United States Department of Energy

Savannah River Site

Annual Corrective Action Report for the F-Area Hazardous Waste Management Facility, the H-Area Hazardous Waste Management Facility, and the Mixed Waste Management Facility (U)

SRNS-RP-2012-00045

Volume I

April 2012

Prepared By:
Savannah River Nuclear Solutions, LLC
Savannah River Company
Aiken, SC 29808

Prepared for the U. S. Department of Energy under Contract No. DE-AC09-08SR22470

DISCLAIMER

This document was prepared in conjunction with work accomplished under Contract No. DE-AC09-08SR22470 with the U.S. Department of Energy.

This work was prepared under an agreement with and funded by the U.S. Government. Neither the U.S. Government or its employees, nor any of its contractors, subcontractors or their employees, makes any express or implied: 1. warranty or assumes any legal liability for the accuracy, completeness, or for the use or results of such use of any information, product, or process disclosed; or 2. representation that such use or results of such use would not infringe privately owned rights; or 3. endorsement or recommendation of any specifically identified commercial product, process, or service. Any views and opinions of authors expressed in this work do not necessarily state or reflect those of the United States Government, or its contractors, or subcontractor.

Printed in the United States of America

Prepared for
U. S. Department of Energy
and
Savannah River Nuclear Solutions, LLC
Aiken, South Carolina

EXECUTIVE SUMMARY

This Corrective Action Report (CAR) has been prepared to support the regulatory reporting requirements for the F-Area Hazardous Waste Management Facility (HWMF), the H-Area HWMF, and the Mixed Waste Management Facility (MWMF) at the Savannah River Site (SRS). The reporting requirements are defined by the Office of Environmental Quality Control Bureau of Land and Waste Management Hazardous and Mixed Waste Permit (SC1 890 008 989), dated September 30, 2003, hereafter referred to as the "Permit" and by Section C of the Underground Injection Control (UIC) Permit Application, as well as other information by agreement with the South Carolina Department of Health and Environmental Control (SCDHEC). In accordance with the Permit, an Annual CAR will be submitted on or before April 30 of each year and will document the effectiveness of the Corrective Action Program for the F-Area HWMF, the H-Area HWMF, and the MWMF for the period of January 1 through December 31 (First, Second, Third and Fourth Quarters).

F-Area HWMF and H-Area HWMF

The well network for the F-Area HWMF and the H-Area HWMF monitors the Upper Aquifer Zone (UAZ) and the Lower Aquifer Zone (LAZ) of the Upper Three Runs Aquifer (UTRA), and the Gordon Aquifer (GA) in the uppermost aquifer system beneath the facility. Groundwater sampling and surface water sampling, analysis, and other monitoring requirements are conducted as required by the Permit.

The scheduled sampling was completed successfully for all wells, except for the following wells FSB 129D (all 2011) and FSL 4D (1Q, 2Q, and 4Q) because they were dry. Overall, there were no changes in groundwater flow direction or velocity from previous years except for changes associated with the installation of the groundwater barrier walls (see Section 5 for further discussion). Compliance monitoring data revealed that organic, inorganic, and radionuclide constituents exceeded the Groundwater

Protection Standard (GWPS). At the wetlands of Fourmile Branch (FMB) groundwater exceeded the GWPS for cadmium, cobalt, nitrate, carbon-14, iodine-129, strontium-90, gross alpha, nonvolatile beta, radium, uranium-238, and tritium. Surface water sampling within the FMB Watershed revealed that iodine-129 (two locations), carbon-14 (one location), and tritium exceeded the GWPS in FMB.

During 2011, no new constituents were added to the GWPS based on detection monitoring results.

The current Corrective Actions for the F-Area HWMF include an engineered groundwater barrier system with gates, a base injection system for treatment within the gates and at the wetlands and placement of silver chloride within the middle gate for in-situ treatment of iodine-129. The F-Area base injection treatment was effective all year although in the wetlands additional base was injected over approximately 2 months. Approximately 1.1 million gallons of base solution were injected during this reporting period for treatment of groundwater beneath the wetlands. The Remedial Action for the H-Area HWMF currently consists of engineered barrier walls (without gates) and a base injection system, which began initial operation in 2010. The H-Area base injection system operated for 12 months, injecting approximately 8.1 million gallons during 2011. At F-Area SRS completed construction of an extension to the barrier system. The new barrier extends 1,150 feet to the east and contains a gate with five base injection wells. SRS also deployed a technology for the in-situ treatment of iodine-129 using injectable ultra-fine silver chloride particles. Approximately 77,000 gallons of silver chloride mixed with domestic water were injected. Although preliminary, initial monitoring results indicate up to a 70 percent reduction in iodine-129.

During 2011, at H-Area the average flux of tritium to FMB was similar to measurements from 2010. Since the baseline was established in 2000, the flux of tritium at the H-Area HWMF has been attenuated by approximately 77 percent (56 Ci/yr in 2011). At the F-Area HWMF, in 2011 the flux (117 Ci/yr) returned to normal levels after being elevated

in 2010 (240 Ci/yr). SRS believes that the extensive base injection treatment at the wetlands of F-Area during 2009 and 2010 caused the temporary increase in tritium flux to FMB. Based on current tritium measurements, since 2000, the flux in F-Area has been reduced by up to 80 percent.

MWMF

The well network for the MWMF monitors the UAZ and LAZ of the UTRA and the GA in the uppermost aquifer system beneath the facility. In addition, the MWMF is divided into the following four plume areas: Southwest Plume (SWP), Northwest Plume (NWP), Northeast Plume (NEP), and Southeast Plume (SEP). Groundwater and surface water sampling, analysis, and other monitoring requirements at the SWP are conducted as required by the Permit. The NWP, NEP, and SEP remain in Interim Status. Therefore, the constituents for these plumes are not addressed in the Permit but are identified in the most recent revision of the 2000 RCRA Part B Renewal Application.

During 2011, fifteen (15) wells were dry and therefore were not sampled. There were no changes in groundwater flow direction from previous years and groundwater velocities remained consistent with previous observations. In 2011, seventeen (17) constituents exceeded the GWPS within the four plume areas. These exceedances included fourteen (14) constituents in the SWP, nine (9) constituents in the SEP, nine (9) constituents in the NEP, and six (6) constituents in the NWP.

Detection monitoring (Appendix IX and Comprehensive Radiological Monitoring List (CRML)) indicated that two (2) constituents not on the current GWPS (endrin and 1,2 dichlorobenzene) were detected in selected POC wells. Neither of the detections were confirmed by follow-on sampling and analysis performed by SRS.

The corrective action for the SWP consists of the MWMF Phytoremediation System. In 2011, approximately 12.4-million gallons (46.9-million liters) of tritiated water were irrigated on the plots and sprayed over the collection pond. Operation of the

phytoremediation system prevented approximately 177 Ci of tritium from reaching FMB. The tritium concentrations in FMB have remained low since the valve was closed (2000) at the collection pond, except during 2006, when the valve was opened to drain the pond for system maintenance. The average evapotranspirative efficiency of the irrigation system during 2011 was approximately 84 to 93 percent. The efficiency varies over the seasons and is least efficient during the winter months when evapotranspiration rates are low. To maximize the efficiency of the remedial action, the collection pond must be maintained at a low level, thus necessitating adequate irrigation acreage to maintain irrigation during the winter months.

SRS has completed a 24-acre expansion to the east of the existing phytoremediation area. The expansion was completed during January 2011 and was used for irrigation during 2011. In addition, SRS has received approval for and is in the process of implementing an expansion of the irrigation system to the west of the pond (western expansion) in order to further improve the capture effectiveness of the pond. SRS believes the combined irrigation capacity will help keep pond levels low year round (especially during winter months).

Recent additions to irrigation capacity in the eastern and western expansions will help to maximize contaminant flux reductions to FMB, caused by water overflowing the dam and bypassing in the subsurface. SRS plans to continue operation of the system with greater irrigation capacity into the winter months using the two expansion areas. The overall objective is to maintain as low a level as possible in the irrigation pond throughout the year to maximize the volume of water going to the pond from the UAZ and LAZ.

Source control from the completed installation of a low permeability cap at the Old Radioactive Waste Burial Ground (ORWGB) is expected to moderate the contamination concentration within the SWP, the SEP, and the NWP. Contaminant concentrations in the NEP may be affected as well.

TABLE OF CONTENTS

SECTION PAGE NO.

EXECUTIVE SUMMARY ES-1

LIST OF FIGURES v

LIST OF TABLES vi

LIST OF ACRONYMS AND ABBREVIATIONS vii

1.0 INTRODUCTION 1

1.1 Purpose and Scope 1

2.0 MONITORING/REPORTING REQUIREMENTS 4

2.1 F-Area HWMF and H-Area HWMF/Monitoring/Reporting Requirements 4
2.2 MWMF Monitoring/Reporting Requirements 4

3.0 COMPLIANCE MONITORING 6

3.1 Water Quality and Elevation Data (IVB.B.11.c.i, IVC.B.11.c.i, and IVD.B.10.b.i) 6
3.2 Hydrographs (IVB.B.11.c.ii, IVC.B.11.c.ii, and IVD.B.10.b.ii) 6
3.3 Time Series Plots (IVB.B.11.c.iii, IVC.B.11.c.iii, and IVD.B.10.b.iii) 7
3.4 Isoconcentration Maps (IVB.B.11.c.iv, IVC.B.11.c.iv, and IVD.B.10.b.iv) 7
3.5 Potentiometric Maps (IVB.B.11.c.v, IVC.B.11.c.v, and IVD.B.10.b.v) 8
3.6 Isoconcentration Cross Sections (IVB.B11.c.vi, IVC,B.11.c.vi, and IVD.B.10.b.vi) 10
3.7 Determination and Extent of Severity of Groundwater Contamination (IVB.B.11.c.viii, IVC.B.11.c.viii, and IVD.B.10.b.vii) 11
3.8 Statistical Evaluation for Changes in Groundwater Elevations and Change in pH for F-Area HWMF and H-Area HWMF 19
3.9 Rainfall (IVB.B.11.b.viii, IVC.B.11.b.viii, and IVD.B.10.b.viii) 22

4.0 DETECTION MONITORING 25

4.1 F-Area HWMF Appendix IX 25
4.2 H-Area HWMF Appendix IX 25
4.3 MWMF Appendix IX 26

5.0 CORRECTIVE ACTION EFFECTIVENESS MONITORING 27

5.1 F-Area HWMF Corrective Action Program 27
5.2 H-Area HWMF Corrective Action Program 40
5.3 Description of the MWMF Corrective Action Program 46

Table of Contents
(Cont'd)

6.0 CONCLUSION 65

6.1 F-Area HWMF and H-Area HWMF.....65
6.2 MWMF 66

7.0 APPENDICES 68

LIST OF FIGURES

FIGURE 1. RAINFALL FOR 2011 24
FIGURE 2. BASE INJECTION LAYOUT 30
FIGURE 3 F-AREA HWMF SILVER CHLORIDE INJECTION LAYOUT 37
FIGURE 4. REDUCTION OF IODINE-129 AT WELL FIT 14 FROM INJECTION OF SILVER CHLORIDE SOLUTION 38
FIGURE 5. MWMF GENERAL MERCURY ATTENUATION CURVES (UAZ AND LAZ) 48
FIGURE 6. MWMF SOUTHEAST PLUME AREA (UAZ/LAZ-UTRA) TRITIUM CONCENTRATIONS PRE-INJECTIONS 51
FIGURE 7 MWMF SOUTHEAST PLUME AREA (UAZ/LAZ-UTRA) TRITIUM CONCENTRATIONS POST INJECTION SHUT-OFF 52
FIGURE 8. TRITIUM DECAY IN THE LAZ OF THE SOUTHEAST PLUME AREA AND THE H-AREA HWMF 53
FIGURE 9. MWMF SW PLUME 1,4-DIOXANE CONCENTRATIONS IN THE UAZ 59
FIGURE 10. MWMF SW PLUME 1,4-DIOXANE CONCENTRATIONS IN THE LAZ 60
FIGURE 11. TRITIUM CONCENTRATIONS IN FOURMILE BRANCH 64

LIST OF TABLES

TABLE 1. HORIZONTAL GROUNDWATER VELOCITIES IN THE HYDROSTRATIGRAPHIC UNITS BENEATH THE F-AREA HWMF 9
TABLE 2. HORIZONTAL GROUNDWATER VELOCITIES IN THE HYDROSTRATIGRAPHIC UNITS BENEATH THE H-AREA HWMF....9
TABLE 3. HORIZONTAL GROUNDWATER VELOCITIES IN THE HYDROSTRATIGRAPHIC UNITS BENEATH THE MWMF....10
TABLE 4. RAINFALL FOR 2011 22
TABLE 5. F-AREA BASE INJECTION FLOW RATE 2011 31
TABLE 6. F-AREA HWMF BASE INJECTION CAMPAIGNS VOLUMES INJECTED 34
TABLE 7. F-AREA HWMF ANNUAL TRITIUM FLUX TO FOURMILE BRANCH 39
TABLE 8. H-AREA BASE INJECTION FLOW RATE 2011 43
TABLE 9. H-AREA HWMF ANNUAL TRITIUM FLUX TO FOURMILE BRANCH....44
TABLE 10. PHYTOREMEDIATION IRRIGATION RATES AND TRITIUM CONCENTRATIONS FOR 2011....54

LIST OF ACRONYMS AND ABBREVIATIONS

ACL/MZ	Alternative Concentration Limit/Mixing Zone
CAP	Corrective Action Plan
CAR	Corrective Action Report
Ci	curie
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRML	Comprehensive Radiological Monitoring List
ED	Engineered Ditch
EQL	estimated quantitation limit
FMB	Four Mile Branch
ft	foot
gal	gallon
GA	Gordon Aquifer
GSA	General Separations Area
gpm	gallon per minute
GSACU	General Separations Area Consolidation Unit
GWPS	Groundwater Protection Standard
hr	hour
HWMF	Hazardous Waste Management Facility
L	liter
LAZ	Lower Aquifer Zone
MCL	maximum contamination limit
µg	microgram
mL	milliliter
MWMF	Mixed Waste Management Facility
MZ	mixing zone
NEP	Northeast Plume
NOD	Notice of Deficiency
NWP	Northwest Plume
OFED	Old F-Area Effluent Ditch
ORWBG	Old Radioactive Waste Burial Ground
OU	Operable Unit
PCE	tetrachloroethylene
pCi	picocurie
POC	point of compliance

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

PWMS	Purge Water Management System
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SEP	Southeast Plume
SREL	Savannah River Ecology Lab
SRNL	Savannah River National Laboratory
SRNS	Savannah River Nuclear Solutions
SRS	Savannah River Site
SWP	Southwest Plume
TCCZ	tan clay confining zone
TCE	trichloroethylene
UAZ	Upper Aquifer Zone
UIC	Underground Injection Control
USDOE	United States Department of Energy
UTRA	Upper Three Runs Aquifer
VOC	volatile organic compound
WTU	Wastewater Treatment Unit
yr	year

1.0 INTRODUCTION

1.1 Purpose and Scope

This Corrective Action Report (CAR) has been prepared to support the regulatory reporting requirements for the F-Area Hazardous Waste Management Facility (HWMF), the H-Area HWMF, and the Mixed Waste Management Facility (MWMF) at the Savannah River Site (SRS). The reporting requirements are defined by the Office of Environmental Quality Control Bureau of Land and Waste Management Hazardous and Mixed Waste Permit (SC1 890 008 989), dated September 30, 2003, hereafter referred to as the "Permit" and by Section C of the Underground Injection Control (UIC) Permit Application, as well as other information by agreement with the South Carolina Department of Health and Environmental Control (SCDHEC). In accordance with the Permit, an annual report will be submitted on or before April 30 of each year and will document the effectiveness of the Corrective Action Program for the F-Area HWMF, the H-Area HWMF, and the MWMF for the period of January 1 through December 31 (First, Second, Third and Fourth Quarters).

1.1.1 F-Area and H-Area HWMFs Regulatory Background

The F- and H-Area Seepage Basins Groundwater Operable Units (OUs) consist of the groundwater impacted by operations of the F- and H-Area HWMFs. Each area has an extensive monitoring well network that is sampled for a variety of chemical and radioactive contaminants. Groundwater monitoring results have indicated the major contaminants are metals, radionuclides, and nitrates at both areas. In addition, investigations performed at the F-Area HWMF and to a lesser extent the H-Area HWMF, revealed the presence of acid contamination in the subsurface, which increases mobility of metals.

The remedial action for the F-Area HWMF and H-Area HWMF consists of engineered underground barrier walls and base injection. These technologies are targeted to address both stream/seepline and groundwater contamination, and replaced the pump-treat-reinjection systems for both areas. Installation of the engineered barriers at the F-Area HWMF and the H-Area HWMF was completed September 13, 2004 and December 16, 2004, respectively. An extension to the F-Area barrier system was constructed in 2011.

In 2011, an Underground Injection Control Permit was approved to deploy a technology for the treatment of iodine in situ at the F-Area HWMF. A solution containing finely ground silver chloride particles and domestic water was successfully placed into the subsurface using injection wells. Approximately 77,000 gallons were injected over two months. This study is discussed in Section 5.1 and is designed to test the capture potential for radioactive iodine.

1.1.2 MWMF Regulatory Background

An extensive monitoring well network measures groundwater quality beneath the MWMF. The MWMF is divided into the following four plume areas: Southwest Plume (SWP), Northwest Plume (NWP), Northeast Plume (NEP), and Southeast Plume (SEP). During 2011, the SEP, NWP, and NEP were in Interim Status. Therefore, monitoring of these three plumes was performed as proposed in the most recent revision of the 2000 Part B Renewal Application.

The SWP discharges tritium-contaminated groundwater into a small tributary that feeds Fourmile Branch (FMB). Groundwater monitoring results revealed that tritium concentrations from these seeps exceed the Groundwater Protection Standards (GWPS).

The remedial action for the SWP involves phytoremediation. The remedial action consists of the following three major components: 1) construction of a small sheet pile dam over the portion of the seeps with the highest tritium concentration; 2) collection of contaminated groundwater behind the dam in a surface pond; and 3) pumping of the seep

water from the surface pond to an irrigation system that distributes the water to a mixed pine/hardwood forest and to an engineered pine forest referred to as the Eastern Expansion Area. The irrigation process is located over the plume area and causes direct evaporation of water containing contaminants (tritium and low concentrations of volatile organic compounds), oxidation of organics, and uptake of water into trees for transpiration to the atmosphere. Dose modeling indicates atmospheric levels of tritium are well below regulatory standards.

In the future additional irrigation area will be added to the west of the collection pond. This new section is referred to as the Western Expansion.

1.1.3 GSA CERCLA-Related Activities

The General Separations Area Consolidation Unit (GSACU) combined four waste sites (H-Area Retention Basin, Warner's Pond, HP-52 Ponds, and the Old Radioactive Waste Burial Ground [ORWBG]) into one program. Final remedial actions, which included waste consolidation and capping for the GSACU, began in December 2003 and are physically complete. The Revision 1 Post-Construction Report (PCR)/Corrective Measures Implementation Report (CMIR)/Remedial Action Completion Report (RACR) for the GSACU was submitted to the USEPA and the SCDHEC on April 24, 2008. Regulatory approval of this document was received from the USEPA on May 21, 2008 and from the SCDHEC on May 22, 2008.

2.0 MONITORING/REPORTING REQUIREMENTS

2.1 F-Area HWMF and H-Area HWMF/Monitoring/Reporting Requirements

The F-Area HWMF groundwater monitoring requirements are described in Module IV, Section B, of the Permit. The H-Area HWMF groundwater monitoring requirements are described in Module IV, Section C, of the Permit. The well networks for the F-Area and H-Area HWMFs monitor the Upper Aquifer Zone (UAZ) and the Lower Aquifer Zone (LAZ) of the Upper Three Runs Aquifer (UTRA), and the Gordon Aquifer (GA). (Refer to Maps 1A, 1B, and 1C, Volume II.) The wells that are Purge Water Management System (PWMS) wells are listed in Appendix A (Table A-2), Volume I.

Groundwater sampling, analysis, and other monitoring requirements are conducted as required by the Permit. The F-Area and H-Area Waste Treatment Units (WTUs) were placed in a dry lay-up configuration during 1Q2005 and 4Q2003 (respectively), and their industrial wastewater permits closed during 4Q2009.

2.2 MWMF Monitoring/Reporting Requirements

The MWMF groundwater monitoring requirements are defined in Module IV, Section D of the Permit. The well network for the MWMF monitors the UAZ and LAZ of the UTRA and the GA beneath the facility in all four plume areas (SWP, SEP, NWP, and NEP). (Refer to Maps 1A, 1B, and 1C, Volume II.) The wells in the network that are PWMS wells are listed in Appendix A (Table A-2), Volume I.

Groundwater and surface water monitoring is conducted as specified in the Permit. As documented in the Savannah River Site Resource Conservation and Recovery Act (RCRA) Permit, the GWPS in Permit Appendix IVD-A are specific to the SWP only. The NWP, NEP, and SEP are in Interim Status and are awaiting approval of the plume-specific constituents proposed in the 2000 RCRA Part B Renewal Application, Revision

13. SRS received Notice of Deficiencies (NODs) for the NWP, NEP, and SEP plumes in July 2006. Responses to these NODs were submitted in November 2006. Additional NODs for the NWP, NEP, and SEP were received in November 2010. For purposes of this report, the most recent modification to the 2000 RCRA Part B Renewal Application is Revision 16 (submitted August 2011).

Permit Section IVD.B.10.b.xii requires a list of wells and corresponding well construction details for wells installed since the submittal of the 2000 RCRA Part B Renewal Application. A list of all existing, installed, and abandoned wells during this reporting period (2011) is presented in Appendix A, Volume I.

3.0 COMPLIANCE MONITORING

3.1 Water Quality and Elevation Data (IVB.B.11.c.i, IVC.B.11.c.i, and IVD.B.10.b.i)

All water quality (monitoring wells, wetland piezometers, and surface water) and water-elevation data (water levels) for the F-Area HWMF, the H-Area HWMF (Appendix B, Tables, Volume I), and the MWMF (see Appendix B, Tables and Appendix C, CD, Volume I) during 2011 are presented, in accordance with the Permit requirements. The data tables present the analytical data in a matrix format depicting sampling stations and analytical constituents by sampling quarter. The data tables include laboratory-qualified data that are verified, per SRS procedures. Because some radiological constituents have more than one standard (e.g., radium-228: sum of beta dose, sum of beta, and total radium), the most restrictive standard is presented in the data table.

Field data for the F-Area HWMF, the H-Area HWMF, and the MWMF for 2011 are also included in the data tables, in accordance with the Permit requirements. The tables include water elevations as they correspond to a specific sampling event.

3.2 Hydrographs (IVB.B.11.c.ii, IVC.B.11.c.ii, and IVD.B.10.b.ii)

Hydrographs for selected wells for the F-Area HWMF, the H-Area HWMF, and the MWMF are provided in Appendix D (Volume I), in accordance with the Permit requirements. The wells were selected to provide a representative evaluation of the hydrogeology at the waste units. Hydrograph data includes water-level specific measurements and water-level measurements taken during routine sampling from 1995 through 2011. Clustered wells are shown on a single graph. Unique symbols are assigned for each well cluster, and the aquifer zone for each well is identified in the legend.

3.3 Time Series Plots (IVB.B.11.c.iii, IVC.B.11.c.iii, and IVD.B.10.b.iii)

Time series plots for selected wells for the F-Area HWMF, the H-Area HWMF, and the MWMF are provided in Appendix E (Volume I), in accordance with the Permit requirements. The wells were selected to provide a representative evaluation of the groundwater contamination and corrective actions at the waste units. The time series plots show permit-required constituents monitored from 1995 through 2011. Data from clustered wells are shown on a single graph, and the GWPS is depicted with a horizontal dashed line for reference. Unique symbols are assigned for each well in a cluster, and the aquifer zone for each well is identified in the legend. Scaling is optimized and all graphs are semi-log plots with concentration on the log scale.

Because it is possible to have negative values for radiological results below the detection limit, these negative values will not plot on the log scale and the plotted positive values on either side of the negative value are not connected by a line. This will only be apparent for plots below the detection limit.

The data used to develop the time series plots was not filtered to graphically present comparisons among the parent sample, field duplicates, field splits, reruns, and laboratory duplicates.

3.4 Isoconcentration Maps (IVB.B.11.c.iv, IVC.B.11.c.iv, and IVD.B.10.b.iv)

Isoconcentration plan-view maps for the F-Area HWMF, the H-Area HWMF, and the MWMF are provided in Volume II, in accordance with the Permit requirements. Individual maps depict the contaminant plumes. The concentration contour intervals on each map include the GWPS for that contaminant and additional contours that adequately represent the contaminant distribution.

3.5 Potentiometric Maps (IVB.B.11.c.v, IVC.B.11.c.v, and IVD.B.10.b.v)

Potentiometric contours and groundwater flow lines for 3Q2011 are provided on the isoconcentration maps for the F-Area HWMF, the H-Area HWMF, and the MWMF (Volume II). The combined maps show groundwater flow direction for the UAZ and LAZ of the UTRA and the GA.

Groundwater velocity calculations provide a basis for estimates of the transport rate for constituents. Groundwater velocities are calculated using the following equation:

$$\text{Velocity (ft/day)} = \frac{\text{Hydraulic Conductivity (ft/day)}}{\text{Porosity (unitless)}} \times \frac{\Delta h(\text{ft})}{\Delta l(\text{ft})}$$

The value Δh is the difference in head, and Δl is the length of the flow path. Flow path length is calculated to the nearest 25 feet.

Groundwater velocities are relatively constant in F and H-Areas, down gradient of the ORWBG (vicinity of the SWP and SEP), and in the north plumes of the MWMF, as has been reported for many years. The following tables provide the 3Q2011 horizontal flow rate estimates for the hydrostratigraphic units for the F-Area HWMF (Table 1), the H-Area HWMF (Table 2), and the MWMF (Table 3).

Table 1. Horizontal Groundwater Velocities in the Hydrostratigraphic Units beneath the F-Area HWMF

F-Area HWMF	UAZ of the UTRA	LAZ of the UTRA	GA
Kh (ft/day)	91.7	1.5	40
Effective Porosity	0.2	0.2	0.25
dh/dl	**Varies**	**Varies**	**Varies**
Groundwater Velocity (ft/yr) (Third Quarter 2011)			
Flow Path F	1,062	14	347

Note: Table depicts approximate values.

Flow was southwest in the UAZ of the UTRA, southwest in the LAZ of the UTRA, and northwest in the GA.

Table 2. Horizontal Groundwater Velocities in the Hydrostratigraphic Units beneath the H-Area HWMF

H-Area HWMF	UAZ of the UTRA	LAZ of the UTRA	GA
Kh (ft/day)	37.1	1.5	39
Effective Porosity	0.2	0.2	.25
dh/dl	**Varies**	**Varies**	**Varies**
Groundwater Velocity (ft/yr) (Third Quarter 2011)			
Flow Path H	809	34	182

Note: Table depicts approximate values.

Flow was southwest in the UAZ of the UTRA, southwest in the LAZ of the UTRA, and northwest in the GA.

Table 3. Horizontal Groundwater Velocities in the Hydrostratigraphic Units beneath the MWMF

MWMF	UAZ of the UTRA	LAZ of the UTRA	GA
Kh (ft/day)	32	1.5	39
Effective Porosity	0.2	0.2	0.25
dh/dl	**Varies**	**Varies**	**Varies**
Groundwater Velocity (ft/yr) (Third Quarter 2011)			
Flow Path SWP	584	24	---------
Flow Path SEP	565	17	---------
Flow Path NWP	*	14	---------
Flow Path NEP	*	24	---------
Flow Path MWMF	---------	---------	164

Note: Table depicts approximate values.

Flow directions in the UAZ and LAZ of the UTRA were to the southwest (SWP), northwest (NWP), northeast (NEP), and southwest (SEP). Flow direction in the GA was to the northwest.

*Due to the limited extent of the UAZ (i.e., the water table drops into the LAZ), no calculation is made for the UAZ in the NWP and the NEP areas.

3.6 Isoconcentration Cross Sections (IVB.B.11.c.vi, IVC.B.11.c.vi, and IVD.B.10.b.vi)

Isoconcentration cross sections for the F Area HWMF, the H Area HWMF, and the MWMF are presented in Volume II of this report, in accordance with the Permit requirements. All cross sections selected to represent contamination transport are essentially parallel to groundwater flow from the waste units. For well clusters in a cross section, each screen in a cluster is depicted on the cross section and available data for each screen is posted. The plan-view location of the cross sections is shown on insets on each cross section map.

3.7 Determination and Extent of Severity of Groundwater Contamination (IVB.B.11.c.viii, IVC.B.11.c.viii, and IVD.B.10.b.vii)

Monitoring results for groundwater, surface water, and wetlands are included for the F-Area HWMF, the H-Area HWMF, and the MWMF. The extent and severity of the groundwater contamination is determined based on the analytical results of the groundwater sampling performed for that period. The following sections describe the extent and severity of the groundwater contamination in terms of compliance monitoring and GWPS exceedances for the F-Area HWMF, the H-Area HWMF, and the MWMF.

3.7.1 Compliance Groundwater Monitoring

3.7.1.1 F-Area HWMF Compliance Groundwater Monitoring

Compliance monitoring for the F-Area HWMF was performed during 1Q2011, 2Q2011, 3Q2011and 4Q2011, in accordance with the Permit requirements. Results are shown in Appendix B, Tables B-1, Volume I.

The scheduled sampling was completed for all wells in F-Area during 1Q2011, 2Q2011, 3Q2011 and 4Q2011, with the exception of wells FSB 129D (dry all quarters) and FSL 4D (dry during 1Q, 2Q, and 4Q).

3.7.1.2 H-Area HWMF Compliance Groundwater Monitoring

Compliance monitoring for the H-Area HWMF was performed during 1Q2011, 2Q2011, 3Q2011 and 4Q2011, in accordance with the Permit requirements. Results are shown in Appendix B, Table B-2, Volume I.

The scheduled sampling was completed for all wells in H-Area during 1Q2011, 2Q2011, 3Q2011 and 4Q2011.

3.7.1.3 MWMF Compliance Groundwater Monitoring

Compliance monitoring was performed for the MWMF, in accordance with the Permit, and is discussed by plume areas (SWP, SEP, NEP, and NWP). During 2009, all four plume areas were monitored.

All four of the plume areas (SWP, NWP, NEP, and SEP) have radiological indicator parameters (nonvolatile beta, gross alpha, sum of beta, sum of beta dose, and sum of alpha) that exceed GWPS levels. Radiological indicator parameter exceedances indicate the need for speciation. GWPS exceedances of radiological indicator parameters are only discussed when the indicator parameter exceeds the GWPS and are not supported by speciated radiological isotopes. However, due to an analysis phenomenon known as "cross talk", radiological indicator analyses such as gross alpha and nonvolatile beta never agree with the sum of the speciated data. Cross talk occurs when part of the alpha emissions are counted as beta and part of the beta emissions are counted as alpha so that the overall sum of gross measurements is usually higher than the sum of the speciation. Therefore, gross radiological parameter exceedances should not be considered at the same level of importance as speciated values.

SWP Compliance Monitoring

During 1Q2011 and 3Q2011, the SWP monitoring wells (Appendix B, Table B-7, Volume I) were monitored for compliance requirements. Analytical results indicate fourteen (14) analytes exceeded the GWPS. The results and the aquifer zones, in which the exceedances occurred, are presented in Appendix B, Table B-7, Volume I.

SEP Compliance Monitoring

For the NWP, NEP, and SEP plumes, in this report, the 1Q2011 and 3Q2011 data were compared to the SWP GWPS .

During 1Q2011 and 3Q2011, the SEP monitoring wells (Appendix B, Table B-8, Volume I) were monitored for semi-annual compliance requirements. Analytical results indicate nine (9) analytes exceeded the GWPS proposed in the 2000 Part B Renewal Application. The results and the aquifer zones in which the exceedances occurred, are presented in Appendix B, Table B-8, Volume I.

NEP Compliance Monitoring

For the NWP, NEP, and SEP plumes, in this report, the 1Q2011 and 3Q2011 data were compared to the SWP GWPS.

During 1Q2011 and 3Q2011, the NEP monitoring wells (Appendix B, Table B-9, Volume I) were monitored for semi-annual compliance requirements. Analytical results indicate nine (9) analytes exceeded the GWPS. The results and the aquifer zones, in which the exceedances occurred, are presented in Appendix B, Table B-9, Volume I.

NWP Compliance Monitoring

For the NWP, NEP, and SEP plumes, in this report, the 1Q2011 and 3Q2011 data were compared to the SWP GWPS.

During 1Q2011 and 3Q2011, the NWP monitoring wells (Appendix B, Table B-10, Volume I) were monitored for compliance requirements. Analytical results indicate six (6) analytes exceeded the GWPS. The results and the aquifer zones, in which the exceedances occurred, are presented in Appendix B, Table B-10, Volume I.

3.7.2 Wetland Compliance Monitoring

The following subsections discuss Wetland Compliance Monitoring for the F-Area HWMF, the H-Area HWMF, and the MWMF.

3.7.2.1 F-Area HWMF Wetland Compliance Monitoring

During 1Q2011, 2Q2011, 3Q2011 and 4Q2011, sampling was scheduled for 17 F-Area HWMF wetland piezometers. Samples were collected from all 17 piezometers during all four quarters, except for FPZ 7A (dry in 3Q) and FPZ 7B (dry in 2Q and 3Q). Wells FPZ 7A and FPZ 7B will be sampled for the full suite of GWPS constituents during monitoring in the third quarter of 2012.

In accordance with the Permit requirements, during the third quarter of each year, all 17 wetland stations were analyzed for the full suite of GWPS constituents, except for piezometers that were dry in the third quarter. During the remaining quarters, the stations were analyzed for a reduced suite of GWPS constituents based on the analytes detected during the full suite sampling event. If a constituent was not detected during the third quarter sampling event, it was excluded from further analyses during the remaining quarters. However, gross alpha, nonvolatile beta, tritium, and nitrate-nitrite, were sampled for during all quarterly events. The results for the stations that were sampled are presented in Appendix B, Table B-3, Volume I, and the locations are shown on Map 1A, Volume II.

At the wetlands of FMB, cadmium, cobalt, nitrate, carbon-14, iodine-129, strontium-90, gross alpha, nonvolatile beta, radium, uranium-238 and tritium were the most prevalent constituents in groundwater that exceeded the GWPS. Tritium was the most widespread constituent at the wetlands, exceeding the GWPS at all but one location. The maximum concentration was lower than in 2010 at 1,950 pCi/mL at location FPZ 6B. The results

for the piezometers that were sampled are presented in Appendix B, Table B-3, Volume I. The locations are shown on Map 1A, Volume II.

3.7.2.2 H-Area HWMF Wetland Compliance Monitoring

During 1Q2011, 2Q2011, 3Q2011 and 4Q2011, sampling was scheduled for 10 H-Area HWMF wetland piezometers. All wetland piezometers were sampled during all four quarters, except for HPZ 5B, which was dry during the third quarter. Well HPZ 5B will be sampled for the full suite of GWPS constituents during monitoring in the third quarter of 2012.

In accordance with the Permit requirements, during the third quarter of each year, all 10 wetland stations were analyzed for the full suite of GWPS constituents, except for HPZ 5B which was dry. During the remaining quarters, the stations were analyzed for a reduced suite of GWPS constituents based on the analytes detected during the full suite sampling event. If a constituent was not detected during the third quarter sampling event, it was excluded from further analyses during the remaining quarters. However, gross alpha, nonvolatile beta, tritium, nitrate-nitrite, and mercury were sampled for during all quarterly events. The results for the stations that were sampled are presented in Appendix B, Table B-4, Volume I, and the locations are shown on Map 1A, Volume II.

At the wetlands of FMB, nitrate, carbon-14, iodine-129, nonvolatile beta, and tritium were the most prevalent constituents that exceeded the GWPS. Tritium was the most widespread constituent at the wetlands, exceeding at all ten locations. The maximum concentration for tritium was 2,240 pCi/mL at location HPZ 1A. The results for the piezometers that were sampled are presented in Appendix B, Table B-4. The locations are shown on Map 1A, Volume II.

3.7.2.3 MWMF SWP Wetland Compliance Monitoring

During 2011, MWMF SWP wetland piezometers were monitored for tritium (Appendix B, Table B-11, Volume I). Analytical results indicate tritium exceeded the GWPS. The results for the piezometers that were sampled are presented in Appendix B, Table B-11, Volume I. The locations are shown on Map 1A, Volume II.

Generally, tritium is consistently found at higher concentrations in the deeper piezometers. One reason for this is that recent data indicate the deeper wetland piezometers are monitoring groundwater just above the Tan Clay. This horizon has lower conductivities, higher effective porosities, and is not easily flushed by groundwater movement. In addition, the shallower piezometers are screened to the surface and intersect a highly conductive root zone near the surface, which can transmit rainwater or overland flow and dilute the concentrations.

3.7.3 Surface Water Compliance Monitoring

The following sections discuss Surface Water Compliance Monitoring for the F-Area HWMF, the H-Area HWMF, and the MWMF (SWP and NWP/NEP).

3.7.3.1 F-Area HWMF and H-Area HWMF Surface Water Compliance Monitoring

In accordance with the Permit requirements, during the third quarter of each year, all 12 FMB stations were analyzed for the full suite of GWPS constituents. During the remaining quarters, the stations were analyzed for a reduced suite of GWPS constituents determined based on the analytes detected during the full suite sampling event. If a constituent was not detected during the third quarter sampling event, it was excluded from further analyses during the remaining quarters. However, gross alpha, nonvolatile beta, tritium, nitrate-nitrite, and mercury were sampled for during all quarterly events.

The results for the stations that were sampled are presented in Appendix B, Table B-3 and B-4, Volume I, and the locations are shown on Map 1A, Volume II.

As part of the flux monitoring program, an additional station (FMC 002H) was sampled for tritium only. The results for this station are also presented in Appendix B, Table B-3 and B-4, Volume I. The location is shown on Map 1A, Volume II.

During 2011 carbon-14 (one location at H Area), iodine-129 (two locations at F Area), and tritium (eight locations at F and H Areas) exceeded the GWPS in FMB. Tritium was the most prevalent contaminant. Tritium exceedances were detected above the GWPS at eight of the thirteen locations. The concentration of tritium exceedances ranged from 20 to 1,820 pCi/mL, with the highest concentration measured at FM 3A (located on Old F-Area Effluent Ditch at the MWMF SWP).

3.7.3.2 MWMF Surface Water Compliance Monitoring

SWP (Fourmile Branch Watershed)

During 2011, the nine (9) MWMF SWP surface water locations (Engineered Ditch [ED], Old F-Area Effluent Ditch (OFED), phytoremediation pond, and FMB) were monitored for tritium. Analytical results indicate tritium exceeded the GWPS in FMB at all locations except for the background station FM-2. The results for the locations that were sampled are presented in Appendix B, Table B-11, Volume I. The locations are shown on Map 1A, Volume II.

Surface water locations ED-01, OFD-01, and OFD-02 monitor tritium concentrations from the ED, the OFED below the pond, and the OFED farther downstream of the pond, respectively. Locations FHP-001A and FHP-001 are representative of the phytoremediation pond. Surface water in the ED originates from the discharge of F-Area process water and storm water runoff. Surface water in the OFED consists of many

braided streams originating from numerous groundwater seep locations that combine to form a single stream. Location FM-3A is located just below the confluence of the ED and the OFED and is the last sampling location before entering FMB. FMC-002H, FMC-002HD and FM-2B are FMB sampling locations at the MWMF while FM-2 is a background station on FMB.

Tritium exceeded the GWPS at all nine monitoring locations during 2011. The maximum concentration in the pond was 5,440 pCi/mL at location FHP-001. At the ED the maximum concentration was 2,000 pCi/mL while at the OFED tritium peaked at 5,400 pCi/mL close to the sheetpile dam. Downstream at the confluence of the ED and OFED tritium was 1,820 pCi/mL in 2011. In FMB tritium concentrations were much lower with a maximum value of 88.8 pCi/mL detected at downstream location FMC-002HD.

NWP and NEP (Upper Three Runs Watershed)

Stream locations CBS 010, CBS 020, and CBS 030 monitor surface water in Crouch Branch, a tributary of Upper Three Runs. This tributary's headwaters originate in H-Area. Crouch Branch also receives water from groundwater seeps emanating from the NEP. Stream location UTR-155 monitor the unnamed tributary, which receives water from seeps where the NWP is projected to discharge

Eleven (11) MWMF NWP and NEP surface water locations (Crouch Branch and an unnamed tributary to Upper Three Runs) were monitored for tritium during 2011. Analytical results revealed four (4) tritium exceedances at locations CBS 010 (59.1 pCi/mL), CBS 030 (27.8 pCi/mL), CBS BF1 (29.7 pCi/mL) and UTR BF1 (54.5 pCi/mL) in the first quarter of 2011. During 2Q2011, analytical results revealed four (4) tritium exceedances at locations CBS 010 (74.1 pCi/mL), CBS 030 (25.4 pCi/mL), CBS BF1 (24.0 pCi/mL) and UTR BF1 (45.3 pCi/mL). During 3Q2011, analytical results revealed two (2) tritium exceedances at locations CBS BF1 (252 pCi/mL) and UTR BF1 (36.9 pCi/mL). During 4Q2011, analytical results revealed two (2) tritium exceedances at locations CBS BF1 (80.6 pCi/mL) and UTR BF1 (51.5 pCi/mL). The results for the locations that were sampled are presented in Appendix B, Table B-12, Volume I. The locations are shown on Map 1A, Volume II.

3.8 Statistical Evaluation for Changes in Groundwater Elevations and pH for F-Area HWMF and H-Area HWMF

In accordance with the Permit requirements, the F Area and the H Area HWMFs are required to perform a statistical evaluation of annual groundwater quality and elevation changes for the point of compliance (POC) wells and selected assessment wells. No statistical evaluation is required for the MWMF.

Since the remedial system consists of the barrier walls and the base injection system, the statistical evaluation focuses on the impacts of the barrier walls and base injection system on the groundwater elevations and change in pH. It is important to assess the effects of the barriers and the base injection on the aquifer to better understand the long-term impacts on groundwater quality. Base injection (pH adjustment) represents the treatment mechanism for metals at the F-Area Barriers and at the wetlands of F and H Areas. Therefore, several years after the installation of the remedial systems, during the April 2007 reporting period, a simple hypothesis test was used to assess the impact of the barriers and base injection system on the groundwater elevations (F- and H-Areas HWMFs) and changes in pH (F-Area HWMF only). Although the H-Area HWMF has a base injection system, it has not been operating for sufficient time to warrant a statistical evaluation. A detailed description of the test and the trend statistics for all available wells are presented in Appendix F (Volume I). An evaluation of the previous statistical analysis, during this reporting period, indicates that the statistical evaluation continues to be valid, and is included in this report as Section 3.8.1 and 3.8.2.

3.8.1 Groundwater Elevations

The groundwater elevation statistical results for the F-Area HWMF and the H-Area HWMF are included in Appendix F, Table 1 and Table 2 (Volume I), respectively.

Water level changes resulting from barrier installation were statistically evaluated by analyzing the gradients between wells located across the barriers. Although many wells exist near the barriers, only a few well pairs contained sufficient data to adequately perform statistical tests. The majority of the well pairs excluded from the analysis had an insufficient number of measurements collected before the installation of the barriers.

The water level gradient evaluation for the F-Area HWMF and the H-Area HWMF indicates that groundwater flow has changed, due to the installation of the barriers. This is demonstrated by at least four well pairs. At F-Area, at least one well pair indicated a

significant change in gradient, due to the installation of the barrier walls. This well pair is located in the area with the greatest groundwater contamination. The remaining three well pairs are located at the H-Area barriers. Due to the configuration of the barriers, located both up gradient and down gradient of the waste unit, the H-Area barriers had an immediate impact on groundwater flow.

3.8.2 Change in pH

The change in pH statistical results for the F-Area HWMF are included in Appendix F, Table 3, Volume I.

Significant changes in groundwater pH were statistically evaluated using monitoring wells and wetland sampling locations within the vicinity of the injection wells. The differences in pH before and after injection of the base solution are often a function of location of the monitoring wells and geochemical buffering of the groundwater plume. The most appropriate locations for monitoring pH are the wells that are located down gradient and in close proximity of the injection zone.

Five of the wells that were statistically evaluated showed significant indications of change in the groundwater plume pH, due to base injection. The majority of these wells are located in the eastern portion of the plume. This is also the area of the plume containing the most significant groundwater contamination. As expected, all of the wells located up gradient and outside of the influence of the base injection, with the exception of one (FSB 118), show no statistical impact to pH. Well FSB 118 shows a significant change in pH, however it is located a significant distance away from the injection system and thus is not impacted by the base injection.

The statistical evaluation indicates that pH adjustment was accomplished near the gates, due to base injection into the aquifer. This is supported by monitoring data from the wells that are located close to the zone of injection.

3.8.3 Changes in Tritium Concentration

The time series plots in Appendix E, Volume I illustrate the increasing and decreasing changes in tritium concentration in the groundwater near the barriers, since the termination of pump and treat operations at the F-Area and H-Area Seepage Basins.

Since installation of the barriers and operation of the base injection system, the tritium concentration down gradient of the F-Area Seepage Basin barriers and gates has decreased significantly. The reduction in concentration is attributed to the control of the contaminated groundwater by the barriers and the release of less contaminated groundwater through the gates.

The tritium concentrations down gradient of the H-Area Seepage Basin barriers has decreased significantly, as shown in the time series graphs. The reduction in concentration is due to the control of the contaminated groundwater by the barrier.

In conclusion, sampling and analysis performed during this reporting period has confirmed that significant reductions in concentration of tritium continue to occur and are consistent with the planned performance of the barriers and gates. SRS believes that the barriers are reducing contamination in FMB.

3.9 Rainfall (IVB.B.11.c.xi, IVC.B.11.c.xi, and IVD.B.10.b.viii)

Because of the central proximity, the F-Area rain gauge station was selected to represent rainfall patterns within the study area. The monthly, quarterly, and cumulative rainfall data in inches for the F-Area HWMF, the H-Area HWMF, and the MWMF during 2011 are included and presented in the following table:

Table 4. Rainfall for 2011

Month	Rainfall (in)
January	2.28
February	5.12
March	6.32
First Quarter Total	**13.72**
April	4.32
May	3.01
June	3.62
Second Quarter Total	**10.95**
Cumulative Total for First Half of 2011	**24.67**
July	1.25
August	3.69
September	3.23
Third Quarter Total	**8.17**
October	1.94
November	2.23
December	1.96
Fourth Quarter Total	**6.13**
Cumulative Total for Second Half of 2011	**14.3**
Cumulative Annual Total	**38.97**

Monthly rainfall totals are graphically presented on Figure 1 for January 1 through December 31, 2011. Rainfall totals for 2011 were similar to the same period during 2010 (38 inches in 2010 versus 39 inches in 2011) and below the 30 year average (47.5 inches). In fact, rainfall at SRS has been below average for four of the past five years.

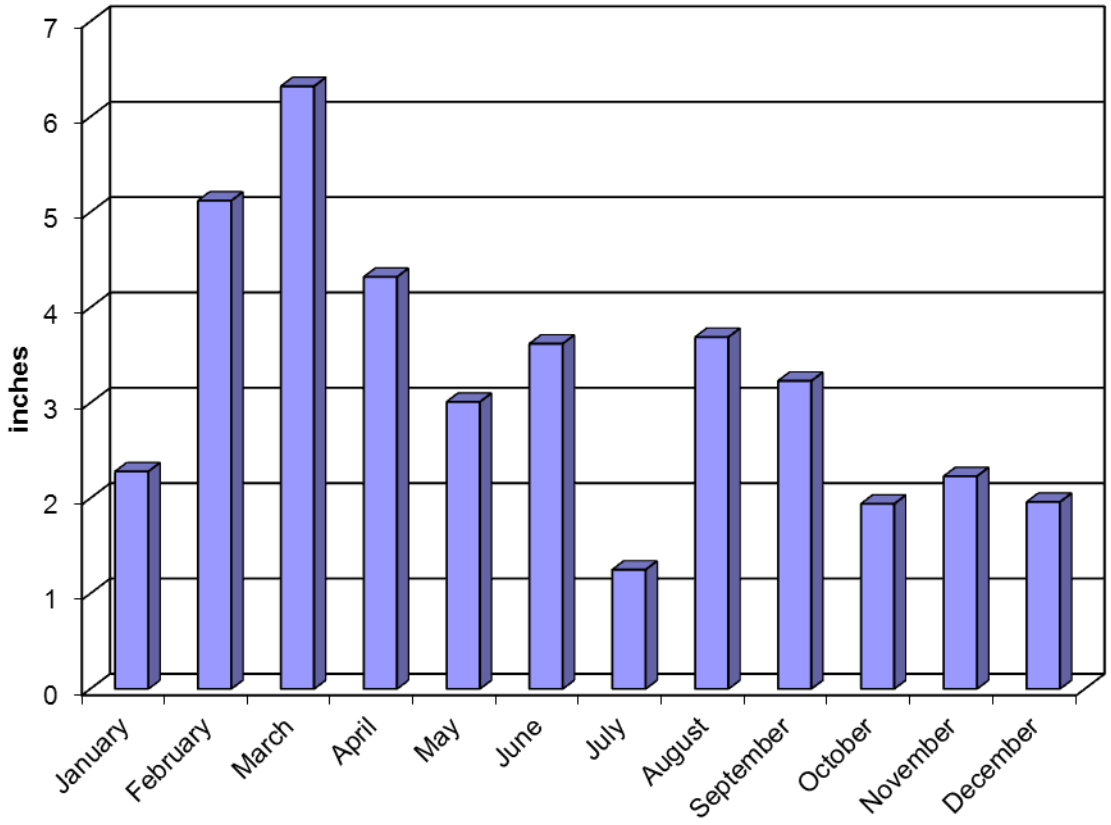


Figure 1. Rainfall for 2011

4.0 DETECTION MONITORING

4.1 F-Area HWMF Appendix IX (IVB.B.10.c)

Detection monitoring for the F-Area HWMF was performed during 3Q2011, in accordance with the Permit requirements. Twenty percent of the POC wells were sampled for Appendix IX, carbon-14, and cesium-134. The results for the wells are presented in Appendix B, Table 5, Volume I.

During detection monitoring in 2011, aniline was detected at 26.6 ug/L at well FSB 94C. A confirmation sample also measured aniline at 10.1 ug/L, which is 0.1 ug/L greater than the estimated laboratory quantitation limit (EQL). Because the result is essentially the same as the EQL, aniline will not be considered for addition to the GWPS at this time. However, well FSB 94C will be measured for aniline in 2012 during detection monitoring sampling. Also, acetone, which was detected in 2010 in well FSB 94C, was not detected during sampling in 3Q2011.

In 2010, at well FSB 90D, isobutanol was detected at 52.7 µg/L. This well is located in the Arcadis enhanced Anaerobic Reductive Precipitation pilot test area where molasses was injected. Isobutanol is a common by-product of molasses fermentation. Once the molasses injection stopped, isobutanol concentrations began to eventually decrease. In 2011, no molasses was injected and isobutanol was not detected in well FSB 90D.

4.2 H-Area HWMF Appendix IX (IVC.B.10.c)

Detection monitoring for the H-Area HWMF was performed during 3Q2011, in accordance with the Permit requirements. Twenty percent of the POC wells were sampled for Appendix IX, carbon-14, and cesium-134. The results for the wells are presented in Appendix B, Table 6, Volume I.

During detection monitoring in 2011, no new constituents were detected above the EQL.

4.3 MWMF Appendix IX and CRML (IVD.B.9.d)

Detection monitoring for the MWMF was performed during 3Q2011, in accordance with the Permit requirements. Twenty percent of the POC wells were sampled for Appendix IX and Comprehensive Radiological Monitoring List (CRML) constituents. The results for the wells are presented in Appendix B, Tables B-13 through 16, Volume I.

The SWP CRML constituents are specified in the Permit. The CRML constituents are plume-specific (the NWP, NEP, and SEP) and are listed in the 2000 RCRA Part B Permit Application.

Detection monitoring indicated that two (2) constituents not on the current GWPS (1,2 dichlorobenzene and endrin) were detected in selected POC wells during the MWMF annual Appendix IX and CRML sampling. None of the detections were confirmed by follow-up sampling and analysis performed by SRS.

In the SWP, 1,2 dichlorobenzene was detected in well BGO 28D at 0.66 ug/L. In well BGO, 33C endrin was detected at 0.054 ug/L. Confirmation sampling and analysis performed by SRS in wells BGO 28D and BGO 33C did not yield results above the laboratory quantitation limits for 1,2 dichlorobenzene or endrin.

There were no new detections in the SEP.

In the NEP, acetone (2.5 ug/L) was detected at well BGO 5D and methyl ethyl ketone (8.8 ug/L) was detected in BGO 3A. As these compounds are possible laboratory contaminants, confirmation sampling was not performed.

In the NWP, bis-2 ethylhexyl phthalate (15 ug/L) was detected in well BGO 12CX and methyl ethyl ketone (7.5 ug/L) was measured in well BGO 11DR. As both of these compounds are possible laboratory contaminants, confirmation sampling was not performed.

5.0 CORRECTIVE ACTION EFFECTIVENESS MONITORING

5.1 F-Area HWMF Corrective Action Program

The current Corrective Actions for the F-Area HWMF include an engineered groundwater barrier system with gates, a base injection system as treatment within the gates and in the wetlands of FMB. A new section of barrier with a gate was added and the base injection system was expanded to the new eastern gate in 2011. Further discussion is provided in Section 5.1.3.

Installation of the original length of engineered groundwater barriers at F Area was completed during 3Q2004. A new section of barriers approximately 1,150 feet long, including a new gate, was added to the east in 2011. There are now three gates in the system: west, middle, and the new east gate. The groundwater barrier funnel and gate system was designed to manage tritium and metal releases to FMB and the seepline. The groundwater barriers have affected the flow of groundwater and reduced the discharge of contaminants to FMB.

During June of 2005, SRS completed construction and commenced operation of the base injection system within the original two gates at the F-Area groundwater barrier. During June 2008, the base injection system was expanded to treat groundwater beneath the wetlands. In 2011, the system was further expanded to include the new east gate at the expansion section of barrier on the east side. The base injection system is designed to mitigate acidic groundwater contamination in-situ. The base injection systems and the installed engineered groundwater barrier walls form the remediation system for the F-Area HWMF. Configuration of the systems is shown in Figure 2.

Iodine-129 is present at levels greater than the GWPS in the groundwater beneath the wetlands and in FMB surface water. A modification to the permit was approved to deploy silver chloride technology at the central gate as part of the corrective action.

During 2011, an aqueous suspension of ultra-fine ground silver chloride particles was injected into the plume using seven temporary injection points. Further discussion is provided in Section 5.1.3.

5.1.1 Injection Well Volumes and Injection Rates (IVB.B.11.c.xii)

From July 2010 through February 2011, base injection treatment for the wetlands was performed. Approximately 4.2 million gallons of base solution were injected. In 2011, 1.1 million of the 4.2 million gallons were injected during January and February. No base injection was needed at the barrier gates in 2011. The base injection treatment areas are shown on Figure 2. Table 5 summarizes the period of operation, volumes injected, and average rate of injection for 2011.

In addition to the base injection activities, silver chloride was injected at the middle gate for the treatment of iodine-129. Approximately 77,000 gallons of silver chloride suspension mixed with domestic water were injected at seven temporary injection points. Additional discussion is provided in Section 5.1.3.

5.1.2 New Surface Water Monitoring at the Seeplines

SRS has installed surface water monitoring stations within the seeplines below the F-Area Seepage Basin and the H-Area Seepage Basin. These monitoring stations support corrective action effectiveness determinations for the 2b goals of the Permit. SRS installed the monitoring stations in 2010 and has incorporated the new stations into the quarterly monitoring program with the first sampling during 1Q2011.

Similar to the monitoring strategy used for surface water in FMB and the wetland piezometers, during the third quarter of each year, the seepline surface water stations were analyzed for the full suite of GWPS constituents. During the remaining quarters, the stations were analyzed for a reduced suite of GWPS constituents determined based on the analytes detected during the full suite sampling event. If a constituent was not

detected during the third quarter sampling event, it was excluded from further analyses during the remaining quarters. However, gross alpha, nonvolatile beta, tritium, nitrate-nitrite, and mercury were sampled for during all quarterly events. The results for the stations that were sampled are presented in Appendix B, Table B-3, Volume I, and the locations are shown on Map 1A, Volume II.

At the seepline, cobalt, nitrate, gross alpha, nonvolatile beta, carbon-14, iodine-129, strontium-90, tritium, uranium-233/234, and uranium-238 exceeded the GWPS in surface water. Iodine-129 and tritium were the most widespread constituents in surface water at the wetlands, exceeding the GWPS at all four locations. The maximum concentration of iodine-129 (264 pCi/L) was measured at location FAS-93. Tritium was the highest at location FAS-91 (507 pCi/mL).

FIGURE 2

BASE INJECTION LAYOUT

TABLE 5

F-AREA BASE INJECTION FLOW RATE 2011

5.1.3 Effectiveness of the F-Area HWMF Corrective Action Program (IVB.B.11.c.xiii)

Groundwater Barriers

During 3Q2004, three groundwater barriers were constructed at the F-Area HWMF. Approximately 1,375 linear feet of low permeability wall was installed from just below the ground surface to the base of the UAZ. Construction utilized an in-situ soil mixing technique (acid resistant pozzolan cement and attapulgite clay were blended with native soils). A small percentage of caustic was also added to the cement to facilitate curing. Upon hardening, the resulting soil/cement mixture formed a low permeability subsurface barrier approximately 2.8 feet thick on average. Configuration of the engineered barriers is shown in Figure 3.

To improve the F-Area Seepage Basin barrier system, SRS installed an extension to the barrier on the east side in 2011. The barrier extension is 1,000 feet long and includes a 200-foot wide gate with base injection. The new wall is anchored into the eastern most side of the existing wall and constructed using the same soil mixing techniques. Construction occurred in February and March of 2011. The general location of the extension is shown on the plume maps in Volume II and on Figure 2.

Base Injection

The primary objective of the base injection technology is reducing concentrations of metals and radionuclides in the groundwater. Previous studies and current monitoring demonstrate that adjusting the acidic groundwater plume to neutral or background pH levels results in reduced concentrations of many metals and radionuclides in the groundwater.

During June 2005, SRS started the base injection system for the F-Area HWMF. Per the approved UIC permit, dilute base solution was injected into the UAZ at the two gate areas located between the groundwater barrier walls (west and middle gates). The injected solution consisted of sodium hydroxide and sodium bicarbonate mixed with domestic water to a pH of approximately 10. The base solution provides treatment of the acidic groundwater at the gates and is an integral component of the groundwater funnel and gate remedial system. The initial injection was completed in 2005.

Since the initial operation in 2005, the injection system has been operated almost every year either to deliver maintenance doses of base solution or to perform technology evaluations. Most recently, in July 2010 through February 2011, the system was operated to provide additional treatment of the wetlands down gradient of the barriers. A total of almost 4.2 million gallons of base solution were injected during this treatment. A summary of base injection campaigns at the F-Area HWMF is provided in Table 6.

The effects of injection vary across each of the injection areas, due to the differences in geochemical conditions and contaminant concentrations within the plumes, groundwater velocity, and proximity of the monitoring wells to the injection galleries. When base is injected, the portions of the aquifer impacted by the base can be identified by changes in indicator parameters, such as tritium, nitrate, chlorides, conductivity, and pH. Monitoring of these parameters before and after break-through of the injection front demonstrates that movement of the injected solution through the aquifer (from point of injection to the monitoring locations) occurs over a 100-150 day period at the middle gate and a 150-200 day period at the western gate.

During a typical injection campaign, the groundwater pH is initially increased to levels approaching the injectate concentration. This serves to alter not only the groundwater chemistry (immediate effect), but also the surfaces of the aquifer sediments such that buffering persist after terminating the injection. Monitoring results reveal that after the initial increase in pH, the groundwater pH remains elevated for some period, due to

buffering by the aquifer. This buffering effect persists for approximately 12 months at the middle gate and approximately 17-plus months at the west gate.

Table 6. F-Area HWMF Base Injection Volumes Injected

Year	West Gate	Middle Gate	East Gate	Wetlands	**Totals**
2005	7.4	5.1	--	--	**12.5**
2006	--	3.6	--	--	**3.6**
2007	5	--	--	--	**5**
2008	--	4	3.8	5	**12.8**
2009	0.5	0.5	1.5	13	**15.5**
2010	2.8	1.4	--	3.1	**7.3**
2011	--	--	--	1.1	**1.1**
Totals	**15.7**	**14.6**	**5.3**	**22.2**	**57.8**

Note: Volumes are in millions of gallons. Due to the barrier extension installed in 2011, the original east gate was closed off and a new east gate created along the extension wall.

Iodine Treatment Pilot Study and Deployment

In 2009, a treatment pilot study was initiated to evaluate the removal of iodine-129 by the injection of silver chloride into the plume. Ultra-fine ground silver chloride particles were mixed with domestic water and then injected into the water table using wells FIB 27R, -28R, and -29R. Approximately 1.13 million gallons of solution (100 pounds of silver chloride) were injected. Monitoring data indicates that the silver chloride

suspension was successfully injected into the subsurface and iodine-129 was reduced by between 55 and 70 percent.

In 2011, a modification to the RCRA permit was approved to deploy silver chloride technology at the middle gate as part of the corrective action. During August and September of 2011, per an approved UIC permit, an aqueous suspension of ultra-fine ground silver chloride particles was injected into the UAZ of the UTRA. Seven temporary injection points, installed by a cone penetrometer rig (CPT), were used to place the silver chloride into the subsurface. Depth discrete placement of the amendment with the CPT rig was used to achieve better distribution in the subsurface versus the traditional wells used in the 2009 pilot study. The configuration of the injection locations and monitoring points is shown in Figure 3.

The silver chloride concentrate consisted of ground silver chloride particles suspended in a propylene glycol carrier fluid. This concentrated material was diluted with domestic water prior to injection into the subsurface. The dilution factor was roughly 460:1 (domestic water to silver chloride concentrate). The resulting concentration of silver chloride in the diluted solution was approximately 130 mg/L.

The treatment zone was from the top of the water table down to the tan clay confining zone (25 to 50 feet below ground surface). Injection was performed starting at the bottom of the aquifer and proceeded upward pumping a specific volume of amendment into each zone at 2.5 foot intervals. The minimum quantity of diluted solution injected at each injection location was 10,800 gallons. Overall 76,912 gallons were injected across the seven locations. This equates to approximately 64 pounds of metallic silver placed into the subsurface.

The silver chloride injection zone was located up gradient of a line of base injection wells at the central gate. During and after the injection of silver chloride, groundwater samples were collected from the six down gradient base injection wells and from two monitoring

wells. Samples were obtained every two weeks during the injection period and monthly thereafter.

A decrease in the concentration of tritium at the monitoring points can serve as an indication of movement of the injected fluid through the aquifer. Currently several of the monitoring wells have very low tritium concentrations suggesting continued influence from the injection. Because of this, an evaluation of the effect of the silver chloride on the iodine concentration is premature. However, preliminary results suggest a reduction of iodine-129 at wells FIT 14 and FSB 130D of between 40 and 70 percent (Figure 4). Two wells actually show an increase in iodine-129. At FIB 23 and FSB 131D the increase in iodine is believed to be untreated groundwater possibly a result of preferential flow at these locations. SRS will continue to sample until ambient conditions return at the majority of the monitoring wells. At that time a definitive evaluation of the treatment will be performed.

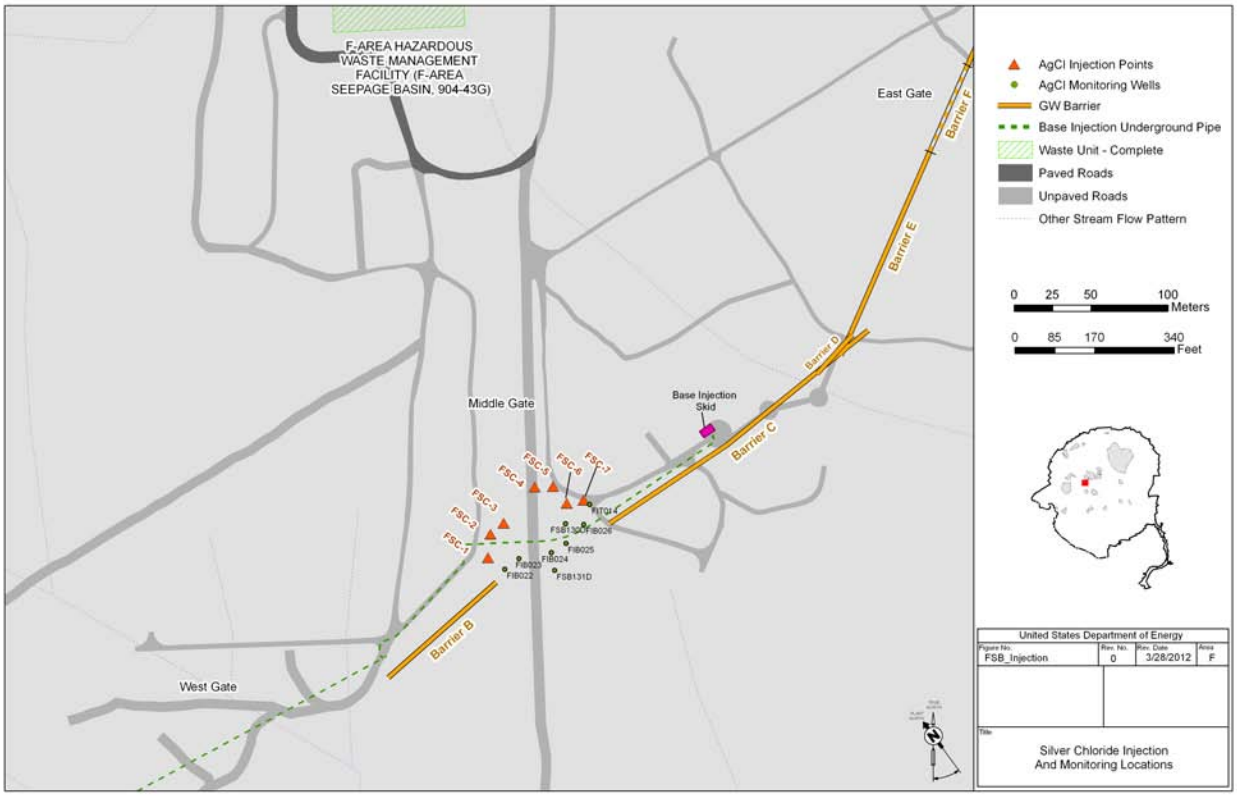


Figure 3. F-Area HWMF Silver Chloride Injection Layout

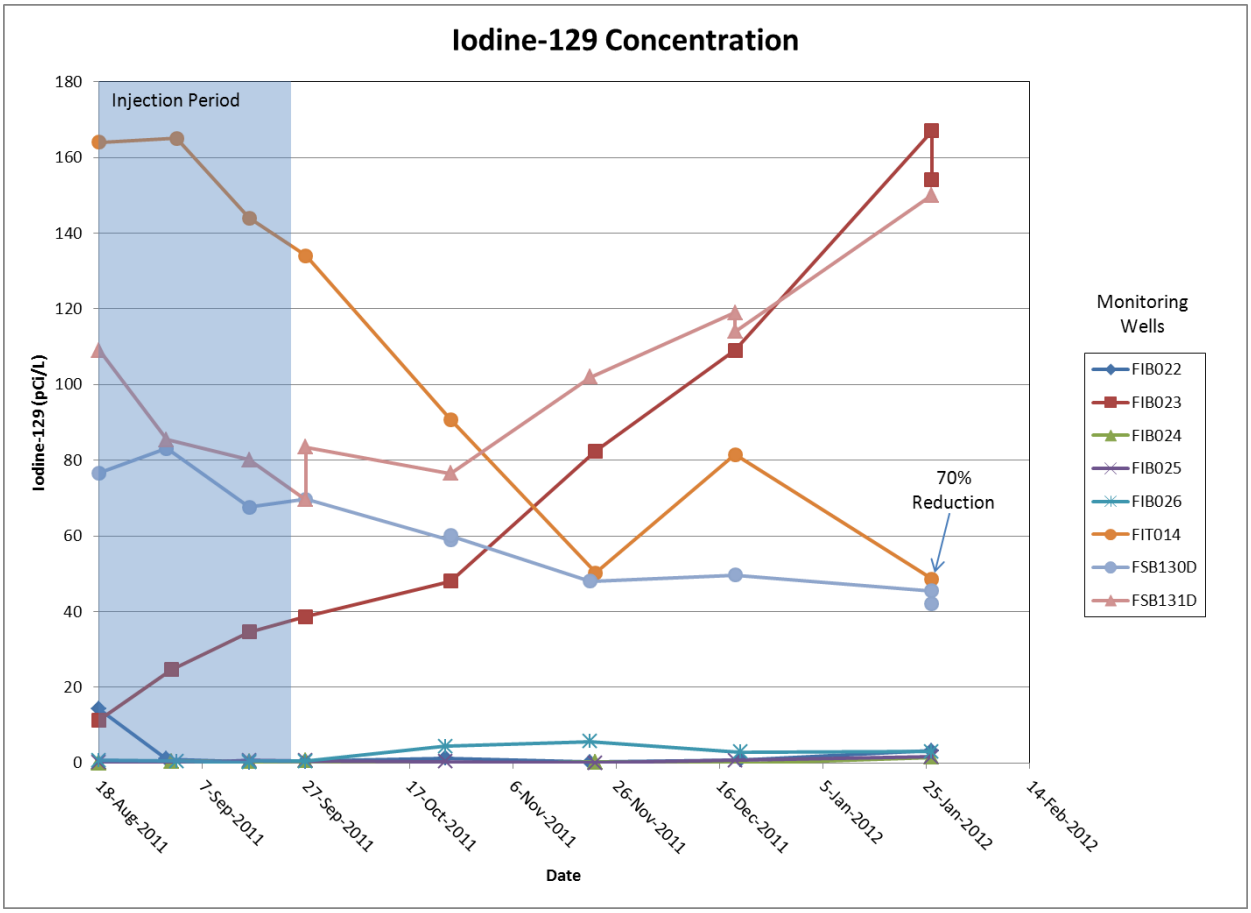


Figure 4. Reduction of Iodine-129 at Well FIT 14 from Injection of Silver Chloride Solution

Tritium Flux

The tritium flux to FMB for calendar year 2011 was approximately 117 Ci/yr. This is an average of monthly measurements of stream discharge and tritium concentrations in FMB. Over the period of a year, seasonal variability in flux to FMB is observed. Due to this variability (observed since the start of monthly flux measurements in 2003), SRS believes that it is more appropriate to report an average flux for the entire year.

SRS has been collecting paired tritium and flow measurements within FMB since 2003. The annual flux from the F-Area HWMF to FMB since 2003 is tabulated in Table 7. Since 2000, including the termination of the pump and treat system, construction of the walls, and operation of the base injection system, the annual flux of tritium to FMB has been attenuated by approximately 80 percent (660 Ci/yr in 2000 versus 117 Ci/yr in 2011).

In 2010, the flux of tritium was observed to be higher than in previous years. SRS believes the temporary increase in flux to FMB was due to flushing of tritium from the aquifer, due to base injection in the wetlands. Between 2009 and 2010, over 16 million gallons of base solution were injected into the plume within the wetlands. The extra flow through the wetland system temporarily accelerated the migration of tritium into the creek. In 2011, the tritium flux returned to lower values as expected.

Historically, the flux values measured in FMB span a wide range. Variability in results is believed to be attributable to environmental factors, such as seasonal variation in precipitation, groundwater discharge rates, volume of surface runoff, natural storage of water within the stream channel, water releases from the MWMF SWP phytoremediation pond, and flushing of tritium from the aquifer, due to base injection at the barrier wall gates and at the wetlands. All of these factors are temporal and influence the ability to calculate flux at the measurement stations.

Table 7. F-Area HWMF Annual Tritium Flux to Fourmile Branch

Year	Tritium Flux (Ci/yr)	Reduction*
2000	660	NA
2003	352	47%
2004	352	47%
2005	254	61%
2006	177	73%

Year	Tritium Flux (Ci/yr)	Reduction*
2007	173	74%
2008	168	74%
2009	115	82%
2010	240	64%
2011	117	82%

*Percent reduction from baseline established in year 2000.

5.2 H-Area HWMF Corrective Action Program

The current Corrective Action for the H-Area HWMF include an engineered groundwater barrier system and a base injection system in the wetlands of FMB. Further discussion is provided in Section 5.2.2.

The installation of the engineered groundwater barrier walls at H Area was completed during 4Q2004. The groundwater barrier walls are the replacement remedial action for the pump and treat system. The new corrective action was designed to reduce the flow of groundwater beneath the waste unit, in order to better manage tritium and metal releases to surface waters. Upon installation of the barriers, the water levels adjacent to the walls changed as the groundwater flow patterns adjusted. Groundwater levels on the up gradient side of the walls increased and levels down gradient of the walls decreased. Additional discussion is provided in Section 5.2.1.

A base injection system was constructed in 2010 to augment the remedial action. The injection system provides treatment for acidic conditions and metals within the wetlands prior to groundwater discharging to FMB. Operations began in September 2010 and are currently on going. Additional discussion is provided in Section 5.2.1.

In 2011, enhancements to the cover system over the basins were completed. Specifically, the drainage system, consisting of concrete lined swales, was re-graded and new concrete

installed. Also, modifications to tie the drainage layer from the cap to the swales were completed.

5.2.1 Effectiveness of the H-Area HWMF Corrective Action Program (IVC.B.11.c.x)

Groundwater Barriers

In 2004, two groundwater barriers were installed at the H-Area HWMF. One barrier was placed up gradient of Basin H-4 and a second barrier was placed down gradient of the basin. Approximately 3,160 linear feet of low permeability walls were installed from just below the ground surface to the base of the UAZ. Construction utilized an in-situ soil mixing technique (pozzolan cement and attapulgite clay were blended with native soils). A small percentage of caustic was also added to the cement to facilitate curing. Upon hardening, the resulting soil/cement mixture formed a low permeability subsurface barrier approximately 2.8 feet thick on average. Configuration of the engineered barriers is shown on the plume maps in Volume II.

Placement of the barriers altered groundwater levels near the walls. Since installation of the barriers, water levels have increased up gradient of the wall system between three to six feet. Down gradient of the barrier system, the water levels have declined one to two feet.

Installation of the barriers has also resulted in a flattening of the water table on the up gradient and down gradient sides. As water backs up behind the barriers, the head level rises, resulting in a smaller horizontal flow gradient. Due to lower gradients, groundwater travel times at the seepage basins are expected to increase, resulting in reduced transport of contamination to surface water and seeplines.

Base Injection

In 2010, SRS constructed and commenced operations of a base injection system at the H-Area HWMF. The primary objective of the base injection technology at H-Area is to reduce concentrations of metals and radionuclides in the groundwater beneath the wetlands of FMB. Previous injections at the F-Area HWMF have demonstrated that adjusting the acidic groundwater plume to neutral or background pH levels results in reduced concentrations of many metals and radionuclides.

During 2011, SRS continued operation of the base injection system for the H-Area HWMF. The injected solution consisted of sodium hydroxide and sodium bicarbonate mixed with domestic water to a pH of approximately 10. The base solution provides treatment of the acidic groundwater beneath the wetlands and is an integral component of the groundwater barrier remedial system. The system operated throughout 2011 injecting approximately 8.1 million gallons of solution. Table 8 summarizes the period of operation, injected volumes, and average flow rates.

TABLE 8

H-AREA BASE INJECTION FLOW RATE 2011

Tritium Flux

Due to the variability (observed since the start of monthly measurements of tritium flux in 2003), SRS believes it is more appropriate to report an average flux for the entire year. The tritium flux to FMB for 2011 was 56 Ci/yr. This is essentially the same as the flux measured for 2010 (50 Ci/yr). The annual flux is an average of monthly measurements of stream discharge and tritium concentrations in FMB.

SRS has been collecting paired tritium and flow measurements within FMB since 2003. The annual flux from the H-Area HWMF to FMB since 2003 is tabulated in Table 9. Since 2000, including the termination of the pump and treat system, completion of the walls, operation of the base injection system, and modifications to the cap, the annual flux of tritium to FMB has been attenuated by approximately 77 percent (240 Ci/yr in 2000 versus 56 Ci/yr in 2011).

Historically, the flux values measured in FMB span a wide range. Variability in results is believed to be due to environmental factors, such as seasonal variations in precipitation, groundwater discharge rates, volume of surface runoff, natural storage of water within the stream channel, and water releases from the MWMF phytoremediation pond. All of these factors are temporal and influence the ability to calculate flux at the measurement stations.

Table 9. H-Area HWMF Annual Tritium Flux to Fourmile Branch

Year	Tritium Flux (Ci/yr)	Reduction*
2000	240	NA
2003	221	8%
2004	147	39%
2005	114	52%

Year	Tritium Flux (Ci/yr)	Reduction*
2006	116	52%
2007	81	66%
2008	90	62%
2009	67	72%
2010	50	79%
2011	56	77%

*Percent reduction from baseline established in year 2000.

4.0 5.3 Description of the MWMF Corrective Action Program

In accordance with the agreement with SCDHEC, each of the four plume areas will be addressed under separate corrective actions.

SWP

The SWP is the first of the four plume areas addressed for corrective action under the current 2000 RCRA Part B Renewal Application. The SWP is the area to the south of the western section of the ORWBG. This plume area extends from the ORWBG to FMB, with the primary contaminants consisting of tritium and TCE. Both of these groundwater contaminants are currently discharging in a natural seepage area north of FMB at the OFED.

The SWP Module of the Permit, which included approval of the CAP, was issued on September 30, 2003, and became effective on October 30, 2003.

The SWP CAP is in Phase 1 with the following objectives:

- reduction of tritium flux from the SWP Area to FMB by 70 percent
- reduction of volatile organic compound (VOC) concentrations using natural degradation for the entire VOC plume
- minimization of human exposure to constituents of concern in the SWP Area using institutional controls

During 3Q2004, mercury was detected in one POC (point of compliance) well (BGO 33C) with values near the GWPS (2 µg/L). Consequently, mercury was added to the GWPS for the SWP.

The installation of a low permeability cap at the ORWBG was completed, in accordance with the GSACU signed Record of Decision (ROD), in 2007. The Revision 1 PCR/CMIR/RACR was submitted to the USEPA and the SCDHEC on April 24, 2008 and was approved on May 21, 2008 and May 22, 2008, respectively. Final EPA concurrence was received on June 25, 2008. The cap is expected to provide appropriate source control for the SWP mercury plume and other constituents (iodine-129, technetium-99, 1,4-dioxane, etc.), by reducing infiltration and flux to the groundwater. The 2000 Part B Renewal Application for the MWMF, Revision 12, proposed submittal of an ACL demonstration for mercury 48 months following source control at the ORWBG. The 2000 Part B Renewal Application, Revision 17, however, will propose a natural attenuation for the mercury corrective action.

The BSW, BGO, and SWP wells were monitored for mercury, to better determine plume attenuation. Groundwater monitoring in the SWP indicates that mercury is above the GWPS in the proximal and central areas of the plume. However, it is not significantly impacting the pond (0.047J ug/L). The majority of exceedances occur in the LAZ of the UTRA. In 2005 during a detailed evaluation of mercury, there were no exceedances of filtered and unfiltered mercury in the LAZ or the UAZ of the UTRA at the distal portion of the SWP near FMB, which indicates significant mercury attenuation (Figure 5) and the viability of a future ACL.

SRS continues to monitor for mercury in the SWP to further establish the natural attenuation of mercury in the groundwater and to quantify the benefit achieved by installation of a low permeability cap on the ORWBG.

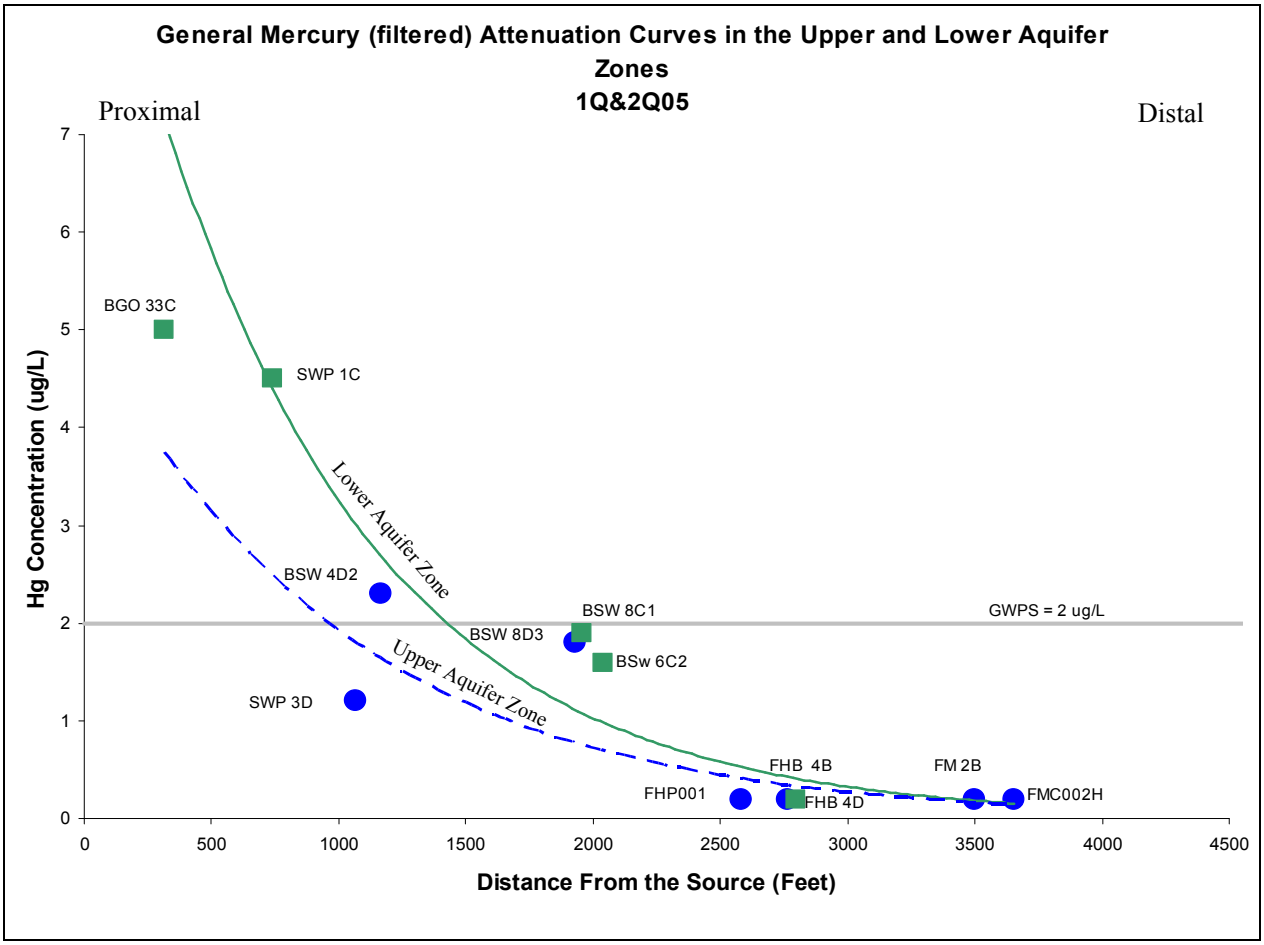


Figure 5. MWMF General Mercury Attenuation Curves (UAZ and LAZ)

SEP

The SEP is located down gradient of the ORWBG and immediately up gradient of the H-Area HWMF. Prior to the H-Area water treatment unit (WTU) injection operations, the tritium concentrations in the UAZ of the UTRA were slightly above the GWPS with a maximum concentration of approximately 43 pCi/mL. Hot spots in the LAZ of the UTRA were present during 1997, and ranged from 200 pCi/mL to 260,000 pCi/mL (BGO 37C) (Figure 6). Operation of the WTU injection wells between 1997 and 2003 has influenced the tritium concentrations in the SEP, as documented in previous CARs. Since the 1990s, tritium concentrations have decreased significantly near the source (ORWBG) in the LAZ of the UTRA. However, the concentrations remain above the GWPS. In 2005, at the time of the previous evaluation, well BGO 37C was approximately 7,350 pCi/mL. Currently the concentration at this well continues to be relatively high (11,000 pCi/mL). Down gradient at assessment wells in the LAZ (close to BGO 37C and the LAZ plume from the H Area WTU injection), concentrations ranged from 750 pCi/mL to 3,660 pCi/mL in 2005. The 2011 results show that the concentrations at these wells have been decreasing over time. The assessment monitoring well that is further down gradient of the injection plume (BSE 3C) was low in concentration (approximately 53 pCi/mL) in 2005. This well continues to be low in concentration (112 pCi/mL), thus demonstrating the slow travel time in the LAZ (Figure 7).

The CAP was submitted for the tritium in the SEP in Revision 6 of the 2000 Part B Renewal Application. The CAP assumed that the SEP tritium would be captured by the H-Area WTU extraction well network (hydraulic control). However, the H-Area WTU was placed in dry lay-up during October 2003 and has been replaced by a subsurface barrier system immediately up gradient and down gradient of the Seepage Basin (H-4) and extending down through the UAZ of the UTRA to the Tan Clay Confining Zone (TCCZ). The barriers will have no effect on the LAZ of the UTRA. The barrier walls will create a longer flow path allowing more time for tritium decay in the UAZ of the

UTRA between the SEP and FMB. The travel time from the SEP to FMB in the LAZ of the UTRA is relatively slow, due to the low hydraulic conductivity. This allows for considerable decay. Preliminary estimates indicate that the travel time in the LAZ of the UTRA will allow for eight (8) to 10 half-lives, thereby reducing a concentration of 7,350 pCi/mL to 20 pCi/mL (Figure 8).

Construction of the low permeability cap at the ORWBG was completed in accordance with the GSACU signed ROD. The cap is expected to reduce infiltration and tritium flux in the SEP. SRS believes that radioactive decay along with the long travel time and the source control for the ORWBG will be sufficient to manage the tritium releases associated with the SEP. SRS will continue to monitor tritium in the SEP to verify the benefit achieved by installation of the H-Area barrier wall and a low permeability cap on the ORWBG.

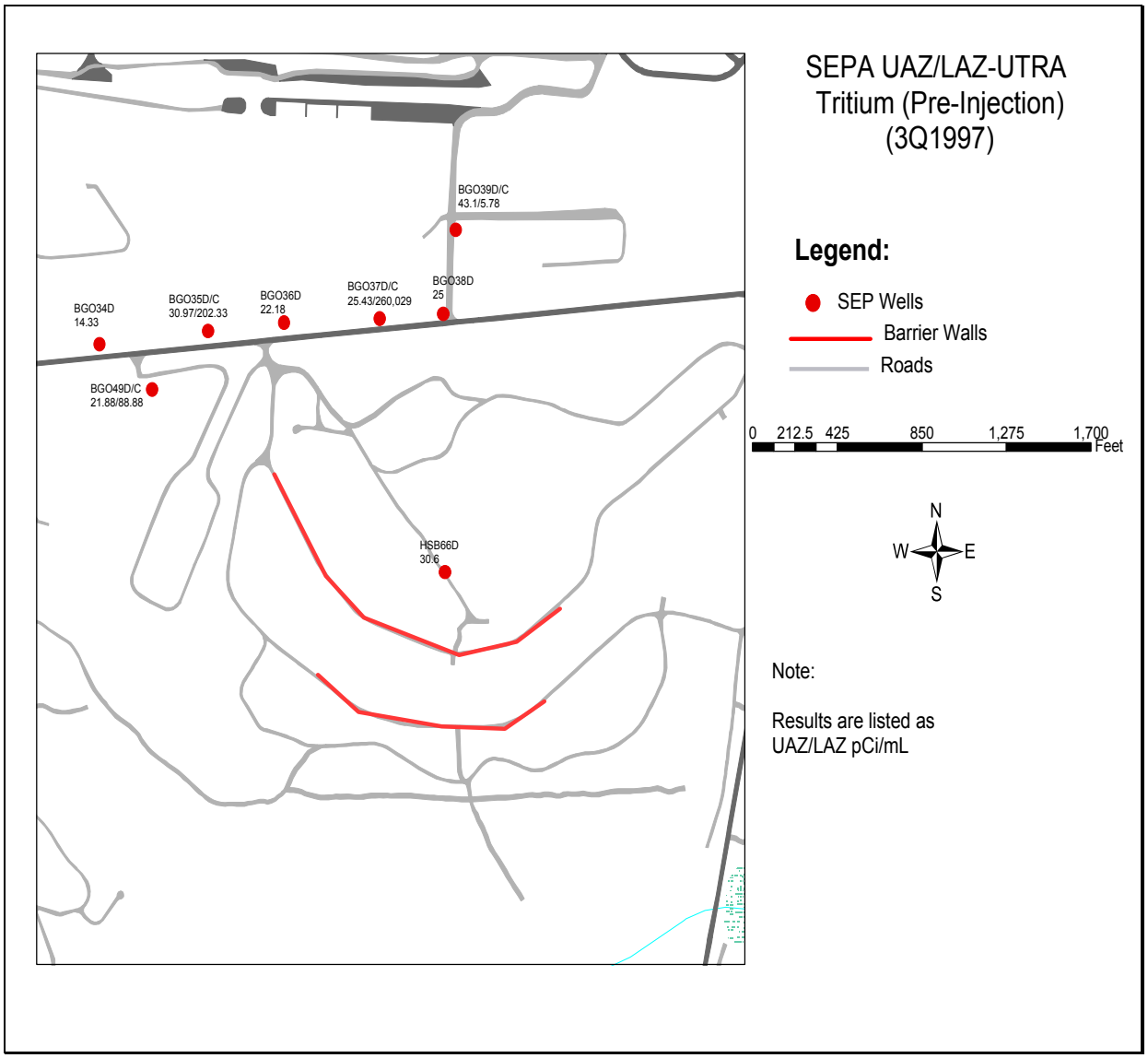


Figure 6. MWMF Southeast Plume Area (UAZ/LAZ-UTRA) Tritium Concentration Pre-Injections

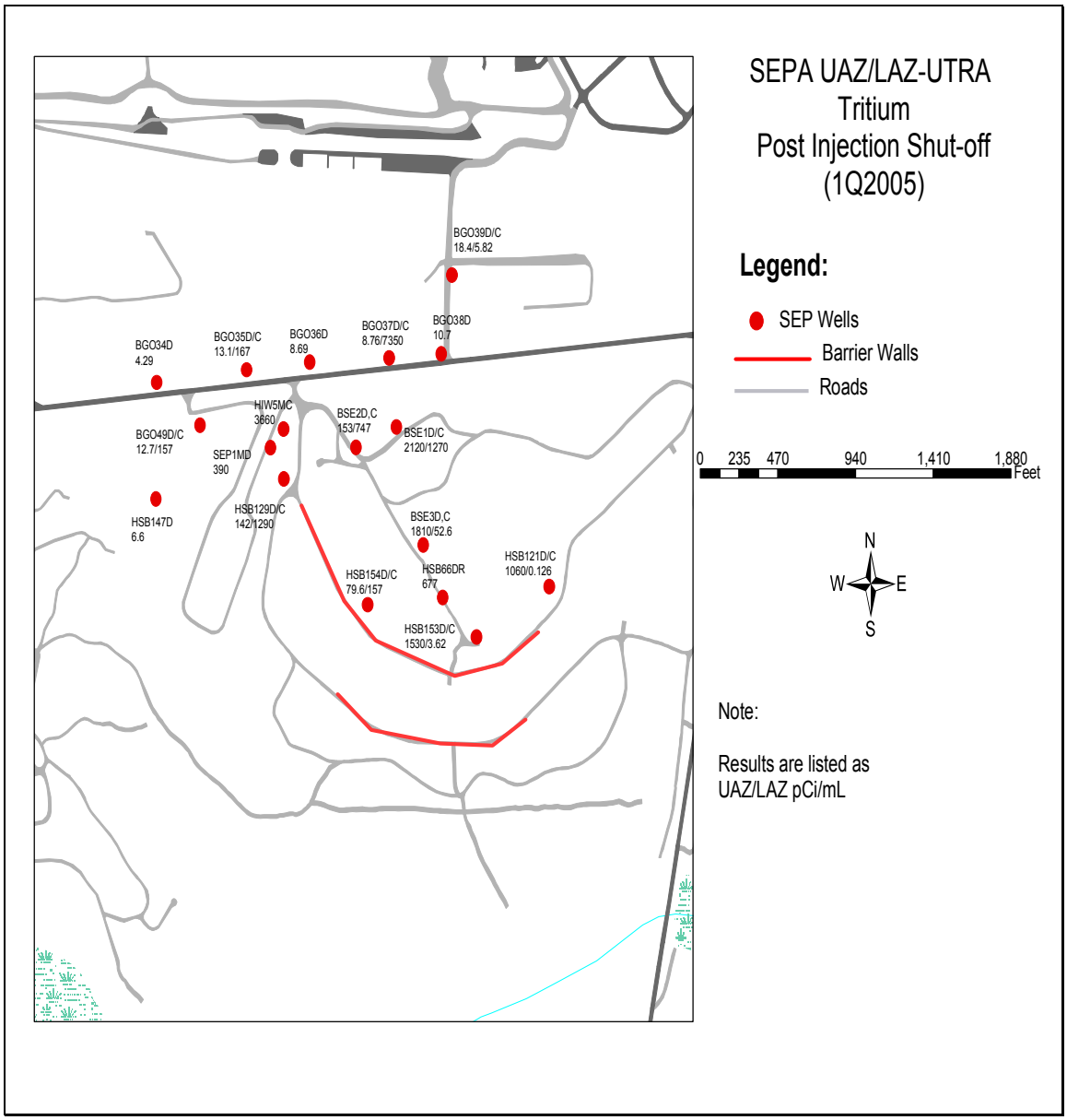


Figure 7. MWMF Southeast Plume Area (UAZ/LAZ/UTRA) Tritium Concentrations Post Injection Shut-Off

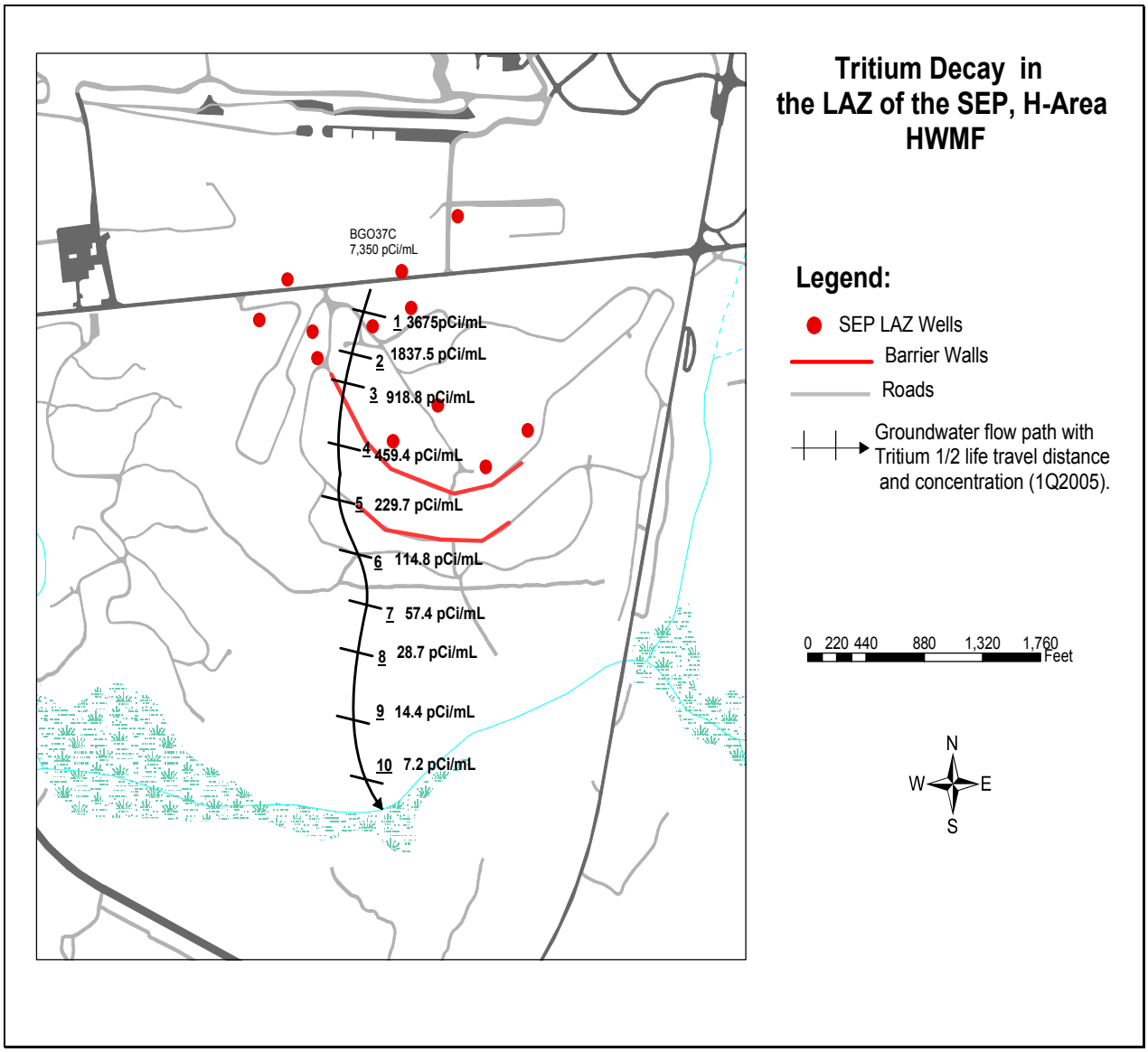


Figure 8. Tritium Decay in the LAZ of the Southeast Plume Area and the H-Area HWMF

5.3.1 MWMF Operational Data

The irrigation system consists of 42 plots. All 42 plots were irrigated as part of the SWP Phytoremediation Project in 2011. Approximately 12.4 million gallons (46.9 million liters) of tritiated water was irrigated on the plots and sprayed over the pond between January 1 and December 31, 2011. The average tritium concentration of the applied water was 3,930 pCi/mL, ranging from 3,170 to 5,440 pCi/mL. Operation of the irrigation system and spray evaporator prevented approximately 177 Ci of tritium from reaching FMB during 2011. It is estimated that an additional 6.6 Ci of tritium evaporated from the pond surface. Table 8 contains the irrigation and spray rates, the average monthly tritium concentrations and the monthly totals of tritium evaporated (in curies).

Table 10. Phytoremediation Irrigation Rates and Tritium Concentrations for 2011

Month	Total Irrigation (G)/Month	Total of Tritium (in Curies) Irrigated to Plots/Month	Total Tritiated Water Sprayed by Evaporator (G)/Month	Total of Tritium (in Curies) Evaporated by Evaporator /Month	Average Tritium Concentrations in the Water/Month (pCi/mL)
January	693,778.9	10.8	0.0**	0.0	3,966
February	1,004,813.2	12.4	0.0**	0.0	3,195
March	1,308,590.8	19.52	106,420.2	0.185	3,804
April	1,419,438.8	24.52	433,713.9	0.84	4,358
May	1,275,465.6	19.78	164,235.6	0.324	4,099.3
June	1,095,572.8	18.63	140,790.1	0.297	4,449.5
July	941,014.3.	14.49	183,372.7	0.362	4,027
August	1,042,580.1	16.13	25,119.6	0.39	4,010
September	831,665.1	13.63	0.0	0.0	4,269.9
October	857,913.1	13.16	0.0	0.0	3,998
November	409,971.6	5.7	0.0	0.0	3,589.1
December	500,100.2	6.55	0.0	0.0	3,393.0
Total	11,380,894.3	174.63	1,053,652.1	2.4	3,929.9

Note: Table depicts approximate rates and concentrations.

***No irrigation due to rainfall/soil saturation.**

****No water sprayed due to low water level in the pond.**

The application rates of pond water to the plots were in accordance with seasonal irrigation schedules derived from calculated soil moisture deficits and pan evaporation rates. The summer schedule (April 15 to October 15) is based on soil moisture deficit. Soil moisture deficit is the difference between evapotranspiration and net precipitation in terms of rainfall and irrigation.

5.3.1.1 Corrective Action Monitoring System

The Corrective Action Monitoring System at the MWMF SWP Phytoremediation Project consist of the monitoring wells specified in the RCRA Permit, pond samples, wetland samples, and surface water samples in FMB. These components are sampled in accordance with the schedule provided in the RCRA Permit. Sampling results are evaluated to determine the effectiveness of the phytoremediation project and reported in the Compliance Monitoring Section of the Annual (April) CAR each year.

The concentration of tritium in the pond water has been decreasing since the start of irrigation, due to radioactive decay of the tritium. Since the installation of the low permeability cap on the ORWBG there has been further reduction in tritium concentration that seems to be significantly greater than the previous decay component. The reduction in tritium concentration and lower pond water volumes in 2011 (volumes lower likely due to drought) resulted in the lower curies irrigated for 2011.

5.3.1.2 Summary of Downtime (IVD.B.10.b.xiii)

Permit Section IVD.B.10.b.xiii requires a summary of any downtime at the SWP Phytoremediation System that exceeds 72 hours and caused by mechanical or equipment failure. There was no downtime event that exceeded 72 hours during 2011 that was due to mechanical or equipment failure.

5.3.1.3 Modifications to System (IVD.B.10.b.ix)

In accordance with the Permit Section IVD.B.10.b.ix, a summary of the modifications to the Correction Action System (SWP Phytoremediation System) is required.

In January 2011, SRS expanded the MWMF Phytoremediation area by approximately 24 acres. The new acreage is located to the east of the original irrigation site over the plume area. The expansion consists of nine new plots and spray piping. The existing distribution piping was utilized for this expansion. Also, the existing twin turbine supply pumps located at the intake structure have the capacity to handle the additional demand without modification. The new expansion provides additional acreage needed to maximize the irrigation capacity, especially during the winter operations, to maintain the pond level as low as possible. It also provides additional irrigation acreage to accommodate any future silvicultural treatment that may be needed.

5.3.2 Effectiveness of the MWMF Corrective Action Program

As part of the effectiveness monitoring, tritium concentration is measured in FMB downstream of the SWP. As illustrated in Figure 10, tritium concentration in FMB dropped approximately 68 percent immediately upon closing the valve during 2000. Tritium concentrations remained at 60 to 80 percent until September 23, 2005, when the pond valve was opened to drain the pond for maintenance and for upgrades to the irrigation system. During this time, tritium concentrations increased in FMB to 642 pCi/mL. During March 2006, the pond valve was closed and tritium concentrations dropped to 111 pCi/mL by April 2006 and have remained between 62 and 200 pCi/mL since that time.

Annually, SREL estimates the evapotranspiration efficiency of the irrigation plots (Appendix G, Volume I). In 2011, evapotranspirative efficiency ranged from 83.8 to 93 percent.

5.3.2.1 Progress and Implementation of the CAPs (IVD.B.10.b.x)

During 2011, the maximum groundwater concentration of 1,4-dioxane in the UAZ of the UTRA was 560 µg/L, which was observed in well SWP004MD. During 2011, the maximum concentration of 1,4-dioxane in the LAZ of the UTRA was 1,100 µg/L observed in well BSW 6C2. The maximum concentration of 1,4-dioxane in surface water was 250 µg/L, which was observed at sampling station ED-01, a seep located to the west and downstream of the pond. Figures 9 and 10 are plume maps for 1,4-dioxane in the UAZ and LAZ.

In the past the concentration of 1,4-dioxane in the SWP was not well understood due to analytical uncertainty. However it was known that 1,4-dioxane was present above the GWPS in the SWP. Some current analytical methods do provide better concentration certainty within the groundwater and the irrigation pond. Pond concentrations are approximately 10 to 20 ug/L. 1,4-dioxane is also present in surface water at ED-01 suggesting leakage along the western end of the pond sheetpile dam. SRS has studied various methods of potentially treating 1,4-dioxane and documented these options in Volume VII, Revision 12 of the MWMF RCRA Permit Application. The 2000 Part B Renewal Application, Revision 17, however, will propose the corrective action for 1,4-dioxane.

The 1,4-dioxane in the SWP is commingled with the tritium, and it is likely that its presence in the plume is as old as the tritium. The age of the plume indicates that the downstream impacts of the 1,4-dioxane will be less in the future.

Current literature indicates that irrigated 1,4-dioxane (in the pond water) will likely degrade to levels that do not represent a threat to receptors or the groundwater. 1,4-dioxane is prone to volatilization and photo-oxidation in air (7 to 10 hour half-life, maximum lifetime of 23 hours) in a spray irrigation setting, and it is reported by researchers to be highly degradable in biologically active soils by filamentous bacteria

and fungus present in the leaf mulch. When tritium is evaporated and transpired to the atmosphere by the spray irrigation it is likely that 1,4-dioxane is volatilized, oxidized, or degraded at a very high efficiency. SRS believes that conditions present in the irrigation plots are favorable for the volatilization, transpiration, and degradation of 1,4-dioxane.

SRS also believes that continuing to manage tritium, cVOCs and 1,4-dioxane with the collection pond and irrigation system is a reasonable approach with a high probability of success. The current system has proven to be effective in managing nearly 70% of the water that is discharging from the plume and was originally impacting FMB. Thus, the long-term corrective action employed for groundwater contamination at the SWP should be the irrigation system (operating at low pond levels to maximize efficiency) coupled with infiltration control via capping of the ORWBG.

Recent additions to irrigation capacity in the eastern and western expansions will help to maximize contaminant flux reductions to FMB, caused by water overflowing the dam and bypassing in the subsurface. SRS plans to continue operation of the system with greater irrigation capacity into the winter months using the two expansion areas. The overall objective is to maintain as low a level as possible in the irrigation pond throughout the year to maximize the volume of water going to the pond from the UAZ and LAZ. Because the LAZ also releases water to the pond, lower water levels will support a maximum groundwater gradient along the sheet pile in the LAZ which is important to minimizing bypass around the pond sheet pile.

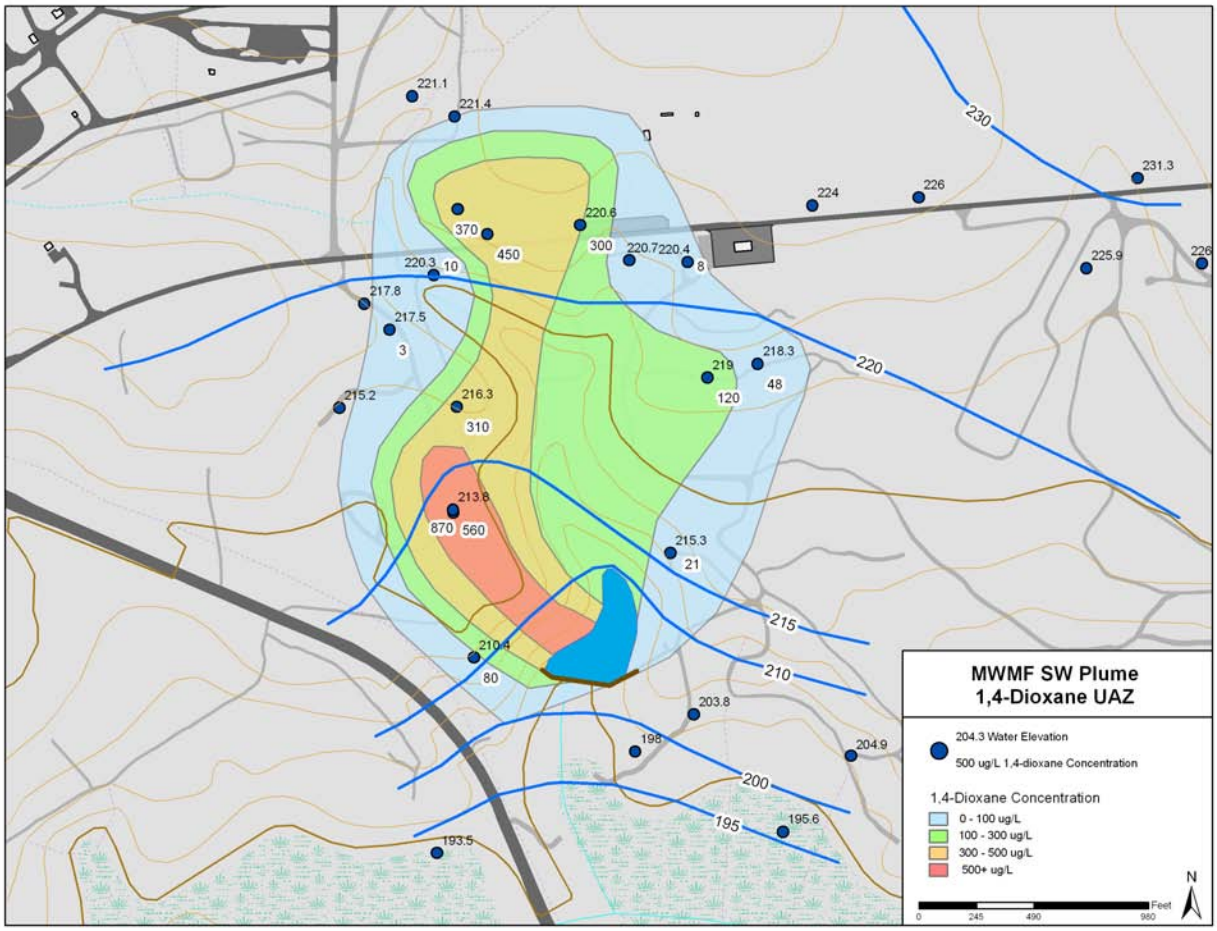


Figure 9. MWMF SW Plume 1,4-dioxane Concentrations in the UAZ

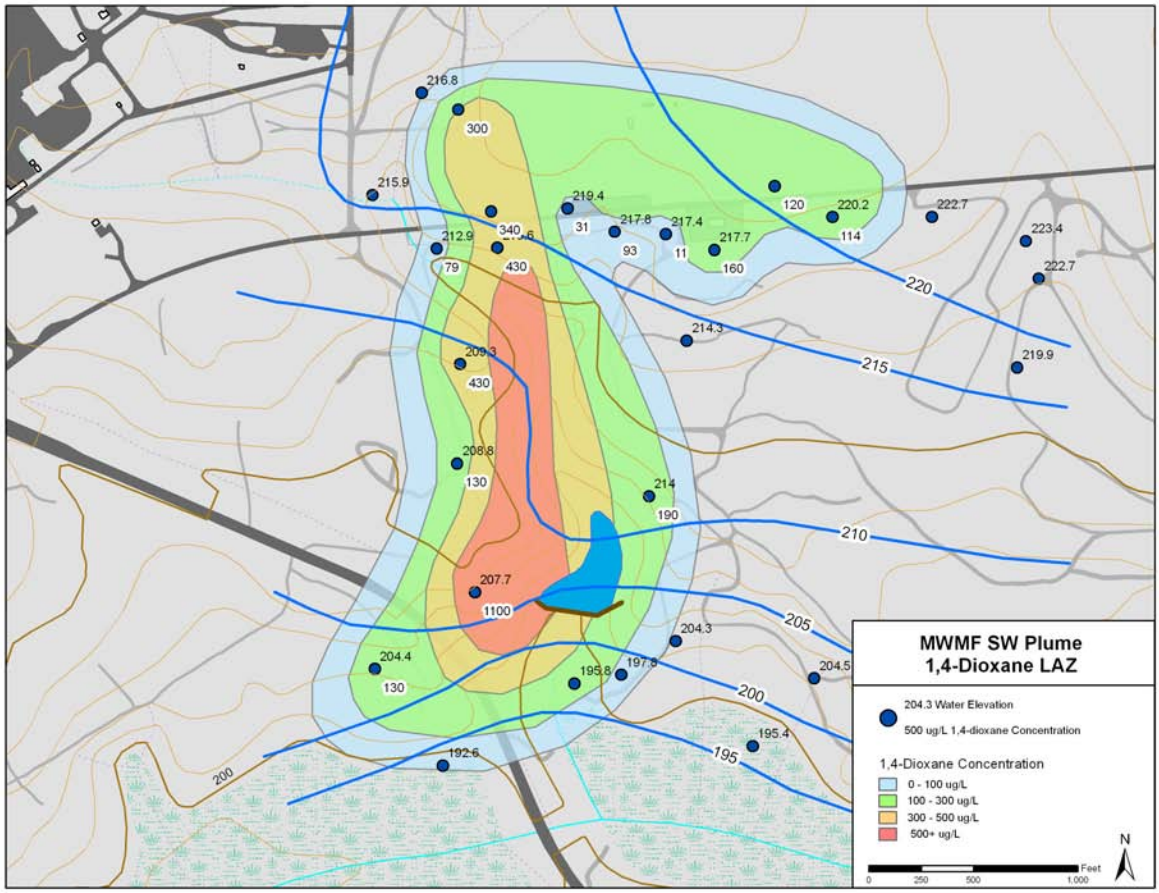


Figure 10. MWMF SW Plume 1,4-dioxane Concentrations in the LAZ

5.3.2.2 VOC Degradation

Relative concentrations of VOC parent and daughter degradation products can give a direct indication of the presence or absence of microbial degradation processes. The production of cis-1,2-dichloroethylene and chloride ions along aquifer flow paths is direct evidence of reductive dechlorination intrinsic bioremediation. The ratios of cis-1,2-dichloroethylene to the total 1,2-dichloroethylene indicate that the 1,2-dichloroethylene is likely of biogenic origin.

SWP

The MWMF SWP monitoring wells were sampled for VOCs during 2011. The ratio of cis-1,2-dichloroethylene to total 1,2-dichloroethylene indicated that the 1,2 dichloroethylene is likely of biogenic origin. Thus, reductions in VOC parents (TCE and PCE) and the presence of cis-1,2-dichloroethylene and chloroethene (vinyl chloride) are reliable indicators of dechlorination within the groundwater system.

