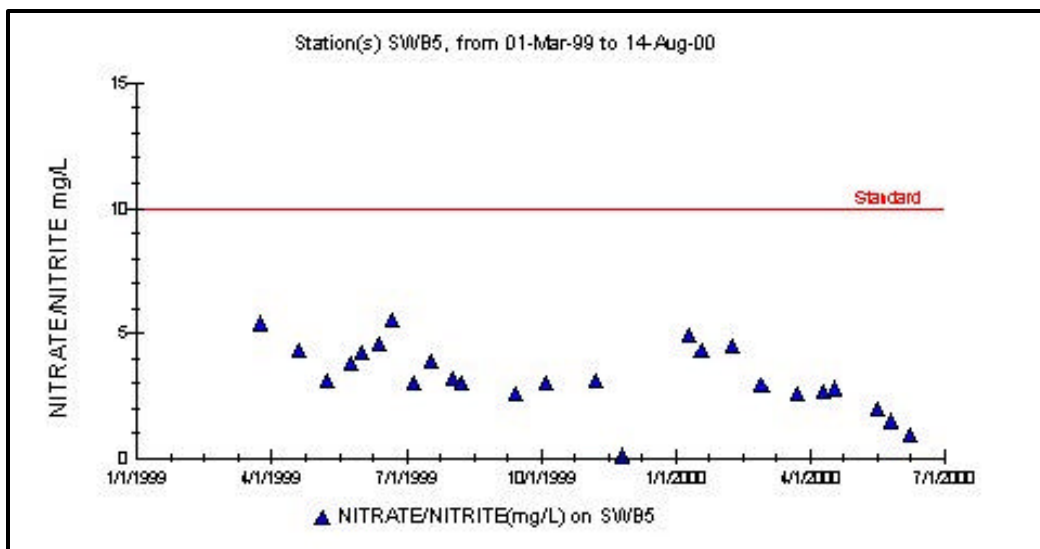
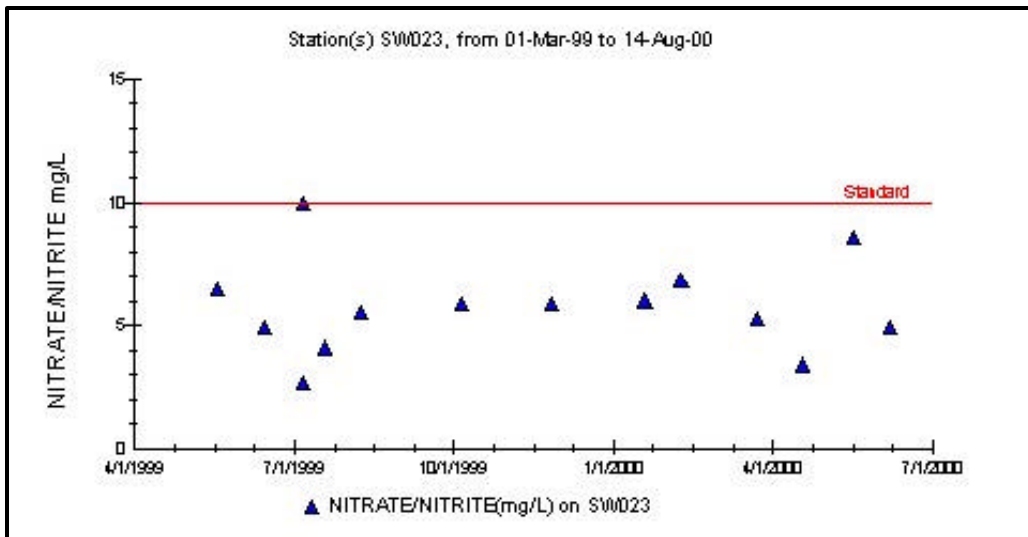


Figure SW4 - Am and Pu Concentrations in Pond B5



Figures SW5 - SW7 (Top to Bottom) - Nitrate Results



Figures SW8 - SW10 (Top to Bottom) - Nitrate Results
Notes - Station SW023 is the Sewage Treatment Plant Effluent
Station SW114 is Walnut Creek at Indiana (near Station GS03)