SRS believes continued implementation of the SWP Corrective Action Effectiveness Monitoring Program for the VOC degradation component of the CAP, as proposed in Sections E.8.1.3 and E.8.1.4 of the 2000 RCRA Part B Permit Application, is appropriate in lieu of an active groundwater treatment system.

SEP

The MWMF SEP monitoring wells were sampled for VOCs during 2011 (Appendix B). The lower hydraulic conductivity in the LAZ aquifer is thought to be beneficial to VOC degradation. The low flow conditions cause an increase in travel time within the aquifer, creating greater opportunity for degradation before discharging to surface water in FMB. The highest concentration of VOCs is associated with the BGO 37C well, which had a

concentration of 160 µg/L of TCE in 1997. By 2003, the TCE concentration in the well had decreased to 126 µg/L and currently remains low at 82 ug/L. The drop in concentration is attributed to natural degradation.

The extent of VOC degradation within the SEP was further evaluated from 2001 to 2011, using the BGO and BSE well series data. VOC degradation product ratios from these wells were plotted on three-phase diagrams to better understand the degree of natural degradation. The classification of the extent of the degradation derived from the diagrams was used to develop a degradation map of the SEP. The overall assessment of the VOC degradation within the plume suggests that it is moderately well advanced and should be sufficient to eliminate the potential for release to FMB.

Concentrations of VOCs within the groundwater beneath the source area in the ORWBG will likely be reduced by infiltration control. A low permeability cap is part of a ROD for the ORWBG. Installation of the cap has been completed.

5.3.2.3 Time Trend Analysis of the Corrective Action Program

The sheet pile dam and Phytoremediation System are continuing to effectively reduce the tritium concentrations in FMB. Since closure of the valve, tritium concentrations have remained 60 to 80 percent lower until 2005, when the pond valve was opened to empty the pond for maintenance and upgrades. After this time, the tritium concentration increased in FMB until 2006, when the pond valve was again closed (see Figure 11). The maintenance actions and upgrades were necessary in order to improve wintertime operation, maintain pond volume at a low level to drive groundwater toward the pond, and to prevent water from outcropping from under the dam. After a review of the upgraded irrigation system, SRS determined that the new system was adequate to supply water for additional irrigation acreage. Therefore, SRS is expanding the irrigation area at MWMF SWP. The eastern expansion was an expansion to the east consisting of 24 acres, which was completed in January 2011. The future western expansion will consist of approximately 17 acres and will be located to the west of original irrigation plots.

Conditional approval of the western expansion has been received and construction is currently under way.

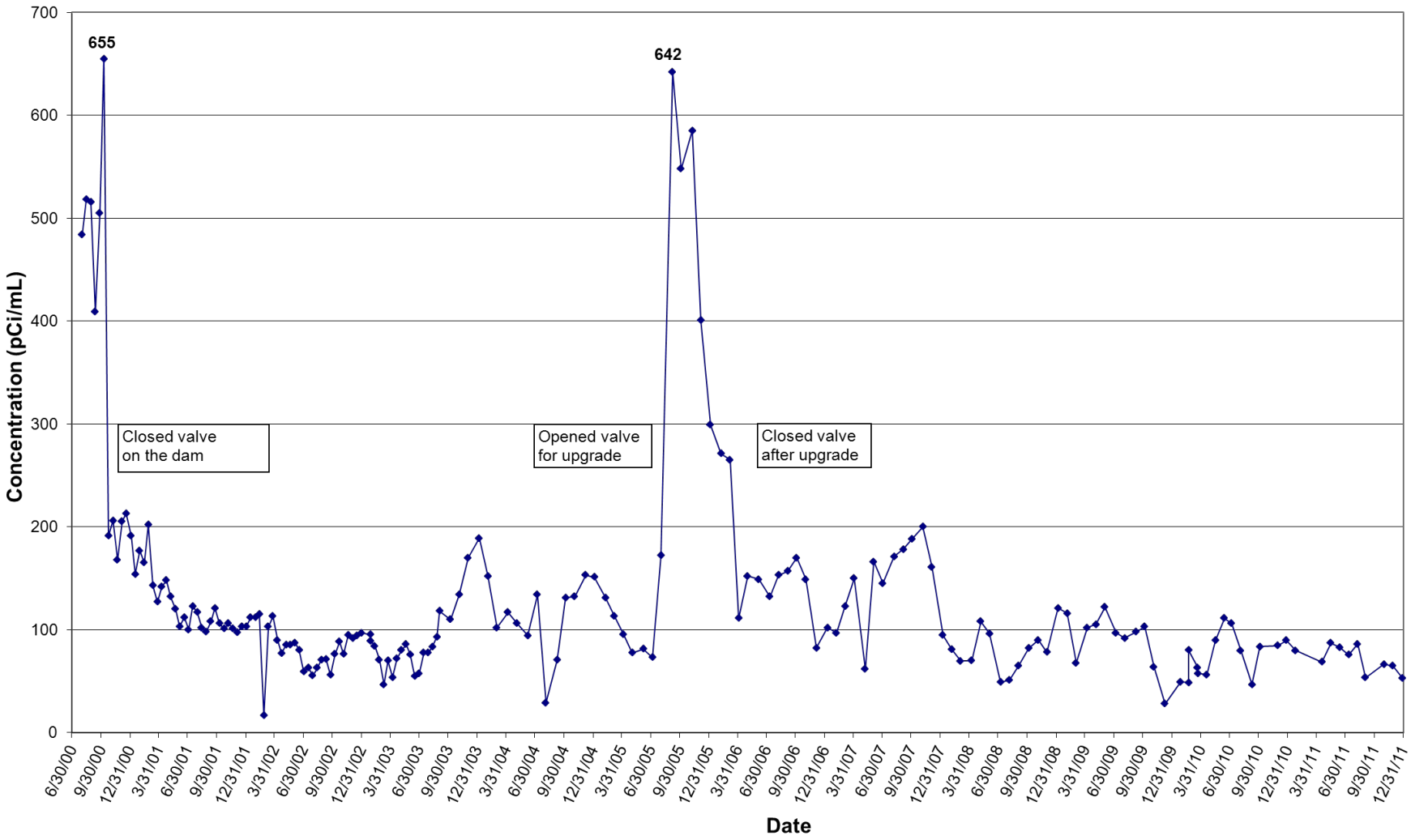


Figure 11. Tritium Concentrations in Fourmile Branch

6.0 CONCLUSION

6.1 F-Area HWMF and H-Area HWMF

Compliance monitoring data for the F-Area HWMF and the H-Area HWMF indicated several organics, inorganics, and radiological constituents exceeded the GWPS. Nitrate-nitrite (inorganic) and tritium (radiological) were the most widespread. Overall, concentrations of most constituents continue to decrease over time.

As discussed in previous CARs, radiological contamination is present at the F and H Area Seepage Basins seepline (soils, vegetation, and groundwater). At the seeplines of FMB, cadmium, cobalt, nitrate, carbon-14, iodine-129, strontium-90, radium, uranium-238 and tritium were the constituents that exceeded the GWPS. Surface water sampling within the FMB revealed that carbon-14, iodine-129, and tritium exceeded the GWPS in FMB. However, only iodine-129 and tritium exceeded at multiple locations in FMB.

The base injection and barriers at the F-Area and the H-Area HWMFs are having a positive effect on the aquifer. In 2011, the base injection system operated for two months treating the wetlands at the F-Area HWMF. Approximately 1.1 million gallons of base solution were injected into the groundwater beneath the wetlands. At H-Area, the base injection operated over the entire year and injected 8.1 million gallons into the groundwater beneath the wetlands. During 2011, the flux of tritium was approximately 117 Ci/yr indicating a return to normal levels after the slight increase in 2010. To date the flux of tritium at F-Area has been attenuated by as much as 80 percent. At H-Area the tritium flux remained low in 2011. The flux was measured at 56 Ci/yr, which is a reduction of 77 percent over the baseline flux established in 2000 for H-Area. Tritium concentrations in FMB along H-Area are also approaching the GWPS.

A new remedial technology was successfully implemented in 2011. A suspension of ultra-fine ground silver chloride particles mixed with domestic water was injected into

the plume at the middle gate during September of 2011 in accordance with an approved UIC permit. Based on sample results obtained to date, the concentration of iodine-129 has been reduced by approximately 40 to 70 percent. SRS believes deployment of this technology will have a positive effect and will reduce discharges of iodine-129 to FMB. In addition to the silver chloride, an extension to the barrier was added along the east side in 2011. The extension consists of 1,150 feet of new barrier and a gate.

The statistical evaluation of the effect of the base injection and the barriers at the F-Area and the H-Area HWMFs continues to be relevant and indicates, during this reporting period, that the remedial actions are having a positive effect on the aquifer. An evaluation of the tritium concentration in vicinity of the barriers at both the F-Area and H-Area indicates that the barrier systems are lowering concentrations down gradient of the barriers. Tritium flux for both F- and H-Areas (117 and 56 ci/yr respectively in 2011) reach of FMB also are lower than previous determinations, which suggests that the barriers are having the desired effects.

During detection monitoring in 2011, no new constituents were added to the GWPS. However, aniline was detected above the EQL in well FSB 94C. Confirmation sampling also detected aniline, but the concentration was at the detection limit and thus, it was not proposed for inclusion as a GWPS constituent. However, SRS will continue to monitor for aniline in FSB 94C during the 2012 Appendix IX sampling. In 2010, isobutanol was detected at FSB 90D from the fermentation of molasses at the Arcadis enhanced Anaerobic Reductive Precipitation pilot test area. Injections of molasses were completed in 2010 and in 2011 isobutanol was not detected.

6.2 MWMF

Compliance monitoring for the MWMF indicated several constituents exceeded the GWPS. Tritium and TCE were the primary constituents at all four plume areas. The other constituents detected slightly above the GWPS are believed to have no significant impact on the existing corrective action system at the SWP area.

Wetland piezometer sampling performed along FMB indicated tritium was the most widespread contaminant. Surface water sampling conducted at the FMB and UTR indicated tritium was the primary constituent.

Detection monitoring indicated that two (2) constituents not on the current GWPS (endrin and 1,2-dichlorobenzene) were detected in selected POC wells during the MWMF annual Appendix IX and CRML sampling. Neither of the detections were confirmed by subsequent sampling and analysis performed by SRS.

The MWMF phytoremediation system had a positive effect on FMB by reducing the amount of tritium reaching FMB during 2011. The MWMF phytoremediation system irrigated and sprayed approximately 12.4-million gallons (46.9 million liters) in 2011 preventing approximately 177 Ci from reaching FMB. In addition, approximately 6.6 Ci directly evaporated from the surface of the collection pond. Approximately 84 to 93 percent of the tritium irrigated over the plots was transferred to the atmosphere.

In 2011, SRS operated the upgraded irrigation system that includes the eastern expansion of 24 acres. Also, SRS recently received conditional approval to further expand the area under irrigation to the west by approximately 17 acres. The western expansion is scheduled to begin construction in 2012.

VOC monitoring at the MWMF during 2011 continues to support the conclusion that degradation is occurring within the groundwater system. Therefore, SRS believes continued implementation of the SWP Corrective Action Effectiveness Monitoring Program for the VOC degradation component of the CAP is appropriate in lieu of an active groundwater treatment system.

The low permeability cap, recently placed on the ORWBG, is expected to reduce groundwater contamination concentrations in the SWP, the SEP, and the NWP. Contaminant concentrations in the NEP may also be affected. SRS believes the effects of capping should be determined prior to future RCRA decisions.

7.0 APPENDICES

Volume I

Appendix A Mixed Waste Management Facility Well Construction Data

Appendix B F-Area, H-Area, and Mixed Waste Management Facility Groundwater and Surface Water Monitoring Results Tables

Appendix C Mixed Waste Management Facility Analytical Data First Quarter 2011 – Fourth Quarter 2011, and 2010

Appendix D F-Area, H-Area, and Mixed Waste Management Facility Hydrographs

Appendix E F-Area, H-Area, and Mixed Waste Management Facility Time Series Plots

Appendix F Statistical Evaluation

Appendix G SREL Evapotranspiration Study

Volume II

Appendix H General Separations Area Location Maps, Isoconcentrations, Potentiometric Maps, and Isoconcentration/Cross Sections

APPENDIX A

MIXED WASTE MANAGEMENT FACILITIES

WELL CONSTRUCTION DATA

THIS PAGE INTENTIONALLY LEFT BLANK

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BGO 1D	BGO 01D	9/10/1987	PVC	4	20	295.3	293	48	68	245	225	3682856	438984	
BGO 2D	BGO 02D	8/12/1987	PVC	4	20	297	297.74	56	76	241.74	221.74	3683062	438846	
BGO 3A	BGO 03A	5/13/1994	PVC	2	10	291.9	288.7	175	185	113.7	103.7	3683310	438664	
BGO 3C	BGO 03C	5/13/1994	PVC	2	10	291.9	288.7	100	110	188.7	178.7	3683307	438666	
BGO 3DR	BGO 03D(R)	10/23/1995	*PVC*	*2*	20.1	291.8	289.3	51.7	71.8	237.6	217.5	3683301	438676	
BGO 4D	BGO 04D	8/13/1987	PVC	4	20	297.5	295.6	55	75	240.6	220.6	3683455	438558	
BGO 5C	BGO 05C	9/4/1987	PVC	4	10	296.1	294.2	101	111	193.2	183.2	3683534	438497	
BGO 5D	BGO 05D	9/4/1987	PVC	4	20	296.3	294.2	54.9	74.9	239.3	219.3	3683532	438494	
BGO 6A	BGO 06A	10/8/1987	PVC	4	10	285.8	283.8	166.3	176.3	117.5	107.5	3683450	438377	
BGO 6B	BGO 06B	3/18/1992	*PVC*	*4*	10	287	284.5	134.8	144.8	149.7	139.7	3683472	438373	
BGO 6C	BGO 06C	9/2/1987	PVC	4	10	285.8	283.5	115.5	125.5	168	158	3683449	438375	
BGO 6D	BGO 06D	8/31/1987	PVC	4	20	285.7	283.2	46	66	237.2	217.2	3683447	438372	
BGO 7D	BGO 07D	8/15/1987	PVC	4	20	287.2	285.2	45	65	240.2	220.2	3683381	438277	
BGO 8AR	BGO 08A(R)	2/25/1991	PVC	4	10	286.8	284.6	180	190	104.6	94.6	3683353	438185	
BGO 8C	BGO 08C	8/28/1987	PVC	4	10	288	285.8	101.5	111.5	184.3	174.3	3683348	438189	
BGO 8D	BGO 08D	8/28/1987	PVC	4	20	288	285.6	45	65	240.6	220.6	3683350	438187	
BGO 9AA	BGO 09AA	7/10/1991	*PVC*	*4*	10	285	282.8	199	209	83.8	73.8	3683401	438057	
BGO 9D	BGO 09D	8/20/1987	*PVC*	*4*	20	285.3	283.2	54	74	229.2	209.2	3683380	438113	
BGO 10AA	BGO 10AA	8/21/1991	*PVC*	*4*	10	300.9	298.8	208	218	90.8	80.8	3683338	437959	
BGO 10AR	BGO 10A(R)	2/20/1991	*PVC*	*4*	10	300.7	298.5	192	202	106.5	96.5	3683304	438011	
BGO 10B	BGO 10B	8/21/1991	*PVC*	*4*	10	301.1	299	150	160	149	139	3683332	437959	
BGO 10C	BGO 10C	9/15/1987	*PVC*	*4*	10	301.5	299.3	132	142	167.3	157.3	3683300	438006	
BGO 10DR	BGO 10D(R)	2/8/1991	*PVC*	*4*	20	300.6	298.3	60	80	238.3	218.3	3683306	438014	
BGO 11DR	BGO 11D(R)	9/7/1995	*PVC*	*4*	19.9	305.5	302.9	69.9	89.8	233	213.1	3683241	437902	
BGO 12AX	BGO 12A(X)	10/3/1995	*PVC*	*4*	10	313.1	310.5	201	211	109.5	99.5	3683167	437808	
BGO 12CX	BGO 12C(X)	9/12/1995	*PVC*	*4*	20.1	313.9	311.3	78.5	98.6	232.8	212.7	3683159	437797	
BGO 12DR	BGO 12D(R)	9/29/1995	*PVC*	*4*	10	313.6	311	159.8	169.8	151.2	141.2	3683162	437801	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BGO 13DR	BGO 13D(R)	2/27/1991	*PVC*	*4*	10	319.5	317.3	97	107	220.3	210.3	3683090	437707	
BGO 14AR	BGO 14A(R)	3/5/1991	*PVC*	*4*	10	300.9	298.7	191.9	201.9	106.8	96.8	3682964	437779	
BGO 14CR	BGO 14C(R)	3/5/1991	*PVC*	*4*	10	300.7	298.4	98.3	108.3	200.1	190.1	3682960	437781	
BGO 14DR	BGO 14D(R)	3/8/1991	*PVC*	*4*	20	300.4	298.2	60.1	80.1	238.1	218.1	3682957	437784	
BGO 15D	BGO 15D	8/25/1987	*PVC*	*4*	20	298.8	296.7	58	78	238.7	218.7	3682883	437864	
BGO 16AR	BGO 16A(R)	7/22/1992	*PVC*	*4*	10	303.8	301.6	187.9	197.9	113.7	103.7	3682891	437993	
BGO 16B	BGO 16B	2/20/1992	*PVC*	*4*	10	305.3	302.9	156.9	166.9	146	136	3682891	437981	
BGO 16D	BGO 16D	8/24/1987	*PVC*	*4*	20	304.8	302.3	65	85	237.3	217.3	3682890	437988	
BGO 17DR	BGO 17D(R)	4/30/1992	*PVC*	*4*	20	299.4	296.9	60	80	236.9	216.9	3682890	438065	
BGO 18A	BGO 18A	10/30/1987	*PVC*	*4*	10	295.3	292.9	183.4	193.4	109.5	99.5	3682942	438138	
BGO 18D	BGO 18D	11/4/1987	*PVC*	*4*	20	295.1	292.6	53	73	239.6	219.6	3682944	438141	
BGO 19DR	BGO 19D(R)	10/19/1995	*PVC*	*4*	20	294.2	291.6	74.9	94.9	216.7	196.7	3682940	438177	
BGO 20A	BGO 20A	1/27/1995	*PVC*	*4*	10	283.9	281.3	185	195	96.3	86.3	3682858	438350	
BGO 20AA	BGO 20AA	1/17/1995	*PVC*	*4*	10	283.6	281.3	253	263	28.3	18.3	3682852	438351	
BGO 20B	BGO 20B	2/21/1995	*PVC*	*4*	10	283.5	281	140	150	141	131	3682858	438358	
BGO 20C	BGO 20C	3/2/1995	*PVC*	*4*	10	283.5	281	97	107	184	174	3682852	438357	
BGO 20D	BGO 20D	3/2/1988	*PVC*	*4*	20	283.7	281.3	45	65	236.3	216.3	3682859	438354	
BGO 21D	BGO 21D	11/11/1987	*PVC*	*4*	20	285.6	283	45.3	65.3	237.7	217.7	3682856	438491	
BGO 22DX	BGO 22D(X)	6/14/1996	*PVC*	*4*	20	286.1	283.35	45.5	65.5	237.85	217.85	3682878	438588	
BGO 23D	BGO 23D	8/6/1987	*PVC*	*4*	20	289.4	287	45	65	242	222	3682863	438735	
BGO 24D	BGO 24D	7/29/1987	*PVC*	*4*	20	293.4	291	50	70	241	221	3682863	438851	
BGO 25A	BGO 25A	10/19/1987	*PVC*	*4*	10	296.6	294.7	180.6	190.6	114.1	104.1	3682895	437784	
BGO 26A	BGO 26A	3/15/1989	*PVC*	*4*	10	287.4	285.1	194.1	204.1	91	81	3682774	437625	
BGO 26D	BGO 26D	12/2/1988	*PVC*	*4*	20.1	285.7	283.5	50	70.1	233.5	213.4	3682770	437628	
BGO 27C	BGO 27C	3/17/1989	*PVC*	*4*	9	276.2	273.9	110	119	163.9	154.9	3682595	437626	
BGO 27D	BGO 27D	12/5/1988	*PVC*	*4*	20	276.6	274.3	45	65	229.3	209.3	3682599	437627	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BGO 28D	BGO 28D	12/16/1988	*PVC*	*4*	20	277.7	275.1	45	65	230.1	210.1	3682478	437631	
BGO 29A	BGO 29A	2/17/1989	*PVC*	*4*	10	264.4	262.1	149.6	159.6	112.5	102.5	3682466	437506	
BGO 29C	BGO 29C	11/14/1991	*PVC*	*4*	10	265	262.8	76	86	186.8	176.8	3682470	437501	
BGO 29D	BGO 29D	11/13/1991	*PVC*	*4*	20	265.6	263.5	35	55	228.5	208.5	3682474	437499	
BGO 30C	BGO 30C	4/5/1989	PVC	4	10	274.7	272.6	84.2	94.2	188.4	178.4	3682446	437674	
BGO 30D	BGO 30D	2/6/1989	PVC	4	20	275	272.8	45	65	227.8	207.8	3682446	437670	
BGO 31C	BGO 31C	4/5/1989	PVC	4	10	273.3	271.1	84.7	94.7	186.4	176.4	3682451	437785	
BGO 31D	BGO 31D	2/11/1989	PVC	4	20	273.9	271.6	40.5	60.5	231.1	211.1	3682457	437790	
BGO 32D	BGO 32D	12/16/1988	PVC	4	20	281.9	279.5	45	65	234.5	214.5	3682467	437937	
BGO 33C	BGO 33C	4/4/1989	PVC	4	10	279.6	277.4	89.6	99.6	187.8	177.8	3682483	438088	
BGO 33D	BGO 33D	12/6/1988	PVC	4	20	280.5	278.1	45	65	233.1	213.1	3682483	438093	
BGO 34D	BGO 34D	12/7/1988	PVC	4	20	275.1	272.7	40	60	232.7	212.7	3682493	438232	
BGO 35C	BGO 35C	4/3/1989	PVC	4	10	273.7	271.4	99.5	109.5	171.9	161.9	3682509	438395	
BGO 35D	BGO 35D	12/8/1988	PVC	4	20	273.8	271.4	32	52	239.4	219.4	3682509	438399	
BGO 36D	BGO 36D	12/8/1988	PVC	4	20	275.7	273.3	30	50	243.3	223.3	3682518	438517	
BGO 37C	BGO 37C	3/31/1989	PVC	4	10	286.5	284.3	105.5	115.5	178.8	168.8	3682528	438658	
BGO 37D	BGO 37D	12/9/1988	PVC	4	20	287.5	285.1	39	59	246.1	226.1	3682529	438662	
BGO 38D	BGO 38D	12/15/1988	PVC	4	20	291.8	289.3	47	67	242.3	222.3	3682536	438756	
BGO 39A	BGO 39A	9/12/1994	*PVC*	*2*	10	296.4	293.7	198.9	208.9	94.8	84.8	3682644	438778	
BGO 39C	BGO 39C	9/12/1994	PVC	2	10	296.9	293.6	108.7	118.7	184.9	174.9	3682640	438778	
BGO 39D	BGO 39D	12/14/1988	PVC	4	20	295.9	293.7	49	69	244.7	224.7	3682648	438778	
BGO 40D	BGO 40D	3/14/1991	PVC	4	9.9	288.5	286.4	59.9	69.8	226.5	216.6	3682702	437536	
BGO 41A	BGO 41A	5/24/1991	*PVC*	*4*	10	300.5	298.3	185	195	113.3	103.3	3682924	437663	
BGO 42C	BGO 42C	5/10/1991	*PVC*	*4*	10	298.1	295.9	100	110	195.9	185.9	3682929	437704	
BGO 43A	BGO 43A	4/26/1991	*PVC*	*4*	10	315.1	312.9	197	207	115.9	105.9	3683222	437766	
BGO 43AA	BGO 43AA	4/1/1991	*PVC*	*4*	10	314.5	312.2	240	250	72.2	62.2	3683226	437769	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BGO 43CR	BGO 43C(R)	6/6/1991	*PVC*	*4*	10	315.5	313.4	125	135	188.4	178.4	3683213	437767	
BGO 43D	BGO 43D	4/29/1991	*PVC*	*4*	10	315.5	313.2	105	115	208.2	198.2	3683218	437763	
BGO 44A	BGO 44A	7/18/1991	*PVC*	*4*	10	285.5	283	175	185	108	98	3683433	438214	
BGO 44AA	BGO 44AA	6/18/1991	*PVC*	*4*	10.1	285.4	283.3	212	222.1	71.3	61.2	3683439	438221	
BGO 44B	BGO 44B	6/27/1991	*PVC*	*4*	10	285.3	283.1	125	135	158.1	148.1	3683436	438218	
BGO 44C	BGO 44C	6/21/1991	*PVC*	*4*	10	285.7	283.4	82.8	92.8	200.6	190.6	3683441	438225	
BGO 44D	BGO 44D	6/13/1991	*PVC*	*4*	10	285.6	283.4	50	60	233.4	223.4	3683445	438228	
BGO 45A	BGO 45A	3/6/1991	*PVC*	*4*	10	279.1	276.9	150	160	126.9	116.9	3682613	437567	
BGO 45B	BGO 45B	3/8/1991	*PVC*	*4*	10	278.7	276.6	129.6	139.6	147	137	3682618	437569	
BGO 45C	BGO 45C	3/11/1991	*PVC*	*4*	10	278.8	276.5	76	86	200.5	190.5	3682619	437573	
BGO 45D	BGO 45D	3/14/1991	*PVC*	*4*	20	278.8	276.6	47	67	229.6	209.6	3682625	437572	
BGO 46B	BGO 46B	11/12/1991	*PVC*	*4*	10	265.6	263.4	113	123	150.4	140.4	3682393	437688	
BGO 46C	BGO 46C	11/19/1991	*PVC*	*4*	10	265.2	263	75	85	188	178	3682393	437683	
BGO 46D	BGO 46D	11/19/1991	*PVC*	*4*	10	265.3	263.1	51	61	212.1	202.1	3682394	437678	
BGO 47A	BGO 47A	4/15/1991	*PVC*	*4*	10	267	264.8	168	178	96.8	86.8	3682407	437854	
BGO 47C	BGO 47C	4/22/1991	*PVC*	*4*	10	267.8	265.6	77	87	188.6	178.6	3682416	437855	
BGO 47D	BGO 47D	4/17/1991	*PVC*	*4*	10	267.6	265.4	52	62	213.4	203.4	3682411	437855	
BGO 48C	BGO 48C	5/6/1991	*PVC*	*4*	10	276.8	274.7	88	98	186.7	176.7	3682413	437929	
BGO 48D	BGO 48D	5/9/1991	*PVC*	*4*	10	277.1	275	63	73	212	202	3682409	437931	
BGO 49A	BGO 49A	5/14/1991	*PVC*	*4*	10	271.4	269.1	184	194	85.1	75.1	3682435	438320	
BGO 49C	BGO 49C	5/24/1991	*PVC*	*4*	10	271.3	269	93	103	176	166	3682438	438317	
BGO 49D	BGO 49D	5/24/1991	*PVC*	*4*	20	271.7	269.5	31	51	238.5	218.5	3682441	438314	
BGO 50A	BGO 50A	11/27/1991	*PVC*	*4*	10	255.6	253.5	153	163	100.5	90.5	3682392	437589	
BGO 50C	BGO 50C	11/27/1991	*PVC*	*4*	10	255.7	253.5	81	91	172.5	162.5	3682392	437595	
BGO 50D	BGO 50D	11/27/1991	*PVC*	*4*	20	256.2	254	26	46	228	208	3682392	437599	
BGO 51A	BGO 51A	6/3/1994	*PVC*	*4*	10	289.6	287.1	202	212	85.1	75.1	3682785	438682	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BGO 51AA	BGO 51AA	5/31/1994	*PVC*	*4*	10	289.5	287.2	248	258	39.2	29.2	3682785	438692	
BGO 51B	BGO 51B	6/7/1994	*PVC*	*4*	10	289.4	286.9	160	170	126.9	116.9	3682785	438685	
BGO 51C	BGO 51C	6/8/1994	*PVC*	*4*	10	289.3	287.1	102	112	185.1	175.1	3682785	438687	
BGO 51D	BGO 51D	6/8/1994	*PVC*	*4*	20	289.6	287.1	47	67	240.1	220.1	3682785	438690	
BGO 52A	BGO 52A	9/14/1994	*PVC*	*4*	10	284.4	281.7	190	200	91.7	81.7	3682790	438431	
BGO 52AA	BGO 52AA	8/11/1994	*PVC*	*4*	10	284.5	281.6	235	245	46.6	36.6	3682791	438428	
BGO 52B	BGO 52B	9/19/1994	*PVC*	*4*	10	284.4	281.7	145	155	136.7	126.7	3682790	438433	
BGO 52C	BGO 52C	9/23/1994	*PVC*	*4*	10	284.5	281.4	92.7	102.7	188.7	178.7	3682790	438435	
BGO 52D	BGO 52D	9/23/1994	*PVC*	*4*	20	284.8	282.1	42.7	62.7	239.4	219.4	3682790	438438	
BGO 53A	BGO 53A	12/1/1994	*PVC*	*4*	10	291.5	288.7	200	210	88.7	78.7	3682829	437739	
BGO 53AA	BGO 53AA	11/18/1994	*PVC*	*4*	10	291.78	288.9	240	250	48.9	38.9	3682829	437742	
BGO 53B	BGO 53B	12/2/1995	*PVC*	*4*	10	291.5	288.6	135.1	145.1	153.5	143.5	3682829	437736	
BGO 53C	BGO 53C	12/2/1994	*PVC*	*4*	10	291.3	288.4	95.2	105.2	193.2	183.2	3682829	437733	
BGO 53D	BGO 53D	12/7/1994	*PVC*	*4*	20	292	289	43.7	63.7	245.3	225.3	3682826	437742	
BGX 1A	BGX 01A	4/12/1991	*PVC*	*4*	10	291.3	289.1	165	175	124.1	114.1	3683584	438383	
BGX 1C	BGX 01C	4/25/1991	*PVC*	*4*	10	291.4	289.3	103.3	113.3	186	176	3683583	438387	
BGX 1D	BGX 01D	4/29/1991	*PVC*	*4*	20	291.4	289.2	54.5	74.5	234.7	214.7	3683582	438391	
BGX 2B	BGX 02B	2/15/1991	*PVC*	*4*	10	291.5	289.2	142	152	147.2	137.2	3683616	438234	
BGX 2D	BGX 02D	3/1/1991	*PVC*	*4*	10	291.3	289.1	98	108	191.1	181.1	3683615	438238	
BGX 3D	BGX 03D	2/7/1991	*PVC*	*4*	20	291.4	289.1	67.5	87.5	221.6	201.6	3683623	438050	
BGX 4A	BGX 04A	1/22/1991	*PVC*	*4*	10	291	288.8	172	182	116.8	106.8	3683596	437856	
BGX 4C	BGX 04C	1/29/1991	*PVC*	*4*	10	290.9	288.7	108	118	180.7	170.7	3683595	437852	
BGX 4D	BGX 04D	1/29/1991	*PVC*	*4*	20	291.1	288.8	65	85	223.8	203.8	3683594	437846	
BGX 5D	BGX 05D	2/5/1991	*PVC*	*4*	20	285.2	283	68	88	215	195	3683741	437785	
BGX 6D	BGX 06D	4/15/1991	*PVC*	*4*	20	277.2	275	64	84	211	191	3683863	437778	
BGX 7D	BGX 07D	4/12/1991	*PVC*	*4*	20	279.4	277.1	63	83	214.1	194.1	3683908	438042	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BGX 8DR	BGX 08D(R)	6/6/1991	*PVC*	*4*	20	278.4	276.1	73	93	203.1	183.1	3683834	438334	
BGX 9D	BGX 09D	3/18/1991	PVC	4	20	279.6	277.4	45	65	232.4	212.4	3683777	438594	
BGX 10D	BGX 10D	2/6/1991	PVC	4	20	277	274.8	38.6	58.6	236.2	216.2	3683635	438789	
BGX 11D	BGX 11D	1/24/1991	*PVC*	*4*	20	276.5	273.8	37.1	57.1	236.7	216.7	3683385	438902	
BGX 12C	BGX 12C	1/21/1991	PVC	4	10	275.3	273.1	89	99	184.1	174.1	3683187	439081	
BGX 12D	BGX 12D	1/21/1991	PVC	4	20	275.4	273.2	29.5	49.5	243.7	223.7	3683182	439084	
BGX 13D	BGX 13D	11/1/2010	PVC	4	10	278.57	275.78	72.8	82.8	202.98	192.98	3683849	438267	
BSE 1C1	BSE 01C	9/10/1997	PVC	4	2.5	292.07	283.65	112.06	114.56	171.59	169.09	3682435	438675	
BSE 1C2	BSE 01C	9/10/1997	PVC	4	2.5	292.07	283.65	130.62	133.12	153.03	150.53	3682435	438675	
BSE 1C3	BSE 01C	9/10/1997	PVC	4	2.5	292.07	283.65	143.16	145.66	140.49	137.99	3682435	438675	
BSE 1C4	BSE 01C	9/10/1997	PVC	4	2.5	292.07	283.65	158.2	160.7	125.45	122.95	3682435	438675	
BSE 1D1	BSE 01D	9/10/1997	PVC	4	2.5	286.52	283.76	57.48	59.98	226.28	223.78	3682436	438679	
BSE 1D2	BSE 01D	9/10/1997	PVC	4	2.5	286.52	283.76	70.02	72.52	213.74	211.24	3682436	438679	
BSE 1D3	BSE 01D	9/10/1997	PVC	4	2.5	286.52	283.76	80.04	82.54	203.72	201.22	3682436	438679	
BSE 1D4	BSE 01D	9/10/1997	PVC	4	2.5	286.52	283.76	97.6	100.1	186.16	183.66	3682436	438679	
BSE 2CR1	BSE 02C(R)	10/24/2001	PVC	2	2.5	287.09	286.09	107.9	110.4	178.19	175.69	3682277	438725	
BSE 2CR2	BSE 02C(R)	10/24/2001	PVC	2	2.5	287.09	286.09	127.4	129.9	158.69	156.19	3682277	438725	
BSE 2CR3	BSE 02C(R)	10/24/2001	PVC	2	2.5	287.09	286.09	137.9	140.4	148.19	145.69	3682277	438725	
BSE 2CR4	BSE 02C(R)	10/24/2001	PVC	2	2.5	287.09	286.09	153.4	155.9	132.69	130.19	3682277	438725	
BSE 2D1	BSE 02D	9/2/1997	PVC	4	2.5	286.48	279.72	53.48	55.98	226.24	223.74	3682407	438602	
BSE 2D2	BSE 02D	9/2/1997	PVC	4	2.5	286.48	279.72	66.02	68.52	213.7	211.2	3682407	438602	
BSE 2D3	BSE 02D	9/2/1997	PVC	4	2.5	286.48	279.72	76.04	78.54	203.68	201.18	3682407	438602	
BSE 2D4	BSE 02D	9/2/1997	PVC	4	2.5	286.48	279.72	93.6	96.1	186.12	183.62	3682407	438602	
BSE 3C1	BSE 03C	8/21/1997	PVC	4	2.5	287.07	286.07	112.78	115.28	173.29	170.79	3682276	438728	
BSE 3C2	BSE 03C	8/21/1997	PVC	4	2.5	287.07	286.07	132.84	135.34	153.23	150.73	3682276	438728	
BSE 3C3	BSE 03C	8/21/1997	PVC	4	2.5	287.07	286.07	145.4	147.9	140.67	138.17	3682276	438728	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BSE 3C4	BSE 03C	8/21/1997	PVC	4	2.5	287.07	286.07	160.46	162.96	125.61	123.11	3682276	438728	
BSE 3D1	BSE 03D	9/2/1997	PVC	4	2.5	287.09	286.09	63.72	66.22	222.37	219.87	3682277	438725	
BSE 3D2	BSE 03D	9/2/1997	PVC	4	2.5	287.09	286.09	71.24	73.74	214.85	212.35	3682277	438725	
BSE 3D3	BSE 03D	9/2/1997	PVC	4	2.5	287.09	286.09	81.26	83.76	204.83	202.33	3682277	438725	
BSE 3D4	BSE 03D	9/2/1997	PVC	4	2.5	287.09	286.09	93.8	96.3	192.29	189.79	3682277	438725	
BSW 1C1	BSW 01C	4/7/2000	PVC	2	2.51	256.68	254.88	74.38	76.89	180.5	177.99	3682223	437629	
BSW 1C2	BSW 01C	4/7/2000	PVC	2	2.5	256.72	254.88	83.88	86.38	171	168.5	3682223	437629	
BSW 1C3	BSW 01C	4/7/2000	PVC	2	2.5	256.72	254.88	101.38	103.88	153.5	151	3682223	437629	
BSW 1C4	BSW 01C	4/7/2000	PVC	2	2.5	256.71	254.88	108.88	111.38	146	143.5	3682223	437629	
BSW 1D1	BSW 01D	4/10/2000	PVC	2	2.5	256.63	254.63	39.46	41.96	215.17	212.67	3682221	437630	
BSW 1D2	BSW 01D	4/10/2000	PVC	2	2.5	256.62	254.63	48.97	51.47	205.66	203.16	3682221	437630	
BSW 1D3	BSW 01D	4/10/2000	PVC	2	2.51	256.63	254.63	60.49	63	194.14	191.63	3682221	437630	
BSW 2C1	BSW 02C	4/11/2000	PVC	2	2.51	241.42	240.06	71.88	74.39	168.18	165.67	3682210	437732	
BSW 2C2	BSW 02C	4/11/2000	PVC	2	2.51	241.41	240.06	96.38	98.89	143.68	141.17	3682210	437732	
BSW 2C3	BSW 02C	4/11/2000	PVC	2	2.51	241.39	240.06	103.89	106.4	136.17	133.66	3682210	437732	
BSW 2D1	BSW 02D	4/13/2000	PVC	2	2.51	241.94	240.01	23.4	25.91	216.61	214.1	3682212	437734	
BSW 2D2	BSW 02D	4/13/2000	PVC	2	2.51	241.93	240.01	29.91	32.42	210.1	207.59	3682212	437734	
BSW 2D3	BSW 02D	4/13/2000	PVC	2	2.51	241.92	240.01	52.42	54.93	187.59	185.08	3682212	437734	
BSW 3C1	BSW 03C	4/4/2000	PVC	2	2.5	260.35	128.3	78.87	81.37	49.43	46.93	3682238	437857	
BSW 3C2	BSW 03C	4/4/2000	PVC	2	2.5	260.35	258.52	96.57	99.07	161.95	159.45	3682238	437857	
BSW 3C3	BSW 03C	4/4/2000	PVC	2	2.51	260.36	258.52	108.87	111.38	149.65	147.14	3682238	437857	
BSW 3C4	BSW 03C	4/4/2000	PVC	2	2.5	260.34	258.52	123.38	125.88	135.14	132.64	3682238	437857	
BSW 3D1	BSW 03D	4/5/2000	PVC	2	2.5	259.54	258.18	39.91	42.41	218.27	215.77	3682234	437857	
BSW 3D2	BSW 03D	4/5/2000	PVC	2	2.51	259.53	258.18	53.41	55.92	204.77	202.26	3682234	437857	
BSW 4C1	BSW 04C	3/29/2000	PVC	2	2.51	267.56	266.44	93.38	95.89	173.06	170.55	3682258	437960	
BSW 4C2	BSW 04C	3/29/2000	PVC	2	2.5	267.42	266.44	110.88	113.38	155.56	153.06	3682258	437960	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BSW 4C3	BSW 04C	3/29/2000	PVC	2	2.51	267.52	266.44	125.39	127.9	141.05	138.54	3682258	437960	
BSW 4D1	BSW 04D	3/31/2000	PVC	2	2.5	268.56	266.61	47.39	49.89	219.22	216.72	3682259	437956	
BSW 4D2	BSW 04D	3/31/2000	PVC	2	2.5	268.51	266.61	61.89	64.39	204.72	202.22	3682259	437956	
BSW 4D3	BSW 04D	3/31/2000	PVC	2	2.5	268.56	266.61	67.39	69.89	199.22	196.72	3682259	437956	
BSW 5C1	BSW 05C	3/14/2000	PVC	2	2.5	257.31	255.41	80.87	83.37	174.54	172.04	3682079	437625	
BSW 5C2	BSW 05C	3/14/2000	PVC	2	2.5	257.23	255.41	90.37	92.87	165.04	162.54	3682079	437625	
BSW 5C3	BSW 05C	3/14/2000	PVC	2	2.5	257.05	255.41	109.88	112.38	145.53	143.03	3682079	437625	
BSW 5C4	BSW 05C	3/14/2000	PVC	2	2.5	257.21	255.41	121.38	123.88	134.03	131.53	3682079	437625	
BSW 5D1	BSW 05D	3/16/2000	PVC	2	2.51	257.24	255.5	41.43	43.94	214.07	211.56	3682082	437625	
BSW 5D2	BSW 05D	3/16/2000	PVC	2	2.52	257.25	255.5	51.94	54.46	203.56	201.04	3682082	437625	
BSW 5D3	BSW 05D	3/16/2000	PVC	2	2.5	257.37	255.5	60.46	62.96	195.04	192.54	3682082	437625	
BSW 6C1	BSW 06C	3/8/2000	PVC	2	2.5	244.06	242.16	67.4	69.9	174.76	172.26	3681891	437651	
BSW 6C2	BSW 06C	3/8/2000	PVC	2	2.5	244.05	242.16	78.9	81.4	163.26	160.76	3681891	437651	
BSW 6C3	BSW 06C	3/8/2000	PVC	2	2.5	243.89	242.16	85.4	87.9	156.76	154.26	3681891	437651	
BSW 6C4	BSW 06C	3/8/2000	PVC	2	2.5	244.07	242.16	104.9	107.4	137.26	134.76	3681891	437651	
BSW 6D1	BSW 06D	3/10/2000	PVC	2	2.5	244.65	242.41	29.4	31.9	213.01	210.51	3681893	437652	
BSW 6D2	BSW 06D	3/10/2000	PVC	2	2.5	244.62	242.41	35.9	38.4	206.51	204.01	3681893	437652	
BSW 6D3	BSW 06D	3/10/2000	PVC	2	2.5	244.65	242.41	44.4	46.9	198.01	195.51	3681893	437652	
BSW 7C1	BSW 07C	3/20/2000	PVC	2	2.5	249.34	248.01	76.89	79.39	171.12	168.62	3681994	437755	
BSW 7C2	BSW 07C	3/20/2000	PVC	2	2.51	249.3	248.01	89.39	91.9	158.62	156.11	3681994	437755	
BSW 7C3	BSW 07C	3/20/2000	PVC	2	2.5	249.31	248.01	102.91	105.41	145.1	142.6	3681994	437755	
BSW 7C4	BSW 07C	3/20/2000	PVC	2	2.51	249.32	248.01	120.42	122.93	127.59	125.08	3681994	437755	
BSW 7D1	BSW 07D	3/23/2000	PVC	2	2.51	250.63	248.7	40.41	42.92	208.29	205.78	3681995	437751	
BSW 7D2	BSW 07D	3/23/2000	PVC	2	2.51	250.67	248.7	49.92	52.43	198.78	196.27	3681995	437751	
BSW 7D3	BSW 07D	3/23/2000	PVC	2	2.5	250.68	248.7	64.93	67.43	183.77	181.27	3681995	437751	
BSW 8C1	BSW 08C	3/27/2000	PVC	2	2.5	234.04	231.79	55.98	58.48	175.81	173.31	3682031	437905	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
BSW 8C2	BSW 08C	3/27/2000	PVC	2	2.5	234.04	231.79	70.48	72.98	161.31	158.81	3682031	437905	
BSW 8C3	BSW 08C	3/27/2000	PVC	2	2.51	234.03	231.79	91.97	94.48	139.82	137.31	3682031	437905	
BSW 8C4	BSW 08C	3/27/2000	PVC	2	2.51	234.05	231.79	104.48	106.99	127.31	124.8	3682031	437905	
BSW 8D1	BSW 08D	3/28/2000	PVC	2	2.5	233.5	232.27	21.9	24.4	210.37	207.87	3682030	437908	
BSW 8D2	BSW 08D	3/28/2000	PVC	2	2.51	233.47	232.27	33.4	35.91	198.87	196.36	3682030	437908	
BSW 8D3	BSW 08D	3/28/2000	PVC	2	2.5	233.45	232.27	39.9	42.4	192.37	189.87	3682030	437908	
FAB 2	(1)	5/9/1994	PVC	4	20	328.5	326.5	90	110	236.5	216.5	3683122	437418	
FAB002MC	**(4)**	2/24/2004	PVC	2	10	329.07	326.5	130	140	196.5	186.5	3683126.88	437417.558	
FCB 2	FCB 02	9/3/1981	PVC	4	30	307.5	305.2	70	100	235.2	205.2	3682911	437537	11/3/2003
FCB 2C	(2)	11/10/2003	PVC	2	10.2	308.51	305.6	124.7	134.72	180.9	170.88	3682918	437536	
FCB 2D	**(1)**	**11/10/2003**	**PVC**	**2**	**10.2**	**308.02**	**305.3**	**70.34**	**80.36**	**234.96**	**224.94**	**3682916**	**437534**	
FCB 2D	**(1)**	**11/10/2003**	**PVC**	**2**	**10.2**	**308.02**	**305.3**	**80.36**	**90.38**	**224.94**	**214.92**	**3682916**	**437534**	
FSS 1D	FSS 01D	10/6/1988	PVC	4	20	266.3	263.9	34	54	229.9	209.9	3682355	437509	
FSS 2D	FSS 02D	10/7/1988	PVC	4	20	261.8	259.4	35	55	224.4	204.4	3682321	437542	
FSS 3D	FSS 03D	10/10/1988	PVC	4	20	258.4	255.8	30	50	225.8	205.8	3682219	437476	
FSS 4D	FSS 04D	10/16/1988	PVC	4	20	292	289.8	67.2	87.2	222.6	202.6	3682241	437207	
HIW5MC	**HIW5MC**	**11/12/1993**	**PVC**	**4**	**29.9**	**268.2**	**266.1**	**84.1**	**114**	**182**	**152.1**	**3682402.9**	**438454.745**	
HIW5MC	**HIW5MC**	**11/12/1993**	**PVC**	**4**	**14.8**	**268.2**	**266.1**	**129**	**143.8**	**137.1**	**129**	**3682402.9**	**438454.745**	
HMD 1D	HMD 01D	2/1/1991	*PVC*	*4*	20	264.7	262.7	43	63	219.7	199.7	3683762	437644	
HMD 2D	HMD 02D	2/1/1991	*PVC*	*4*	20	261.4	259.3	48.5	68.5	210.8	190.8	3684046	437549	
HMD 3D	HMD 03D	2/1/1991	*PVC*	*4*	20	259.6	257.5	49.8	69.8	207.7	187.7	3684110	437682	
HMD 4B	HMD 04B	5/18/2001	*PVC*	*4*	10.04	251.24	248.72	75	85.04	173.72	163.68	3684088	437869	
HMD 4D	HMD 04D	2/1/1991	*PVC*	*4*	20	251.1	248.5	39.6	59.6	208.9	188.9	3684086	437866	
HSB 85A	HSB 85A	7/1/1984	PVC	3	10	294.5	292.1	221	231	71.1	61.1	3682899	439015	
HSB 85B	HSB 85B	7/1/1984	PVC	4	10	294.7	292	148.8	158.8	143.2	133.2	3682900	439018	
HSB 85C	HSB 85C	8/1/1984	PVC	4	10	294.3	292	67.8	77.8	224.2	214.2	3682902	439014	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
HSB142C	HSB 142C	11/5/1990	PVC	4	10	204.2	201.6	30	40	171.6	161.6	3681758	437796	
HSB142D	HSB142D	11/5/1990	PVC	4	10	204.4	201.7	2	12	199.7	189.7	3681754	437794	
HSB143C	HSB 143C	10/9/1990	PVC	4	10	222.4	220.1	41	51	179.1	169.1	3681779	437505	
HSB143D	HSB 143D	10/9/1990	PVC	4	20	223.1	220.9	4	24	216.9	196.9	3681783	437502	
HSB151C	HSB 151C	8/9/1990	PVC	4	10	213.8	211.6	31	41	180.6	170.6	3681819	437943	
HSB151D	HSB 151D	8/20/1990	PVC	4	10	213.8	211.6	4	14	207.6	197.6	3681821	437946	9/18/2003
HSB151DR	(2)	9/8/2003	PVC	2	5.03	214.16	211	14.76	19.79	196.24	191.21	3681819	437939	
NEP 1D	NEP 01D	5/18/2001	PVC	2	10.02	260.27	257.75	64	74.02	193.75	183.73	3684180	437358	
NEP 2D	NEP 02D	5/21/2001	PVC	2	10.01	267.98	265.35	65	75.01	200.35	190.34	3684137	437511	
NEP 4D	NEP 04D	5/18/2001	PVC	2	10	233.32	230.72	34	44	196.72	186.72	3684136	438473	
NEP 3D	*NEP 03D*	*5/15/2001*	*PVC*	*2*	*10*		*238.91*	*45*	*55*	*193.91*	*183.91*	*78358*	*59278*	
NWP 1B	NWP 01B	6/5/2001	PVC	2	10.02	275.76	273.36	92	102.02	181.36	171.34	3683413	437742	
NWP 1D	NWP 01D	6/5/2001	PVC	2	10.1	275.06	272.72	60	70.1	212.72	202.62	3683420	437742	
NWP 2D	NWP 02D	5/24/2001	PVC	2	10.02	249.8	247.33	45	55.02	202.33	192.31	3683875	437500	
NWP 3C	NWP 03C	6/5/2001	PVC	2	10.2	315.69	313.17	114	124.02	199.17	189.15	3682996	437579	
NWP 3D	NWP 03D	5/25/2001	PVC	2	20.12	315.93	313.45	78	98.12	235.45	215.33	3683000	437577	
NWP101D	NWP 101D	2/17/1999	PVC	2	10	336	333.59	110	120	223.59	213.59	3683188	437540	
NWP202C	NWP 202C	2/16/1999	PVC	2	10	336.61	334.3	150.8	160.8	183.5	173.5	3683189	437519	
NWP302A	(1)	3/17/1999	PVC	2	10	337.91	333.37	254	264	79.37	69.37	3683183	437494	
NWP303A	(1)	2/11/1999	PVC	2	10	329.43	326.71	201	211	125.71	115.71	3683117	437420	
SEP001MD	**(4)**	2/23/2004	PVC	2	20	268.01	265.45	40	60	225.45	205.45	3682401.23	438450.548	
SEP002B	**(4)**	2/17/2004	PVC	2	10	214.93	212.35	57	67	155.35	145.35	3681765.31	438145.86	
SEP002D	**(4)**	2/18/2004	PVC	2	10	214.86	212.3	30	40	182.3	172.3	3681765.4	438143.731	
SEP003CL	**(4)**	2/19/2004	PVC	2	10	254.85	252.35	100	110	152.35	142.35	3682116.16	438168.098	
SEP003CU	**(4)**	2/20/2004	PVC	2	10	254.7	252.25	76	86	176.25	166.25	3682116.62	438166.045	
SWP 1C	(1)	10/30/2003	PVC	2	10	280.86	278.2	96.35	106.35	181.85	171.85	3682390	438000	

Table A-1. MWMF Monitoring Well Construction Details

Monitoring Well Designation as Used in This Report	Monitoring Well Designation as Used in the MWMF RCRA Part B Permit Application (Rev. 6)	Installation Date (mo/day/yr)	Well Casing/ Screen Material	Well Casing Diameter (in)	Length of Screen (ft)	Top of Casing Reference Elevation (ft msl)	Land Surface/ Ground Elevation (ft msl)	Top Depth of Screen (ft below land surface)	Bottom Depth of Screen (ft below land surface)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Northing	Easting	Date Abandoned (mo/day/yr)
SWP 2C	(1)	10/31/2003	PVC	2	10.02	272.04	269.4	88.34	98.36	181.06	171.04	3682438	438172	
SWP 3D	**(1)**	**10/31/2003**	**PVC**	**2**	**15.02**	**269.03**	**266.4**	**57.77**	**72.79**	**208.63**	**193.61**	**3682277**	**438022**	
SWP 3D	**(1)**	**10/31/2003**	**PVC**	**2**	**5.01**	**269.03**	**266.4**	**47.75**	**52.76**	**218.65**	**213.64**	**3682277**	**438022**	
SWP004MD	**(4)**	2/25/2004	PVC	2	10	257.73	255.1	58	68	197.1	187.1	3682086.21	437624.581	
HSB 66DR	**(5)**	10/1/2003	PVC	2	20	281.9	278.6	70	90	208.59	188.57	3682203.93	438759.879	
HSB 119C	**(5)**	11/26/2003	PVC	2	10	257.95	255	95.18	105.17	159.82	149.83	3682218.85	438441.82	
HSB 120C	**(5)**	12/3/2003	PVC	2	10	268.28	265.3	100.02	110.02	165.28	155.28	3682348.43	438473.476	
HSB 154D	**(5)**	12/3/2003	PVC	2	10	264.84	261.6	46.92	56.92	214.68	204.68	3682175.78	438639.034	

(1) Added to the monitoring program or installed in 2003; however, will not be sampled for the first time until 1Q04.
(2) Replacement well for HSB151D and sampled for the first time in 4Q03.
(3) Installed in 2003; however, will not be sampled for the first time until 2Q04.
(4) Installed in 2004; however, will not be sampled for the first time until 2Q04.

Italics indicate from ESH-EMS-2000470, Environmental Protection Department's Well Inventory (U), March 2001.
Bold indicates two screen zones.

Summary

Well Series	2002	2003	2004	Comment
BGO	119	119	119	
BGX	18	18	18	
BSE	24	24	24	
BSW	53	53	53	

Table A-2. F-Area HWMF, H-Area HWMF, and MWMF PWMS Wells

F-Area HWMF PWMS Wells **H-Area HWMF PWMS Wells**

Well ID	PWMS Type	Well ID	PWMS Type		Well ID	PWMS Type
FSB 77	Tank	FSB 104D	Tank		HSB 67	Tank
FSB 78	Tank	FSB 105C	Tank		HSB 69	Tank
FSB 78C	TAP	FSB 106C	Tank		HSB 84D	Tank
FSB 79	Tank	FSB 107C	TAP		HSB 86C	Tank
FSB 79C	Tank	FSB 107D	Tank		HSB 86D	Tank
FSB 87C	TAP	FSB 110C	TAP		HSB 102D	Tank
FSB 89D	Tank	FSB 110D	Tank		HSB 103D	Tank
FSB 91D	Tank	FSB 112DR	Tank		HSB 104D	Tank
FSB 92D	Tank	FSB 117D	Tank		HSB 105D	Tank
FSB 93C	TAP	FSB 119D	Tank		HSB 106D	Tank
FSB 94C	TAP	FSB 120C	TAP		HSB 107D	Tank
FSB 94DR	Tank	FSB 121C	TAP		HSB 108D	Tank
FSB 97C	TAP	FSB 121DR	Tank		HSB 109D	Tank
FSB 98C	TAP	FSB 122C	TAP		HSB 114D	Tank
FSB 99C	TAP	FSB 127D	Tank		HSB 115D	Tank
FSB 104C	TAP				HSB 116D	Tank
					HSB 134D	Tank
					HSB 136D	Tank
					HSB 139D	Tank

MWMF PWMS Wells

Well ID	PWMS Type
BGO 6D	Tank
BGO 7D	Tank
BGO 14CR	Tank
BGO 14DR	Tank
BGO 27C	TAP
BGO 28D	Tank
BGO 30C	TAP
BGO 31D	Tank
BGO 33C	TAP
BGO 37C	TAP
BGO 41A	Tank
BGO 42C	Tank
BGO 46C	TAP
BGO 46D	Tank
BGO 48C	TAP
BGO 48D	Tank
BGO 50C	TAP
BGO 53C	Tank
BGX 2D	Tank

APPENDIX B

F-AREA, H-AREA, AND MIXED WASTE MANAGEMENT FACILITY GROUNDWATER AND SURFACE WATER MONITORING RESULTS TABLE

APPENDIX B – MATRIX TABLES

Table B-1. 2011 F-Area Matrix Table

Table B-2. 2011 H-Area Matrix Table

Table B-3. 2011 F-Area Surface Water Matrix Table

Table B-4. 2011 H-Area Surface Water Matrix Table

Table B-5. 2011 F-Area 3Q Appendix IX

Table B-6. 2011 H-Area 3Q Appendix IX

Table B-7. 2011 SWP Matrix Table

Table B-8. 2011 SEP Matrix Table

Table B-9. 2011 NEP Matrix Table

Table B-10. 2011 NWP Matrix Table

Table B-11. 2011 SWP Surface Water Matrix Table

Table B-12. 2011 NEP Surface Water Matrix Table

Table B-13. 2011 SWP 3Q Appendix IX

Table B-14. 2011 SEP 3Q Appendix IX

Table B-15. 2011 NEP 3Q Appendix IX

Table B-16. 2011 NWP 3Q Appendix IX

APPENDIX C

MIXED WASTE MANAGEMENT FACILITIES

ANALYTICAL DATA

FIRST QUARTER 2011 – FOURTH QUARTER 2011, AND 2010

APPENDIX C - MWMF HISTORICAL DATA

2010 Historical Data

2011 Historical Data

APPENDIX D

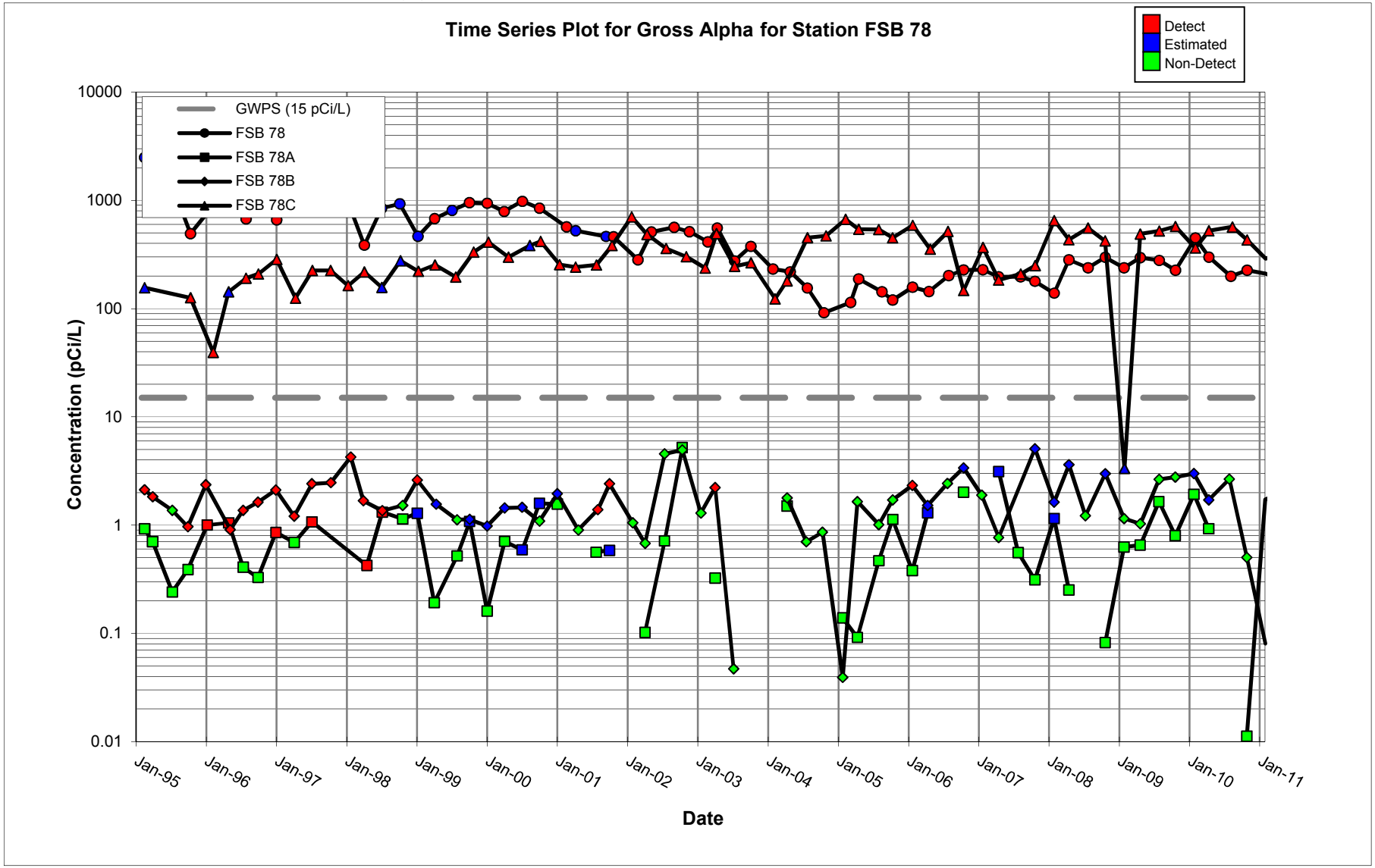
F-AREA, H-AREA, AND MIXED WASTE MANAGEMENT FACILITIES HYDROGRAPHS

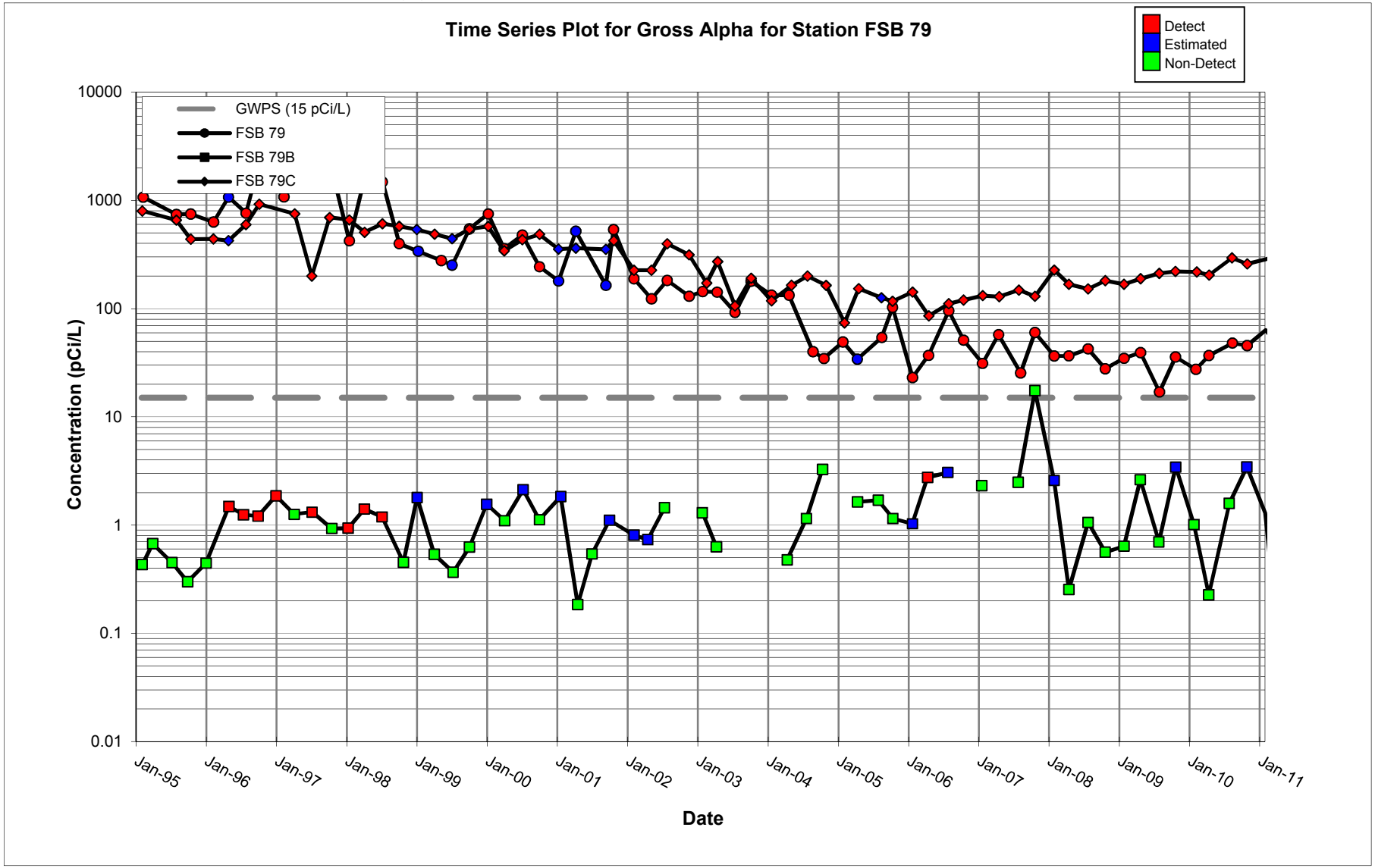
THIS PAGE INTENTIONALLY LEFT BLANK

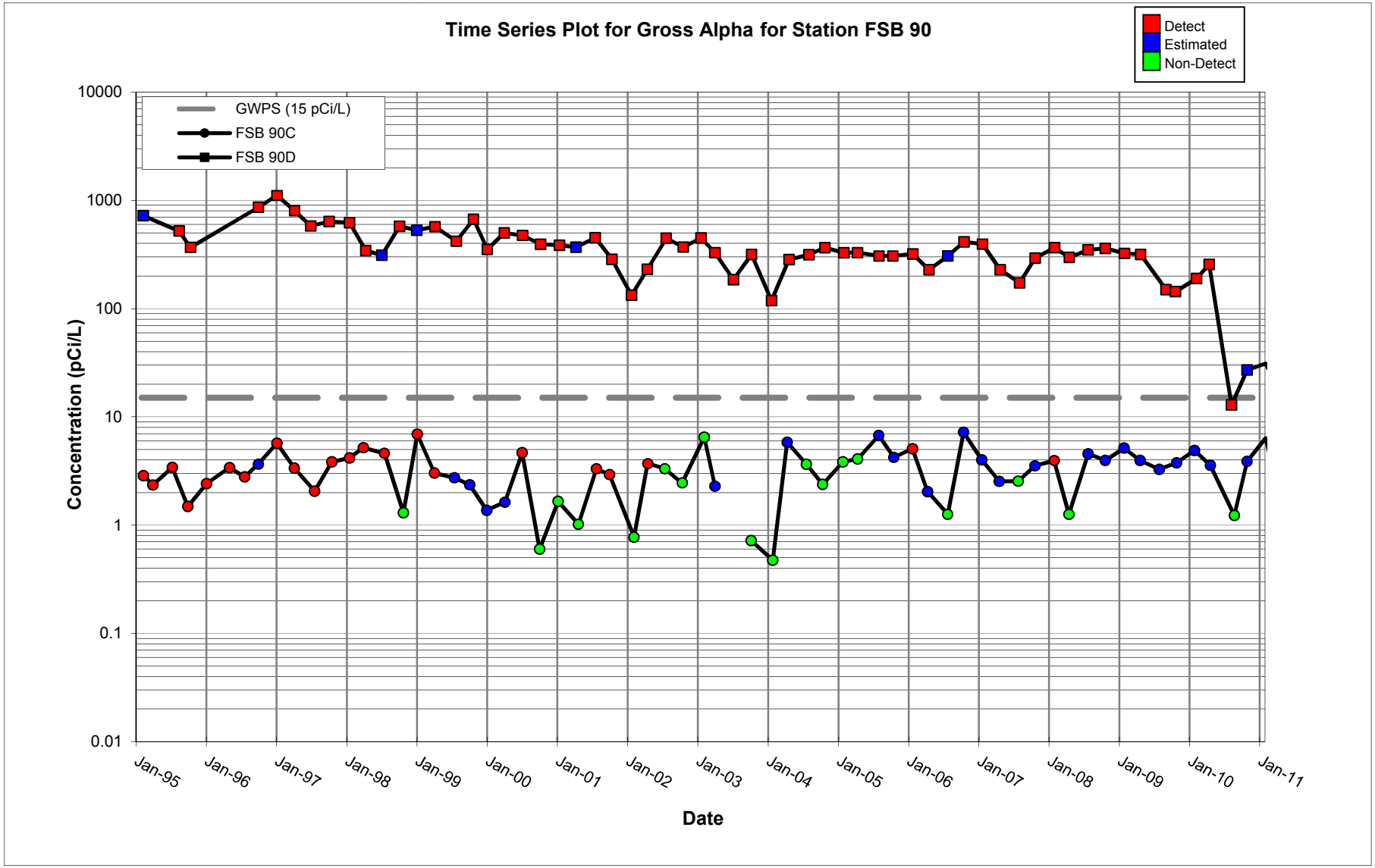
APPENDIX E

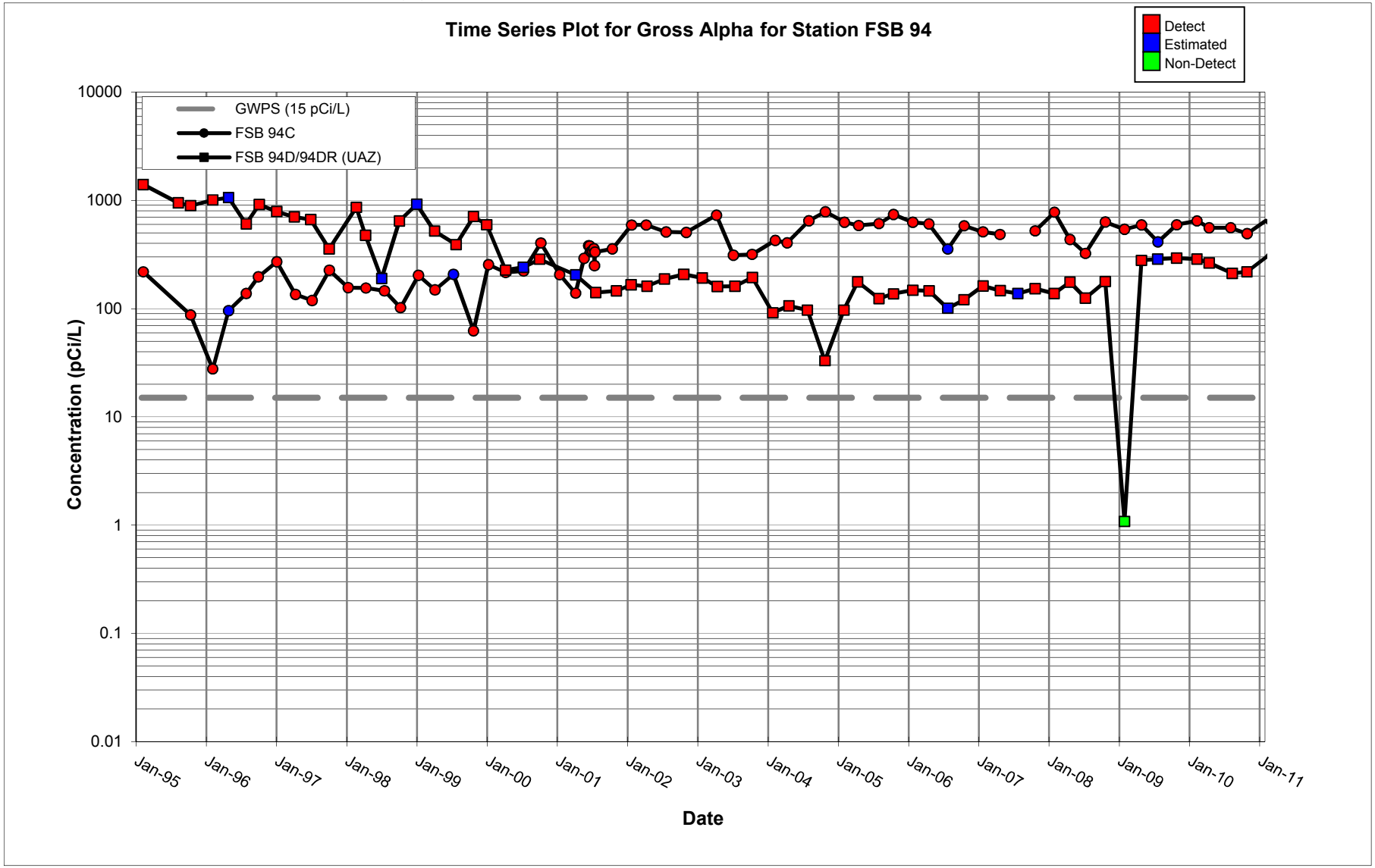
F-AREA, H-AREA, AND MIXED WASTE MANAGEMENT FACILITIES TIME SERIES PLOTS

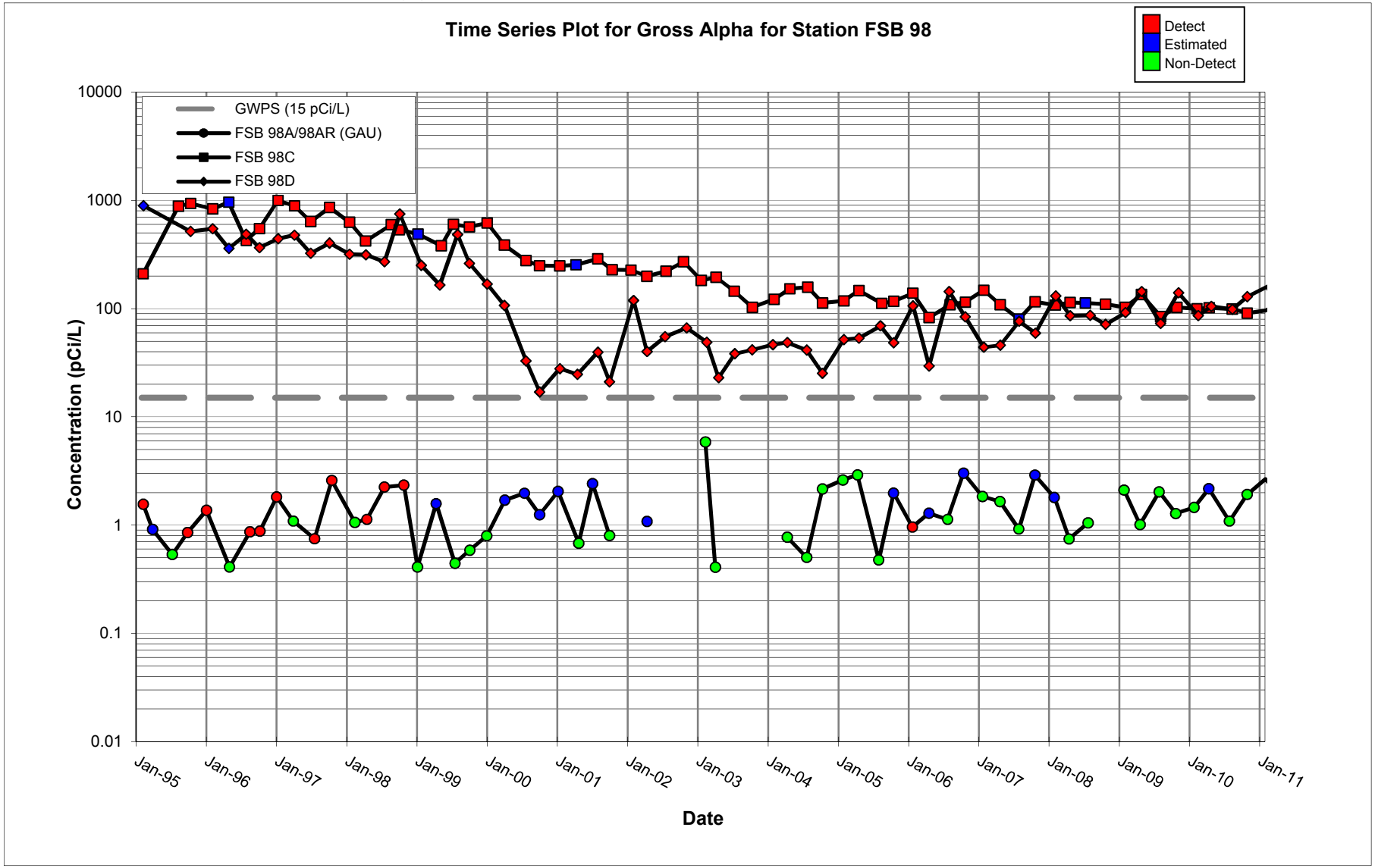
THIS PAGE INTENTIONALLY LEFT BLANK

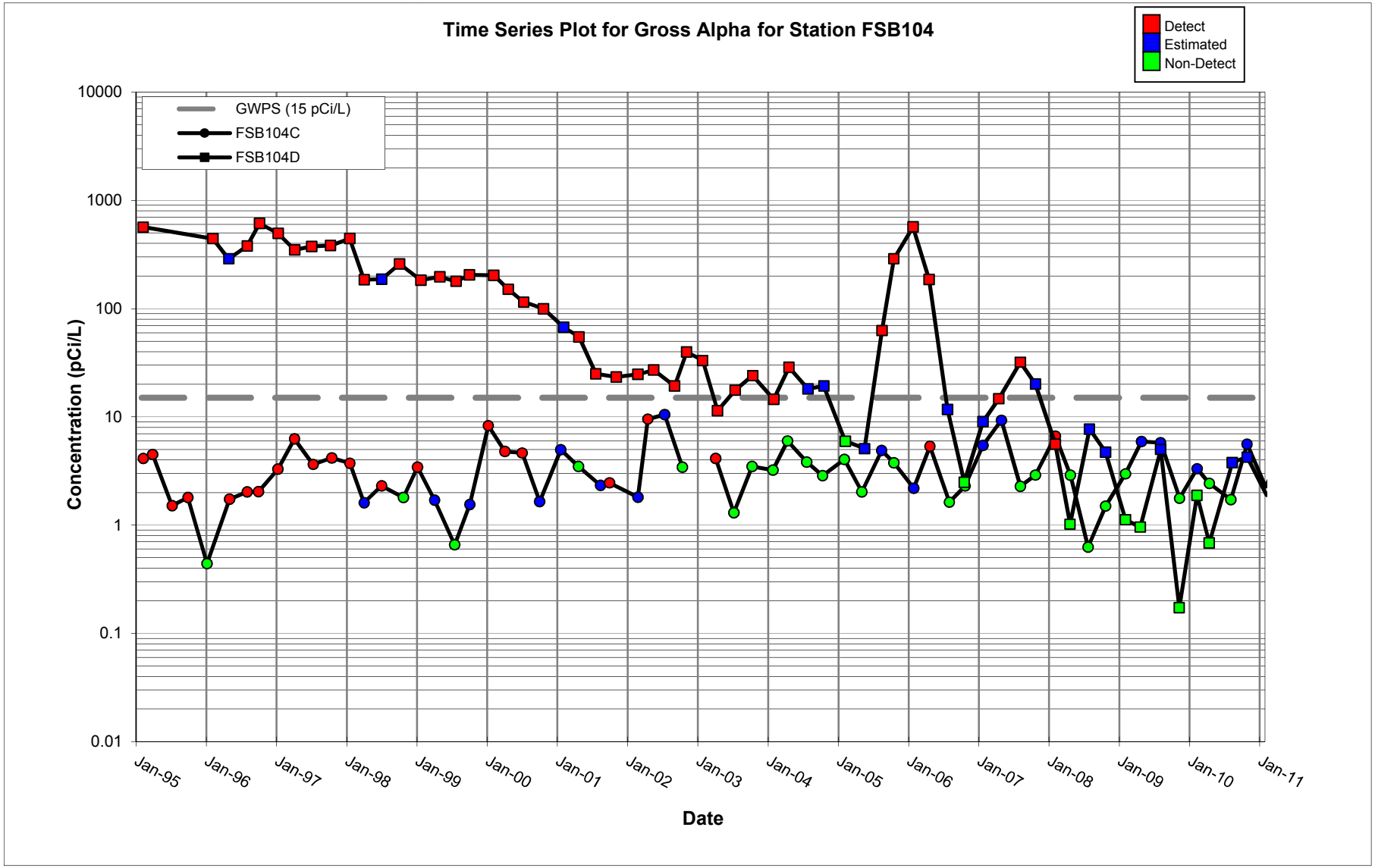

Time Series Plot for Gross Alpha for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 78
FSB 78A
FSB 78B
FSB 78C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

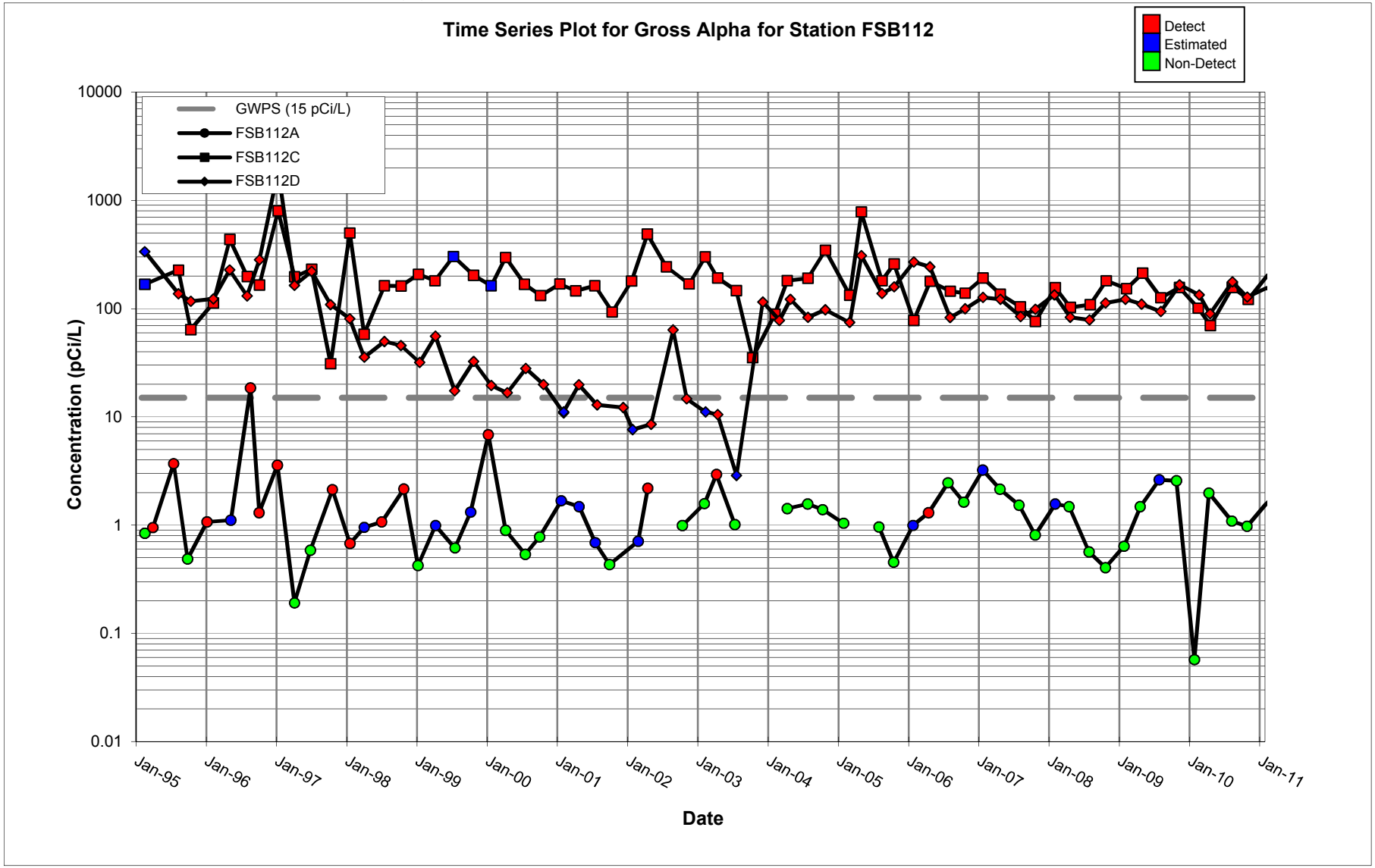

Time Series Plot for Gross Alpha for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 79
FSB 79B
FSB 79C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

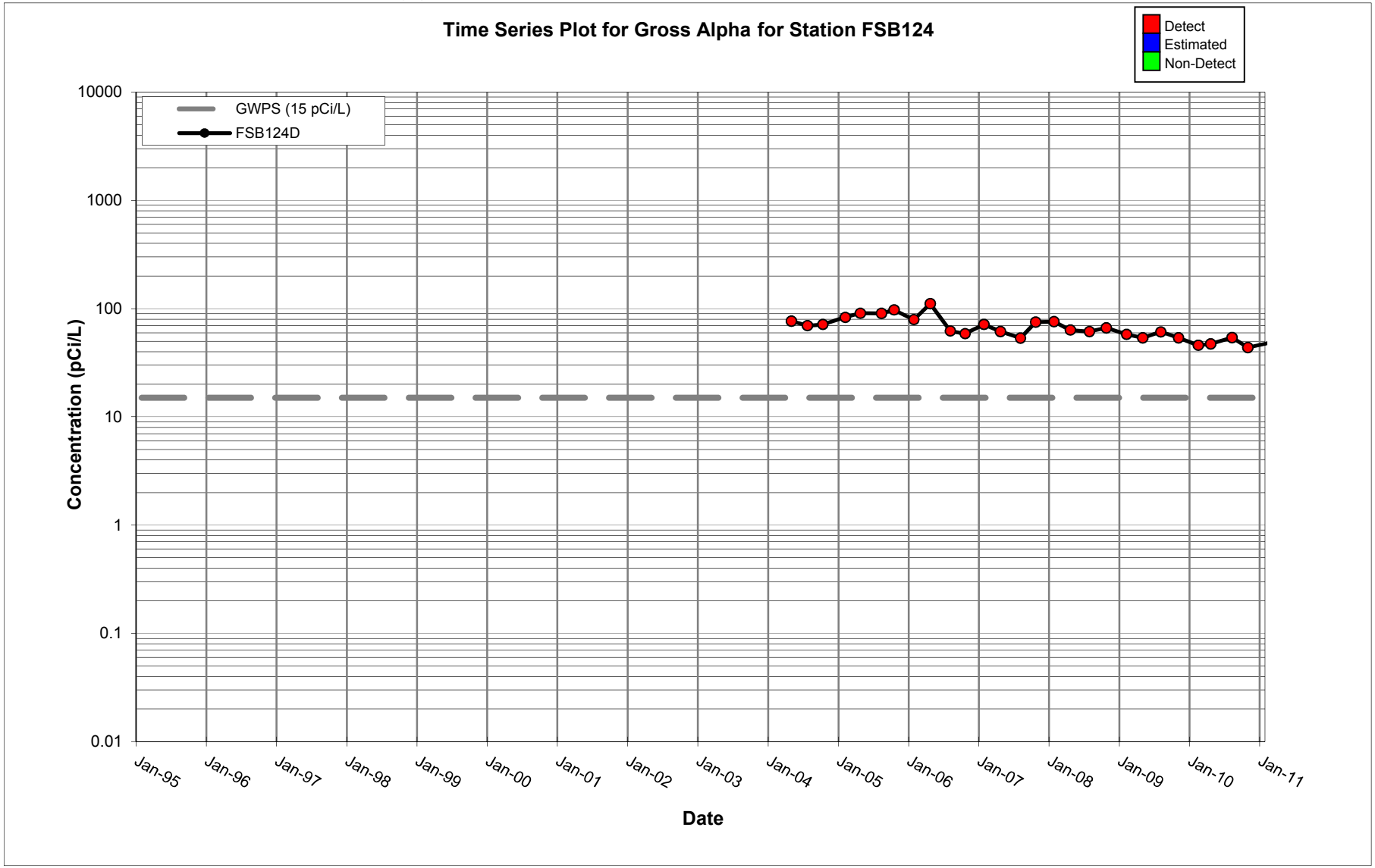

Time Series Plot for Gross Alpha for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 90C
FSB 90D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

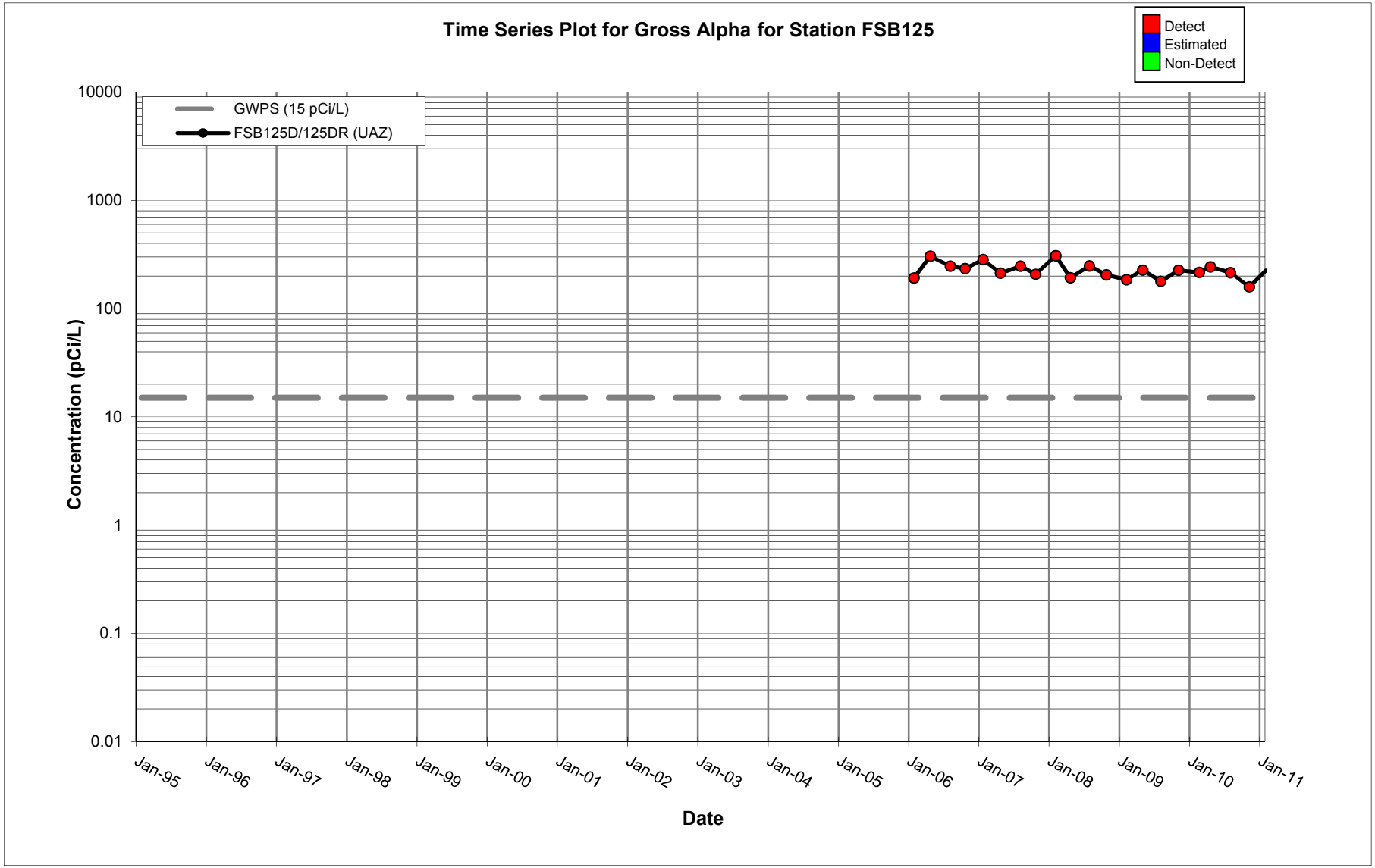

Time Series Plot for Gross Alpha for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 94C
FSB 94D/94DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

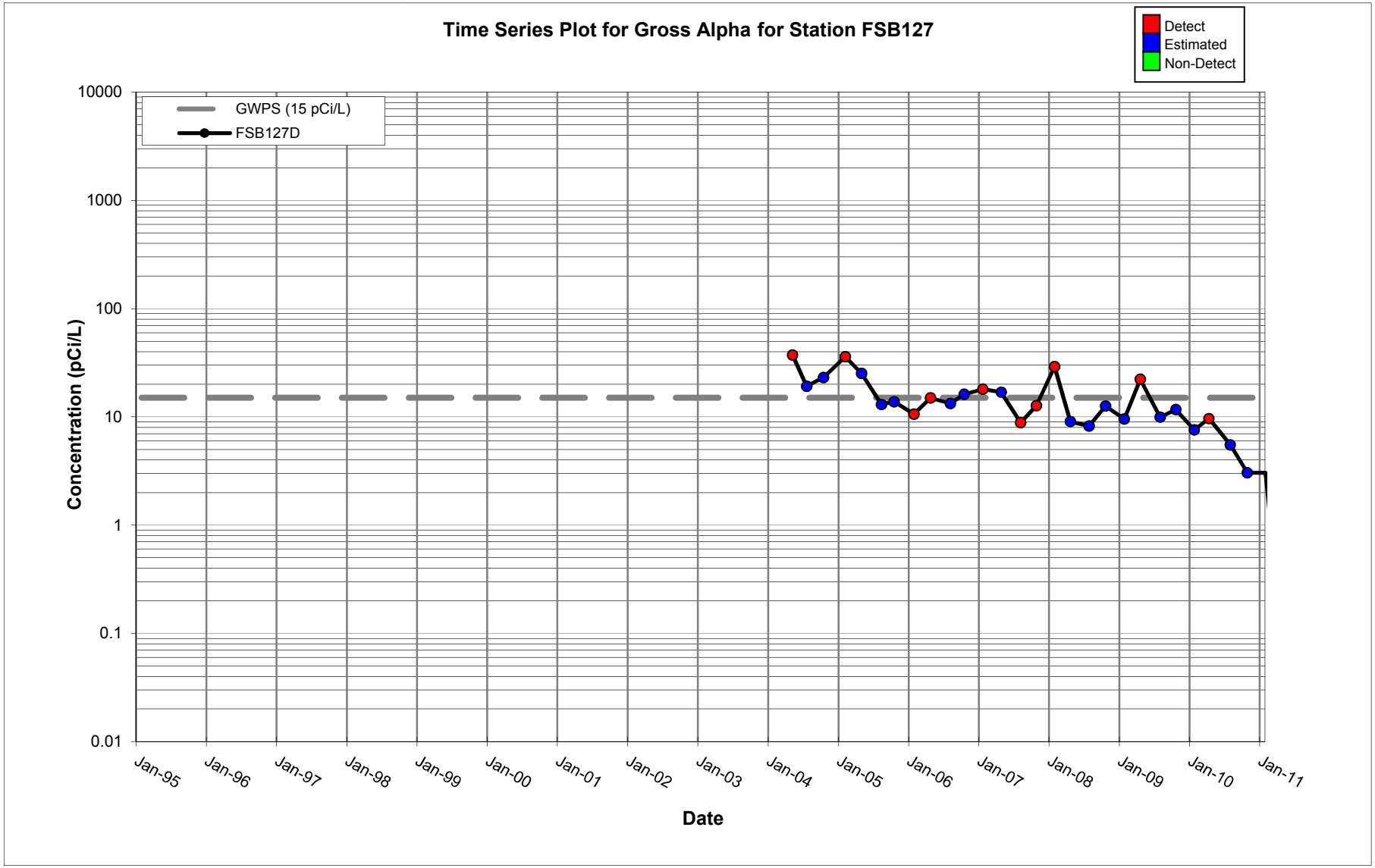

Time Series Plot for Gross Alpha for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

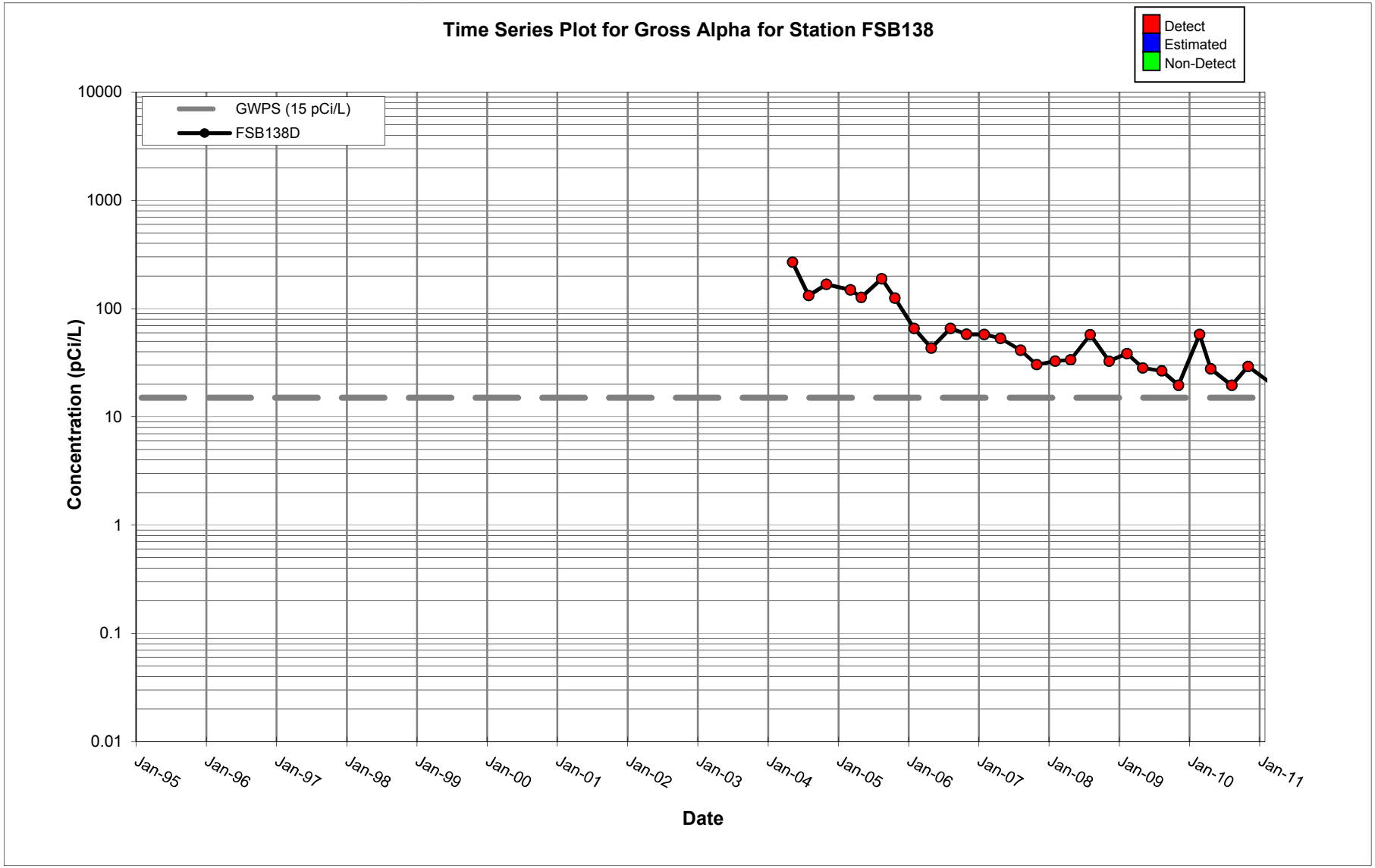

Time Series Plot for Gross Alpha for Station FSB104
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB104C
FSB104D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

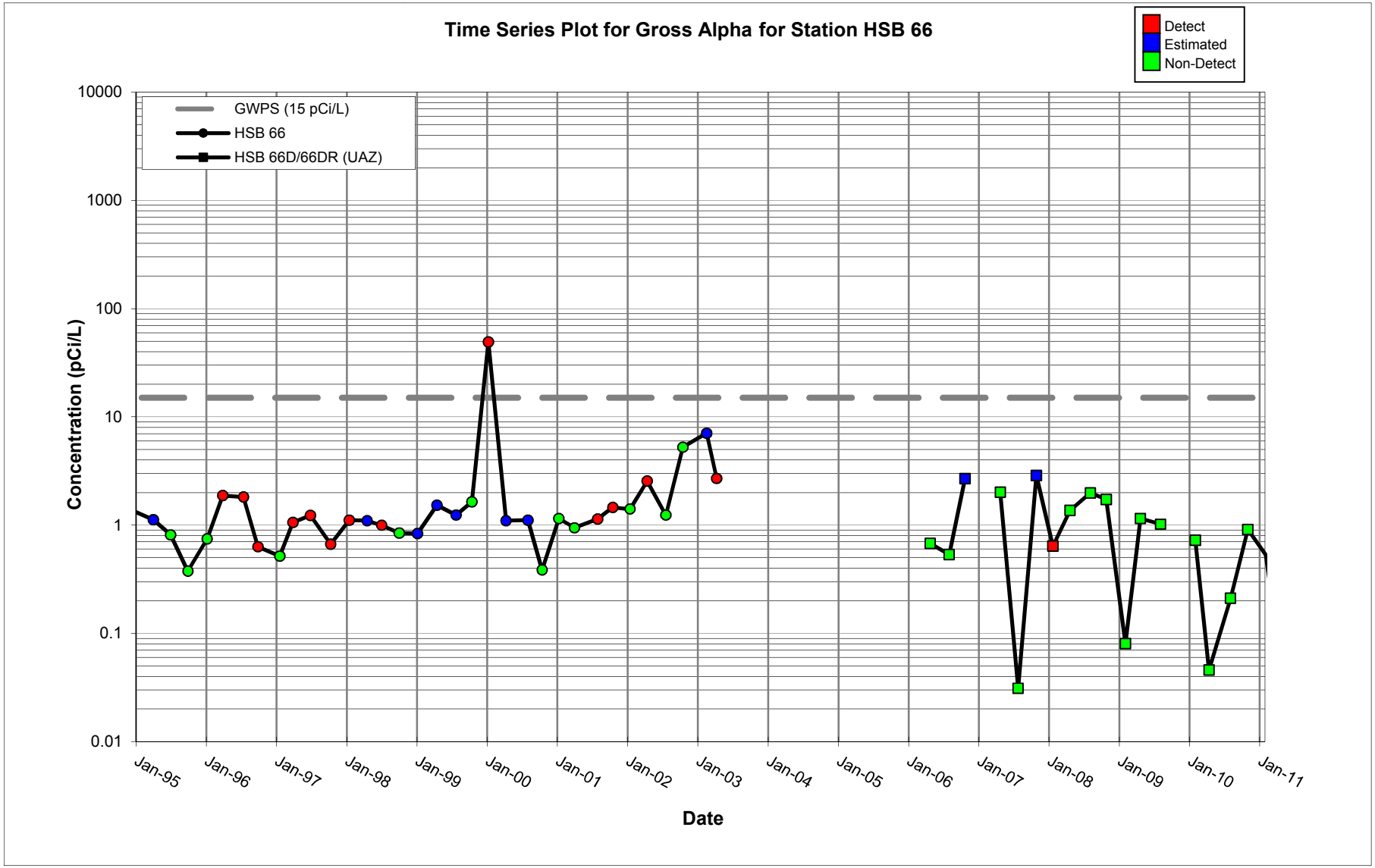

Time Series Plot for Gross Alpha for Station FSB112
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB112A
FSB112C
FSB112D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

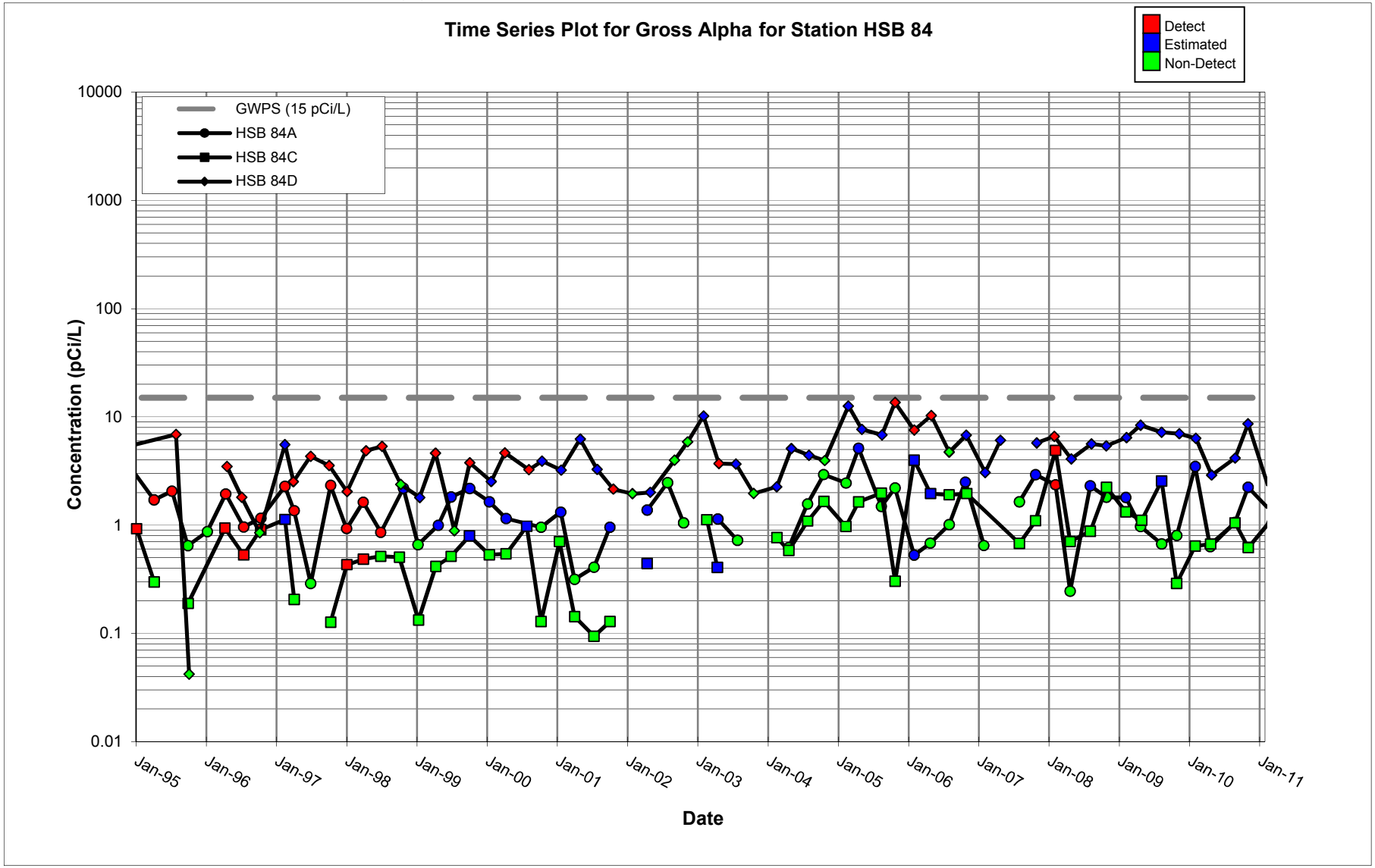

Time Series Plot for Gross Alpha for Station FSB124
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB124D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

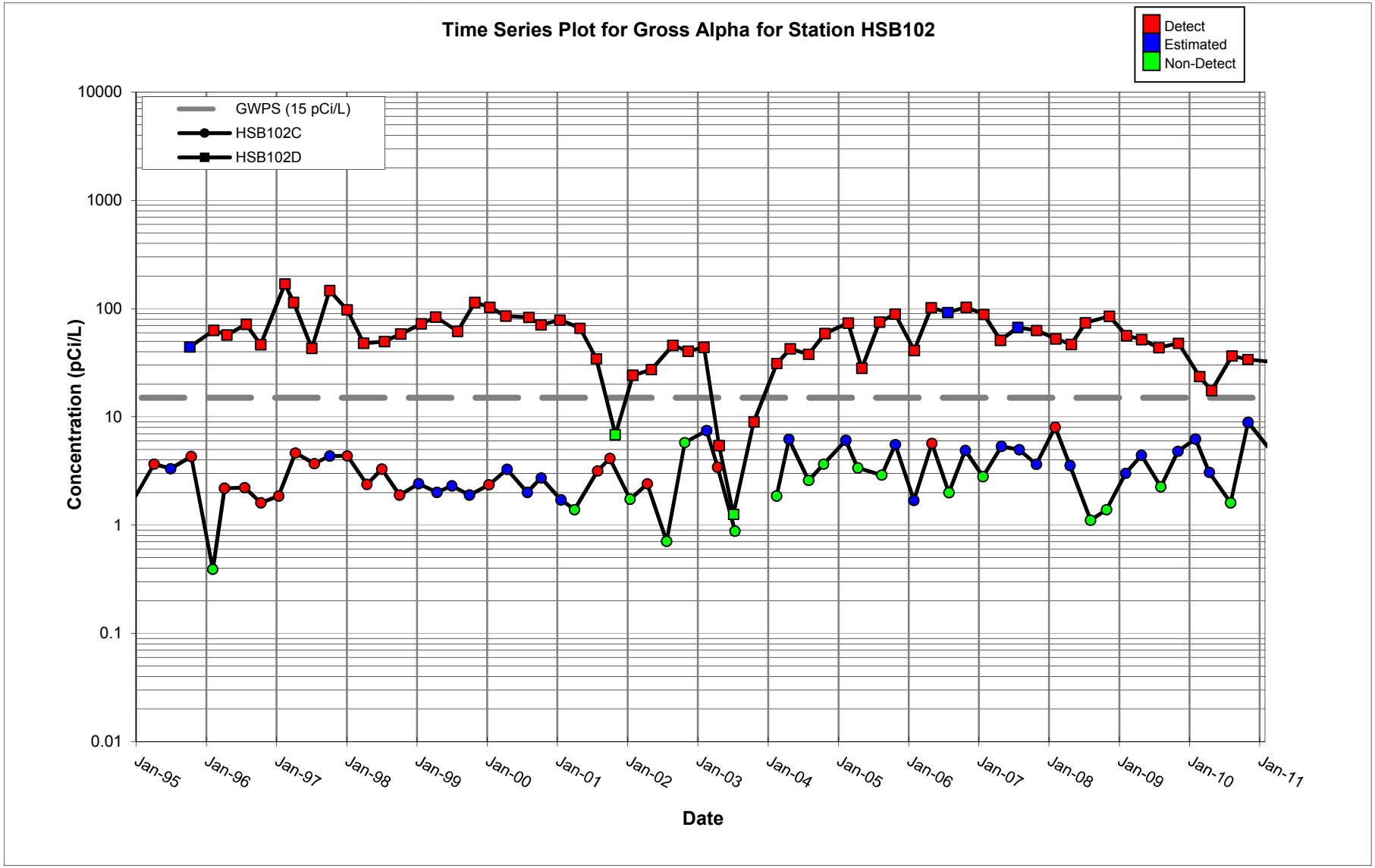

Time Series Plot for Gross Alpha for Station FSB125
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB125D/125DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

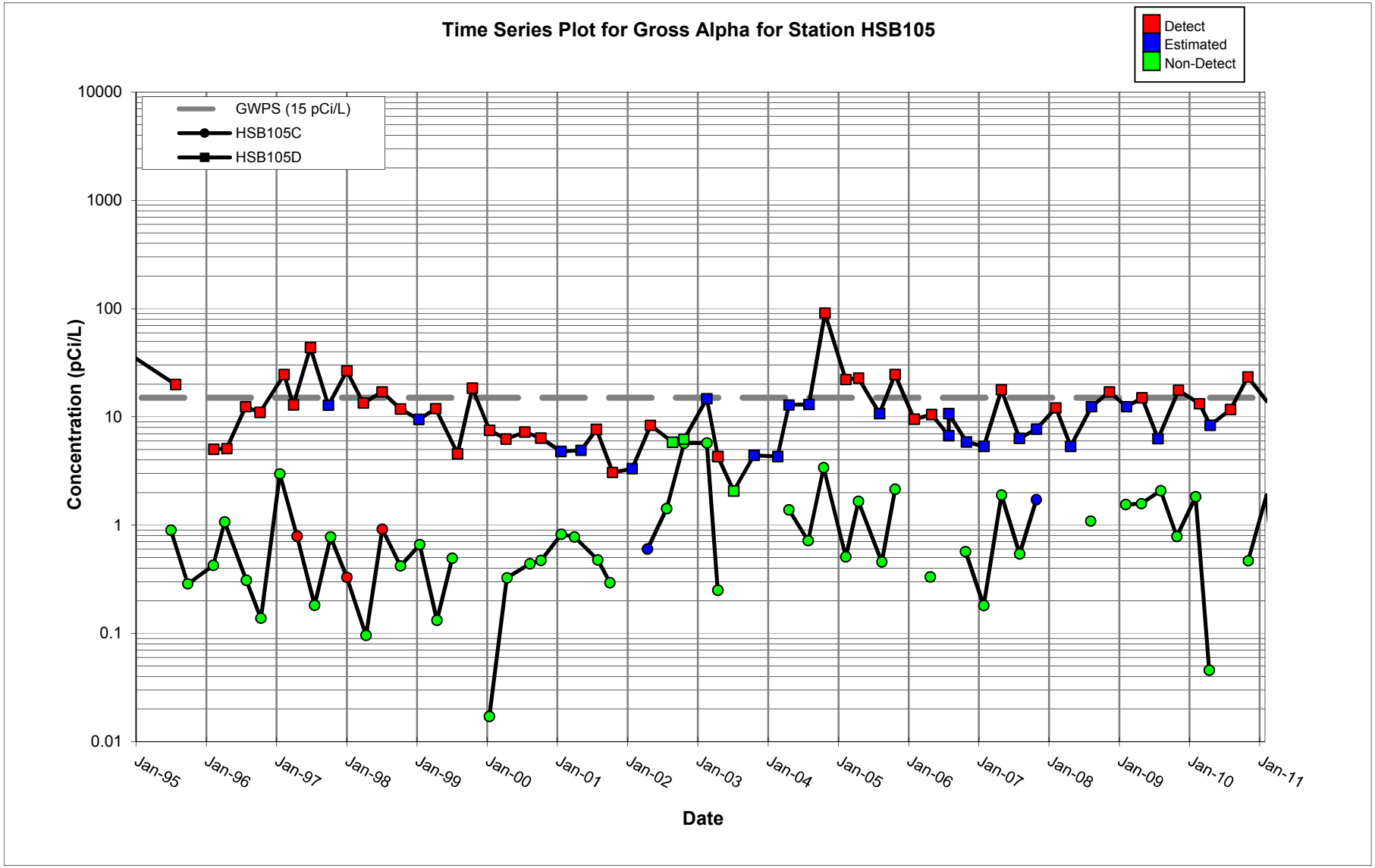

Time Series Plot for Gross Alpha for Station FSB127
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB127D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

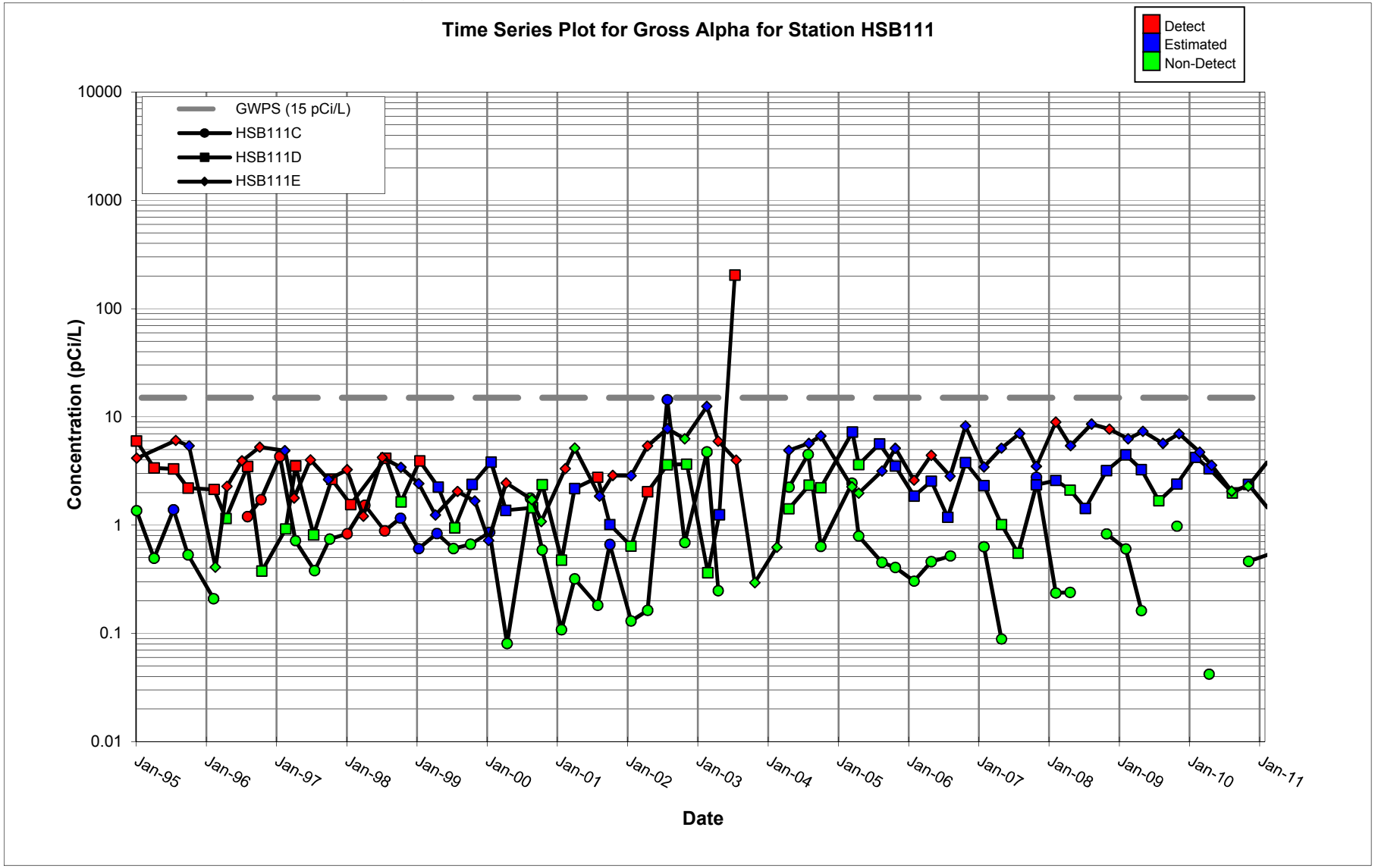

Time Series Plot for Gross Alpha for Station FSB138
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB138D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

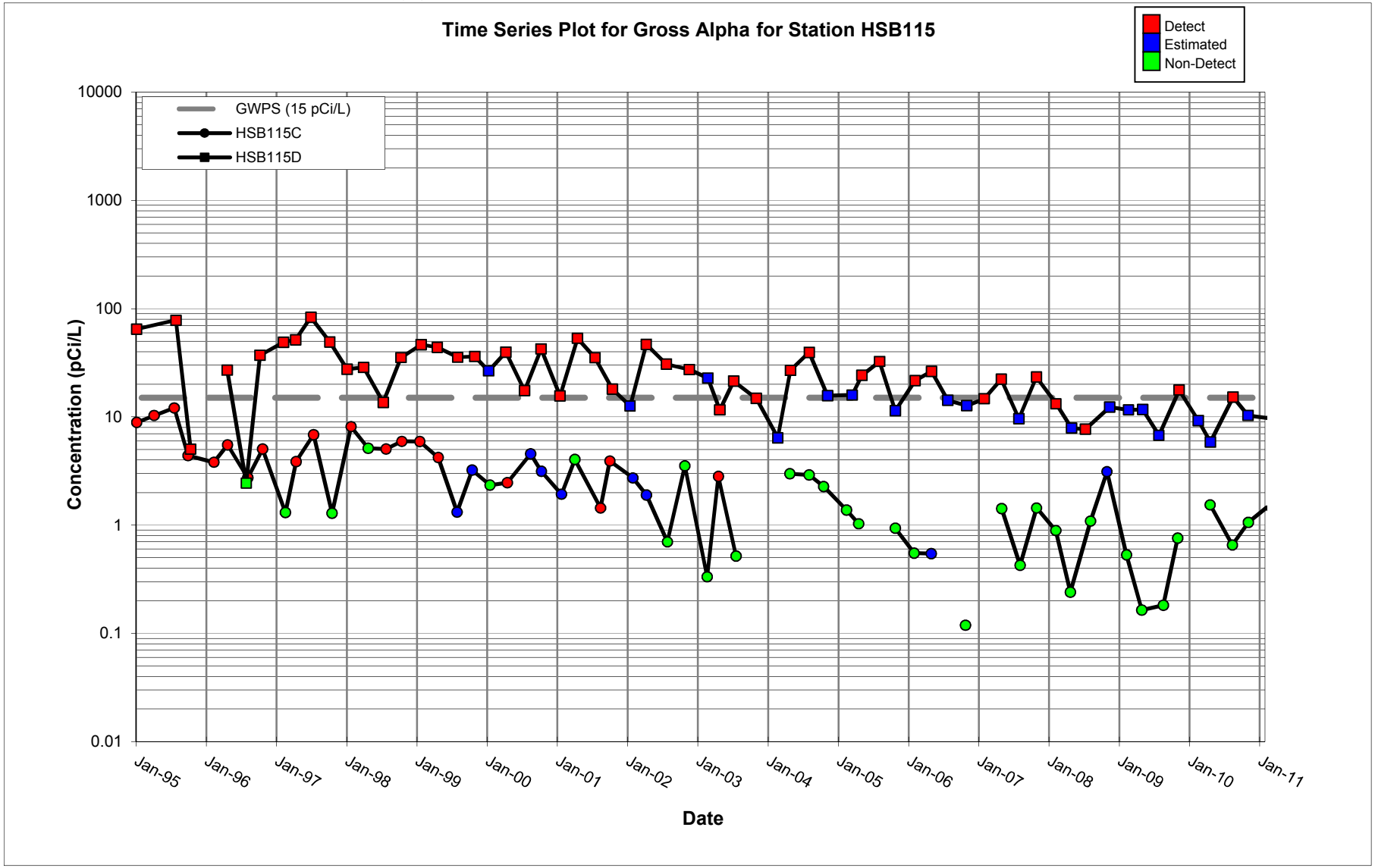

Time Series Plot for Gross Alpha for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB 66
HSB 66D/66DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

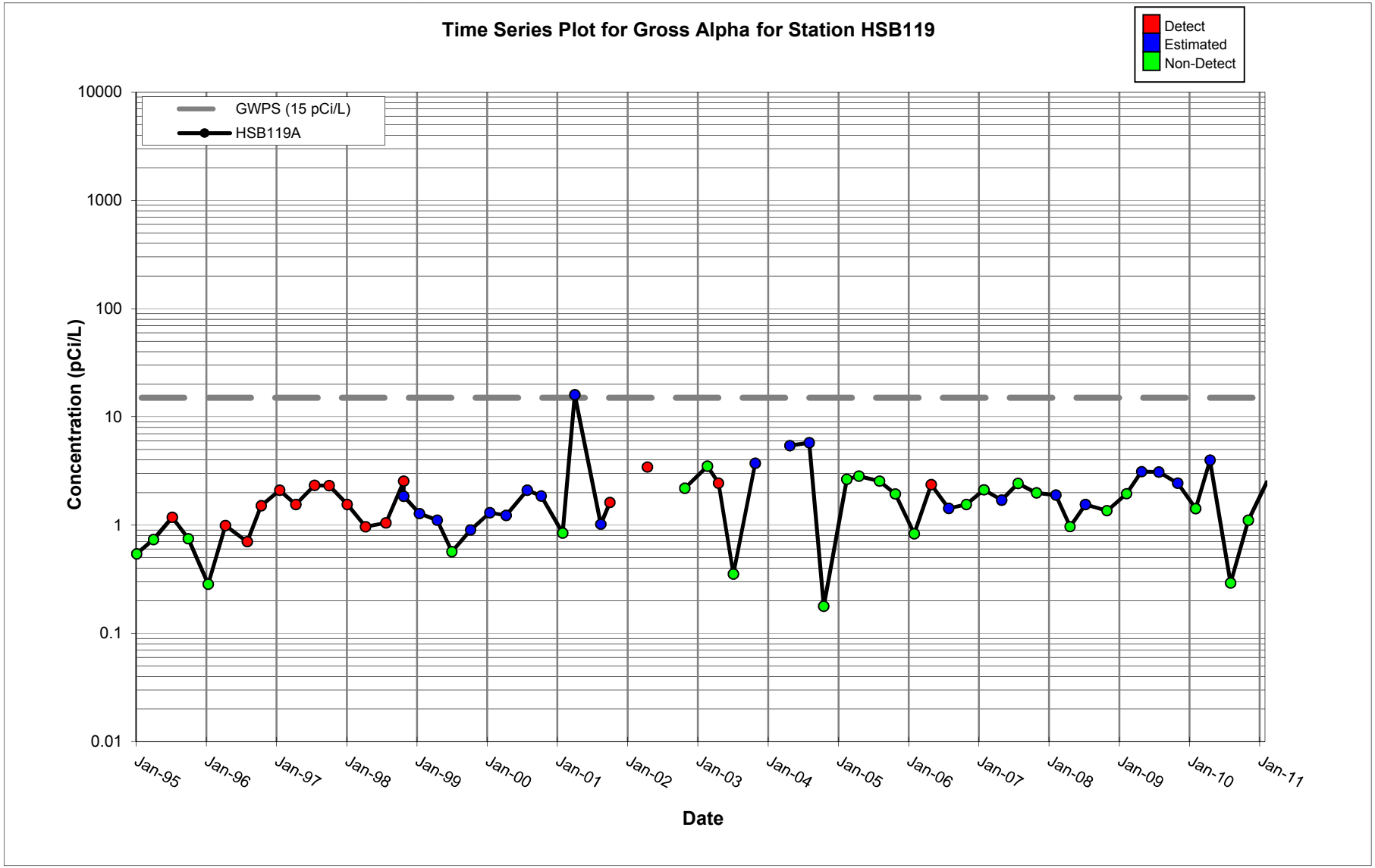

Time Series Plot for Gross Alpha for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB 84A
HSB 84C
HSB 84D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

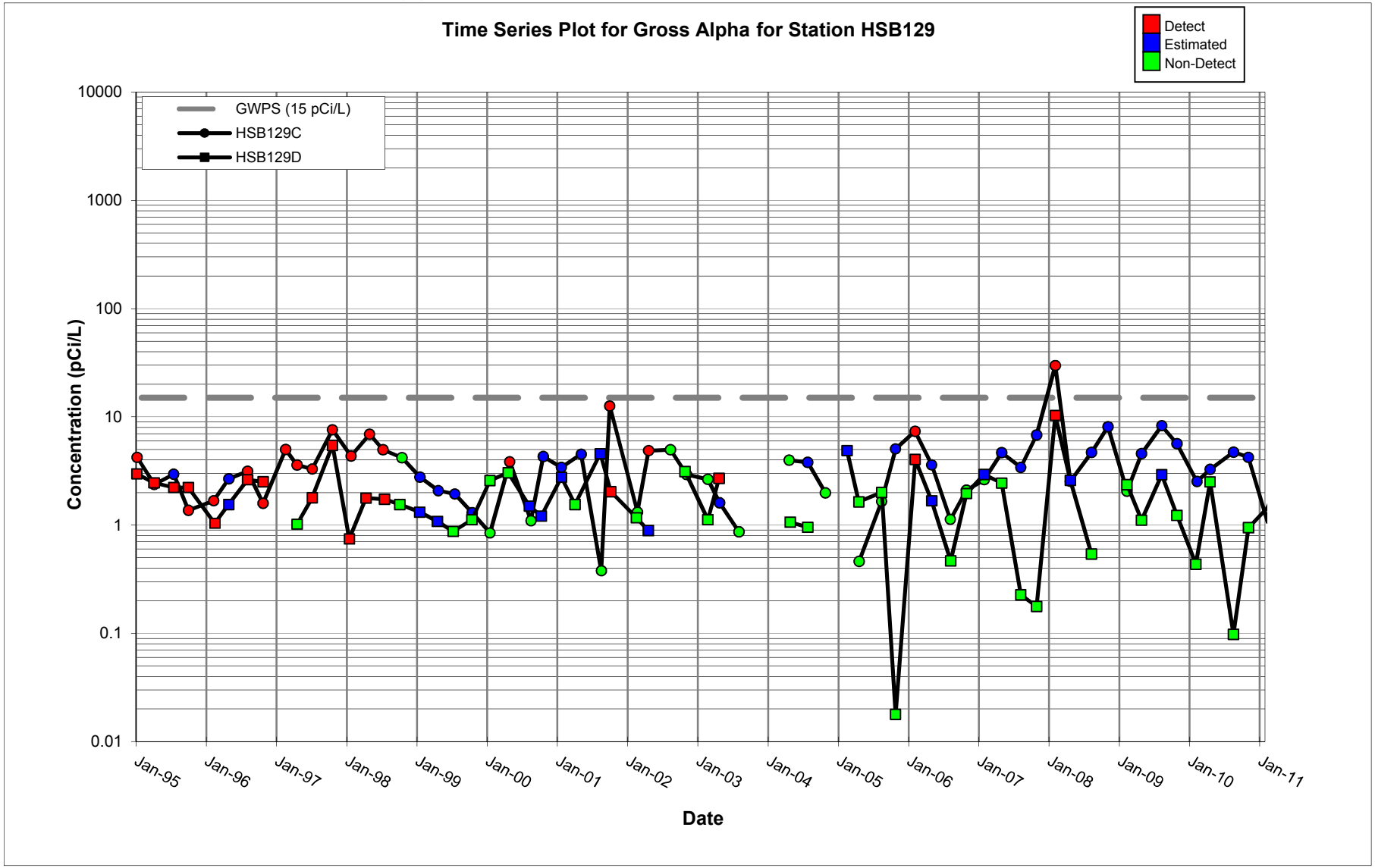

Time Series Plot for Gross Alpha for Station HSB102
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB102C
HSB102D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

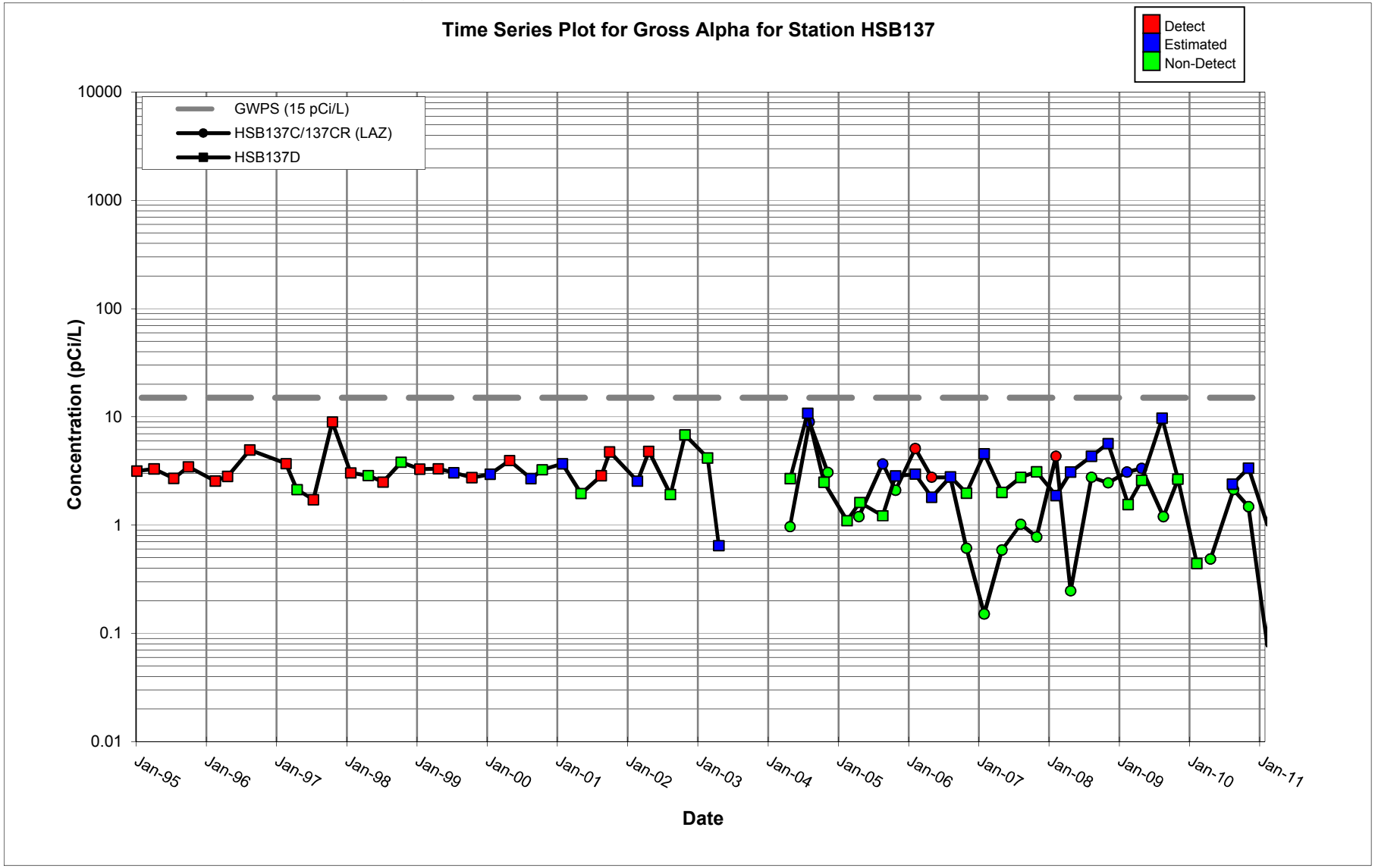

Time Series Plot for Gross Alpha for Station HSB105
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB105C
HSB105D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

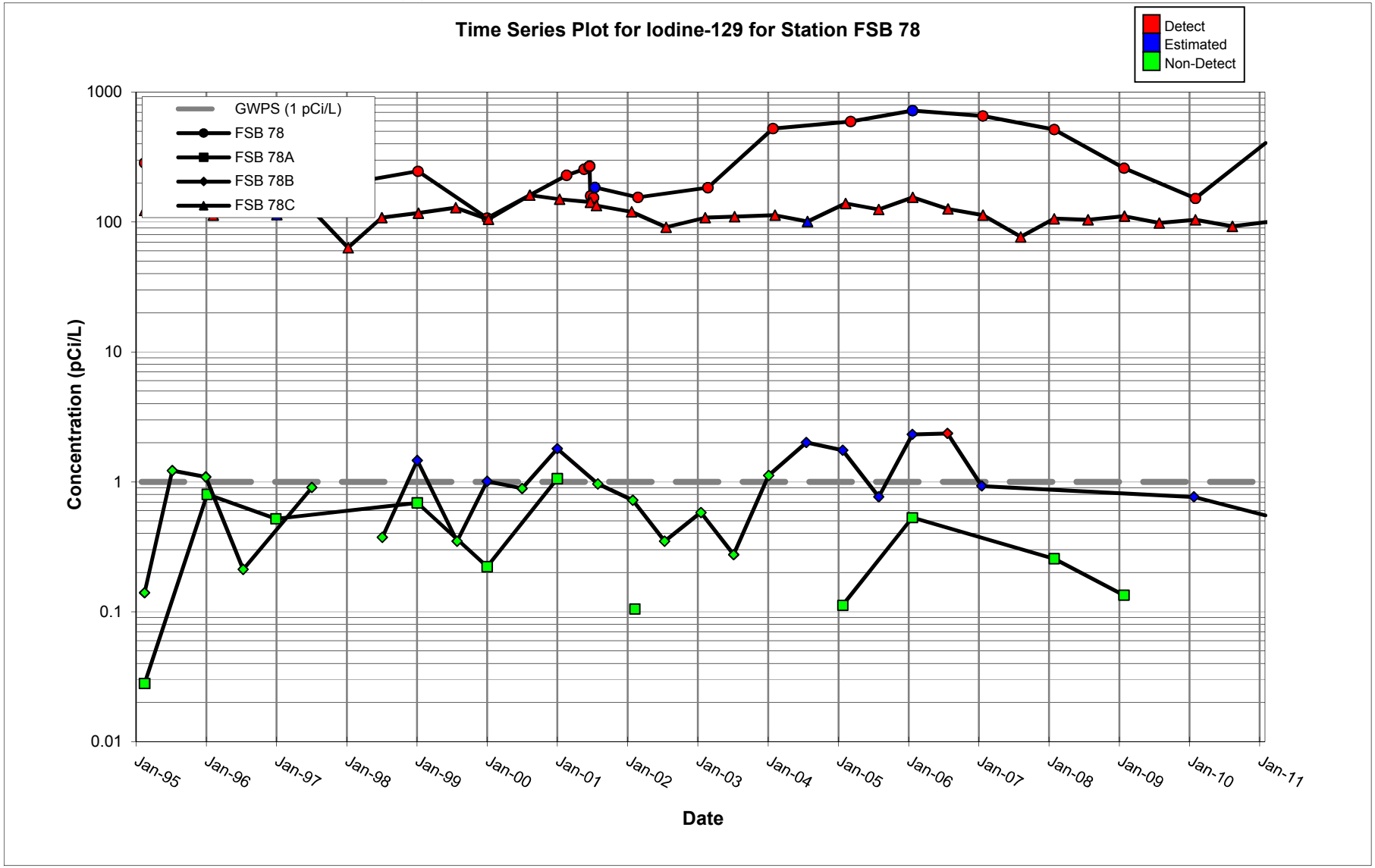

Time Series Plot for Gross Alpha for Station HSB111
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB111C
HSB111D
HSB111E
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

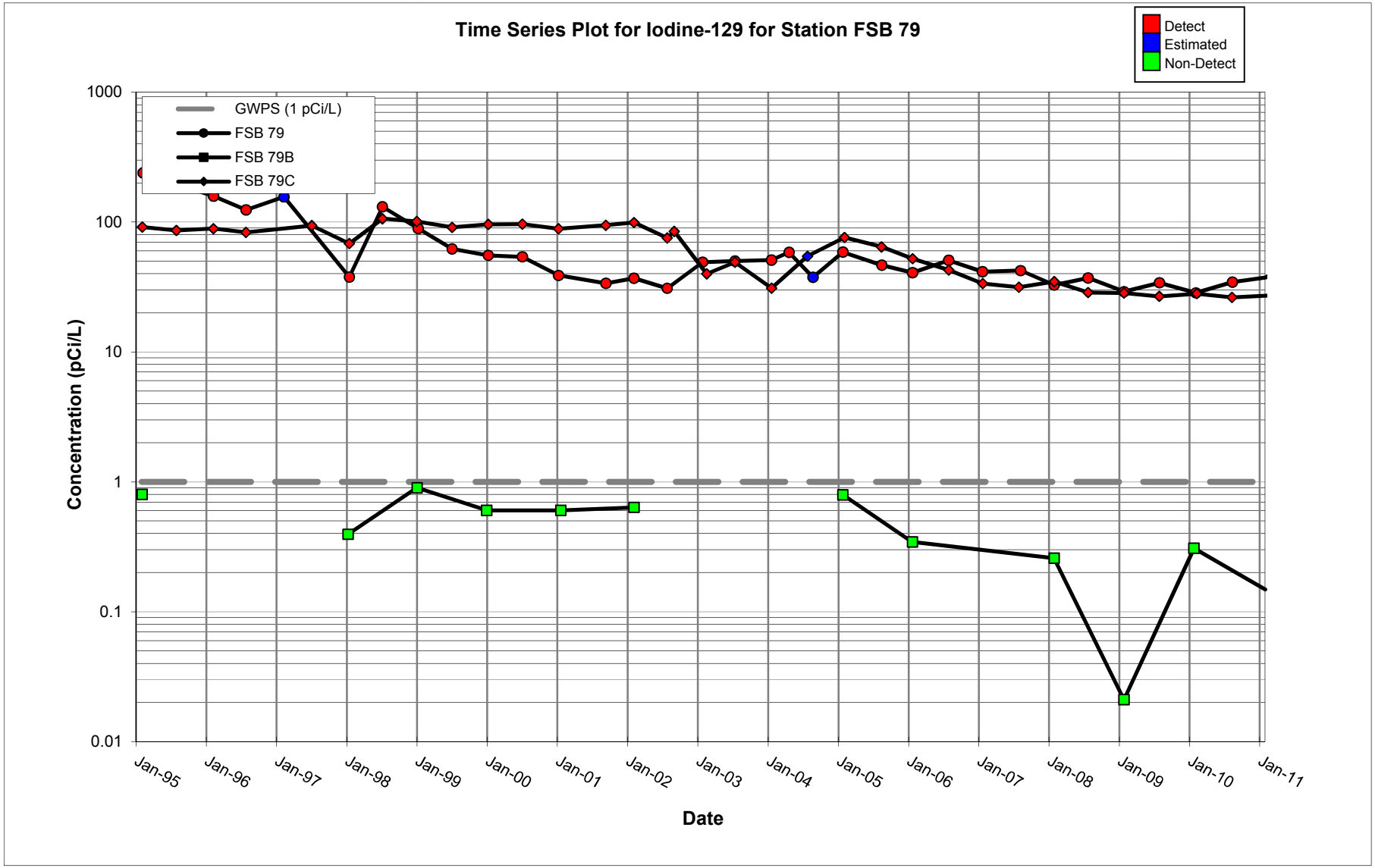

Time Series Plot for Gross Alpha for Station HSB115
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB115C
HSB115D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

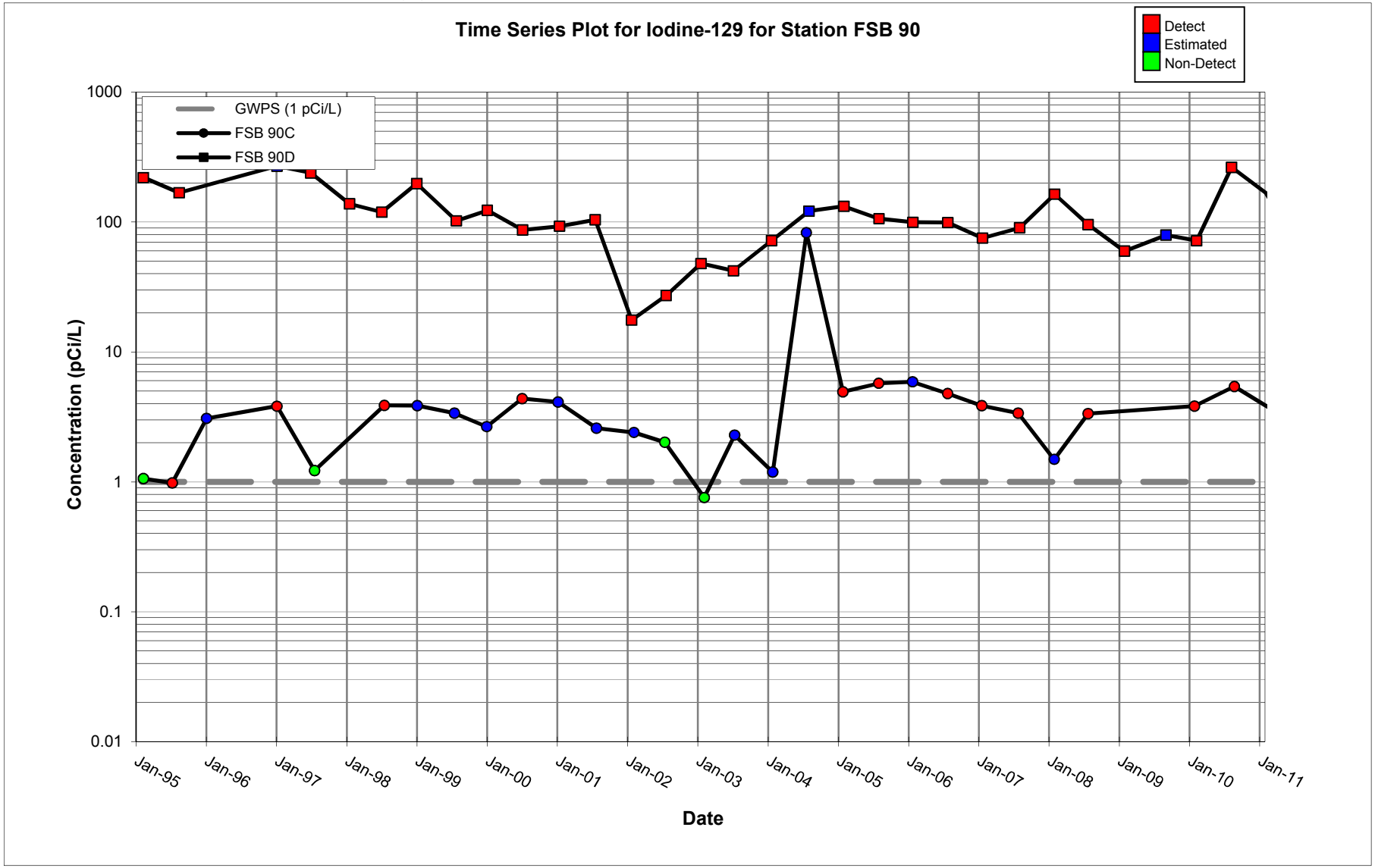

Time Series Plot for Gross Alpha for Station HSB119
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB119A
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

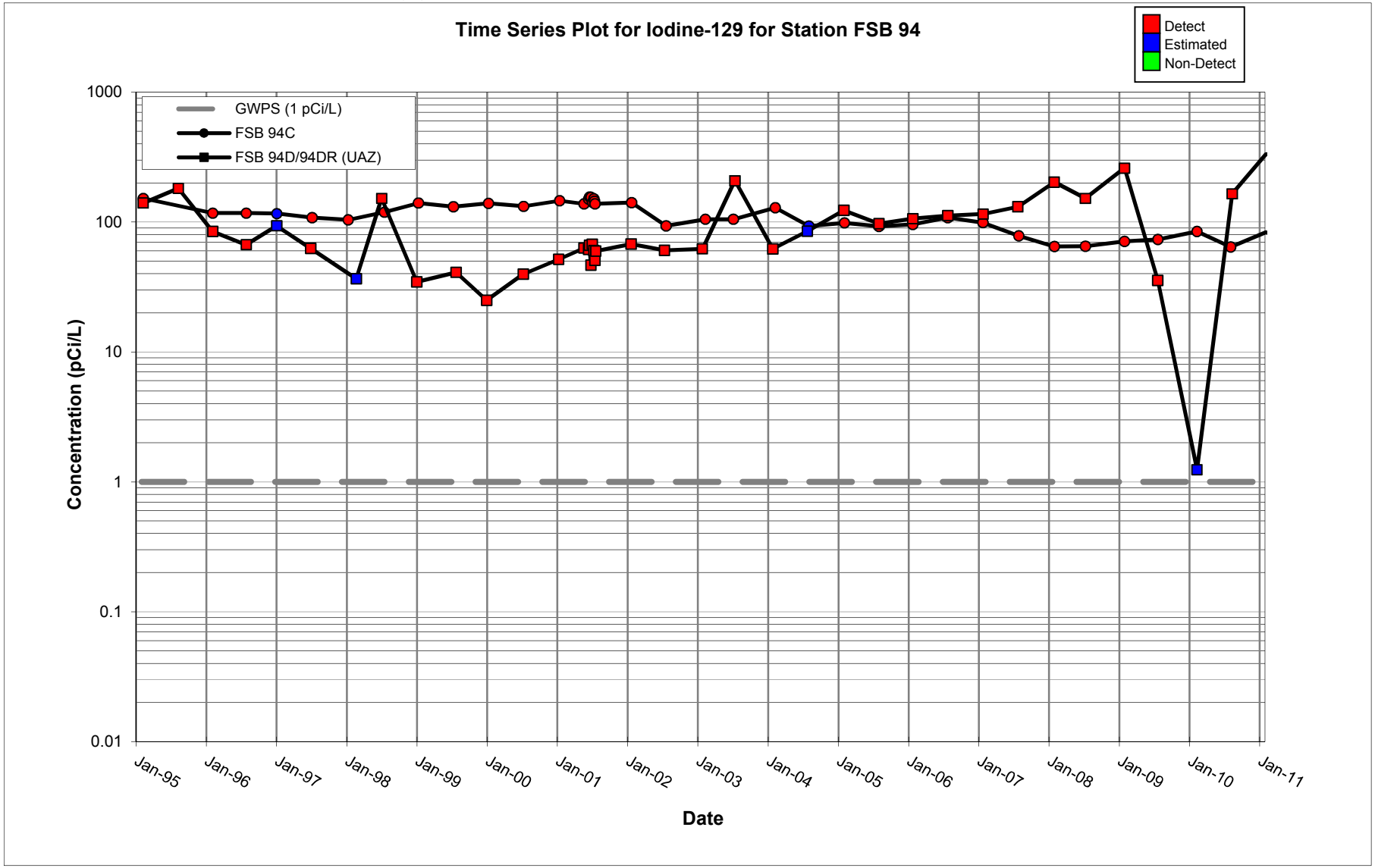

Time Series Plot for Gross Alpha for Station HSB129
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB129C
HSB129D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

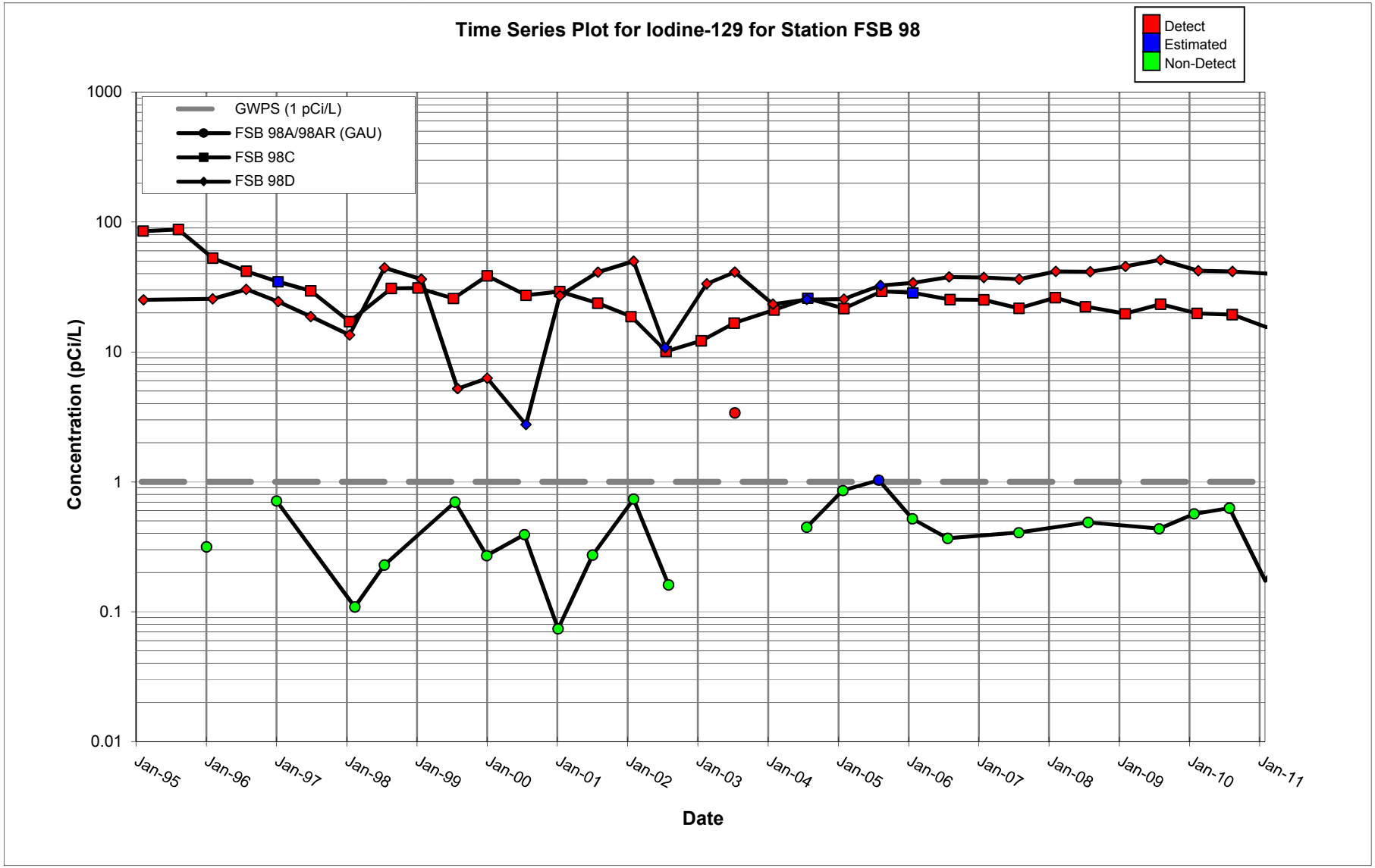

Time Series Plot for Gross Alpha for Station HSB137
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
HSB137C/137CR (LAZ)
HSB137D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

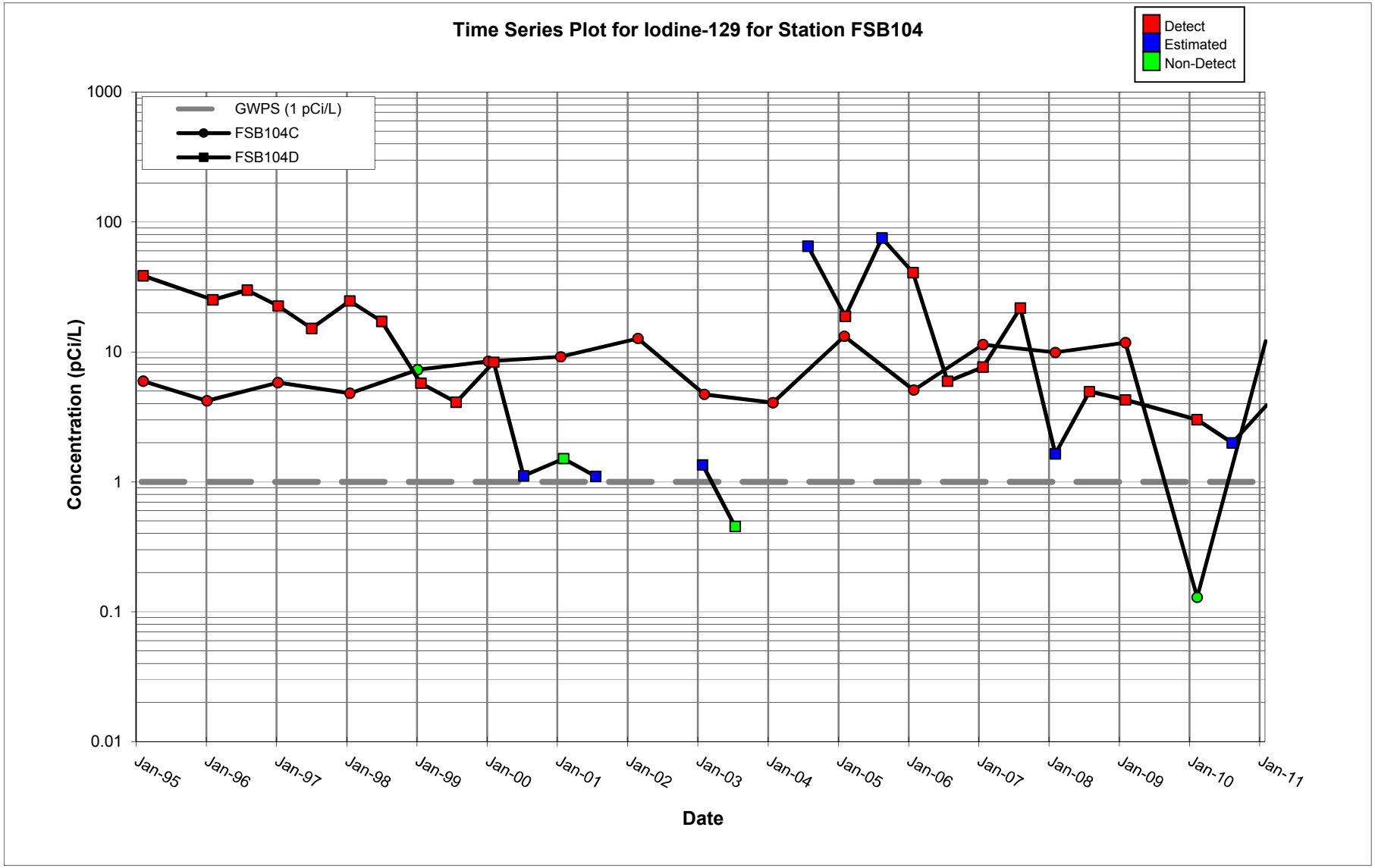

Time Series Plot for Iodine-129 for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB 78
FSB 78A
FSB 78B
FSB 78C
1000
100
10
1
0.1
0.01
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

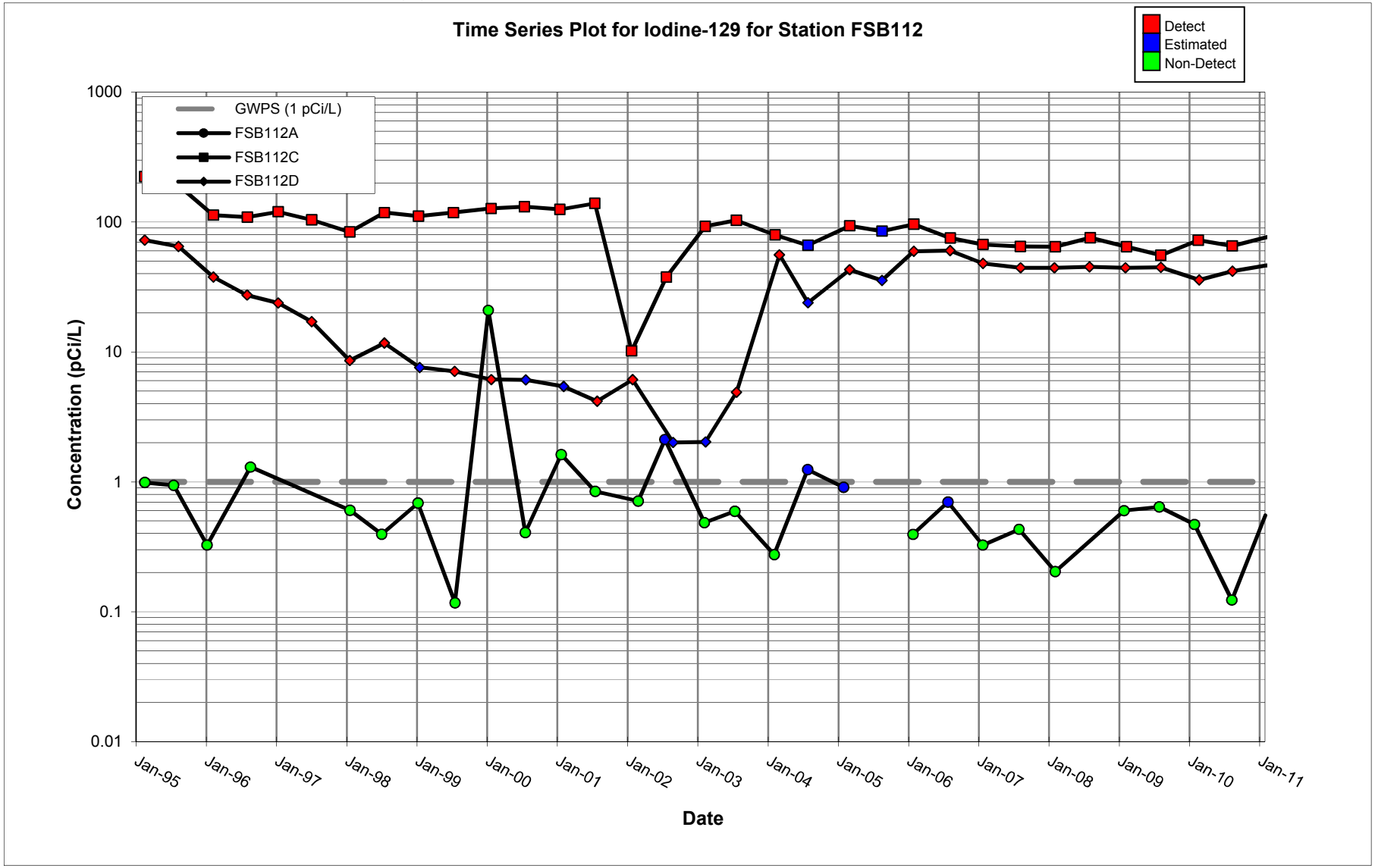

Time Series Plot for Iodine-129 for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB 79
FSB 79B
FSB 79C
1000
100
10
1
0.1
0.01
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

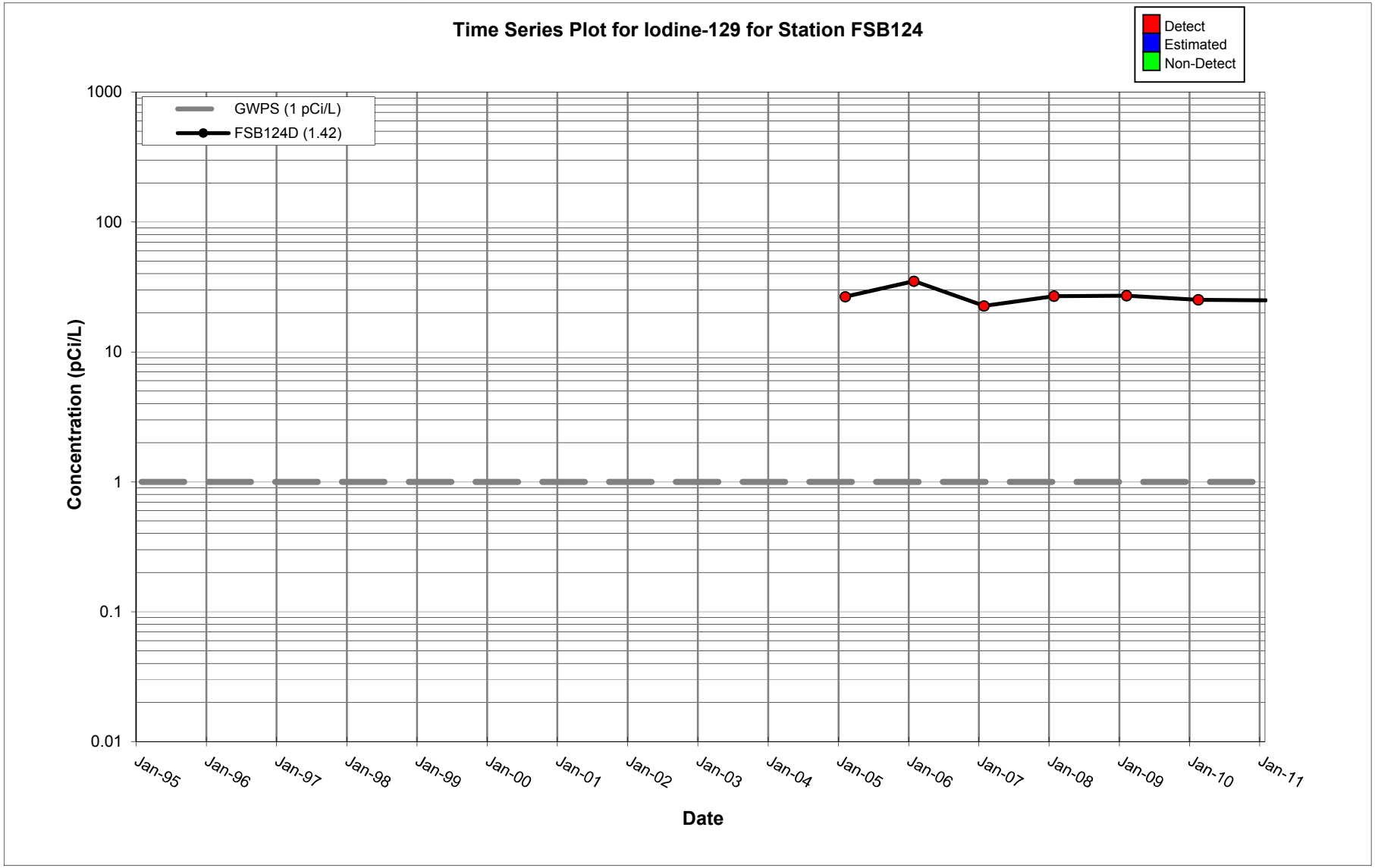

Time Series Plot for Iodine-129 for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB 90C
FSB 90D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

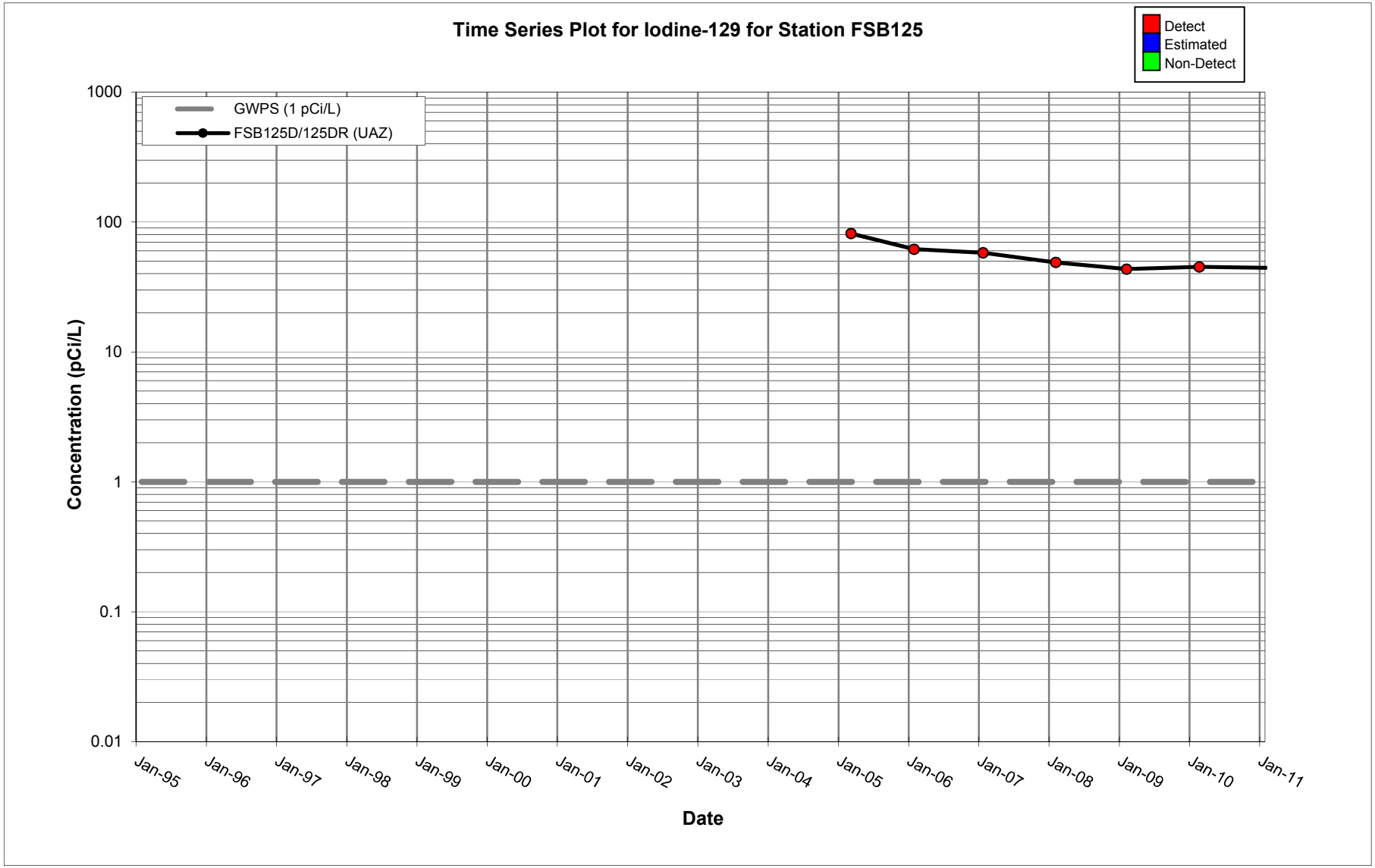

Time Series Plot for Iodine-129 for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB 94C
FSB 94D/94DR (UAZ)
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

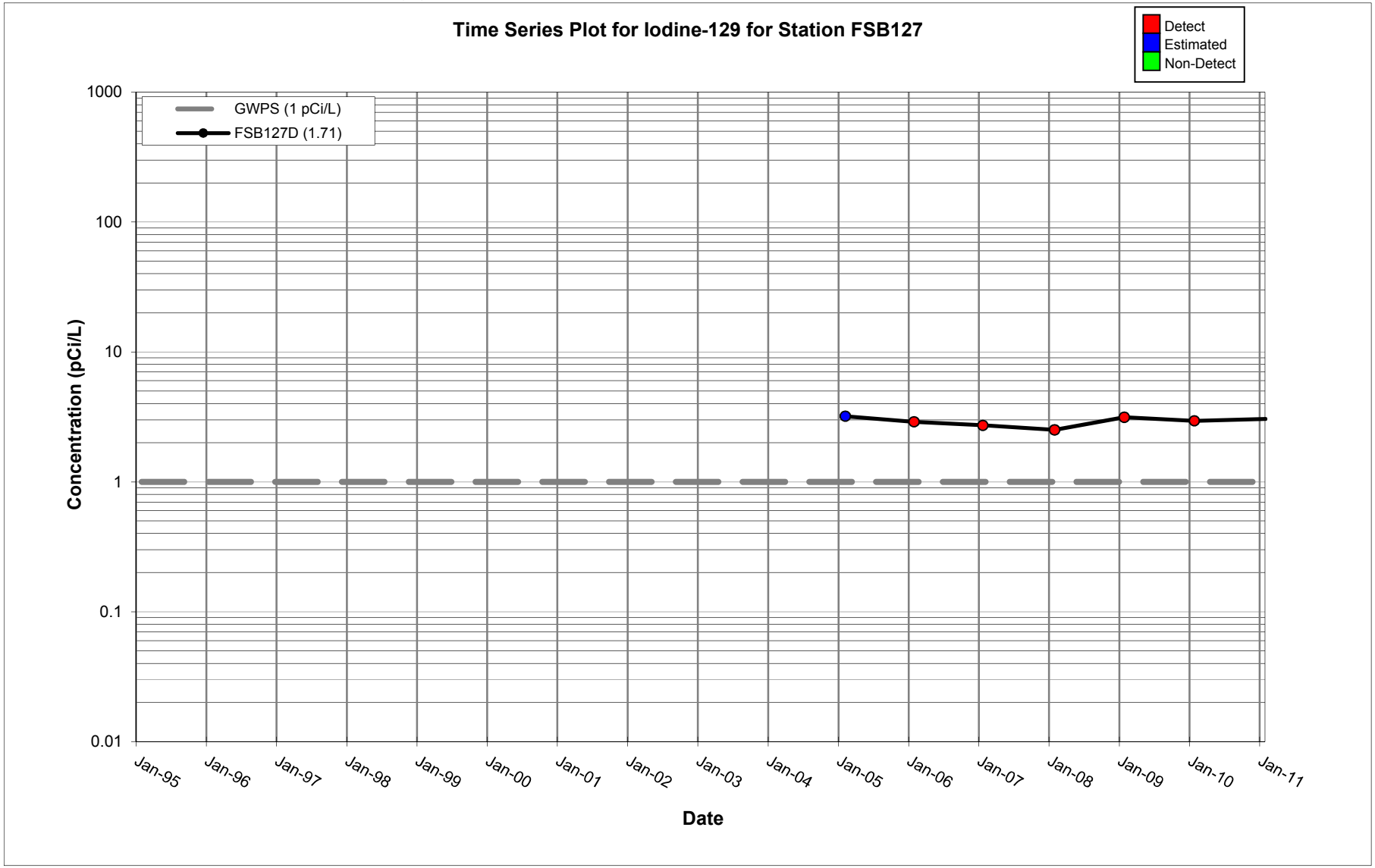

Time Series Plot for Iodine-129 for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
1000
100
10
1
0.1
0.01
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

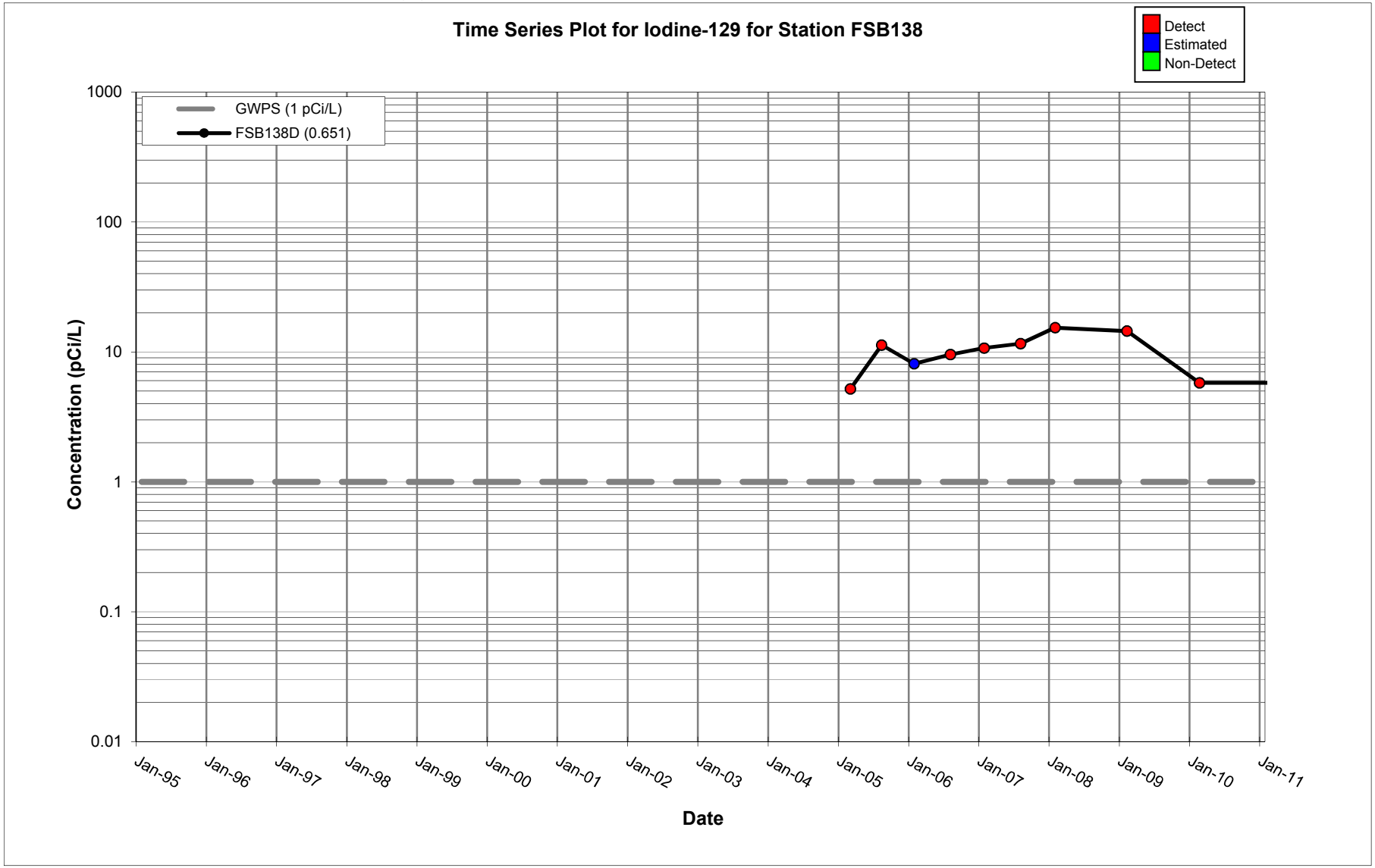

Time Series Plot for Iodine-129 for Station FSB104
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB104C
FSB104D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

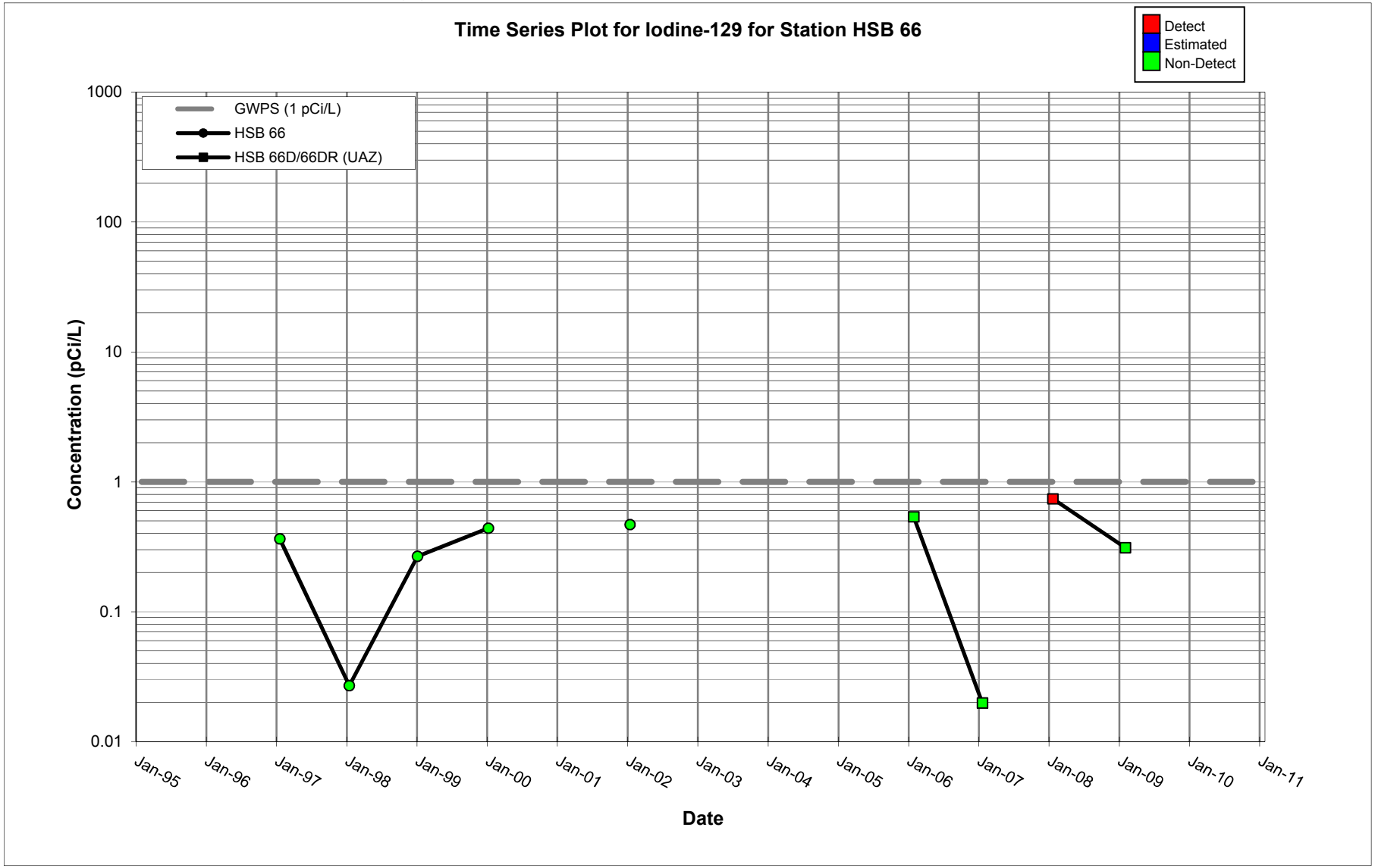

Time Series Plot for Iodine-129 for Station FSB112
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB112A
FSB112C
FSB112D
1000
100
10
1
0.1
0.01
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

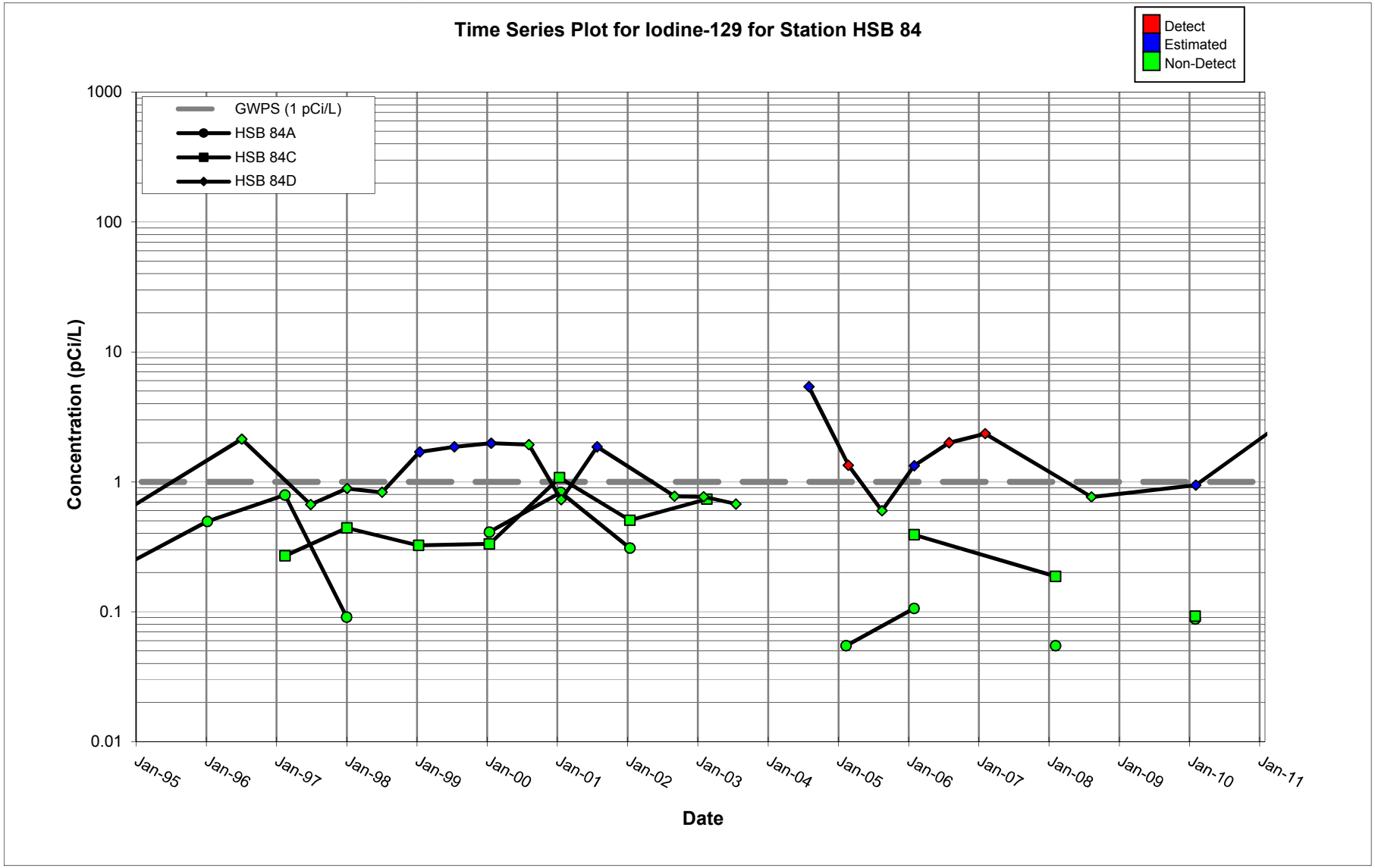

Time Series Plot for Iodine-129 for Station FSB124
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB124D (1.42)
1000
100
10
1
0.1
0.01
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

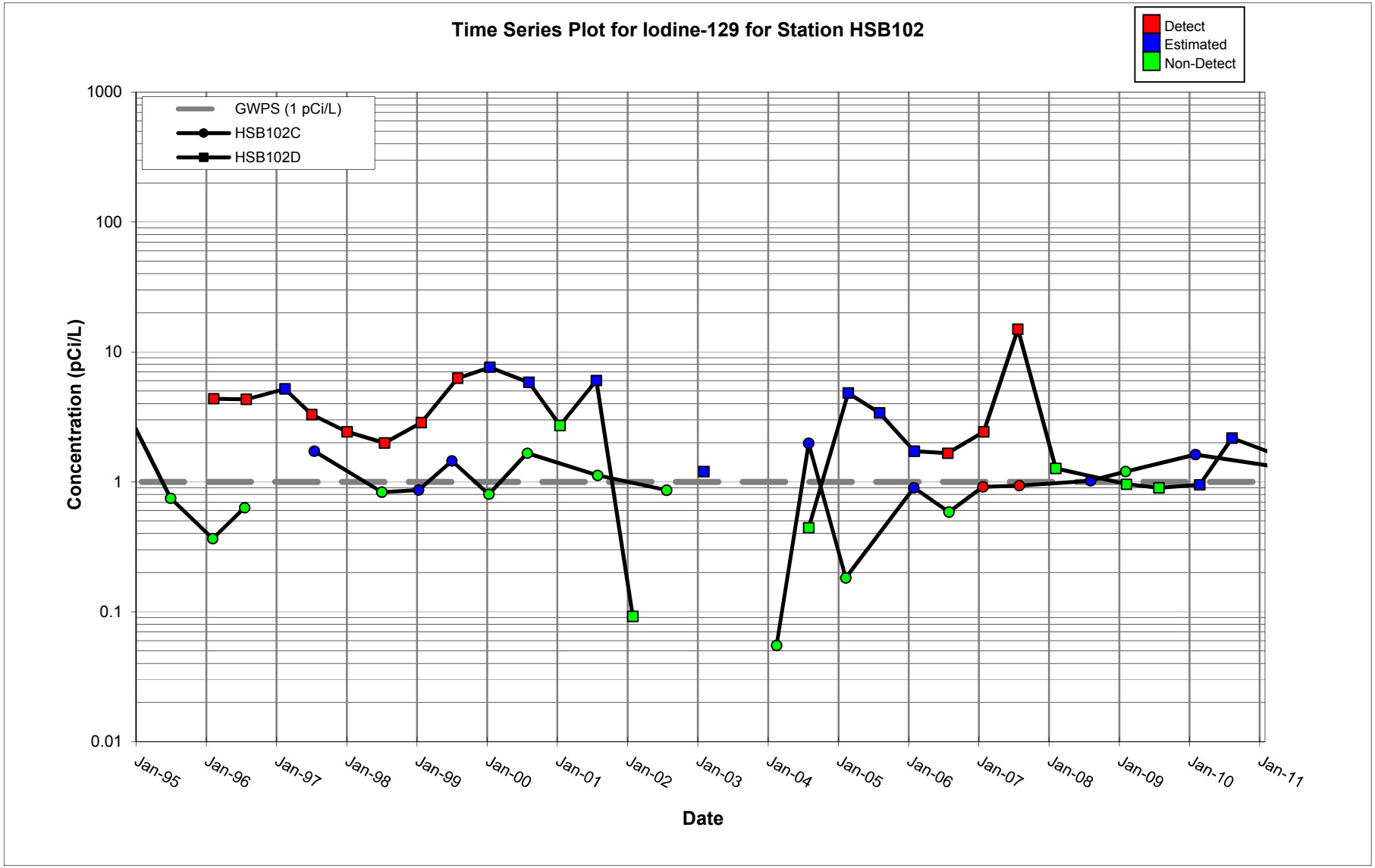

Time Series Plot for Iodine-129 for Station FSB125
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB125D/125DR (UAZ)
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

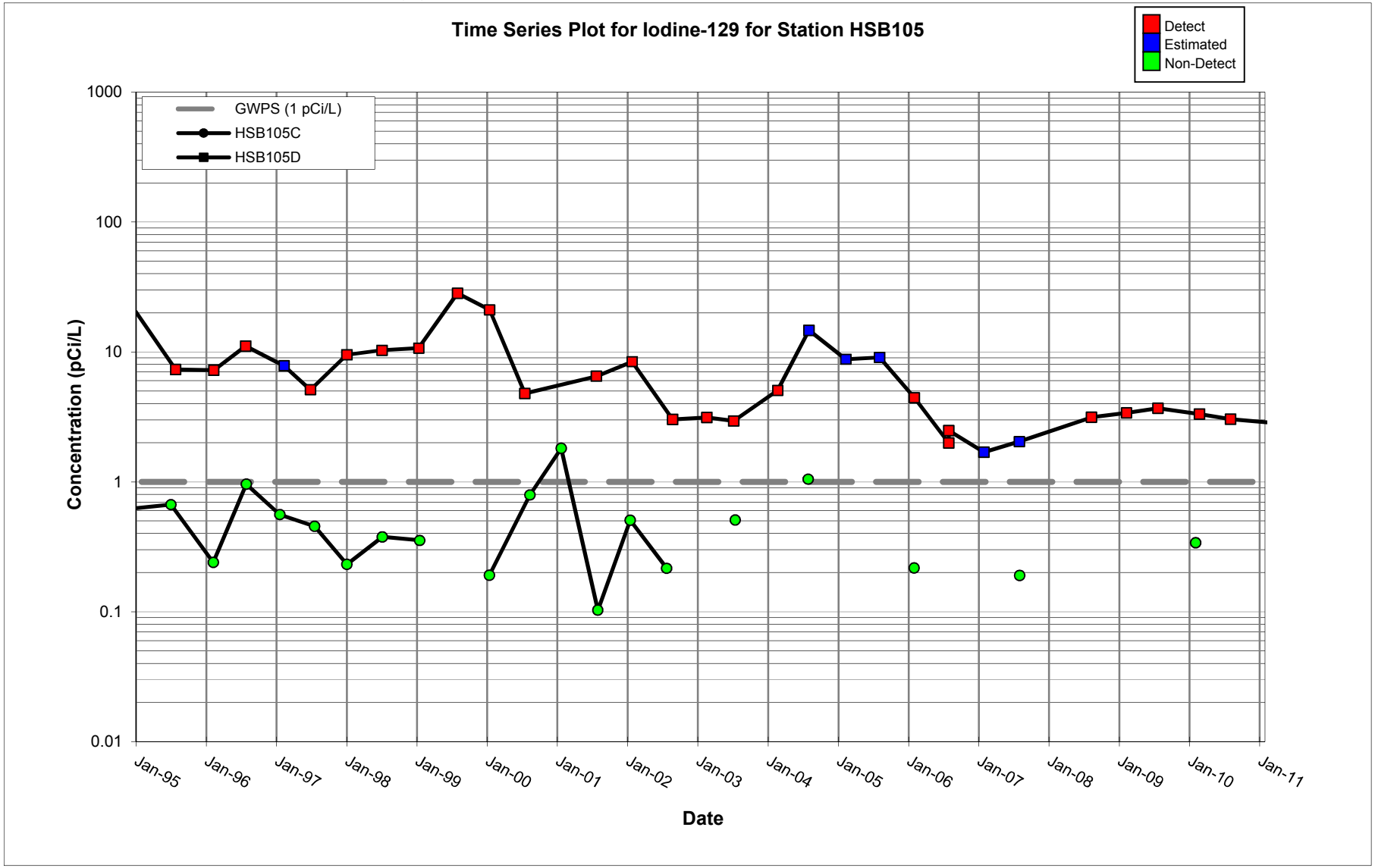

Time Series Plot for Iodine-129 for Station FSB127
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB127D (1.71)
1000
100
10
1
0.1
0.01
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

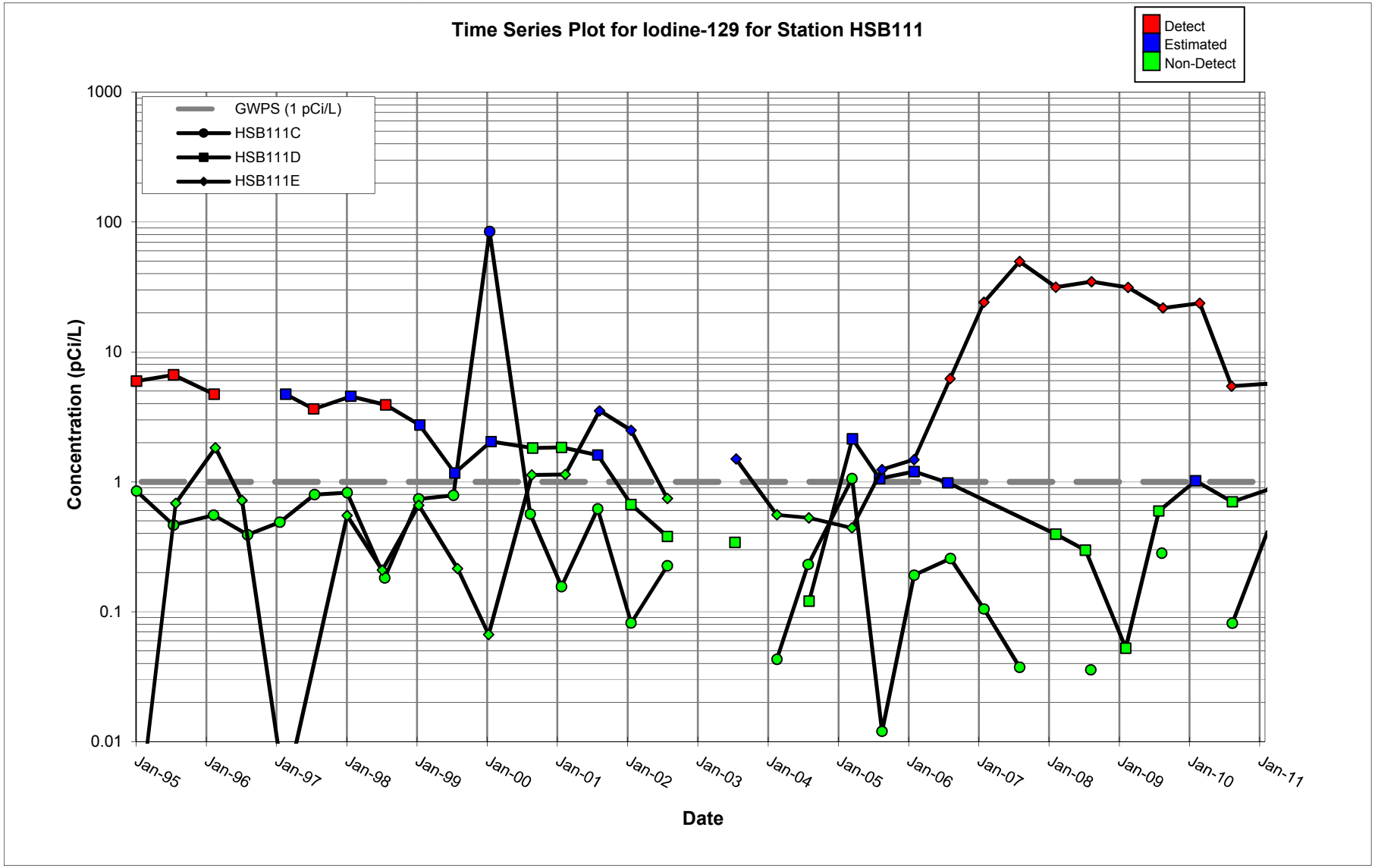

Time Series Plot for Iodine-129 for Station FSB138
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
FSB138D (0.651)
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

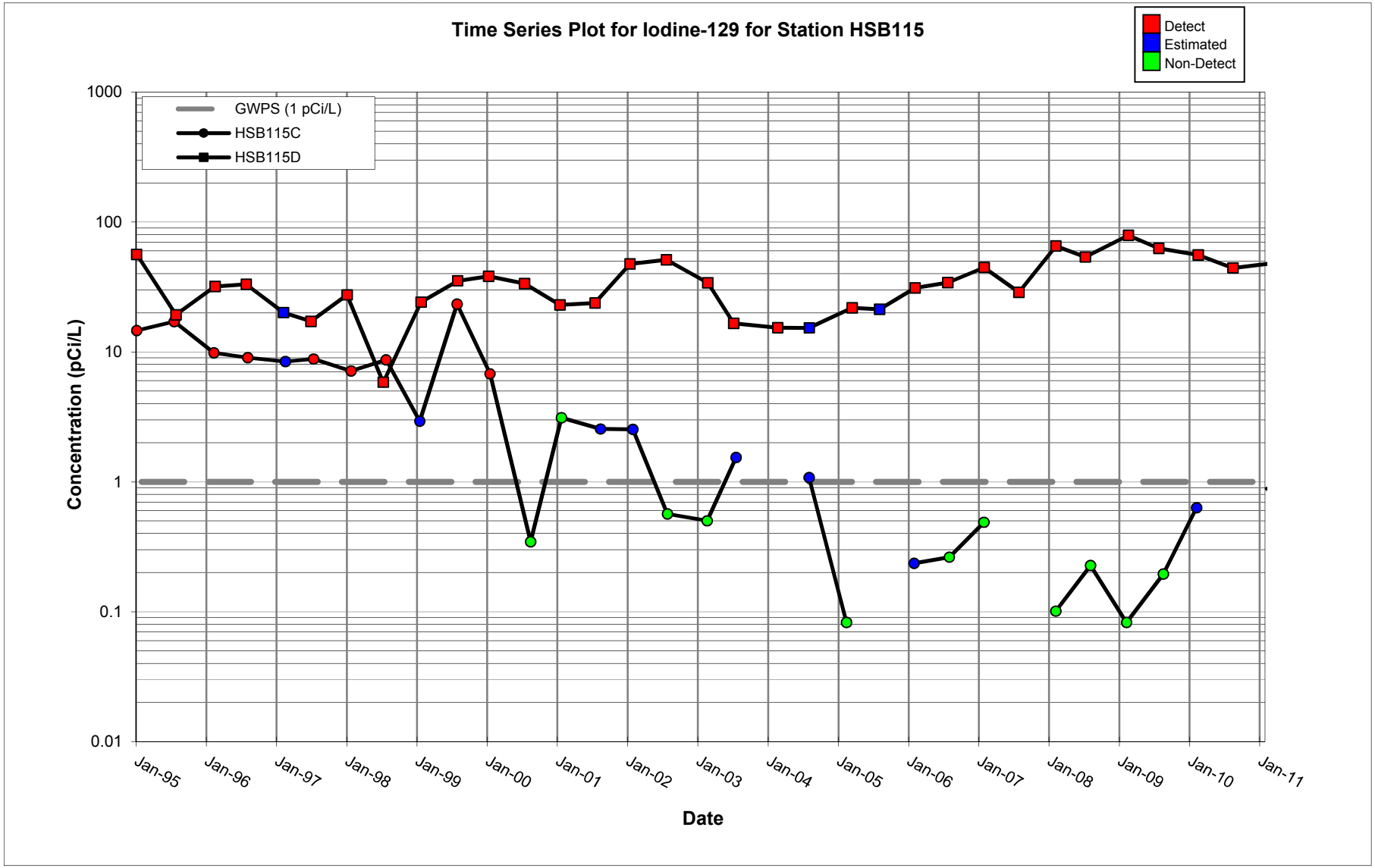

Time Series Plot for Iodine-129 for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB 66
HSB 66D/66DR (UAZ)
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

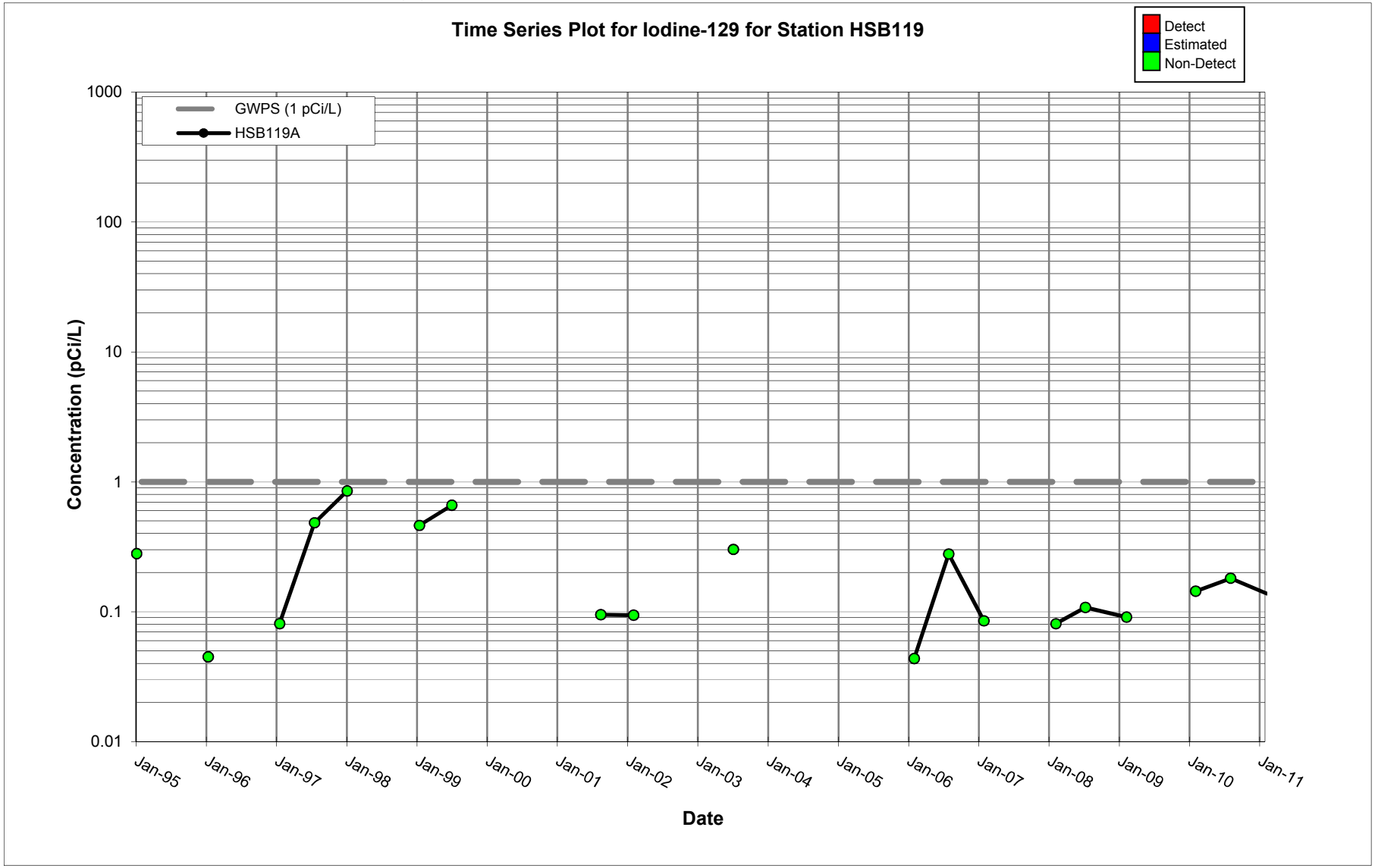

Time Series Plot for Iodine-129 for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB 84A
HSB 84C
HSB 84D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

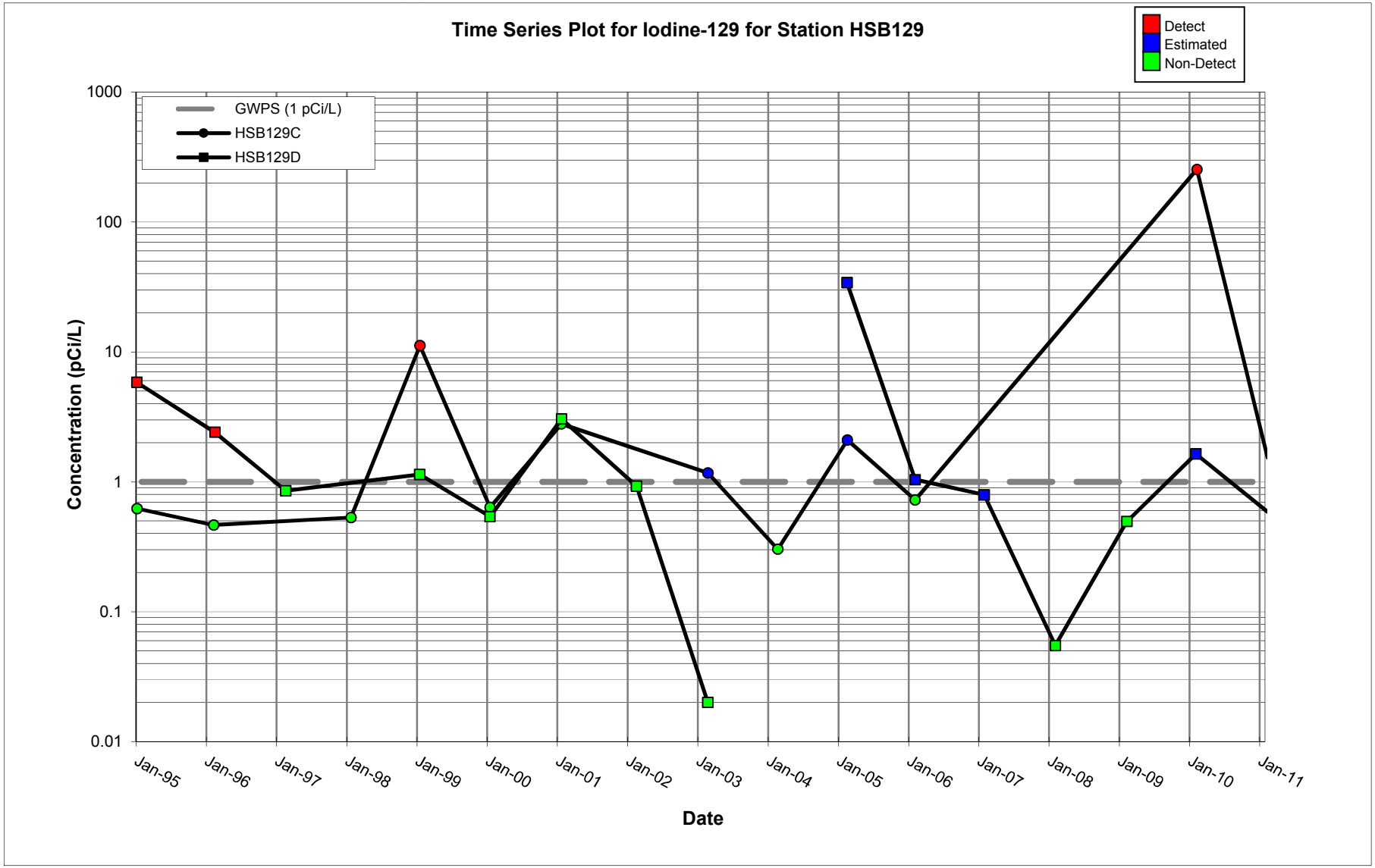

Time Series Plot for Iodine-129 for Station HSB102
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB102C
HSB102D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

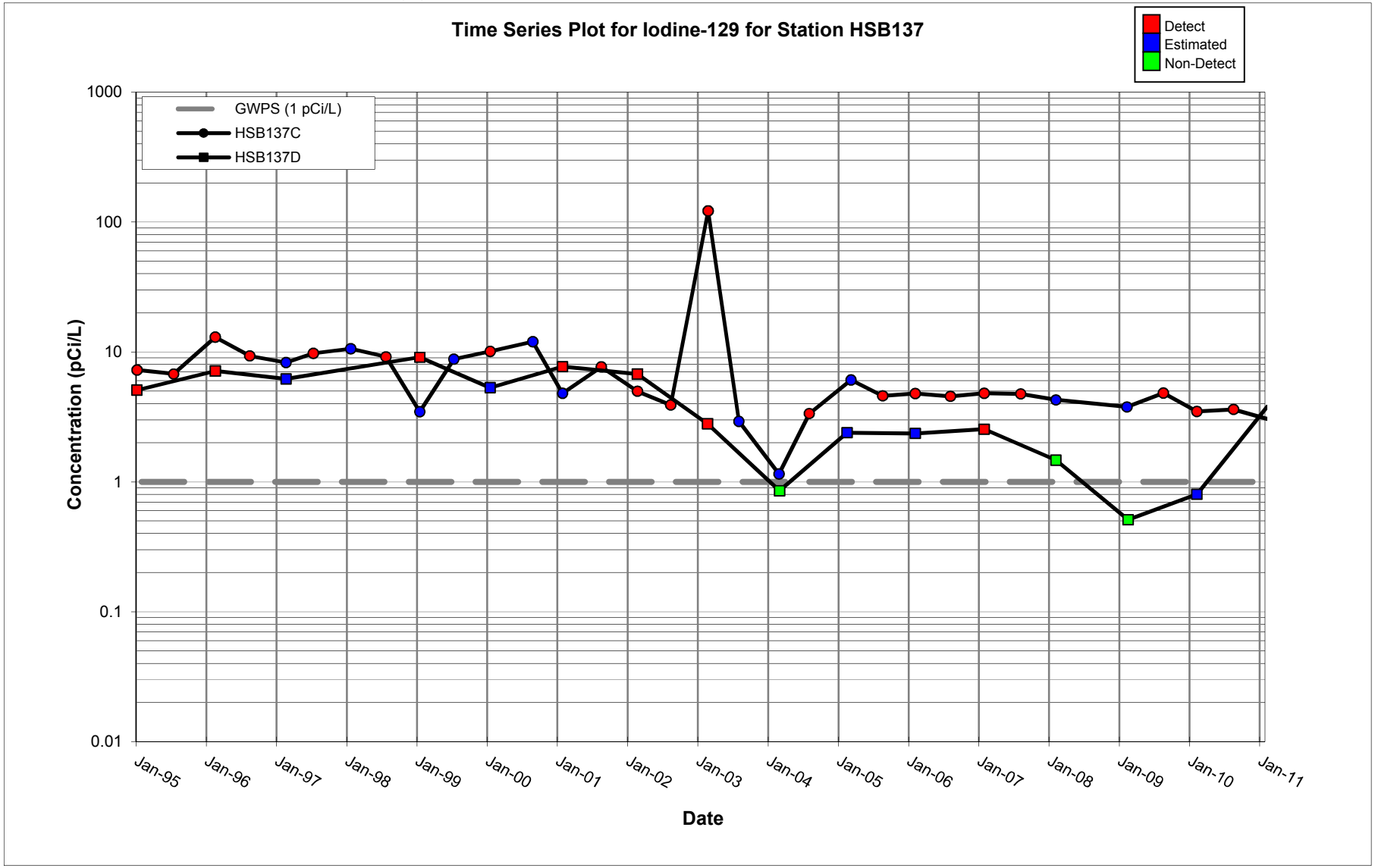

Time Series Plot for Iodine-129 for Station HSB105
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB105C
HSB105D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

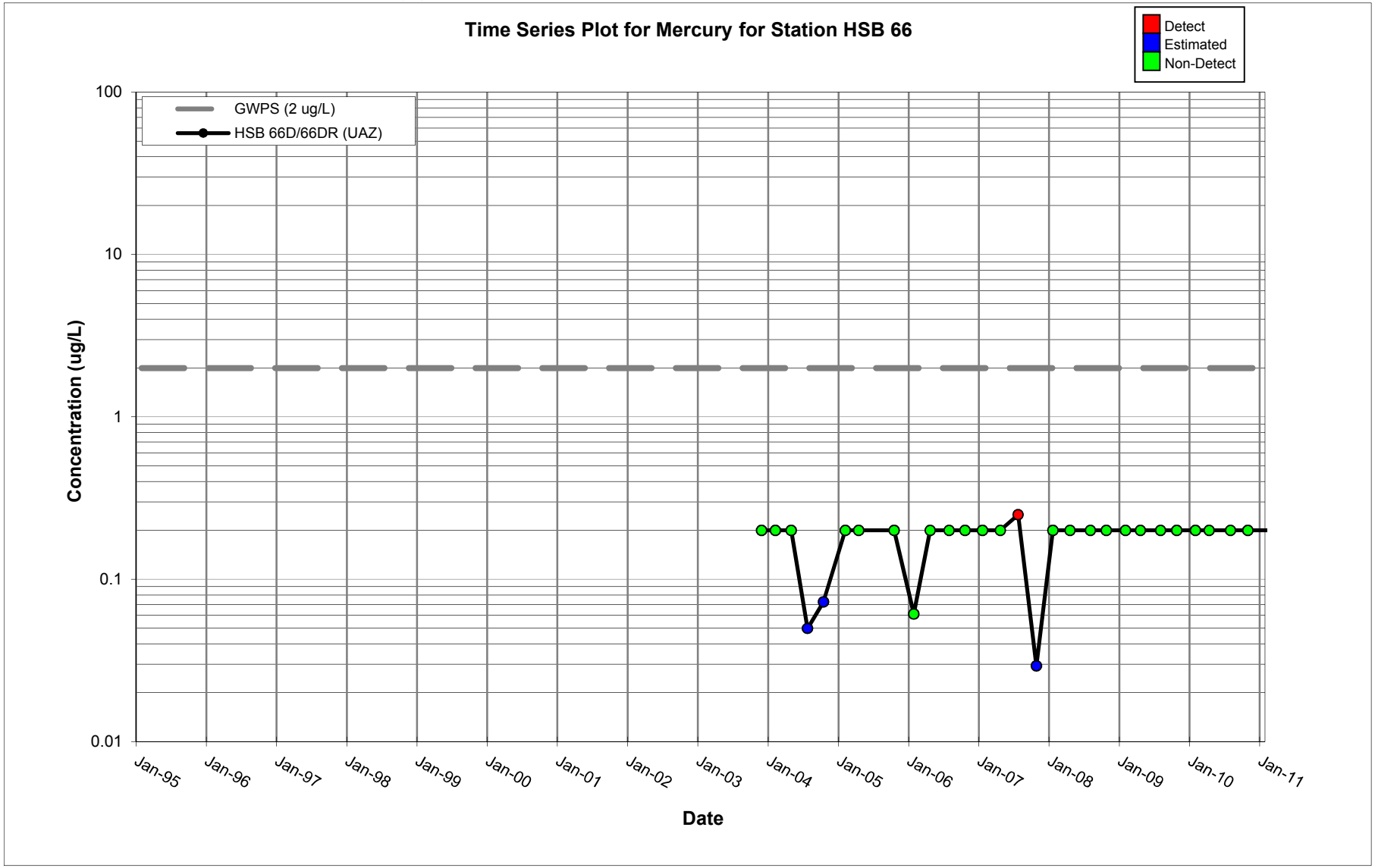

Time Series Plot for Iodine-129 for Station HSB111
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB111C
HSB111D
HSB111E
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

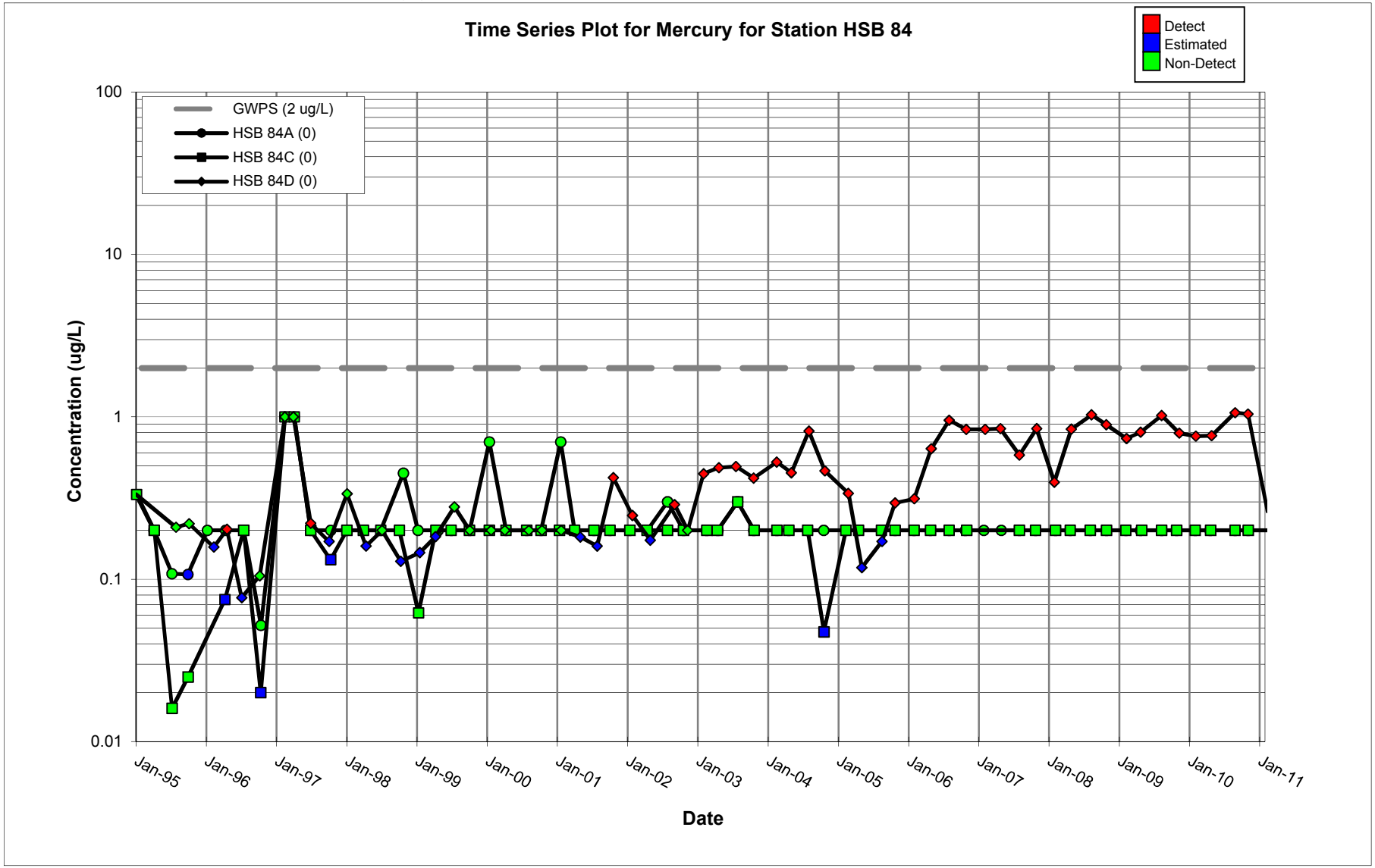

Time Series Plot for Iodine-129 for Station HSB115
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB115C
HSB115D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

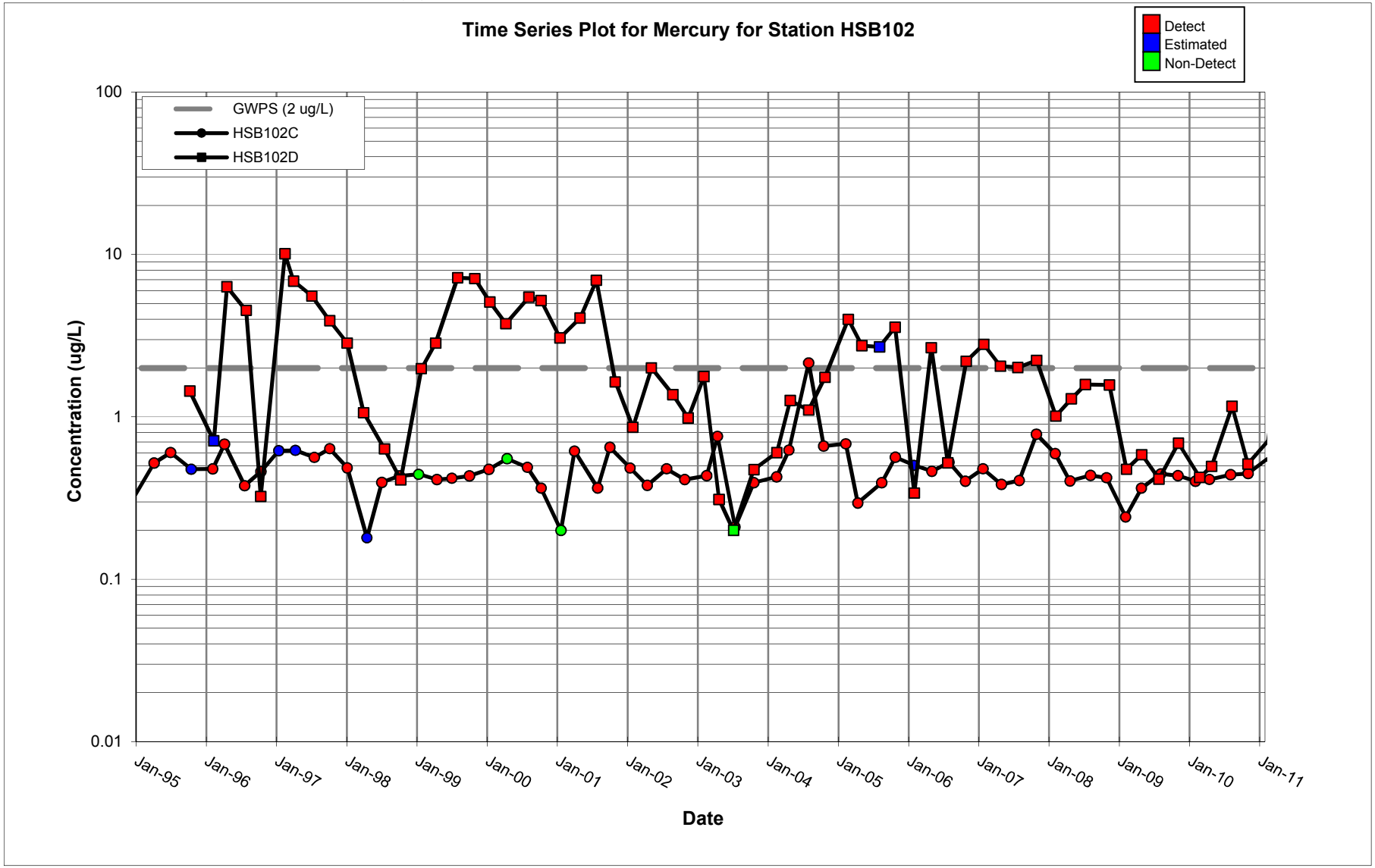

Time Series Plot for Iodine-129 for Station HSB119
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB119A
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

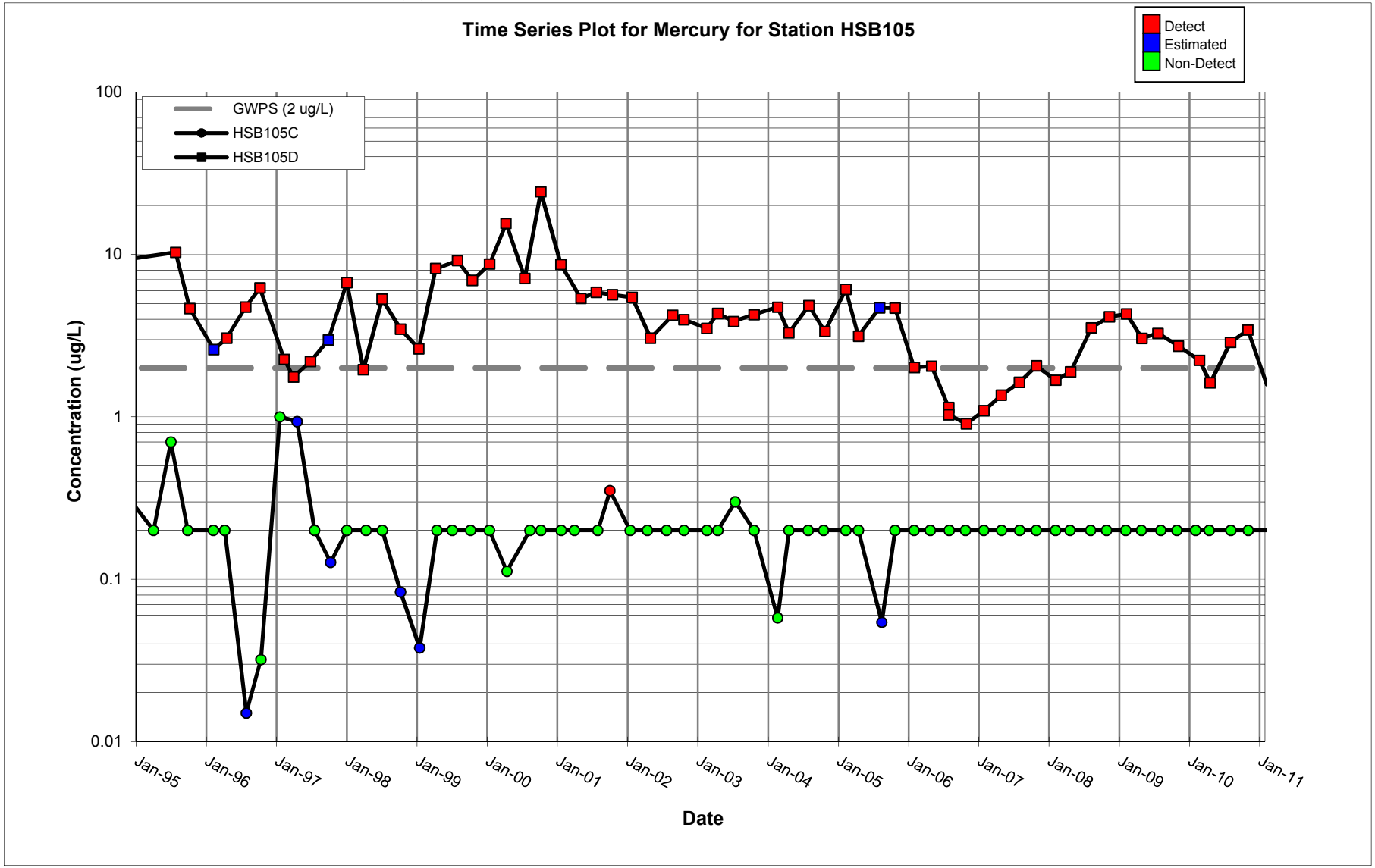

Time Series Plot for Iodine-129 for Station HSB129
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB129C
HSB129D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

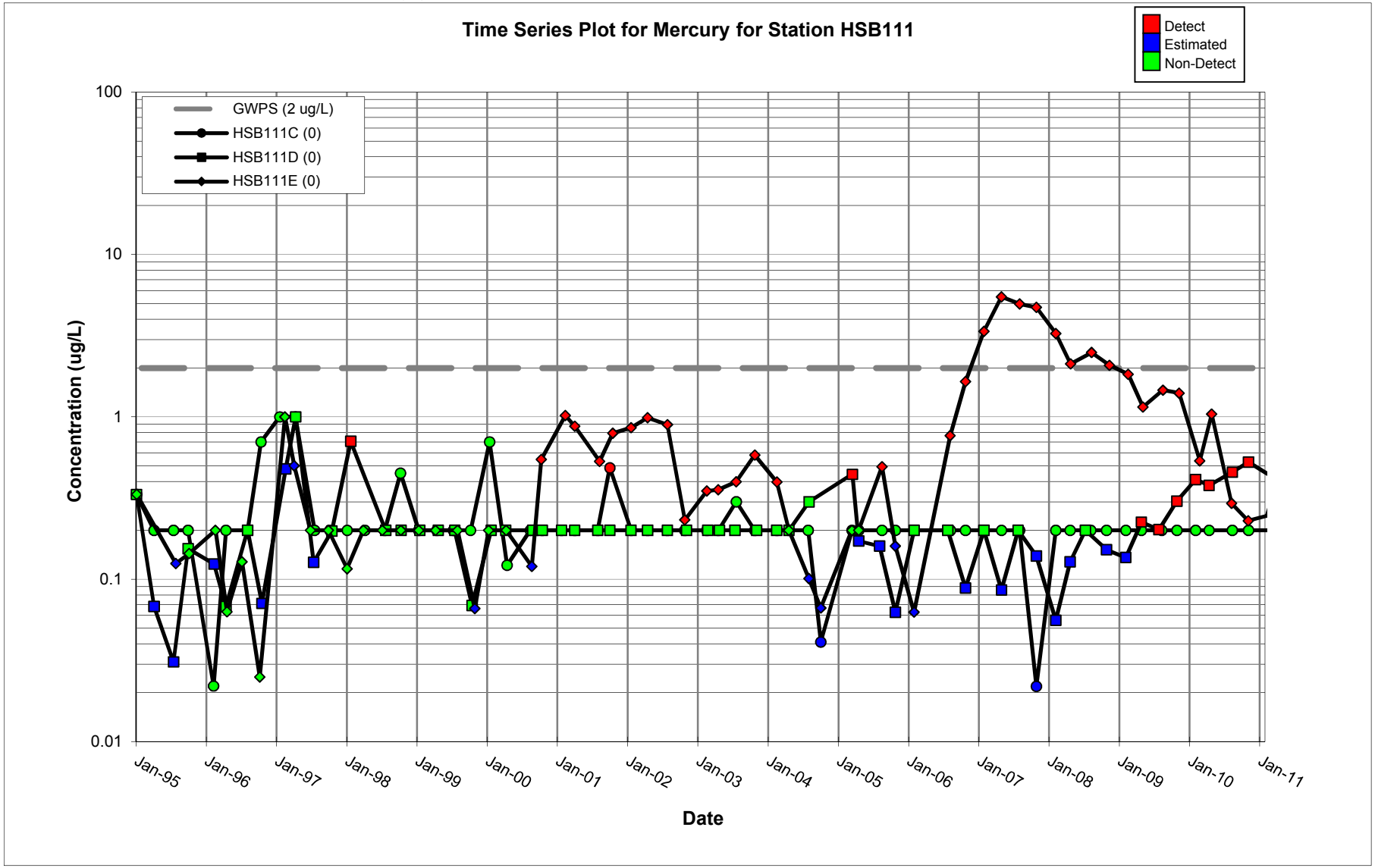

Time Series Plot for Iodine-129 for Station HSB137
Detect
Estimated
Non-Detect
GWPS (1 pCi/L)
HSB137C
HSB137D
Concentration (pCi/L)
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