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
WALNUT CREEK AT IND.	05/03/00	AMMONIA, TOTAL	<	0.05	mg/L			
		BERYLLIUM, DISSOLVED	<	1	ug/L			
		CADMIUM, DISSOLVED	<	0.3	ug/L			
		CHLORIDE		310	mg/L			
		CHROMIUM, TOTAL	<	3	ug/L			
		CONDUCTIVITY, SPECIFIC		1370	umho			
		NITRATE/NITRITE		1.7	mg/L			
		NITRITE		0.17	mg/L			
		PH		9.11	SU			
		PHOSPHATE, ORTHO		0.54	mg/L			
		PHOSPHATE, TOTAL		0.98	mg/L			
		SILVER, DISSOLVED		0.4	ug/L			
		SOLIDS, DISSOLVED		760	mg/L			
		SOLIDS, TOTAL SUSPENDED		42	mg/L			
		TEMPERATURE		15.3	C			

H1

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter		Level	Units	1st	2nd	3rd
	06/16/00	AMMONIA, TOTAL	<	0.05	mg/l			
		BERYLLIUM, DISSOLVED	<	1	ug/l			
		CADMIUM, DISSOLVED	<	0.3	ug/l			
		CHLORIDE		440	mg/l			
		CHROMIUM, TOTAL	<	3	ug/l			
		CONDUCTIVITY, SPECIFIC		1560	umhos			
		NITRATE/NITRITE		0.16	mg/l			
		NITRITE		0.03	mg/l			
		PH		8.87	SU			
		PHOSPHATE, ORTHO		0.06	mg/l			
		PHOSPHATE, TOTAL		0.2	mg/l			
		SILVER, DISSOLVED		0.3	ug/l			
		SOLIDS, DISSOLVED		1020	mg/l			
		SOLIDS, TOTAL SUSPENDED		32	mg/l			
		TEMPERATURE		16.3	C			
POND B5	04/10/00	AMERICIUM-241, TOTAL		0.006 +/-	0.003 pCi/L			
		AMMONIA, TOTAL		1.2	mg/L			

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Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis		*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd
		ARSENIC, TOTAL		2	ug/L		
		BERYLLIUM, DISSOLVED	<	1	ug/L		
		CADMIUM, DISSOLVED	<	0.3	ug/L		
		CHLORIDE		410	mg/L		
		CHROMIUM, TOTAL	<	3	ug/L		
		CONDUCTIVITY, SPECIFIC		1620	umho		
		COPPER, DISSOLVED	<	4	ug/L		
		CYANIDE, DISTILLED	<	0.01	mg/L		
		GROSS ALPHA, TOTAL	<	7	pCi/L		
		GROSS BETA, TOTAL		10 +/-	6.000 pCi/L		
		IRON, RECOVERABLE		140	ug/L		
		MANGANESE, RECOVERABLE		120	ug/L		
		NITRATE/NITRITE		2.7	mg/L		
		NITRITE		0.35	mg/L		
		PH		8.49	SU		

H3

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
		PHOSPHATE, ORTHO	1.4	mg/L				
		PHOSPHATE, TOTAL	1.5	mg/L				
		PLUTONIUM-239, TOTAL	0.012 +/-	0.004 pCi/L				
		SELENIUM, DISSOLVED	1	ug/L				
		SILVER, DISSOLVED	<	0.2 ug/L				
		SOLIDS, DISSOLVED	900	mg/L				
		SOLIDS, TOTAL SUSPENDED	<	10 mg/L				
		SULFATE	37	mg/L				
		SULFIDE	<	0.2 mg/L				
		TEMPERATURE	13	C				
		TRITIUM, TOTAL	<	140 pCi/L				
		URANIUM, TOTAL	<	2 pCi/L				
	05/25/00	AMERICIUM-241, TOTAL	0.007 +/-	0.003 pCi/L				
		AMMONIA, TOTAL	<	0.05 mg/L				

H4

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis		*Analysis			
	Date	Parameter		Level	Units	1st	2nd	3rd
		ARSENIC, TOTAL		2	ug/L			
		BERYLLIUM, DISSOLVED	<	1	ug/L			
		CADMIUM, DISSOLVED	<	0.3	ug/L			
		CHLORIDE		190	mg/L			
		CHROMIUM, TOTAL	<	3	ug/L			
		CONDUCTIVITY, SPECIFIC		930	umho			
		COPPER, DISSOLVED	<	8	ug/L			
		CYANIDE, DISTILLED		0.02	mg/L			
		GROSS ALPHA, TOTAL	<	7	pCi/L			
		GROSS BETA, TOTAL		10 +/-	5.000 pCi/L			
		IRON, RECOVERABLE		61	ug/L			
		MANGANESE, RECOVERABLE		22	ug/L			
		NITRATE/NITRITE		1.5	mg/L			
		NITRITE		0.2	mg/L			
		PH		9.94	SU			

H5

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
		PHOSPHATE, ORTHO	0.25	mg/L				
		PHOSPHATE, TOTAL	0.45	mg/L				
		PLUTONIUM-239, TOTAL	0.008 +/-	0.003 pCi/L				
		SELENIUM, DISSOLVED	<	1 ug/L				
		SILVER, DISSOLVED	<	0.2 ug/L				
		SOLIDS, DISSOLVED	570	mg/L				
		SOLIDS, TOTAL SUSPENDED	18	mg/L				
		SULFATE	19	mg/L				
		SULFIDE	<	0.2 mg/L				
		TEMPERATURE	18.6	C				
		TRITIUM, TOTAL	<	140 pCi/L				
		URANIUM, TOTAL	3	pCi/L				

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
Influent to STP	04/19/00	AMERICIUM-241, TOTAL	0.012 +/-	0.005 pCi/L				
		ARSENIC, TOTAL	1	ug/L				
		BERYLLIUM, TOTAL	< 1	ug/L				
		CADMIUM, TOTAL	0.3	ug/L				
		CHROMIUM, TOTAL	< 3	ug/L				
		COPPER, TOTAL	32	ug/L				
		GROSS ALPHA, TOTAL	< 7	pCi/L				
		GROSS BETA, TOTAL	16 +/-	6.000 pCi/L				
		IRON, TOTAL	520	ug/L				
		MANGANESE, TOTAL	35	ug/L				
		PH	7.75	SU				
		PLUTONIUM-239, TOTAL	0.015 +/-	0.006 pCi/L				
		SELENIUM, TOTAL	1	ug/L				
		SILVER, TOTAL	1.4	ug/L				

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Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
		SOLIDS, TOTAL SUSPENDED	89	mg/L				
		TEMPERATURE	12	C				
		TRITIUM, TOTAL	<	140	pCi/L			
		URANIUM, TOTAL	3	pCi/L				
	05/10/00	AMERICIUM-241, TOTAL	0.014 +/-	0.005	pCi/L			
		ARSENIC, TOTAL	3	ug/L				
		BERYLLIUM, TOTAL	<	1	ug/L			
		CADMIUM, TOTAL	<	0.3	ug/L			
		CHROMIUM, TOTAL	<	3	ug/L			
		COPPER, TOTAL	30	ug/L				
		GROSS ALPHA, TOTAL	<	7	pCi/L			
		GROSS BETA, TOTAL	14 +/-	5.000	pCi/L			
		IRON, TOTAL	460	ug/L				
		MANGANESE, TOTAL	28	ug/L				

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Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
		PH	7.7	SU				
		PLUTONIUM-239, TOTAL	0.031 +/-	0.009 pCi/L				
		SELENIUM, TOTAL	1	ug/L				
		SILVER, TOTAL	0	ug/L				
		SOLIDS, TOTAL SUSPENDED	44	mg/L				
		TEMPERATURE	18	C				
		TRITIUM, TOTAL	<	140 pCi/L				
		URANIUM, TOTAL	<	2 pCi/L				
POND A4								
	05/22/00							
		AMERICIUM-241, TOTAL	0.005 +/-	0.002 pCi/L				
		AMMONIA, TOTAL	<	mg/L				
		ARSENIC, TOTAL	<	ug/L				
		BERYLLIUM, DISSOLVED	<	ug/L				

Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis		Units	*Analysis		
	Date	Parameter	Level			1st	2nd	3rd
		CADMIUM, DISSOLVED	<		ug/L			
		CHLORIDE			mg/L			
		CHROMIUM, TOTAL	<		ug/L			
		CONDUCTIVITY, SPECIFIC			umho			
		COPPER, DISSOLVED	<		ug/L			
		CYANIDE, DISTILLED	<		mg/L			
		GROSS ALPHA, TOTAL	<		pCi/L			
		GROSS BETA, TOTAL		9 +/-	6.000 pCi/L			
		IRON, RECOVERABLE			ug/L			
		MANGANESE, RECOVERABLE			ug/L			
		NITRATE/NITRITE			mg/L			
		NITRITE			mg/L			
		PH			SU			
		PHOSPHATE, ORTHO	<		mg/L			
		PHOSPHATE, TOTAL	<		mg/L			

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Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis		Units	*Analysis		
	Date	Parameter	Level			1st	2nd	3rd
		PLUTONIUM-239, TOTAL	0.006	+/-	0.003	pCi/L		
		SELENIUM, DISSOLVED				ug/L		
		SILVER, DISSOLVED	<			ug/L		
		SOLIDS, DISSOLVED				mg/L		
		SOLIDS, TOTAL SUSPENDED				mg/L		
		SULFATE	28			mg/L		
		SULFIDE	<	0.2		mg/L		
		TEMPERATURE	17.2			C		
		TRITIUM, TOTAL	<	140		pCi/L		
		URANIUM, TOTAL	3			pCi/L		
WWTF EFFLUENT								
	05/10/00	AMERICIUM-241, TOTAL	0.006	+/-	0.002	pCi/L		
		GROSS ALPHA, TOTAL	<	6		pCi/L		
		GROSS BETA, TOTAL	11	+/-	5.000	pCi/L		

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Environmental Surveillance Report
TABLE H - INORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Sample		Analysis			*Analysis		
	Date	Parameter	Level	Units	1st	2nd	3rd	
		PH	7	SU				
		PLUTONIUM-239, TOTAL	0.006 +/-	0.003 pCi/L				
		TEMPERATURE	16.8	C				
		TRITIUM, TOTAL	<	140 pCi/L				
		URANIUM, TOTAL	<	2 pCi/L				

Environmental Surveillance Report
TABLE I - ORGANIC ANALYSIS OF SURFACE WATER
SECOND QUARTER 2000

Location	Date	Method	Result	**Qualifiers**		
				1st	2nd	3rd
POND B5	04/10/00	Volatile Organic Compounds	CHLOROFORM	0.2	ug/L	
		Semivolatile Organic Compounds	PENTACHLOROPHENOL	0	ug/L	
POND B5	05/25/00	Volatile Organic Compounds	CHLOROFORM	0.2	ug/L	
		Semivolatile Organic Compounds	ATRAZINE	0.1	Ug/l	

Results Show Detects Only

B = found in blank

J = detected, but below Practical Quantitative Limit (value is estimated)

10/23/2000 Run Date

Environmental Surveillance Report
TABLE J – SUMMARY OF RESULTS OF
CDPHE SPECIAL NITRATE SAMPLING IN WALNUT CREEK DRAINAGE