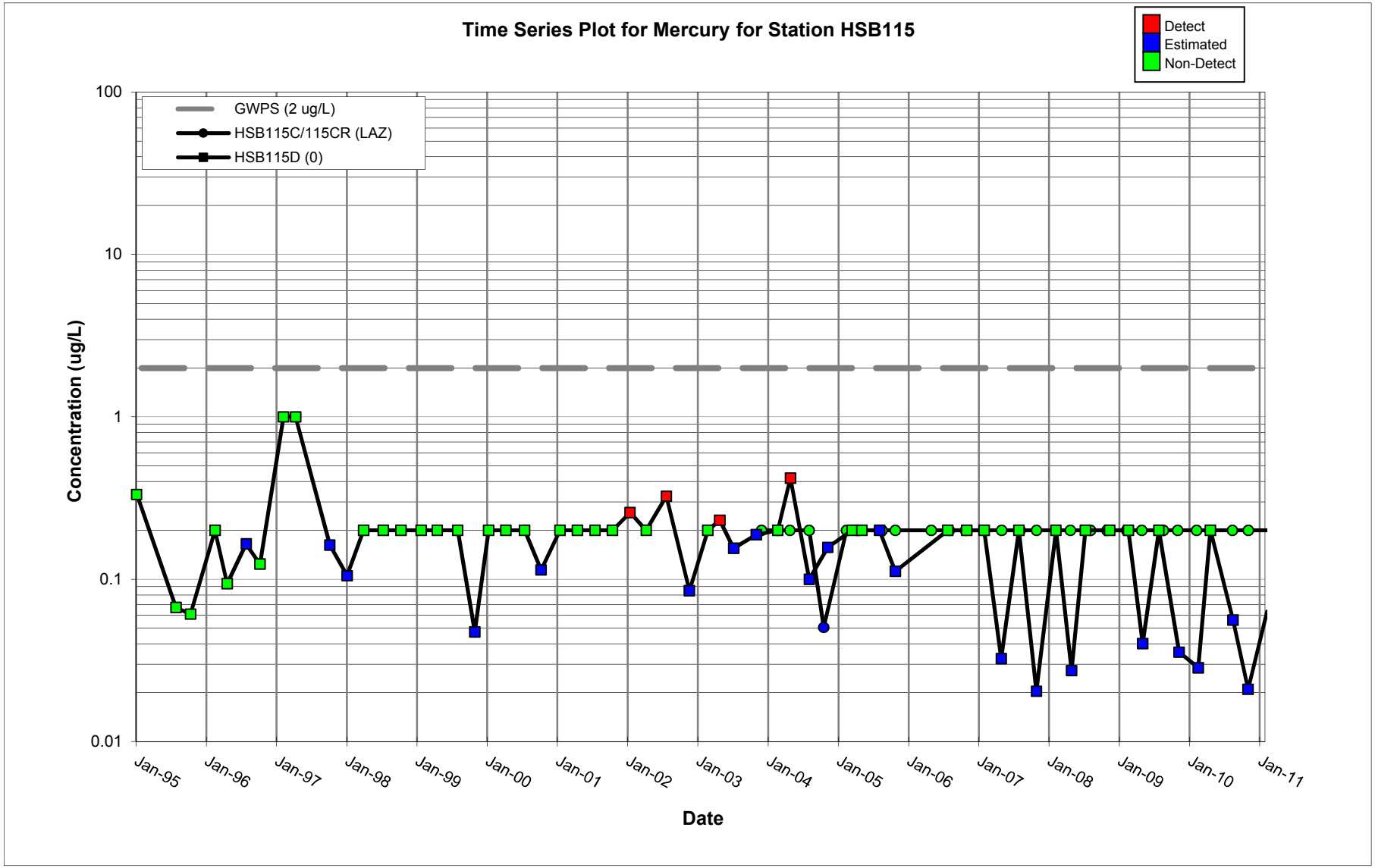

Time Series Plot for Mercury for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB 66D/66DR (UAZ)
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

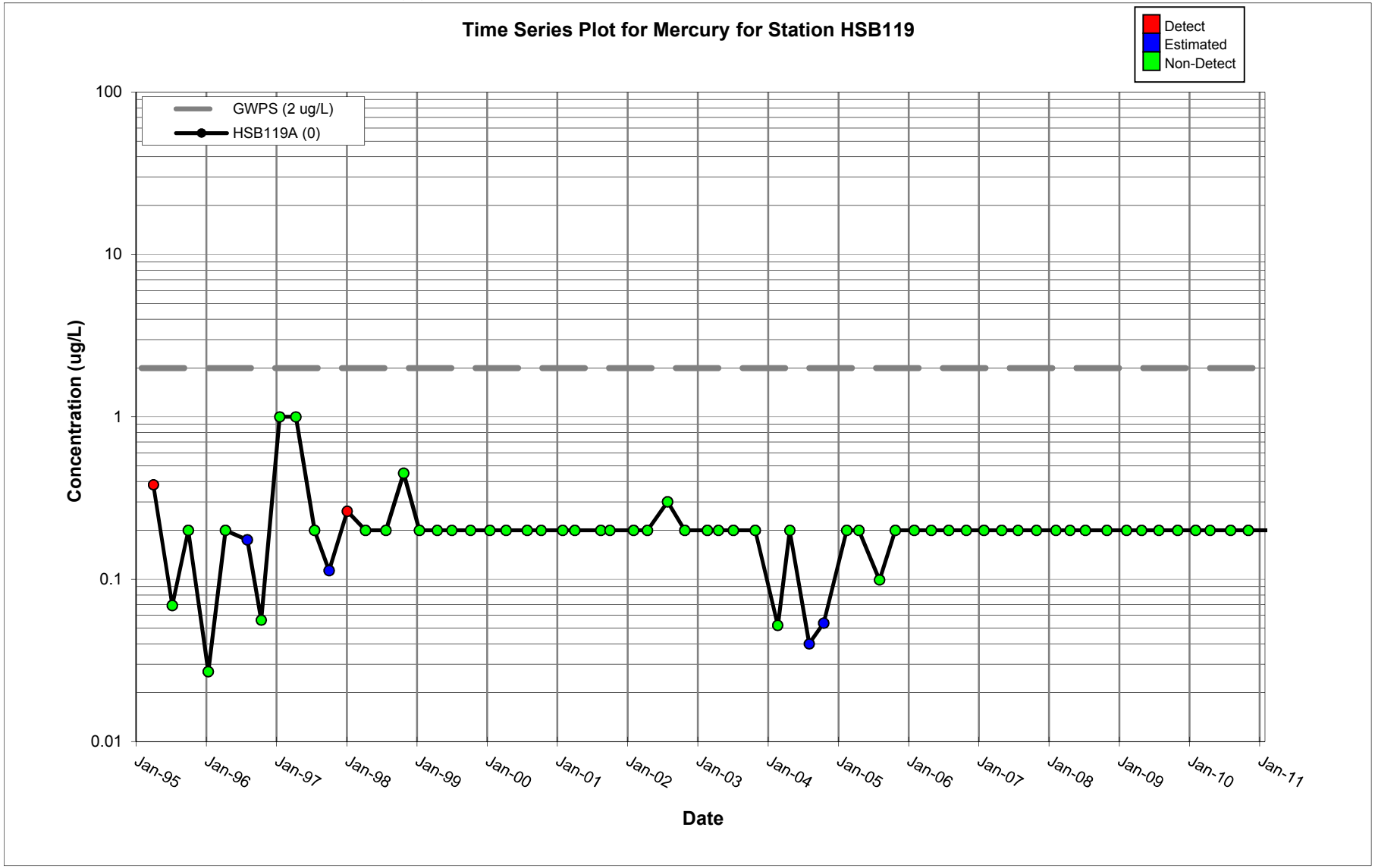

Time Series Plot for Mercury for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB 84A (0)
HSB 84C (0)
HSB 84D (0)
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

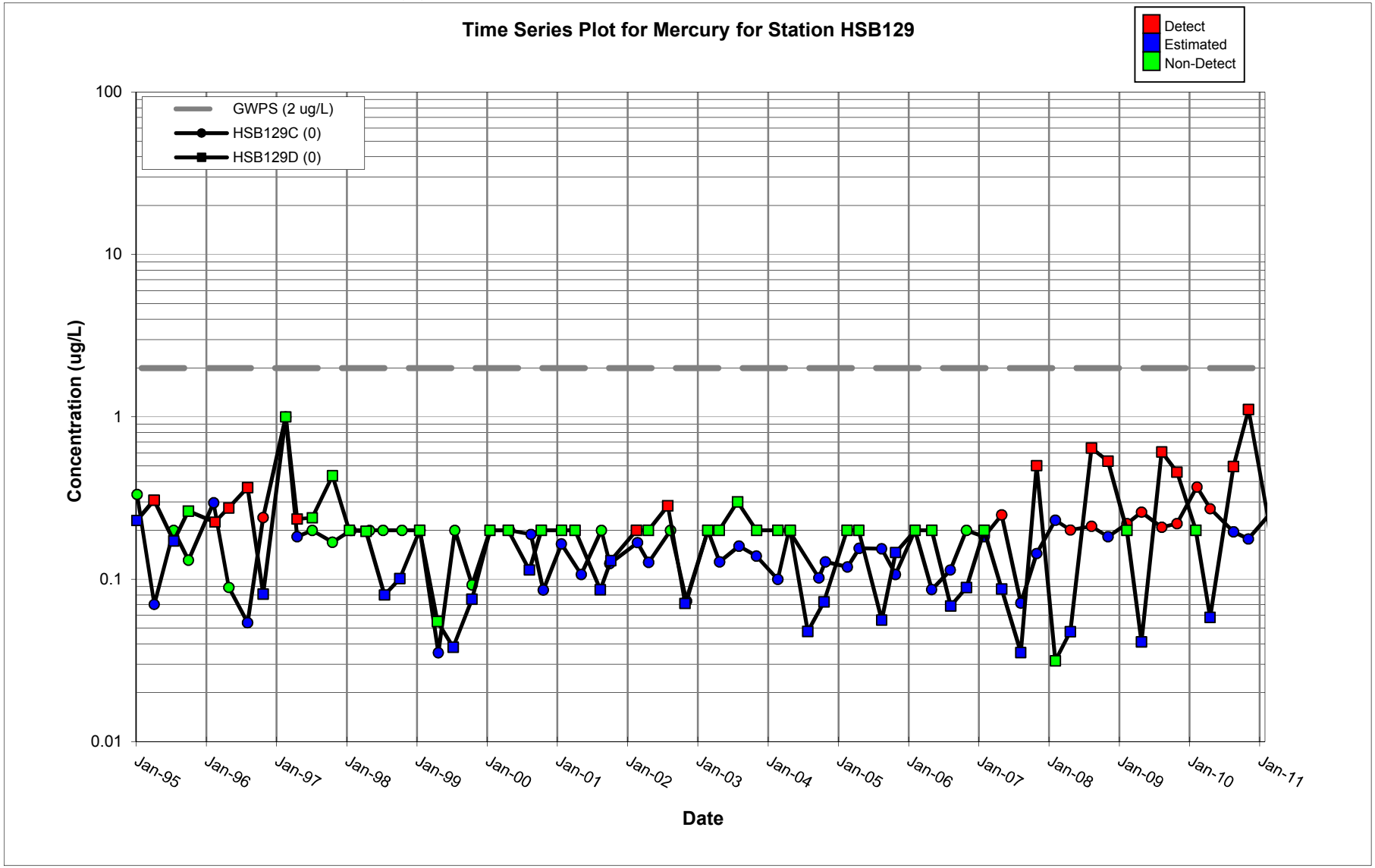

Time Series Plot for Mercury for Station HSB102
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB102C
HSB102D
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

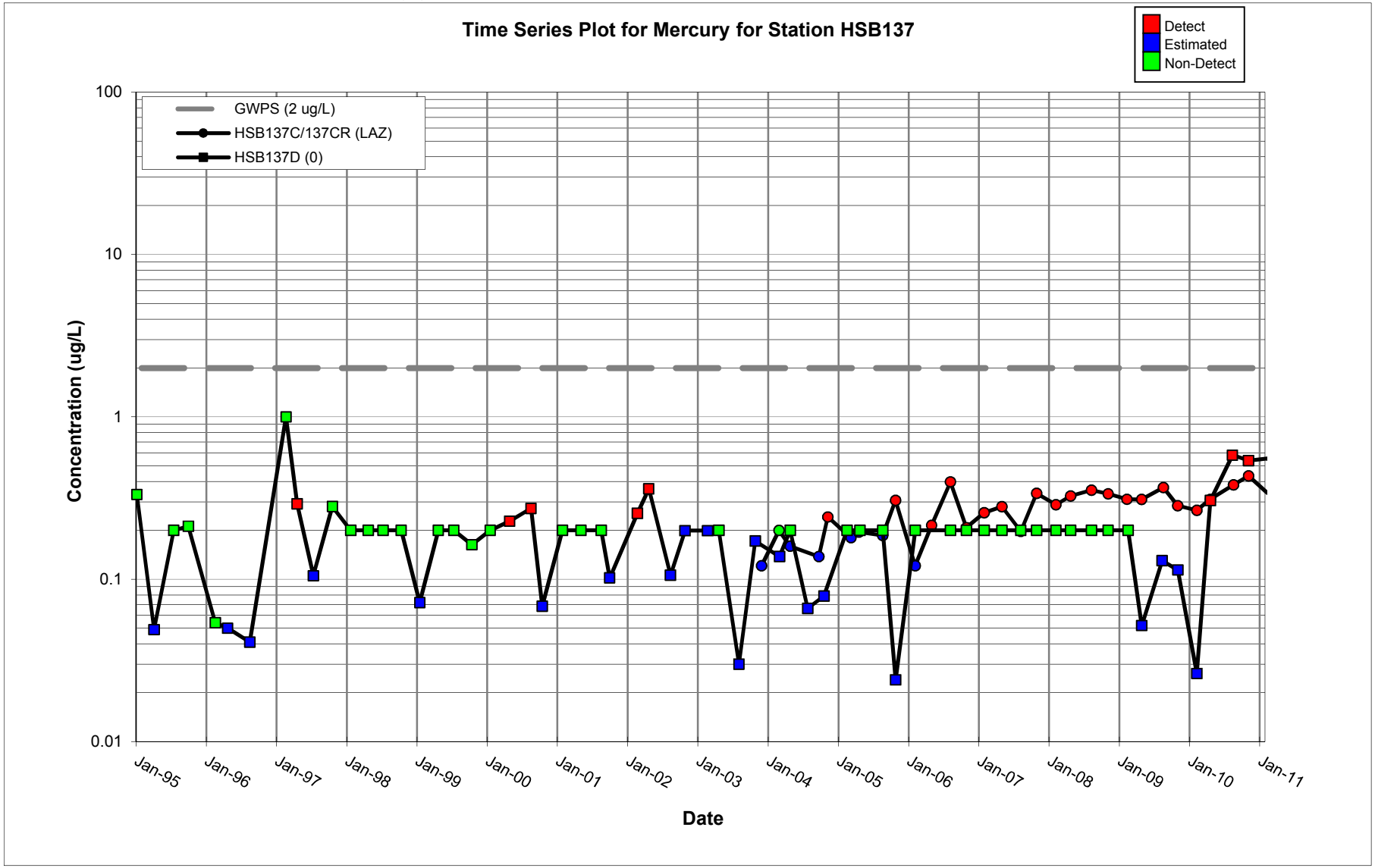

Time Series Plot for Mercury for Station HSB105
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB105C
HSB105D
100
10
1
0.1
0.01
Concentration (ug/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

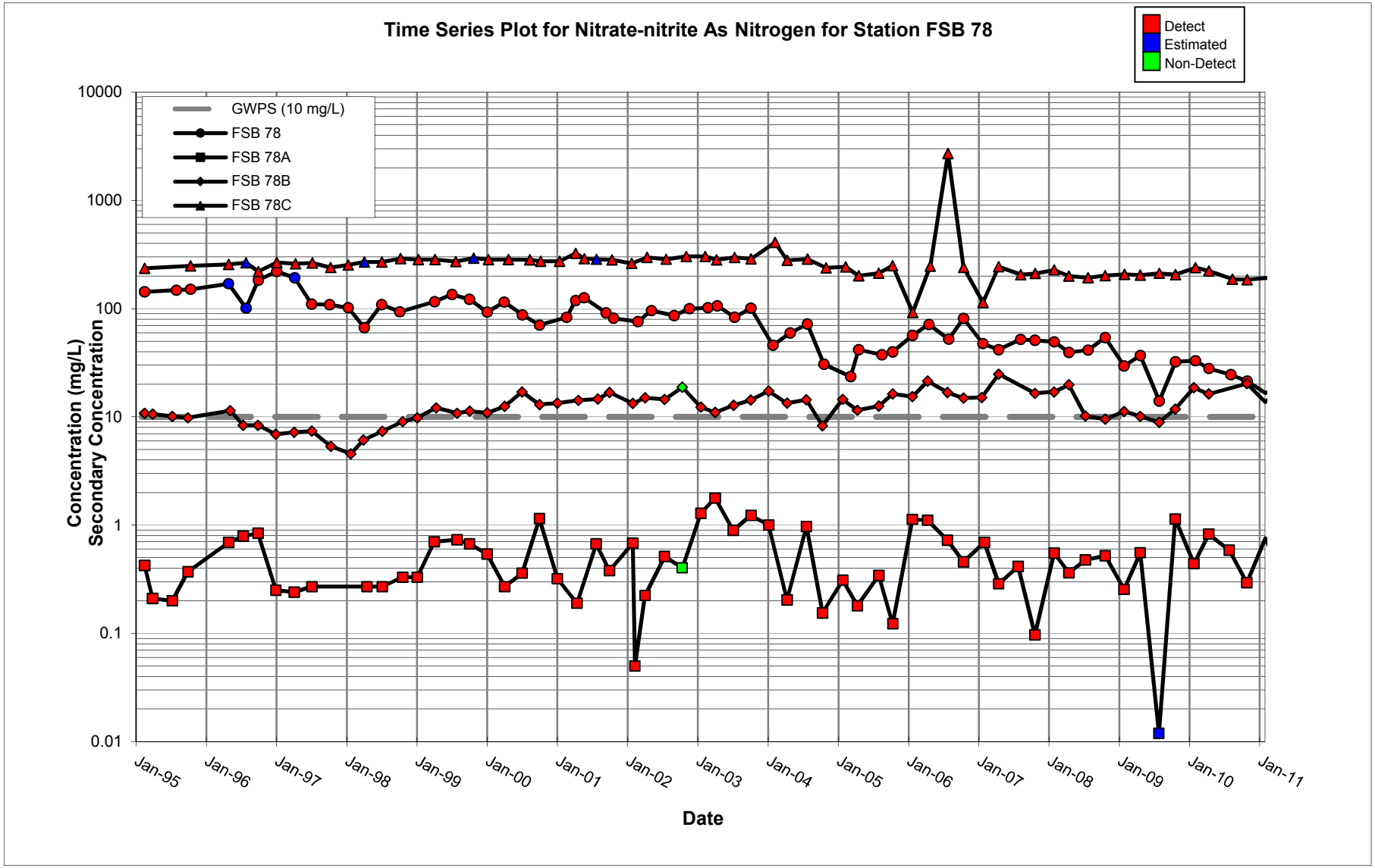

Time Series Plot for Mercury for Station HSB111
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB111C (0)
HSB111D (0)
HSB111E (0)
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

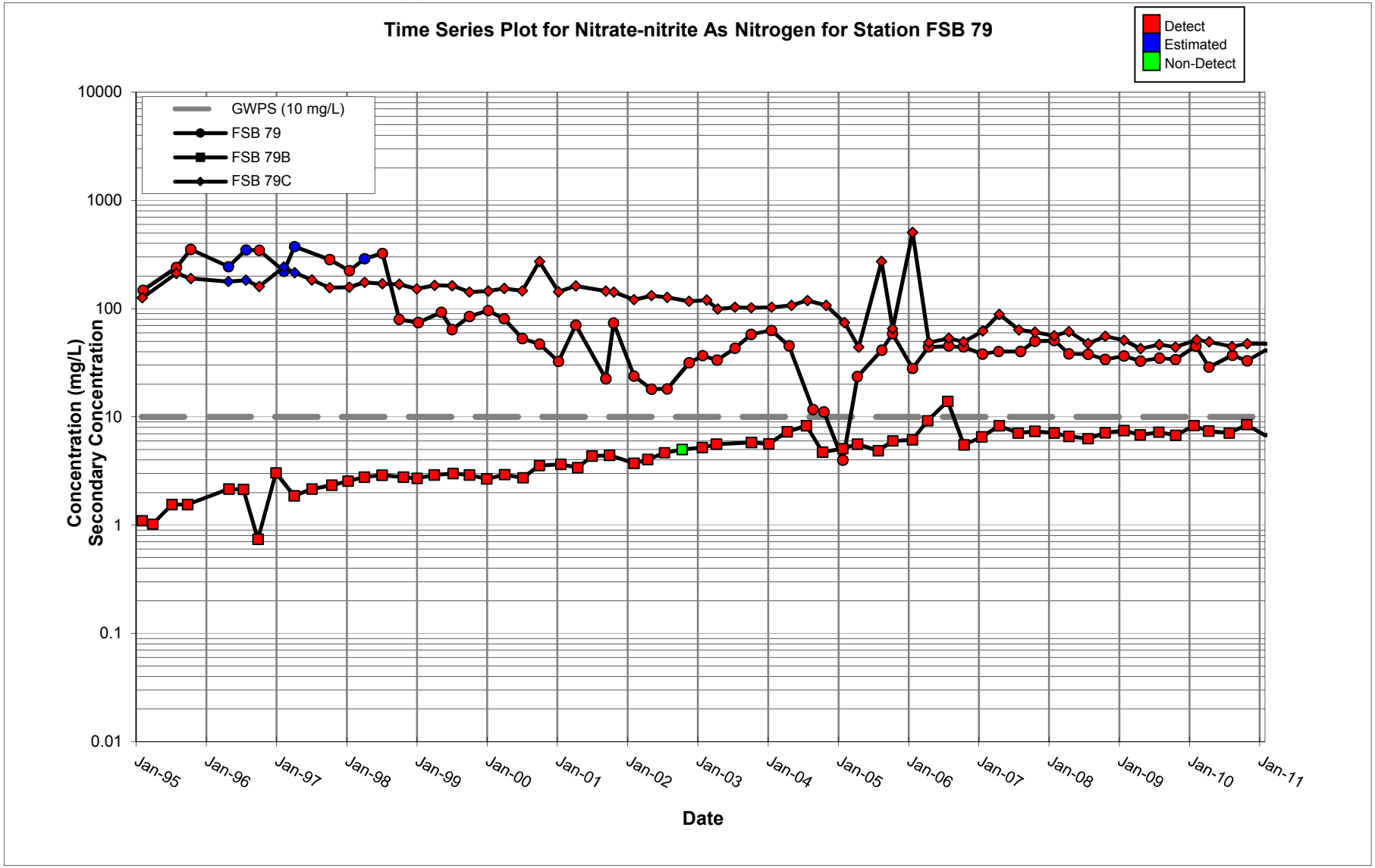

Time Series Plot for Mercury for Station HSB115
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB115C/115CR (LAZ)
HSB115D (0)
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

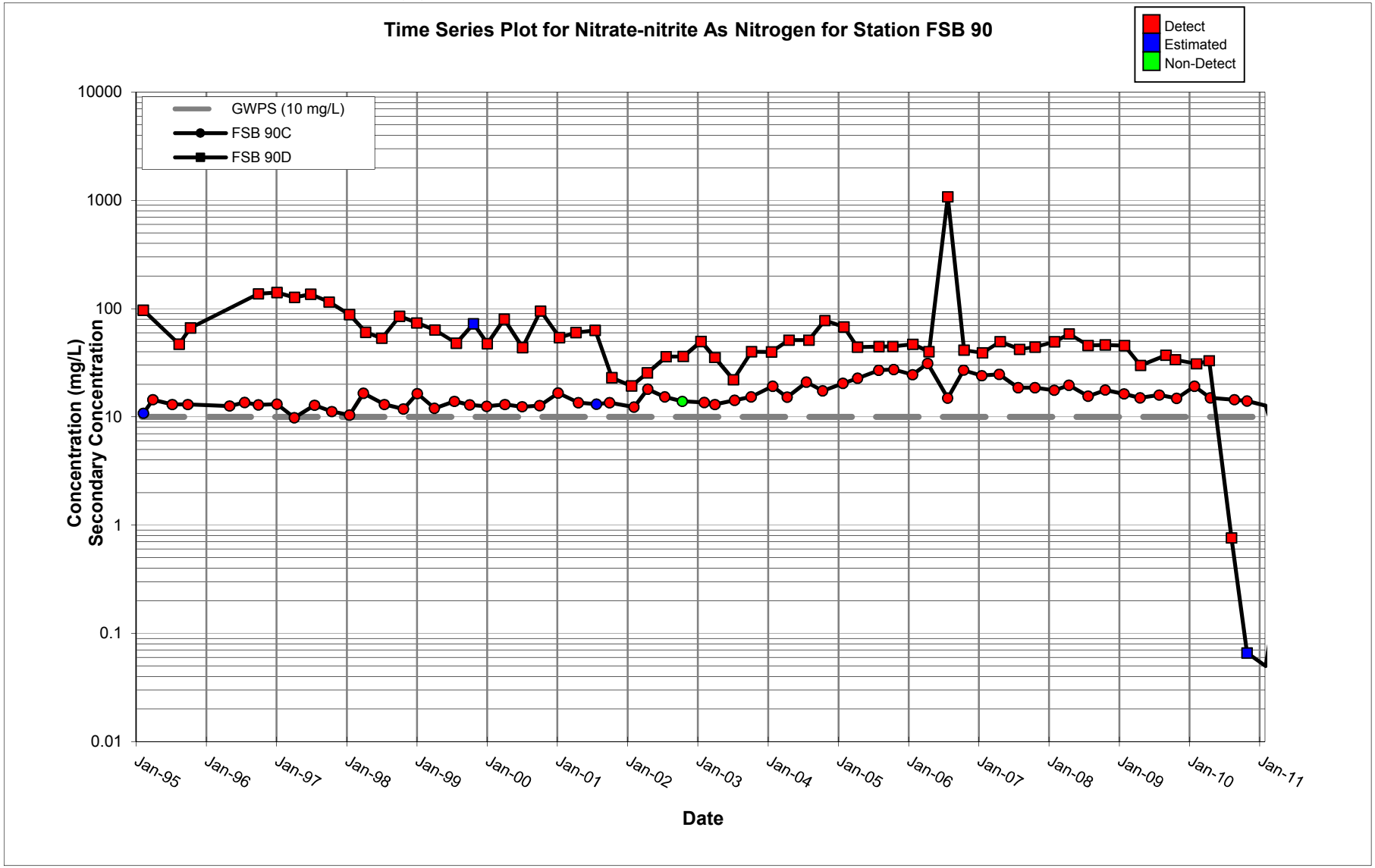

Time Series Plot for Mercury for Station HSB119
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB119A (0)
100
10
1
0.1
0.01
Concentration (ug/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

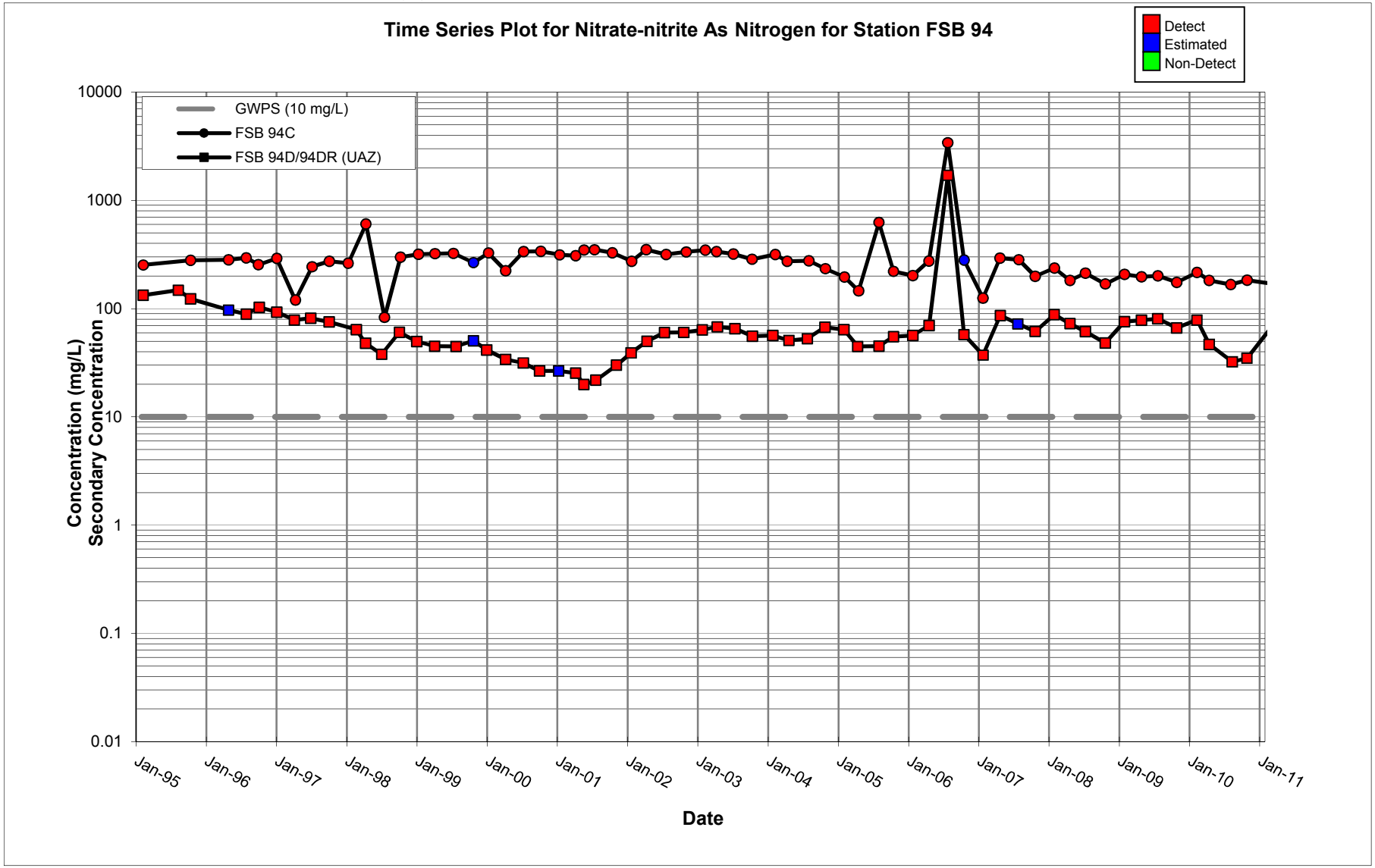

Time Series Plot for Mercury for Station HSB129
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB129C (0)
HSB129D (0)
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

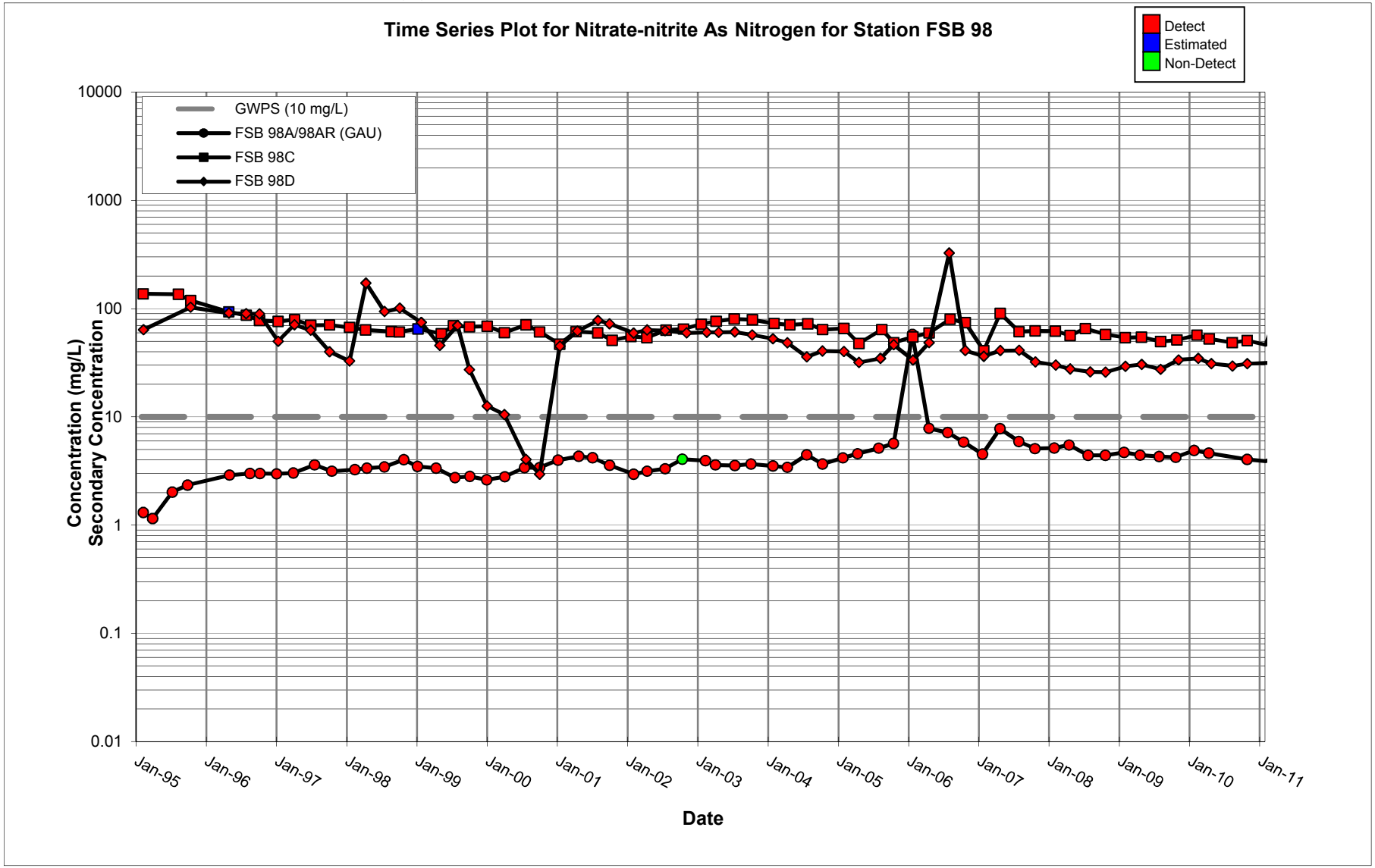

Time Series Plot for Mercury for Station HSB137
Detect
Estimated
Non-Detect
GWPS (2 ug/L)
HSB137C/137CR (LAZ)
HSB137D (0)
Concentration (ug/L)
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

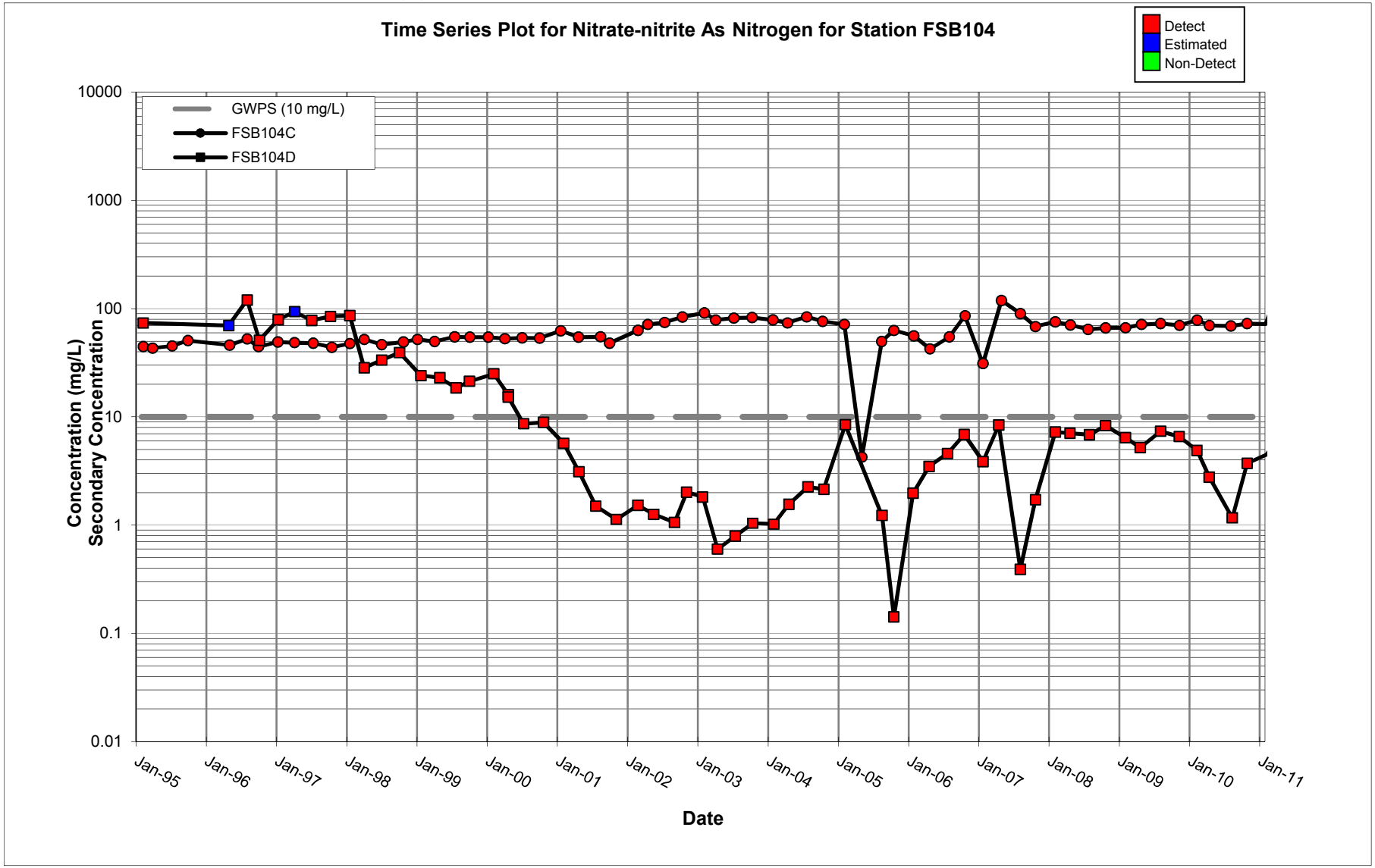

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB 78
FSB 78A
FSB 78B
FSB 78C
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

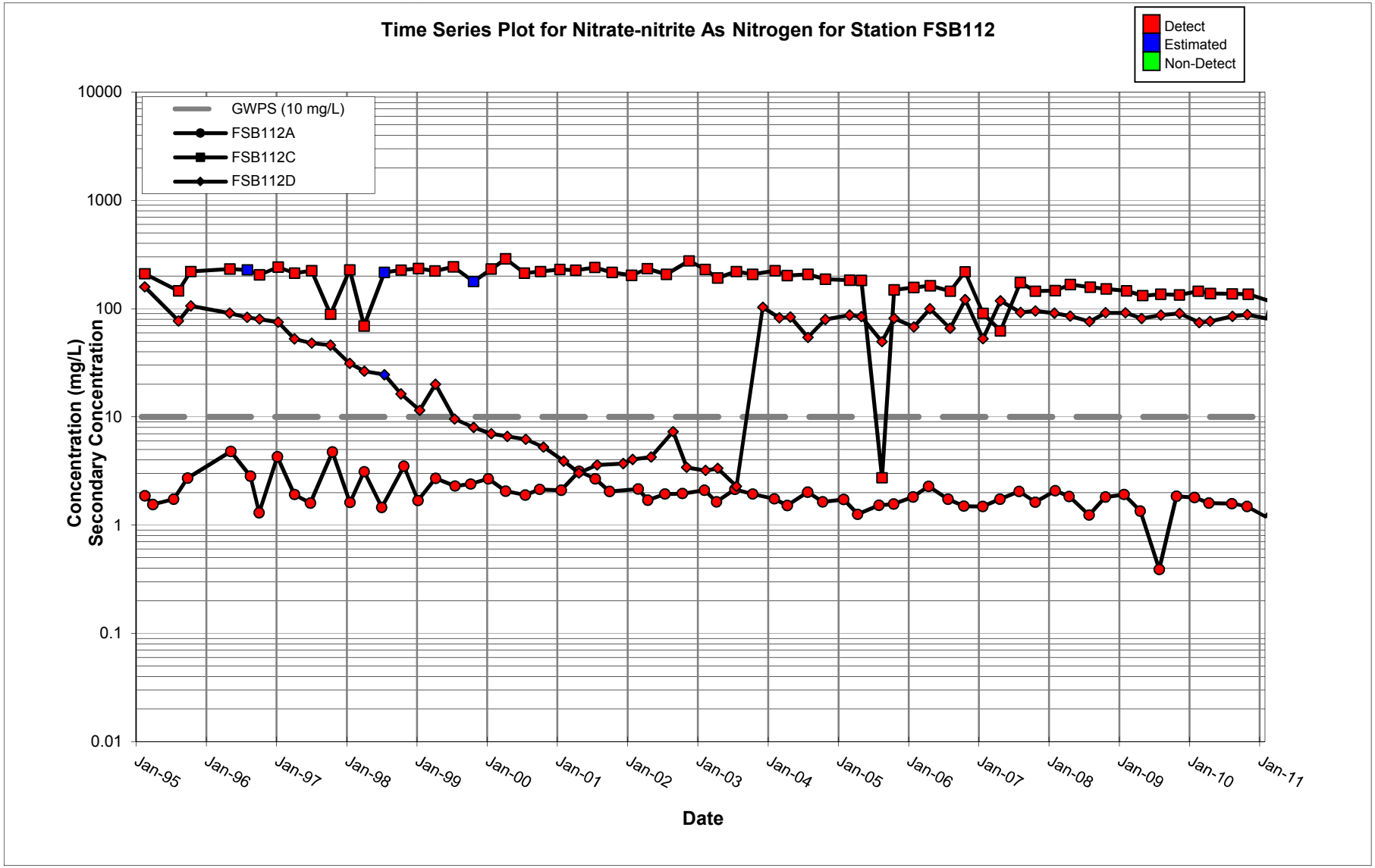

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB 79
FSB 79B
FSB 79C
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

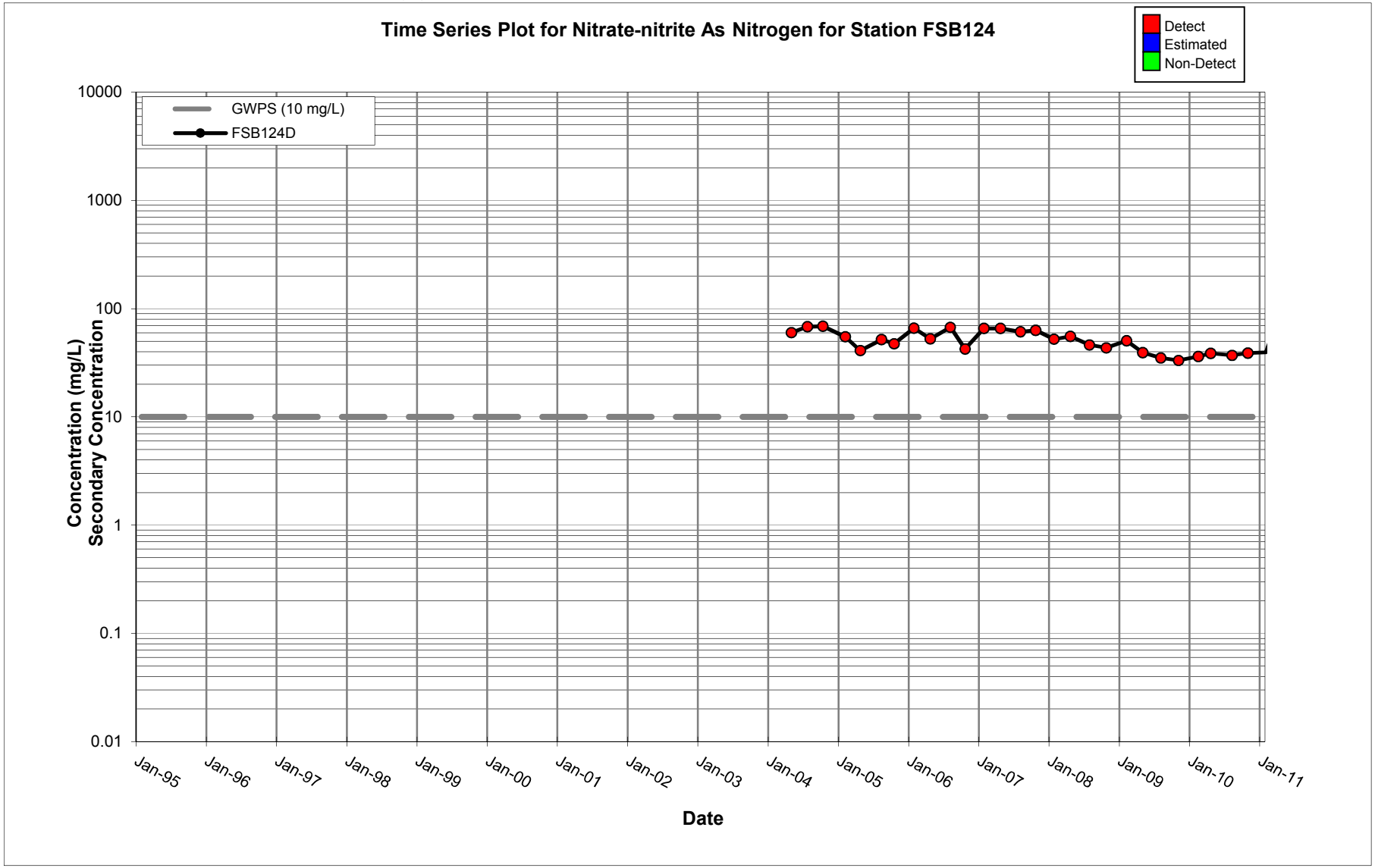

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB 90C
FSB 90D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

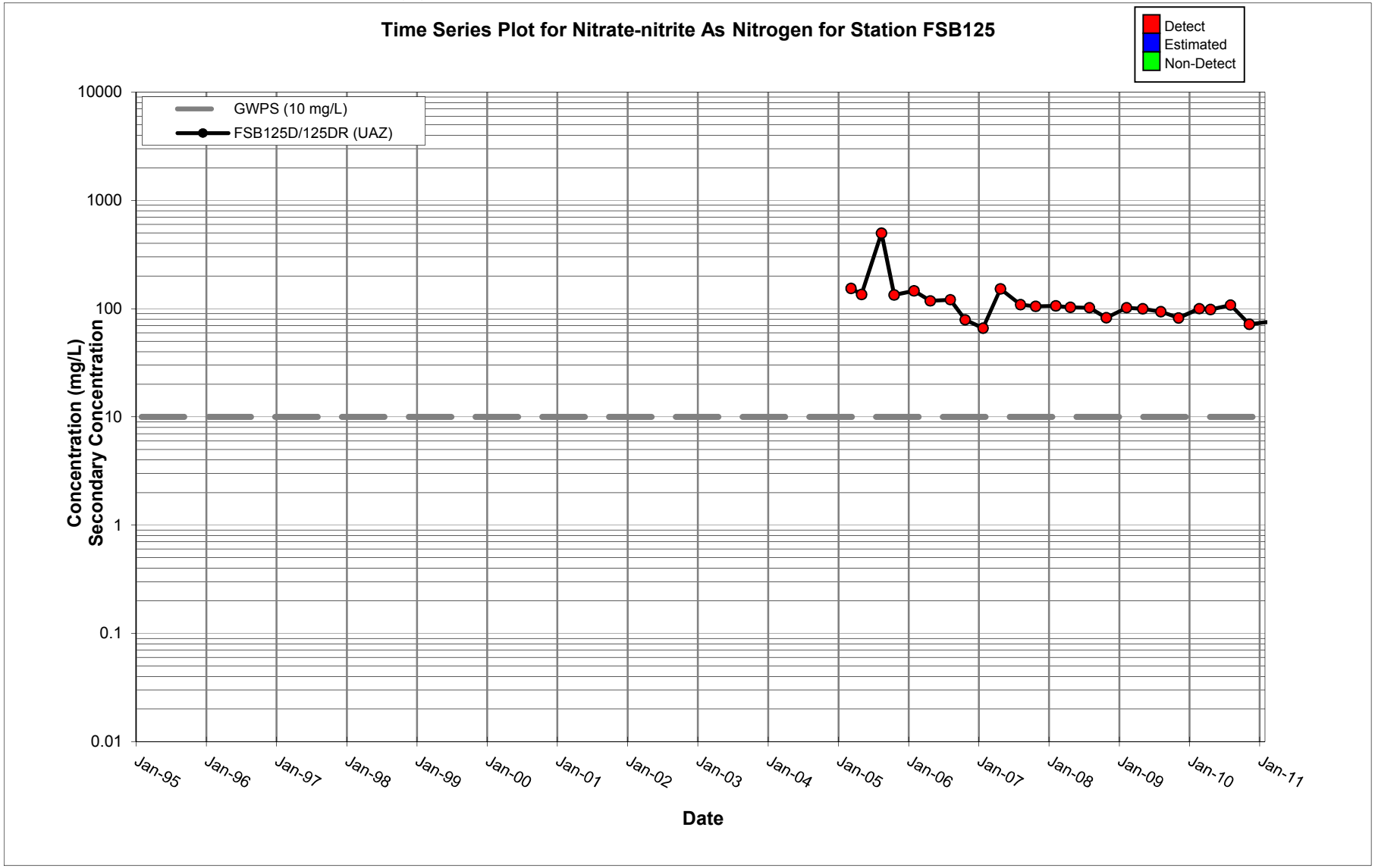

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB 94C
FSB 94D/94DR (UAZ)
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

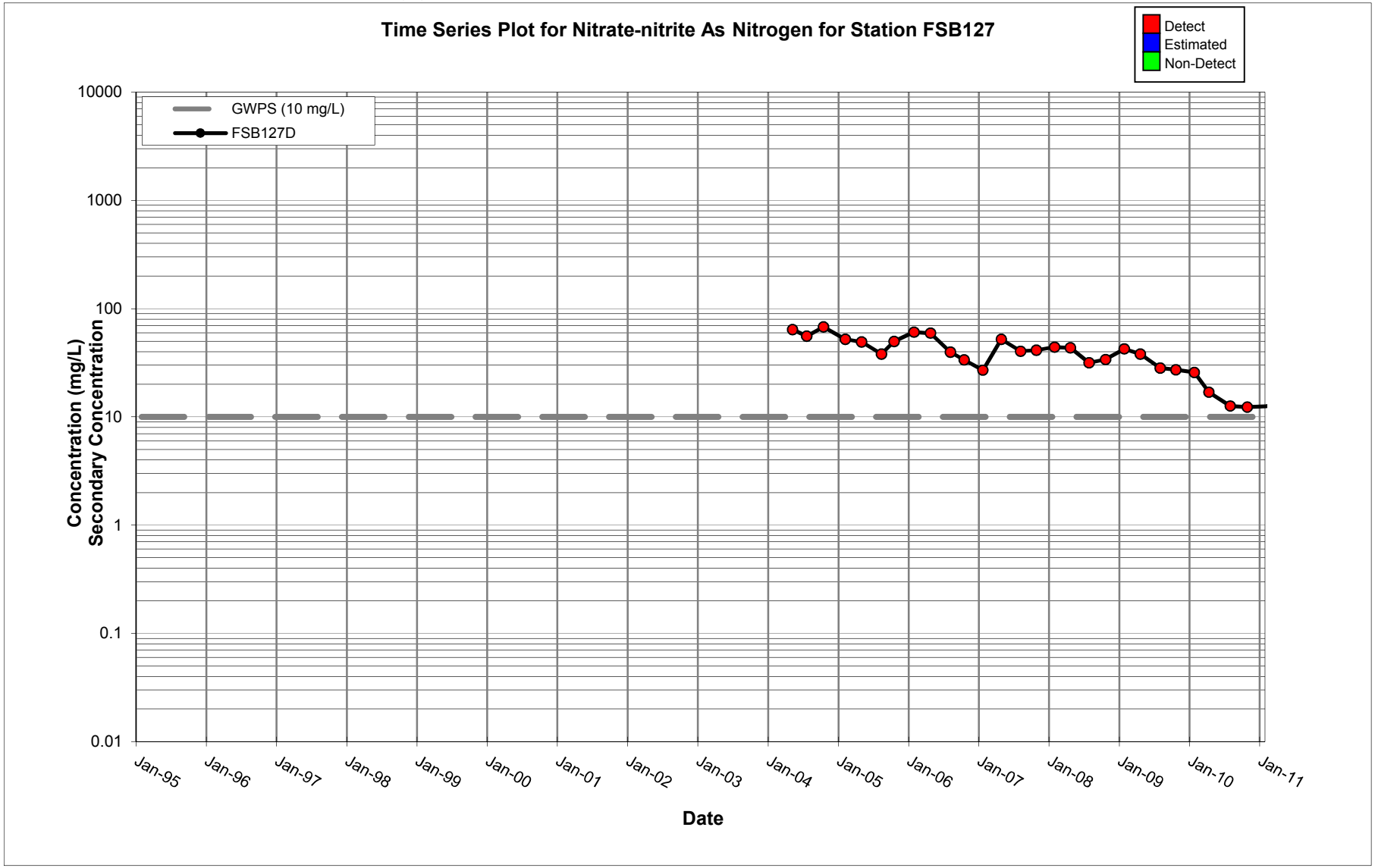

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

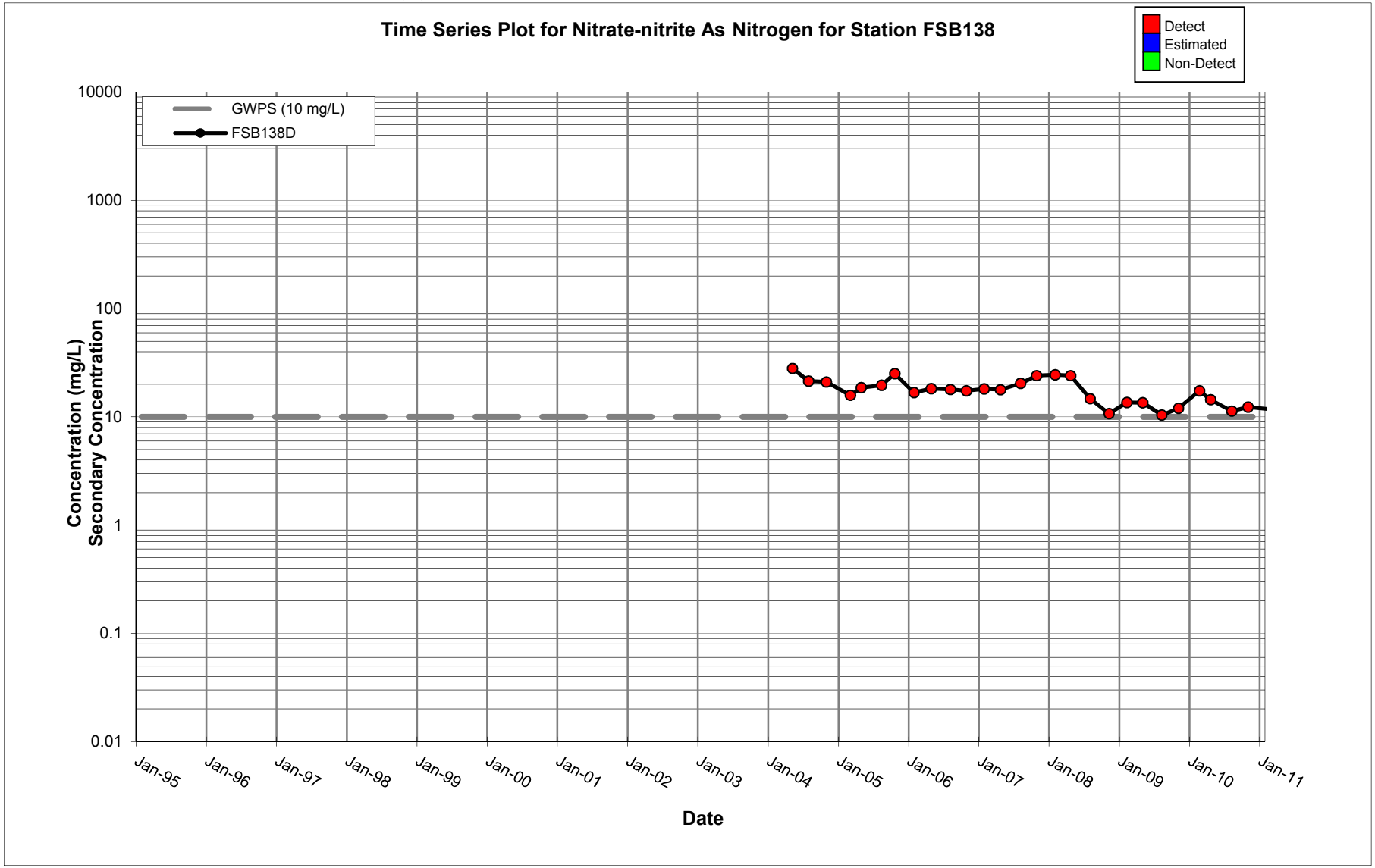

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB104
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB104C
FSB104D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

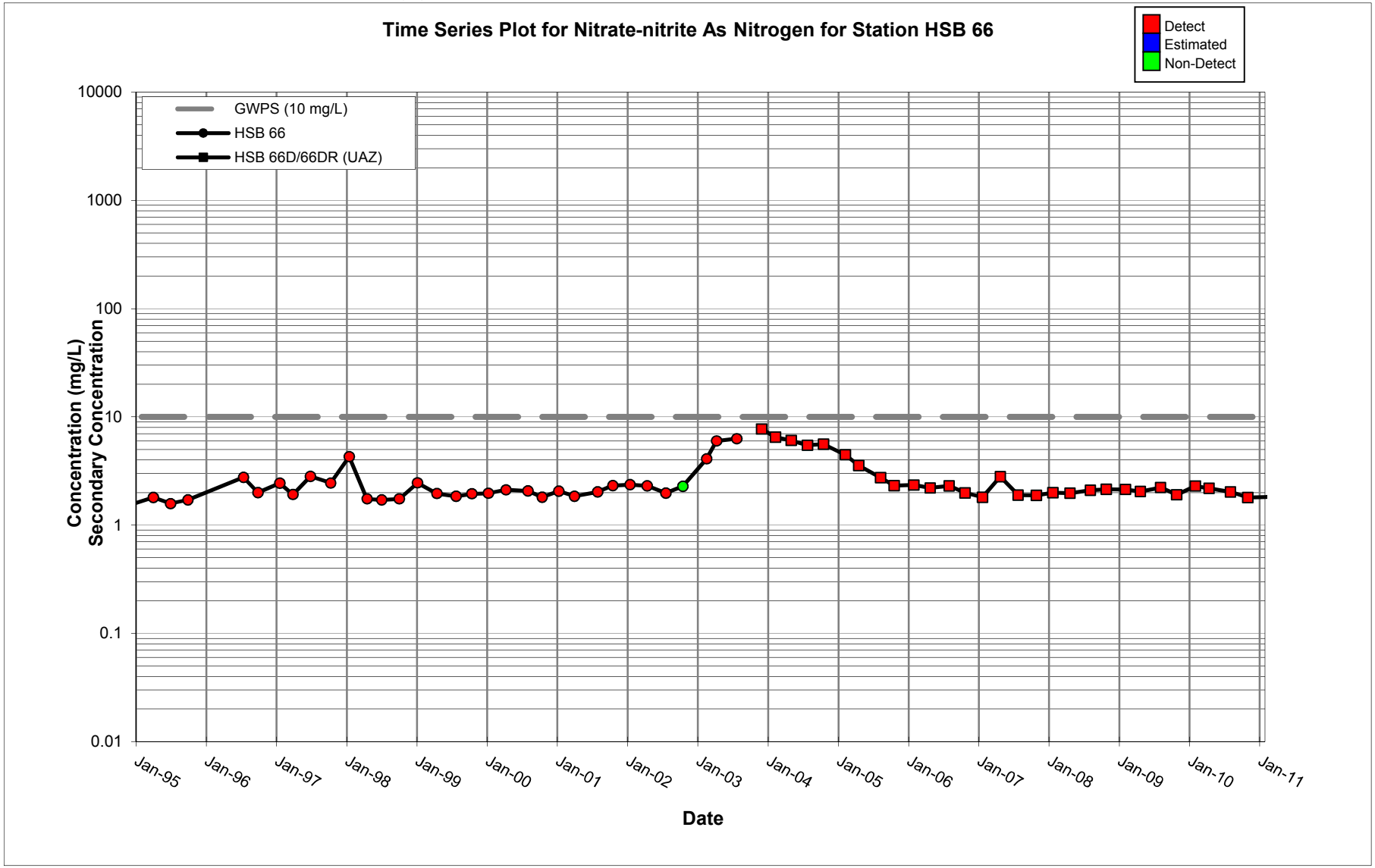

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB112
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB112A
FSB112C
FSB112D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

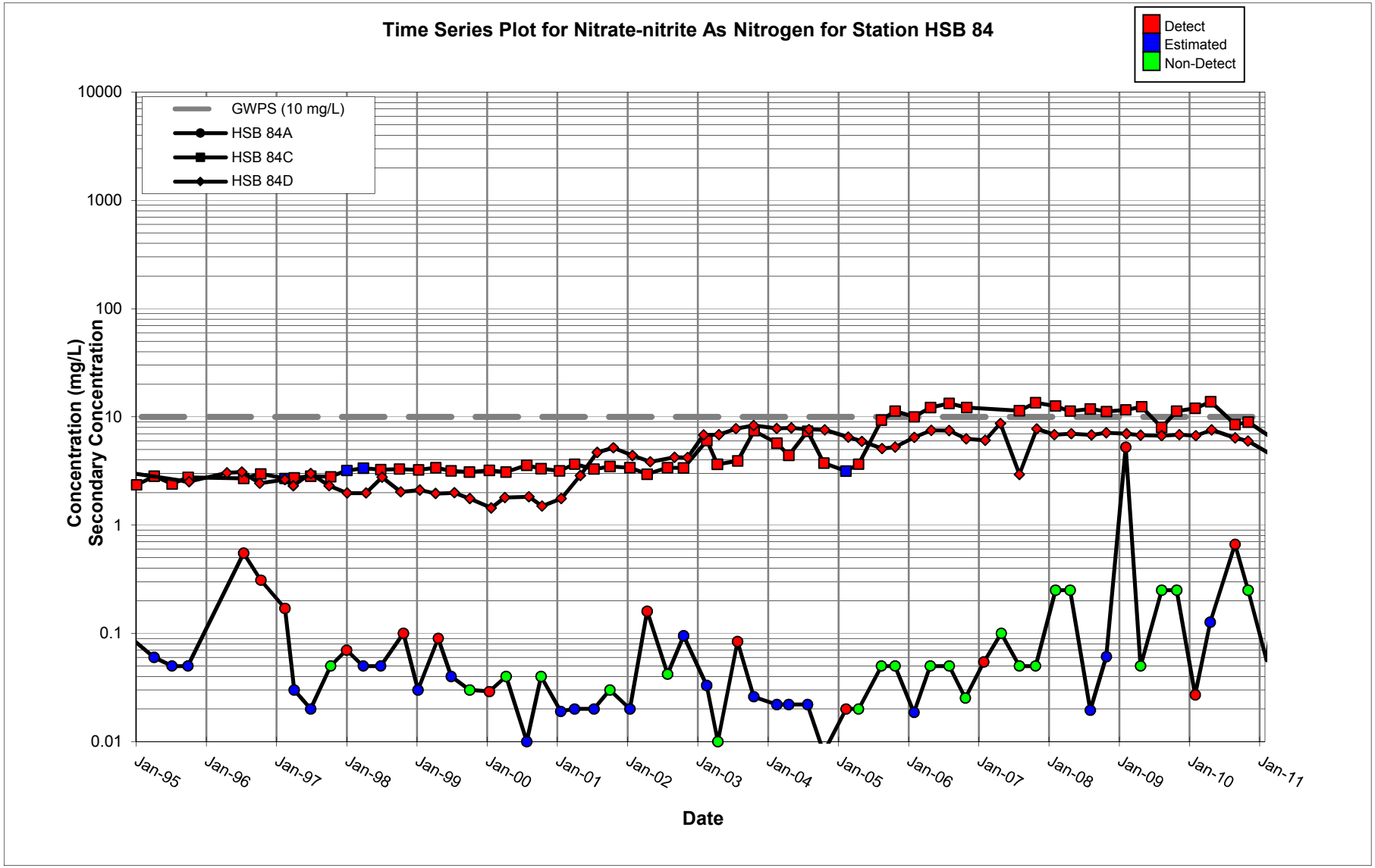

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB124
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB124D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

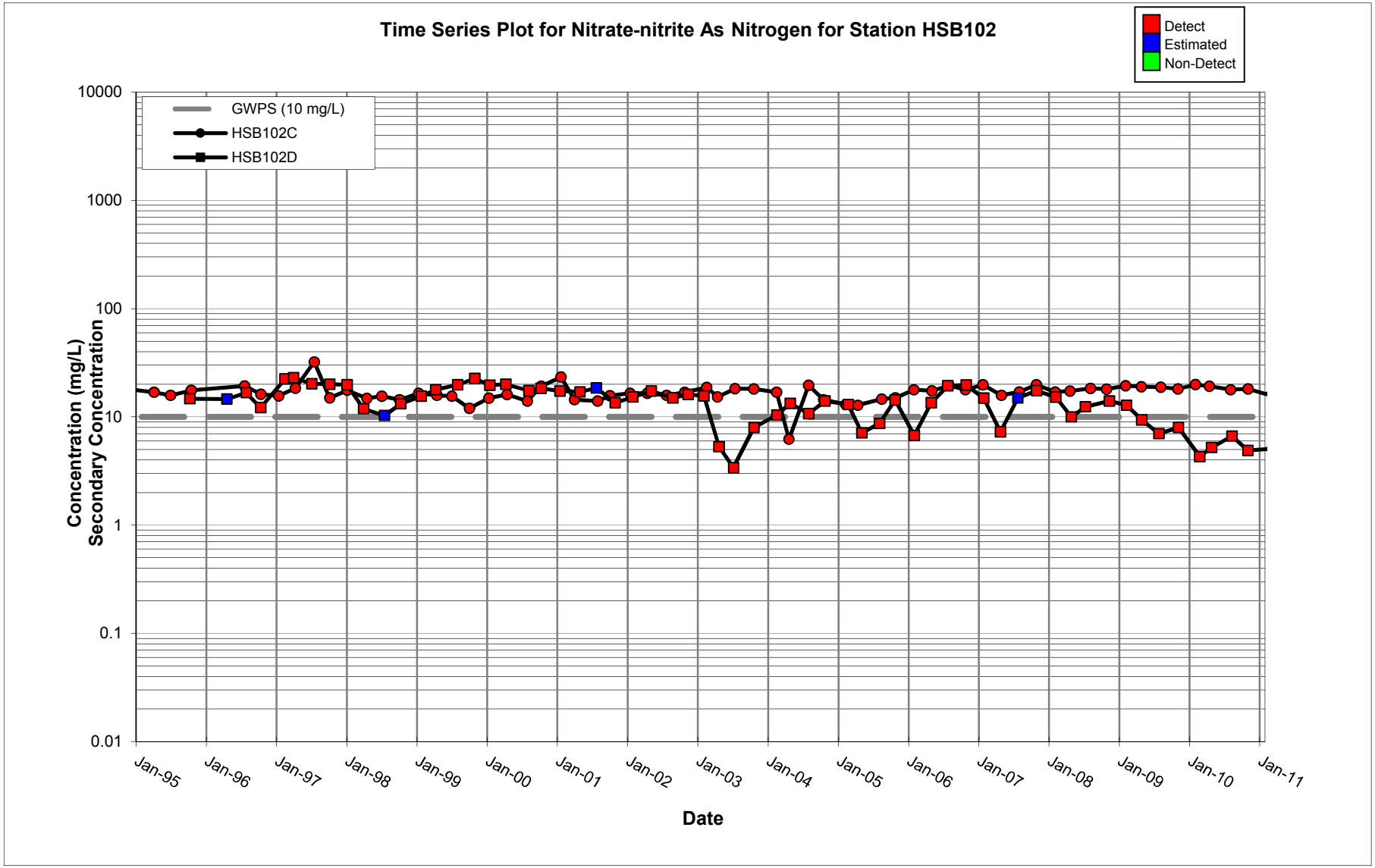

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB125
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB125D/125DR (UAZ)
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

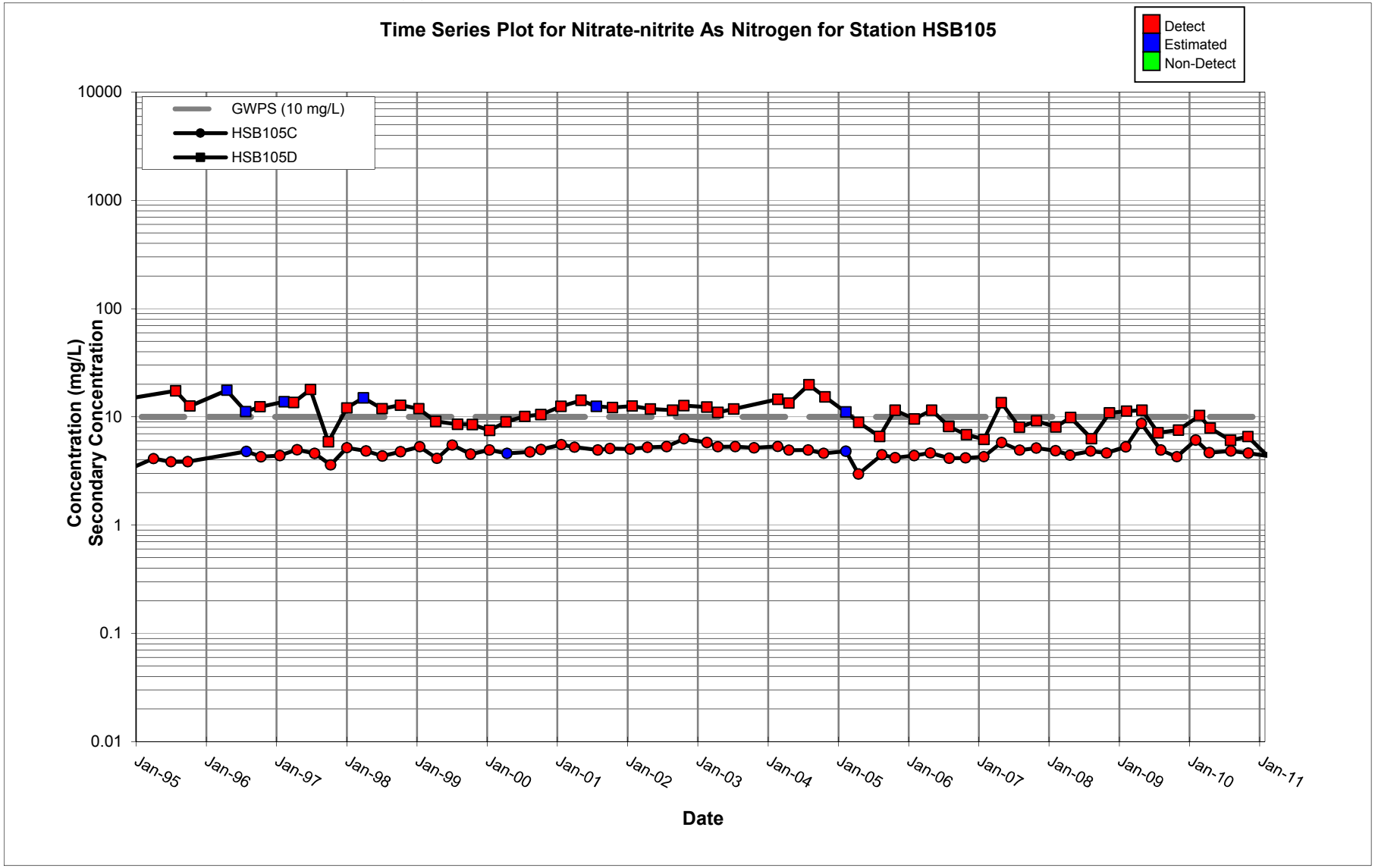

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB127
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB127D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

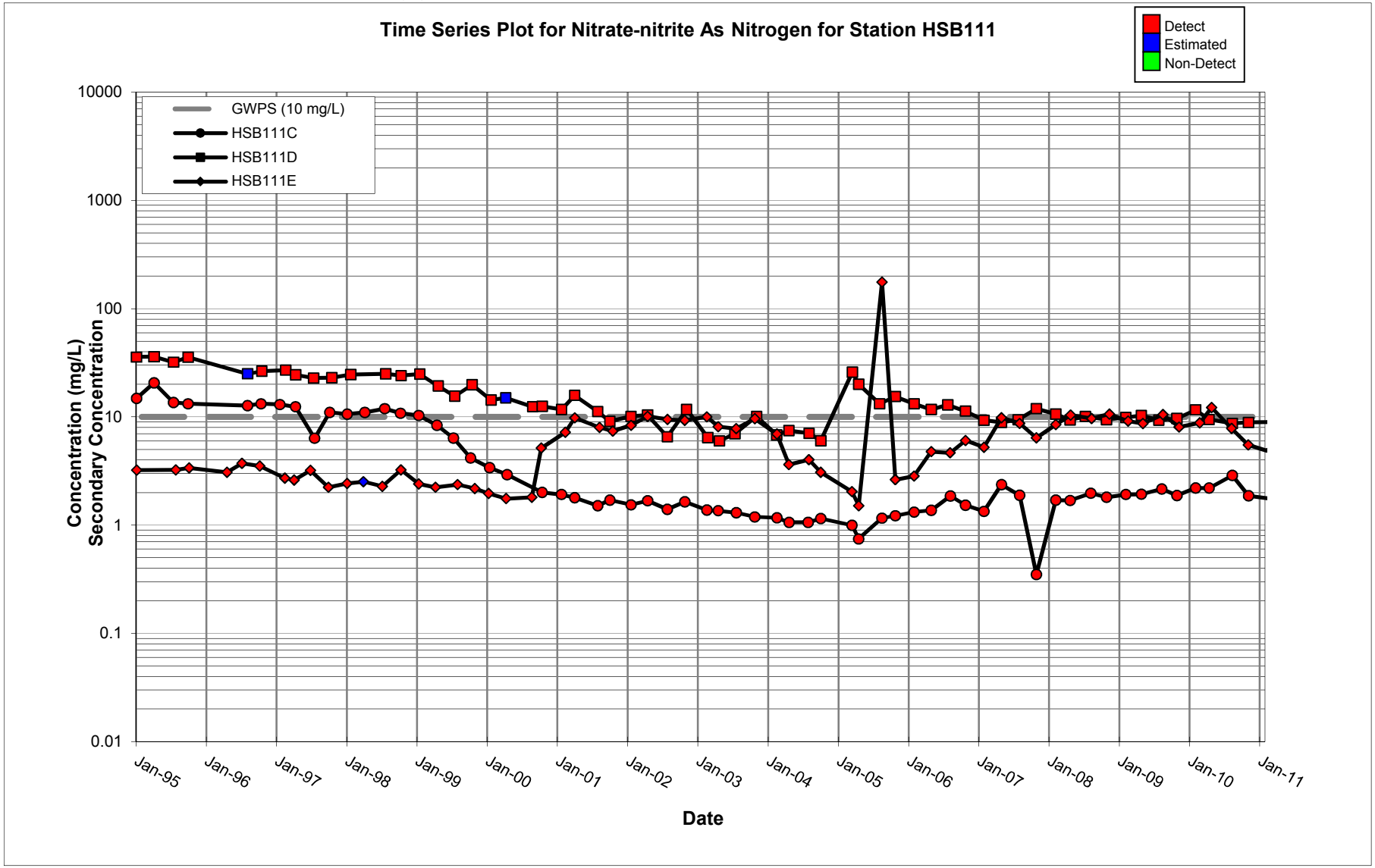

Time Series Plot for Nitrate-nitrite As Nitrogen for Station FSB138
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
FSB138D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

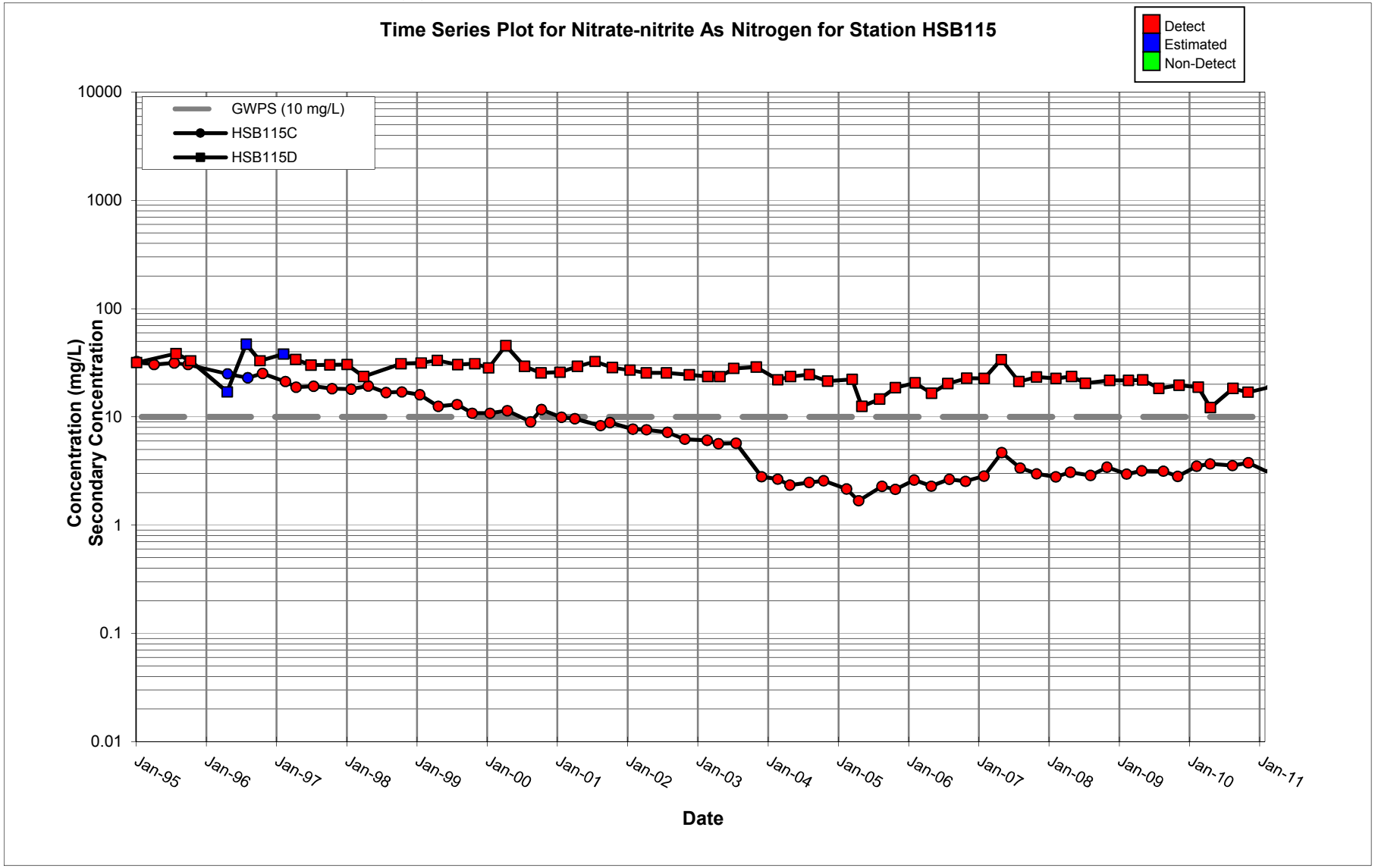

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB 66
HSB 66D/66DR (UAZ)
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

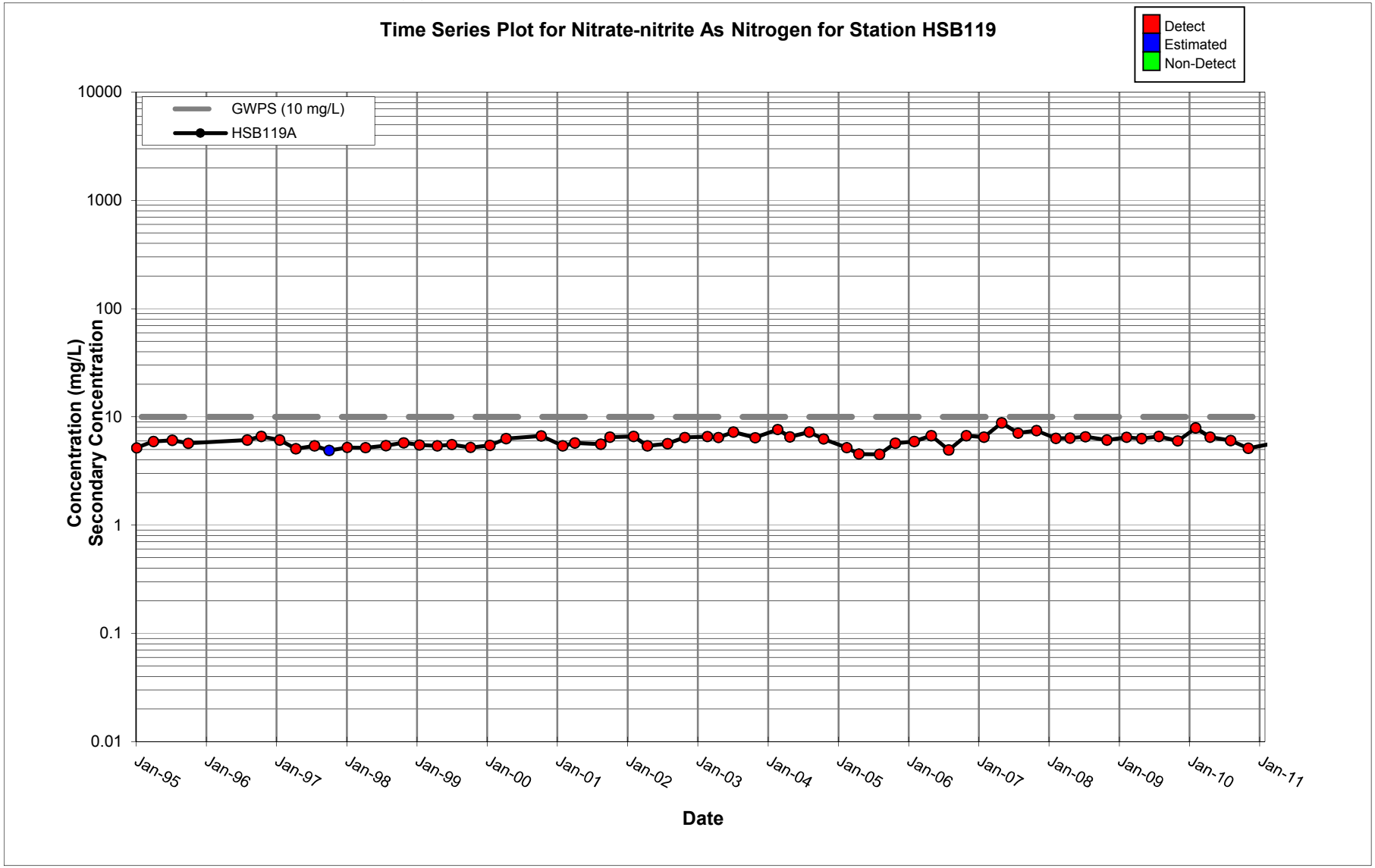

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB 84A
HSB 84C
HSB 84D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

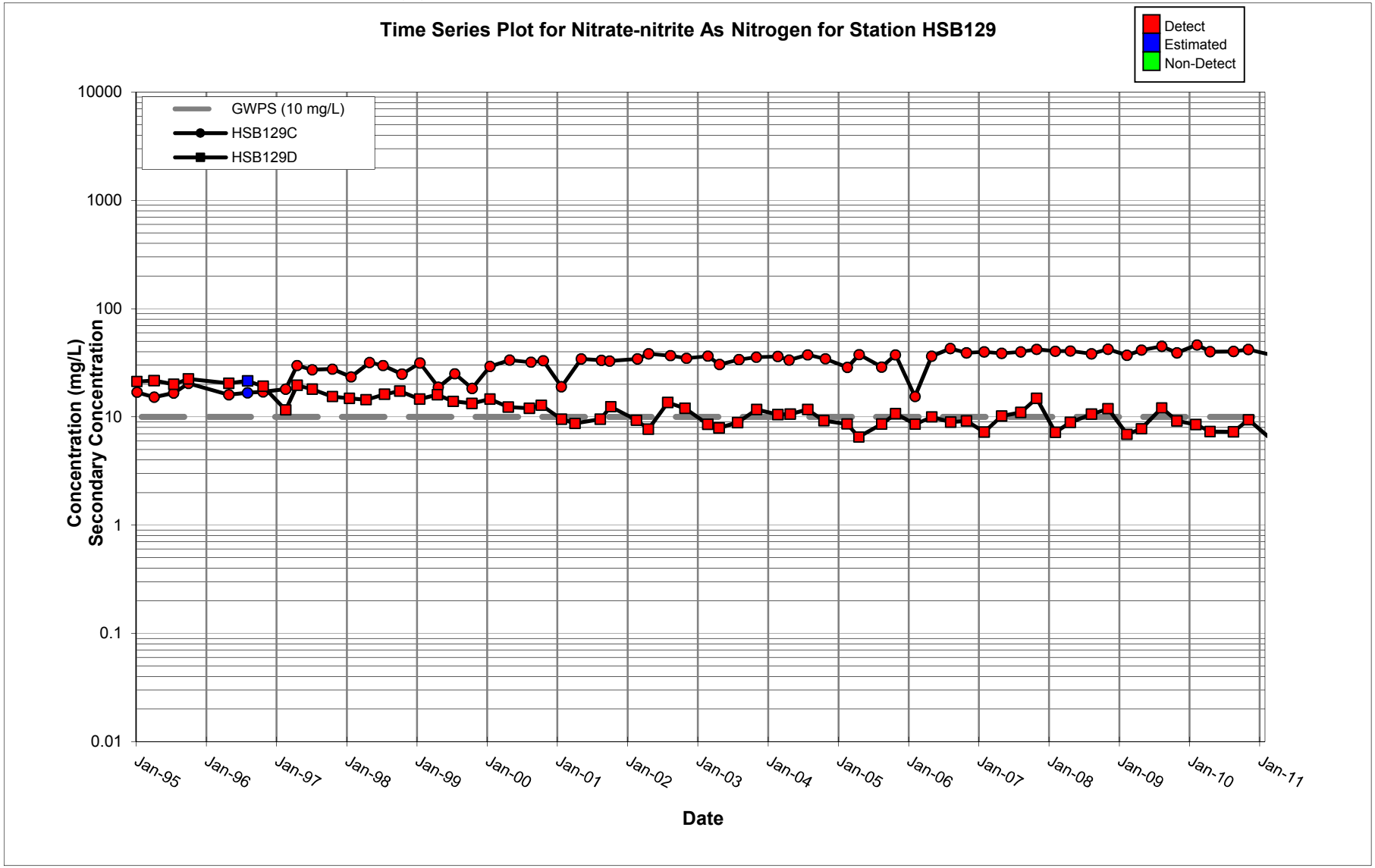

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB102
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB102C
HSB102D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

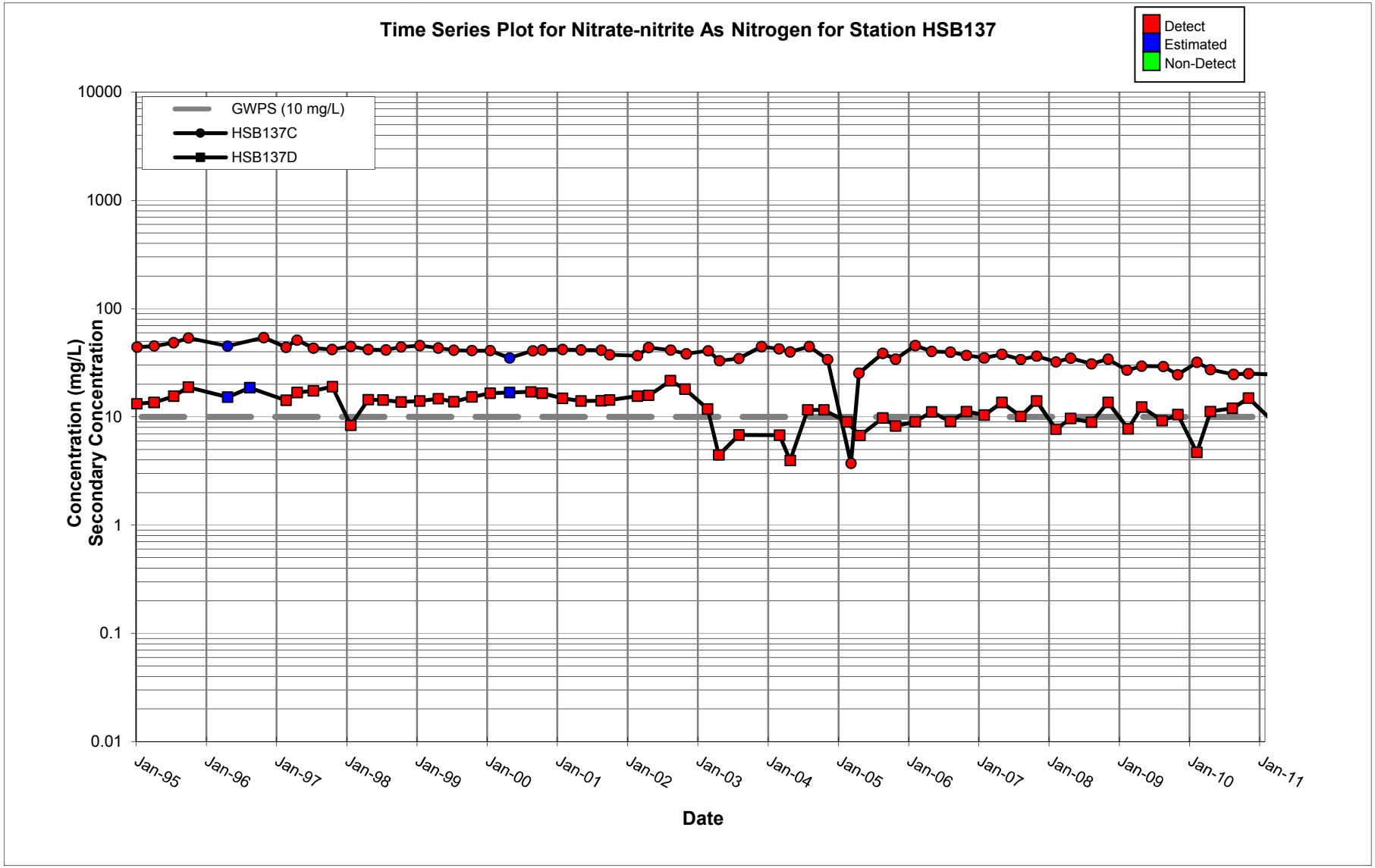

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB105
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB105C
HSB105D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

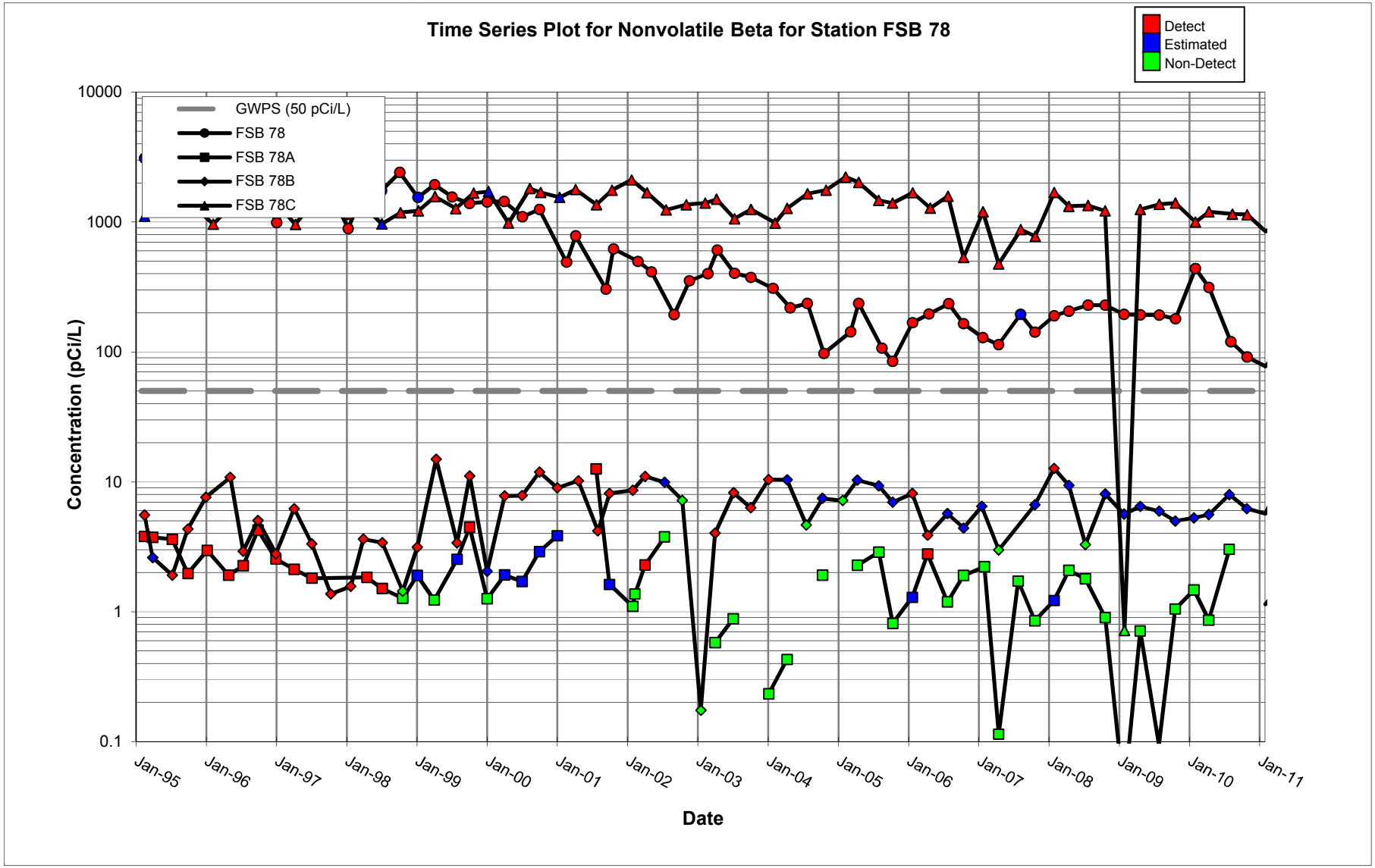

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB111
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB111C
HSB111D
HSB111E
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

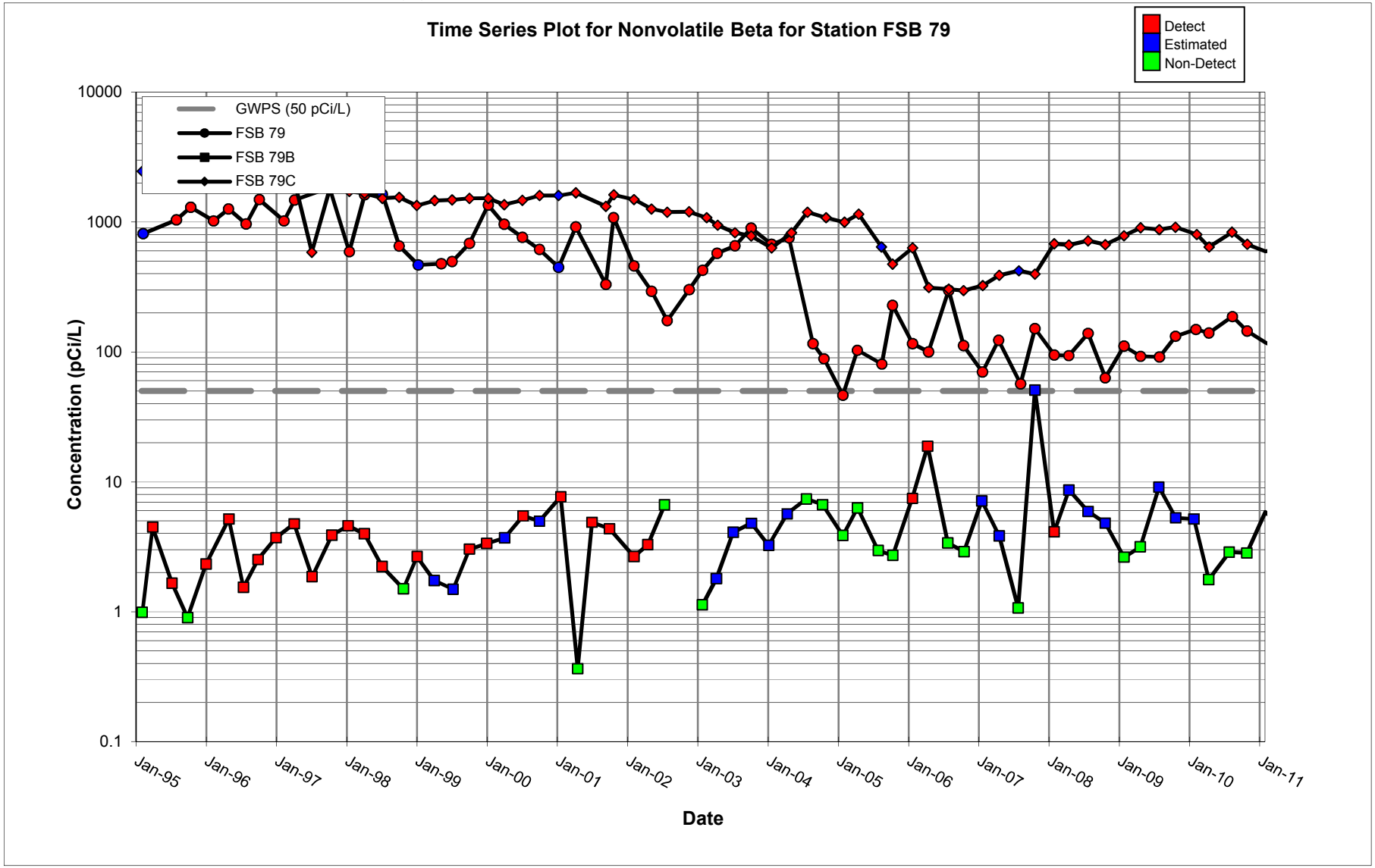

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB115
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB115C
HSB115D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

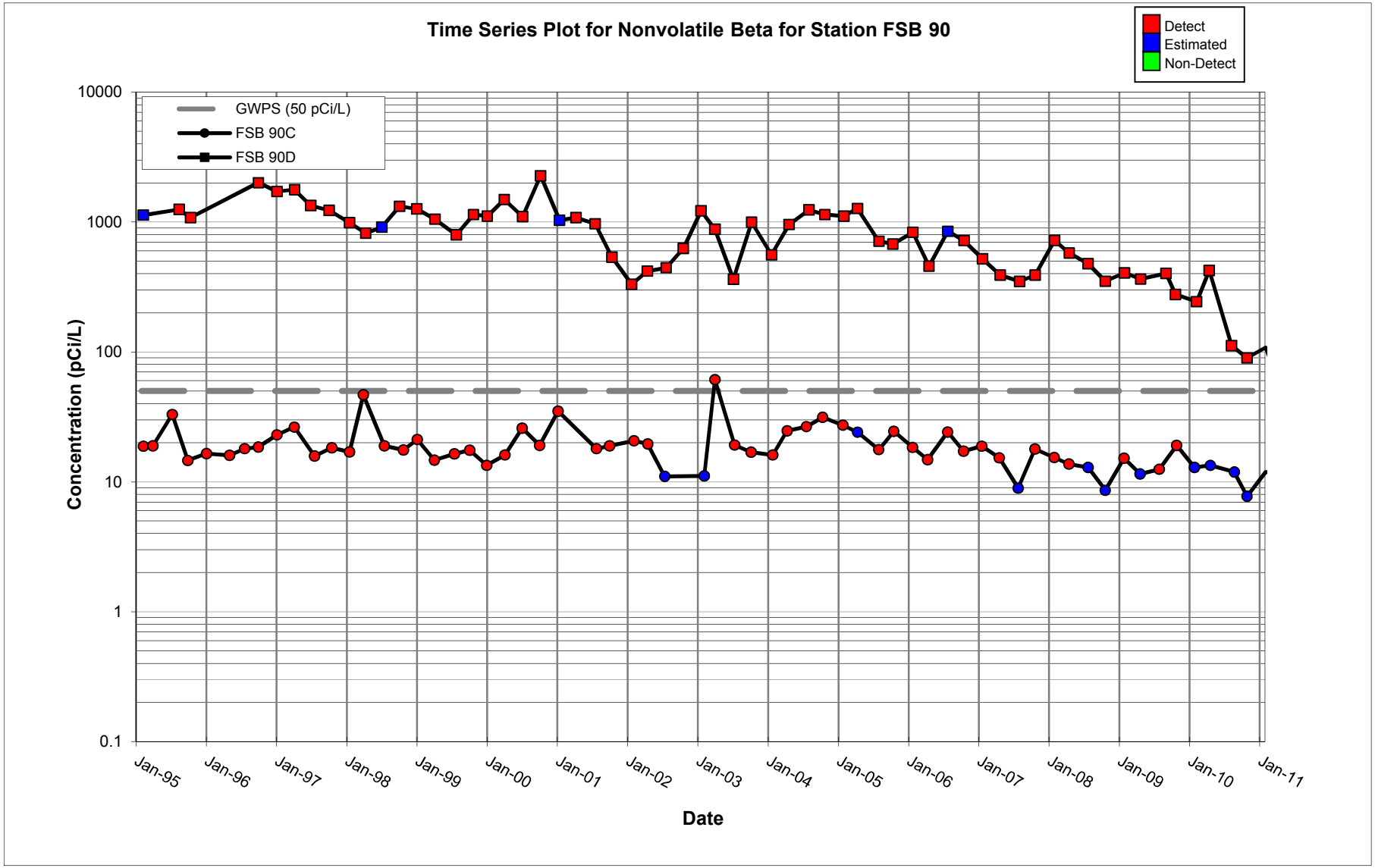

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB119
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB119A
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

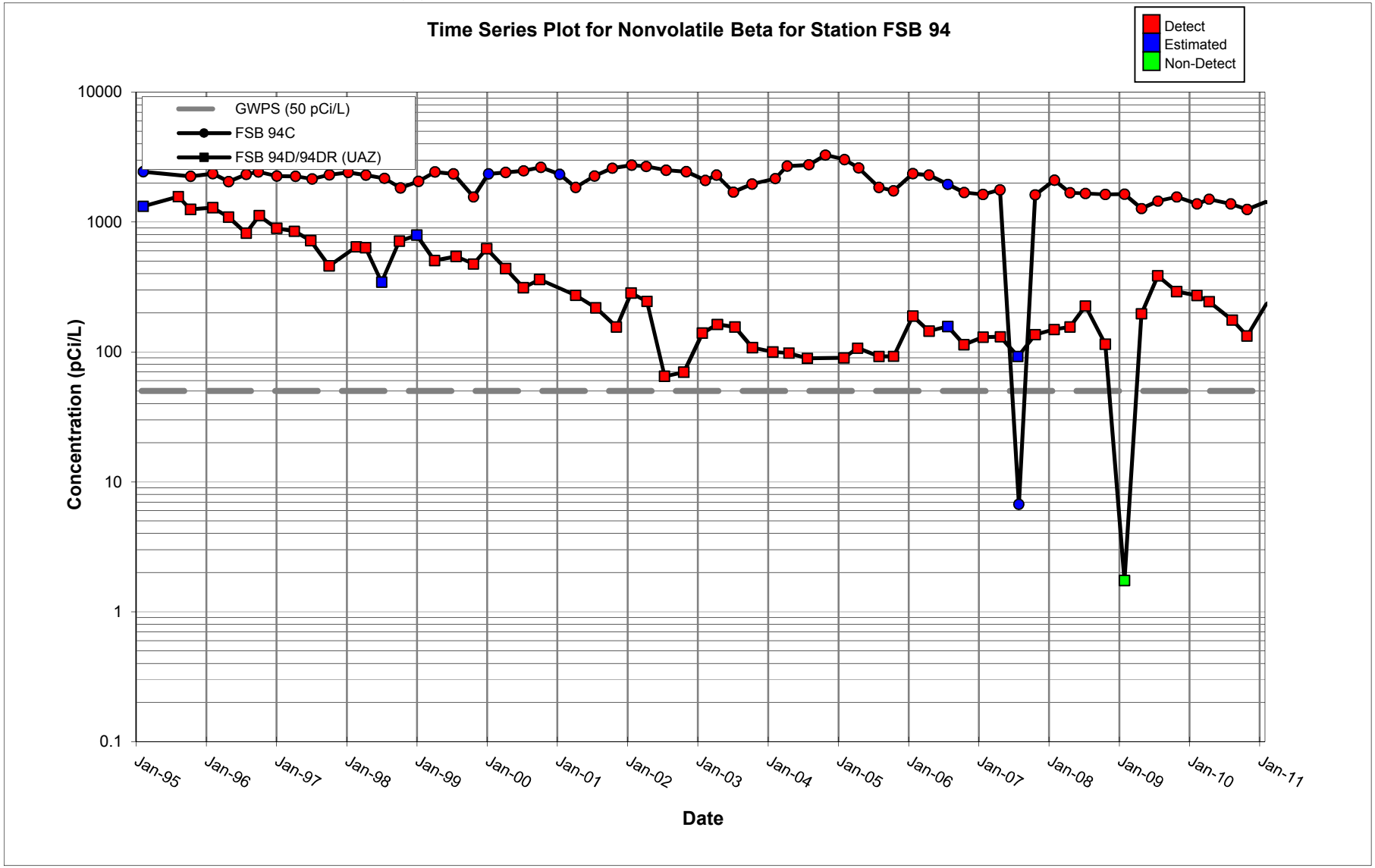

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB129
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB129C
HSB129D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

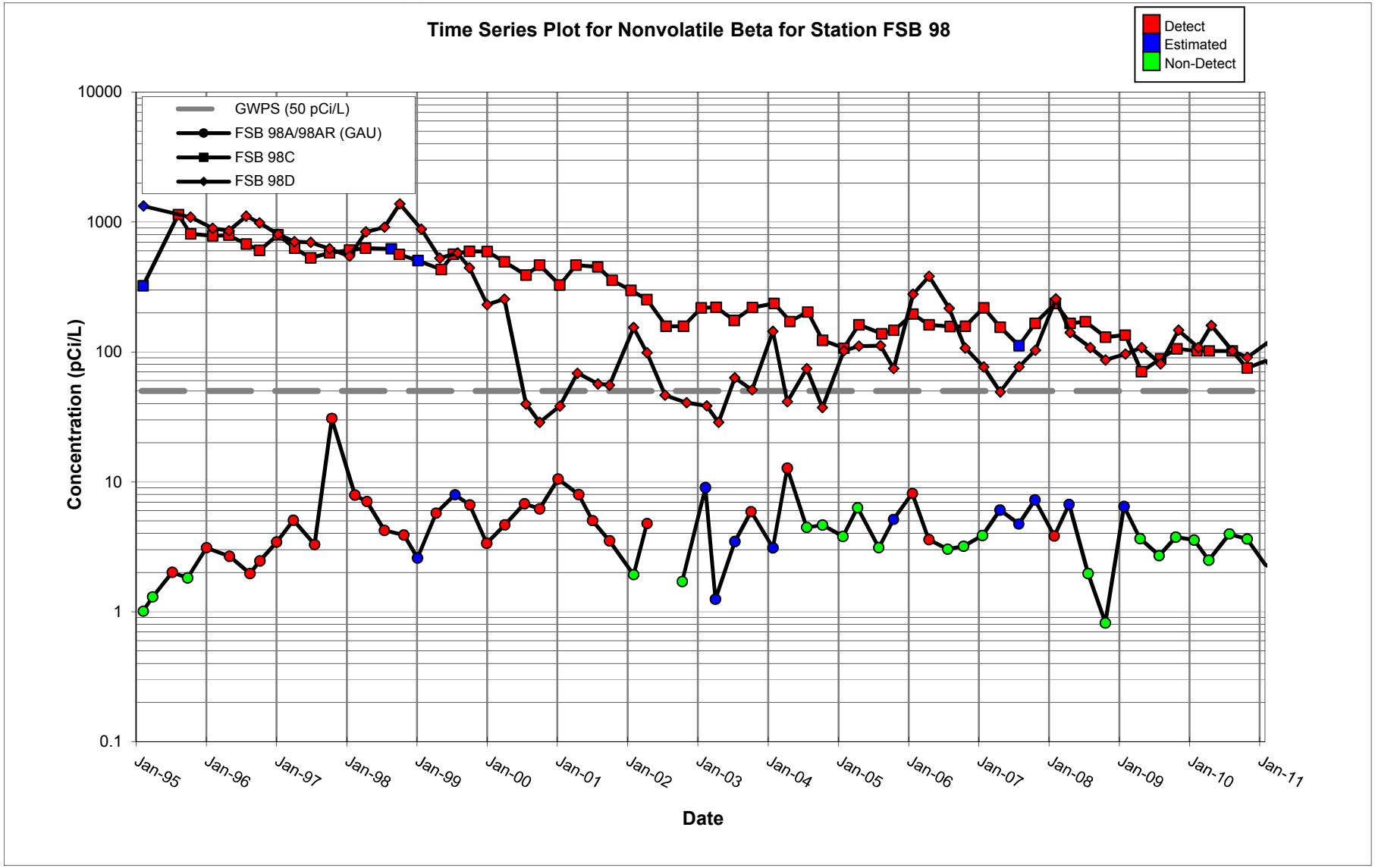

Time Series Plot for Nitrate-nitrite As Nitrogen for Station HSB137
Detect
Estimated
Non-Detect
GWPS (10 mg/L)
HSB137C
HSB137D
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Secondary Concentration
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

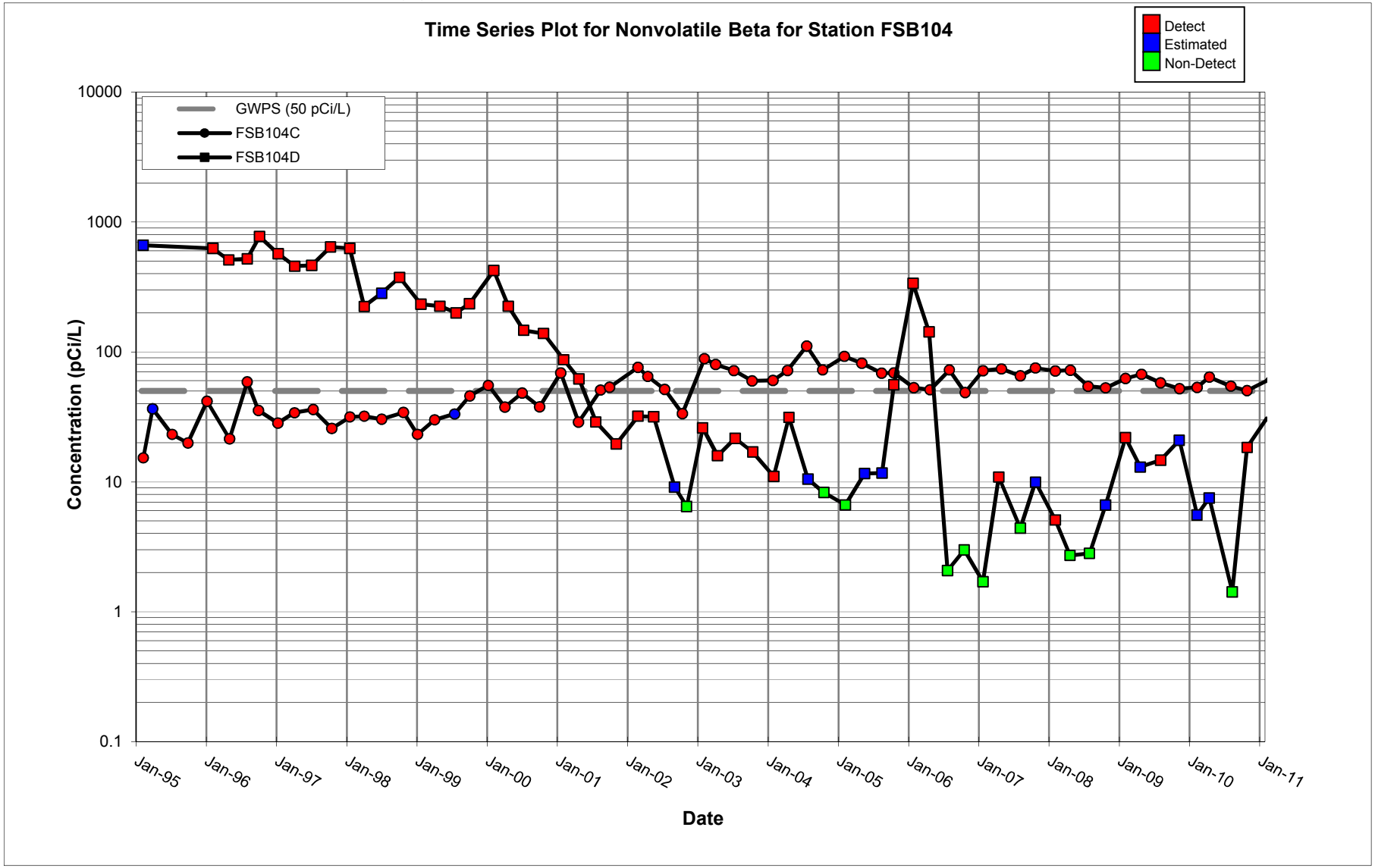

Time Series Plot for Nonvolatile Beta for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB 78
FSB 78A
FSB 78B
FSB 78C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

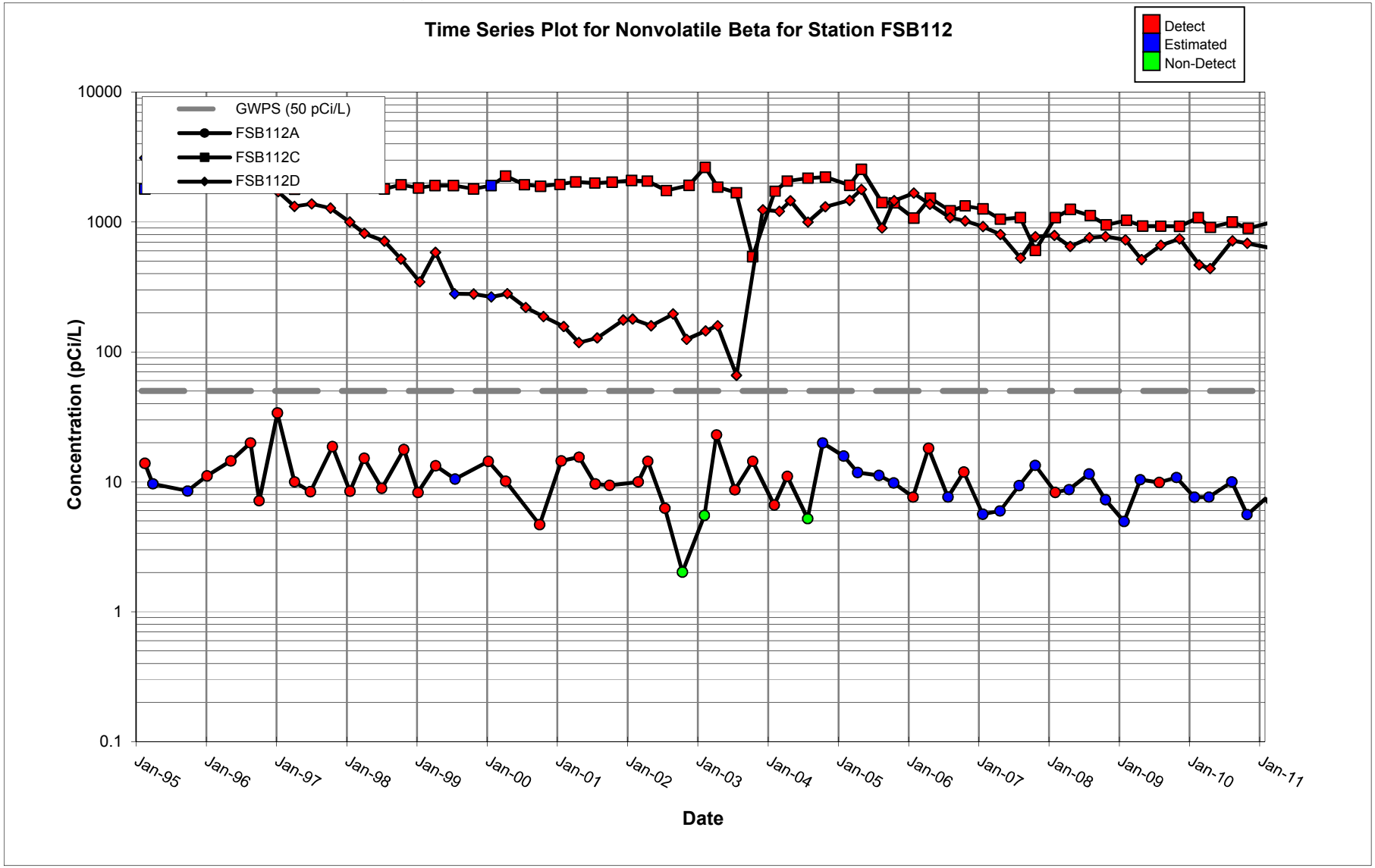

Time Series Plot for Nonvolatile Beta for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB 79
FSB 79B
FSB 79C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

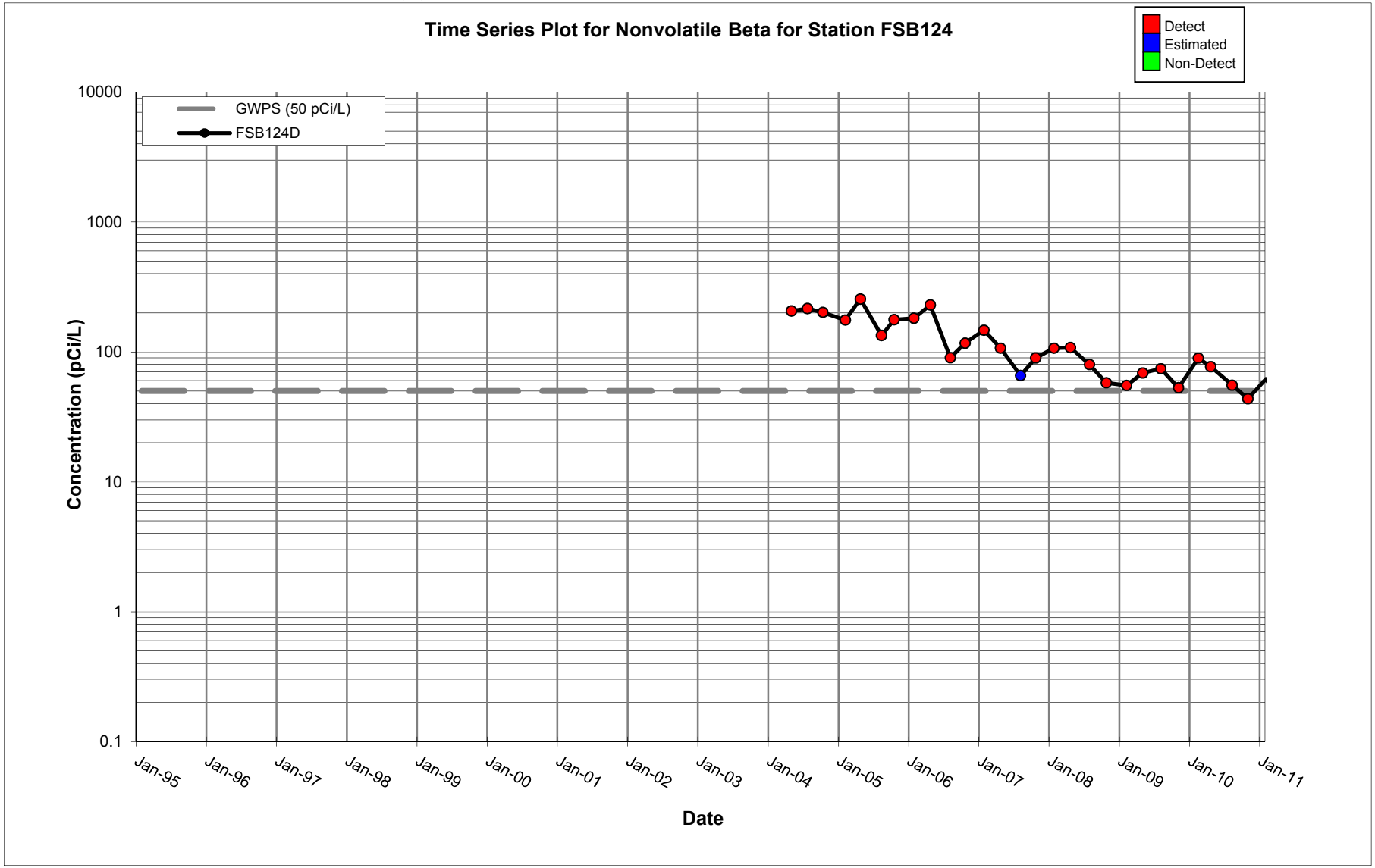

Time Series Plot for Nonvolatile Beta for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB 90C
FSB 90D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

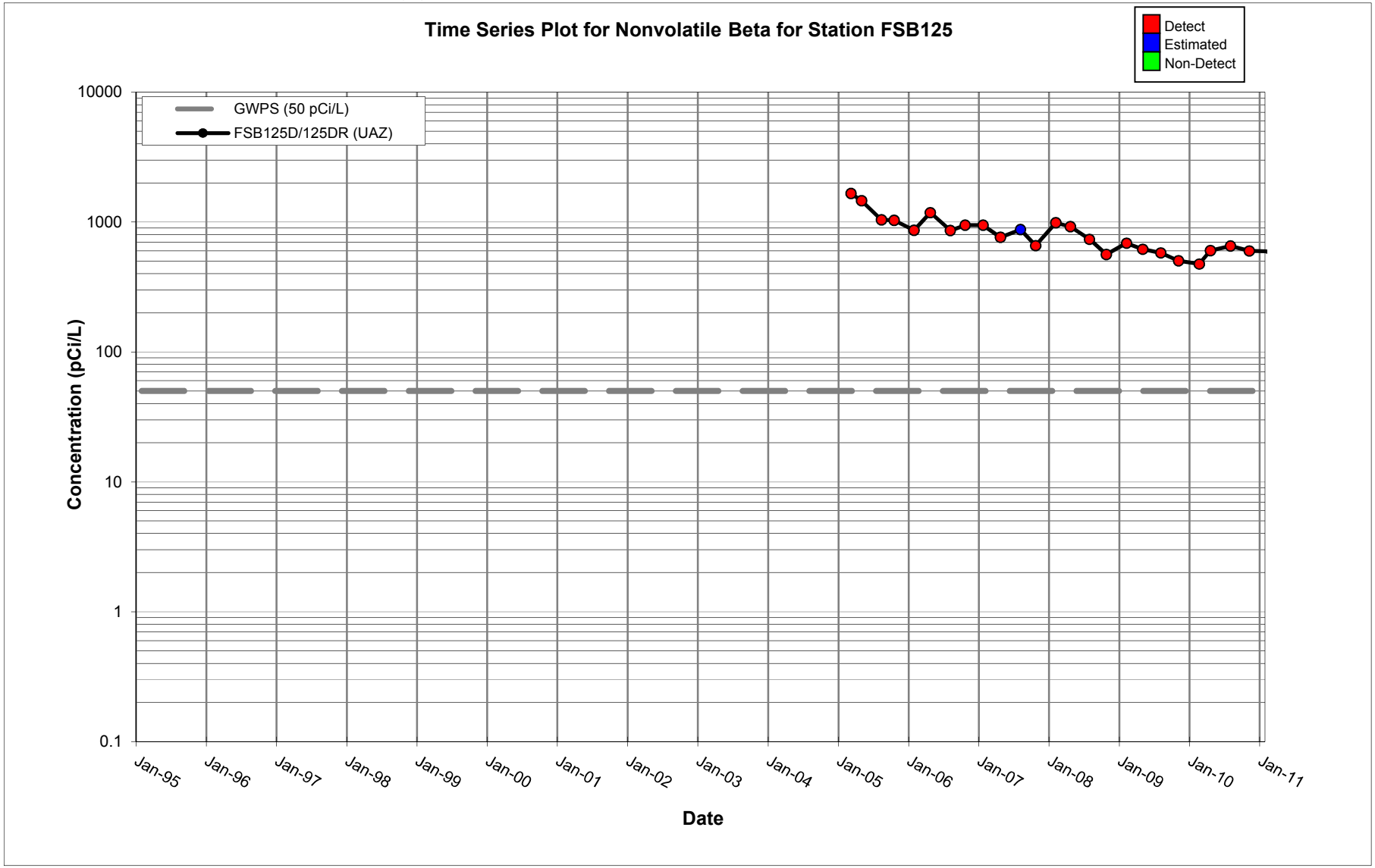

Time Series Plot for Nonvolatile Beta for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB 94C
FSB 94D/94DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

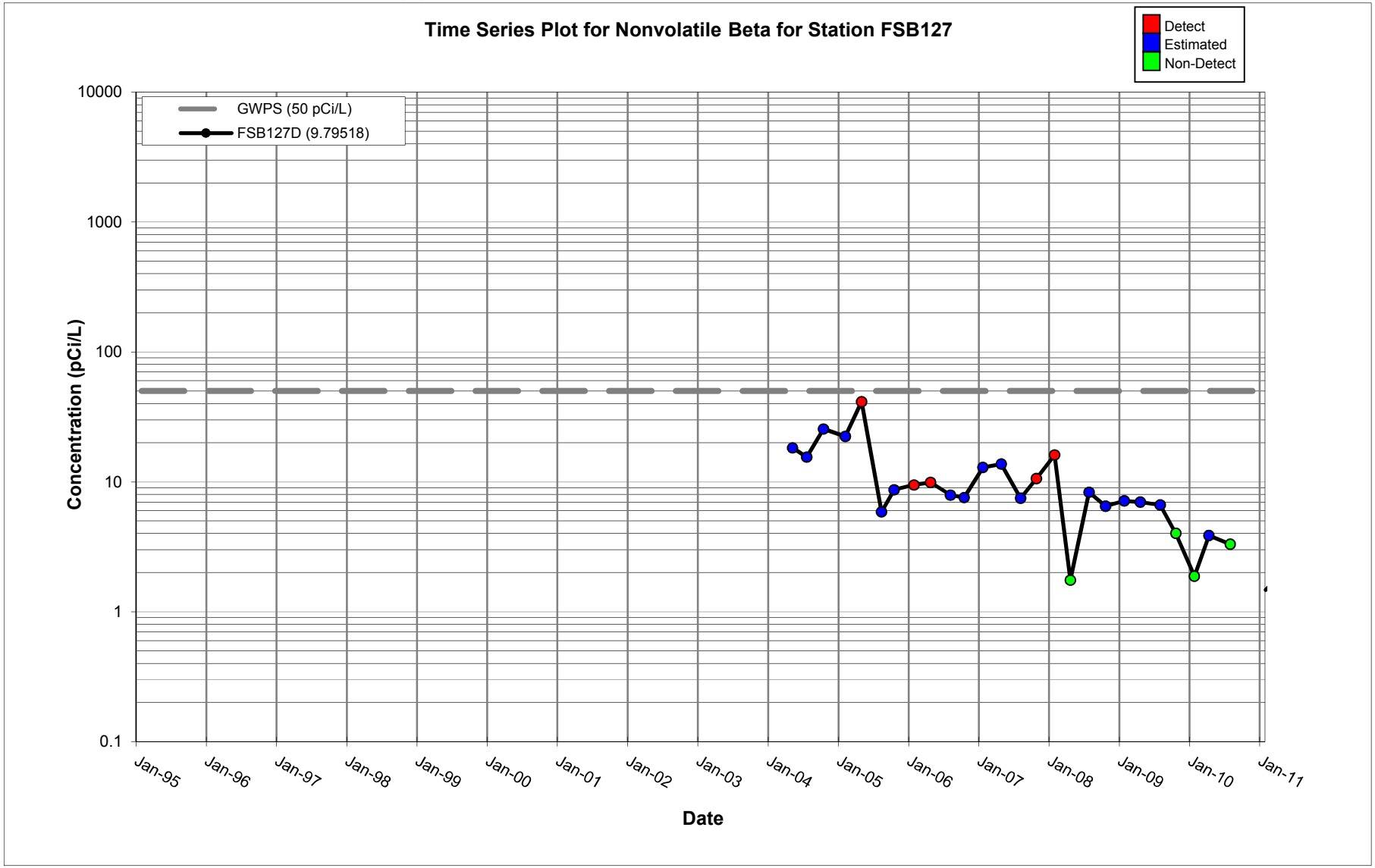

Time Series Plot for Nonvolatile Beta for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

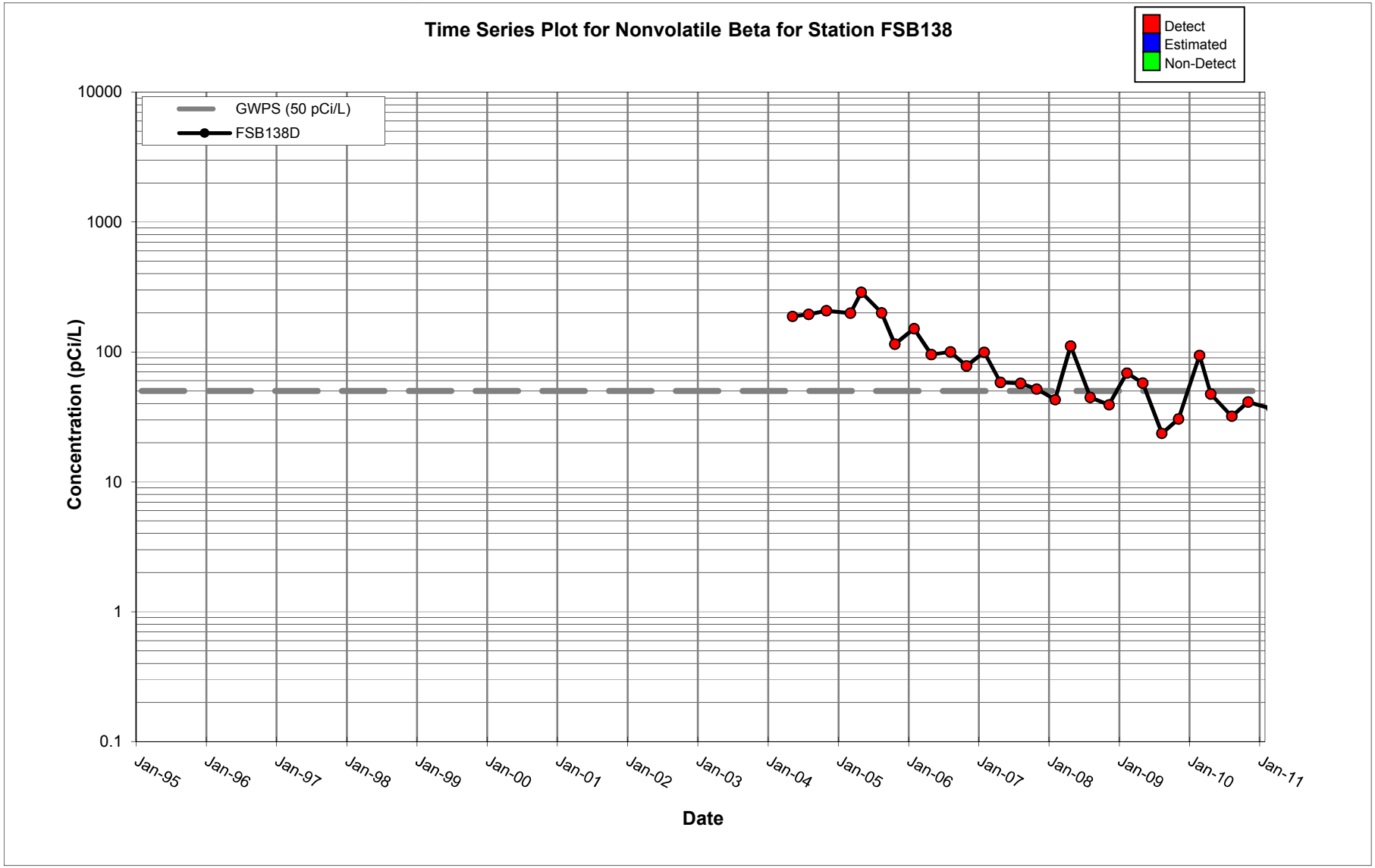

Time Series Plot for Nonvolatile Beta for Station FSB104
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB104C
FSB104D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

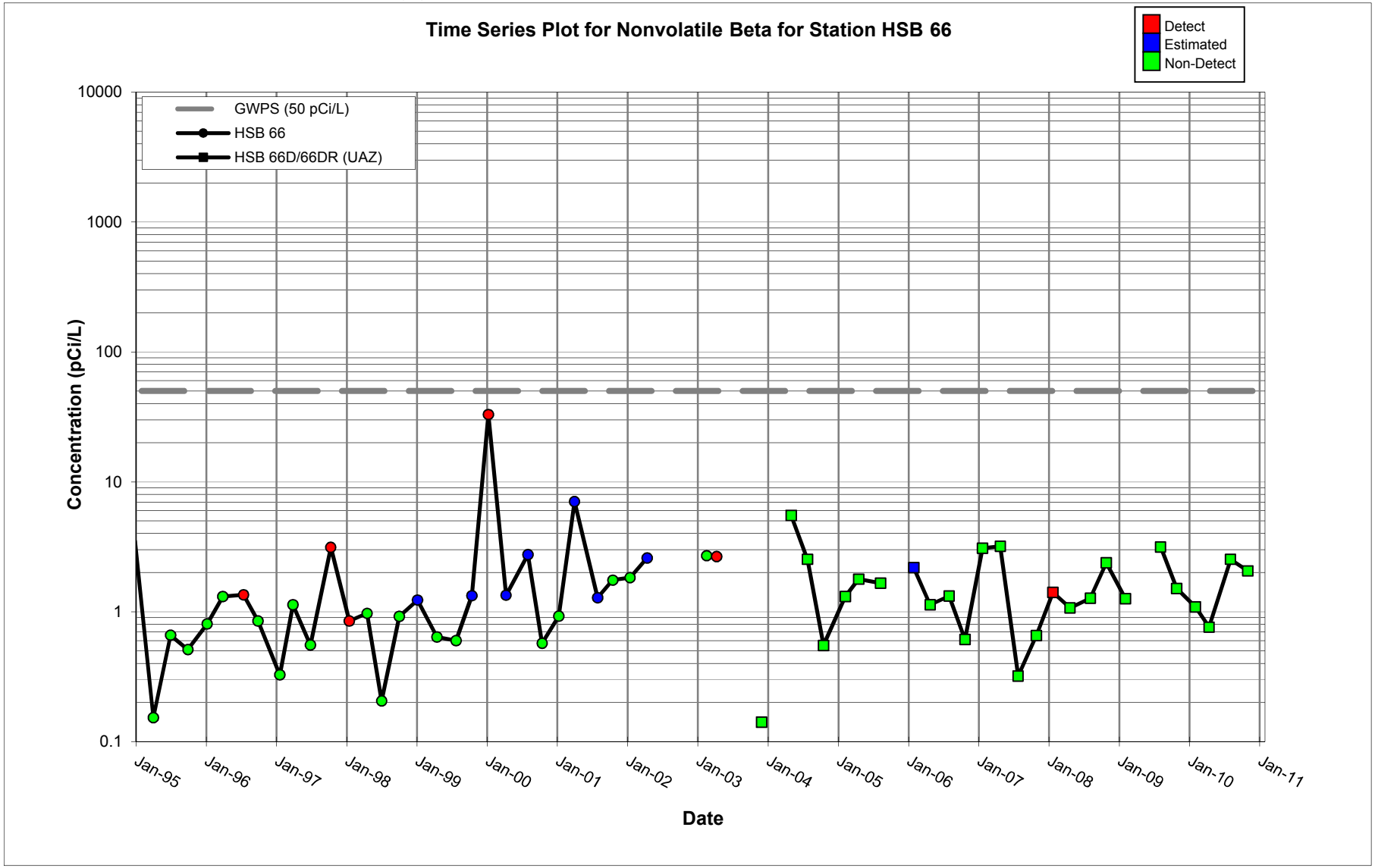

Time Series Plot for Nonvolatile Beta for Station FSB112
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB112A
FSB112C
FSB112D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

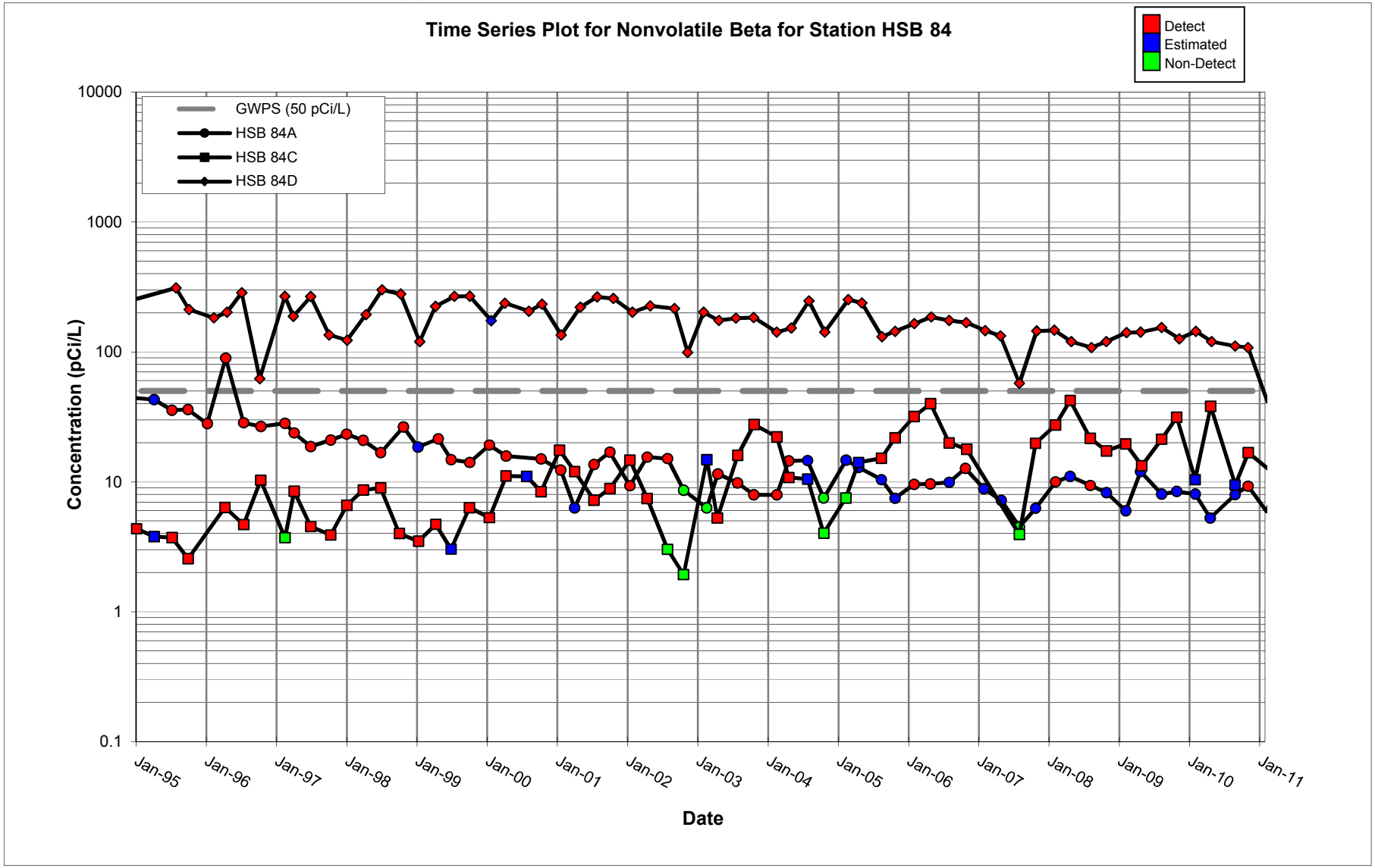

Time Series Plot for Nonvolatile Beta for Station FSB124
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB124D
10000
1000
100
10
1
0.1
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

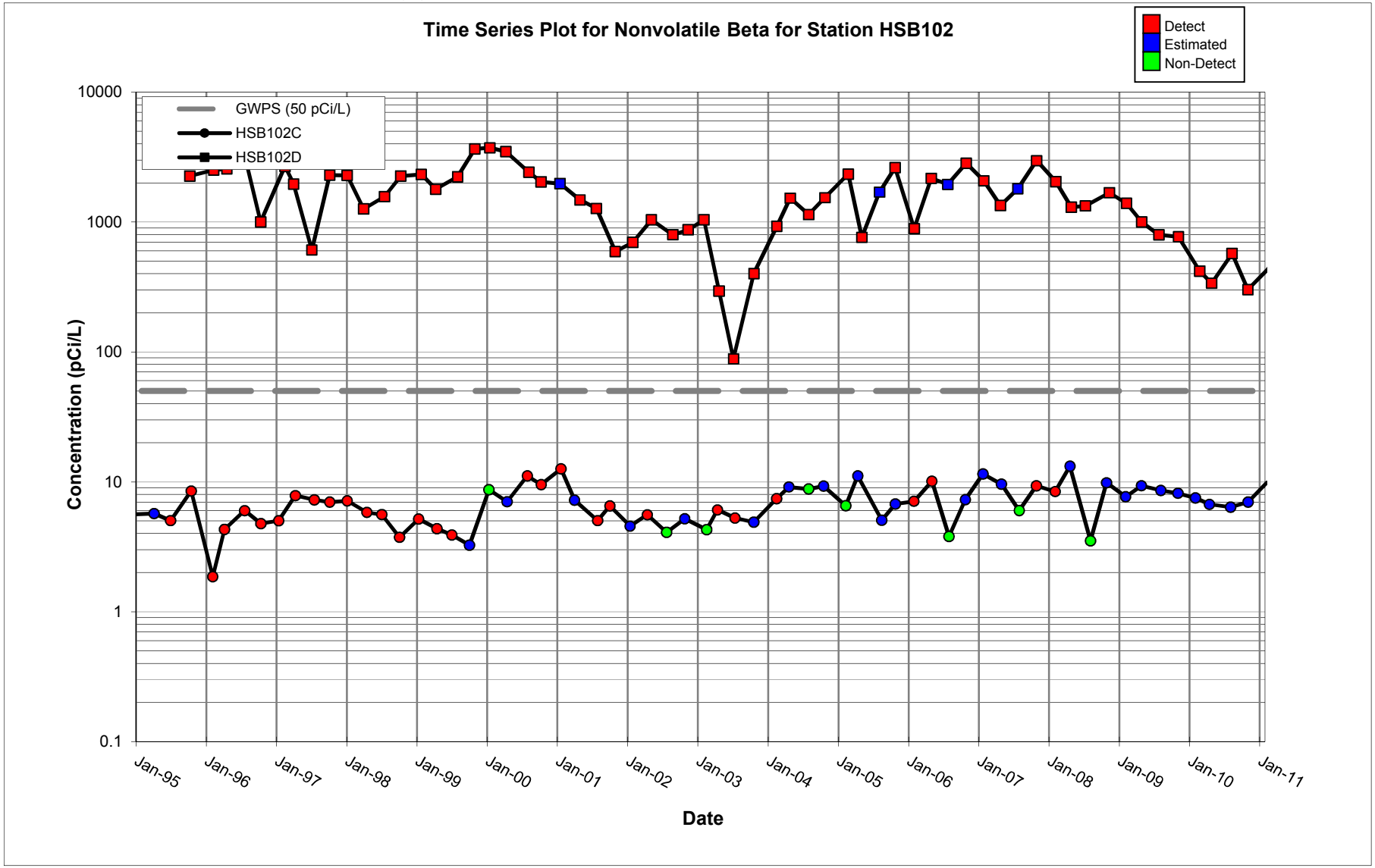

Time Series Plot for Nonvolatile Beta for Station FSB125
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB125D/125DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

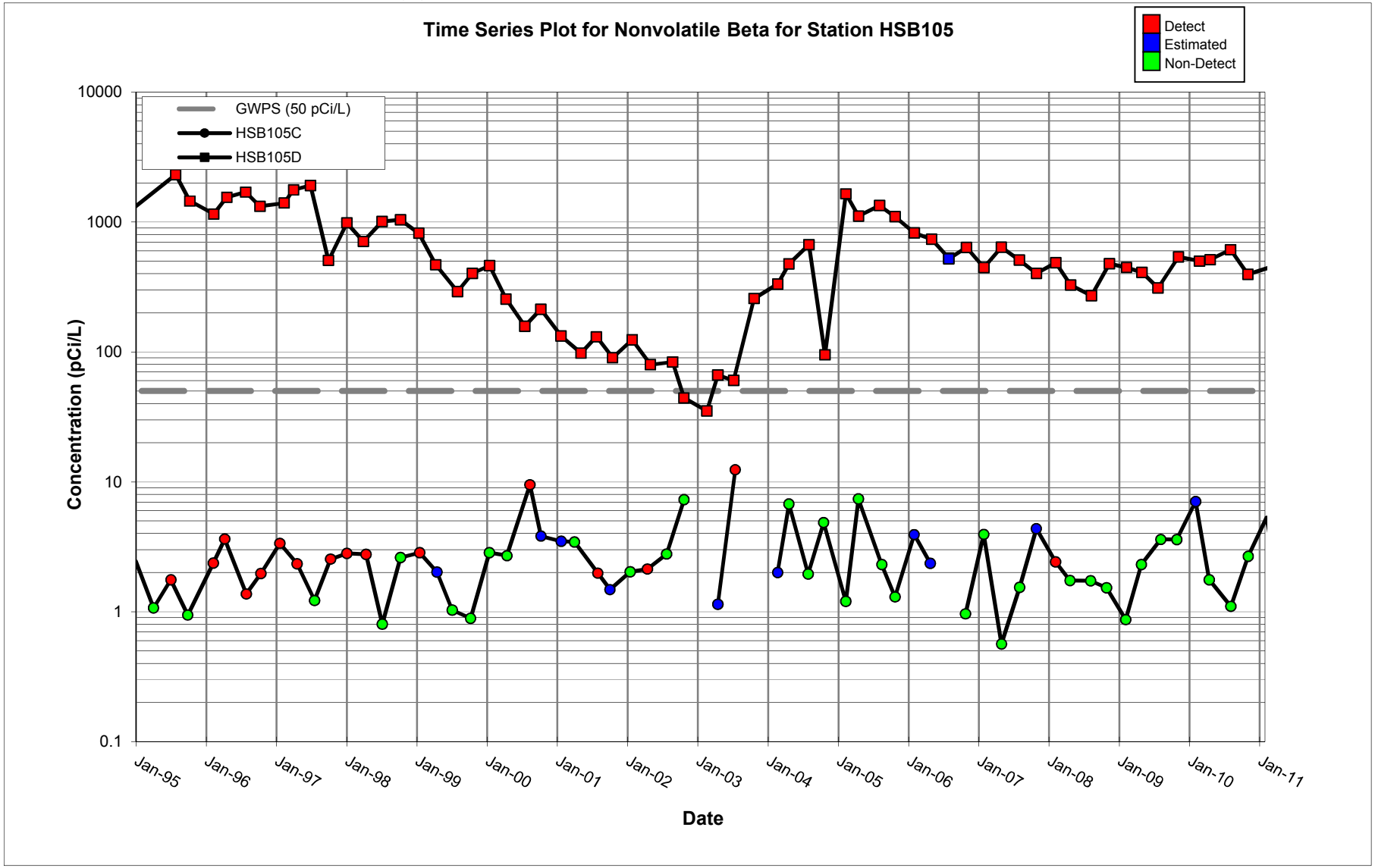

Time Series Plot for Nonvolatile Beta for Station FSB127
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB127D (9.79518)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

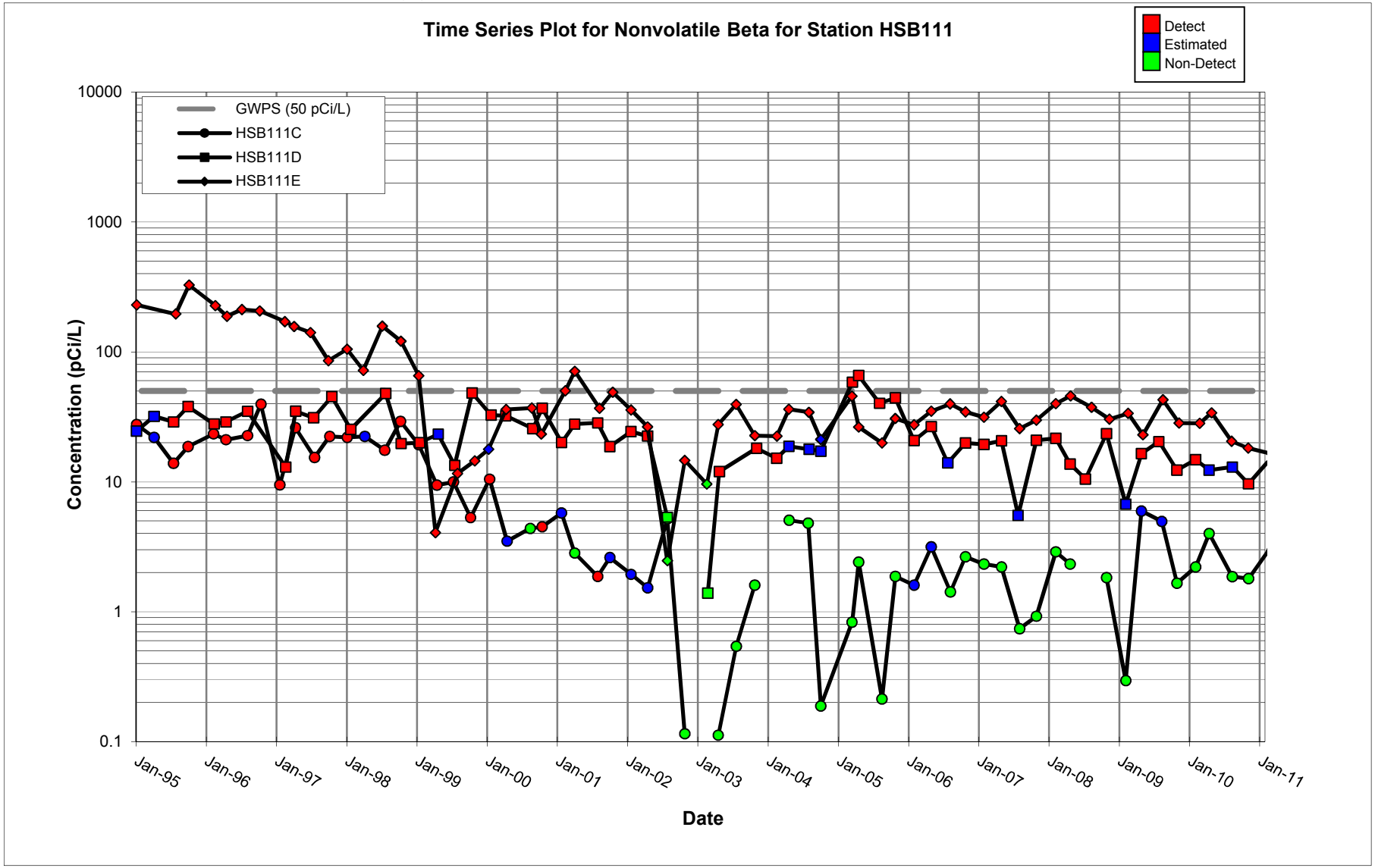

Time Series Plot for Nonvolatile Beta for Station FSB138
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
FSB138D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

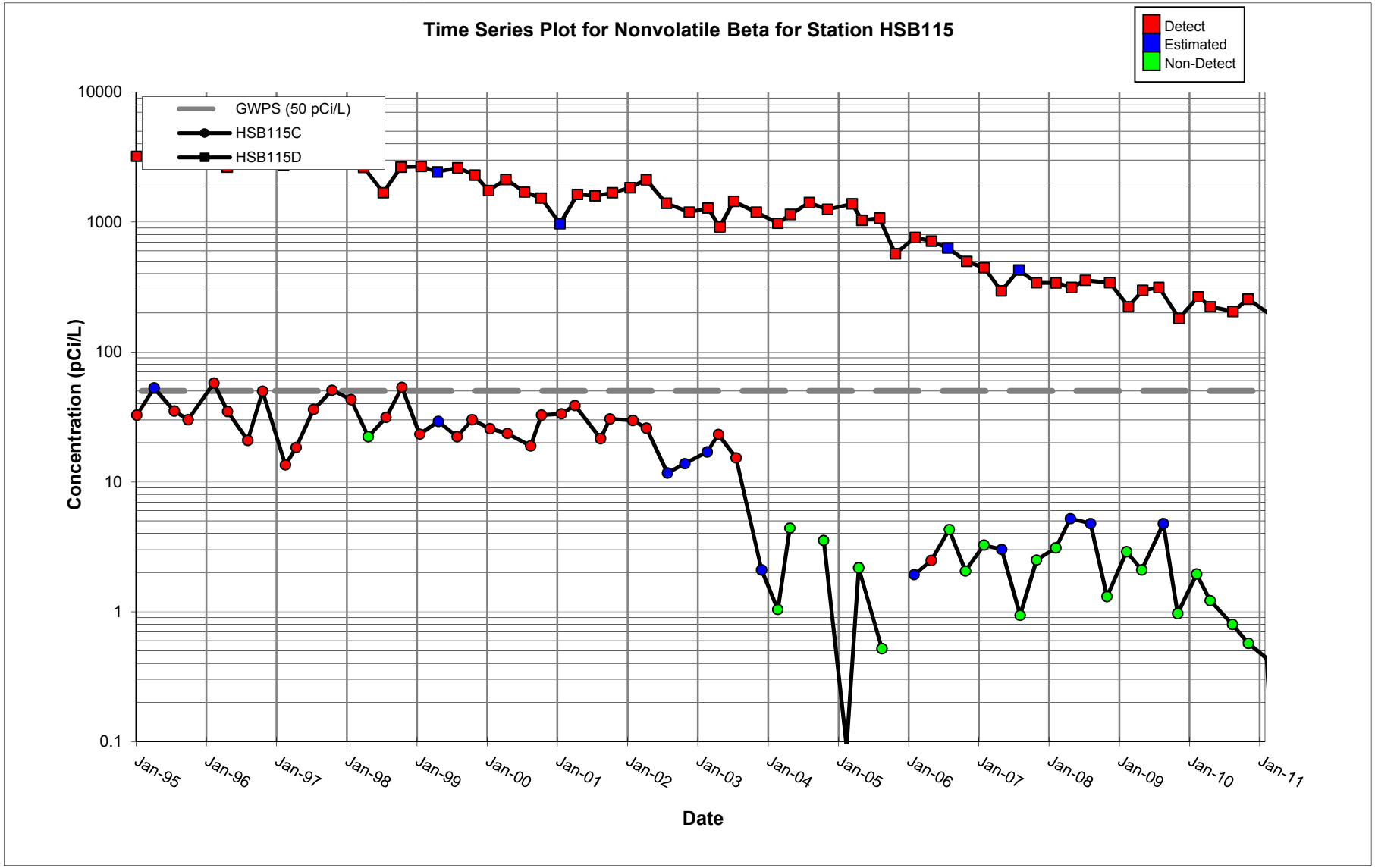

Time Series Plot for Nonvolatile Beta for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB 66
HSB 66D/66DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

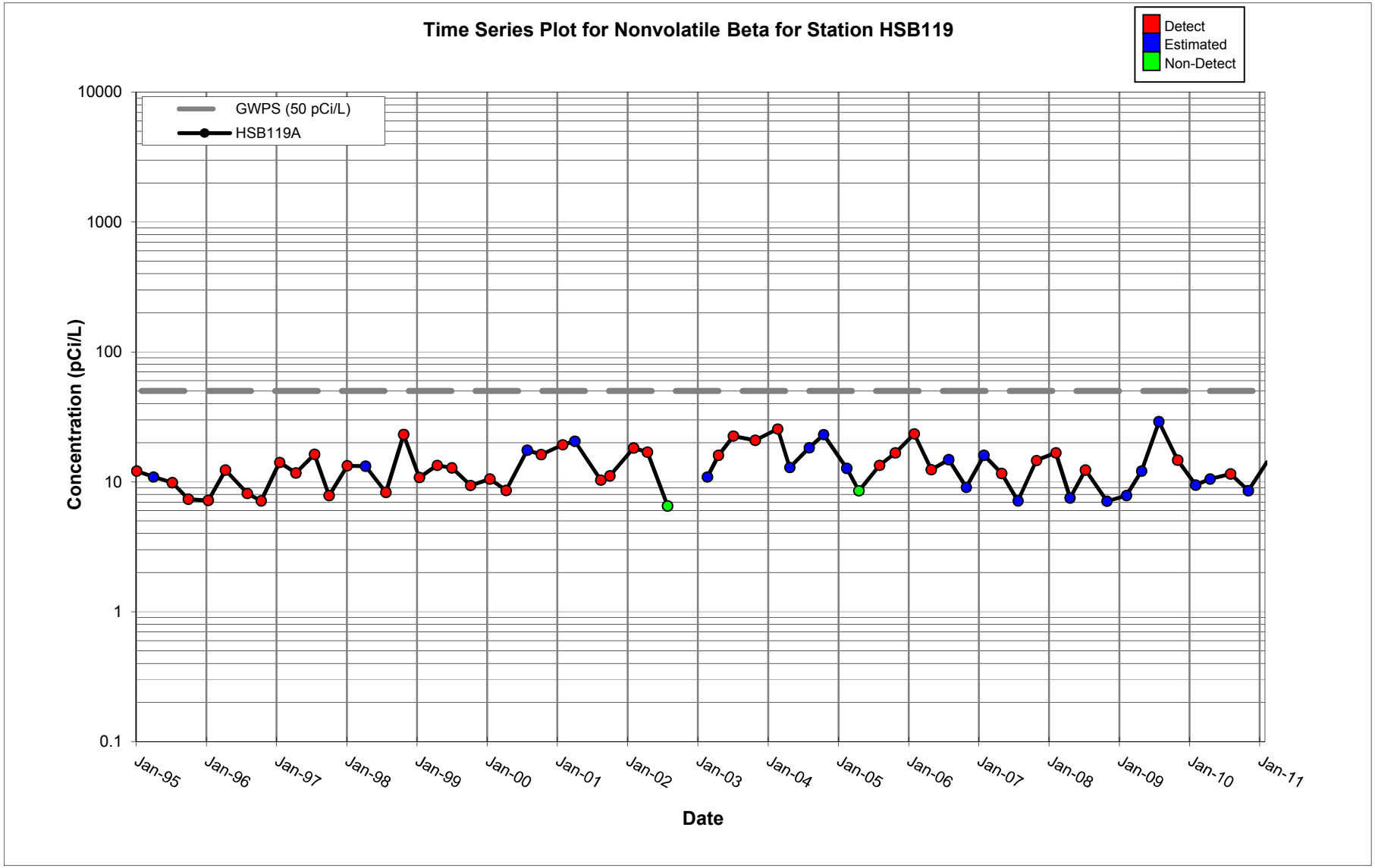

Time Series Plot for Nonvolatile Beta for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB 84A
HSB 84C
HSB 84D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

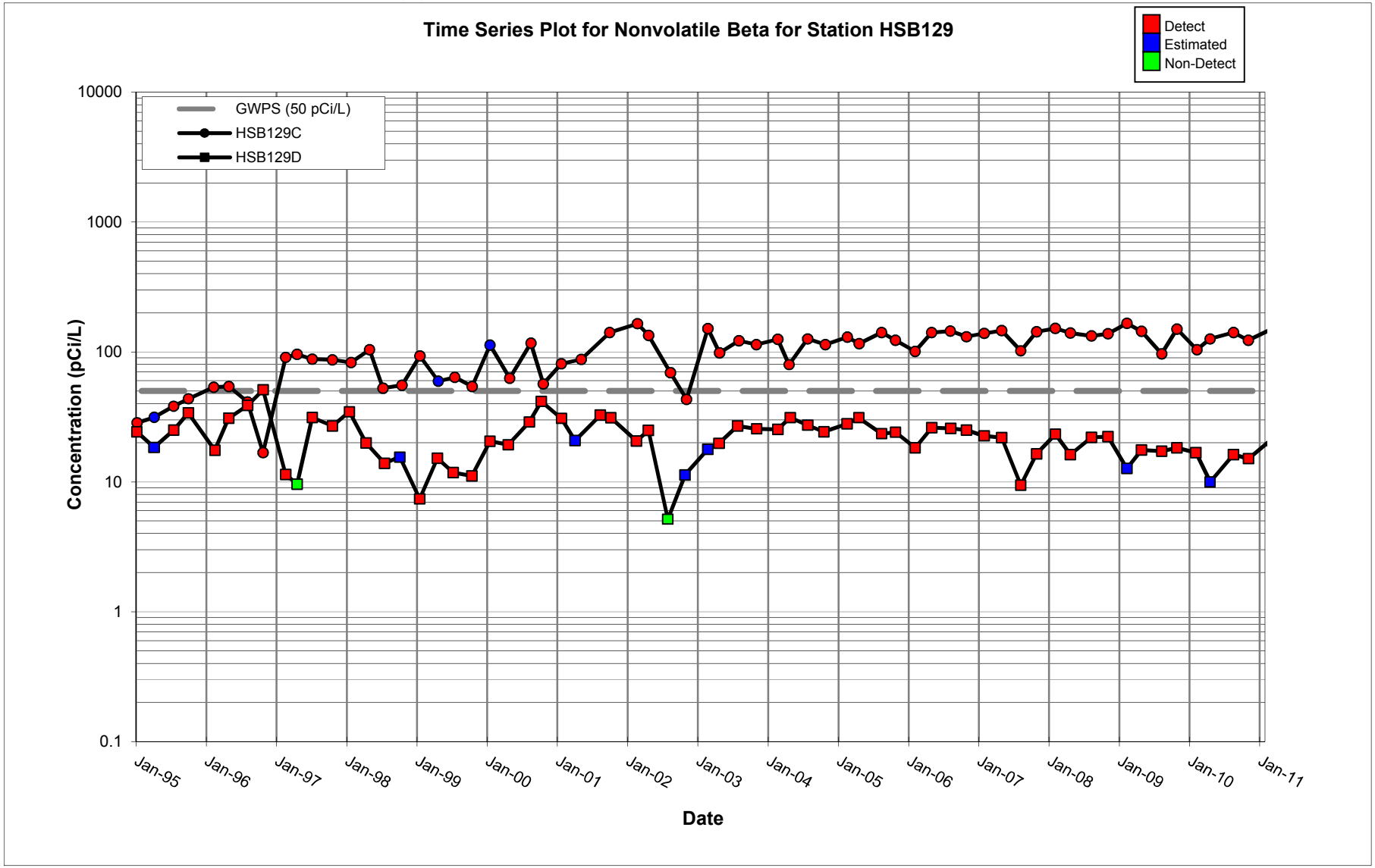

Time Series Plot for Nonvolatile Beta for Station HSB102
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB102C
HSB102D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

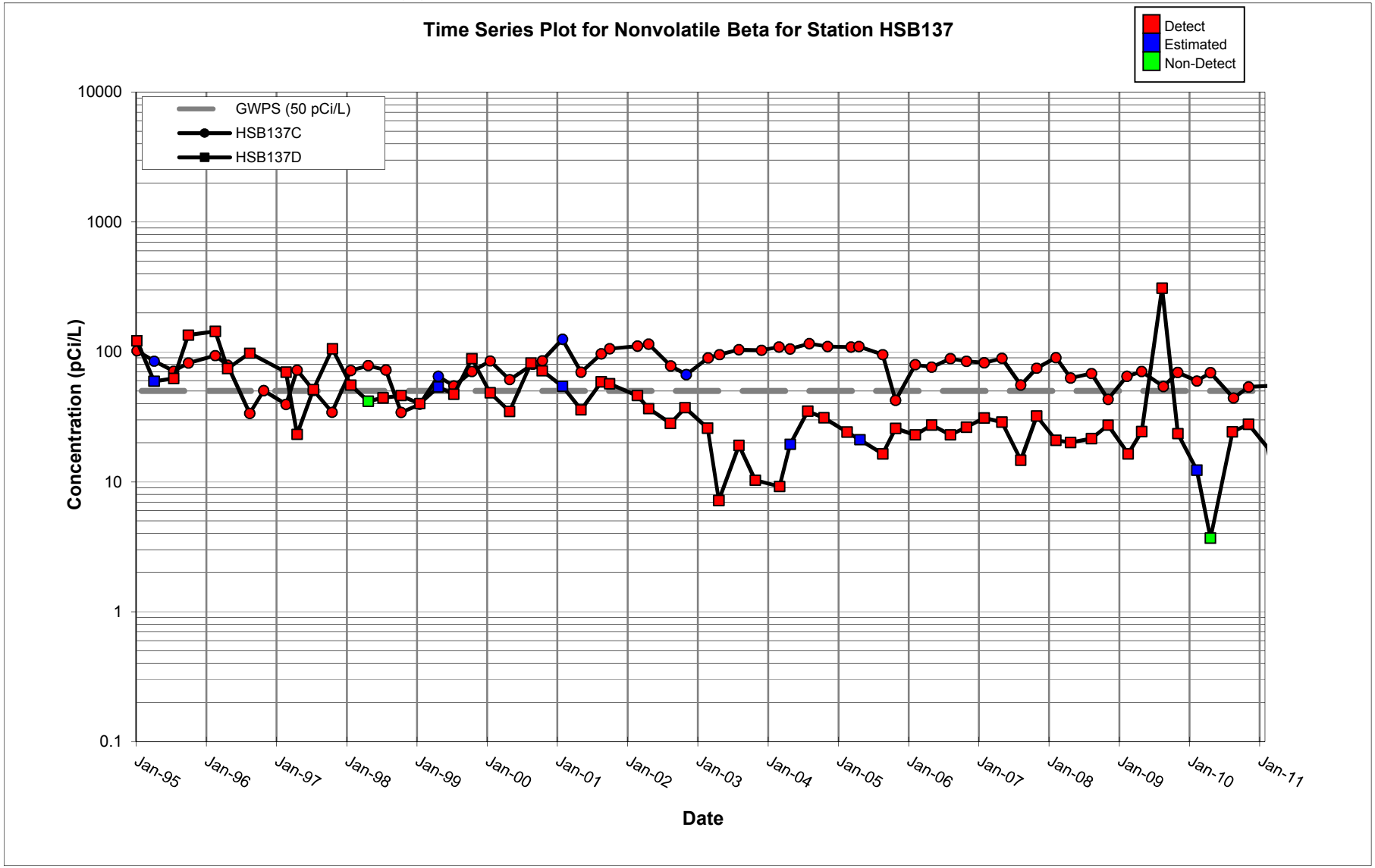

Time Series Plot for Nonvolatile Beta for Station HSB105
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB105C
HSB105D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

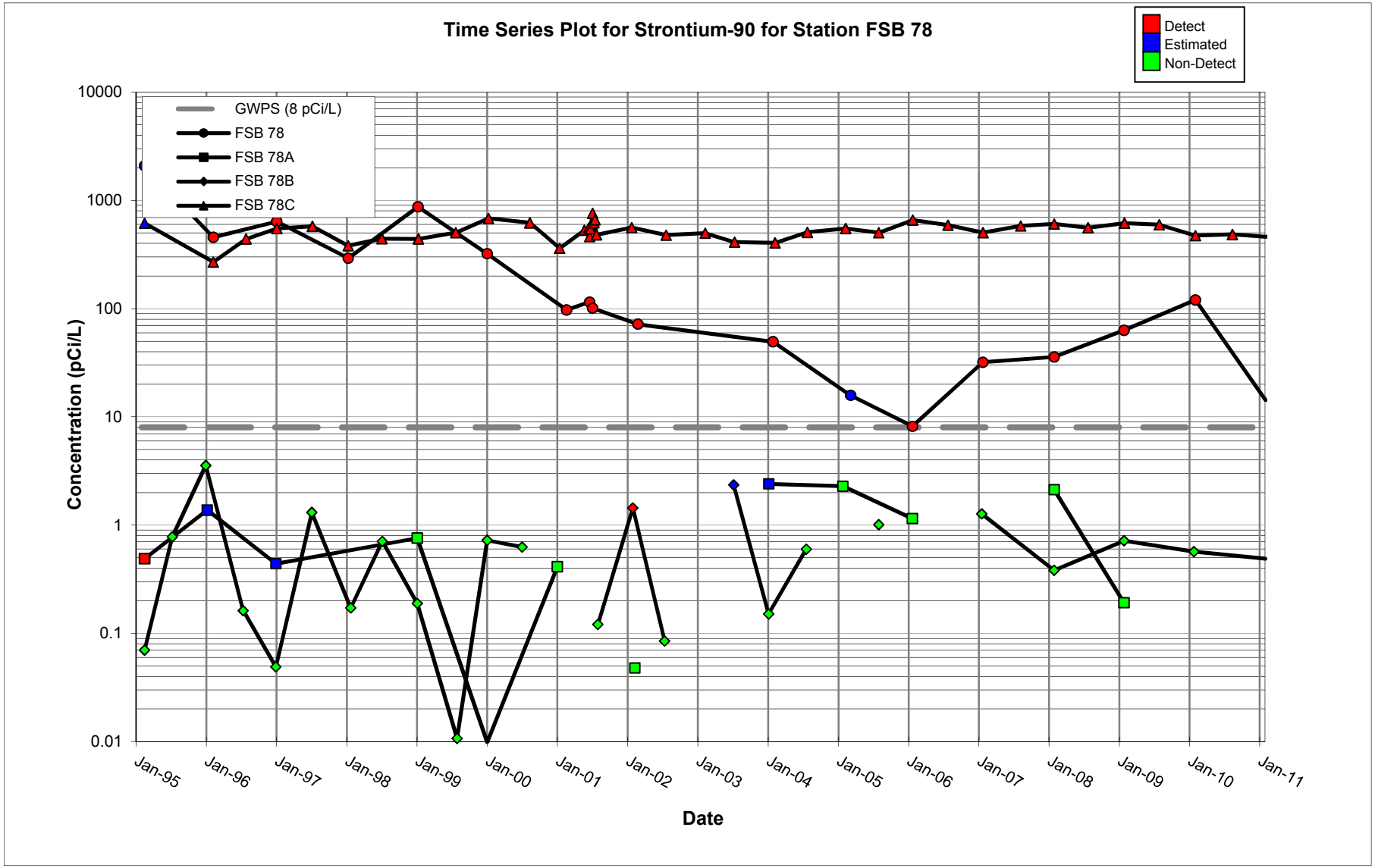

Time Series Plot for Nonvolatile Beta for Station HSB111
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB111C
HSB111D
HSB111E
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

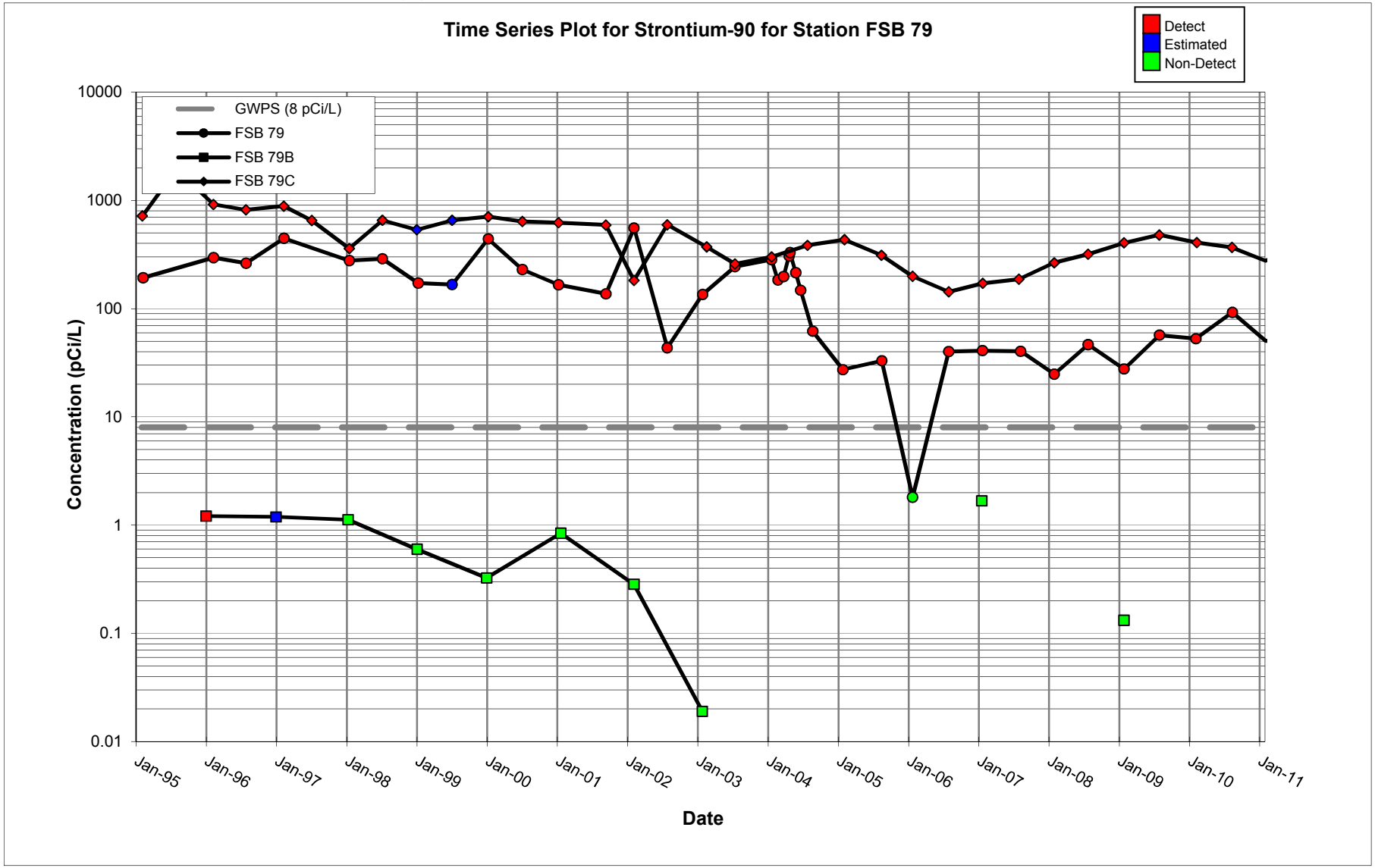

Time Series Plot for Nonvolatile Beta for Station HSB115
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB115C
HSB115D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

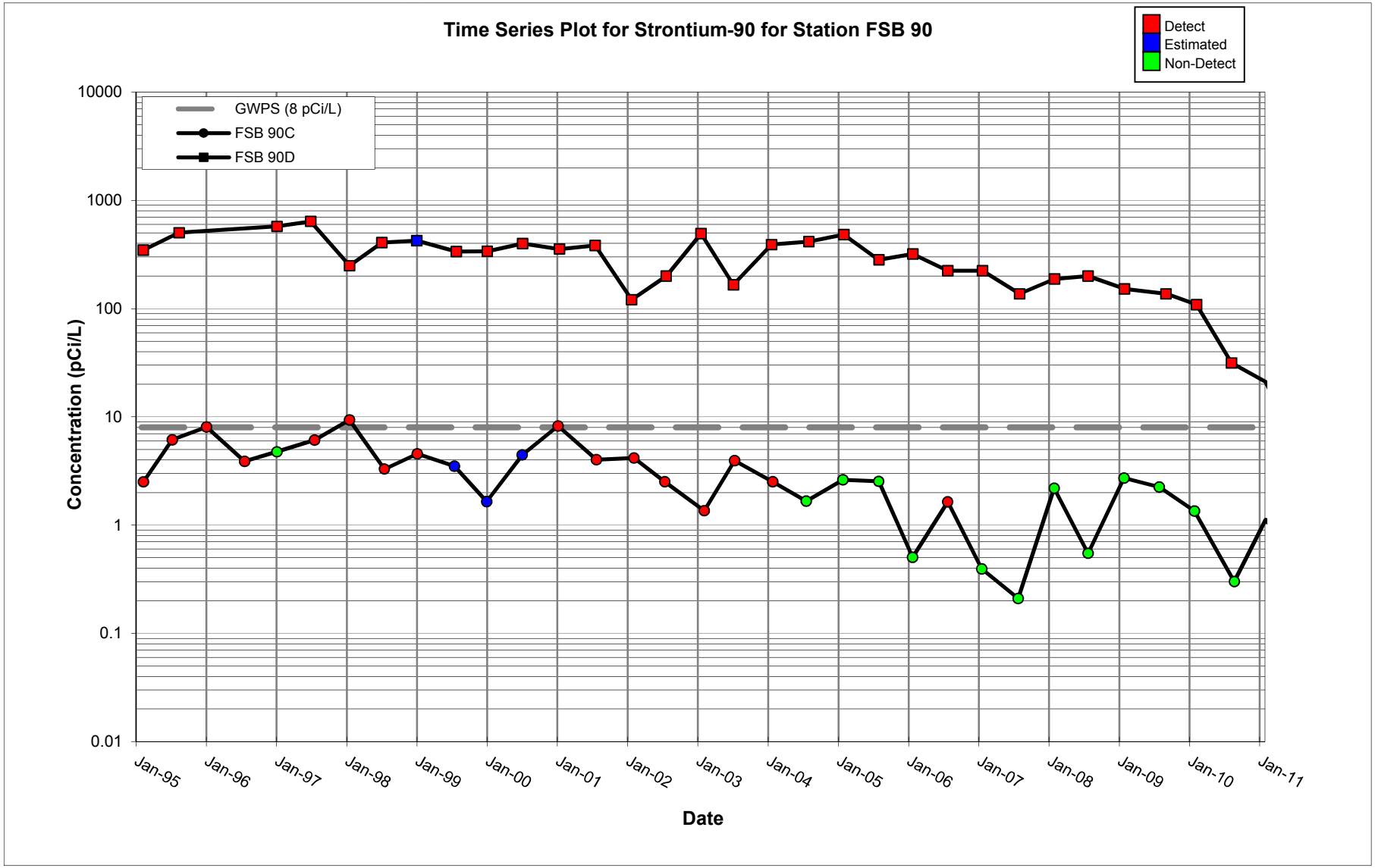

Time Series Plot for Nonvolatile Beta for Station HSB119
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB119A
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

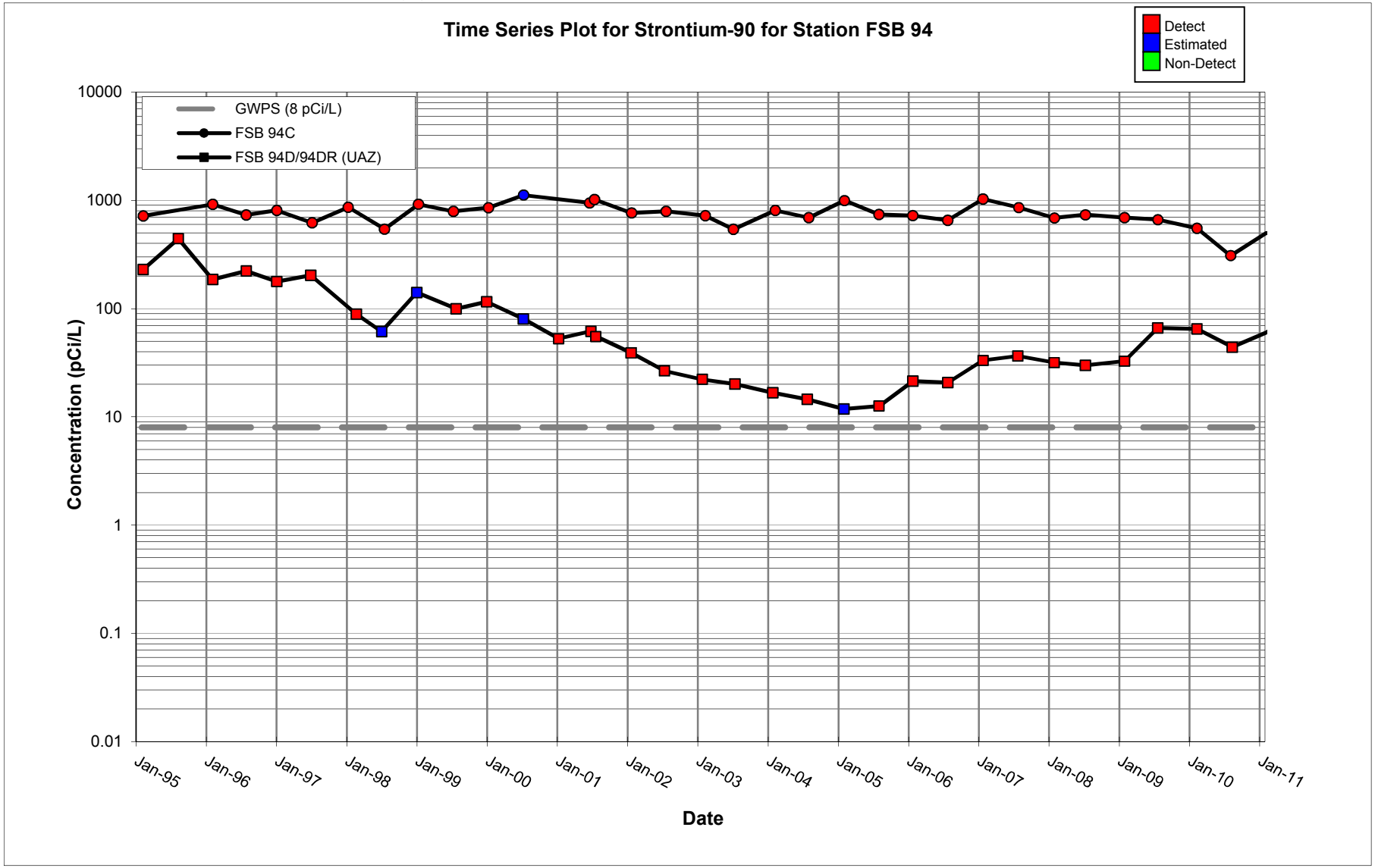

Time Series Plot for Nonvolatile Beta for Station HSB129
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB129C
HSB129D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

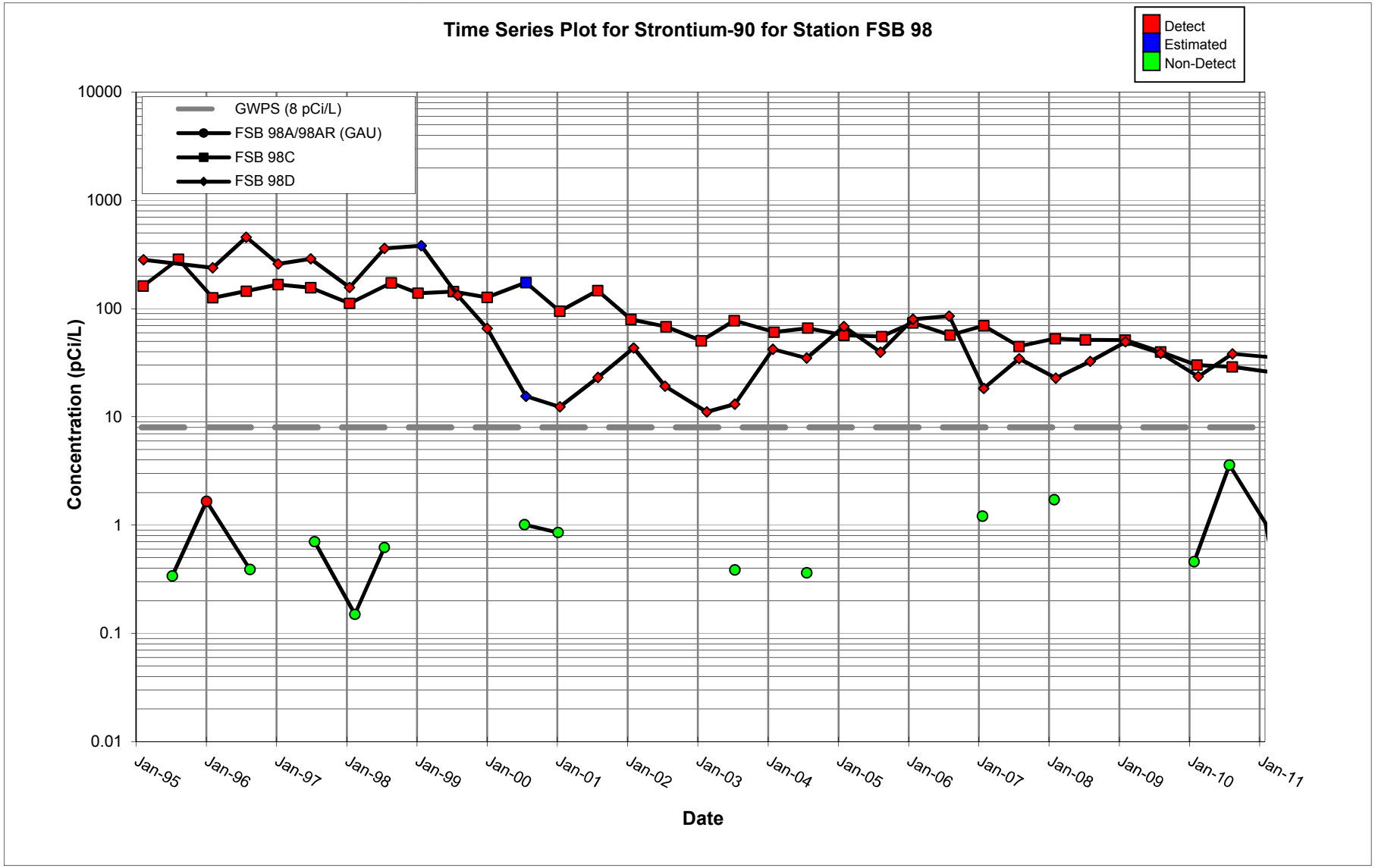

Time Series Plot for Nonvolatile Beta for Station HSB137
Detect
Estimated
Non-Detect
GWPS (50 pCi/L)
HSB137C
HSB137D
10000
1000
100
10
1
0.1
Concentration (pCi/L)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

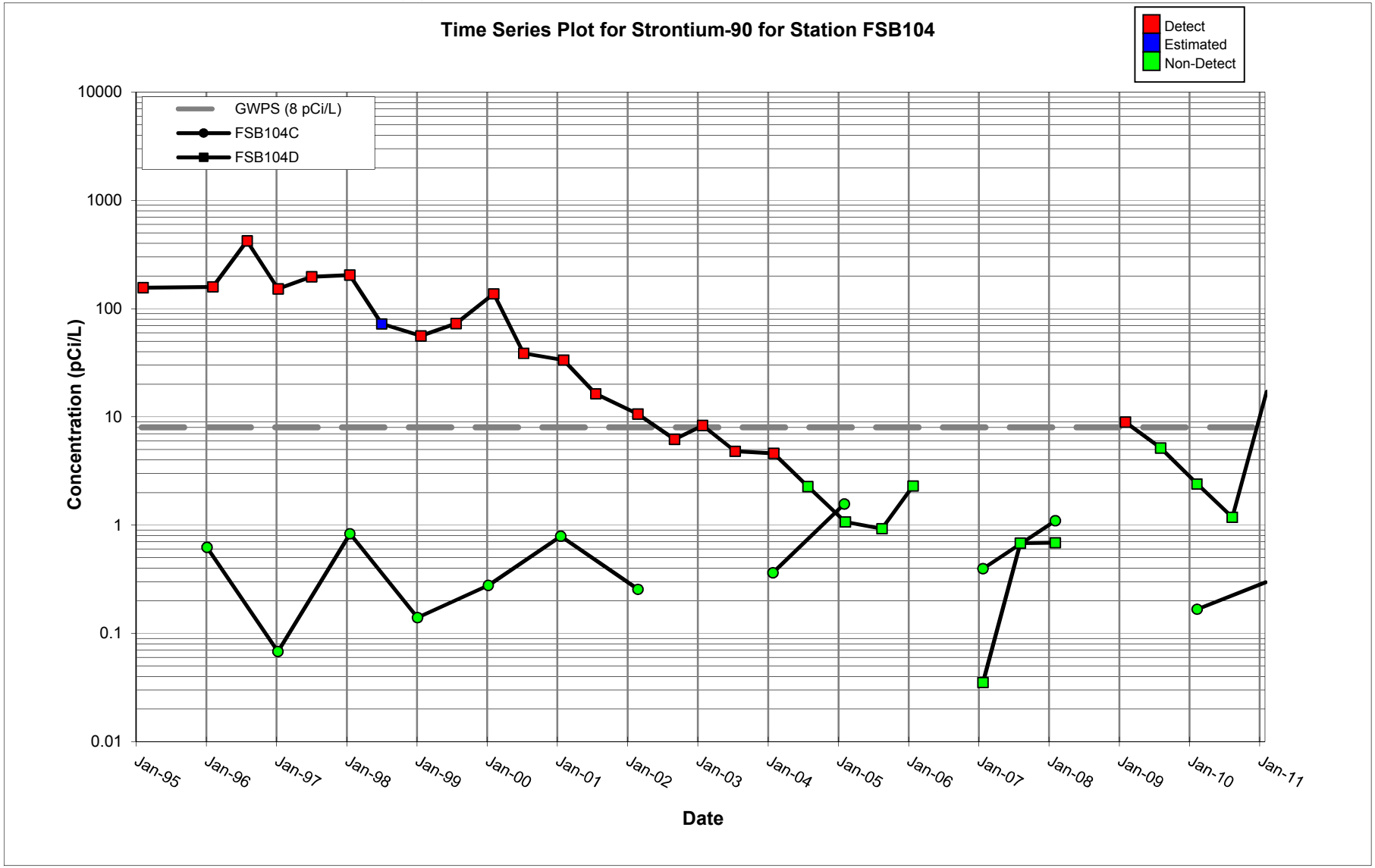

Time Series Plot for Strontium-90 for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB 78
FSB 78A
FSB 78B
FSB 78C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

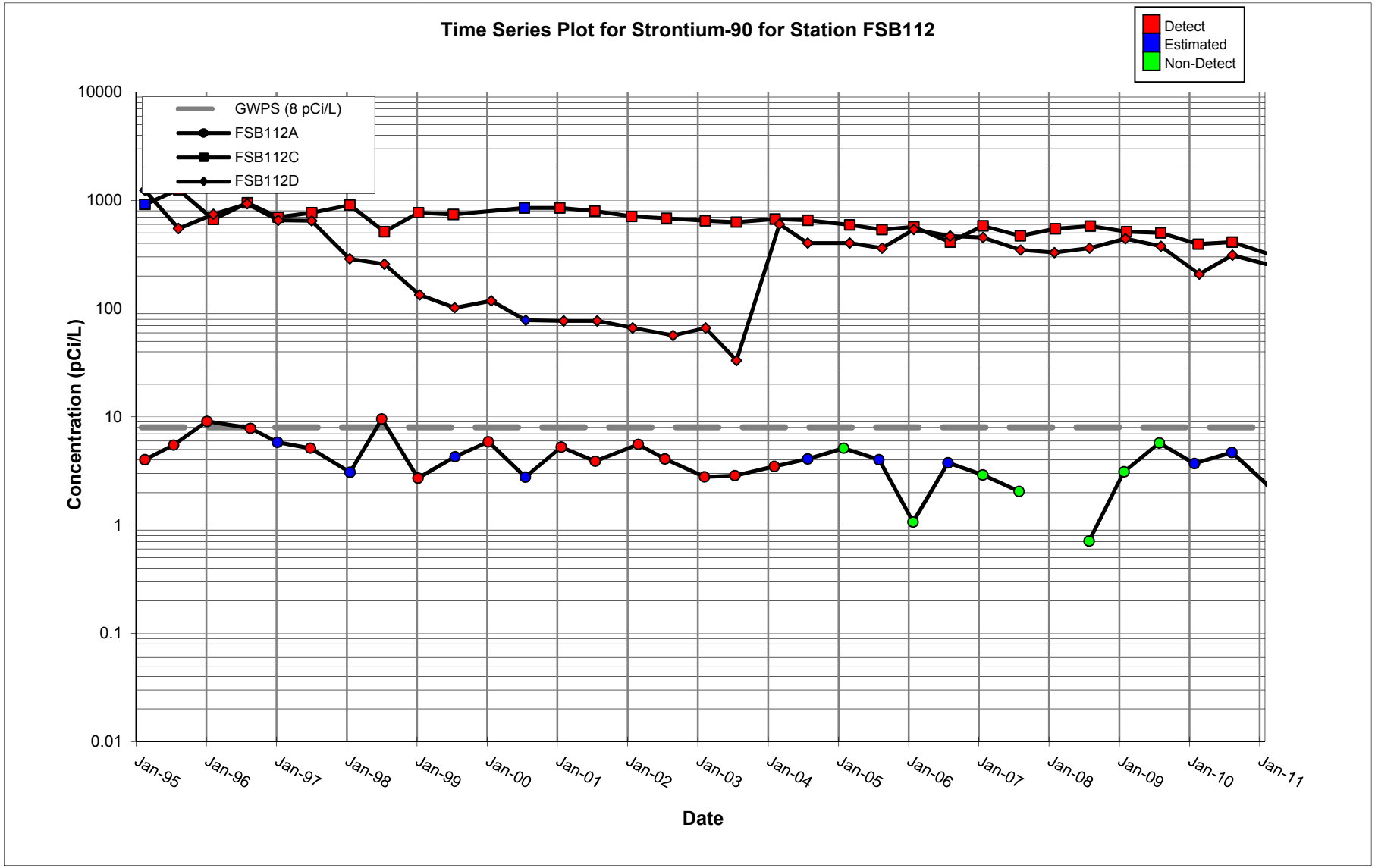

Time Series Plot for Strontium-90 for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB 79
FSB 79B
FSB 79C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

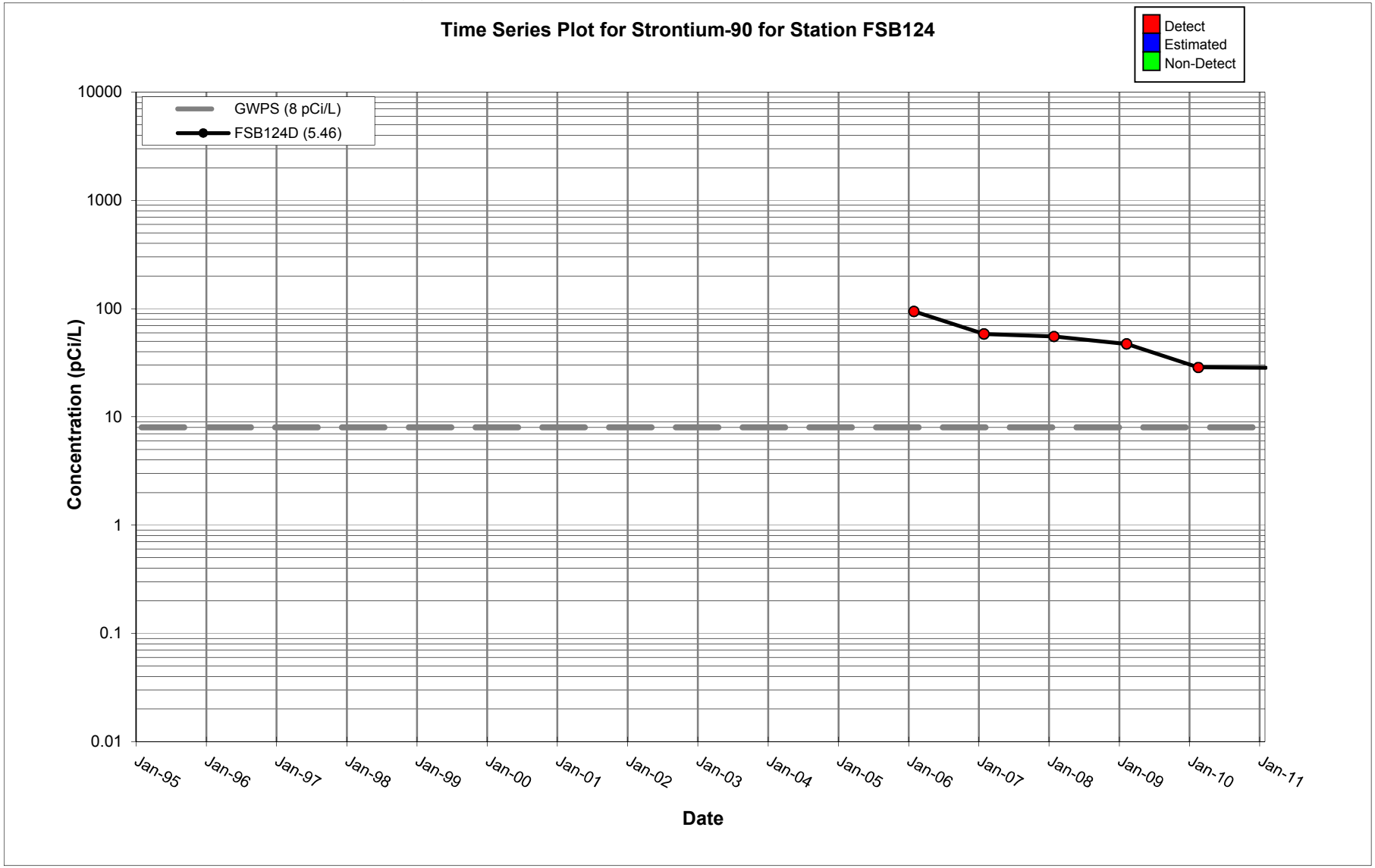

Time Series Plot for Strontium-90 for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB 90C
FSB 90D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

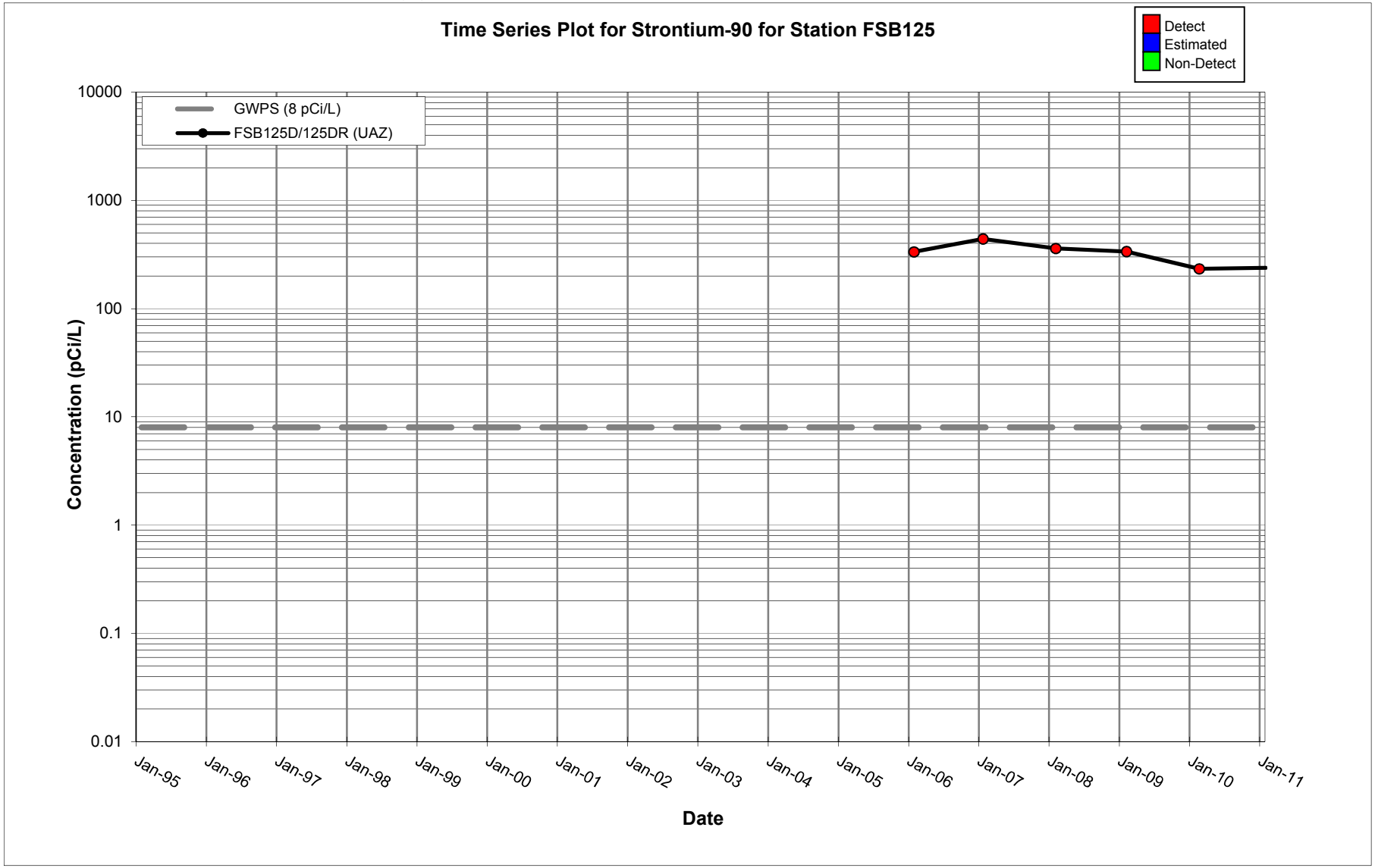

Time Series Plot for Strontium-90 for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB 94C
FSB 94D/94DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

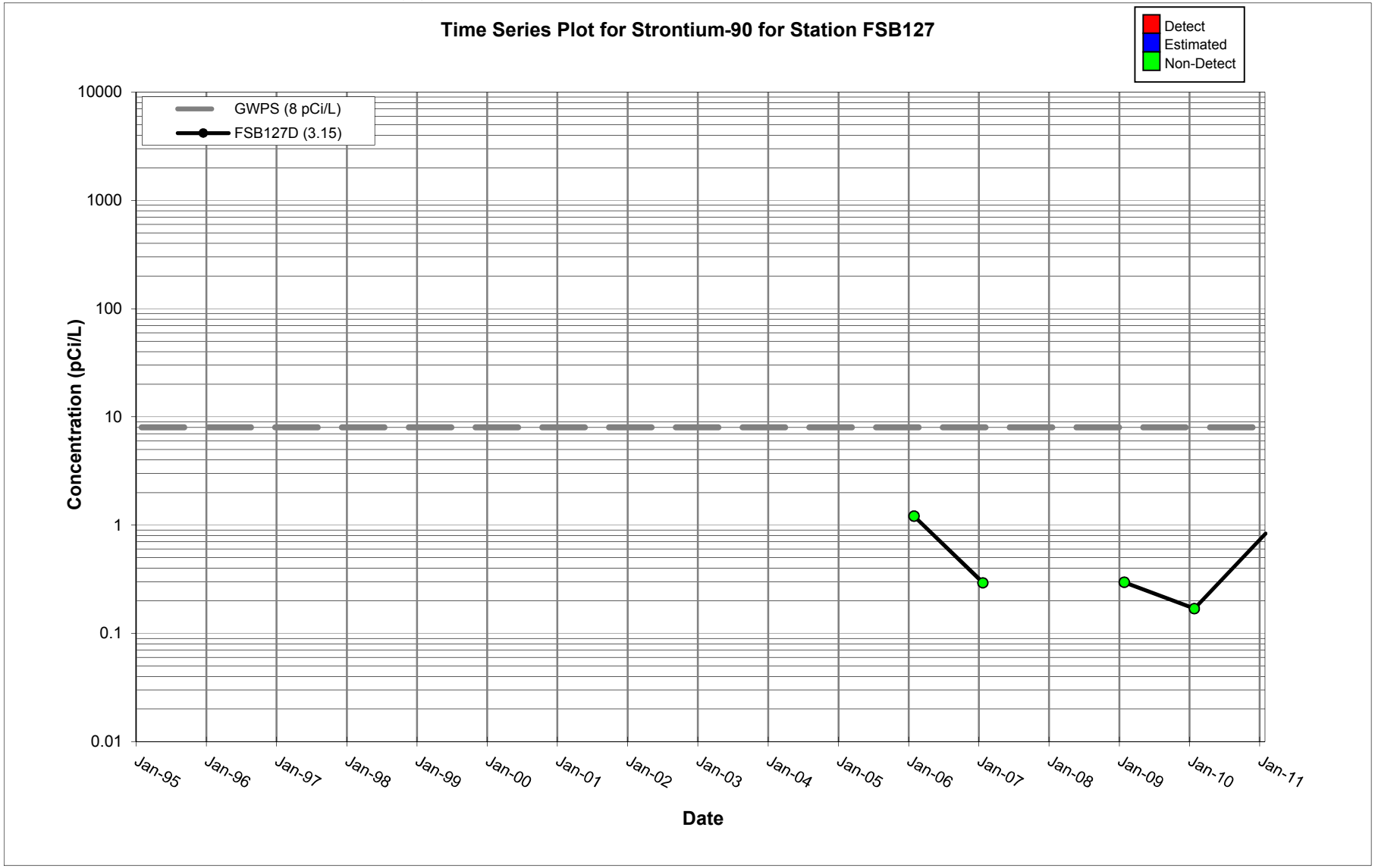

Time Series Plot for Strontium-90 for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

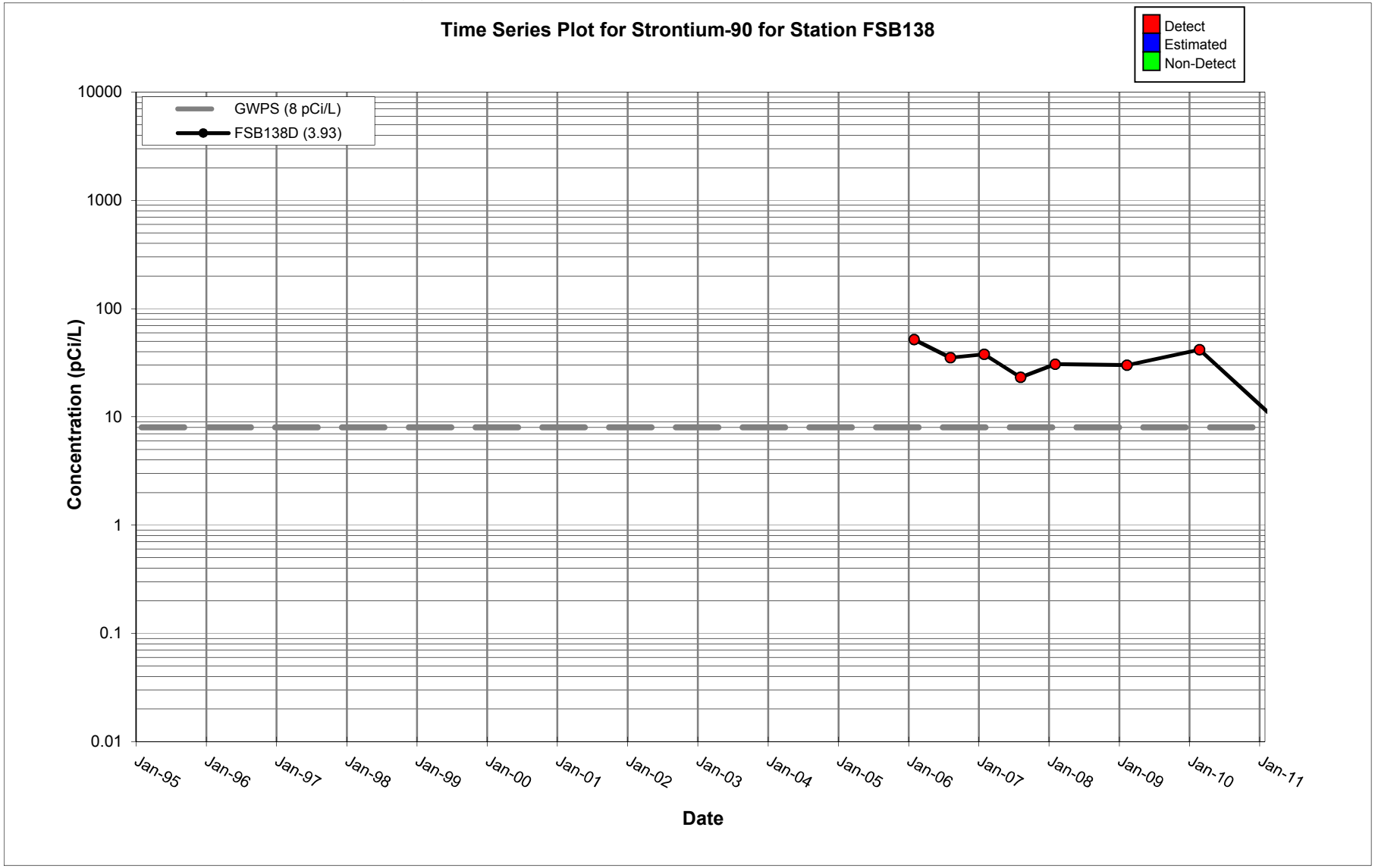

Time Series Plot for Strontium-90 for Station FSB104
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB104C
FSB104D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

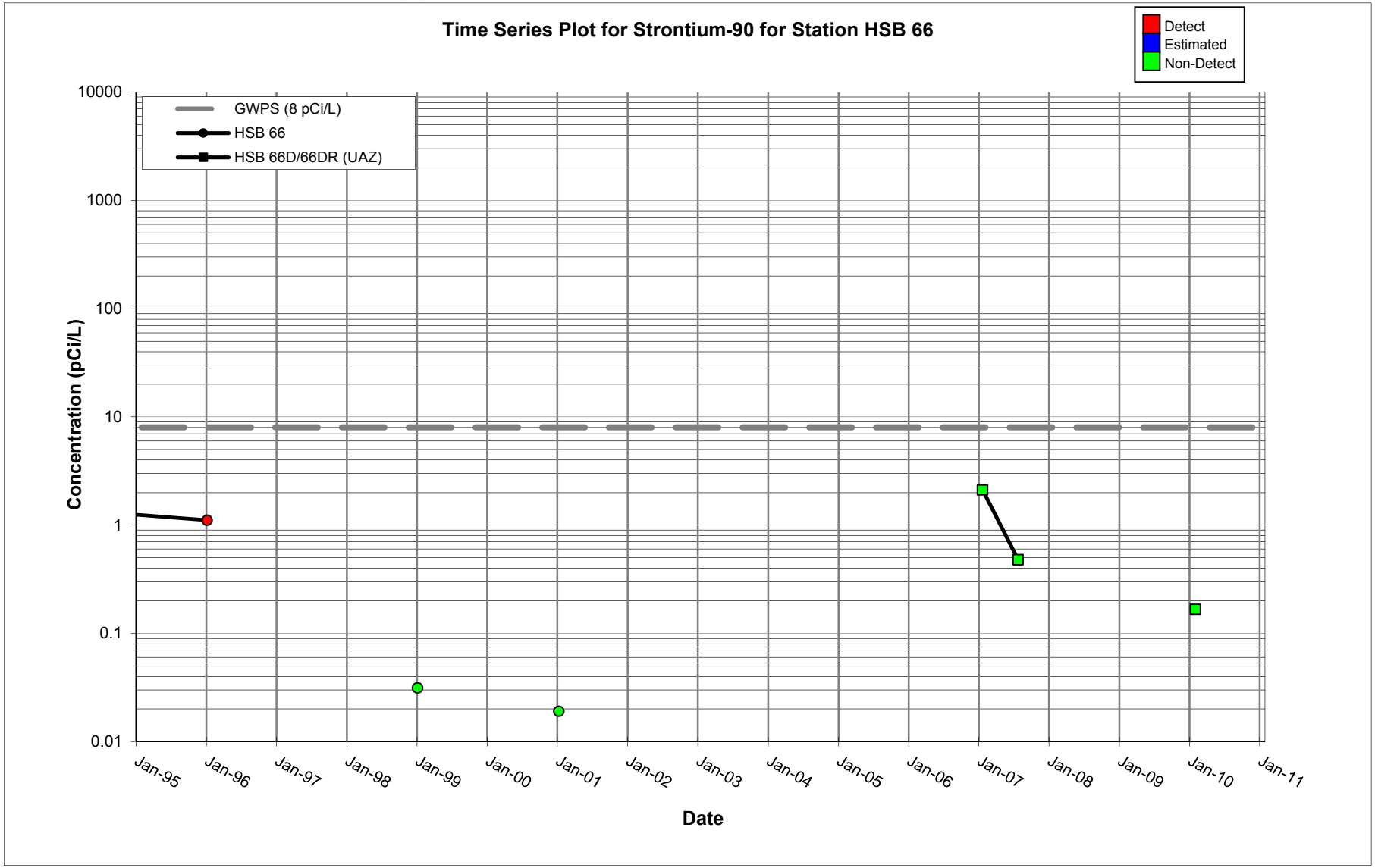

Time Series Plot for Strontium-90 for Station FSB112
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB112A
FSB112C
FSB112D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

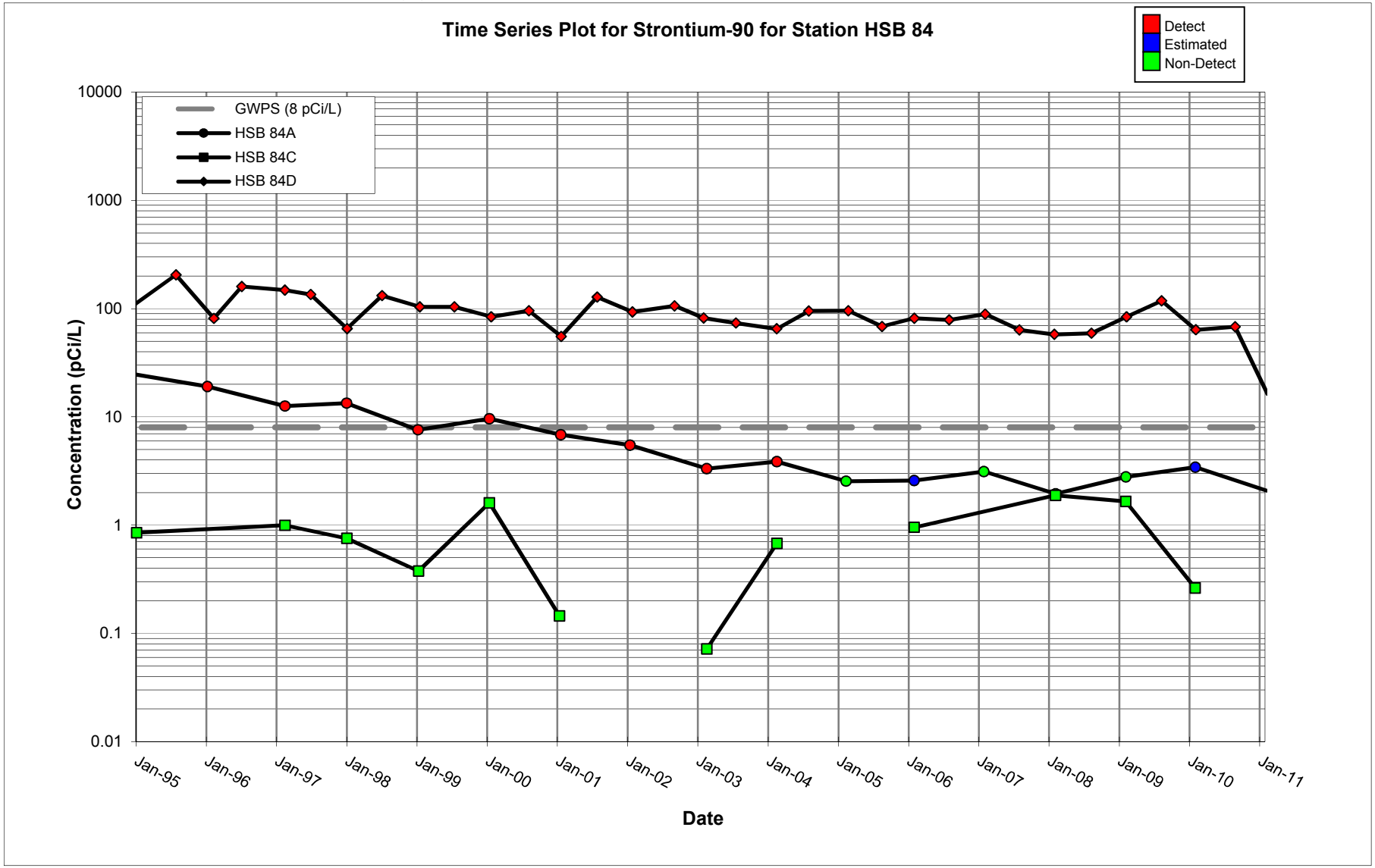

Time Series Plot for Strontium-90 for Station FSB124
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB124D (5.46)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

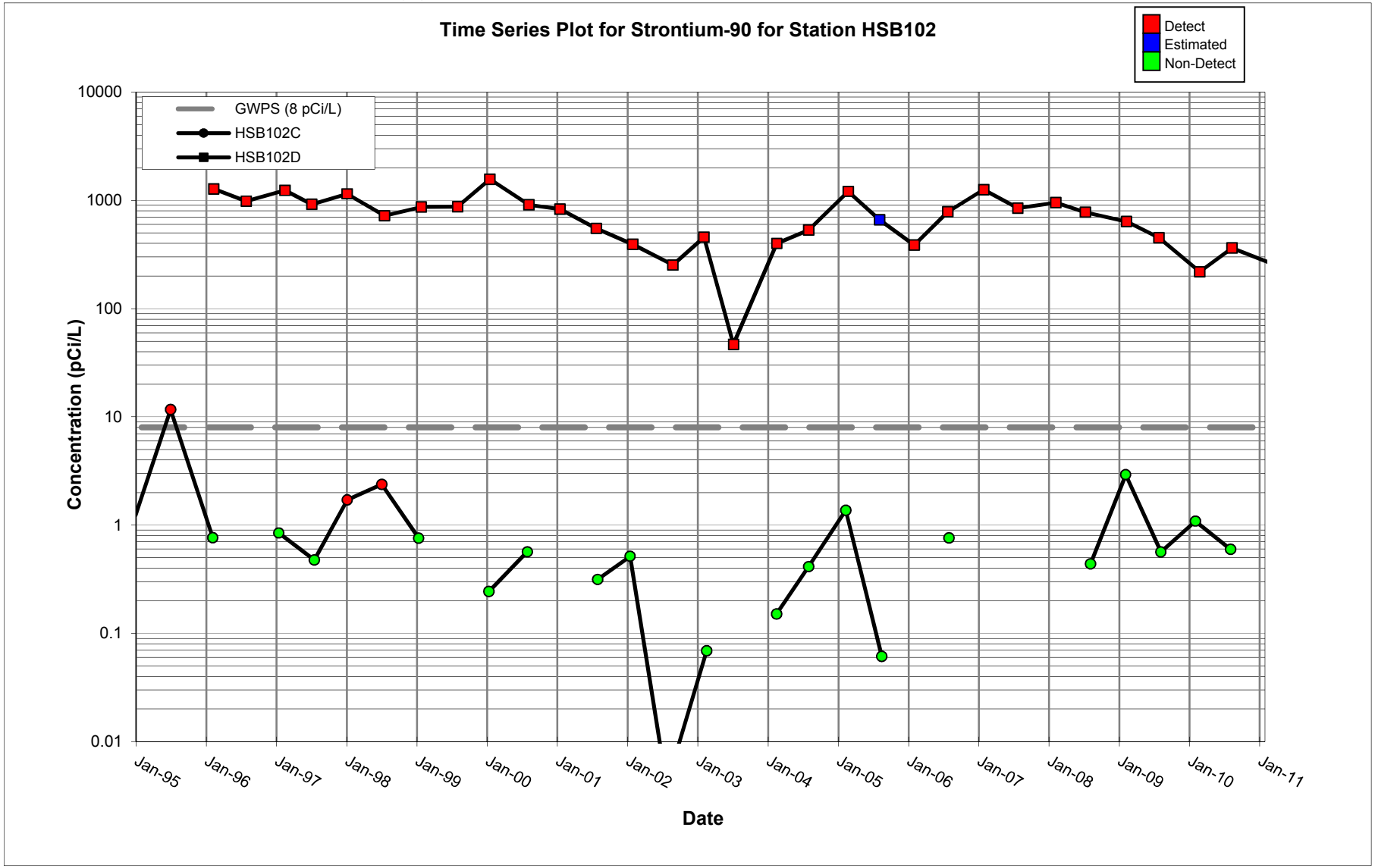

Time Series Plot for Strontium-90 for Station FSB125
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB125D/125DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

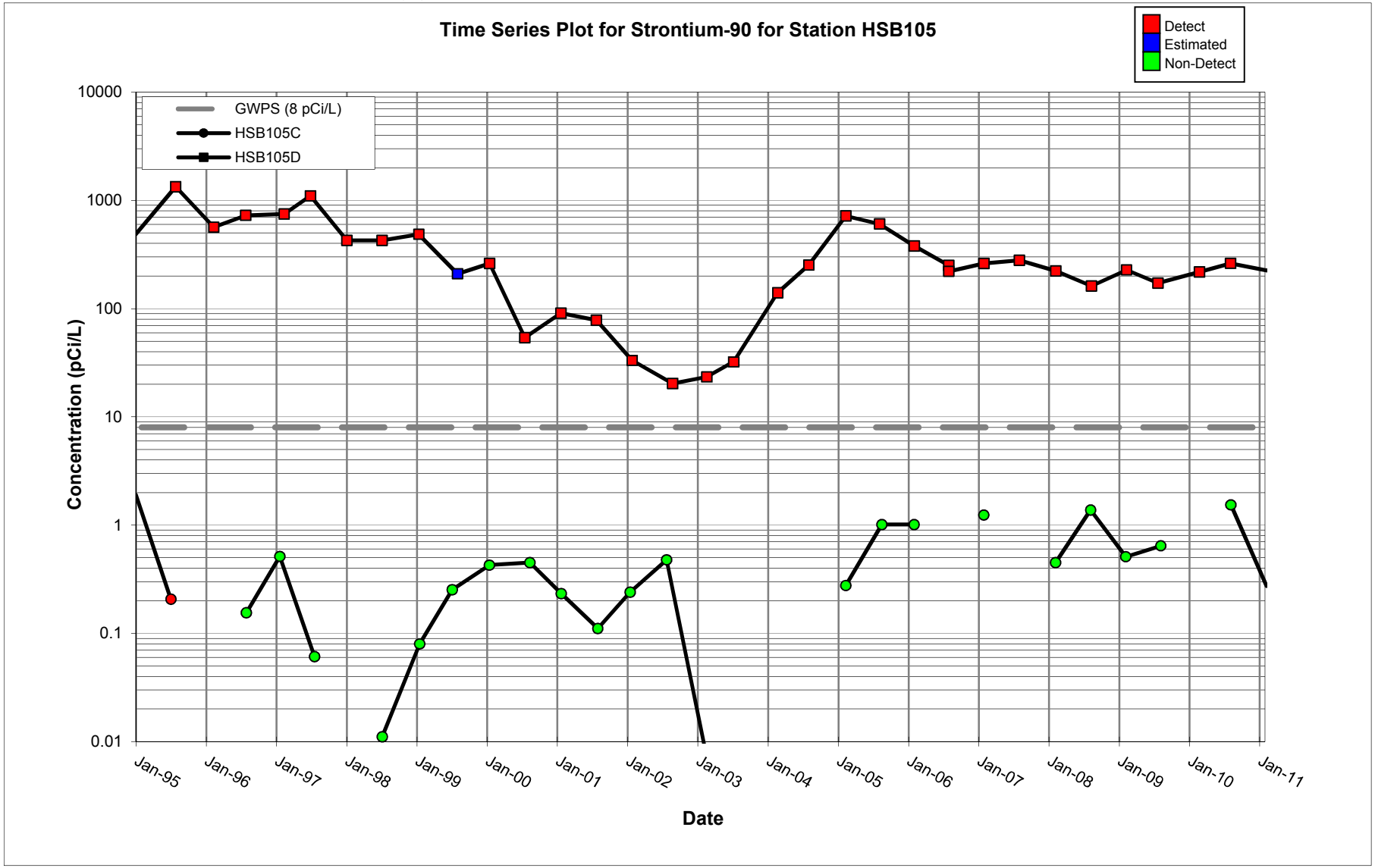

Time Series Plot for Strontium-90 for Station FSB127
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB127D (3.15)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