Location	Number of Samples	Min Date	Max Date	Min Value	Max Value	Mean	15th Percentile	Median	85th Percentile
Ordered By Station Name									
GS10	17	3/17/99	6/7/00	1.4	3.1	2.3	1.8	2.4	2.7
GS13	16	3/17/99	6/7/00	1.0	28.0	10.2	1.5	8.8	19.8
GS33	3	4/28/99	5/26/99	0.0	3.0	1.0	0.0	0.1	2.1
GS34	7	3/25/99	3/23/00	0.1	5.4	2.9	1.6	2.9	5.3
GS35	2	5/10/99	5/26/99	0.1	0.1	0.1	0.1	0.1	0.1
SW022	2	4/28/99	5/10/99	0.2	2.0	1.1	0.5	1.1	1.7
SW023	14	5/18/99	6/7/00	2.7	10.0	5.8	4.1	5.7	6.9
SW091	1	4/28/99	4/28/99	0.4	0.4	0.4	0.4	0.4	0.4
SW093	17	3/17/99	6/7/00	0.5	1.5	0.9	0.6	0.9	1.2
SW114	8	3/25/99	3/23/00	0.0	5.2	2.9	1.6	2.6	5.1
SW118	14	3/17/99	5/17/00	0.0	0.4	0.1	0.0	0.1	0.2
SWA3	16	5/10/99	6/7/00	0.0	11.0	3.5	0.3	1.4	8.1
SWA4	18	4/27/99	6/7/00	0.0	3.4	0.9	0.1	0.1	2.1
SWB3	12	5/26/99	6/7/00	2.8	10.0	5.8	4.0	5.5	8.1
SWB4	17	3/25/99	6/7/00	2.6	9.3	5.1	3.6	4.9	7.1
SWB5	23	3/25/99	6/7/00	0.1	5.5	3.4	2.6	3.1	4.6
Ranked By 85th Percentile Value, In Descending Order									
GS13	16	3/17/99	6/7/00	1.0	28.0	10.2	1.5	8.8	19.8
SWB3	12	5/26/99	6/7/00	2.8	10.0	5.8	4.0	5.5	8.1
SWA3	16	5/10/99	6/7/00	0.0	11.0	3.5	0.3	1.4	8.1
SWB4	17	3/25/99	6/7/00	2.6	9.3	5.1	3.6	4.9	7.1
SW023	14	5/18/99	6/7/00	2.7	10.0	5.8	4.1	5.7	6.9
GS34	7	3/25/99	3/23/00	0.1	5.4	2.9	1.6	2.9	5.3
SW114	8	3/25/99	3/23/00	0.0	5.2	2.9	1.6	2.6	5.1
SWB5	23	3/25/99	6/7/00	0.1	5.5	3.4	2.6	3.1	4.6
GS10	17	3/17/99	6/7/00	1.4	3.1	2.3	1.8	2.4	2.7
GS33	3	4/28/99	5/26/99	0.0	3.0	1.0	0.0	0.1	2.1
SWA4	18	4/27/99	6/7/00	0.0	3.4	0.9	0.1	0.1	2.1
SW022	2	4/28/99	5/10/99	0.2	2.0	1.1	0.5	1.1	1.7
SW093	17	3/17/99	6/7/00	0.5	1.5	0.9	0.6	0.9	1.2
SW091	1	4/28/99	4/28/99	0.4	0.4	0.4	0.4	0.4	0.4
SW118	14	3/17/99	5/17/00	0.0	0.4	0.1	0.0	0.1	0.2
GS35	2	5/10/99	5/26/99	0.1	0.1	0.1	0.1	0.1	0.1
<i>Non-Detect multiplier of 0 Used.</i>									

Data shown in **BOLD** for stations where 85th percentile value exceeds nitrate underlying standard of 10 mg/l.

GLOSSARY

Am	Americium
APCD	Air Pollution Control Division
AQCC	Air quality control commission
B	Found in blank
Be	Beryllium
CAS	Chemical abstracts service number
CDPHE	Colorado Department of Public Health and Environment
EPA	Environmental Protection Agency
H	Exceeds holding time
J	Detected but below practical quantitative limit
LARS	Laboratory and Radiation Services
MCL	Maximum contaminant level (below MCL is safe)
MDL	Minimum detection level
Nd	Not detected
pCi/l	Picocuries per liter
PM	Particulate material
Ppb	Parts per billion
Ppm	Parts per million
PQL	Practical quantitative level
Pu	Plutonium
QNS	Quantity not sufficient
RFETS	Rocky Flats Environmental Technology Site
RFPU	Rocky Flats Program Unit
SVOC	Semivolatile organic compounds
TLV	ACGIH Threshold limit value
TSP	Total Suspended Particulate
TSS	Total suspended solids
ug/m ³	Micrograms per cubic meter
U	Uranium
VOCs	Volatile organic compounds
WQCC	Water Quality Control Commission
WQCD	Water Quality Control Division