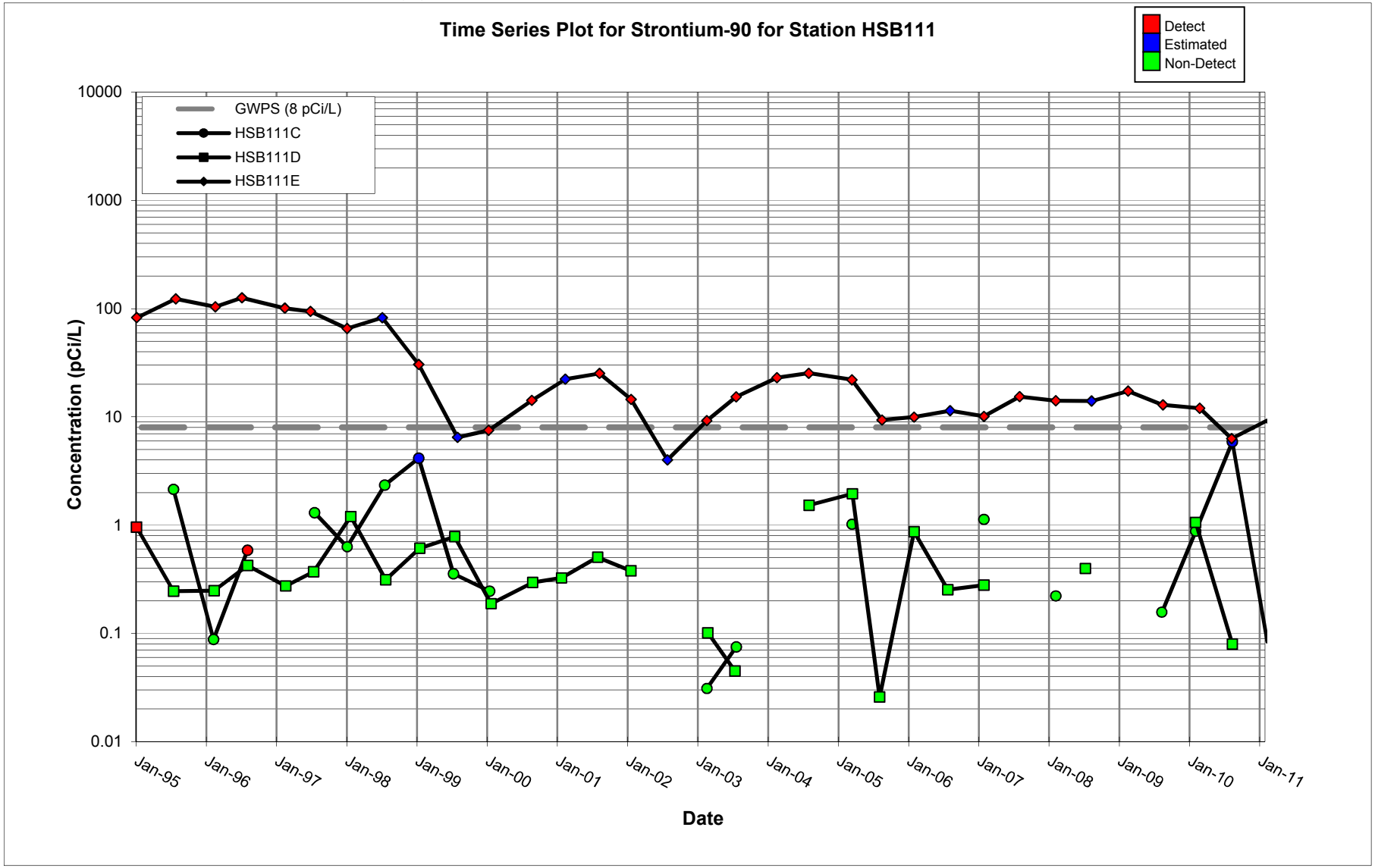

Time Series Plot for Strontium-90 for Station FSB138
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
FSB138D (3.93)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

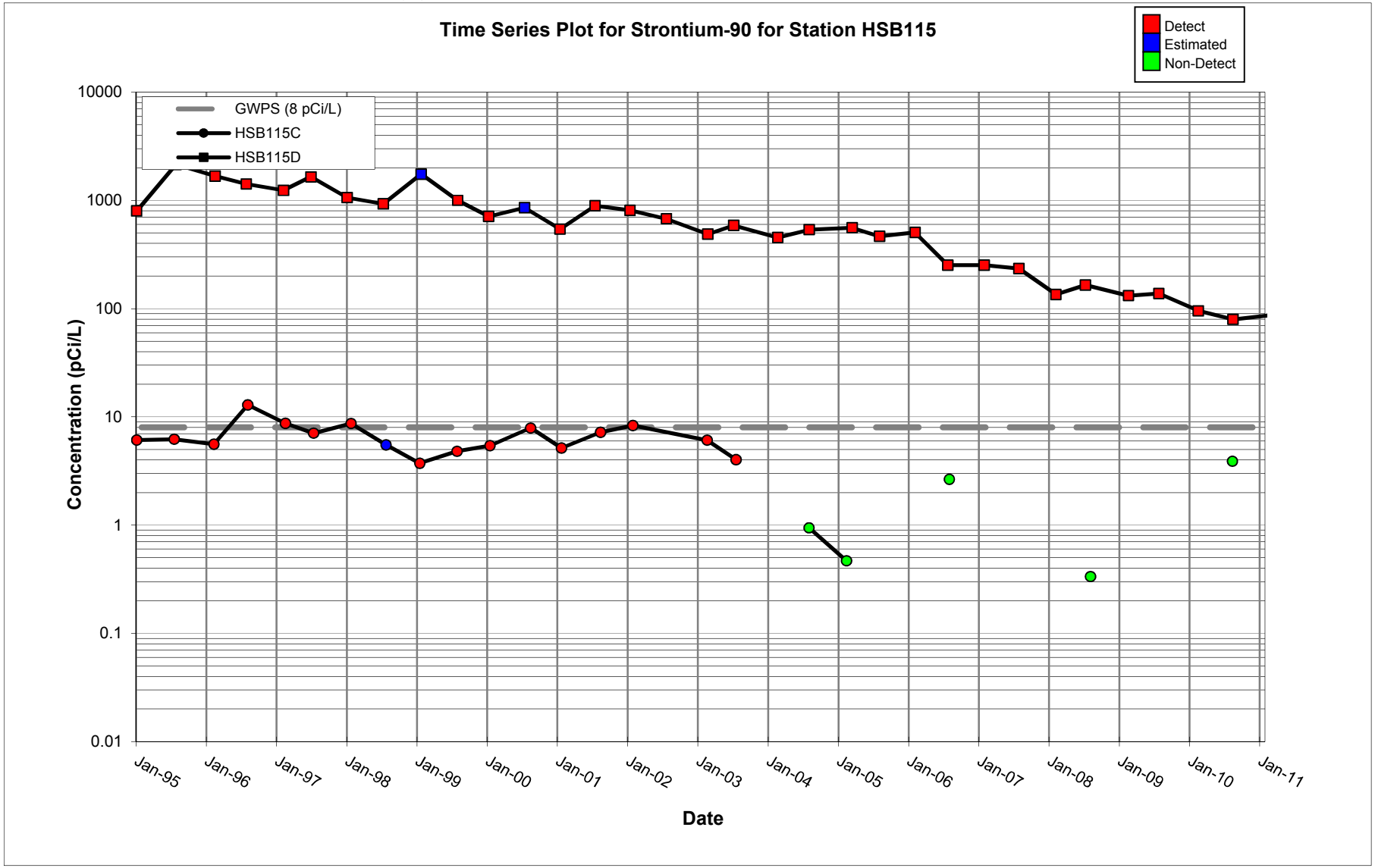

Time Series Plot for Strontium-90 for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB 66
HSB 66D/66DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

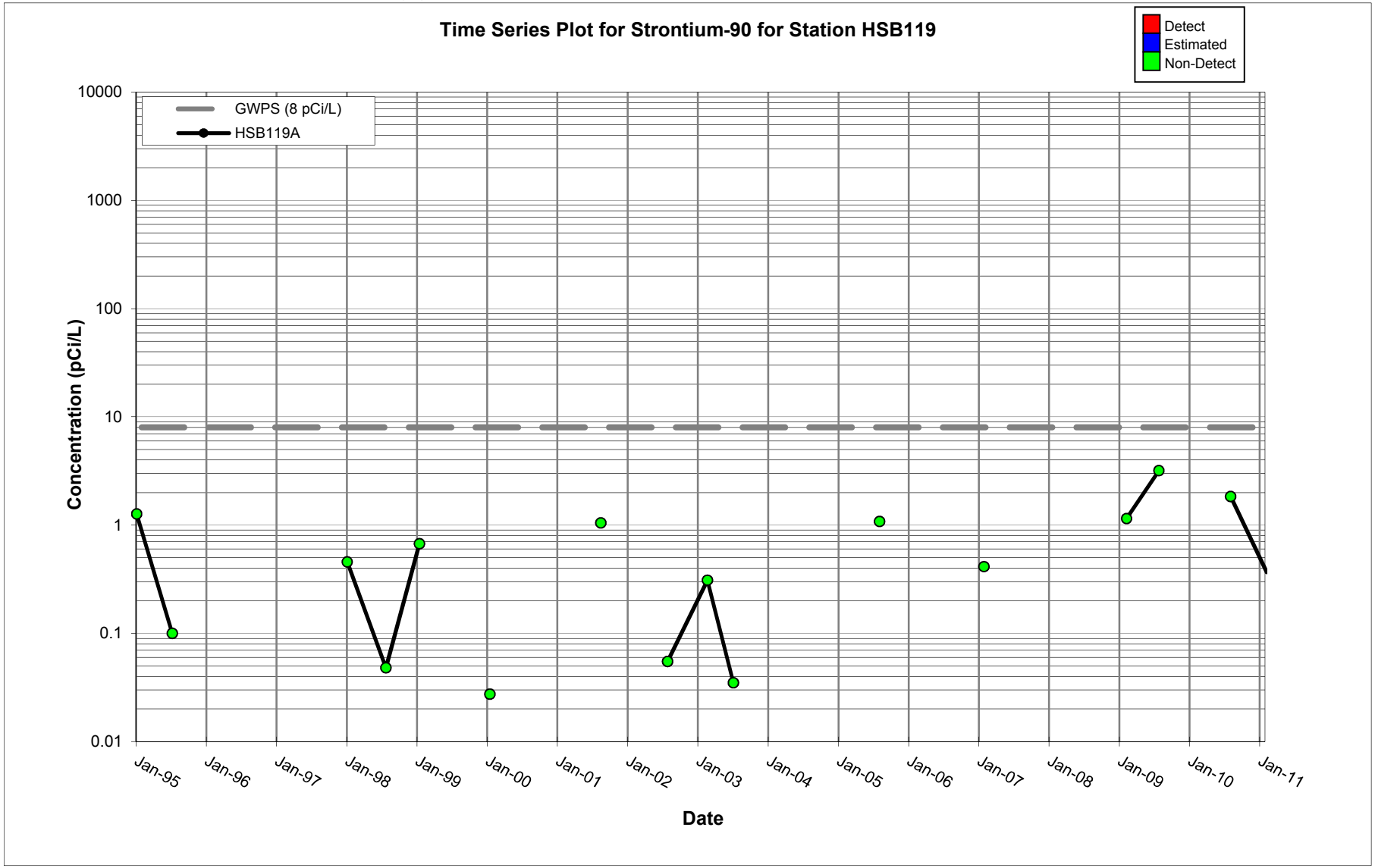

Time Series Plot for Strontium-90 for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB 84A
HSB 84C
HSB 84D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

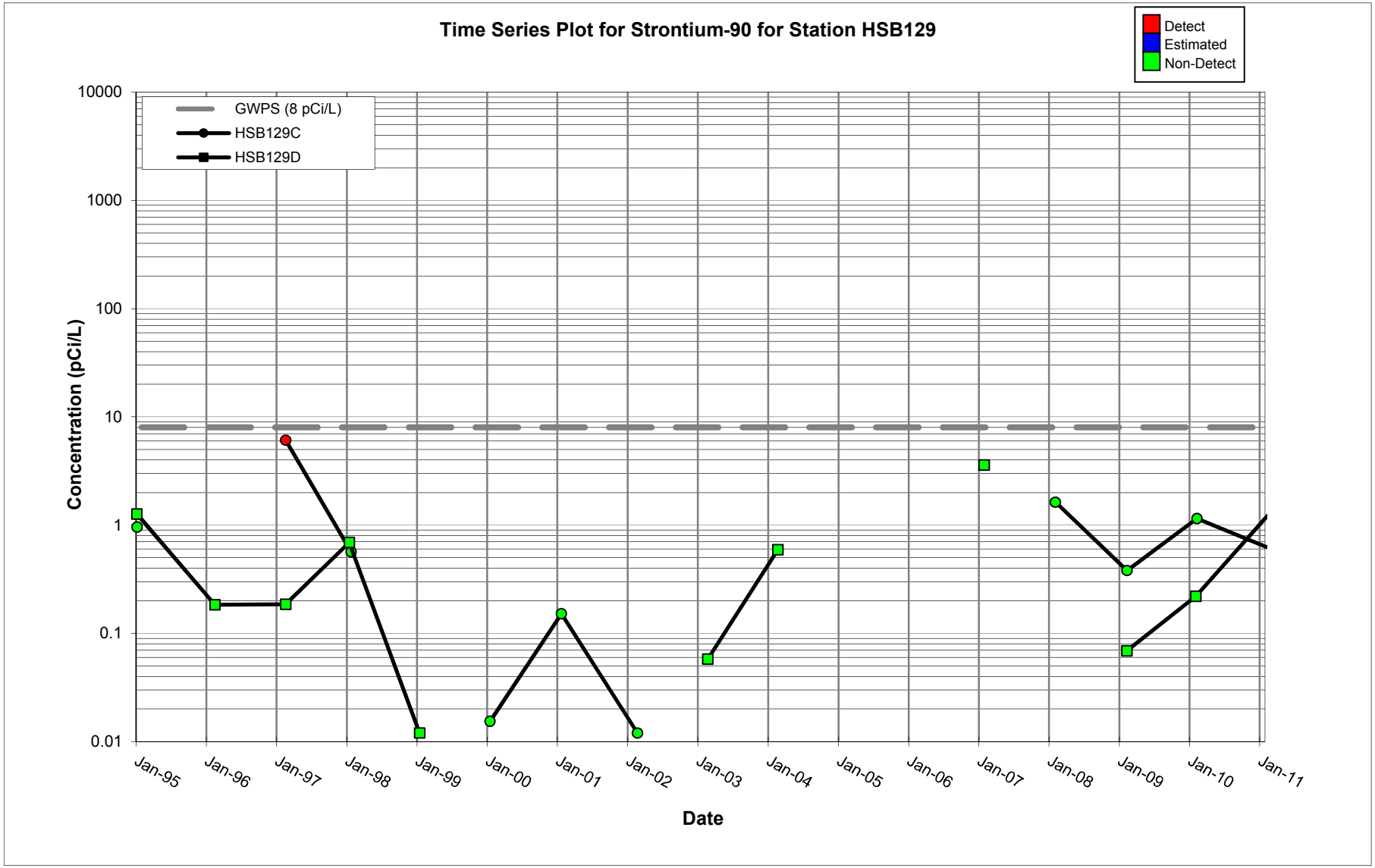

Time Series Plot for Strontium-90 for Station HSB102
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB102C
HSB102D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

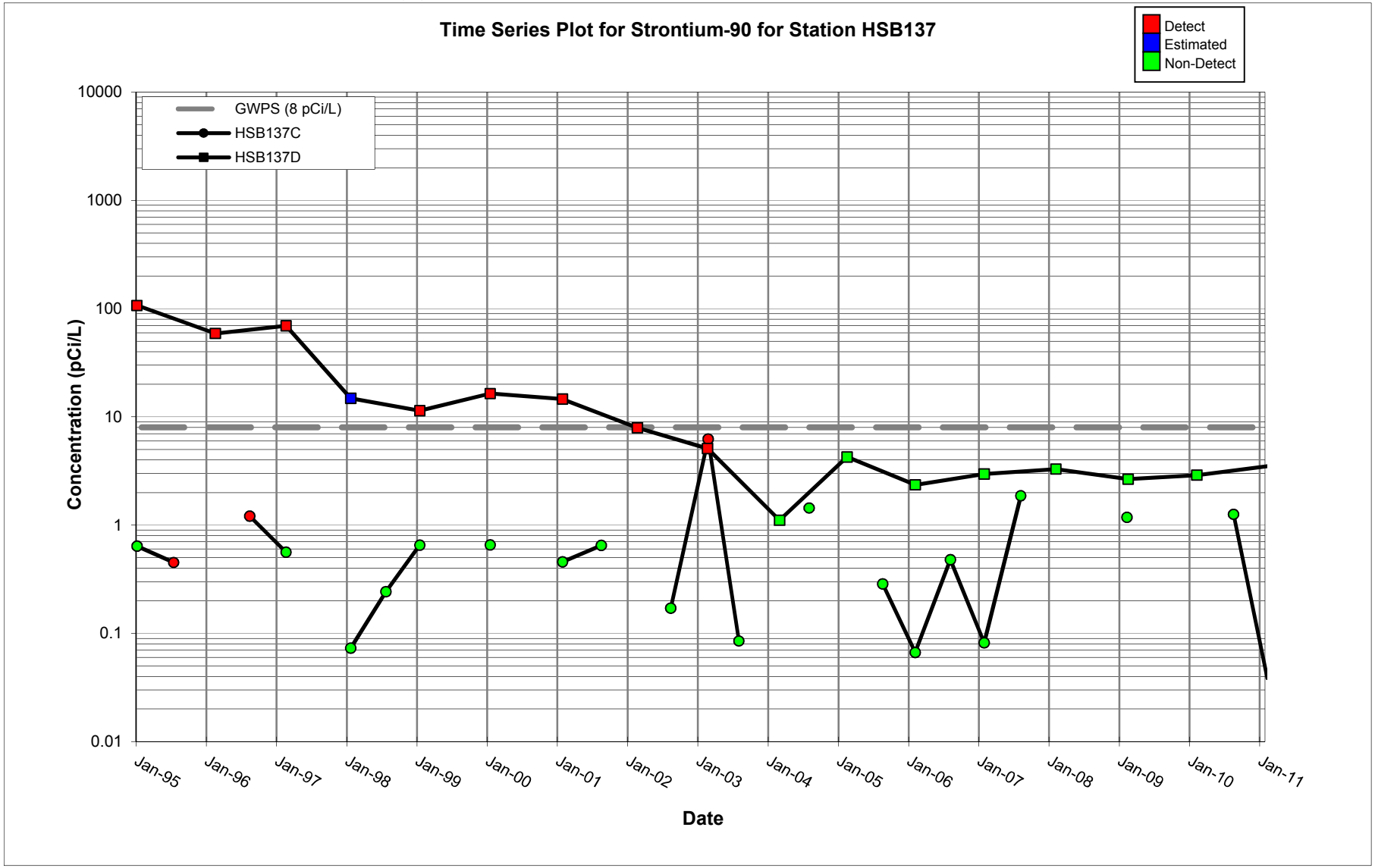

Time Series Plot for Strontium-90 for Station HSB105
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB105C
HSB105D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

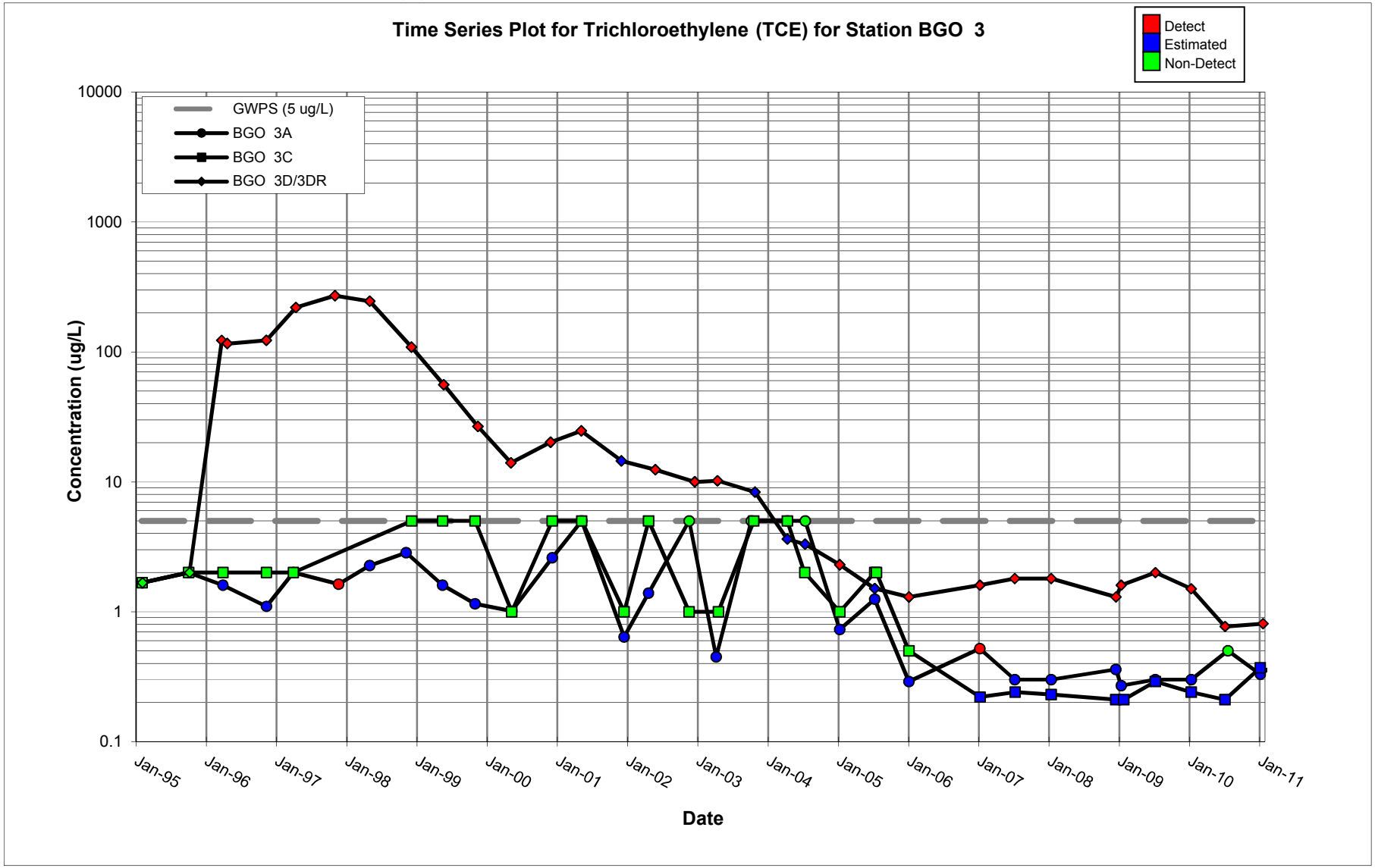

Time Series Plot for Strontium-90 for Station HSB111
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB111C
HSB111D
HSB111E
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

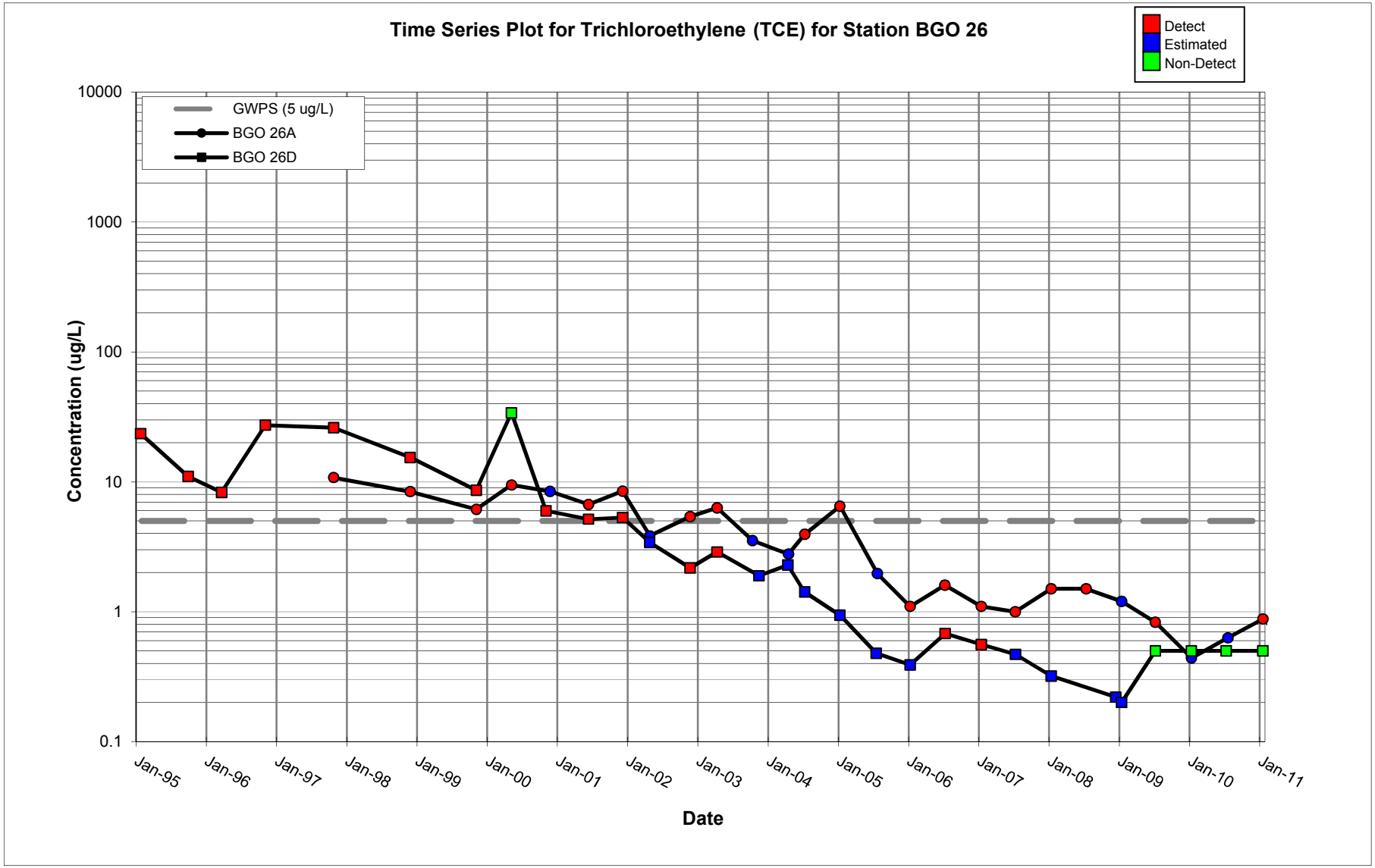

Time Series Plot for Strontium-90 for Station HSB115
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB115C
HSB115D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

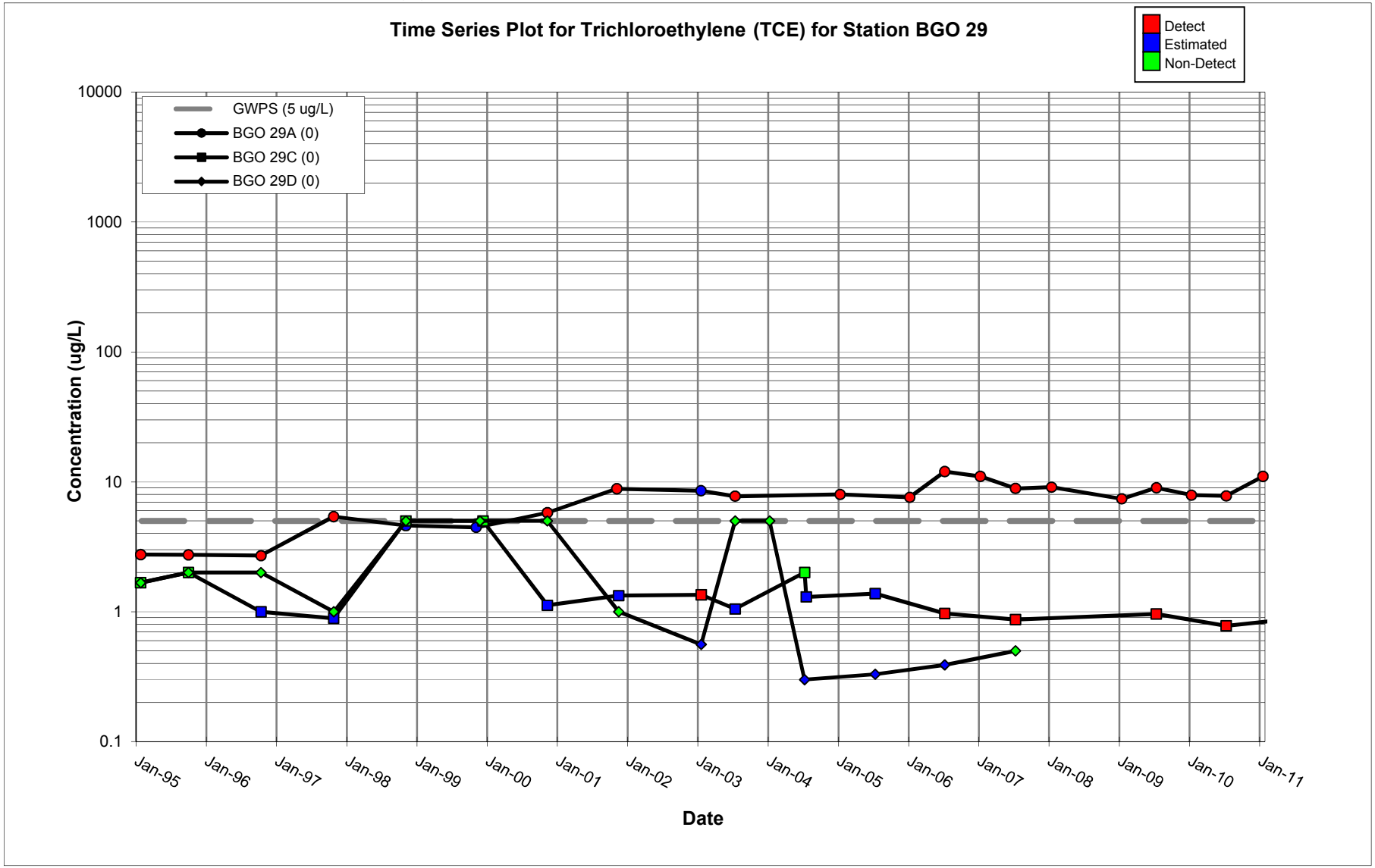

Time Series Plot for Strontium-90 for Station HSB119
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB119A
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

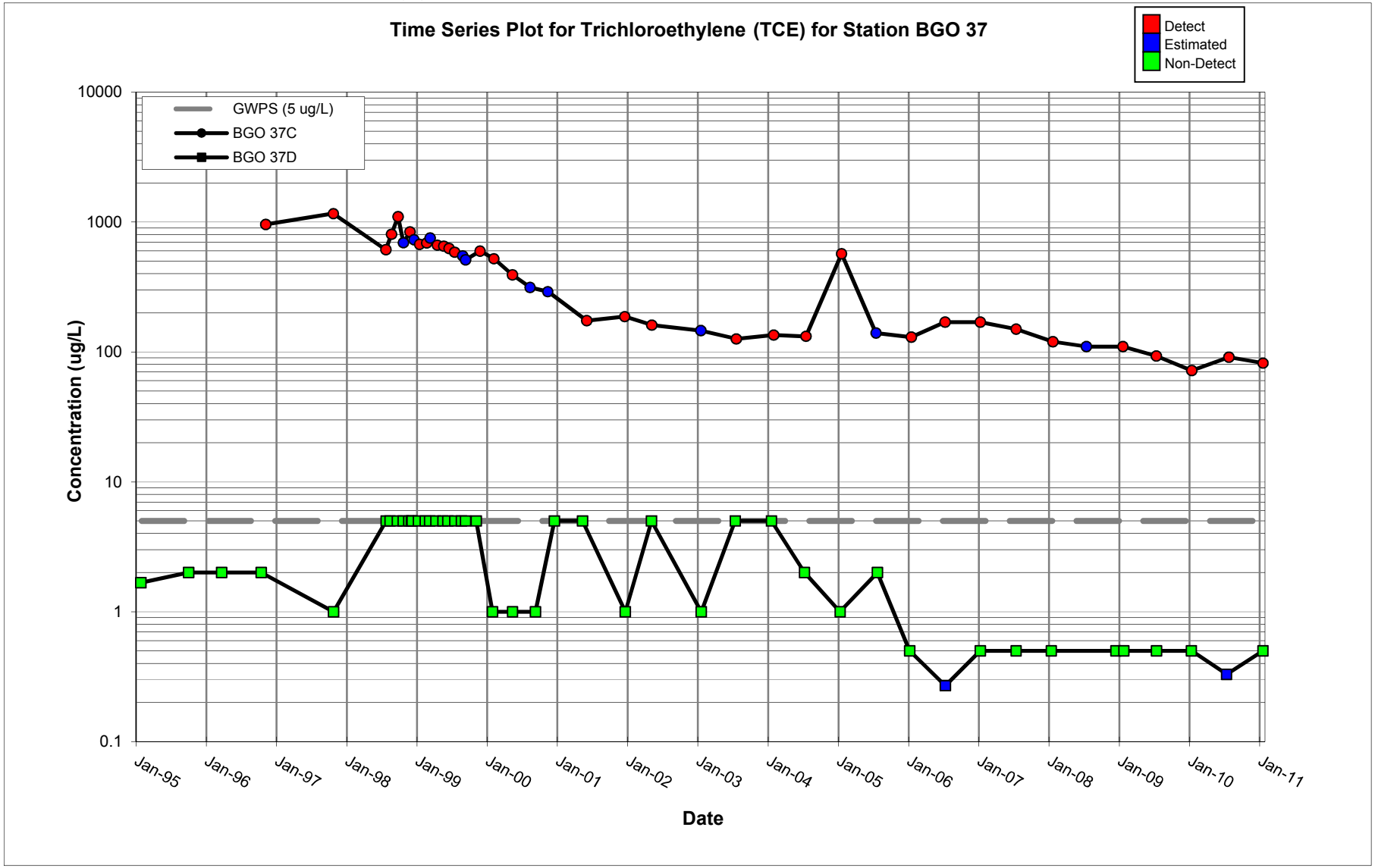

Time Series Plot for Strontium-90 for Station HSB129
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB129C
HSB129D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

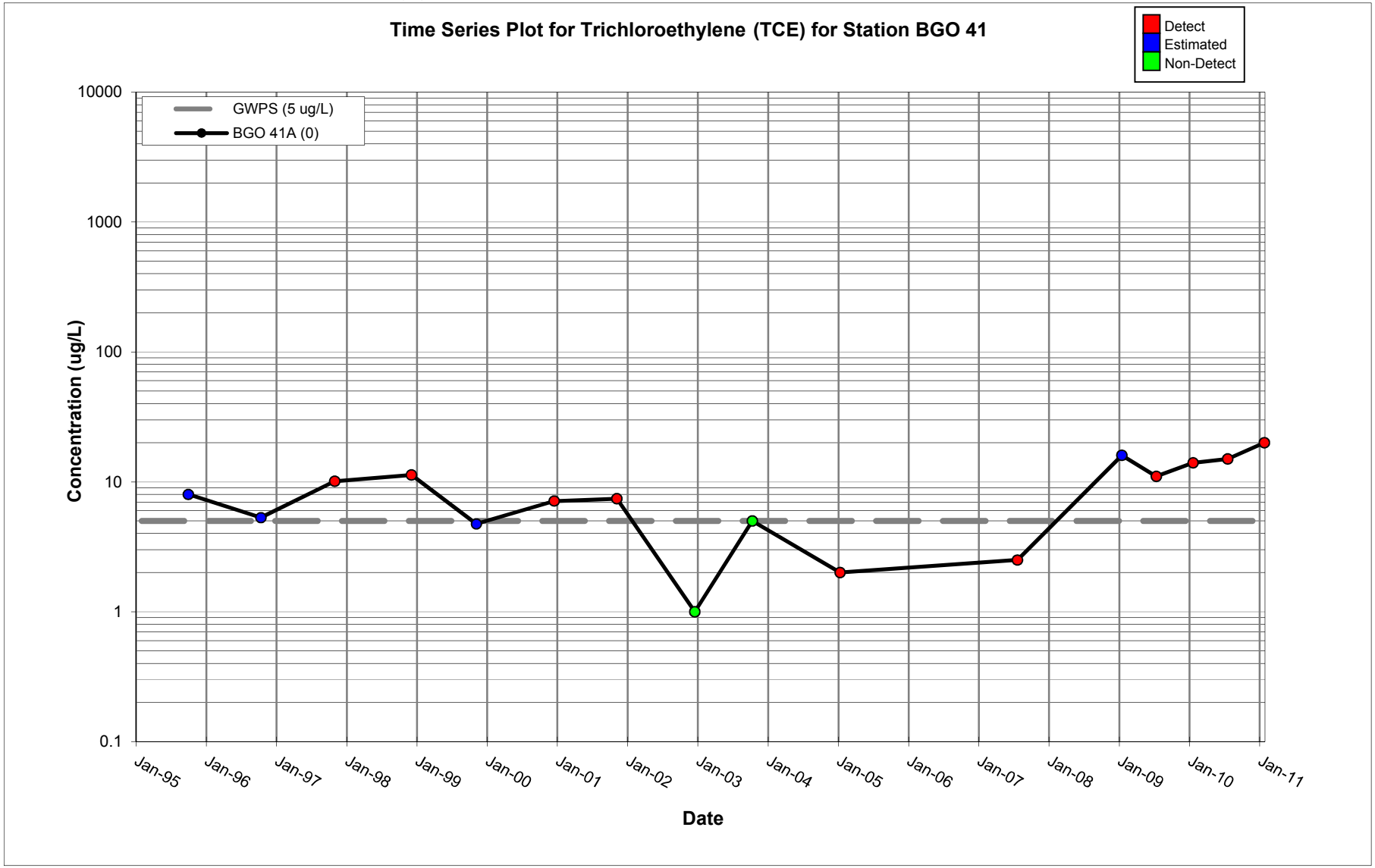

Time Series Plot for Strontium-90 for Station HSB137
Detect
Estimated
Non-Detect
GWPS (8 pCi/L)
HSB137C
HSB137D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

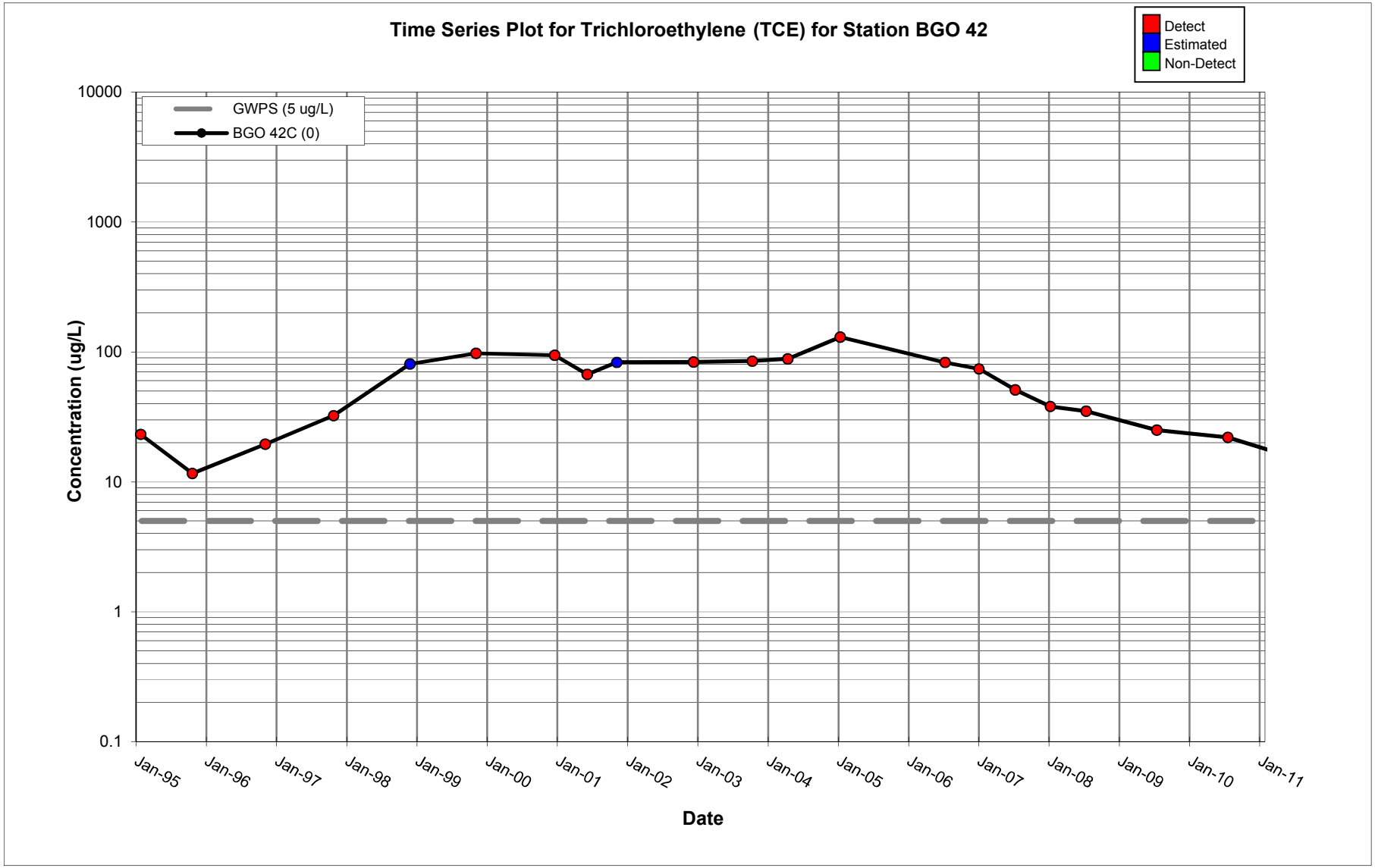

Time Series Plot for Trichloroethylene (TCE) for Station BGO 3
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 3A
BGO 3C
BGO 3D/3DR
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

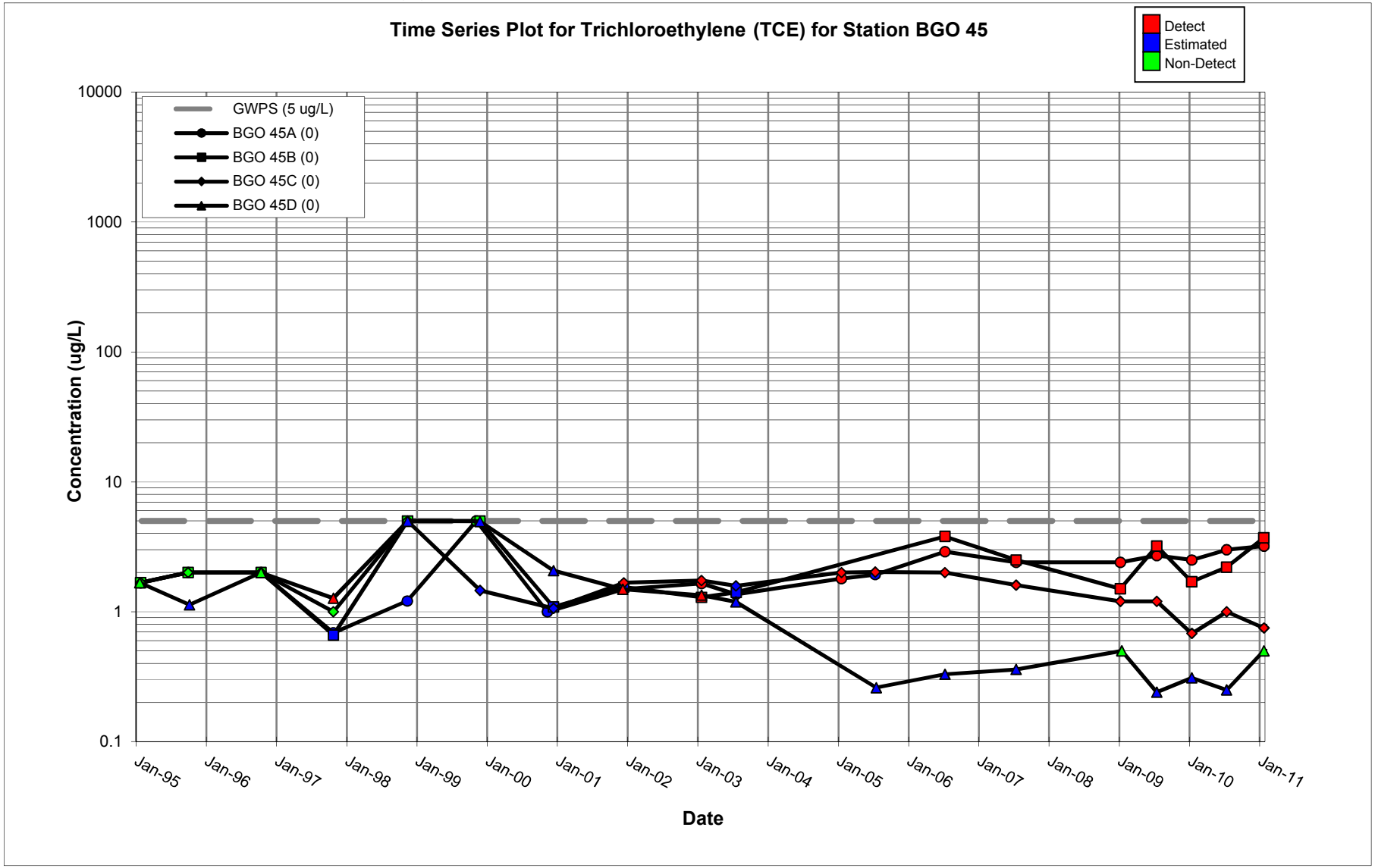

Time Series Plot for Trichloroethylene (TCE) for Station BGO 26
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 26A
BGO 26D
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

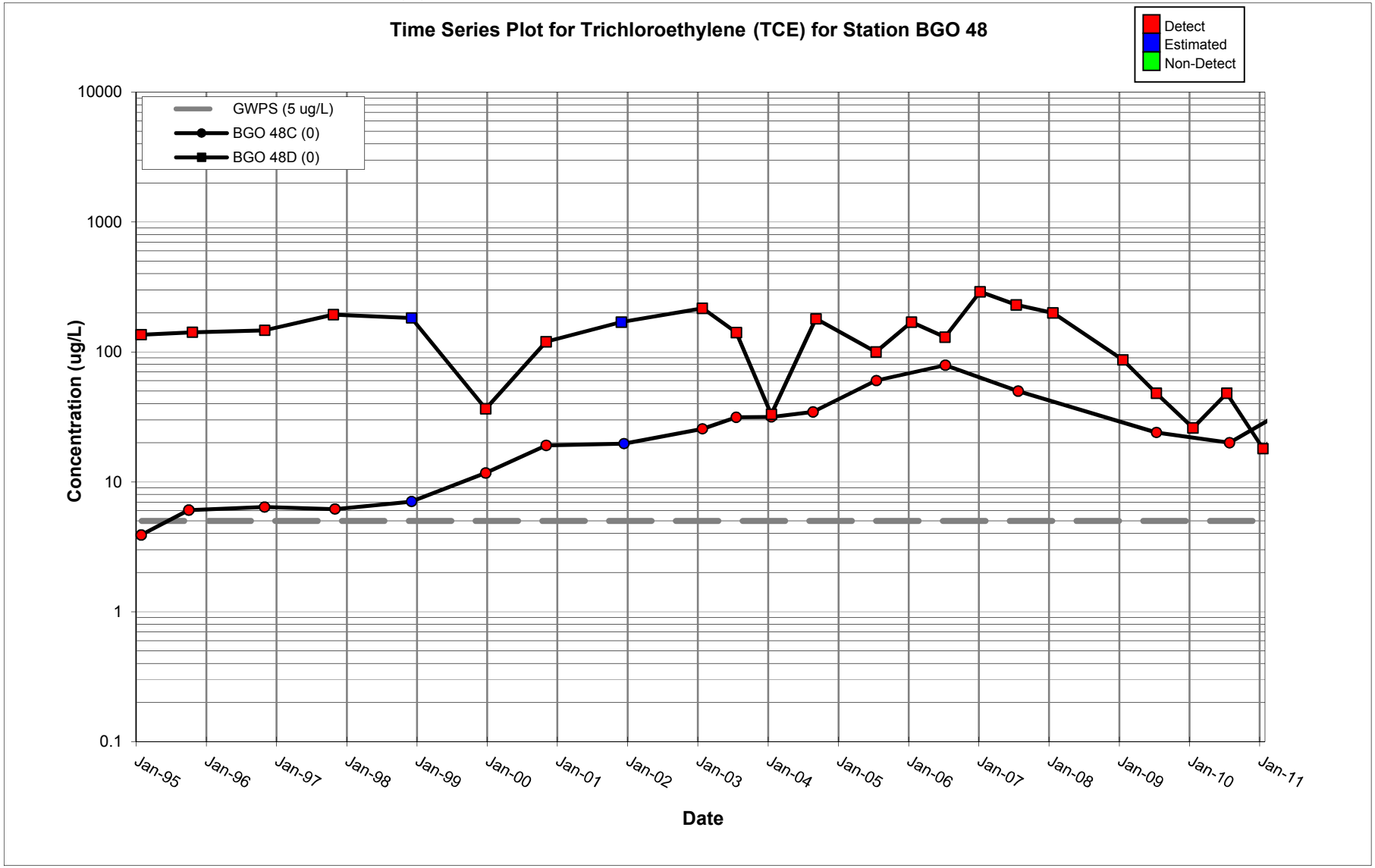

Time Series Plot for Trichloroethylene (TCE) for Station BGO 29
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 29A (0)
BGO 29C (0)
BGO 29D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

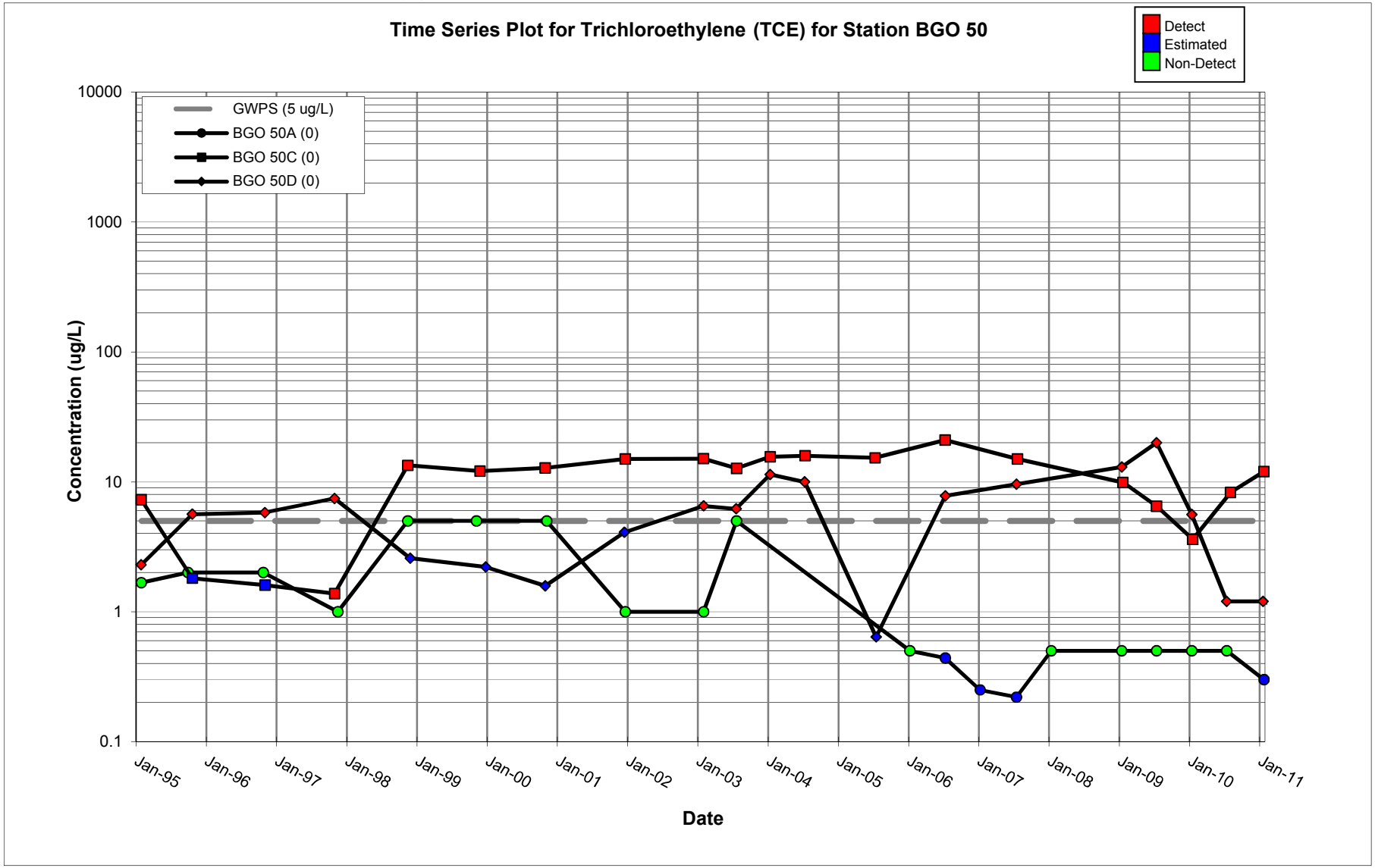

Time Series Plot for Trichloroethylene (TCE) for Station BGO 37
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 37C
BGO 37D
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

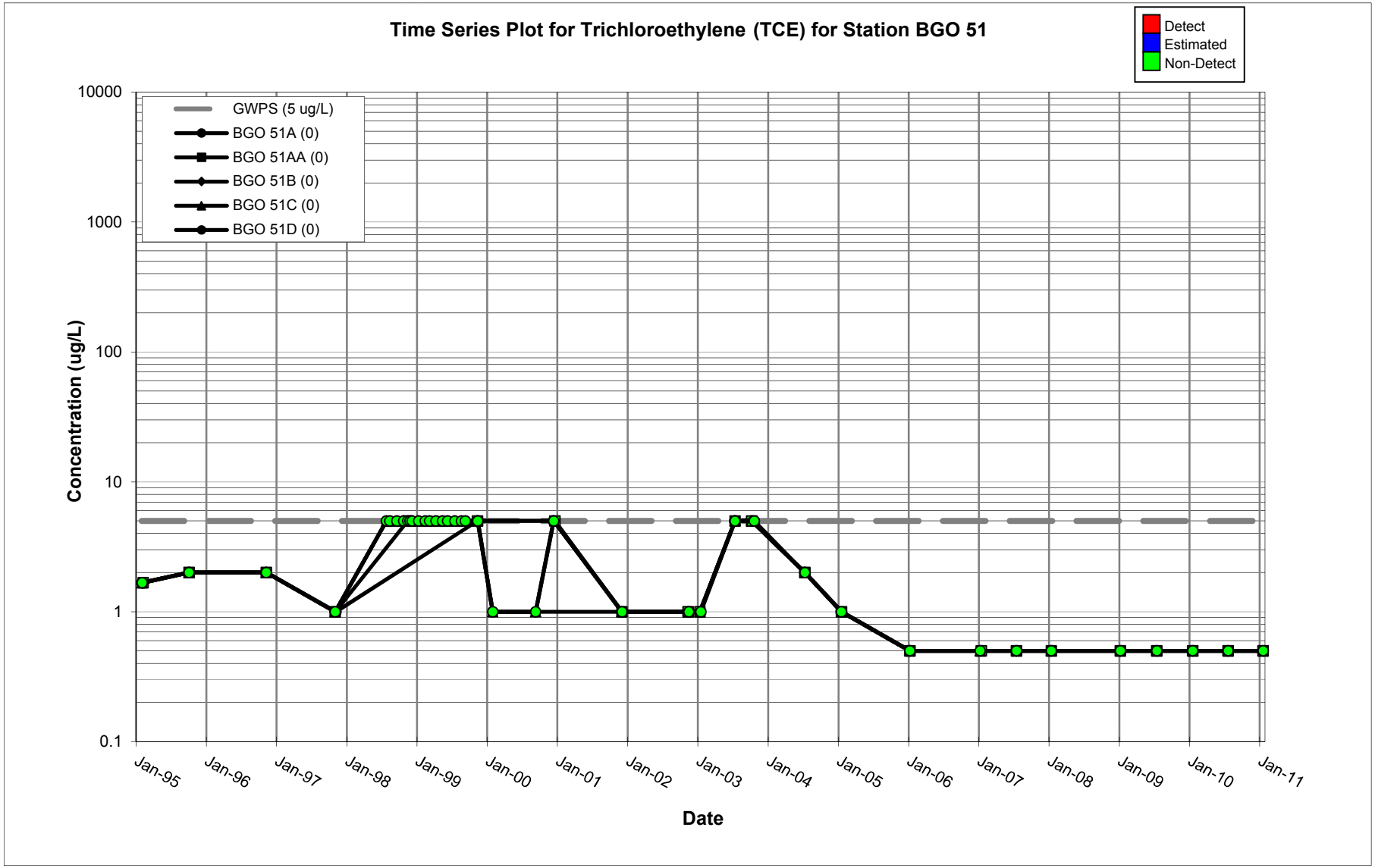

Time Series Plot for Trichloroethylene (TCE) for Station BGO 41
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 41A (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

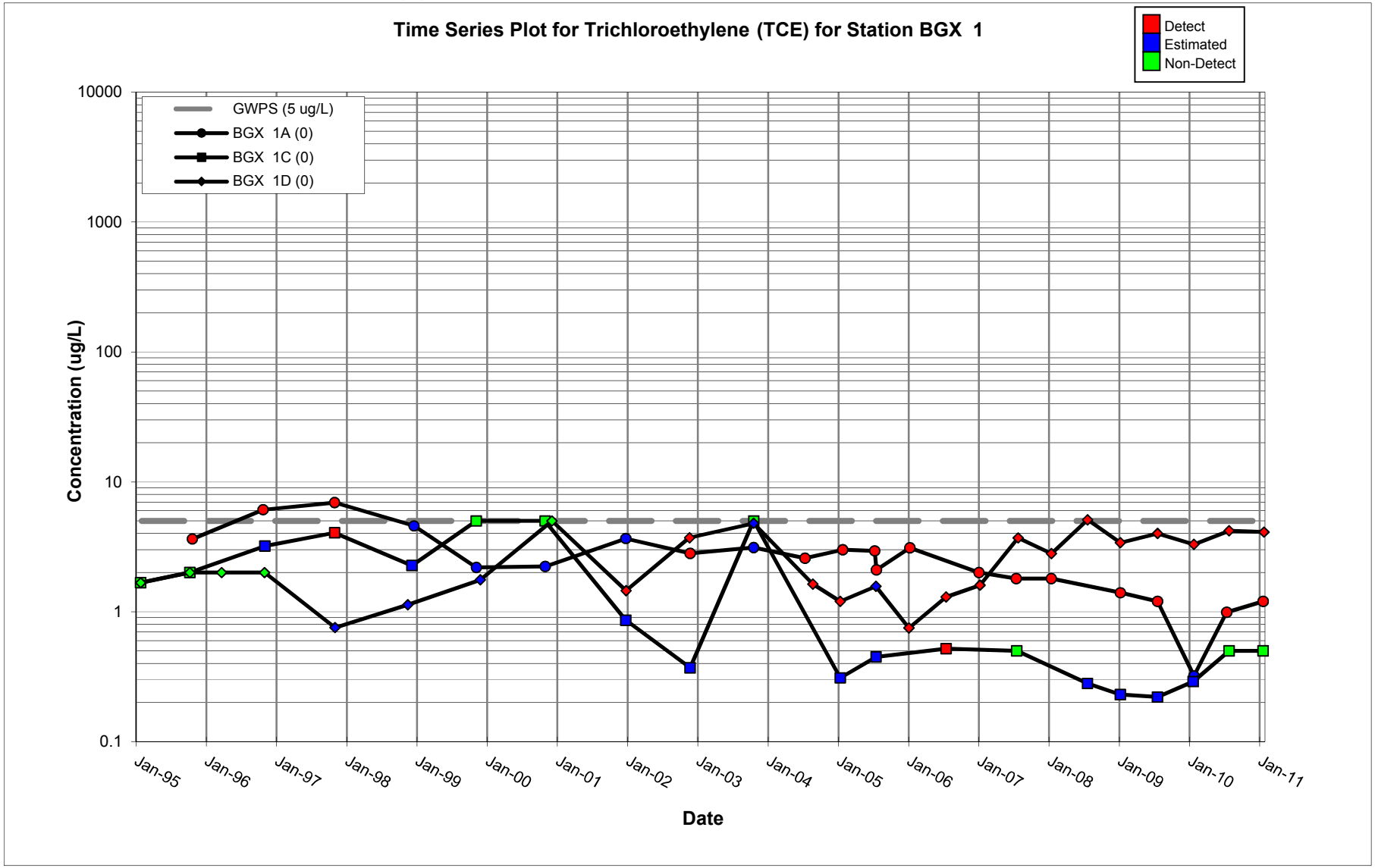

Time Series Plot for Trichloroethylene (TCE) for Station BGO 42
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 42C (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

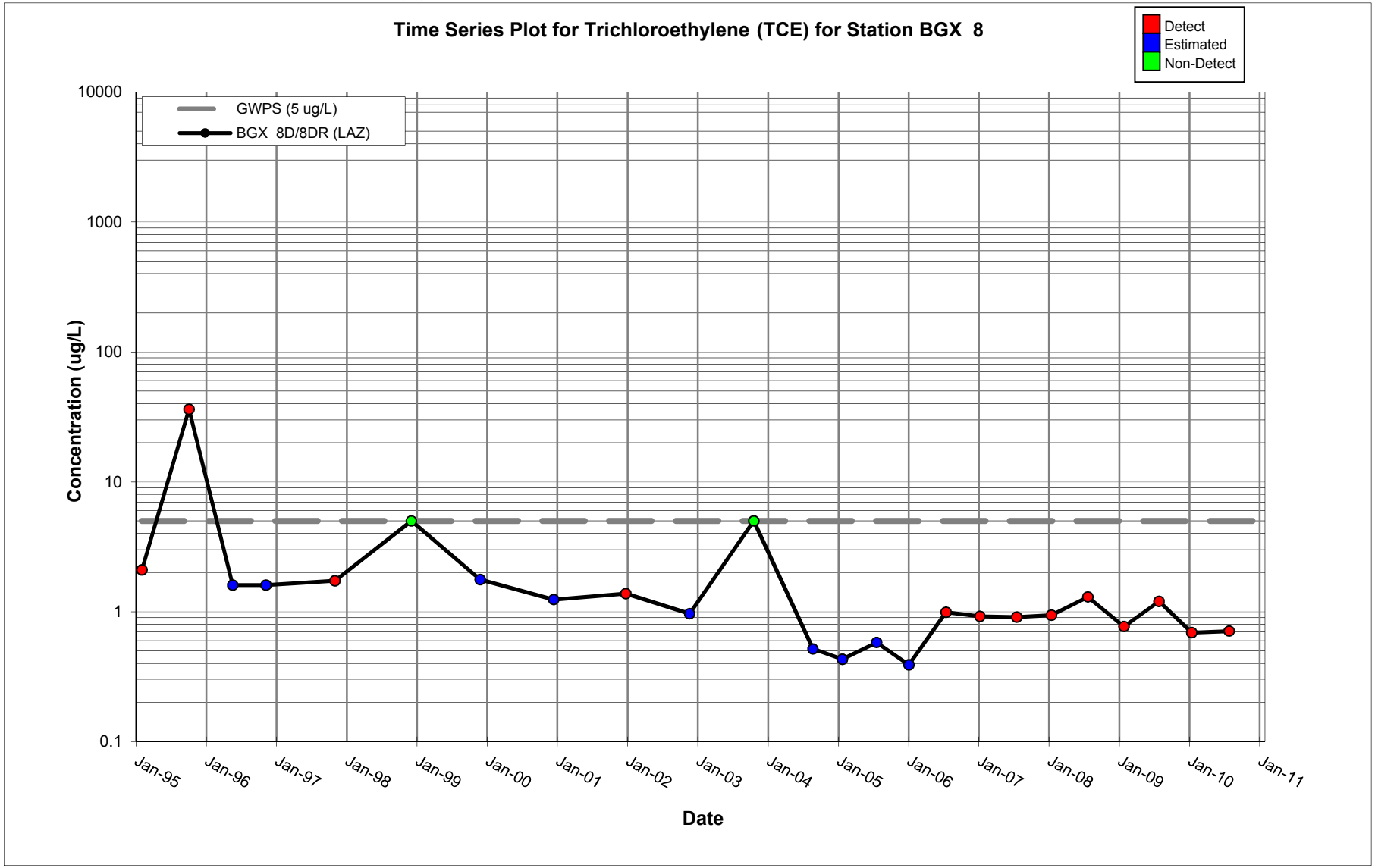

Time Series Plot for Trichloroethylene (TCE) for Station BGO 45
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 45A (0)
BGO 45B (0)
BGO 45C (0)
BGO 45D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

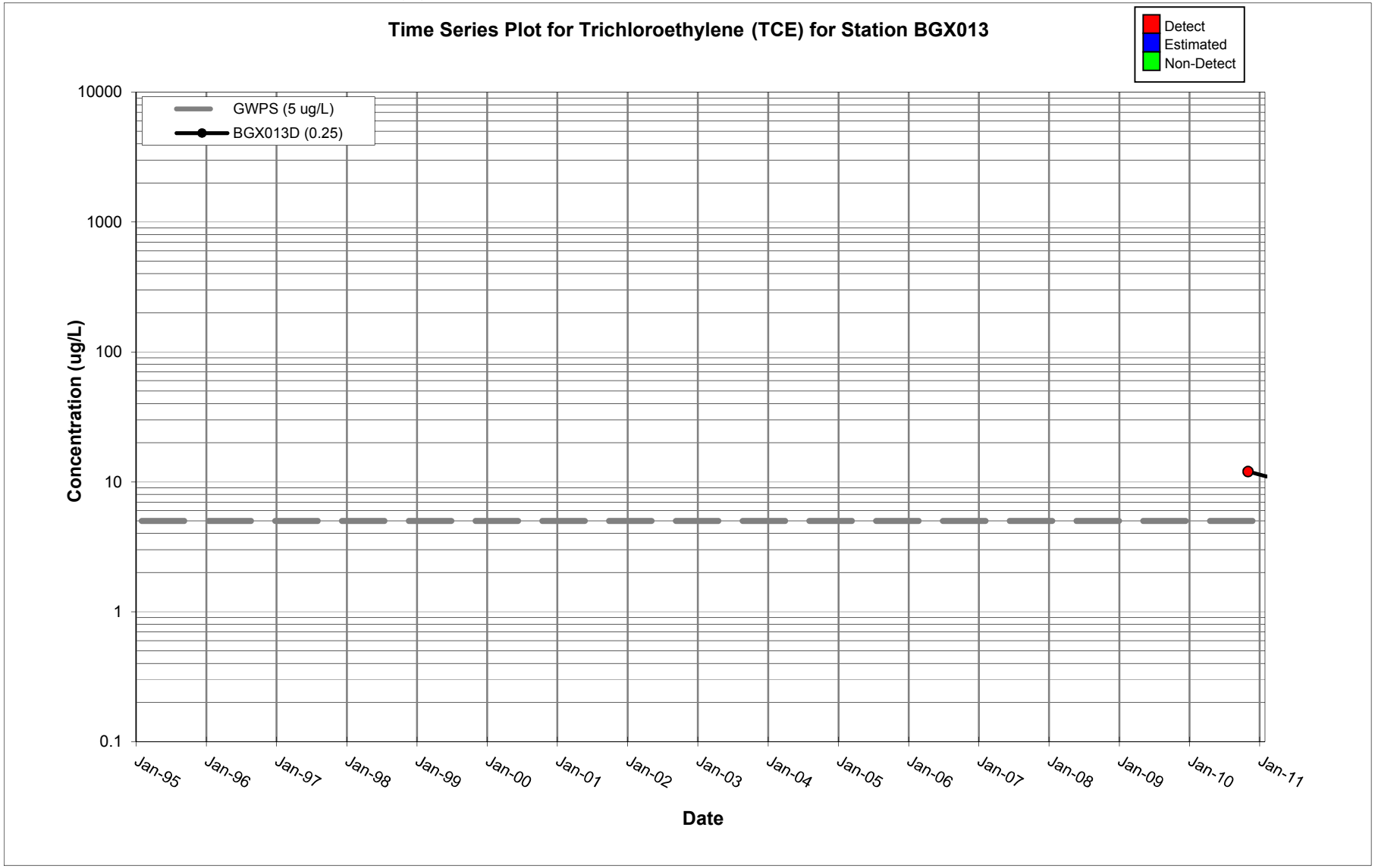

Time Series Plot for Trichloroethylene (TCE) for Station BGO 48
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 48C (0)
BGO 48D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

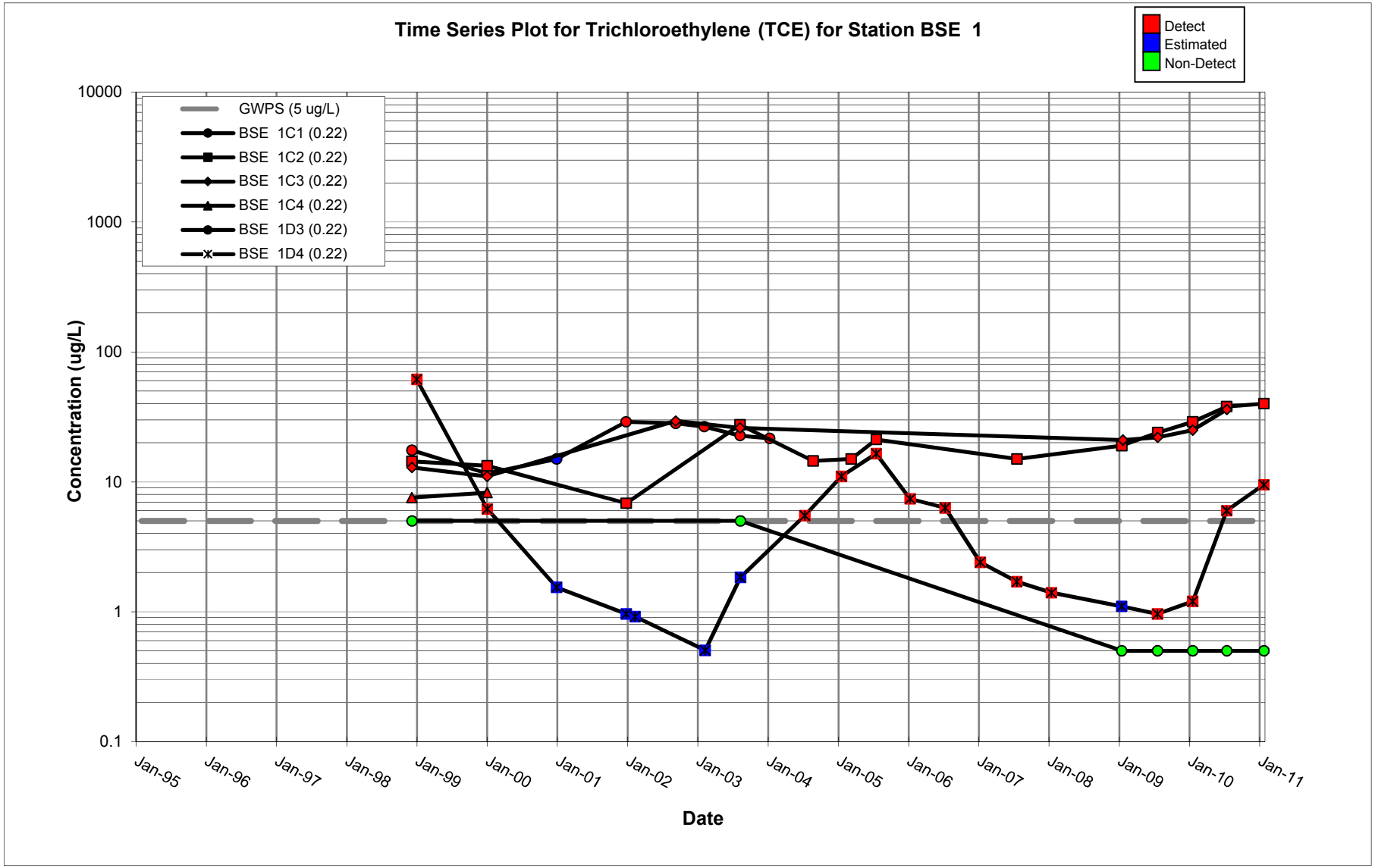

Time Series Plot for Trichloroethylene (TCE) for Station BGO 50
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 50A (0)
BGO 50C (0)
BGO 50D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

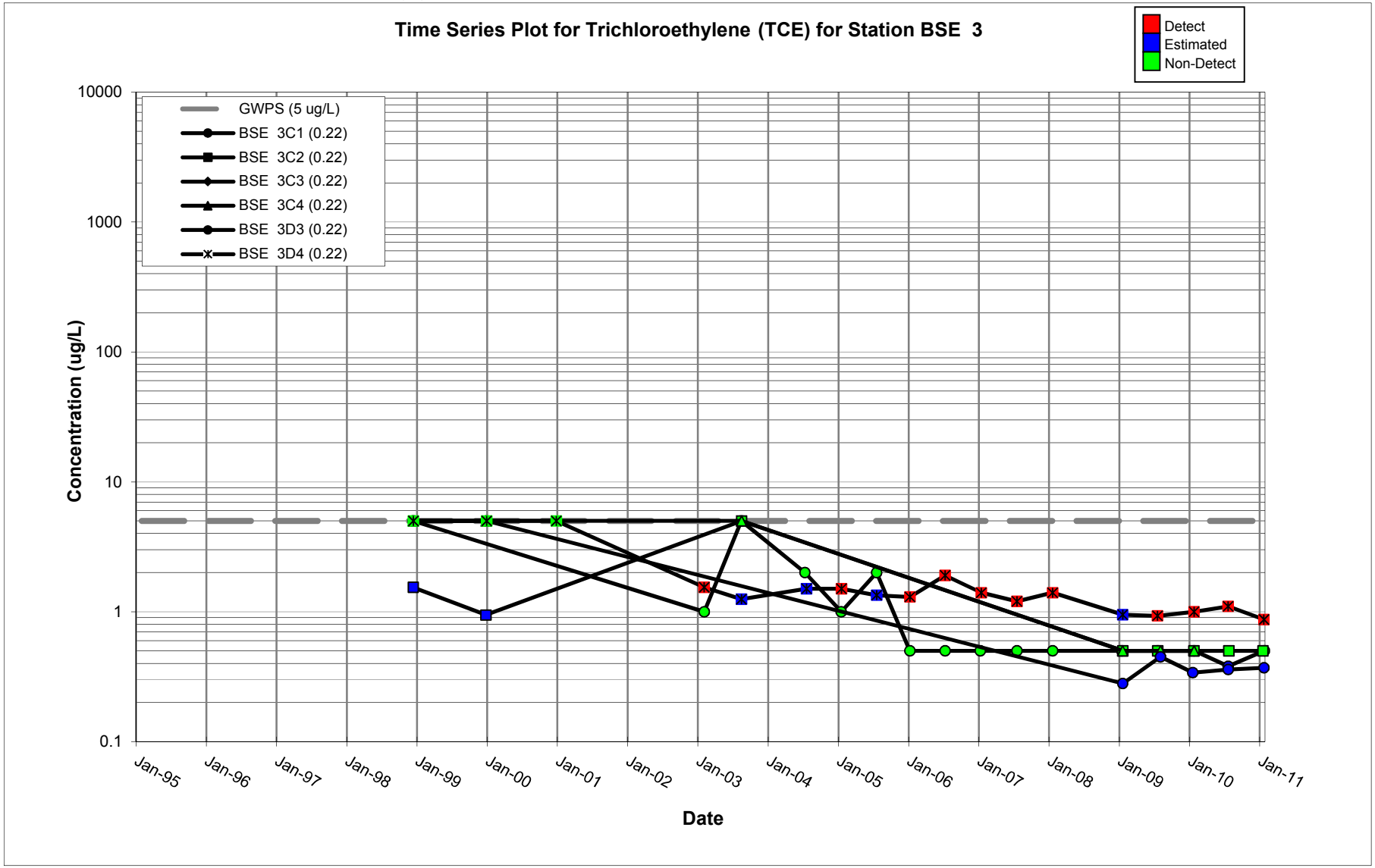

Time Series Plot for Trichloroethylene (TCE) for Station BGO 51
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGO 51A (0)
BGO 51AA (0)
BGO 51B (0)
BGO 51C (0)
BGO 51D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

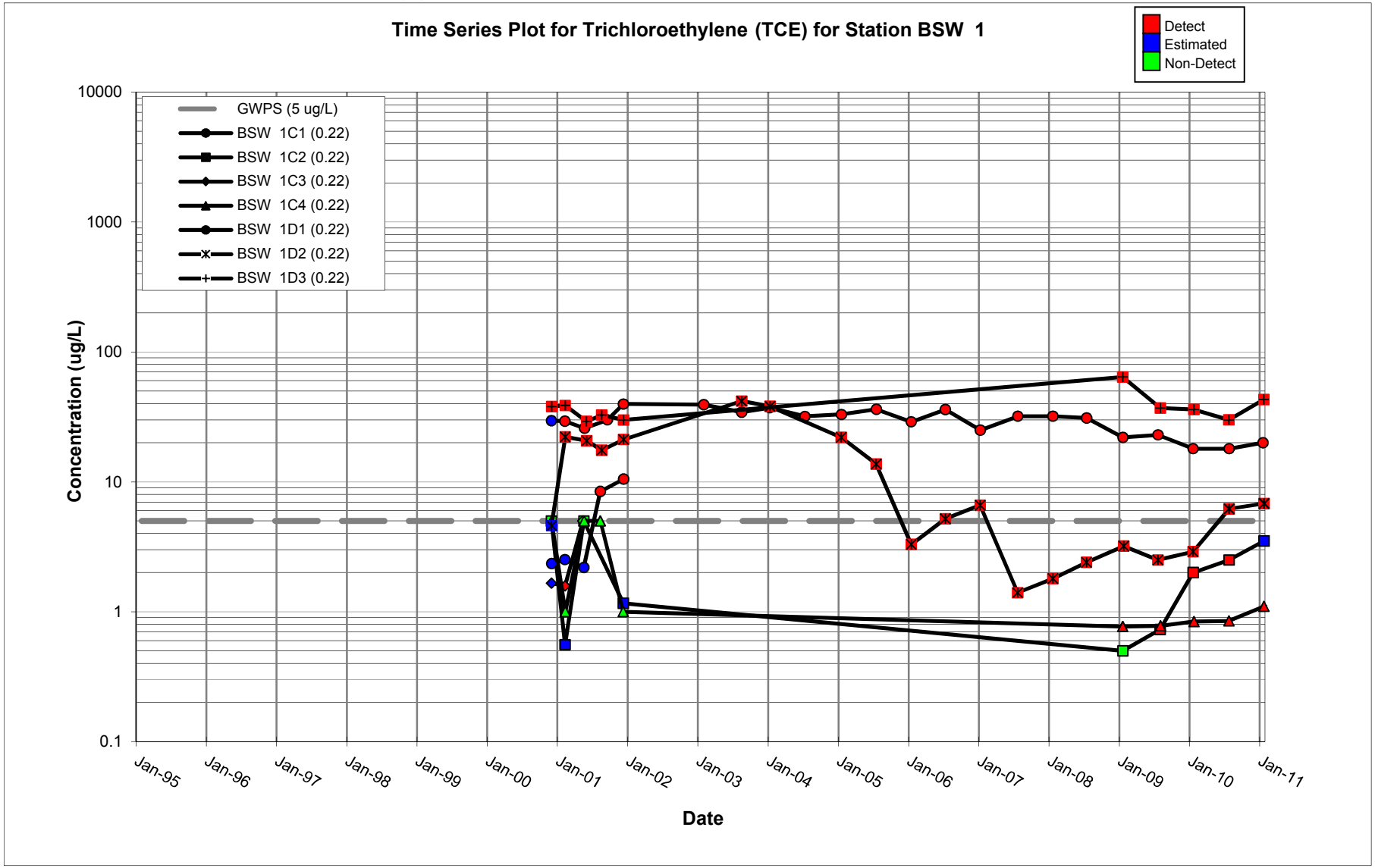

Time Series Plot for Trichloroethylene (TCE) for Station BGX 1
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGX 1A (0)
BGX 1C (0)
BGX 1D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

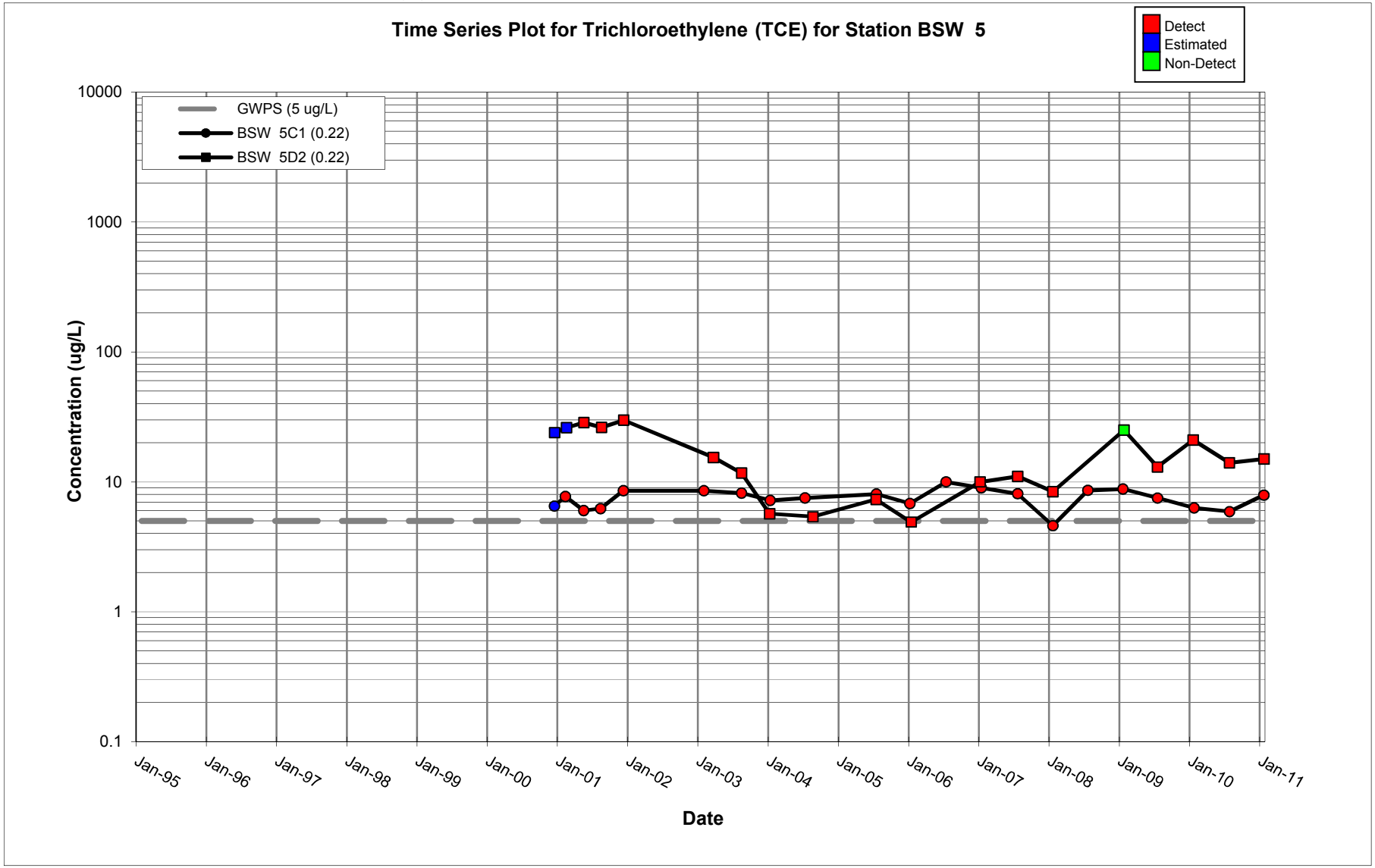

Time Series Plot for Trichloroethylene (TCE) for Station BGX 8
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGX 8D/8DR (LAZ)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

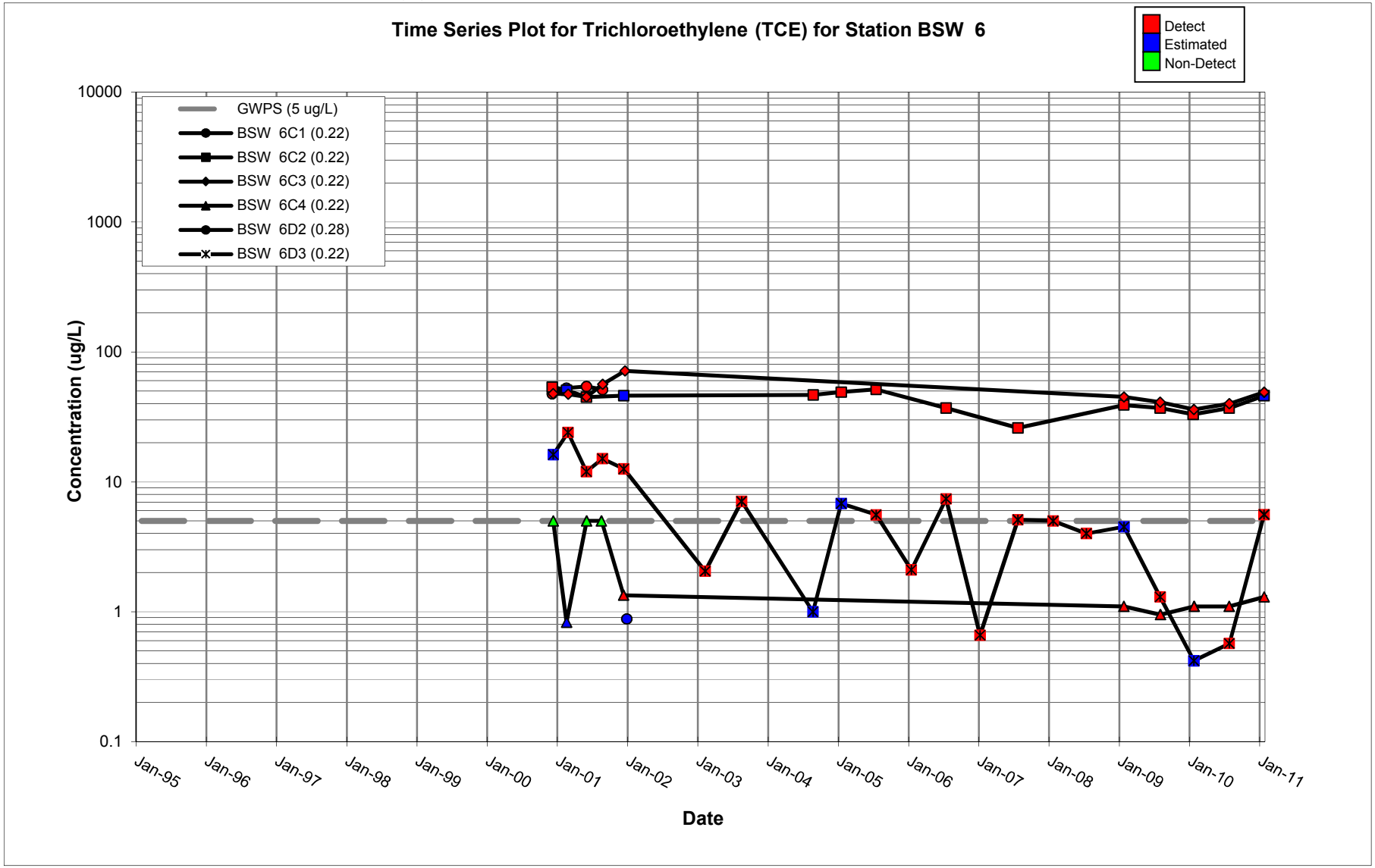

Time Series Plot for Trichloroethylene (TCE) for Station BGX013
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BGX013D (0.25)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

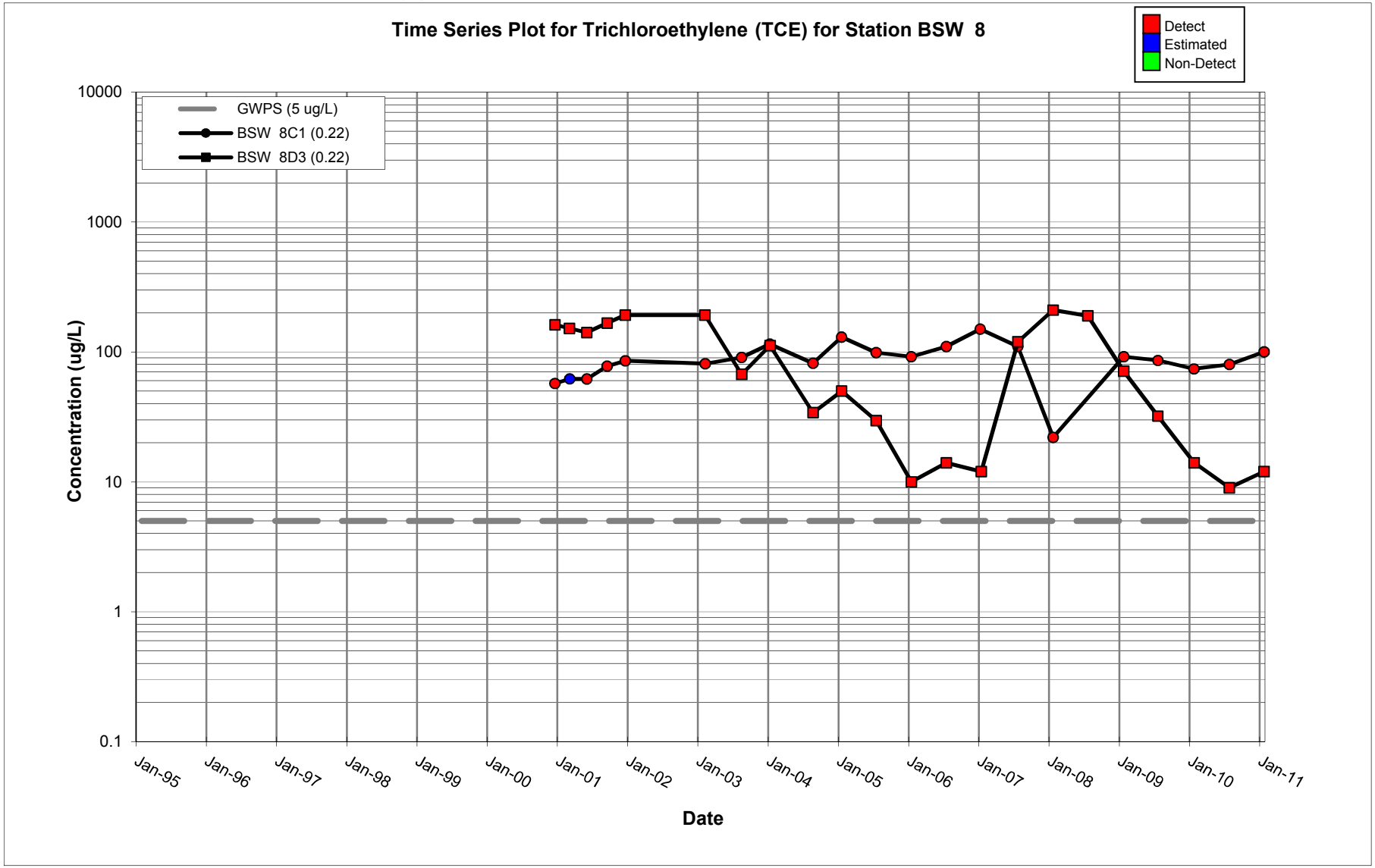

Time Series Plot for Trichloroethylene (TCE) for Station BSE 1
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BSE 1C1 (0.22)
BSE 1C2 (0.22)
BSE 1C3 (0.22)
BSE 1C4 (0.22)
BSE 1D3 (0.22)
BSE 1D4 (0.22)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

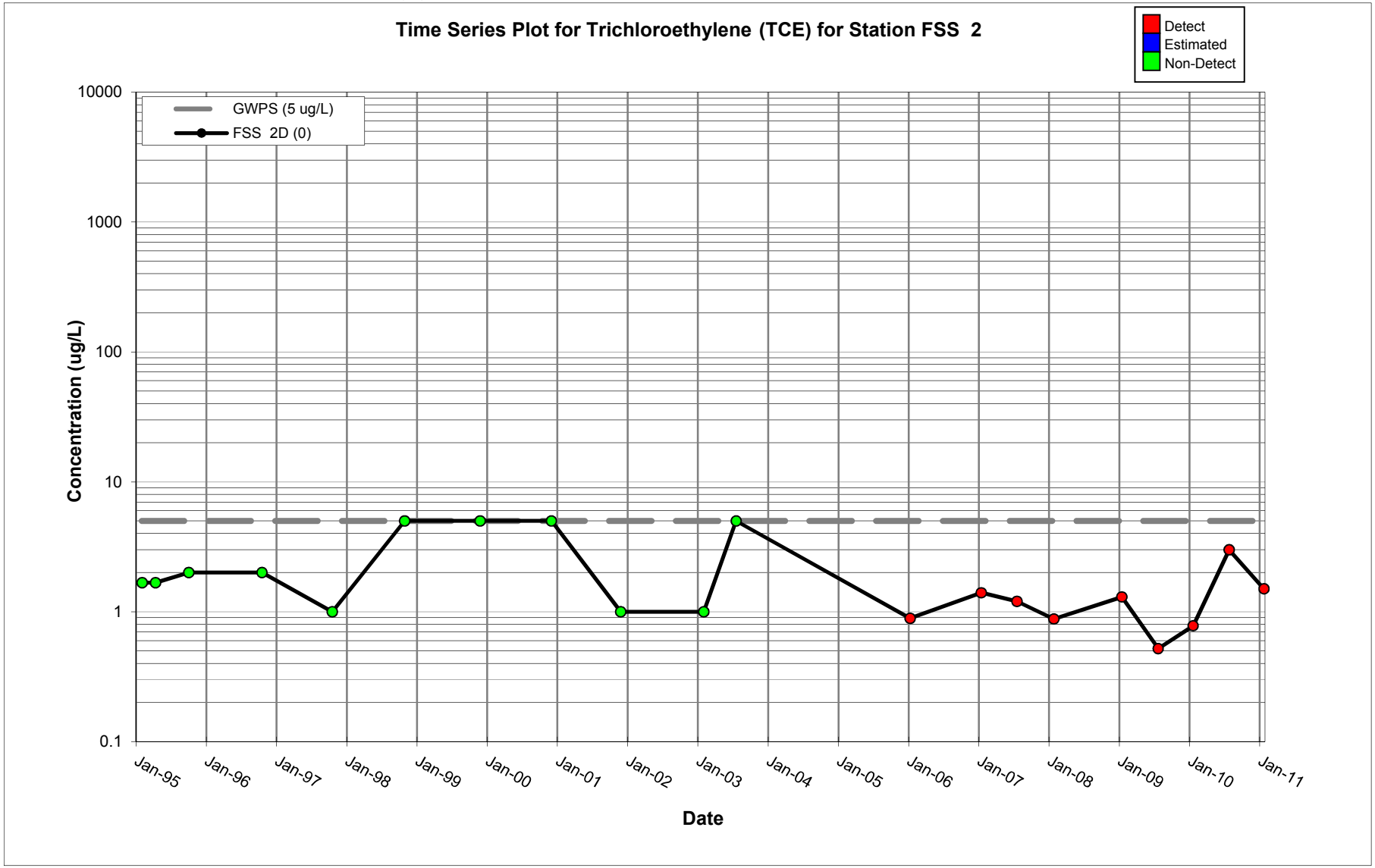

Time Series Plot for Trichloroethylene (TCE) for Station BSE 3
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BSE 3C1 (0.22)
BSE 3C2 (0.22)
BSE 3C3 (0.22)
BSE 3C4 (0.22)
BSE 3D3 (0.22)
BSE 3D4 (0.22)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

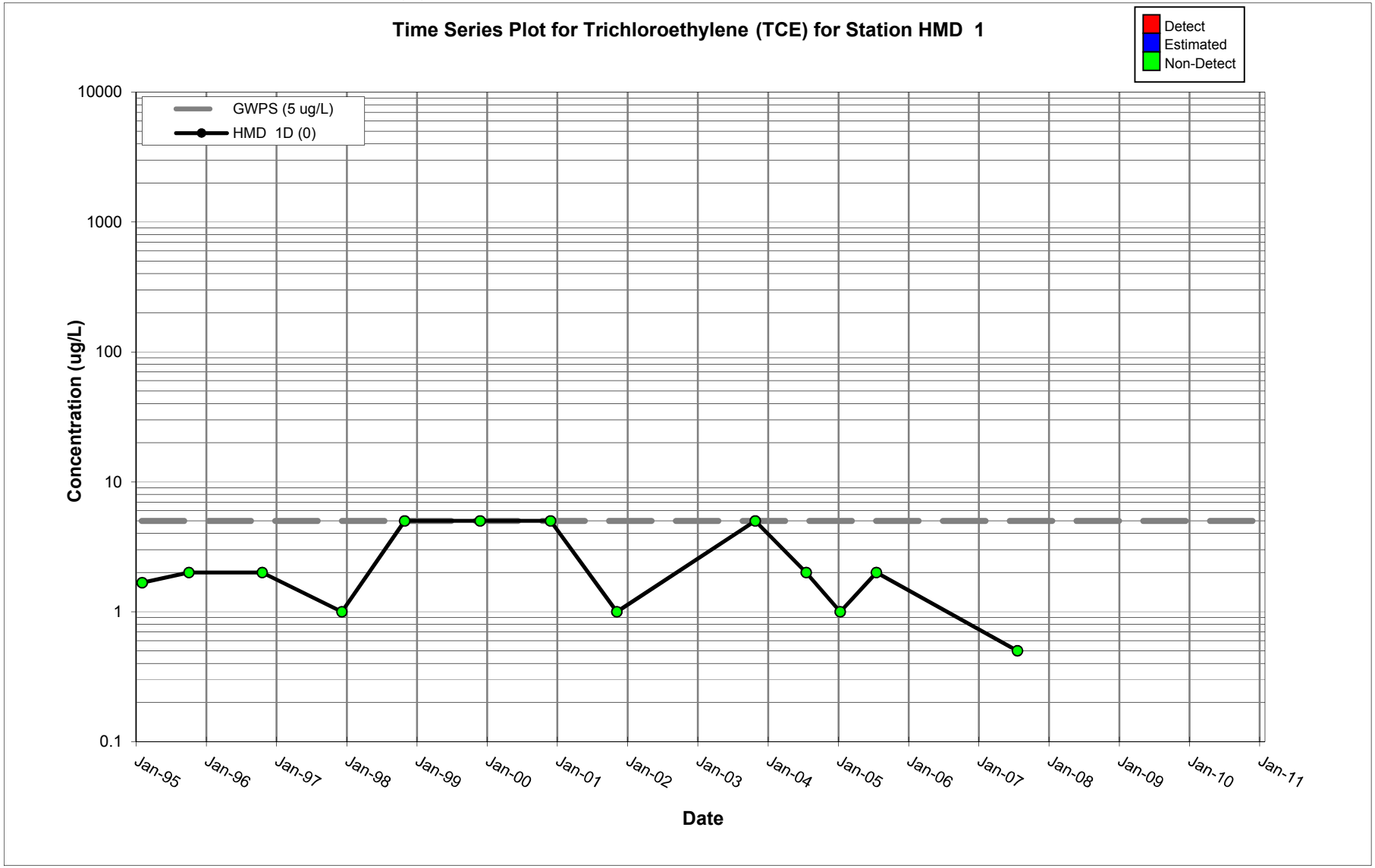

Time Series Plot for Trichloroethylene (TCE) for Station BSW 1
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BSW 1C1 (0.22)
BSW 1C2 (0.22)
BSW 1C3 (0.22)
BSW 1C4 (0.22)
BSW 1D1 (0.22)
BSW 1D2 (0.22)
BSW 1D3 (0.22)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

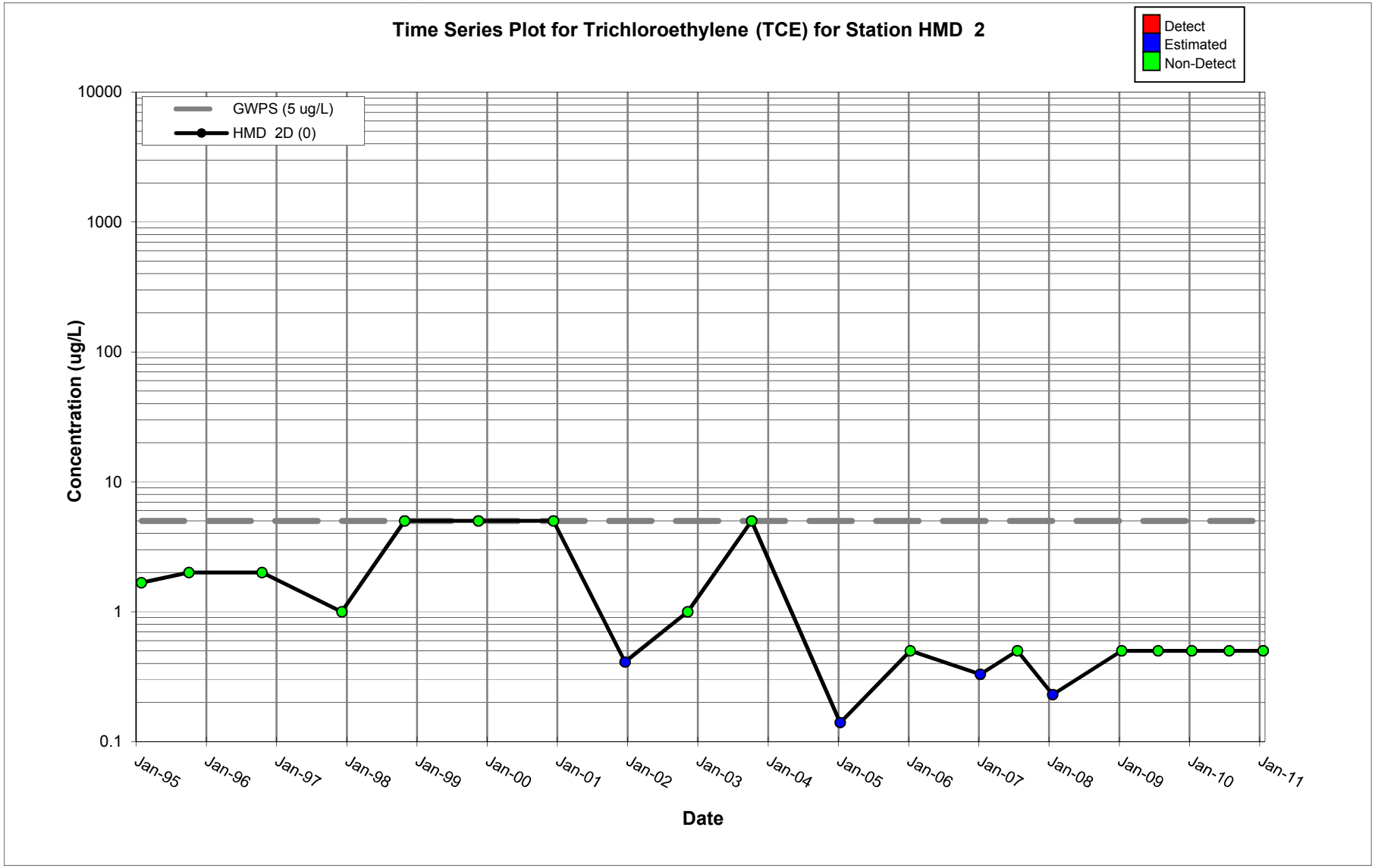

Time Series Plot for Trichloroethylene (TCE) for Station BSW 5
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BSW 5C1 (0.22)
BSW 5D2 (0.22)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

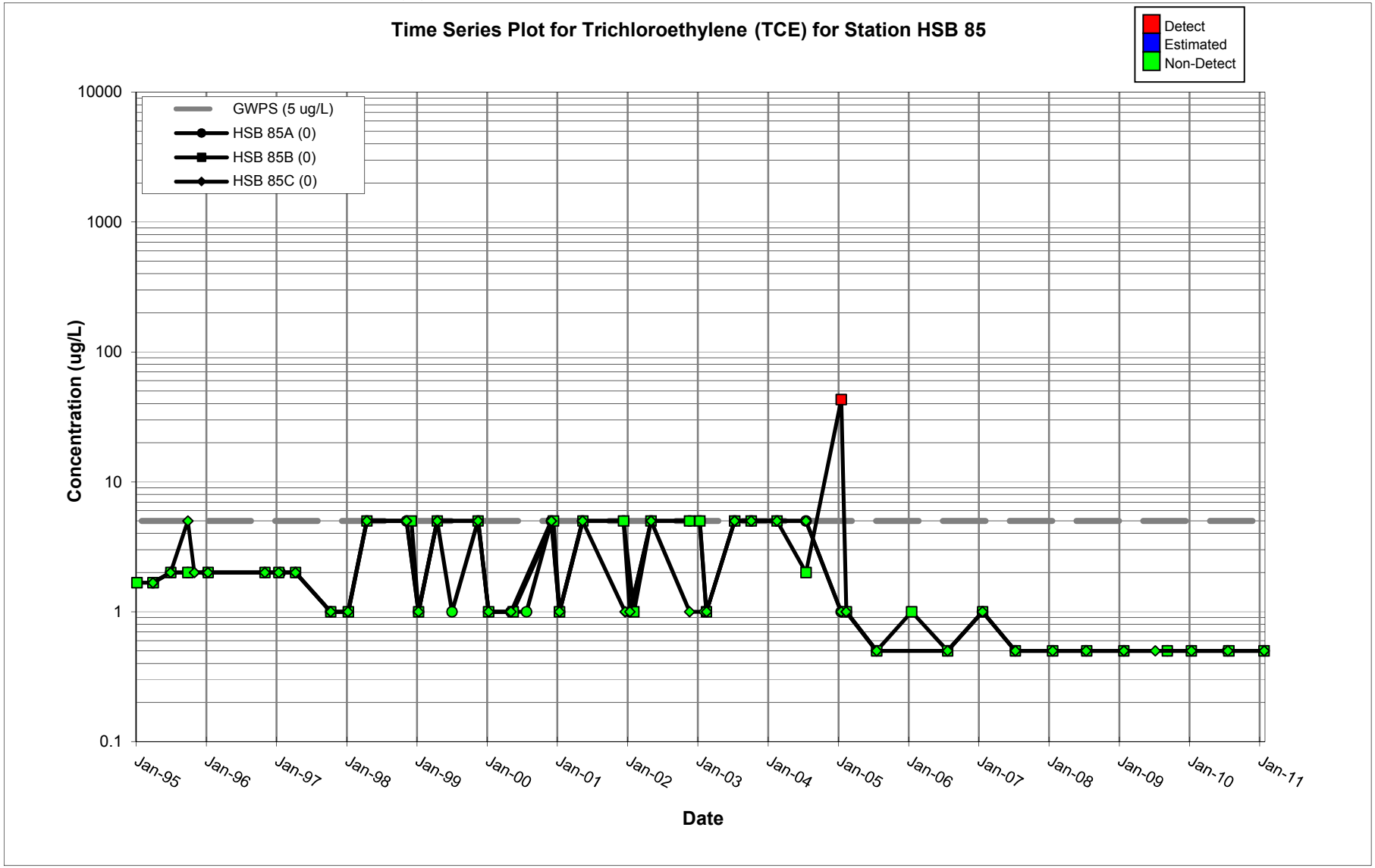

Time Series Plot for Trichloroethylene (TCE) for Station BSW 6
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BSW 6C1 (0.22)
BSW 6C2 (0.22)
BSW 6C3 (0.22)
BSW 6C4 (0.22)
BSW 6D2 (0.28)
BSW 6D3 (0.22)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

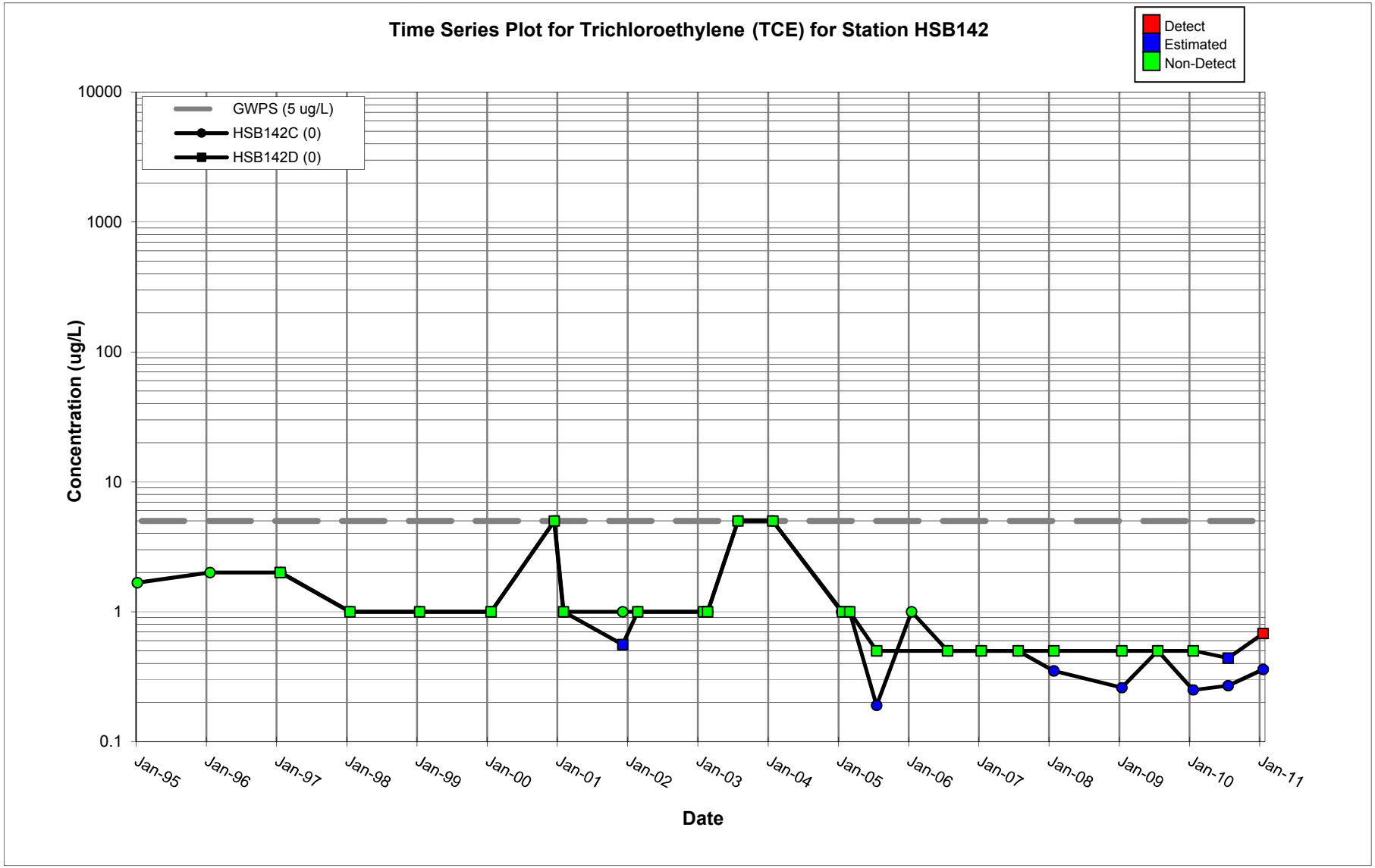

Time Series Plot for Trichloroethylene (TCE) for Station BSW 8
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
BSW 8C1 (0.22)
BSW 8D3 (0.22)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

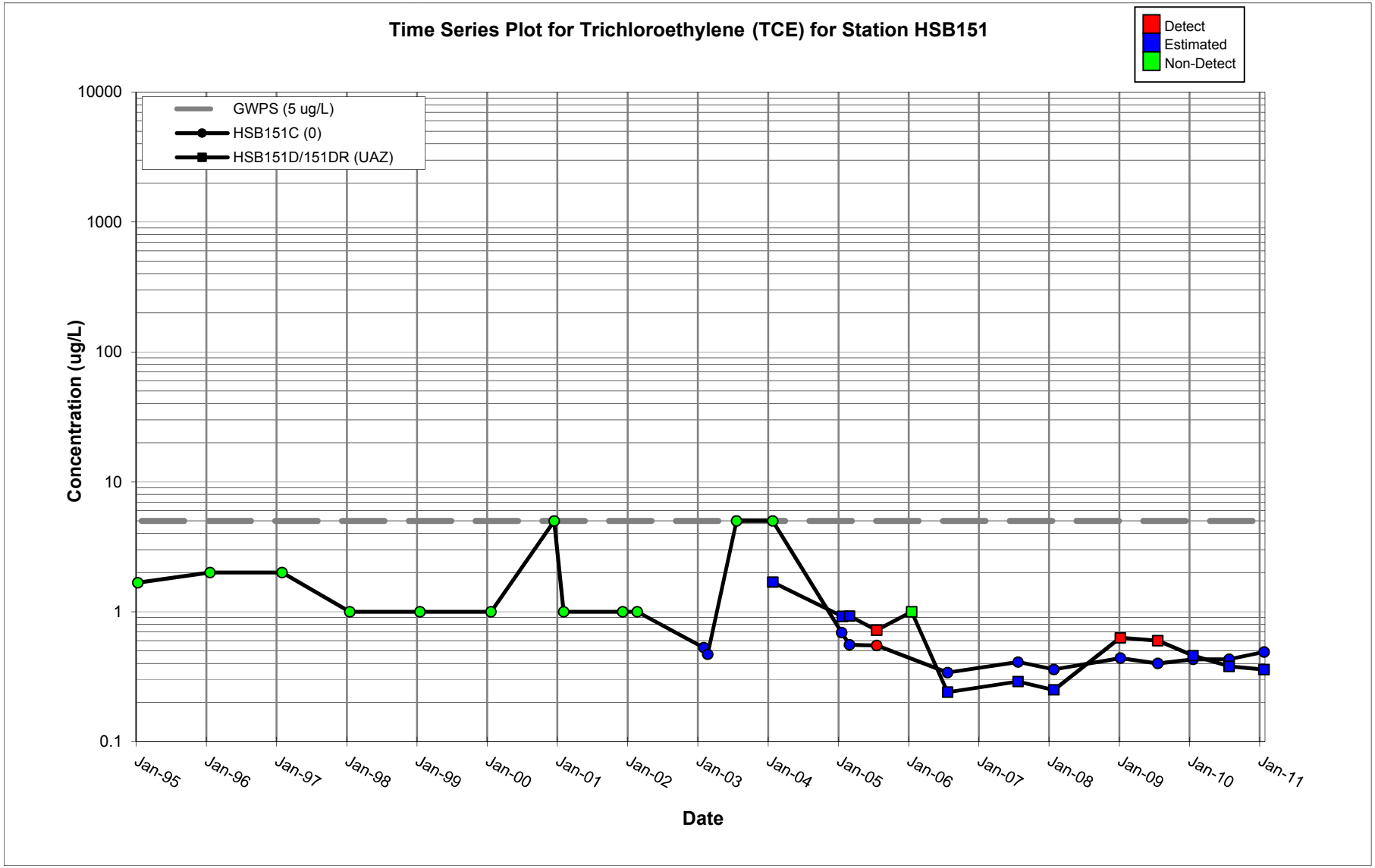

Time Series Plot for Trichloroethylene (TCE) for Station FSS 2
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
FSS 2D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

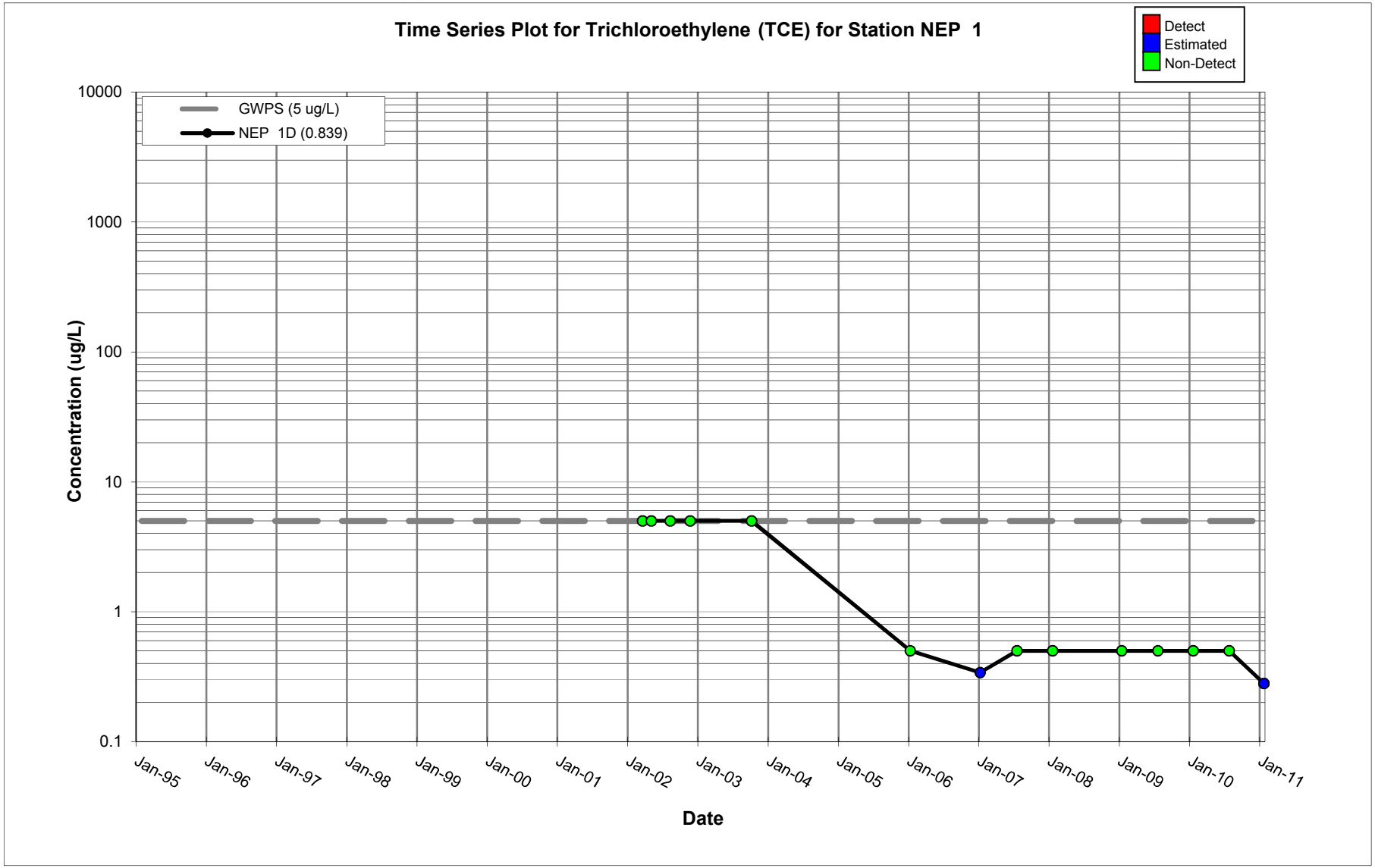

Time Series Plot for Trichloroethylene (TCE) for Station HMD 1
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
HMD 1D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

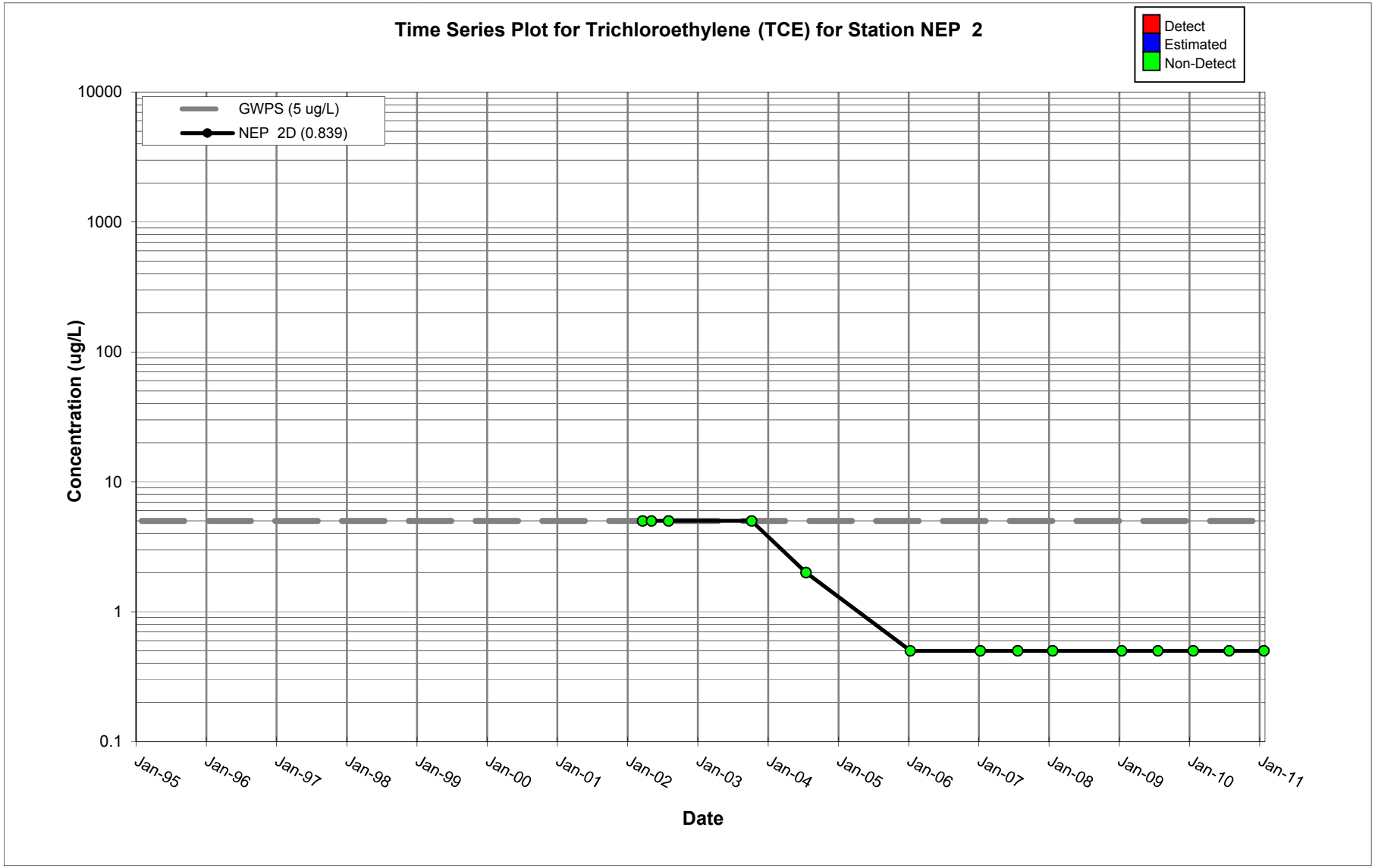

Time Series Plot for Trichloroethylene (TCE) for Station HMD 2
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
HMD 2D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

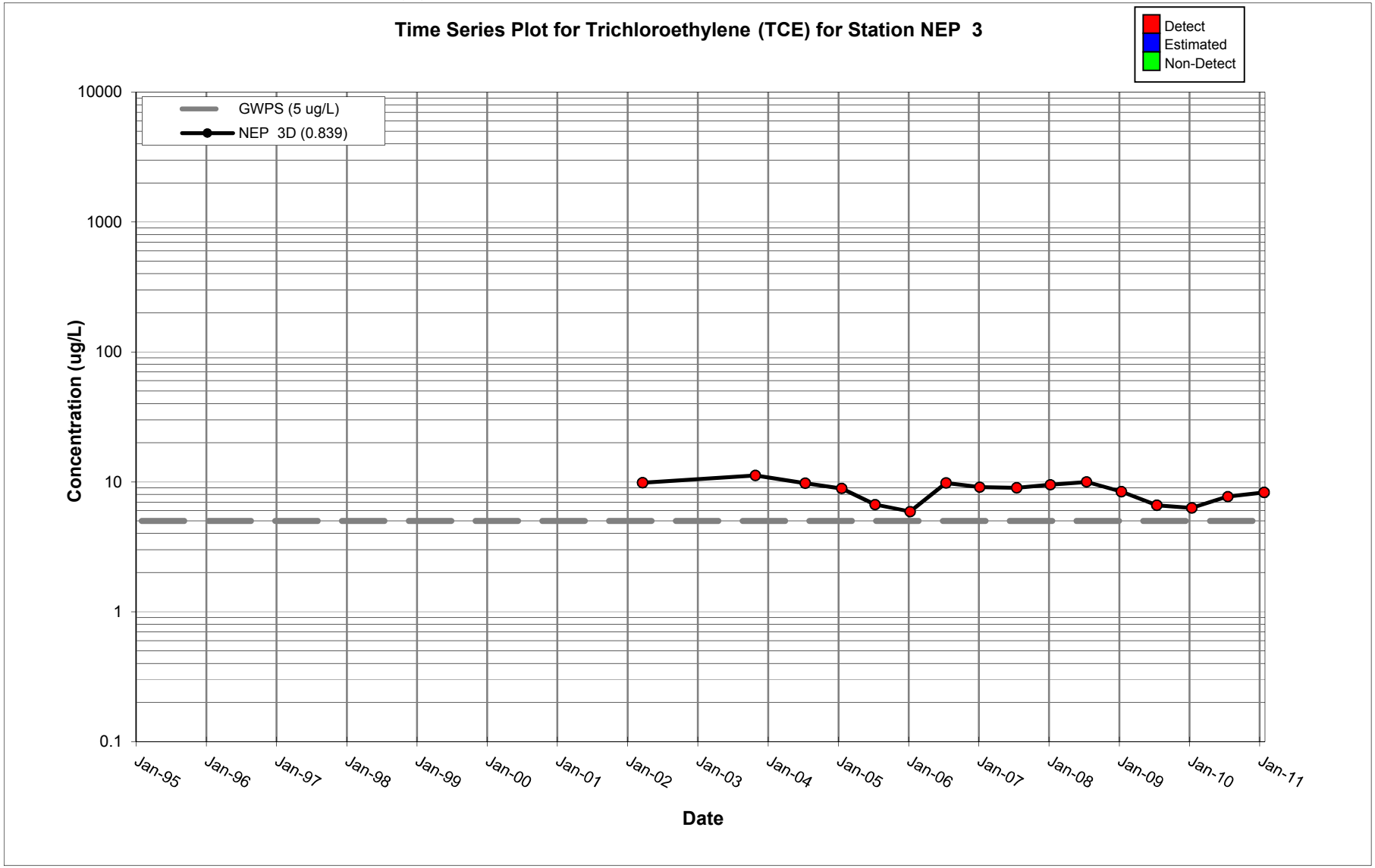

Time Series Plot for Trichloroethylene (TCE) for Station HSB 85
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
HSB 85A (0)
HSB 85B (0)
HSB 85C (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

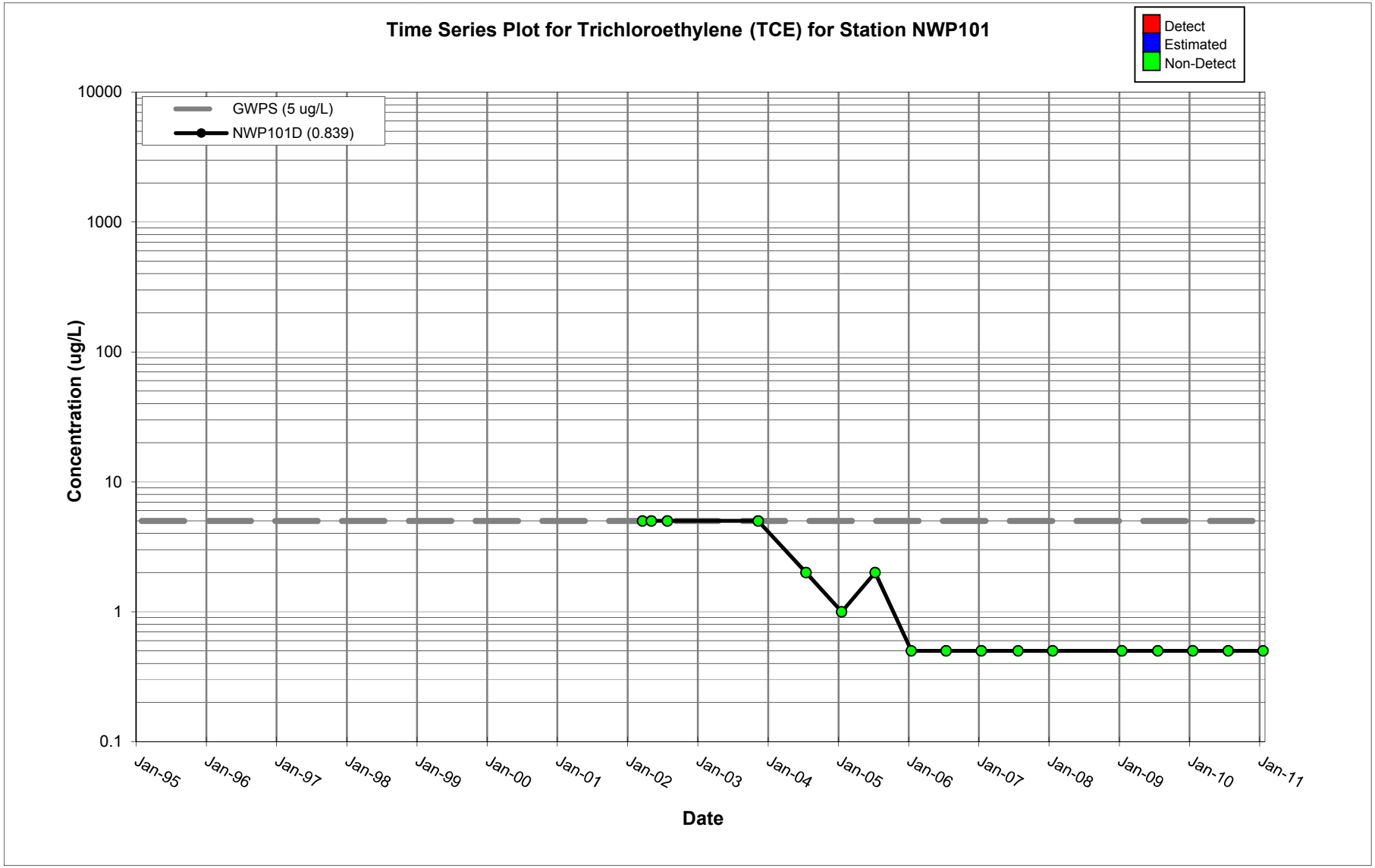

Time Series Plot for Trichloroethylene (TCE) for Station HSB142
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
HSB142C (0)
HSB142D (0)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

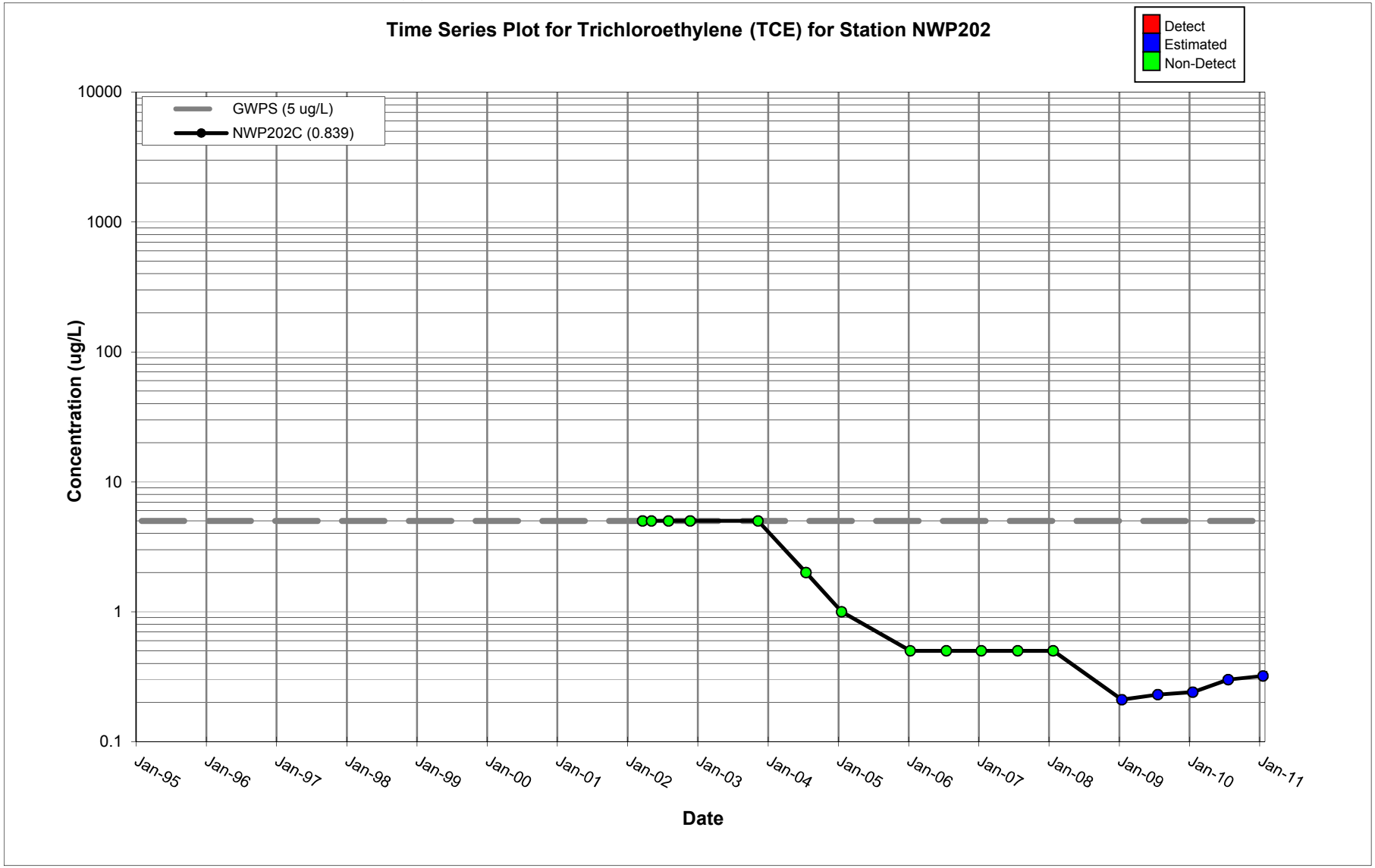

Time Series Plot for Trichloroethylene (TCE) for Station HSB151
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
HSB151C (0)
HSB151D/151DR (UAZ)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

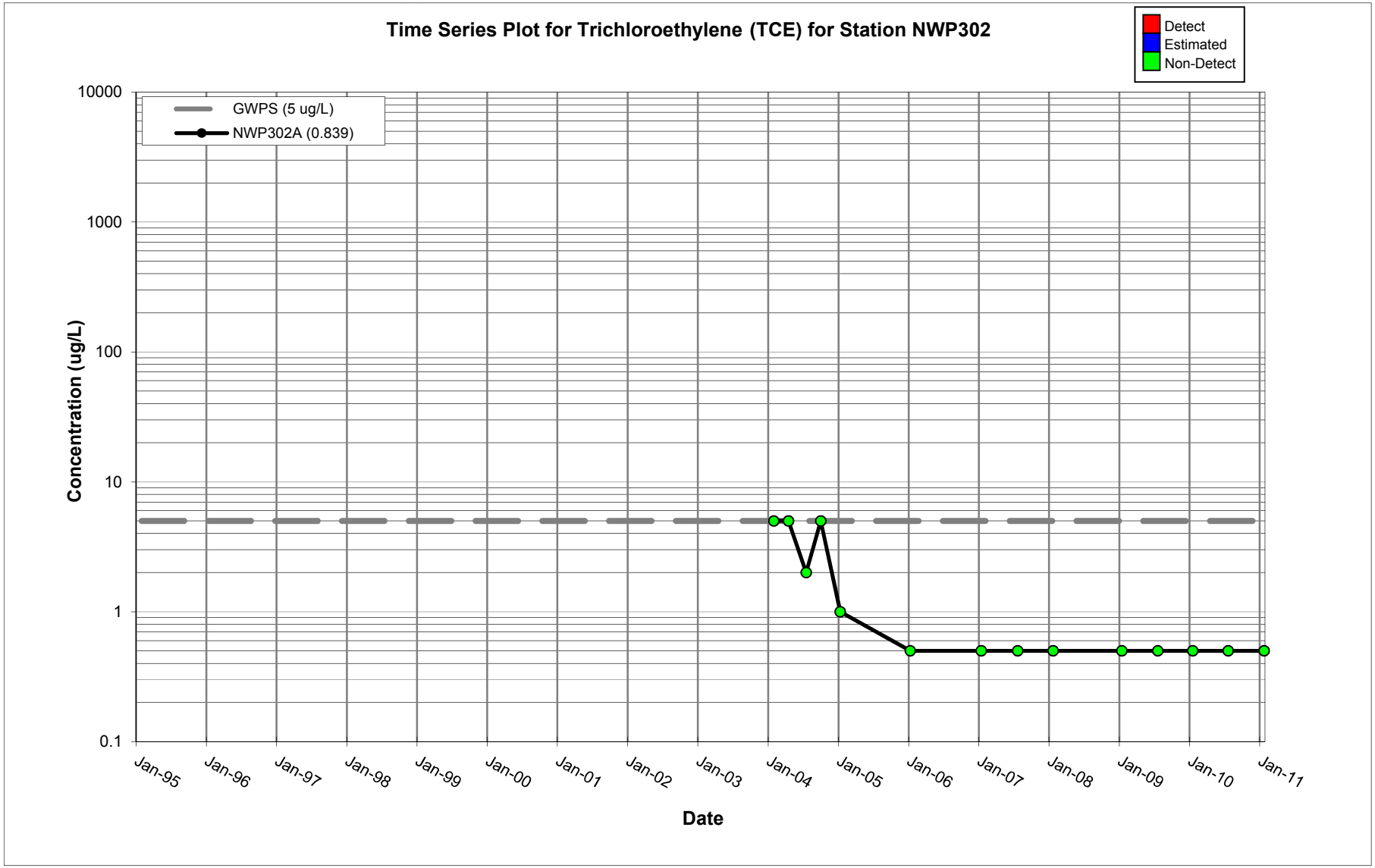

Time Series Plot for Trichloroethylene (TCE) for Station NEP 1
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
NEP 1D (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

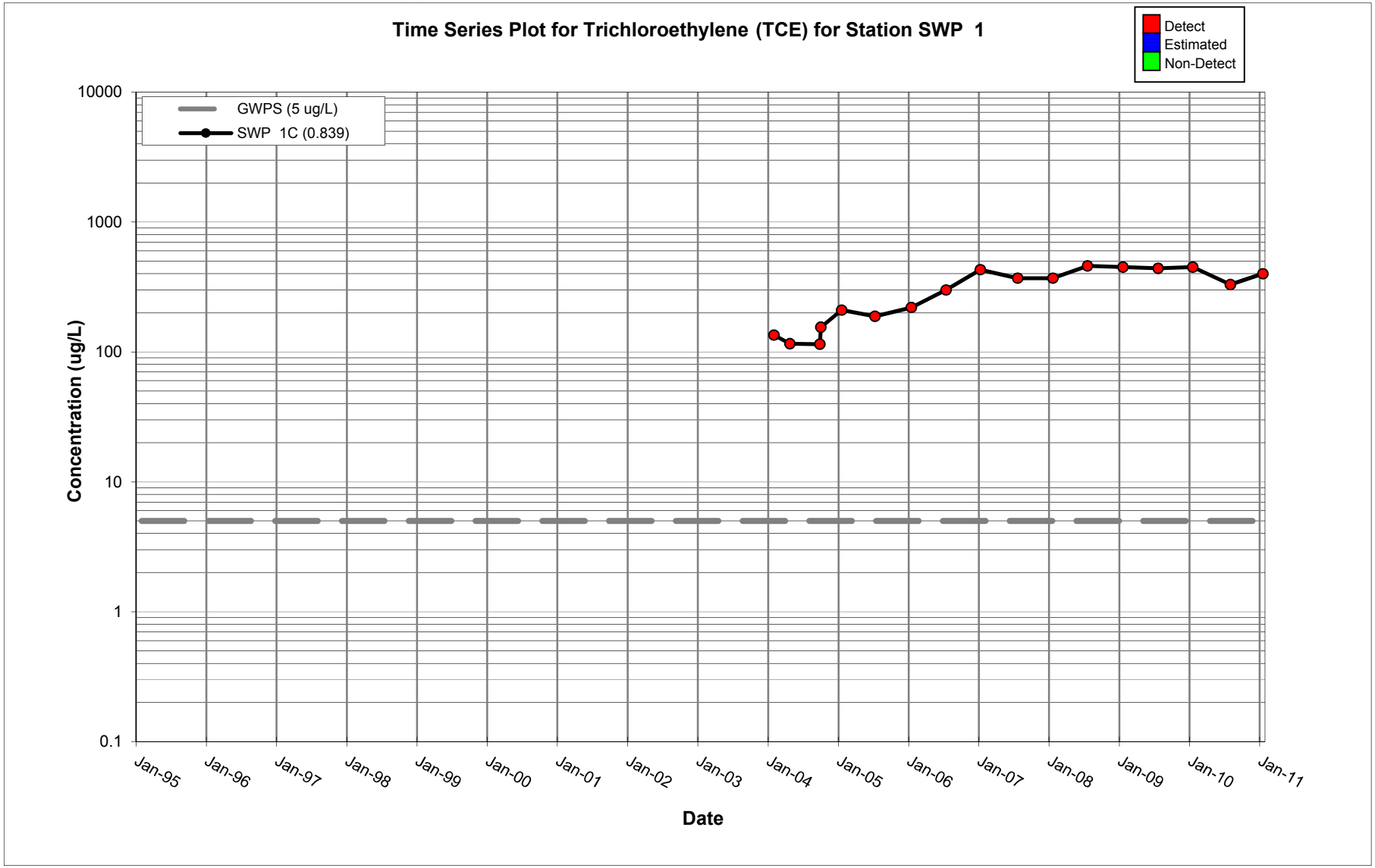

Time Series Plot for Trichloroethylene (TCE) for Station NEP 2
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
NEP 2D (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

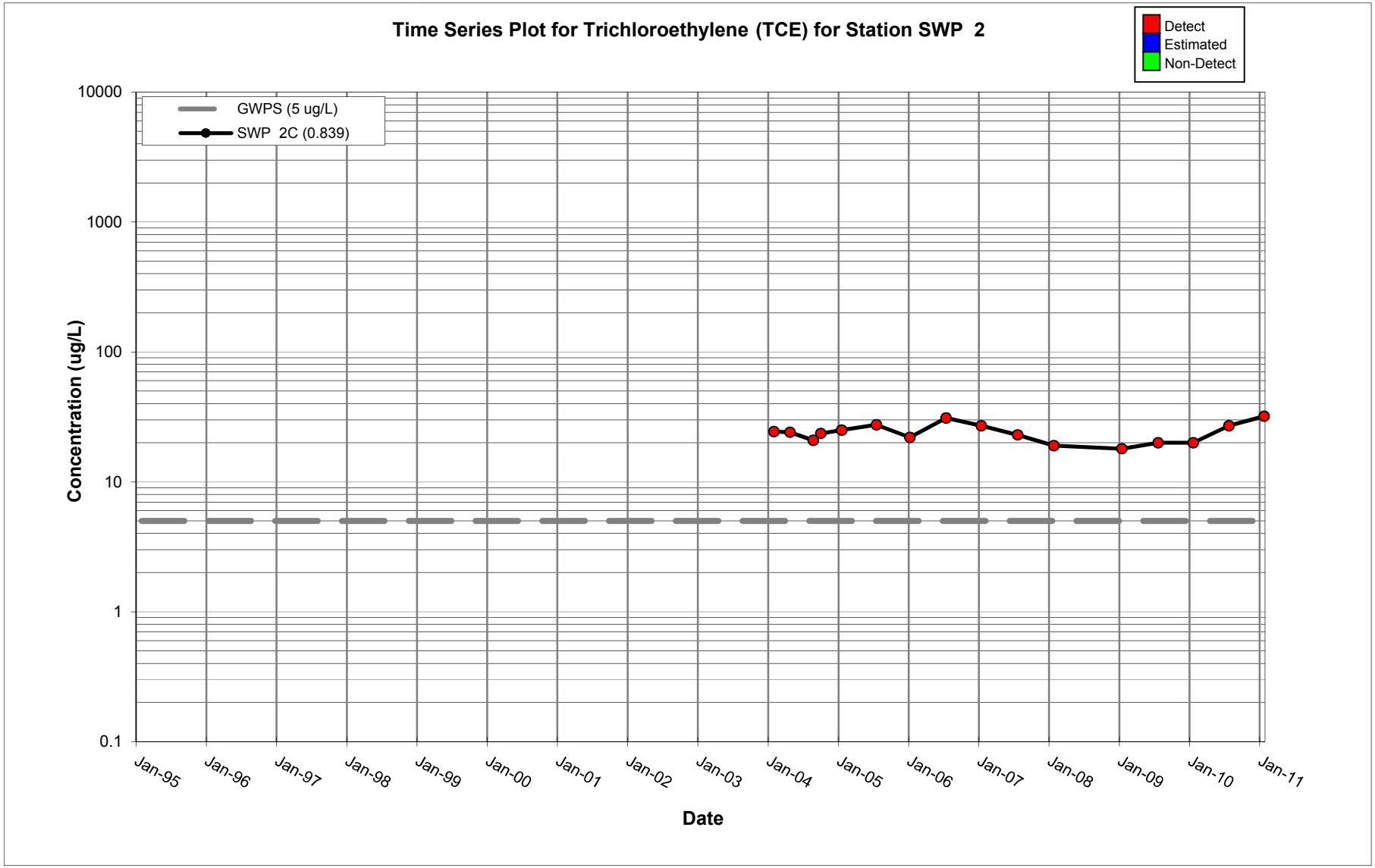

Time Series Plot for Trichloroethylene (TCE) for Station NEP 3
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
NEP 3D (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

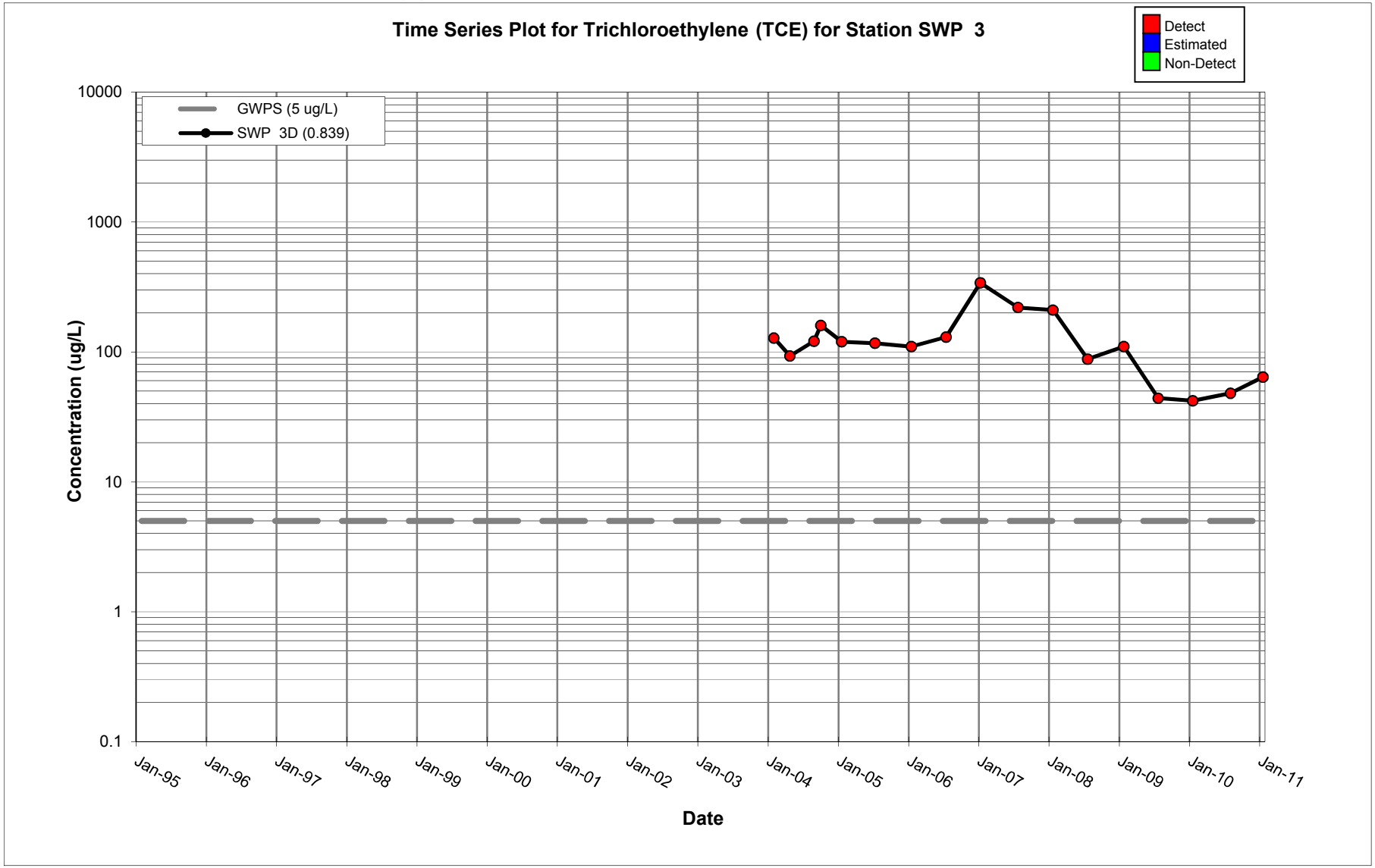

Time Series Plot for Trichloroethylene (TCE) for Station NWP101
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
NWP101D (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

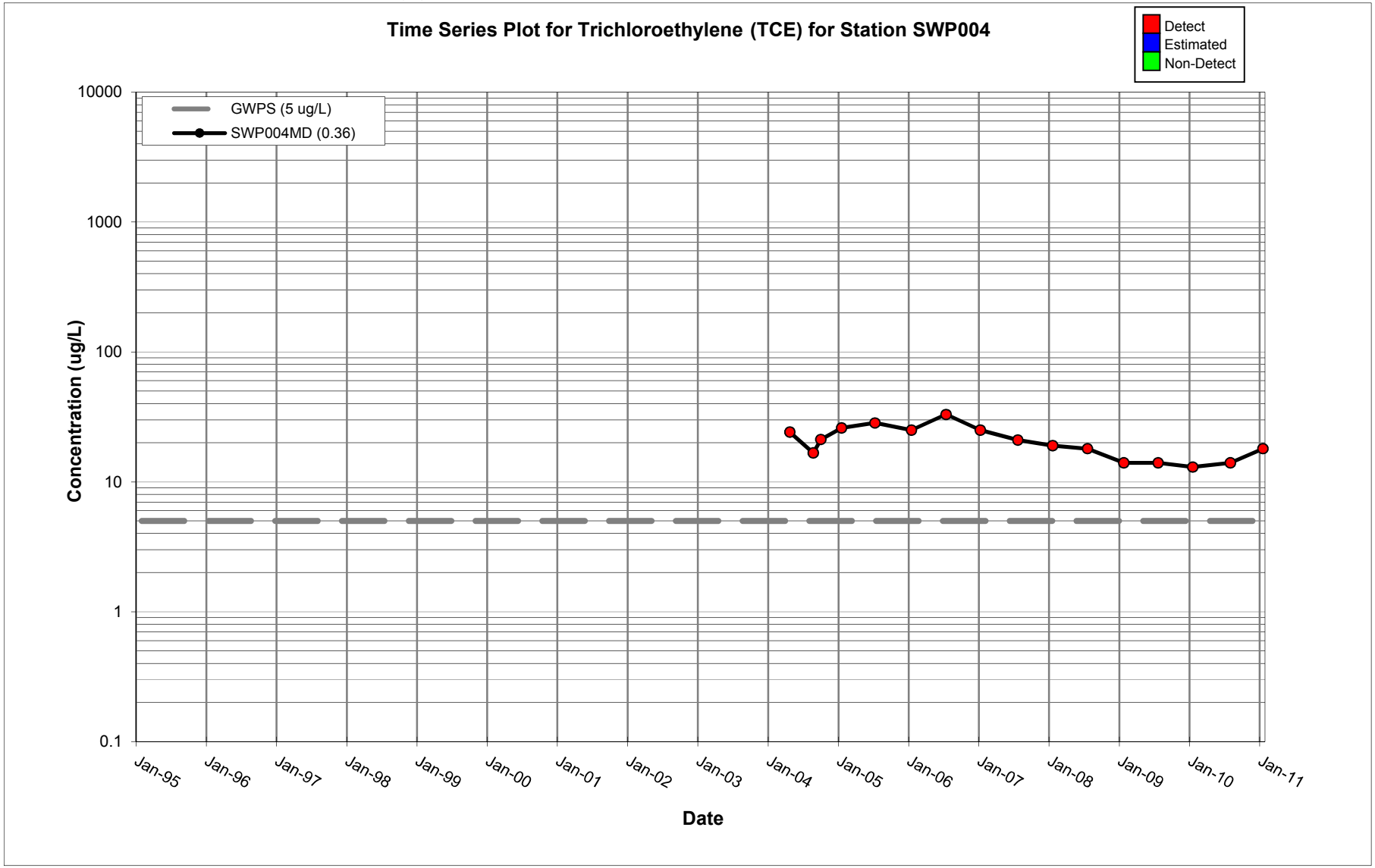

Time Series Plot for Trichloroethylene (TCE) for Station NWP202
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
NWP202C (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

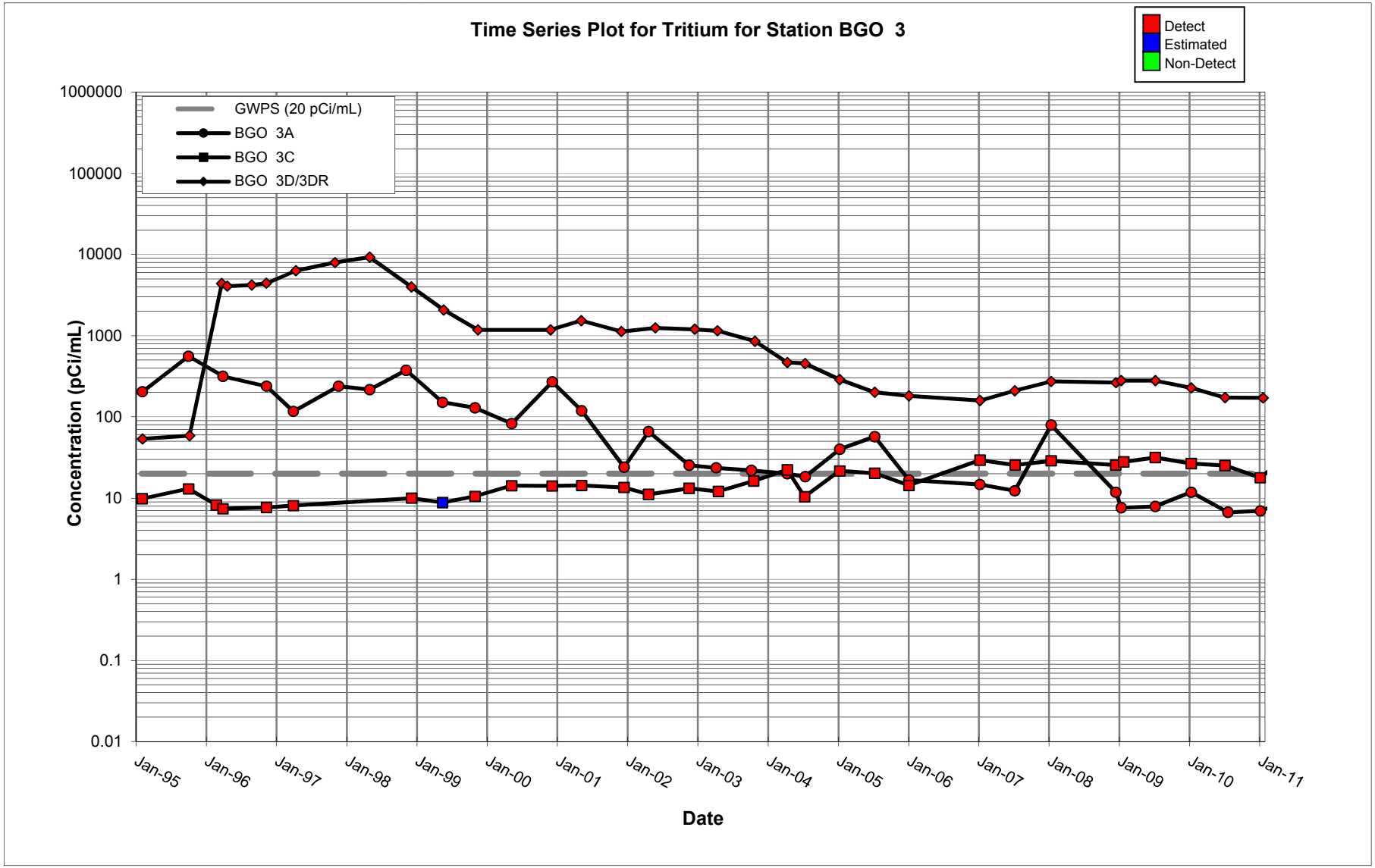

Time Series Plot for Trichloroethylene (TCE) for Station NWP302
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
NWP302A (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

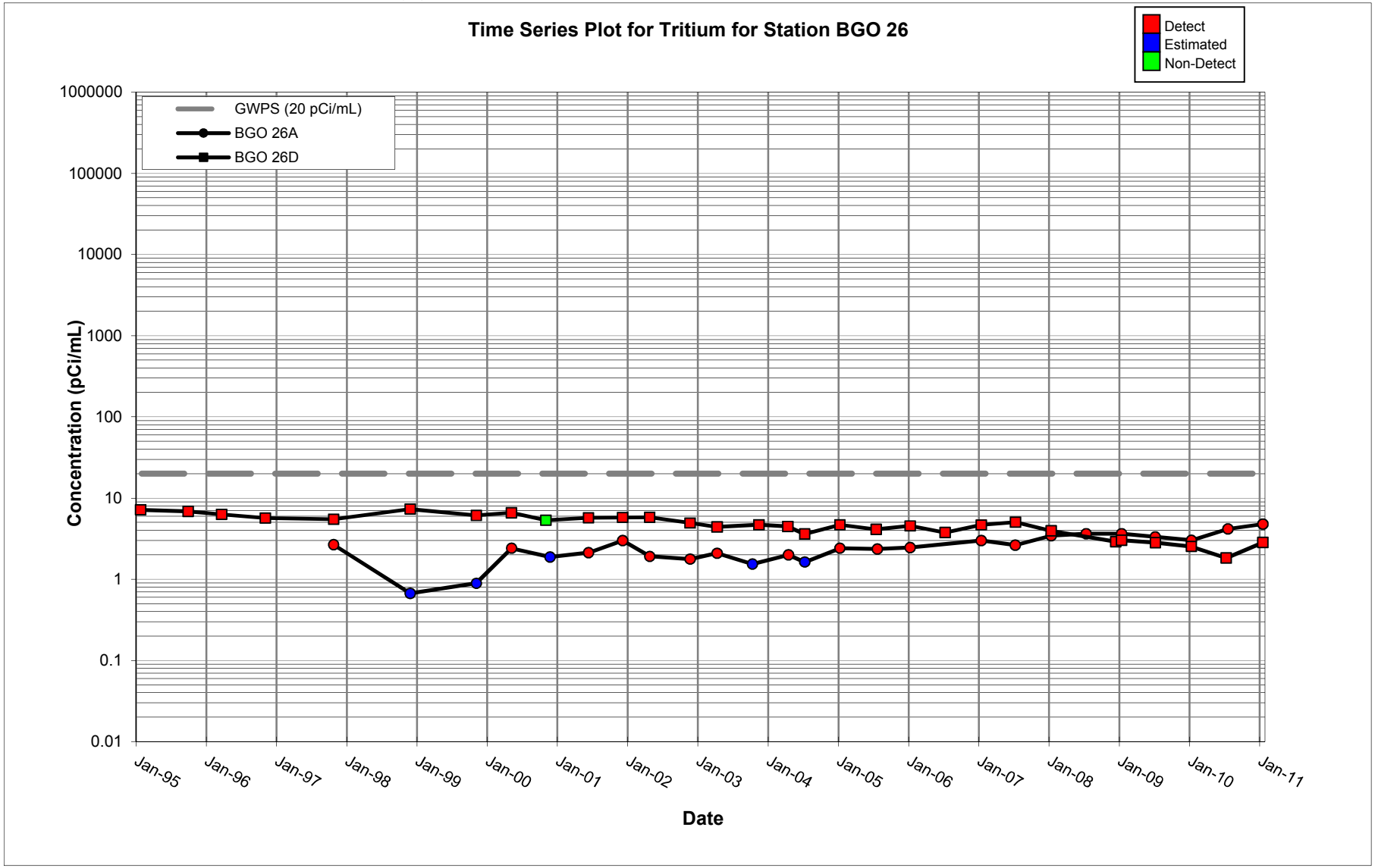

Time Series Plot for Trichloroethylene (TCE) for Station SWP 1
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
SWP 1C (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

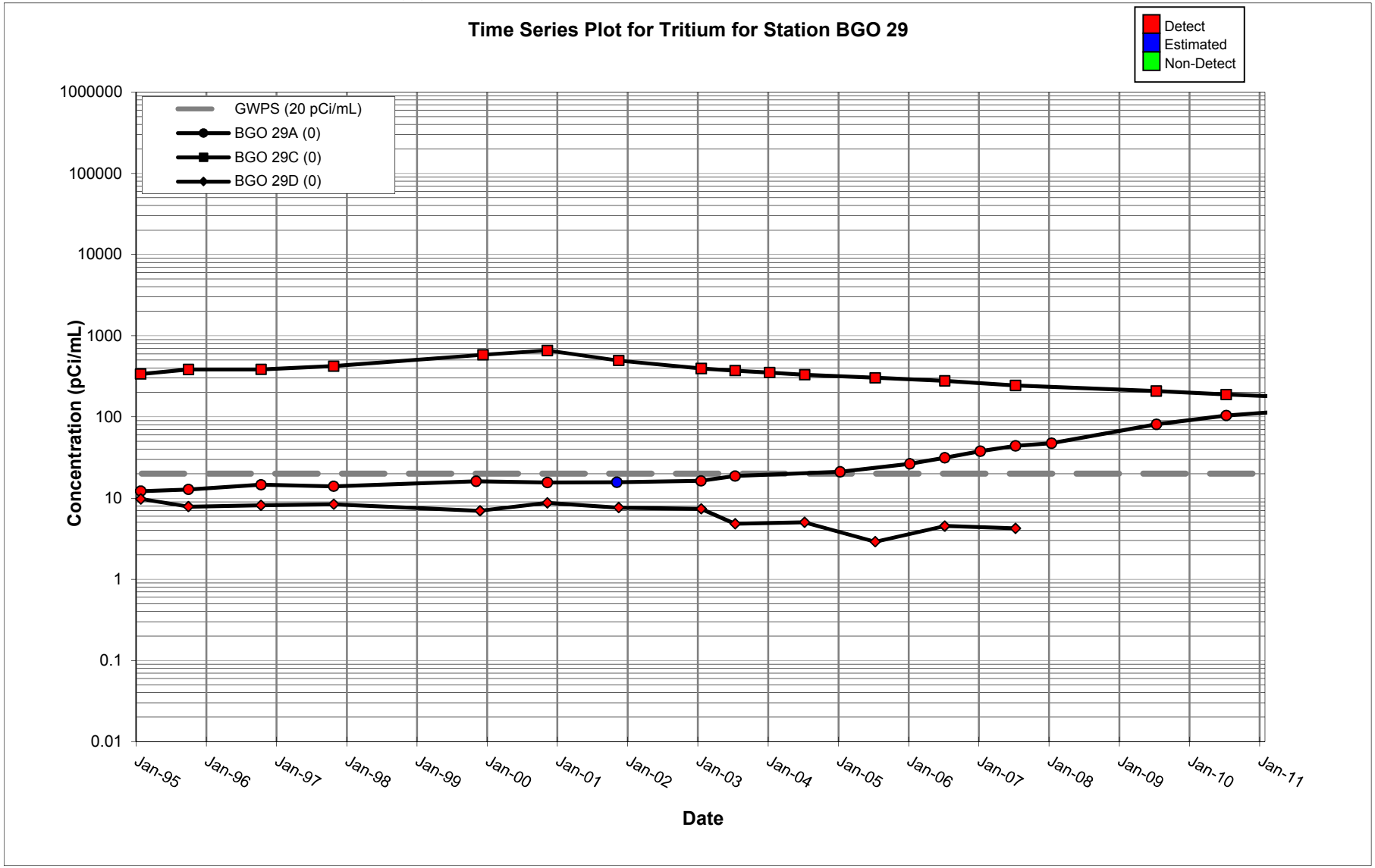

Time Series Plot for Trichloroethylene (TCE) for Station SWP 2
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
SWP 2C (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

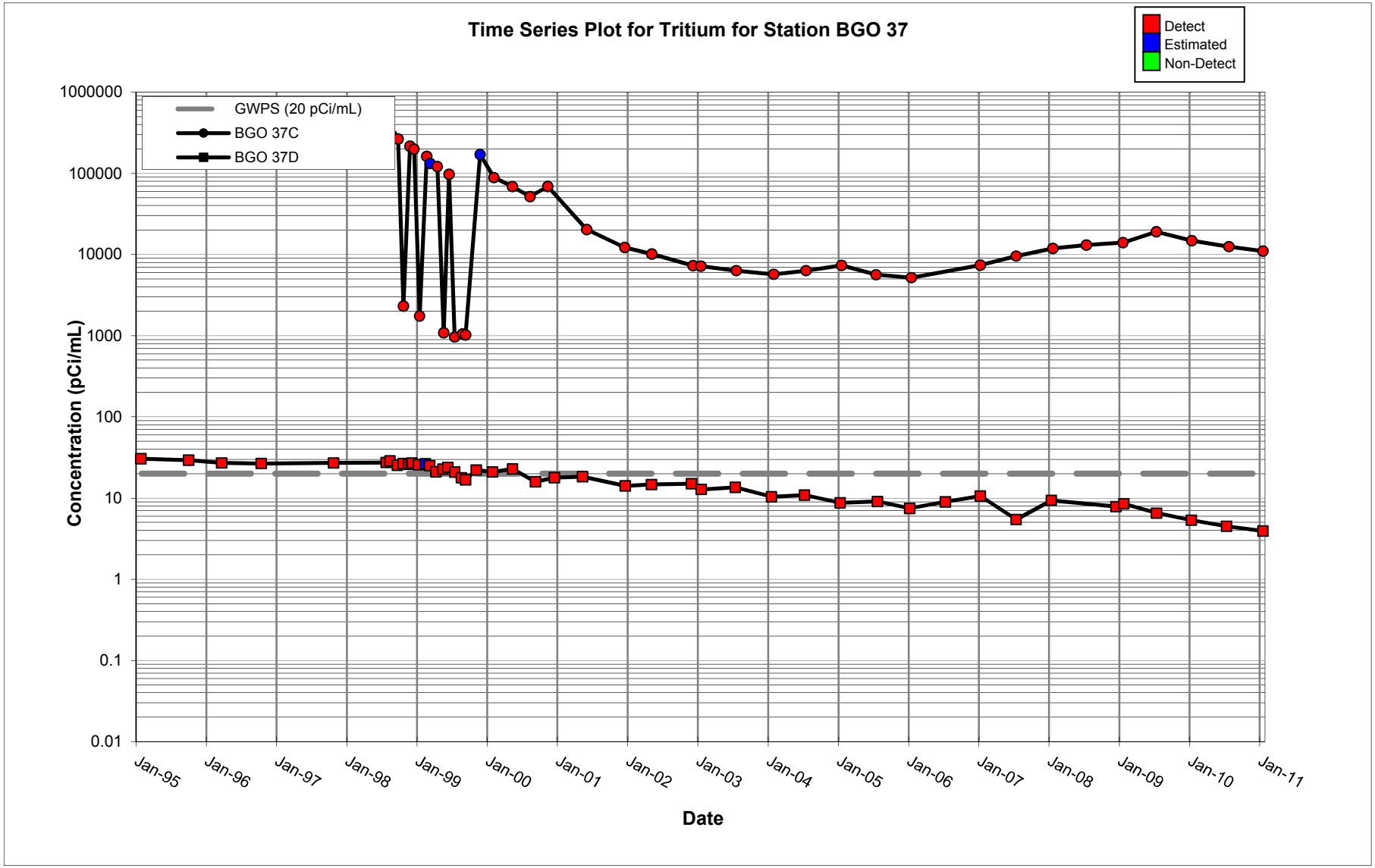

Time Series Plot for Trichloroethylene (TCE) for Station SWP 3
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
SWP 3D (0.839)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

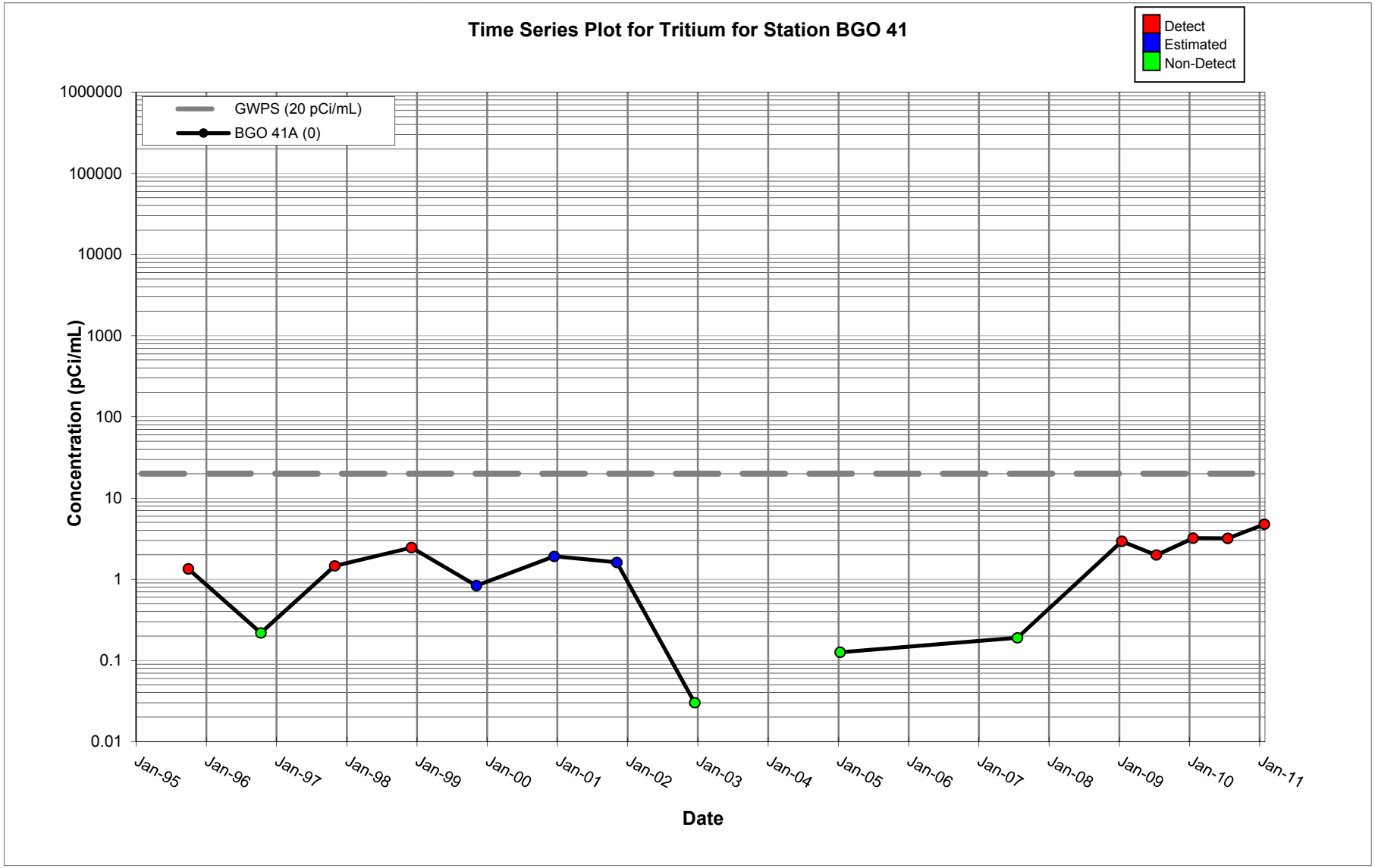

Time Series Plot for Trichloroethylene (TCE) for Station SWP004
Detect
Estimated
Non-Detect
GWPS (5 ug/L)
SWP004MD (0.36)
Concentration (ug/L)
10000
1000
100
10
1
0.1
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

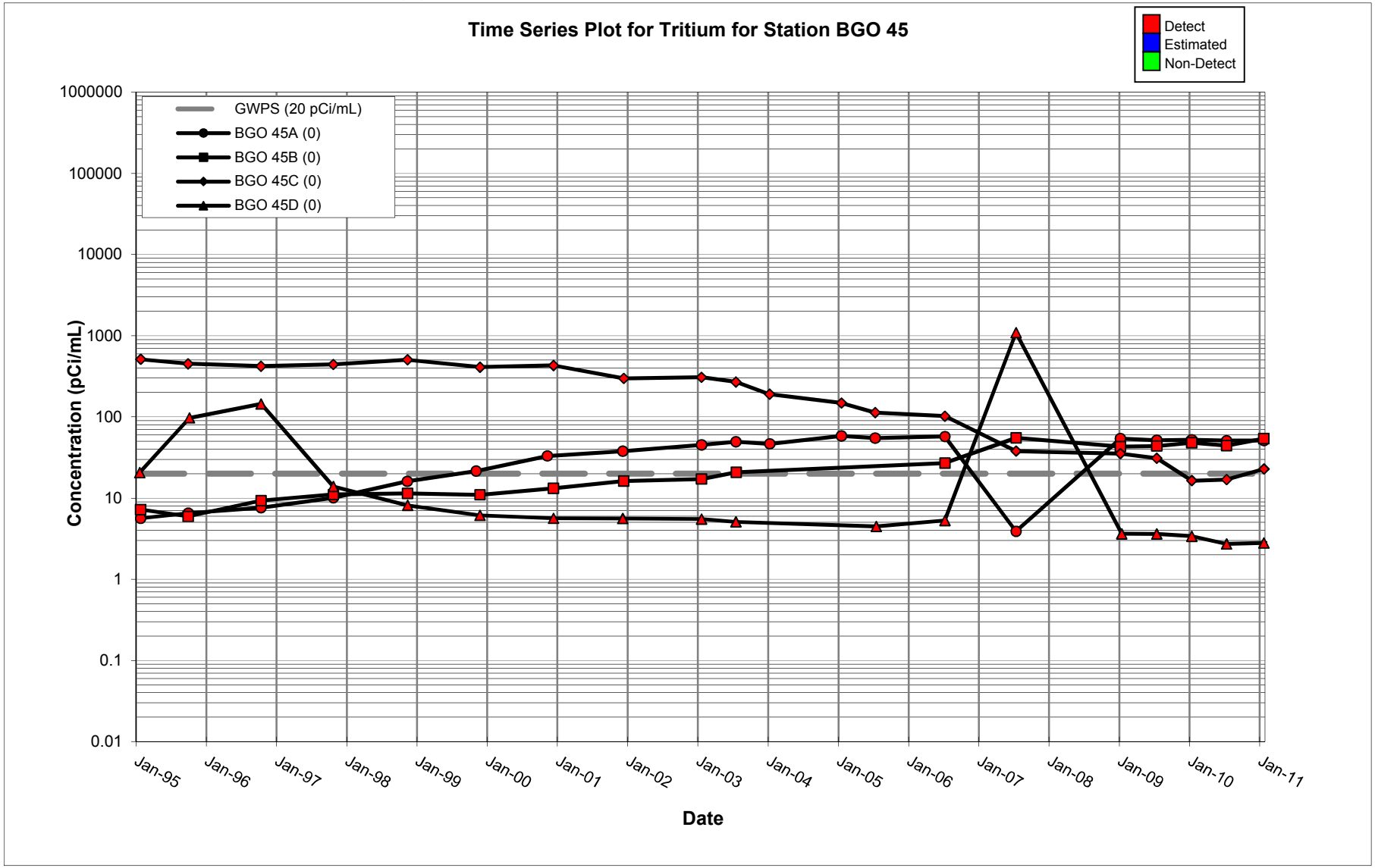

Time Series Plot for Tritium for Station BGO 3
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 3A
BGO 3C
BGO 3D/3DR
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

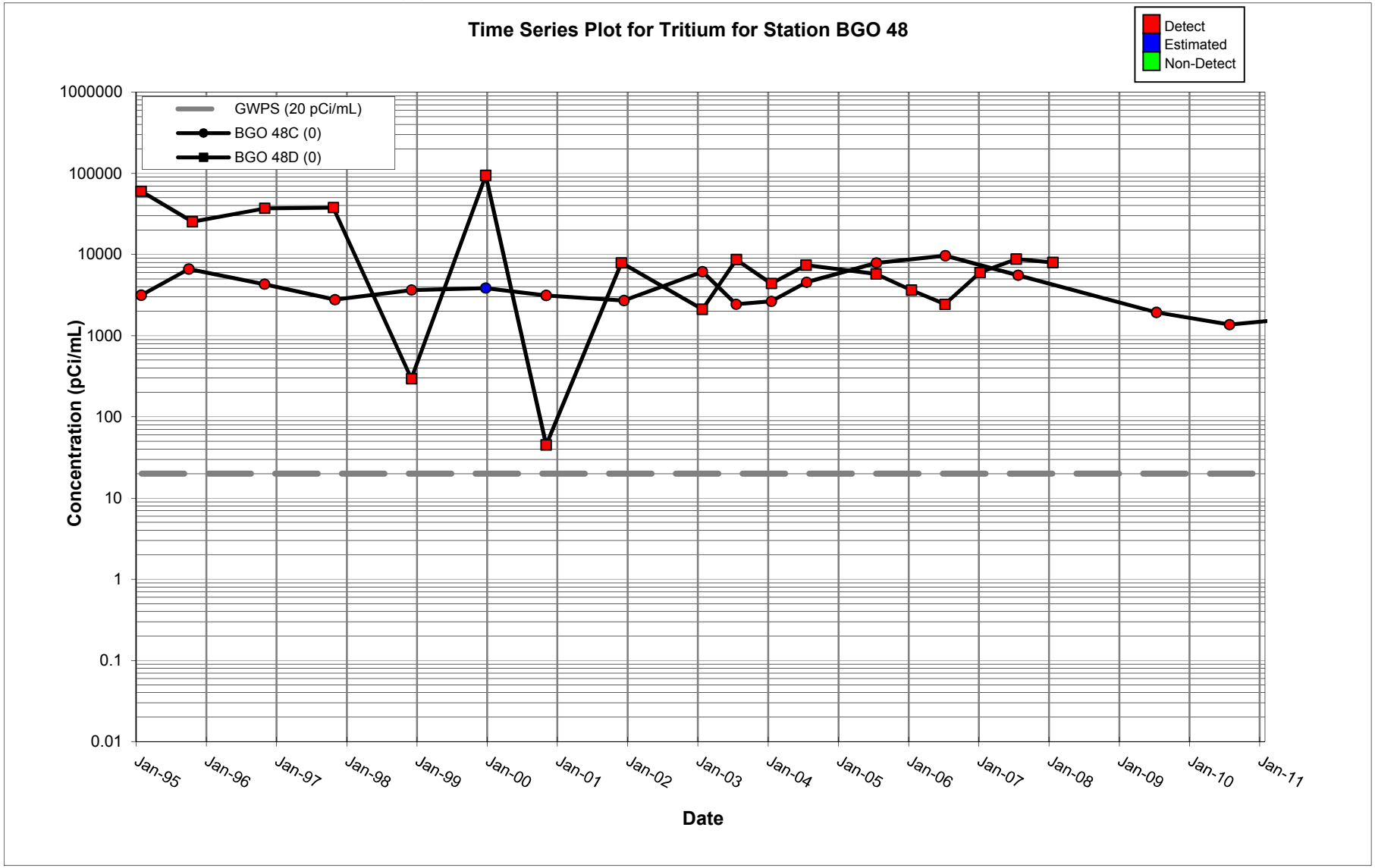

Time Series Plot for Tritium for Station BGO 26
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 26A
BGO 26D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

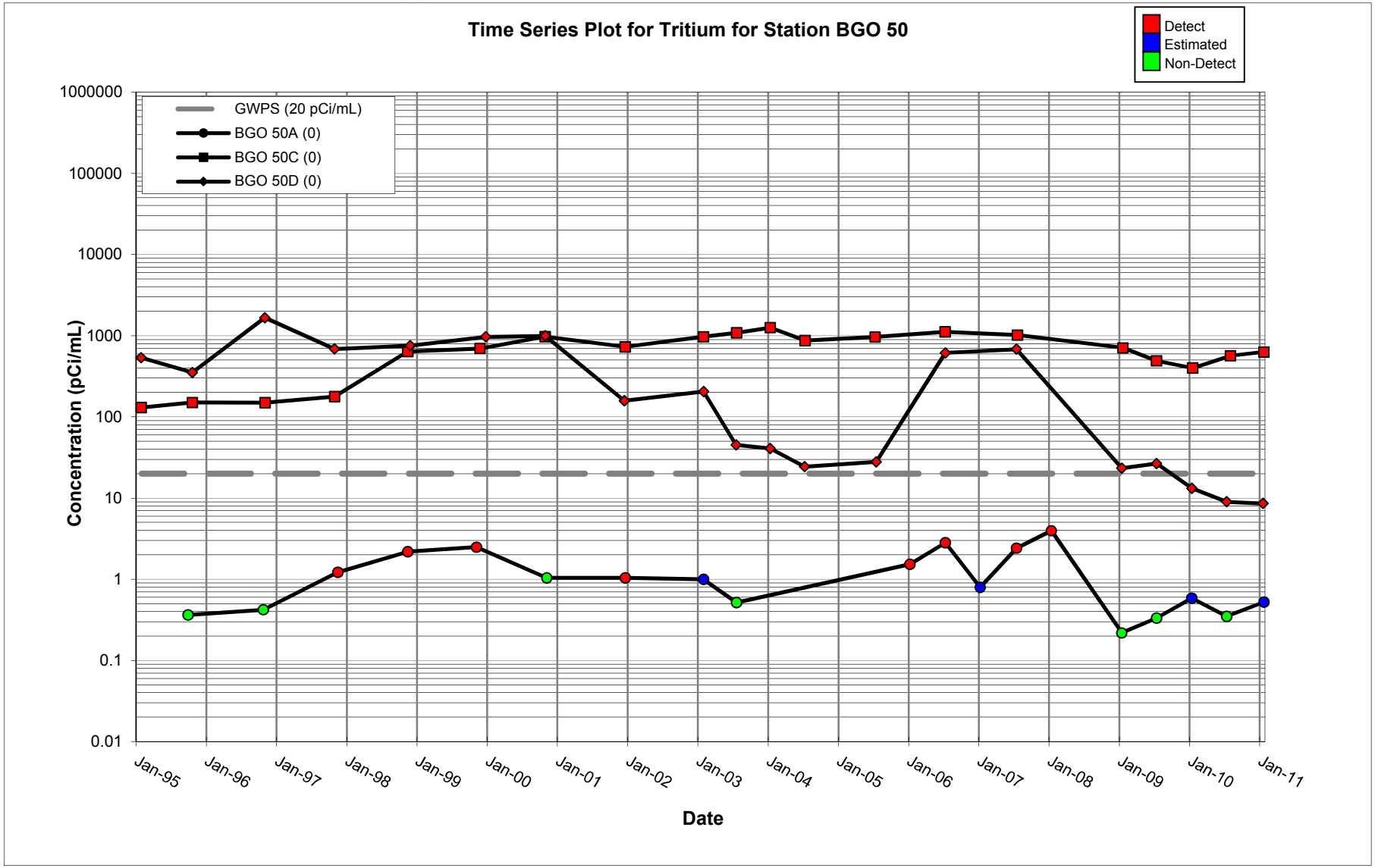

Time Series Plot for Tritium for Station BGO 29
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 29A (0)
BGO 29C (0)
BGO 29D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

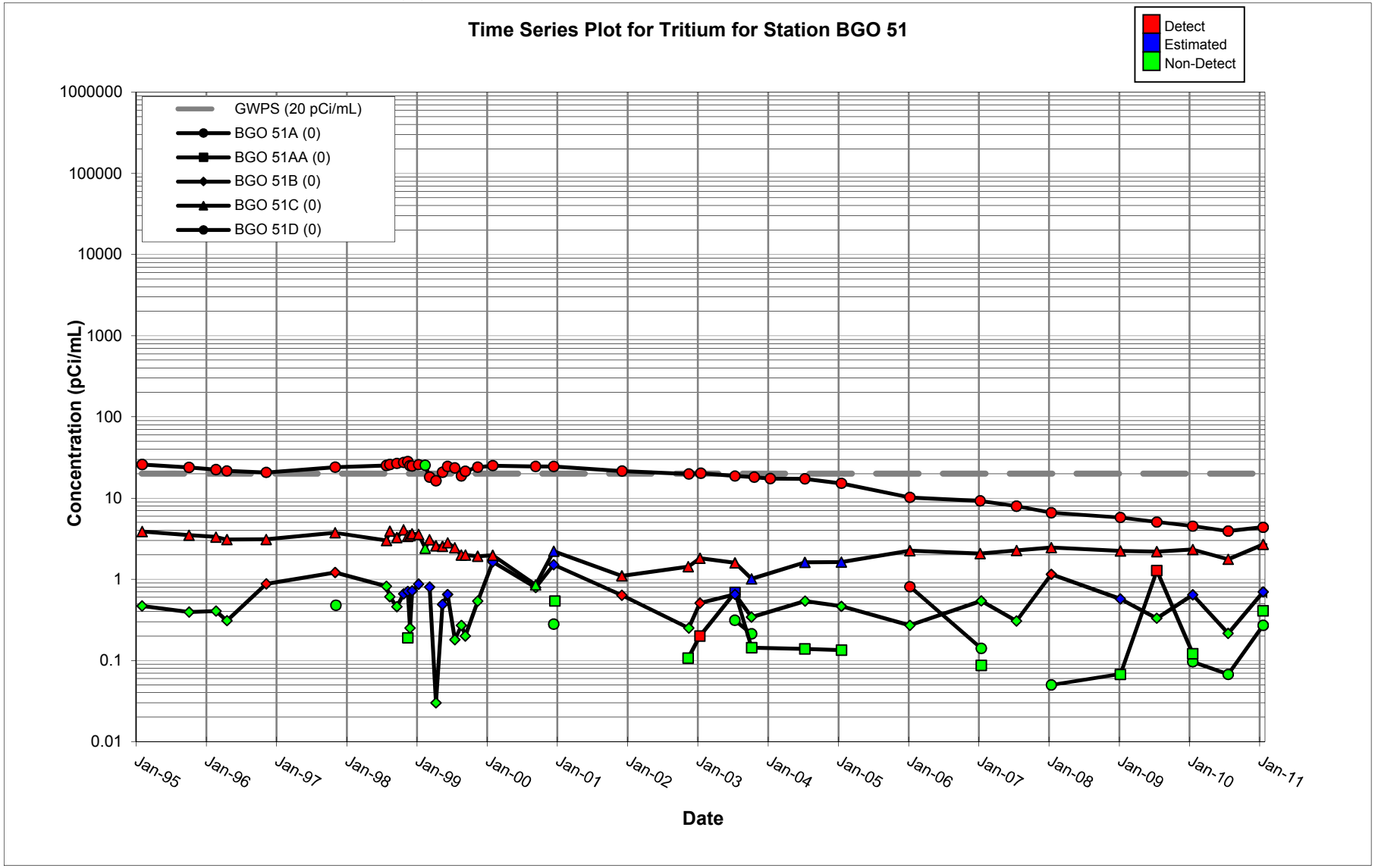

Time Series Plot for Tritium for Station BGO 37
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 37C
BGO 37D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

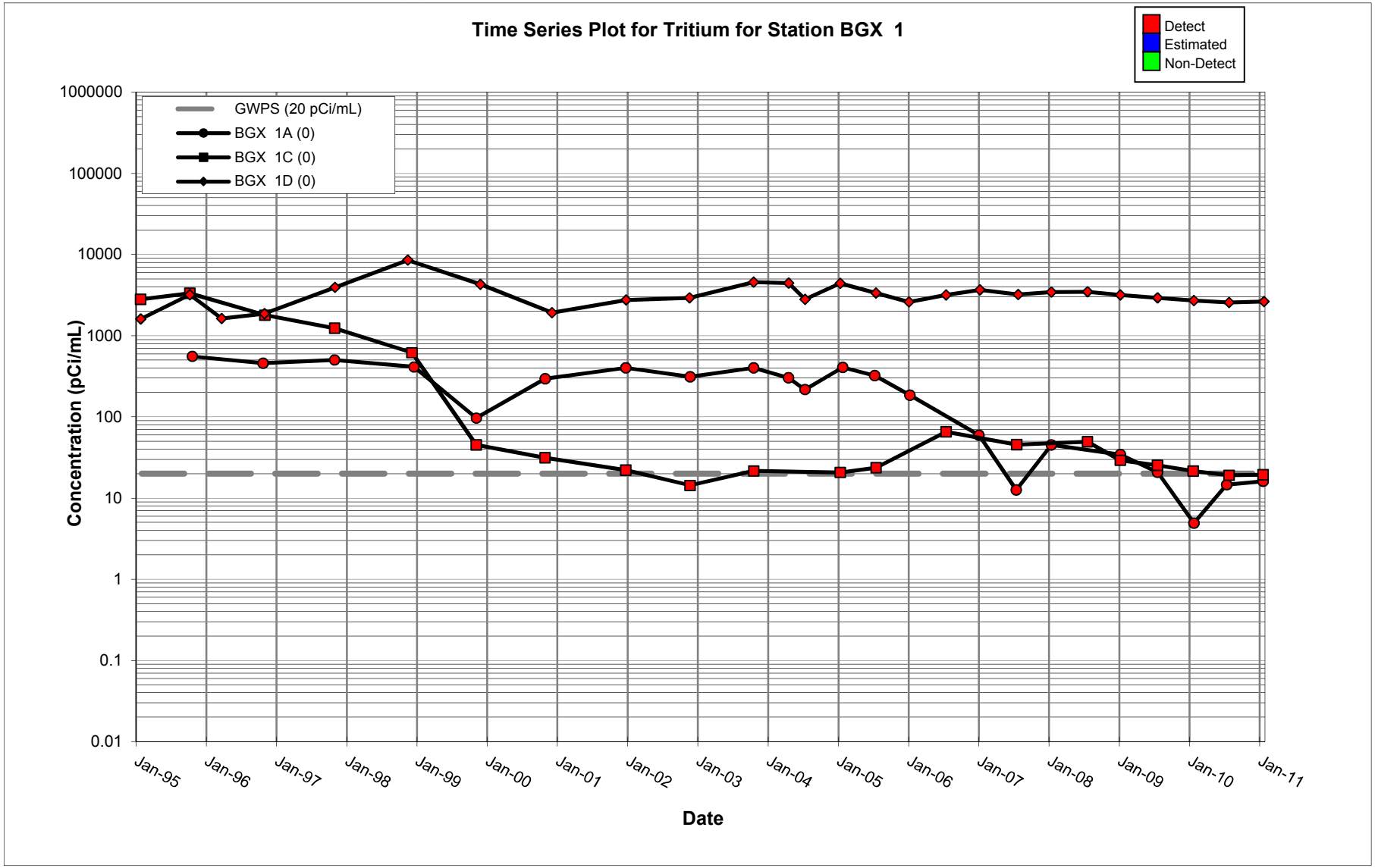

Time Series Plot for Tritium for Station BGO 41
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 41A (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

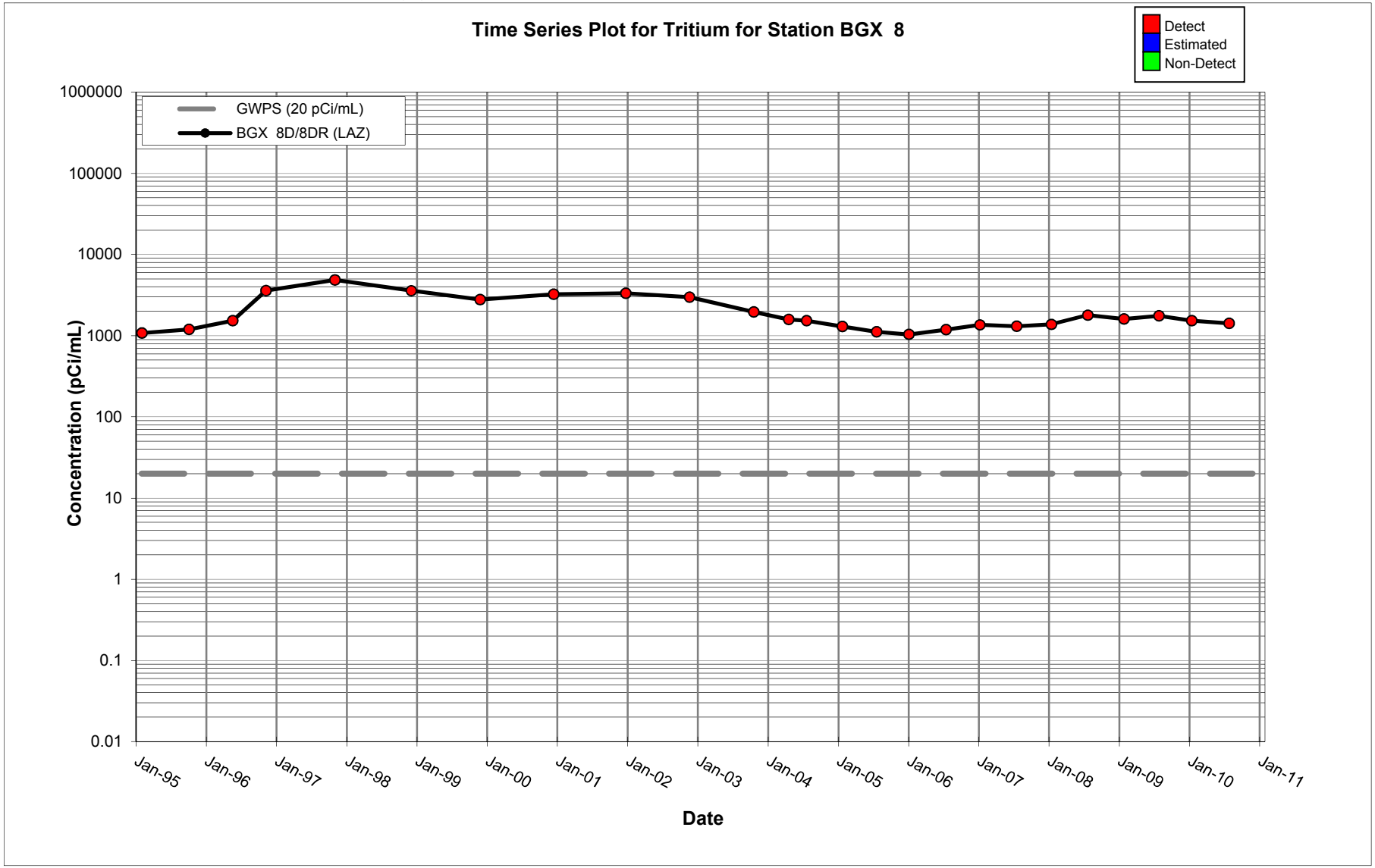

Time Series Plot for Tritium for Station BGO 45
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 45A (0)
BGO 45B (0)
BGO 45C (0)
BGO 45D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

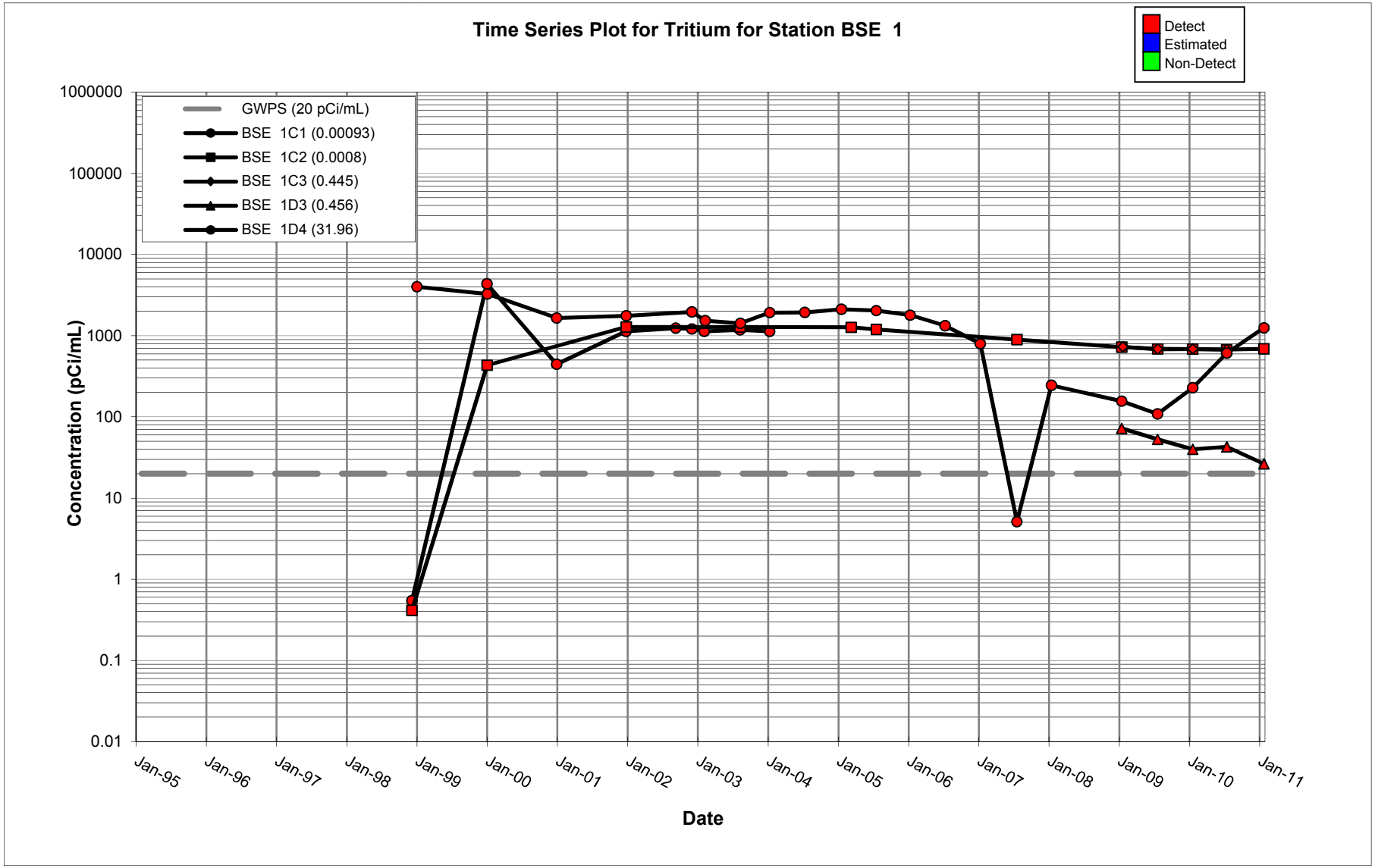

Time Series Plot for Tritium for Station BGO 48
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 48C (0)
BGO 48D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

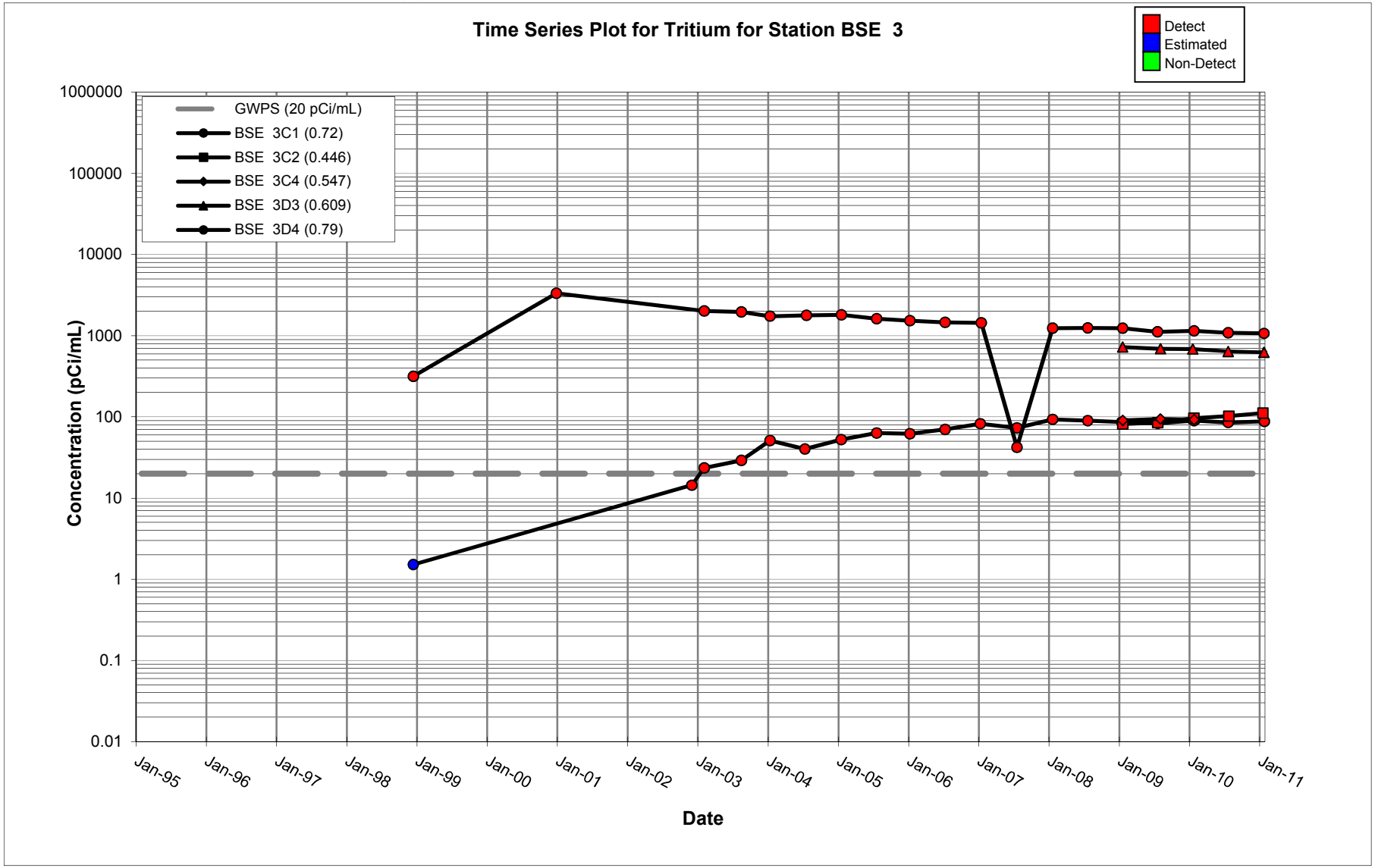

Time Series Plot for Tritium for Station BGO 50
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 50A (0)
BGO 50C (0)
BGO 50D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

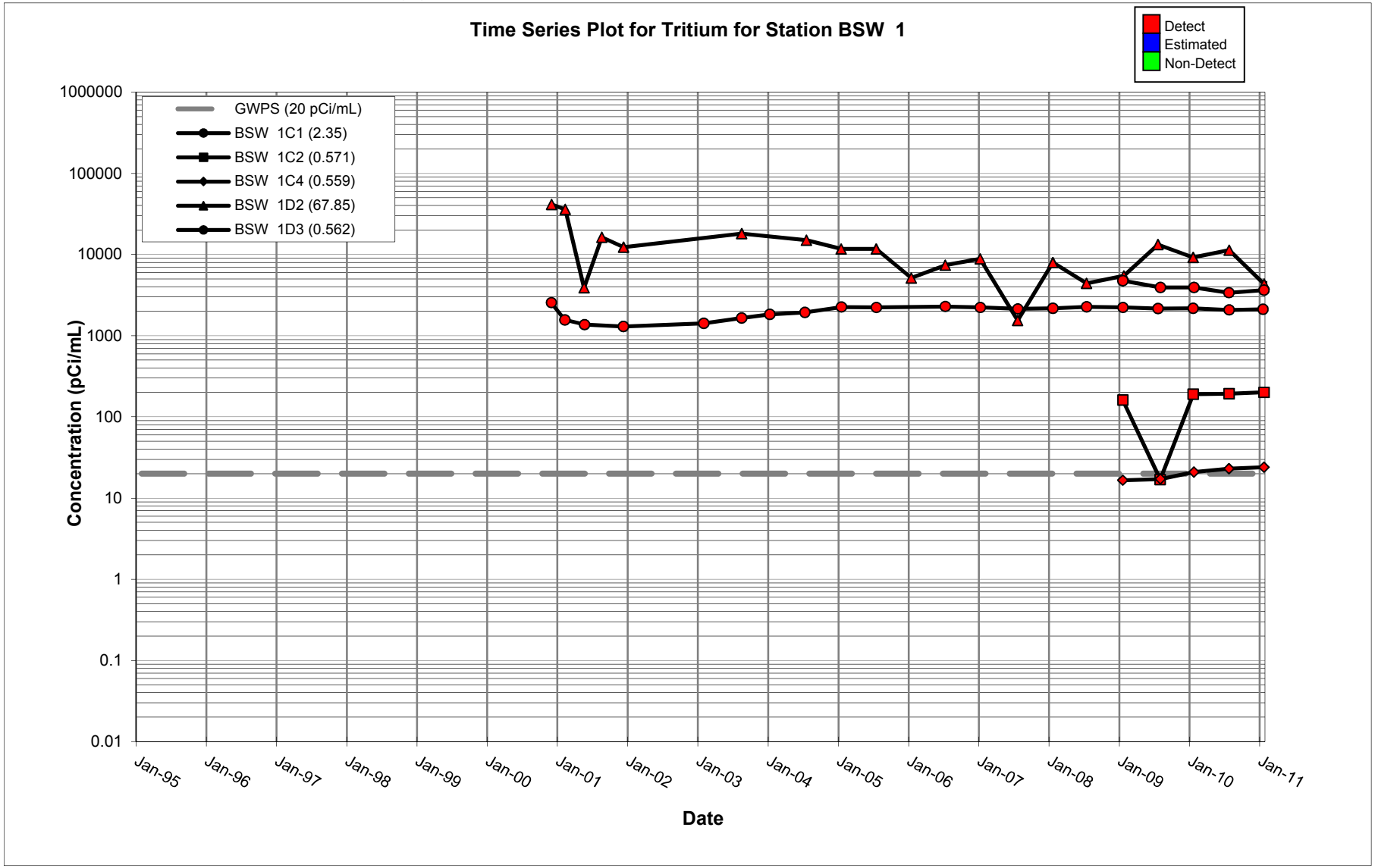

Time Series Plot for Tritium for Station BGO 51
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGO 51A (0)
BGO 51AA (0)
BGO 51B (0)
BGO 51C (0)
BGO 51D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

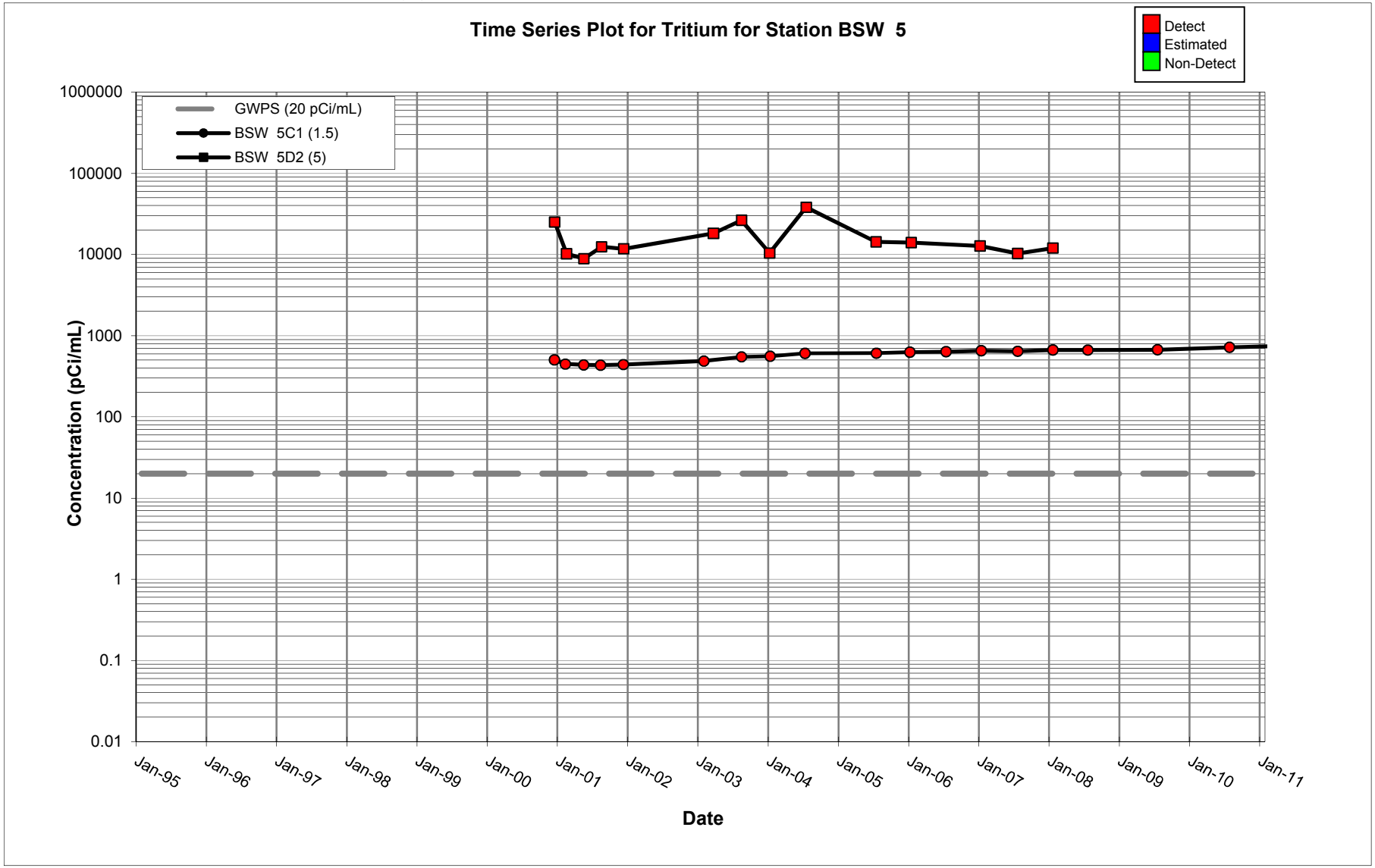

Time Series Plot for Tritium for Station BGX 1
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGX 1A (0)
BGX 1C (0)
BGX 1D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

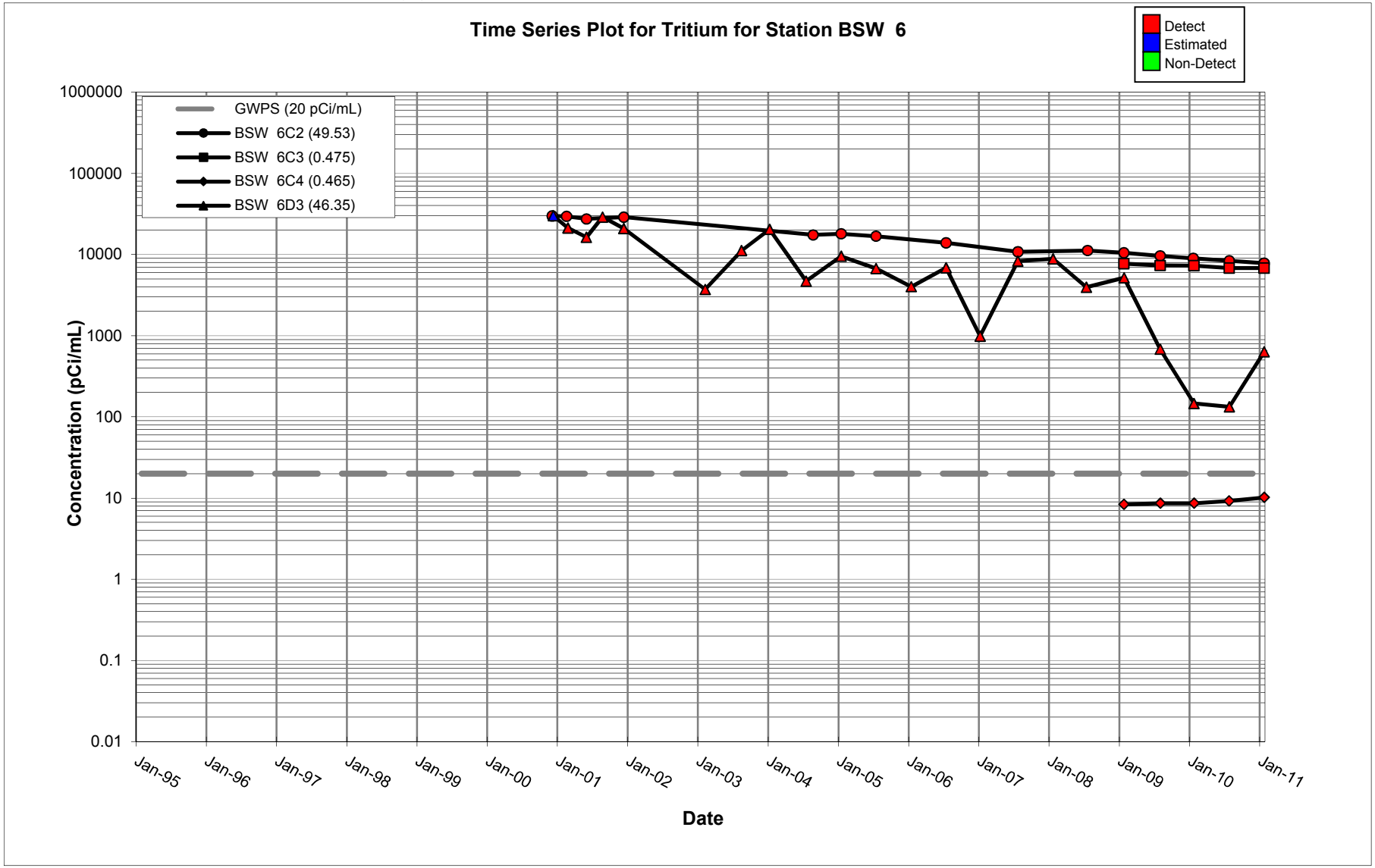

Time Series Plot for Tritium for Station BGX 8
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BGX 8D/8DR (LAZ)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

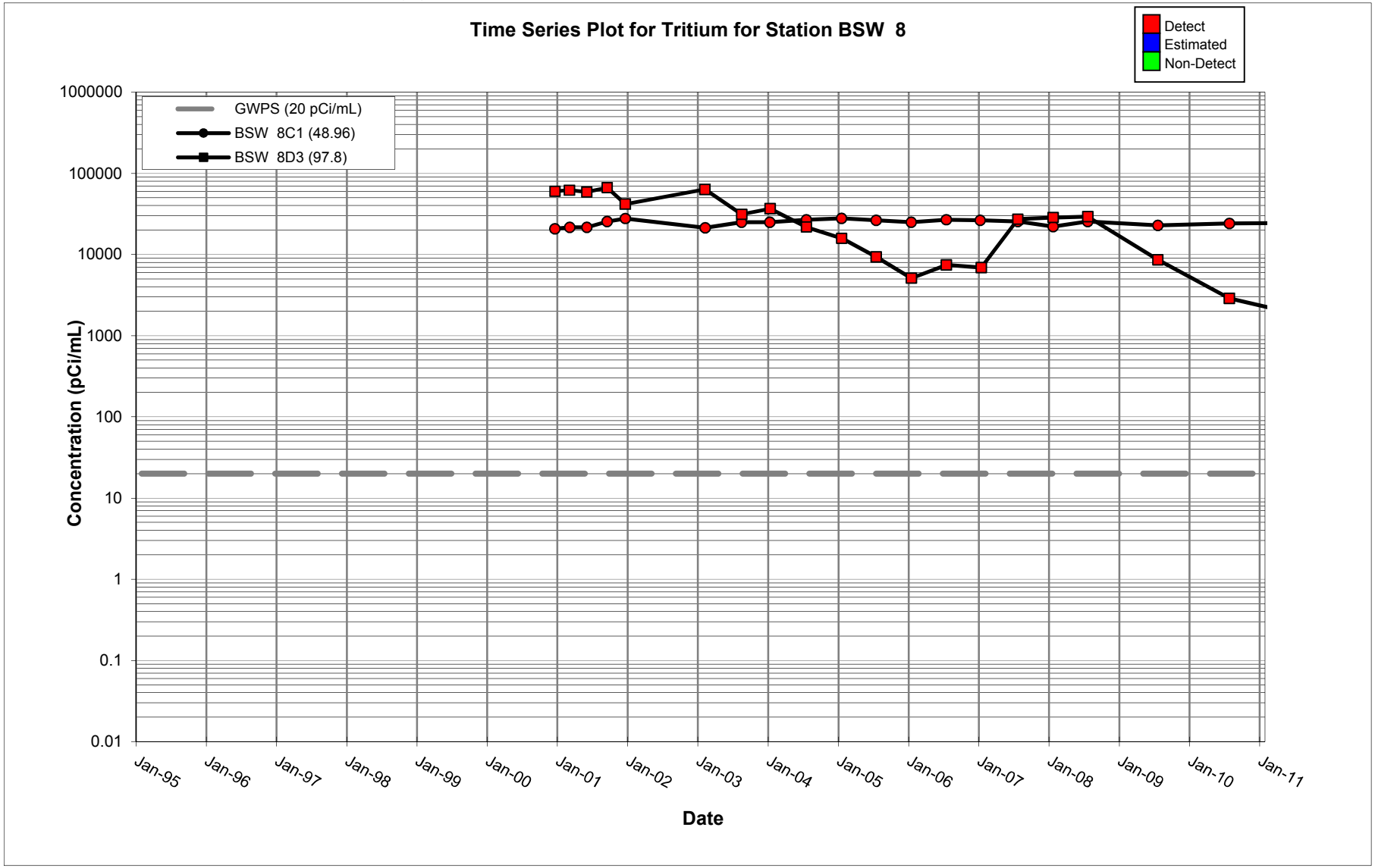

Time Series Plot for Tritium for Station BSE 1
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BSE 1C1 (0.00093)
BSE 1C2 (0.0008)
BSE 1C3 (0.445)
BSE 1D3 (0.456)
BSE 1D4 (31.96)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

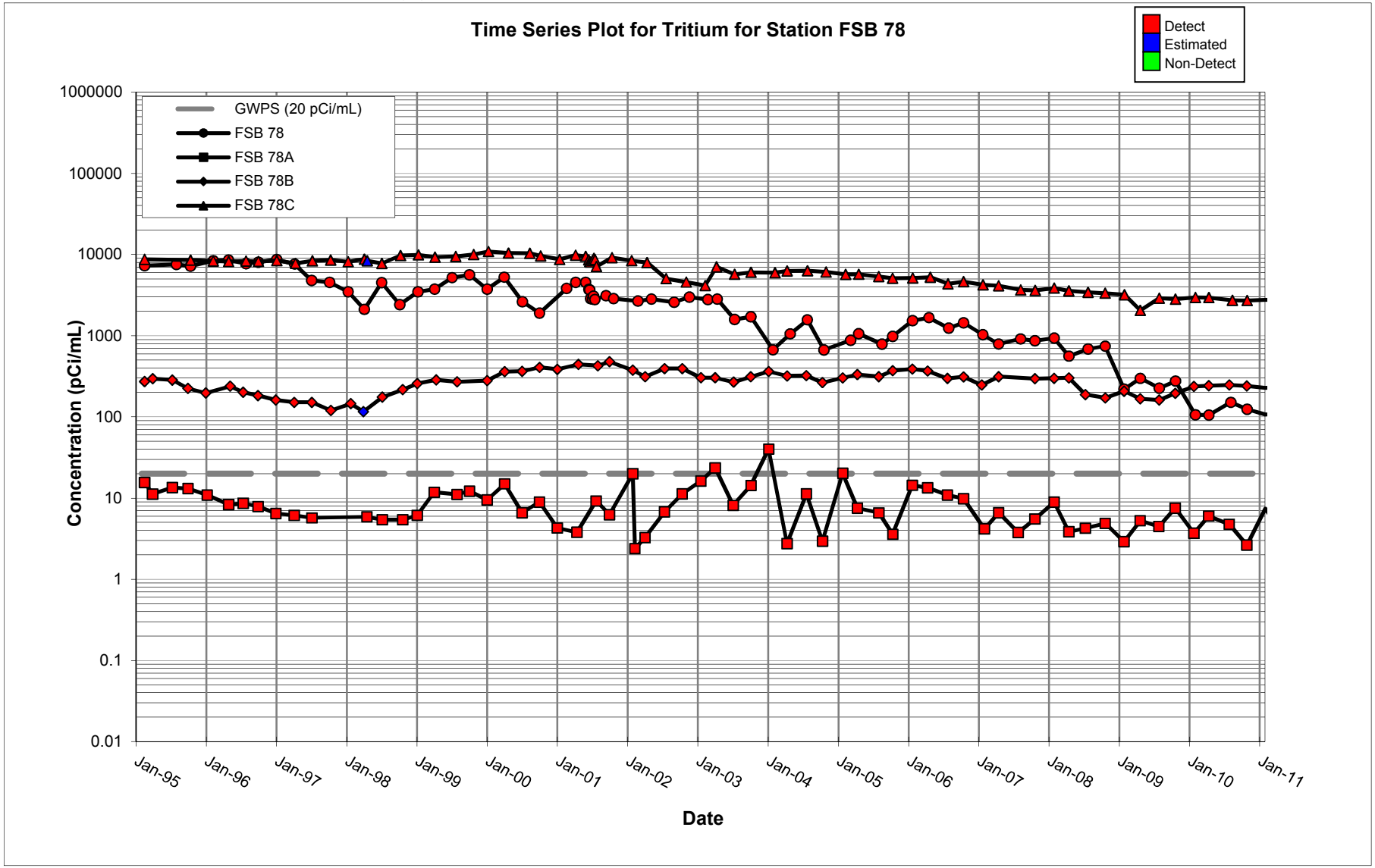

Time Series Plot for Tritium for Station BSE 3
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BSE 3C1 (0.72)
BSE 3C2 (0.446)
BSE 3C4 (0.547)
BSE 3D3 (0.609)
BSE 3D4 (0.79)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

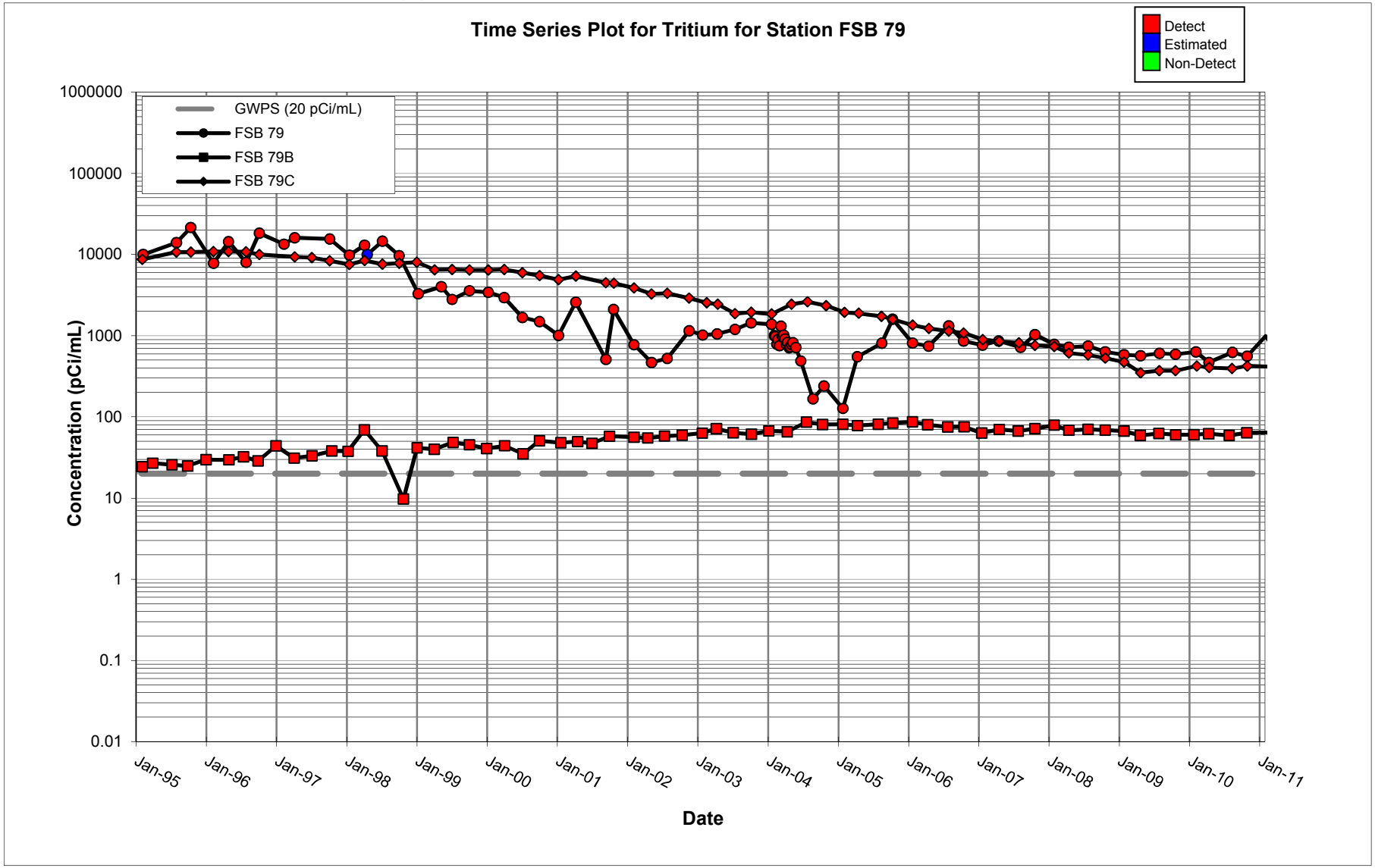

Time Series Plot for Tritium for Station BSW 1
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BSW 1C1 (2.35)
BSW 1C2 (0.571)
BSW 1C4 (0.559)
BSW 1D2 (67.85)
BSW 1D3 (0.562)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

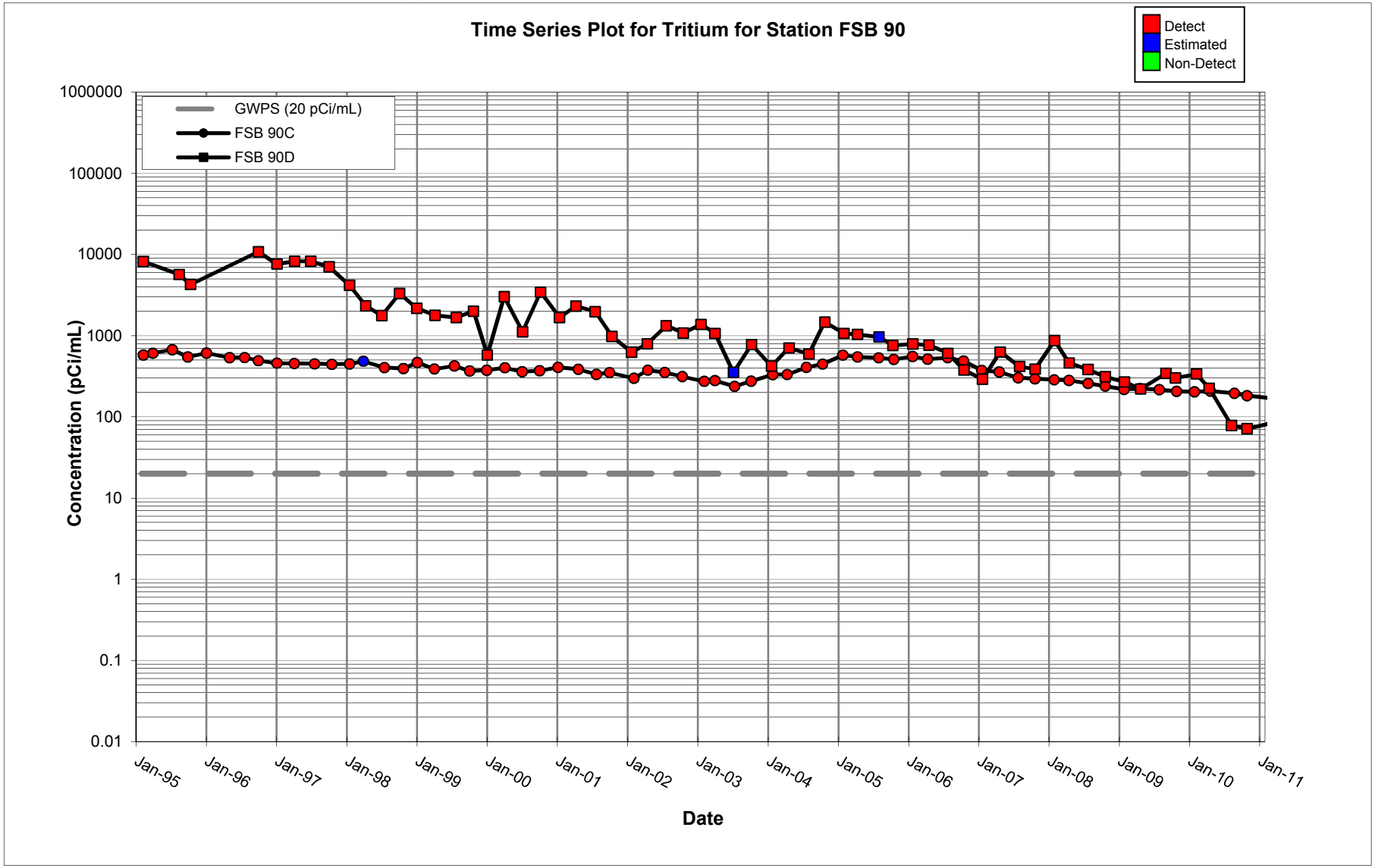

Time Series Plot for Tritium for Station BSW 5
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BSW 5C1 (1.5)
BSW 5D2 (5)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

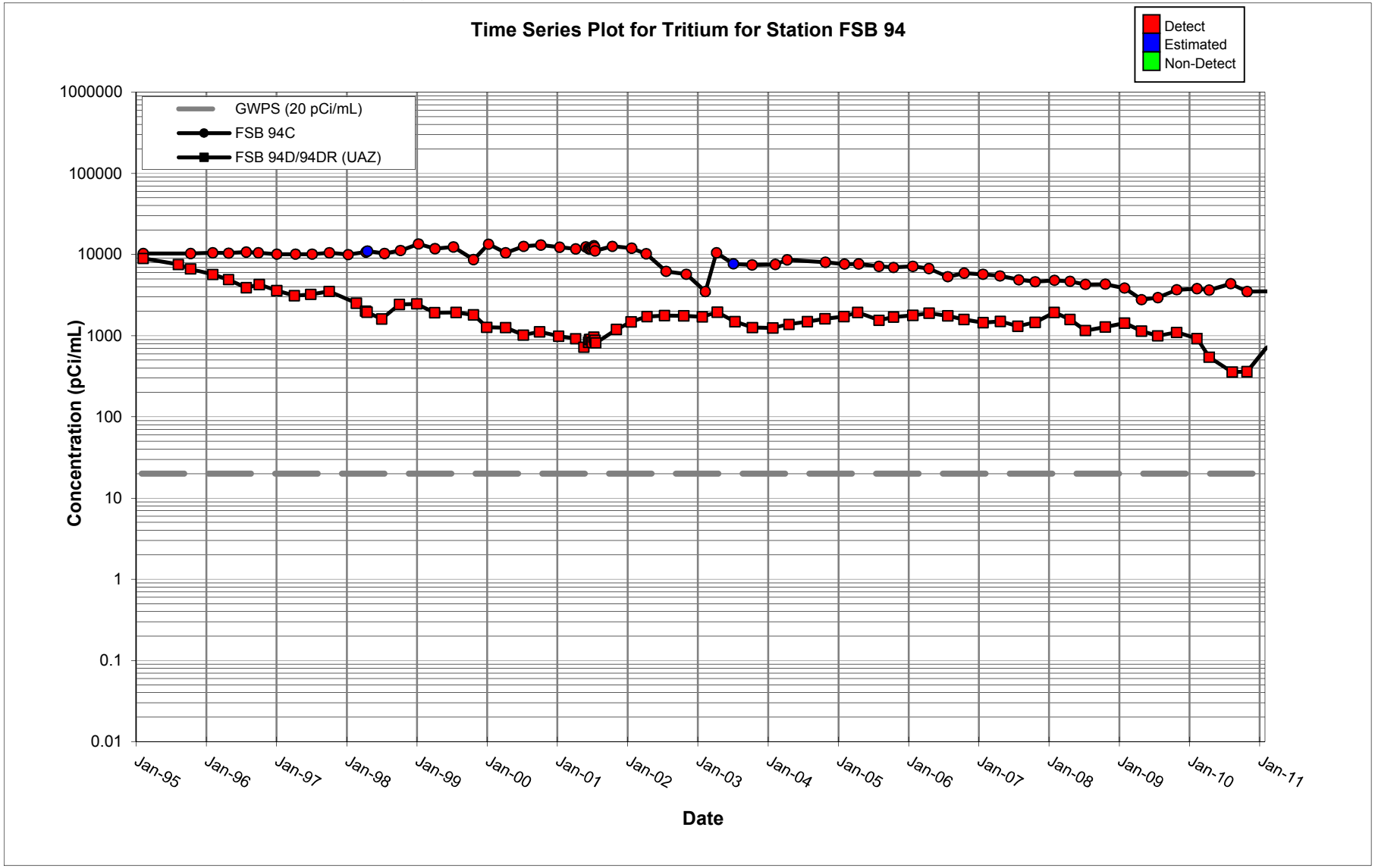

Time Series Plot for Tritium for Station BSW 6
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BSW 6C2 (49.53)
BSW 6C3 (0.475)
BSW 6C4 (0.465)
BSW 6D3 (46.35)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

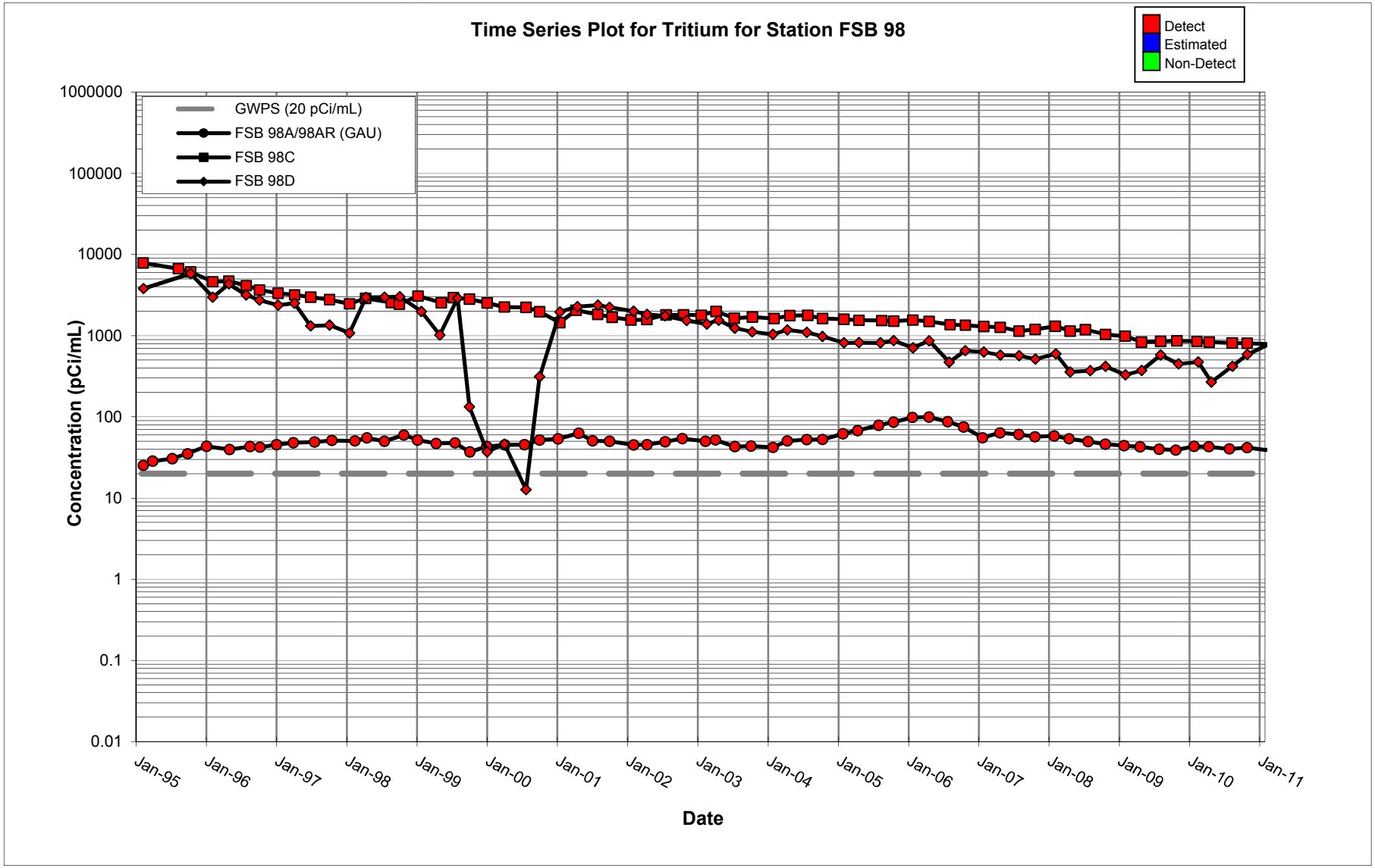

Time Series Plot for Tritium for Station BSW 8
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
BSW 8C1 (48.96)
BSW 8D3 (97.8)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

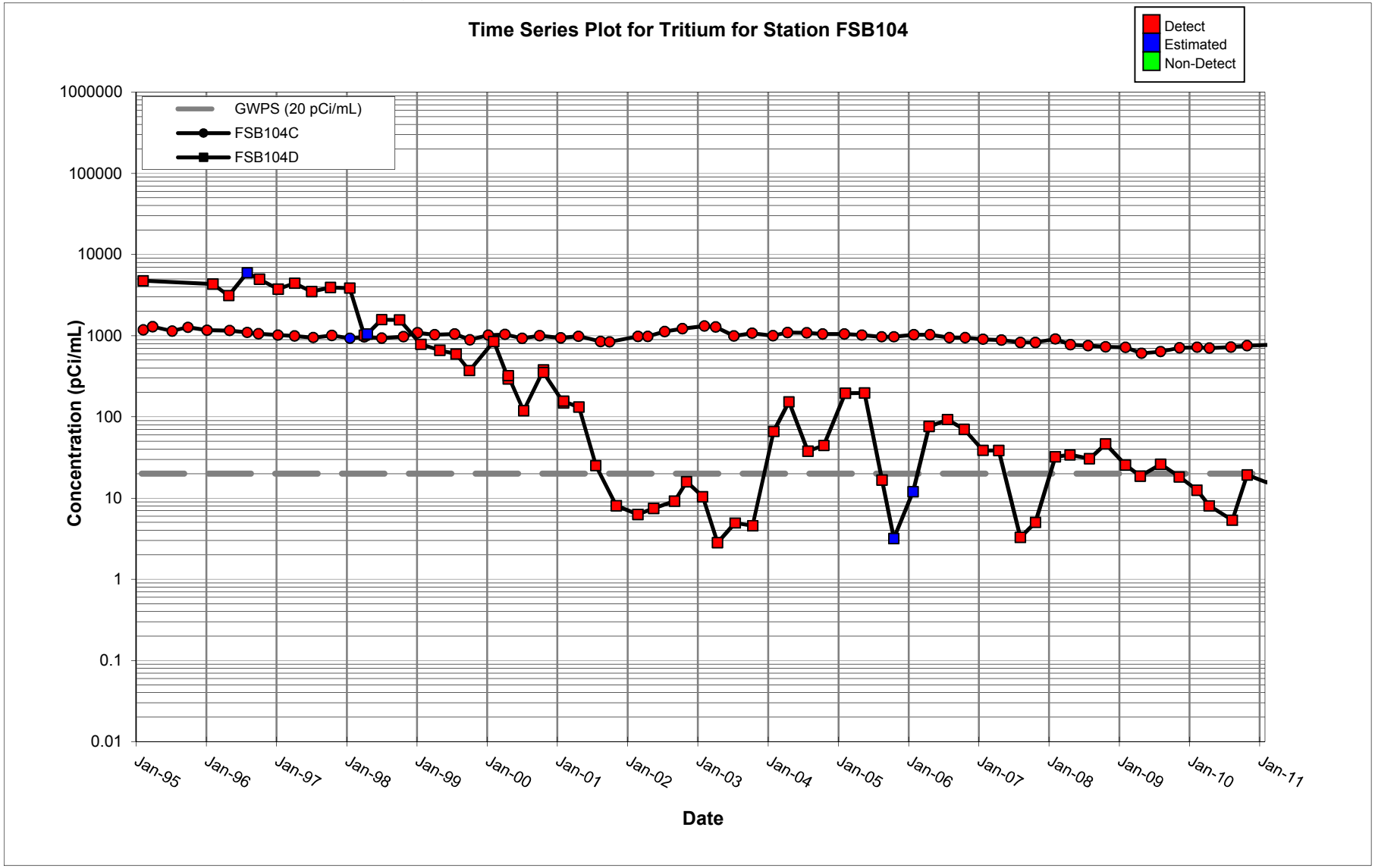

Time Series Plot for Tritium for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB 78
FSB 78A
FSB 78B
FSB 78C
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

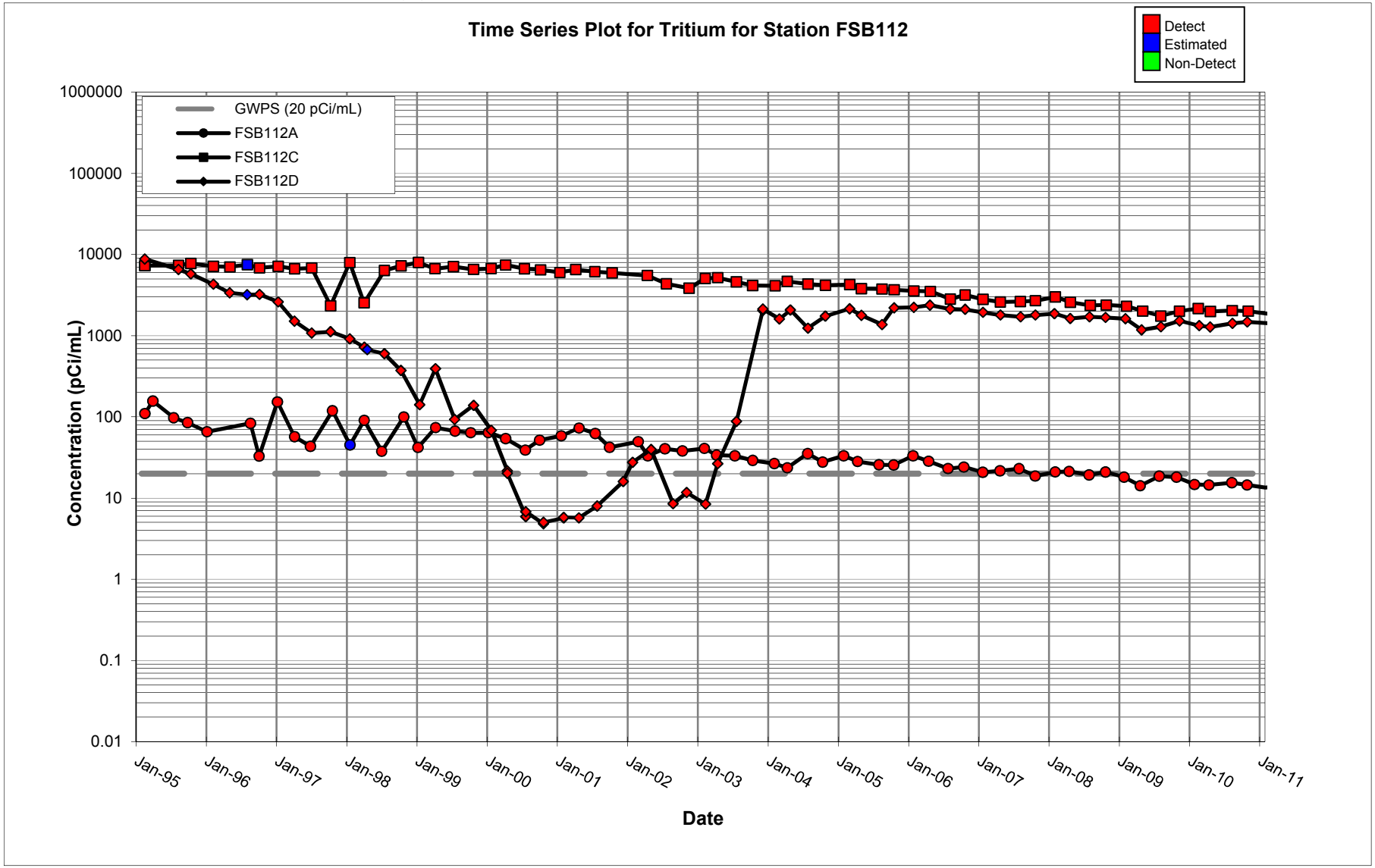

Time Series Plot for Tritium for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB 79
FSB 79B
FSB 79C
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

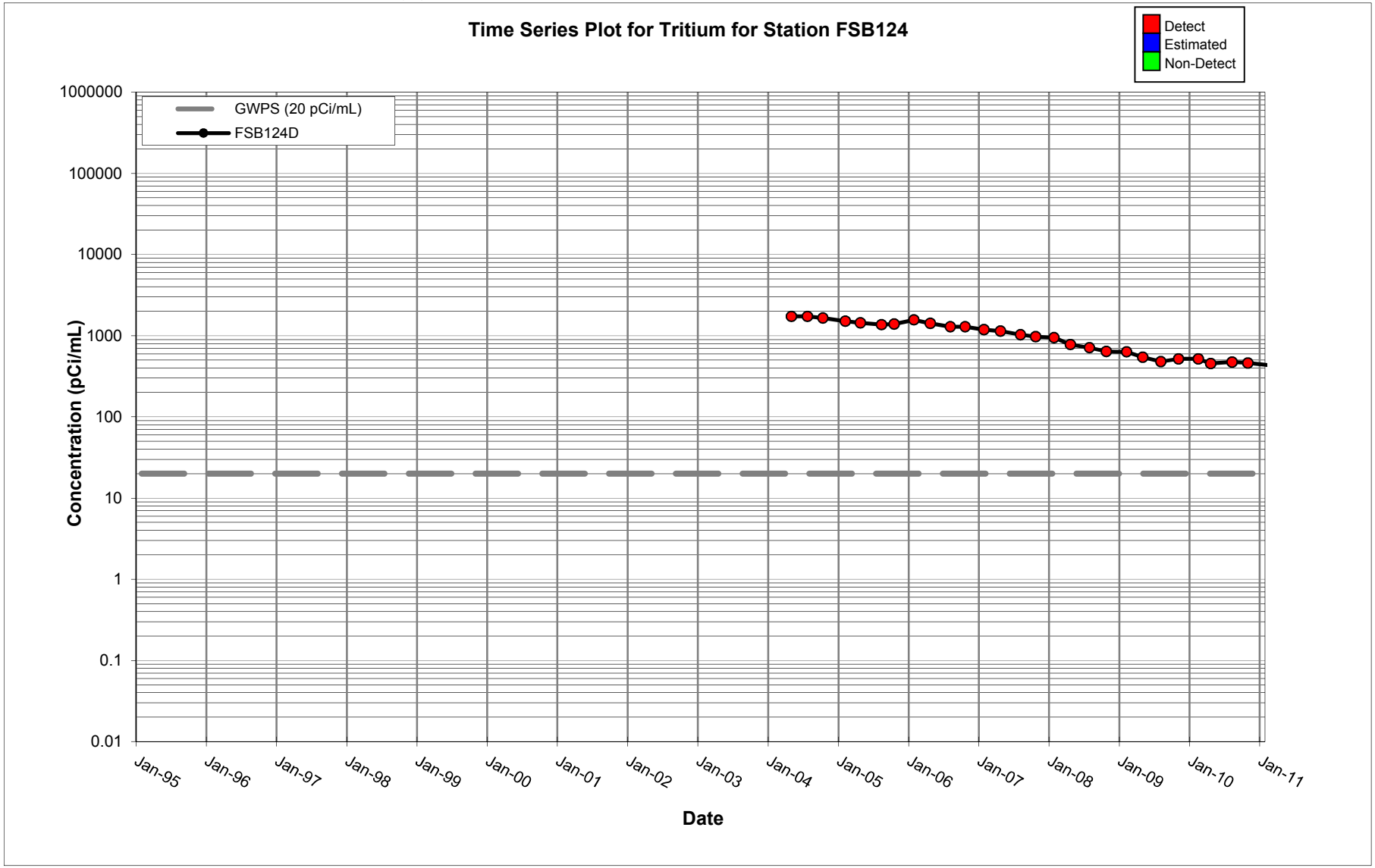

Time Series Plot for Tritium for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB 90C
FSB 90D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

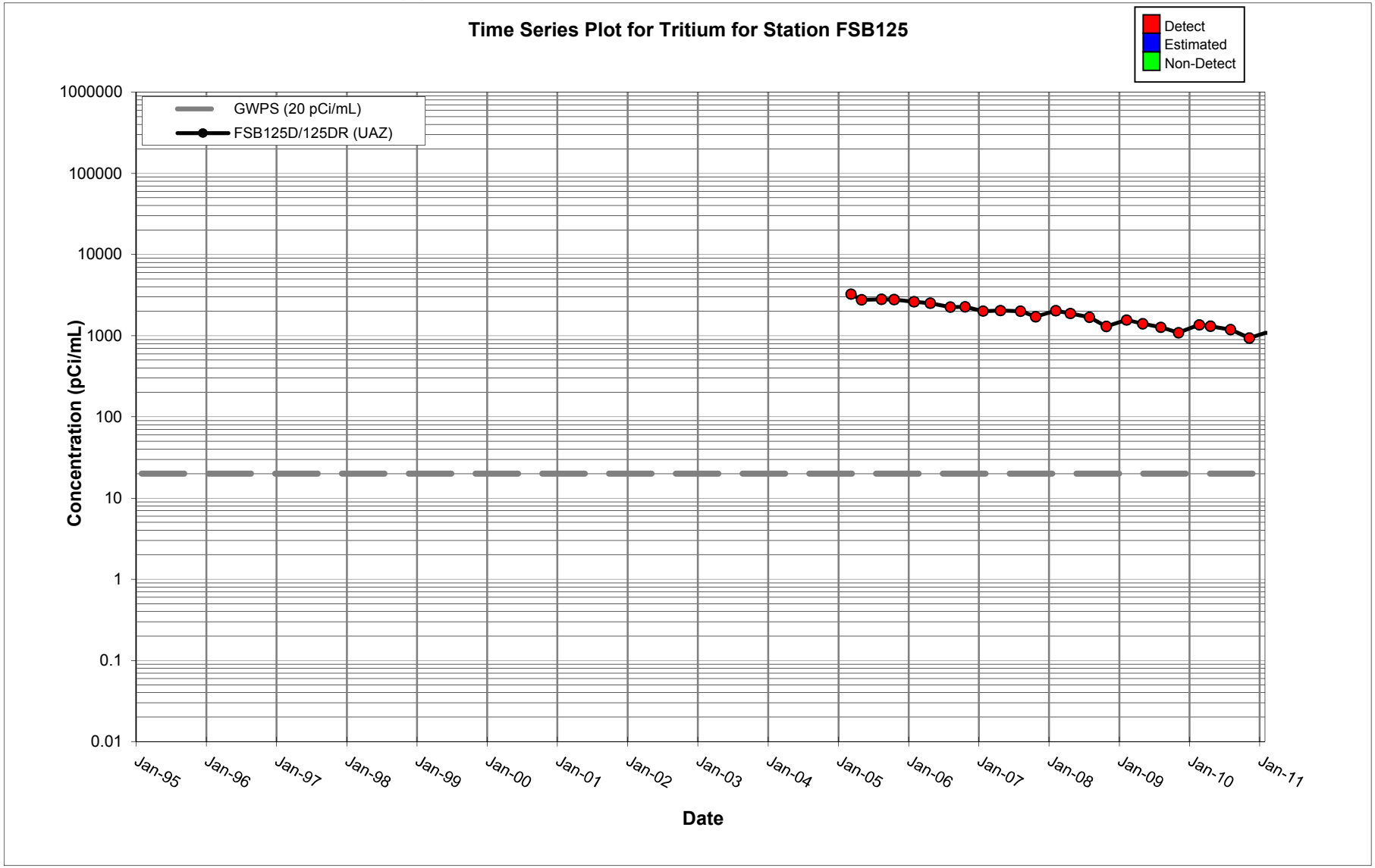

Time Series Plot for Tritium for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB 94C
FSB 94D/94DR (UAZ)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

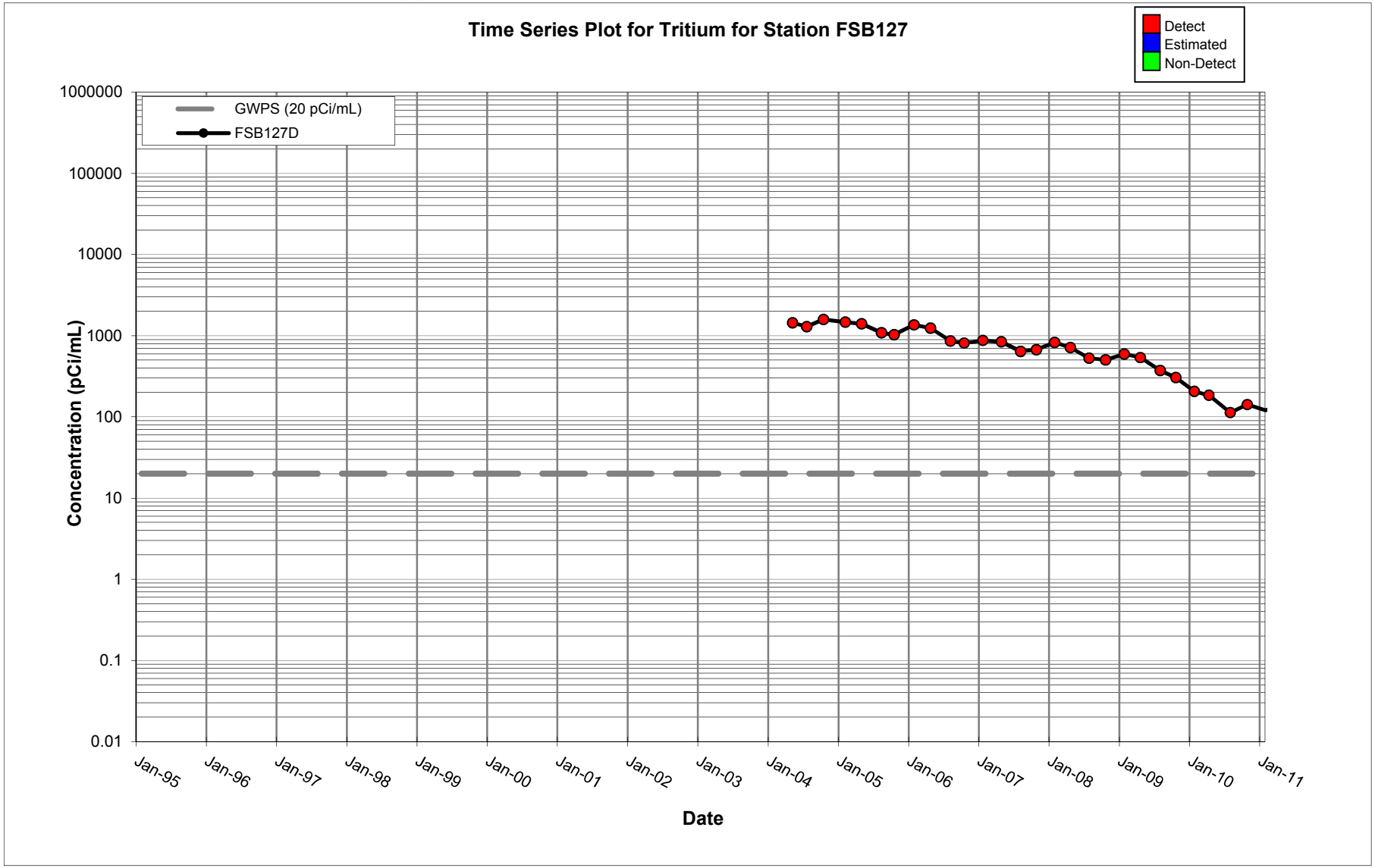

Time Series Plot for Tritium for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
1000000
100000
10000
1000
100
10
1
0.1
0.01
Concentration (pCi/mL)
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

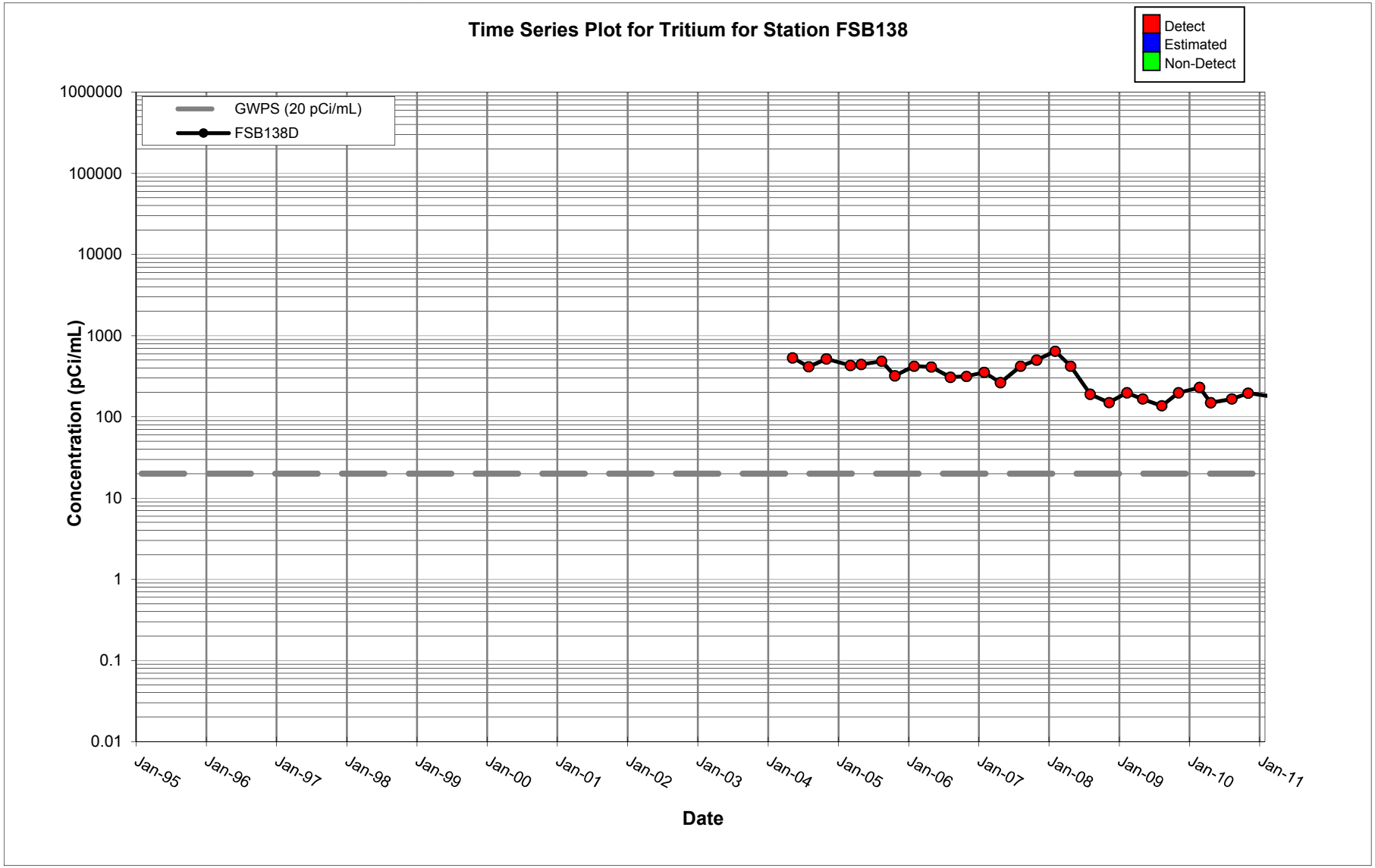

Time Series Plot for Tritium for Station FSB104
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB104C
FSB104D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

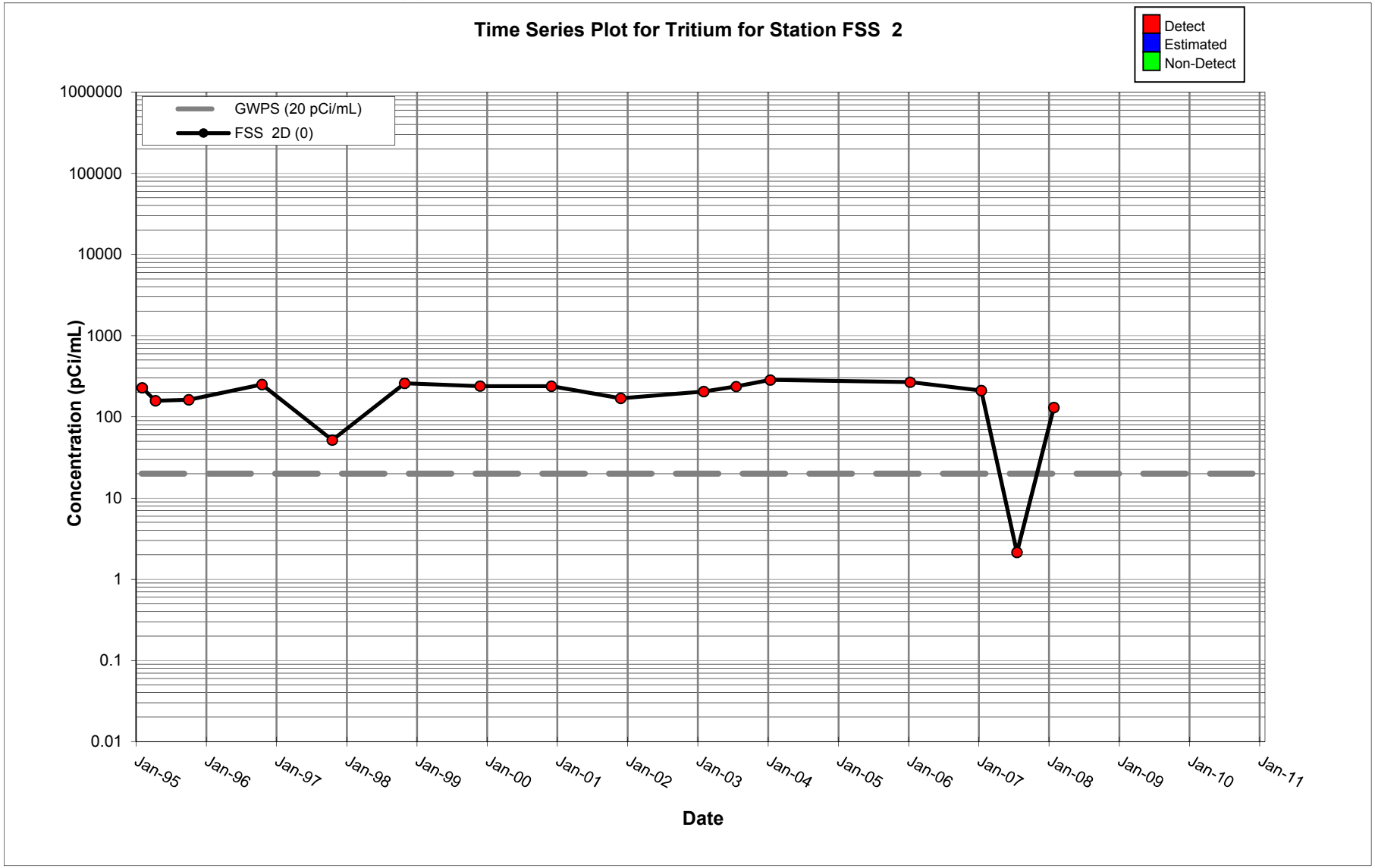

Time Series Plot for Tritium for Station FSB112
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB112A
FSB112C
FSB112D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

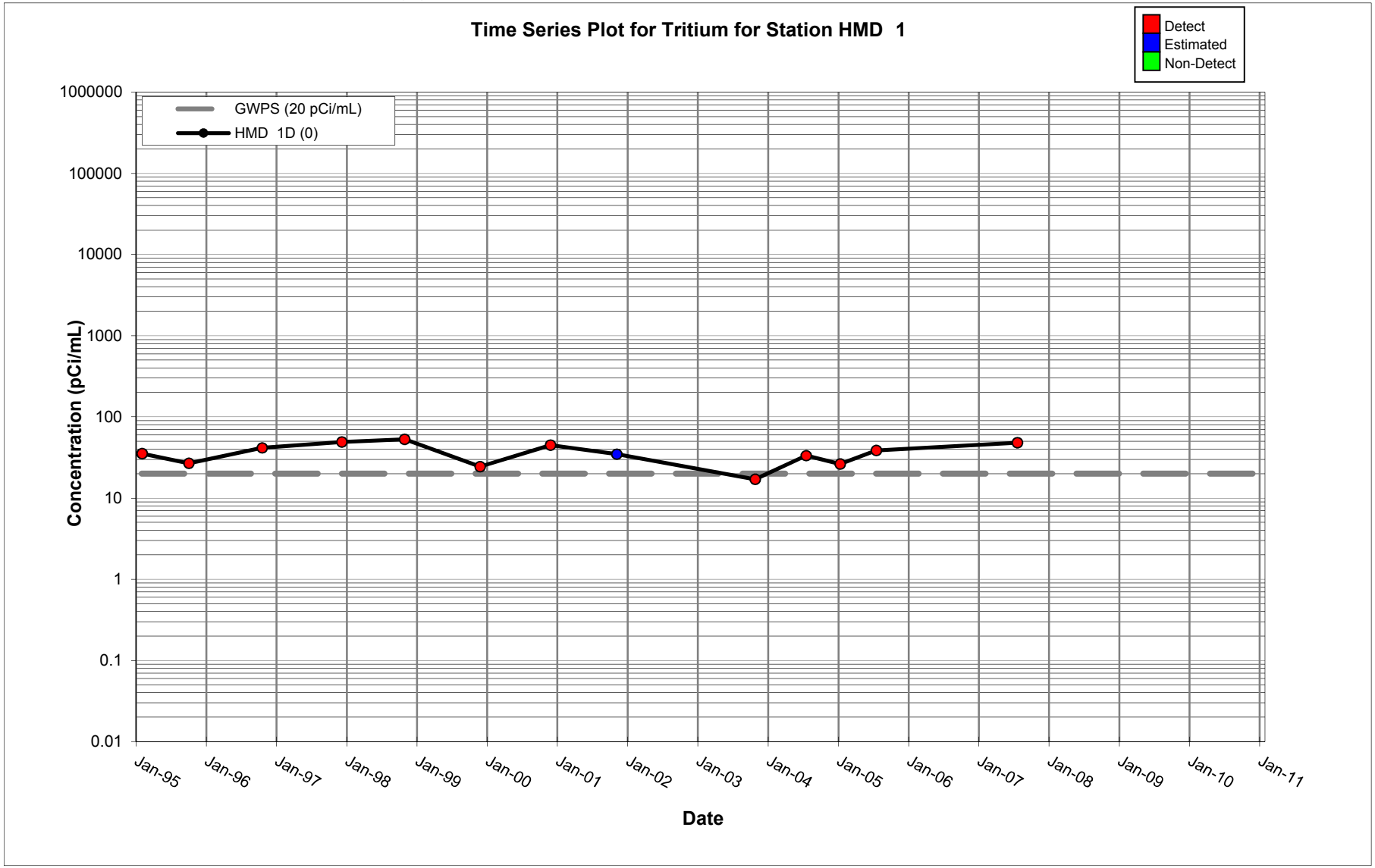

Time Series Plot for Tritium for Station FSB124
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB124D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

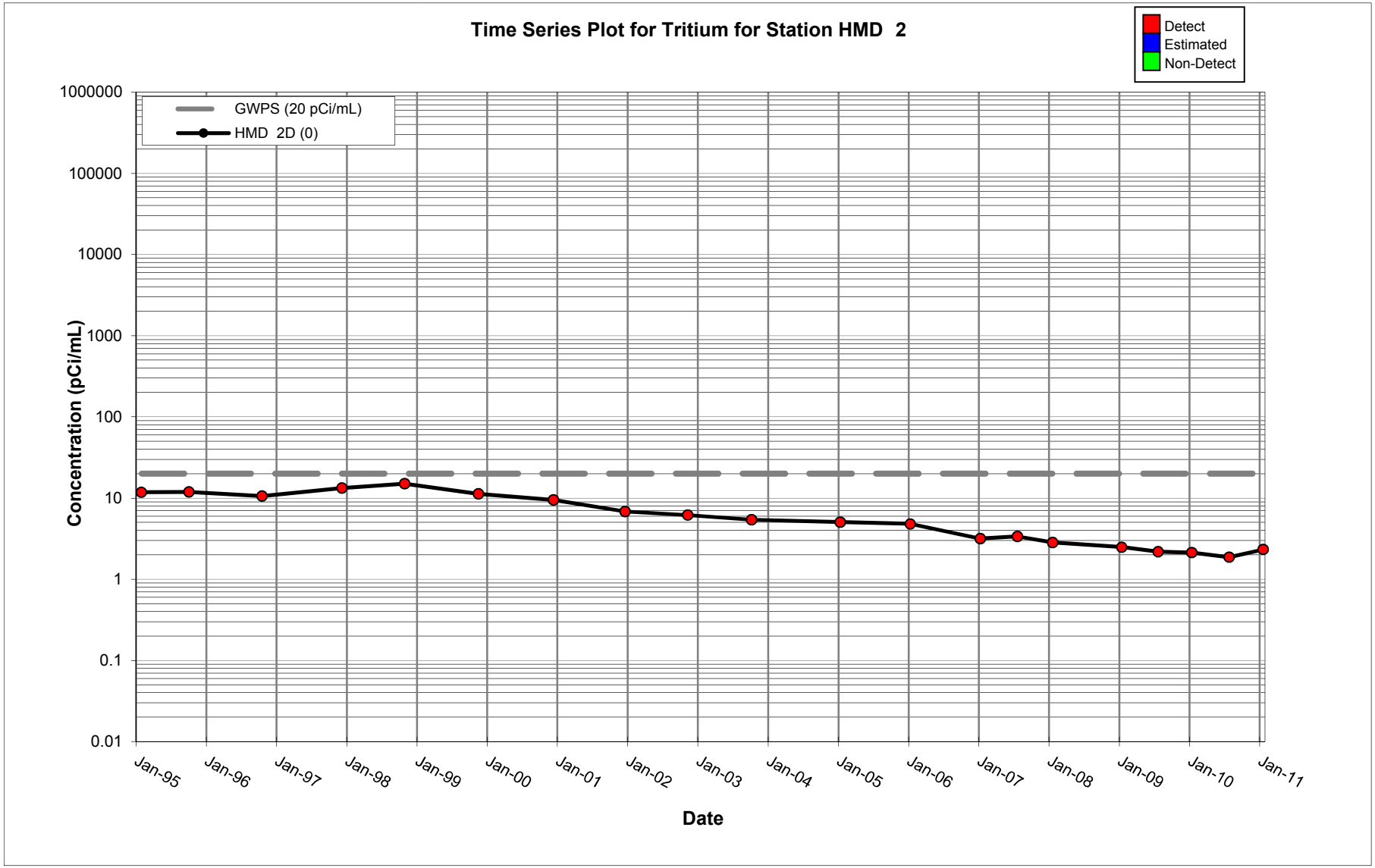

Time Series Plot for Tritium for Station FSB125
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB125D/125DR (UAZ)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

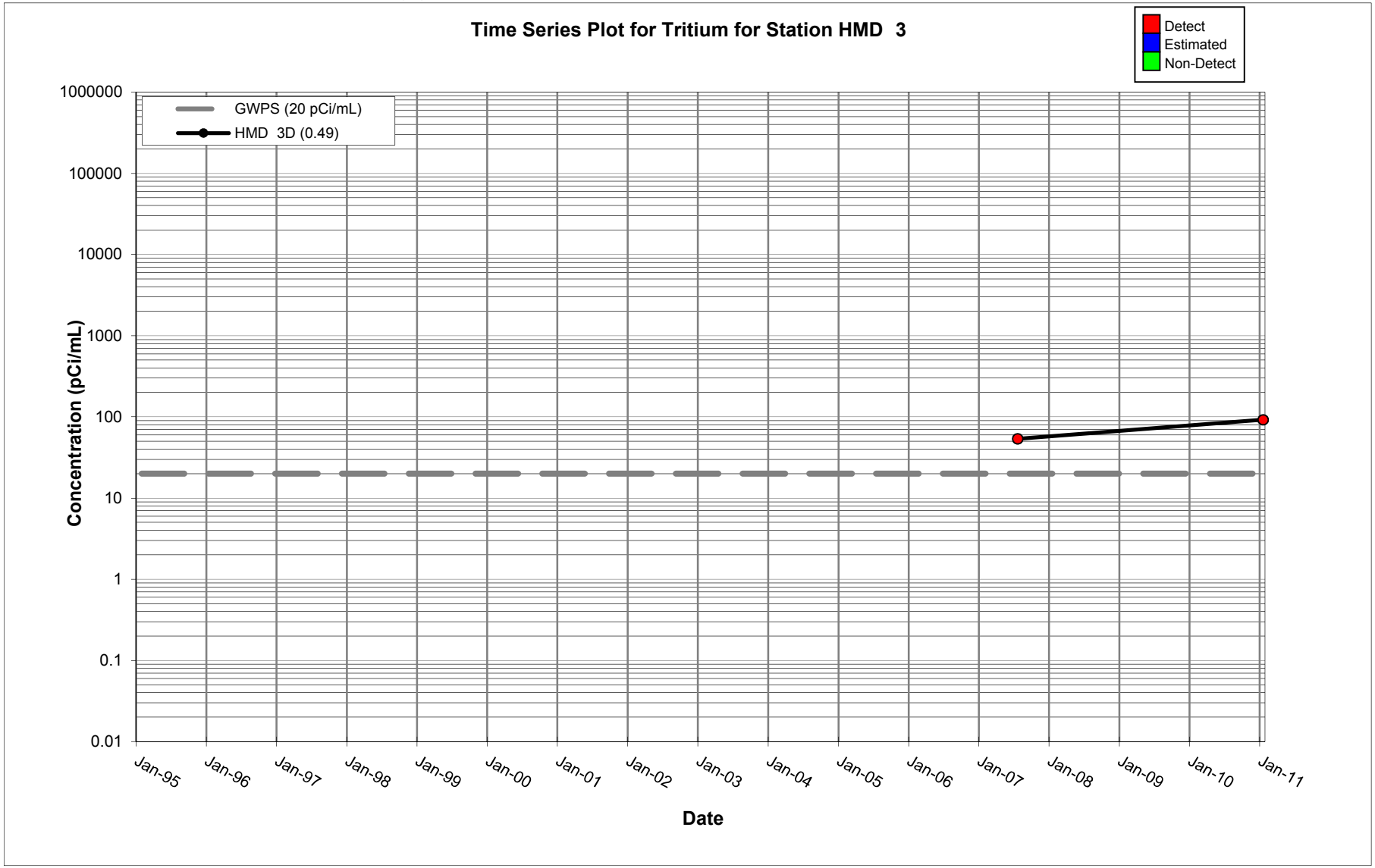

Time Series Plot for Tritium for Station FSB127
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB127D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

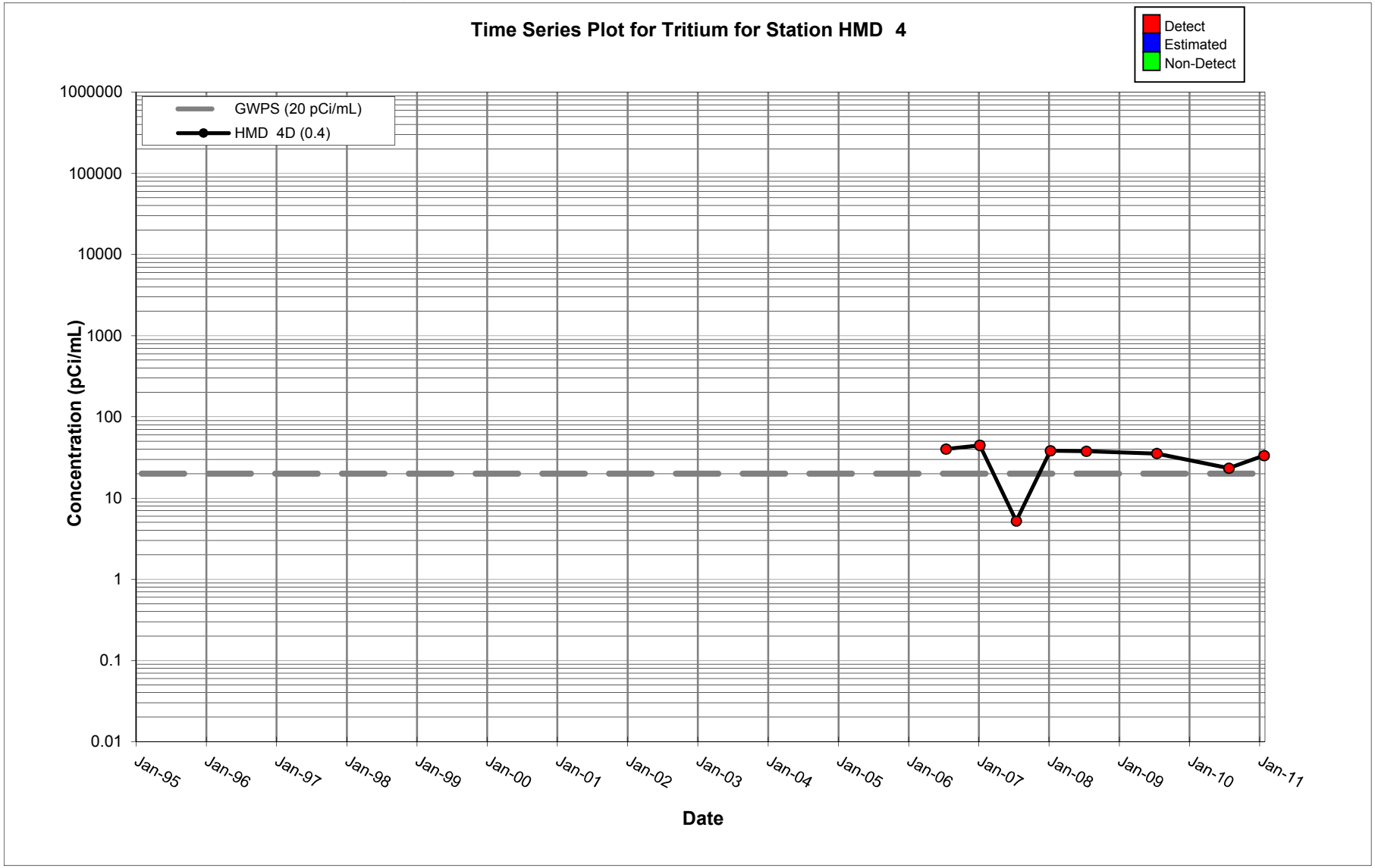

Time Series Plot for Tritium for Station FSB138
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSB138D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

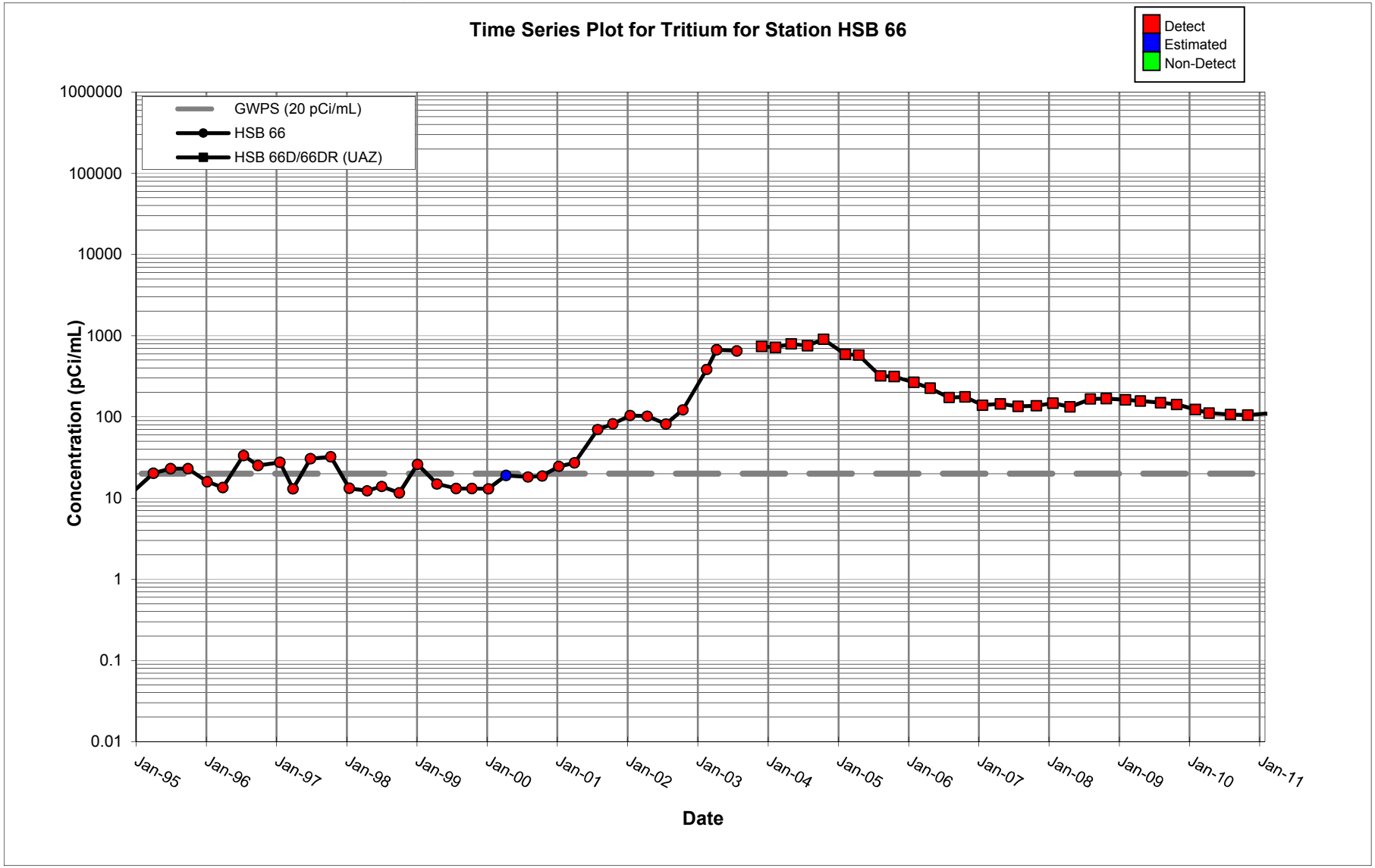

Time Series Plot for Tritium for Station FSS 2
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
FSS 2D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

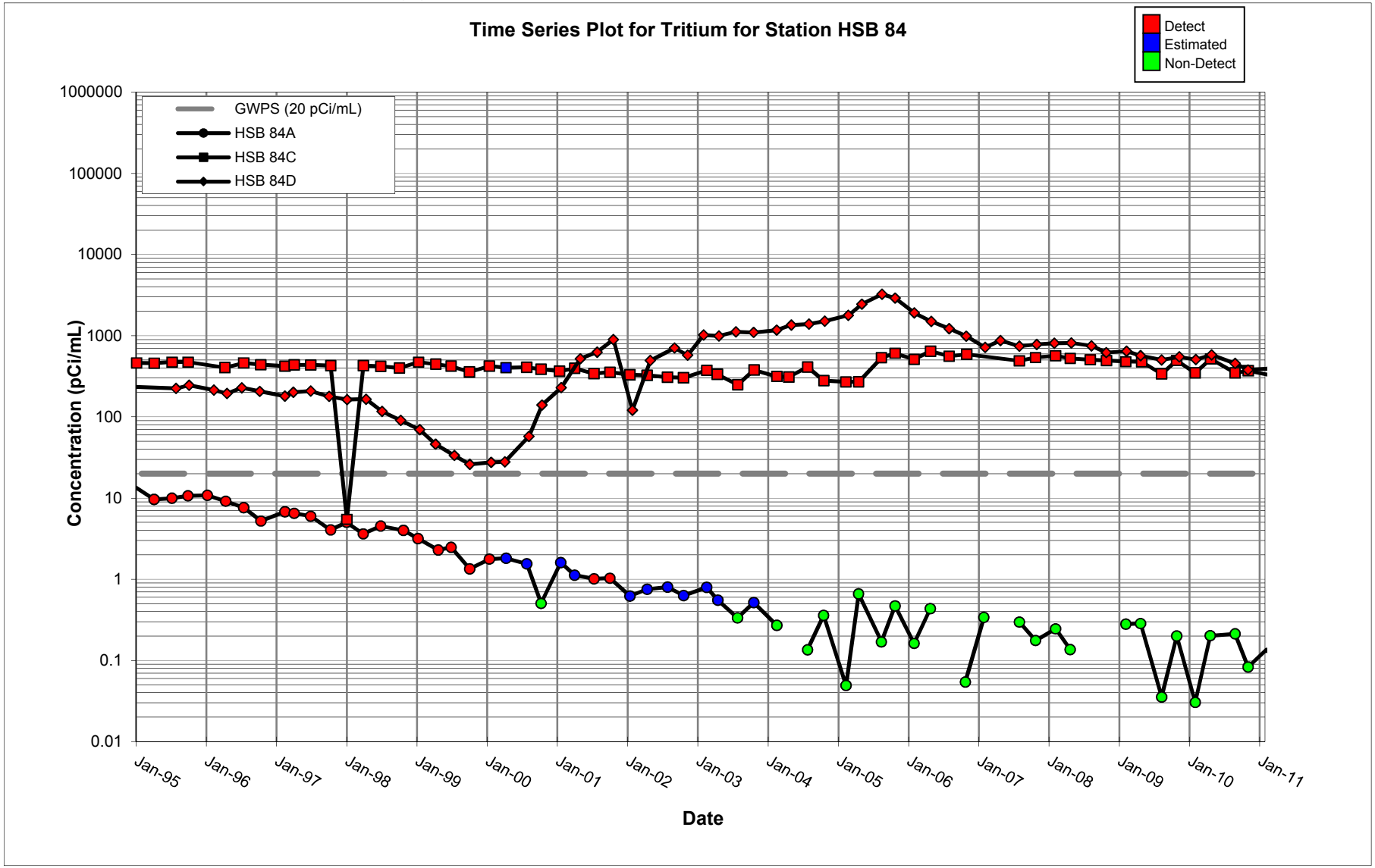

Time Series Plot for Tritium for Station HMD 1
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HMD 1D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

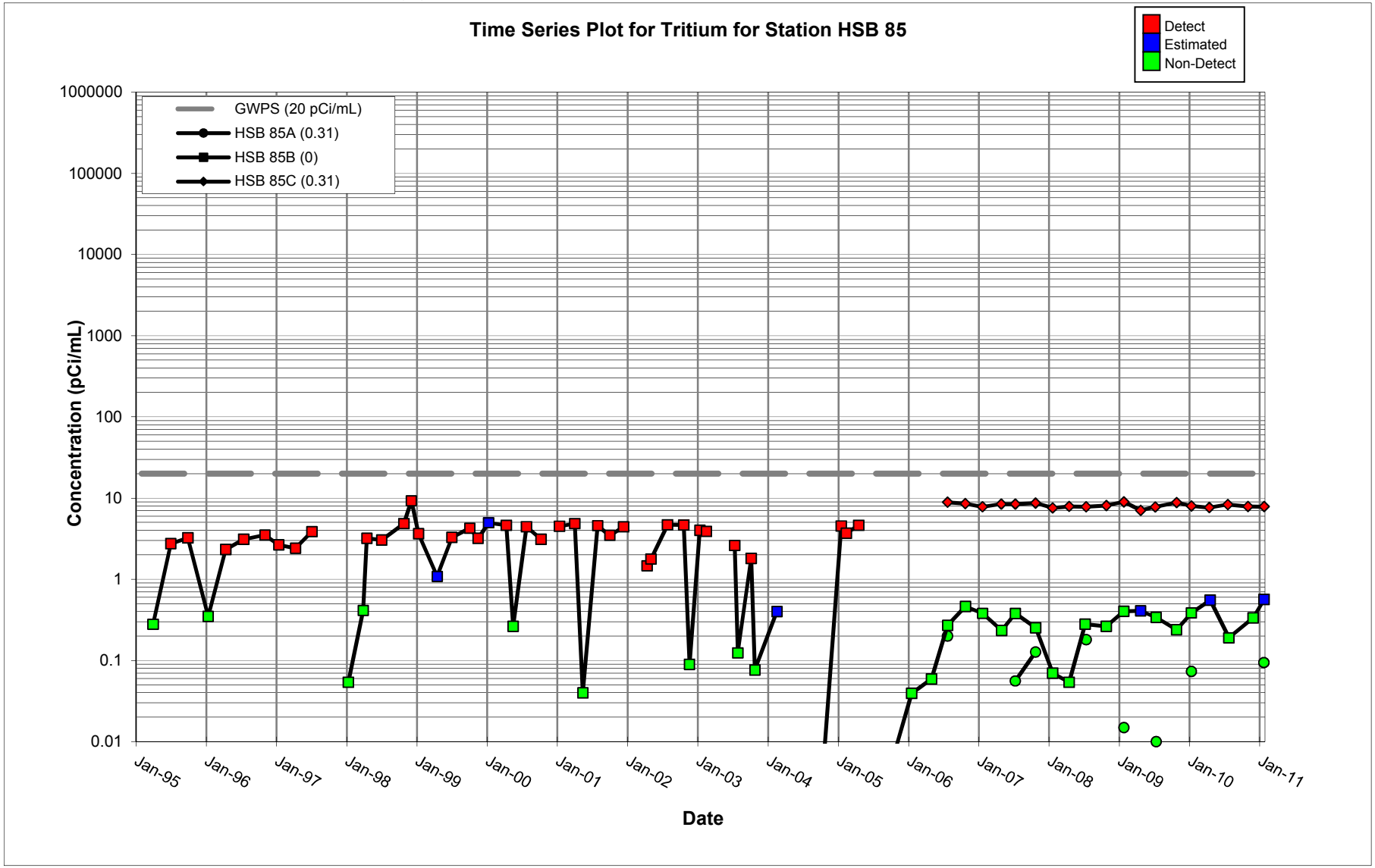

Time Series Plot for Tritium for Station HMD 2
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HMD 2D (0)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

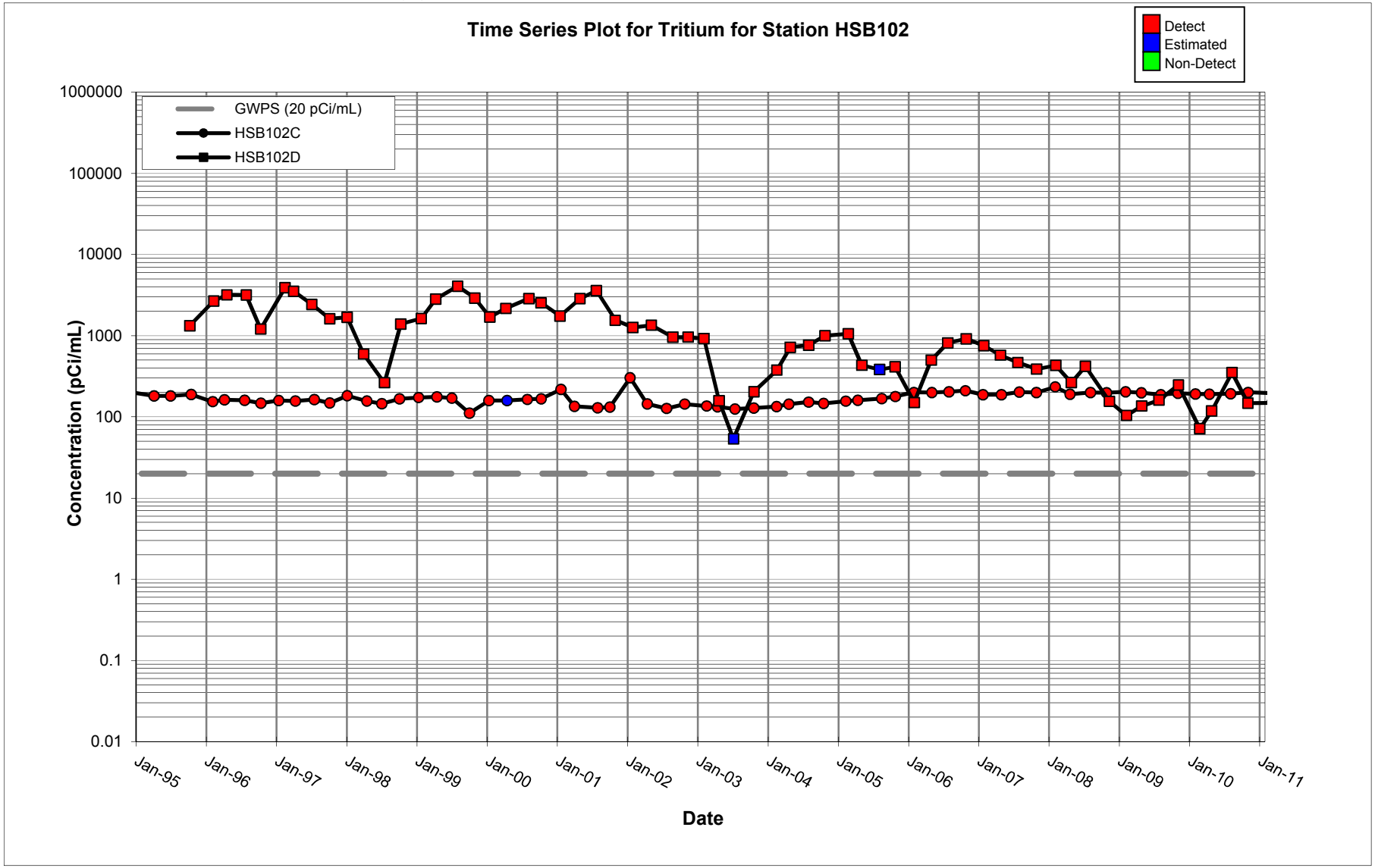

Time Series Plot for Tritium for Station HMD 3
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HMD 3D (0.49)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

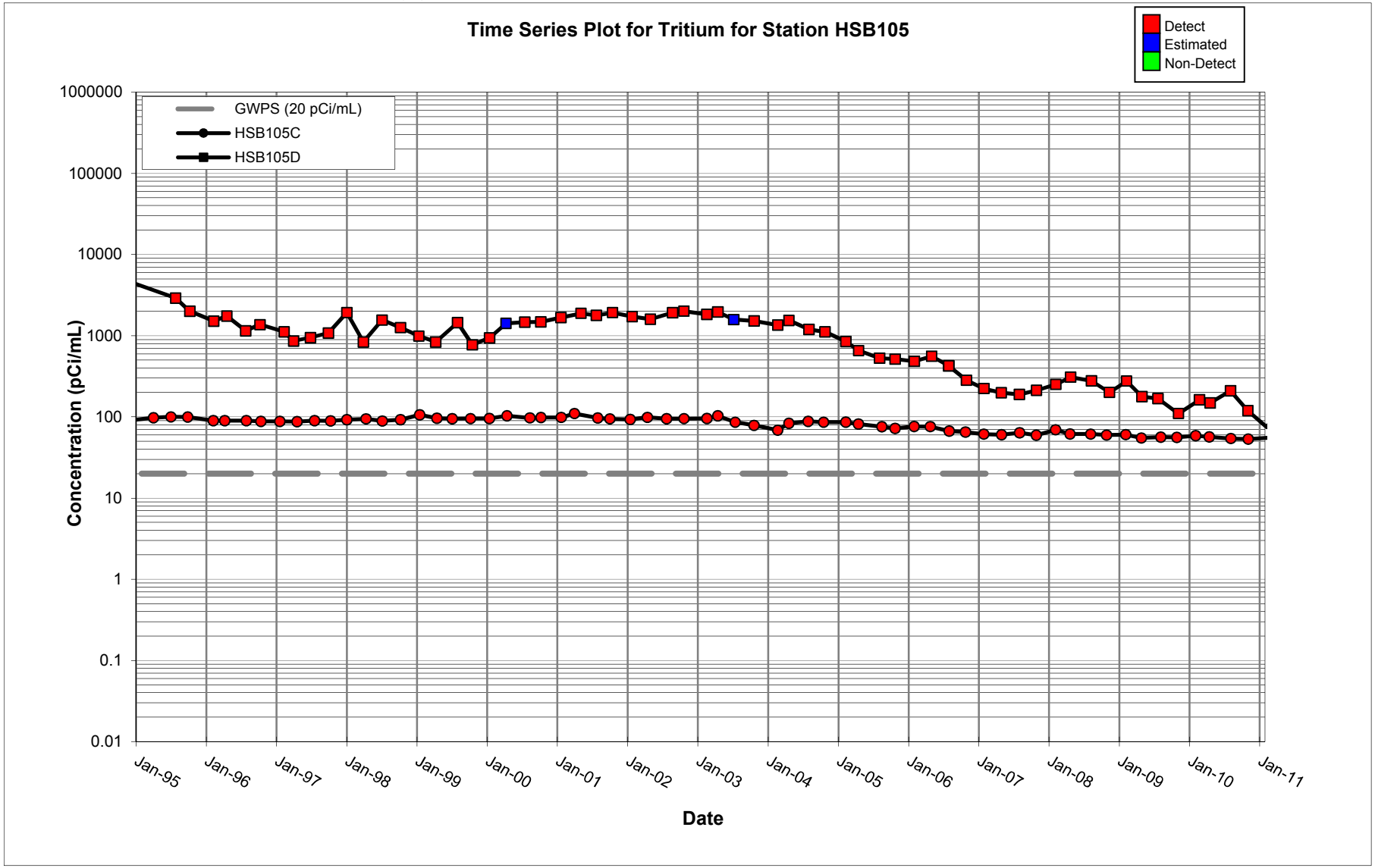

Time Series Plot for Tritium for Station HMD 4
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HMD 4D (0.4)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

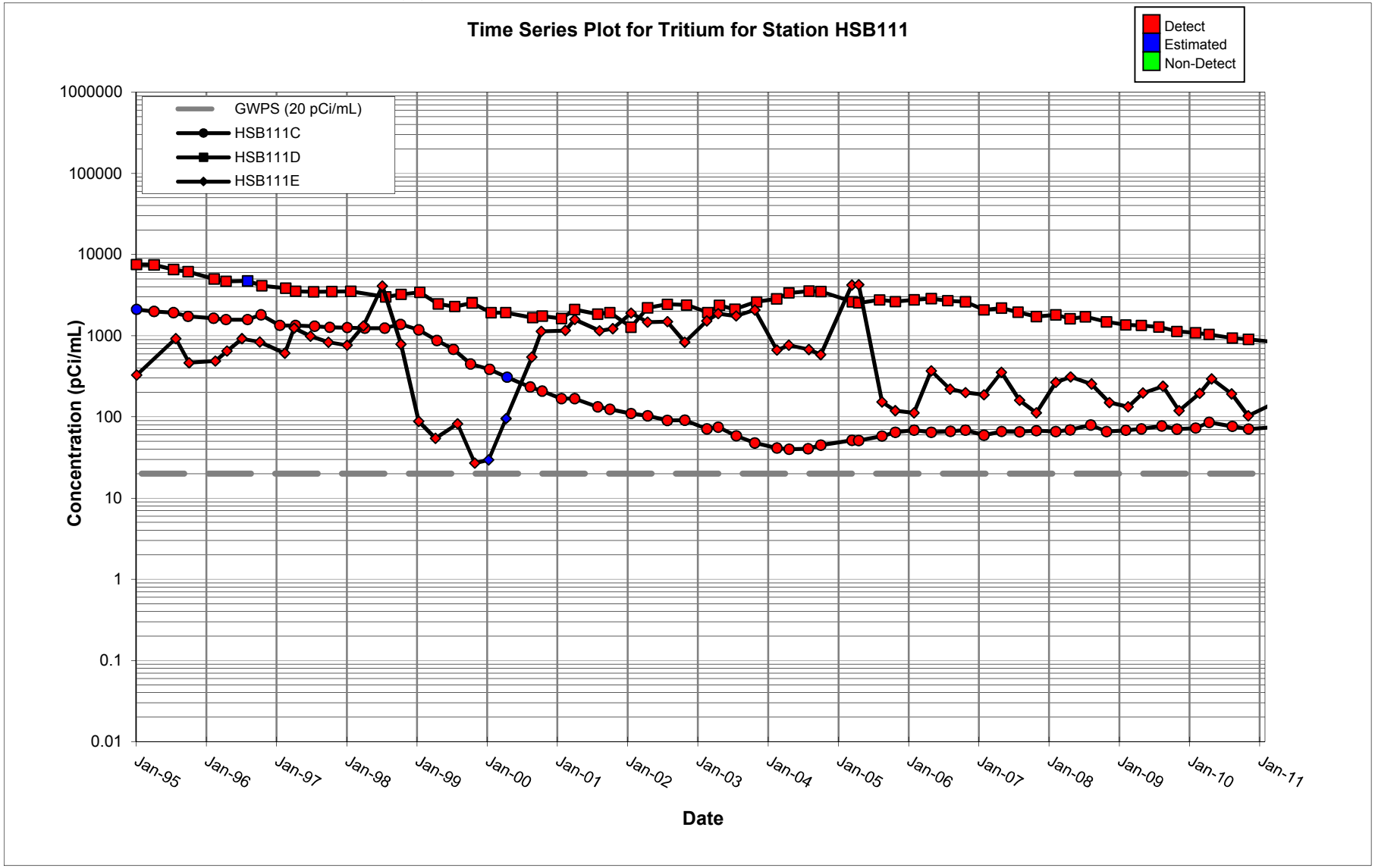

Time Series Plot for Tritium for Station HSB 66
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB 66
HSB 66D/66DR (UAZ)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

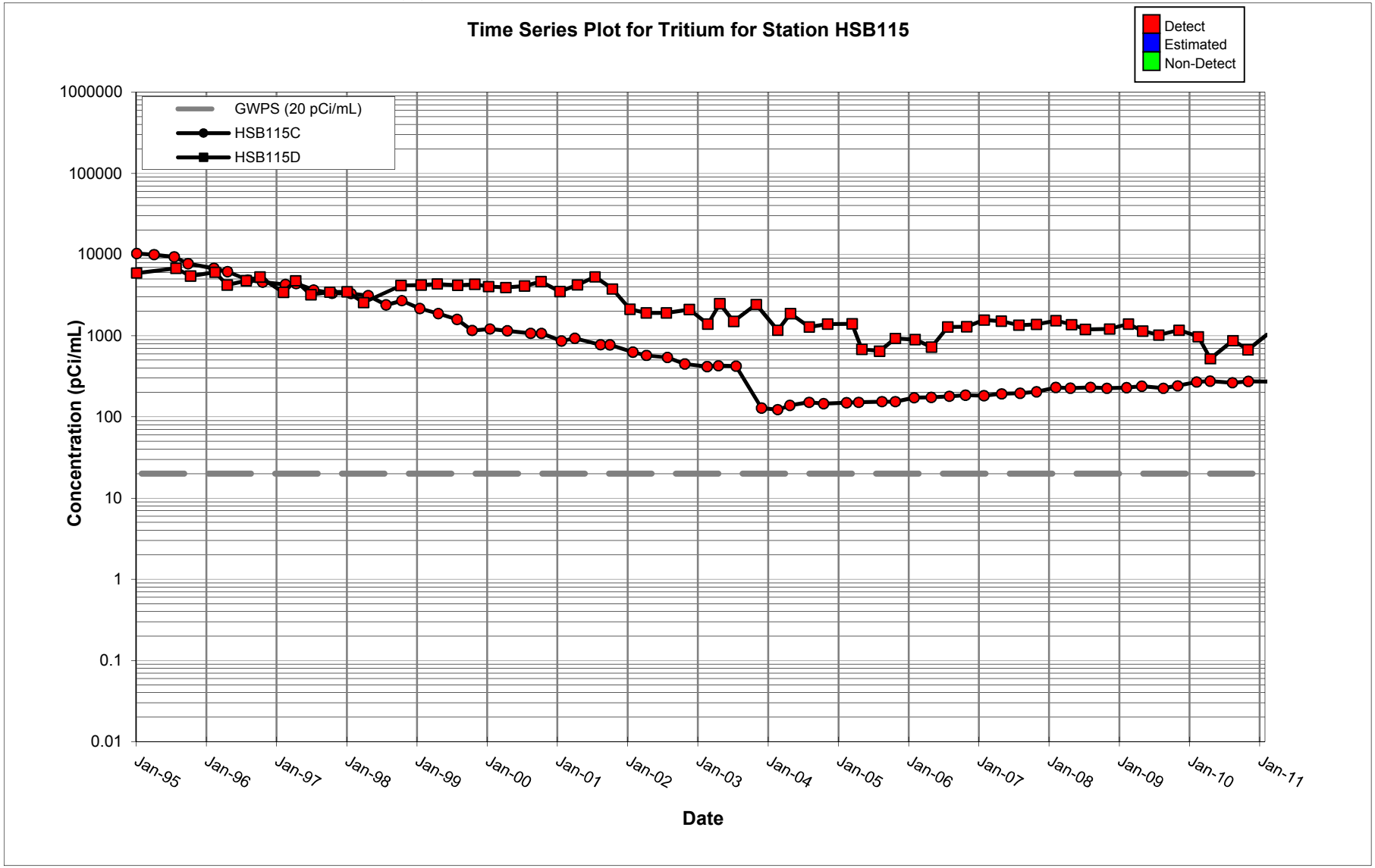

Time Series Plot for Tritium for Station HSB 84
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB 84A
HSB 84C
HSB 84D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

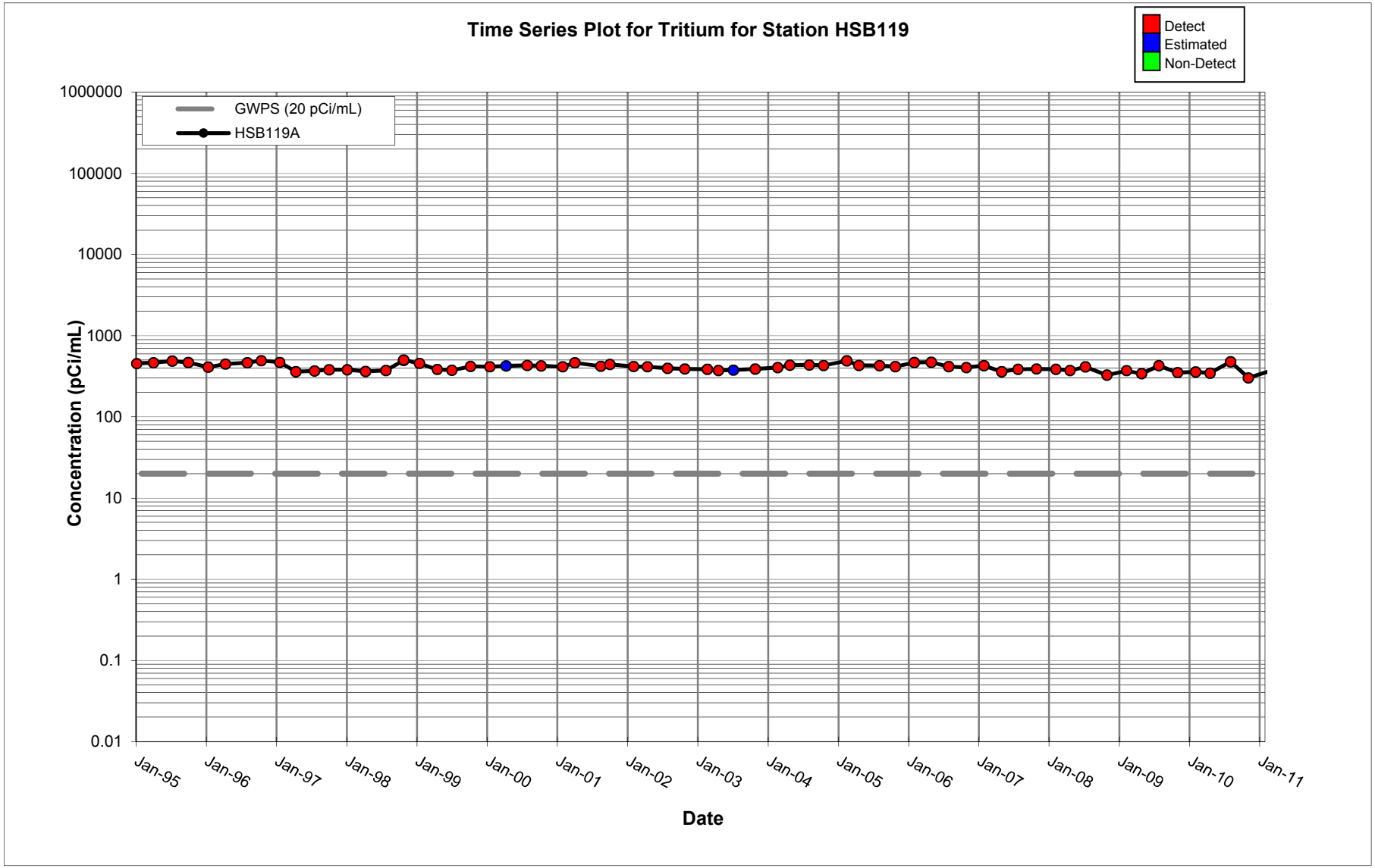

Time Series Plot for Tritium for Station HSB 85
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB 85A (0.31)
HSB 85B (0)
HSB 85C (0.31)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

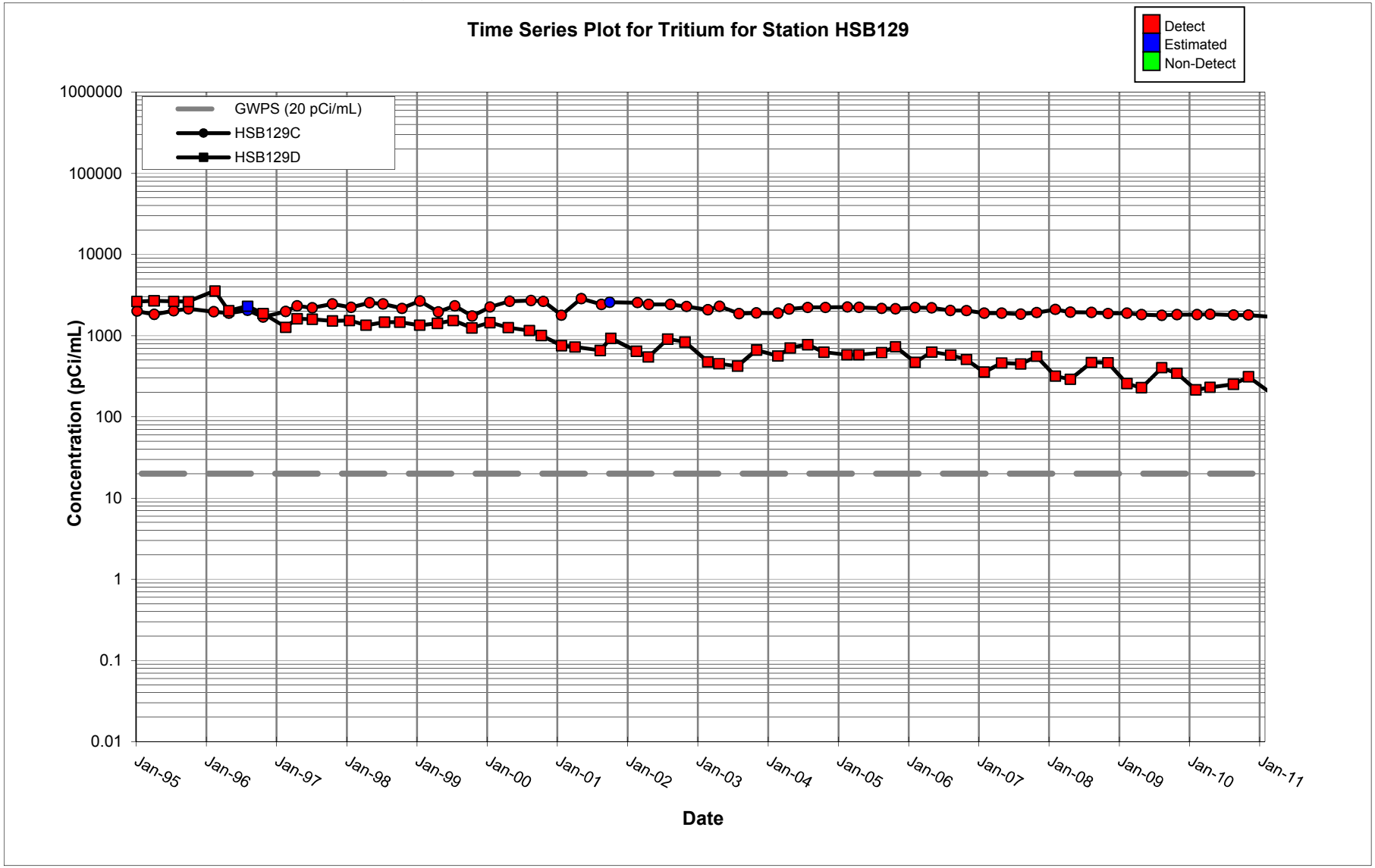

Time Series Plot for Tritium for Station HSB102
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB102C
HSB102D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

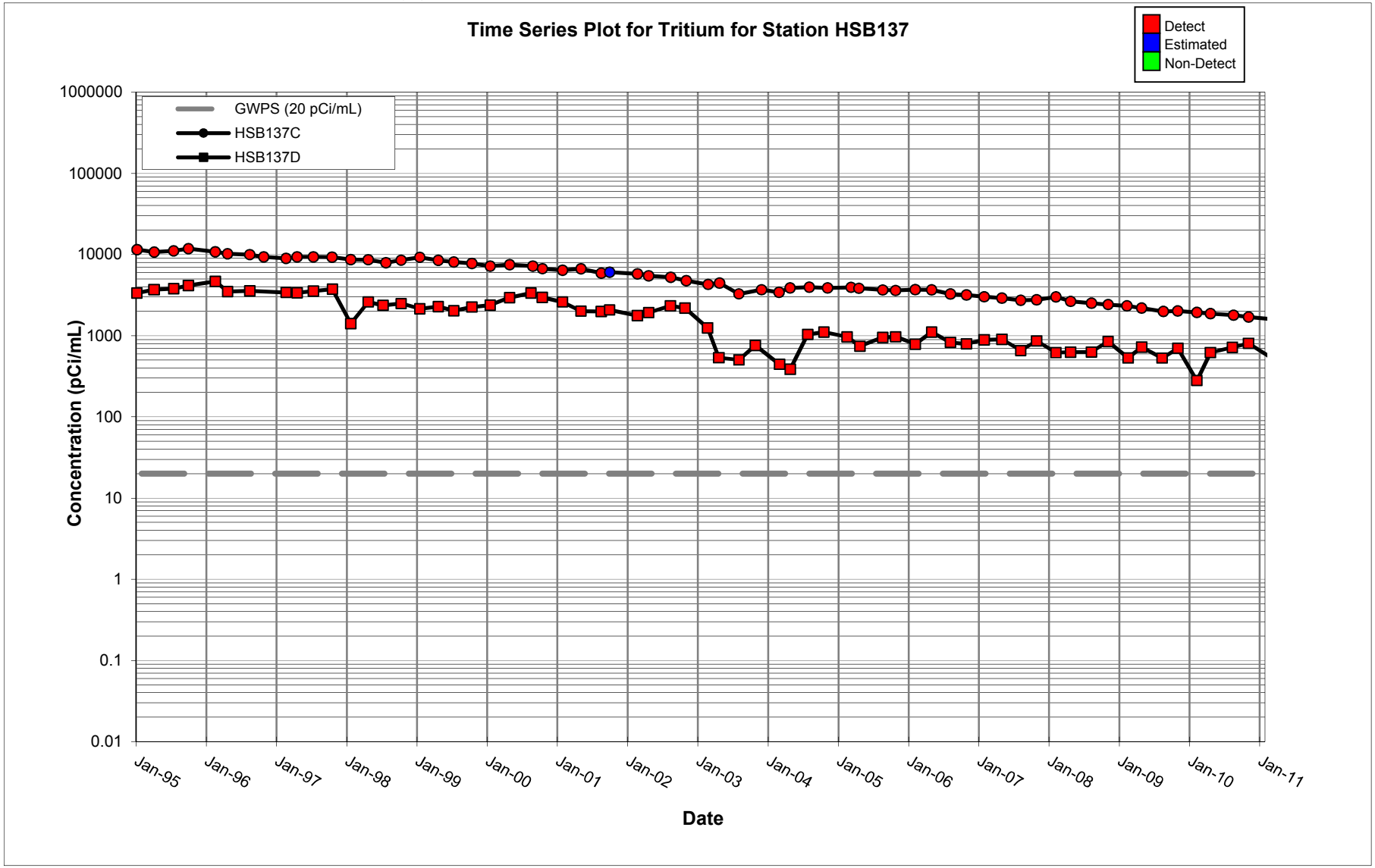

Time Series Plot for Tritium for Station HSB105
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB105C
HSB105D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

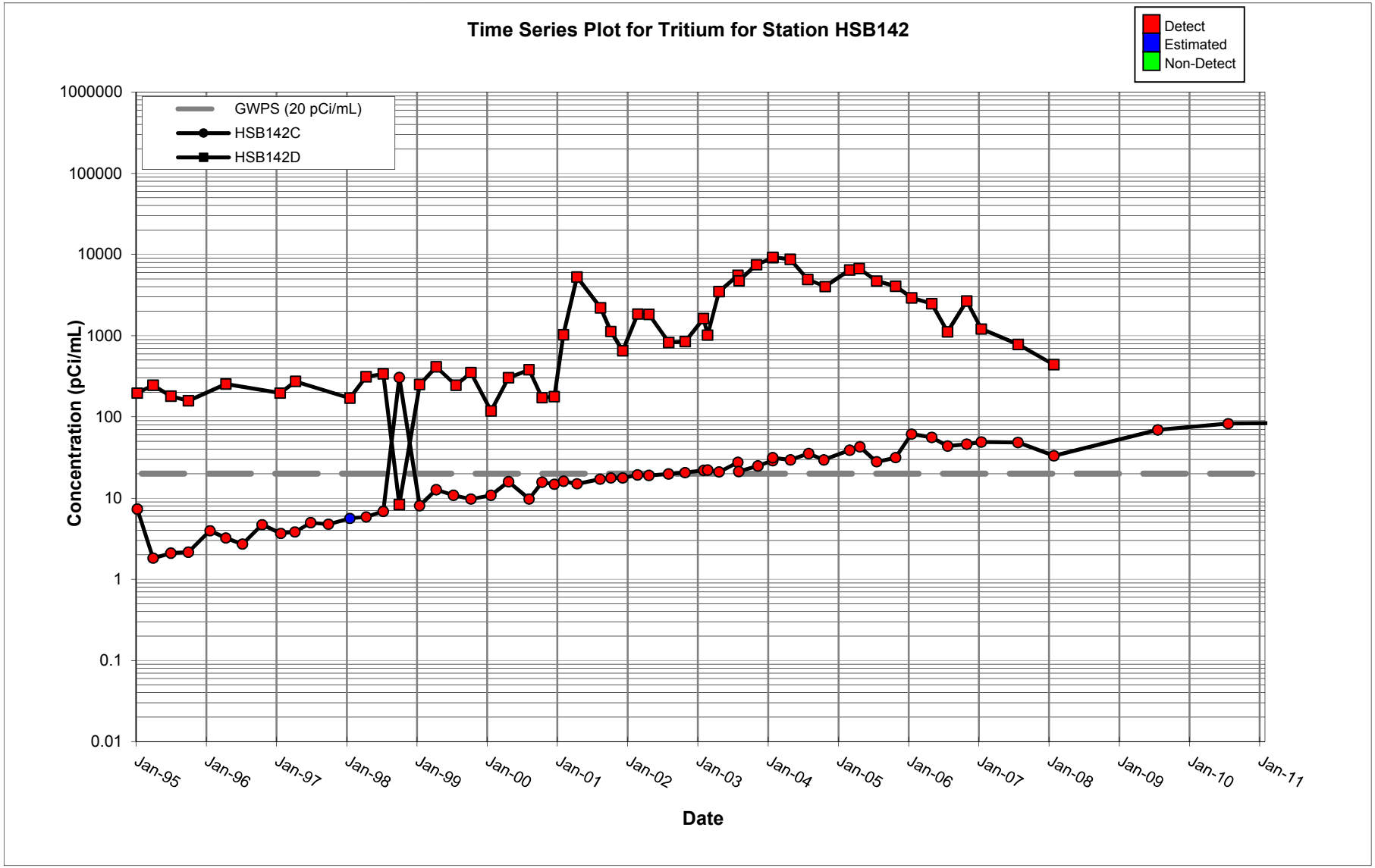

Time Series Plot for Tritium for Station HSB111
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB111C
HSB111D
HSB111E
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

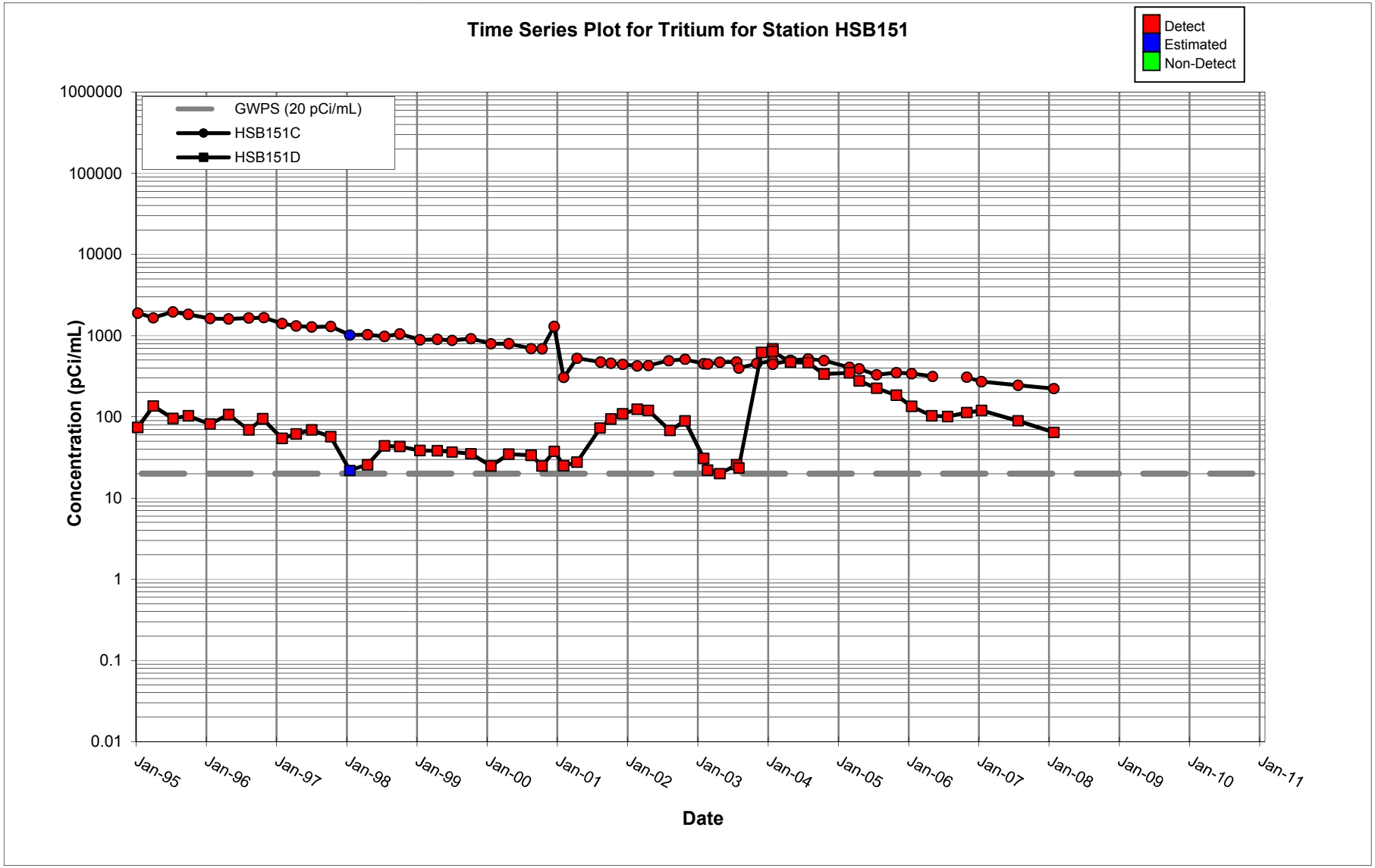

Time Series Plot for Tritium for Station HSB115
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB115C
HSB115D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

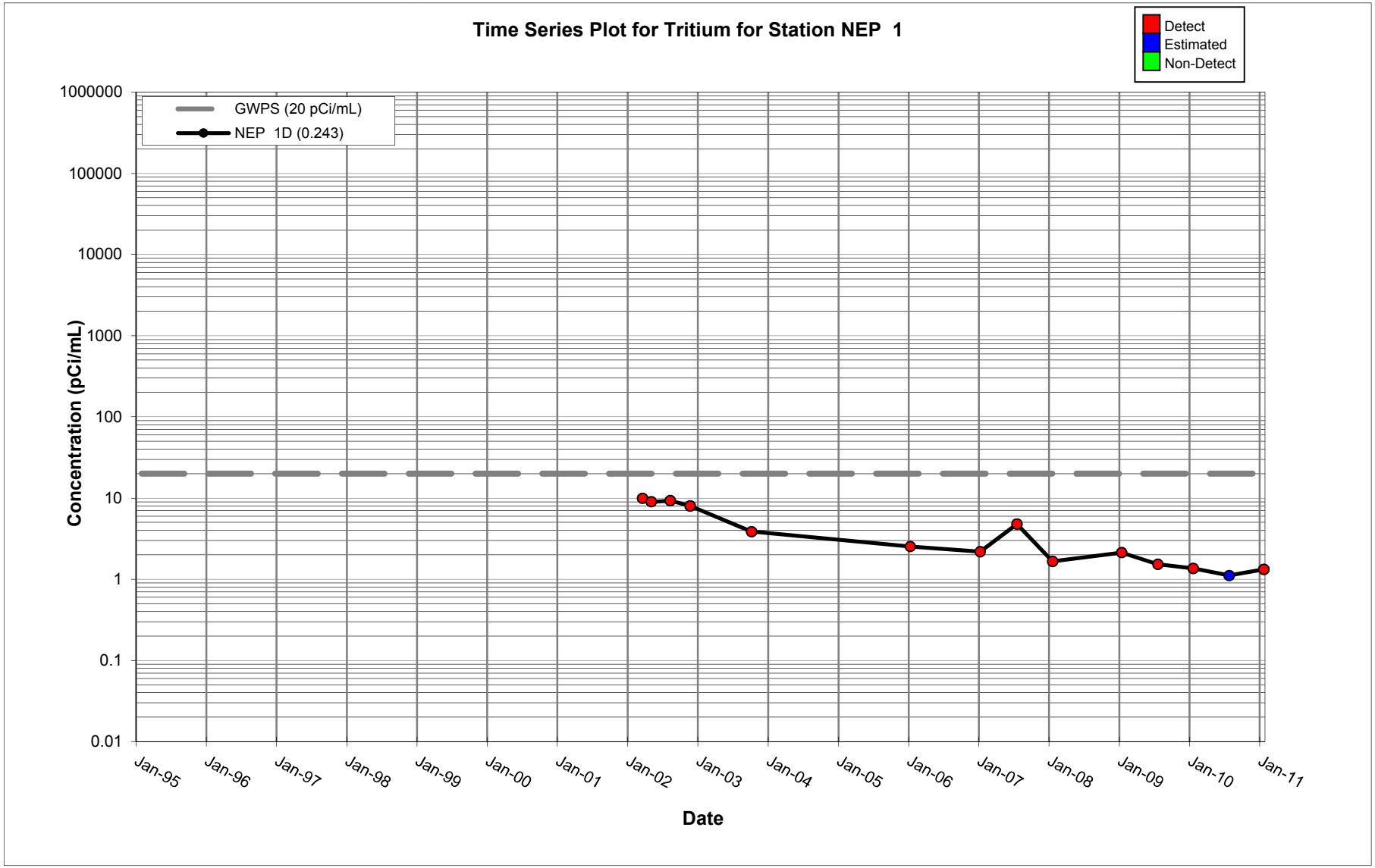

Time Series Plot for Tritium for Station HSB119
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB119A
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

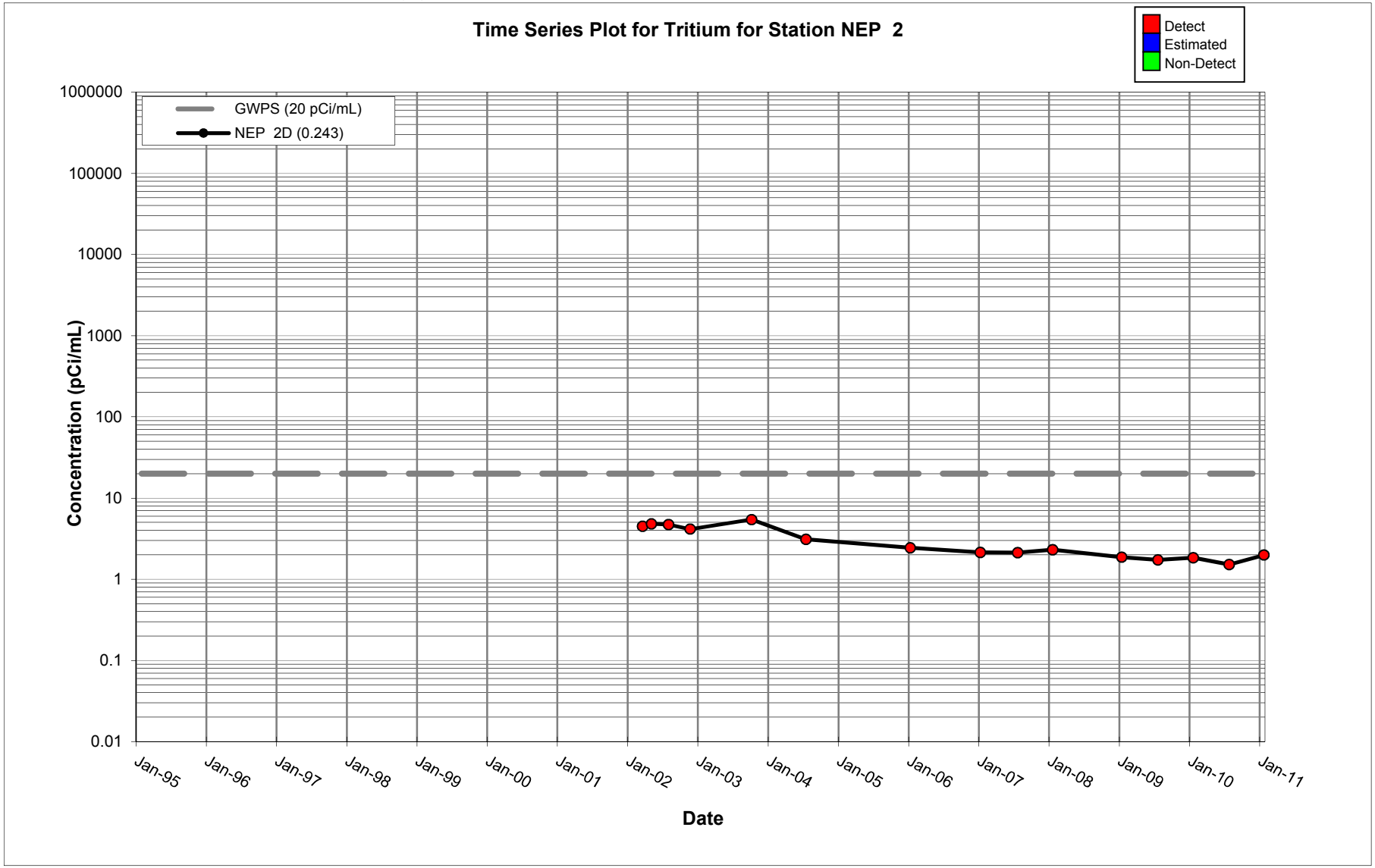

Time Series Plot for Tritium for Station HSB129
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB129C
HSB129D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

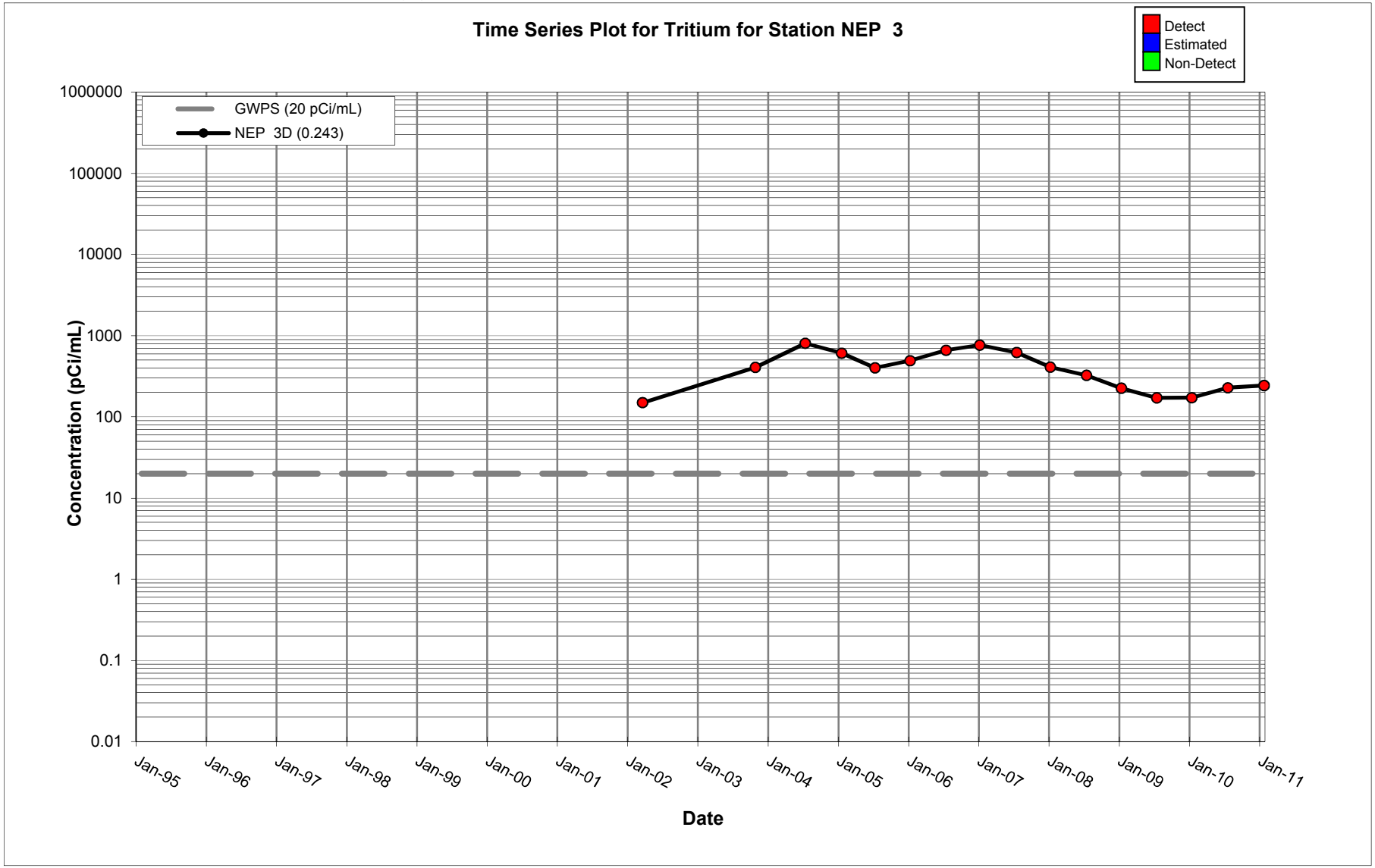

Time Series Plot for Tritium for Station HSB137
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB137C
HSB137D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

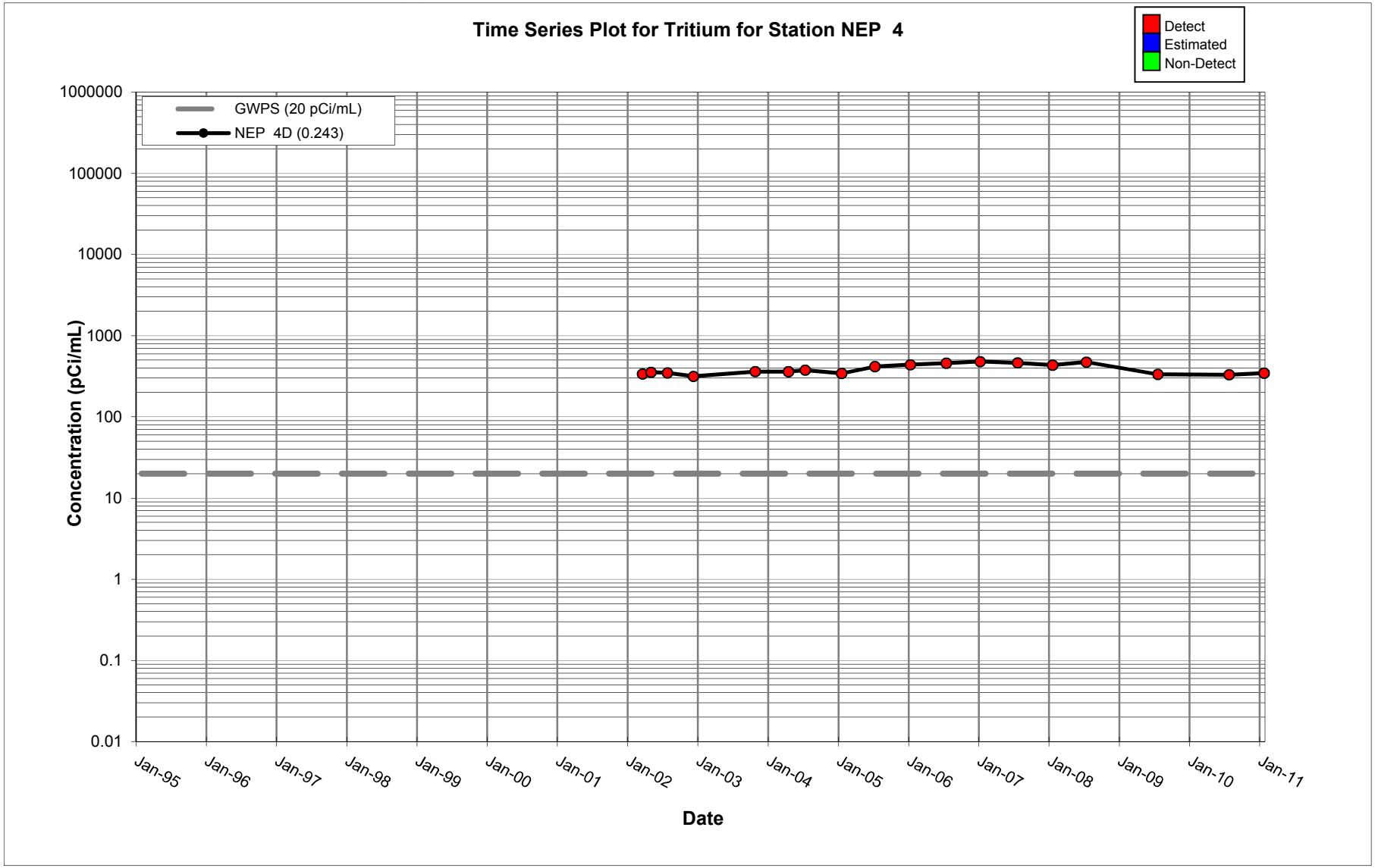

Time Series Plot for Tritium for Station HSB142
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB142C
HSB142D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

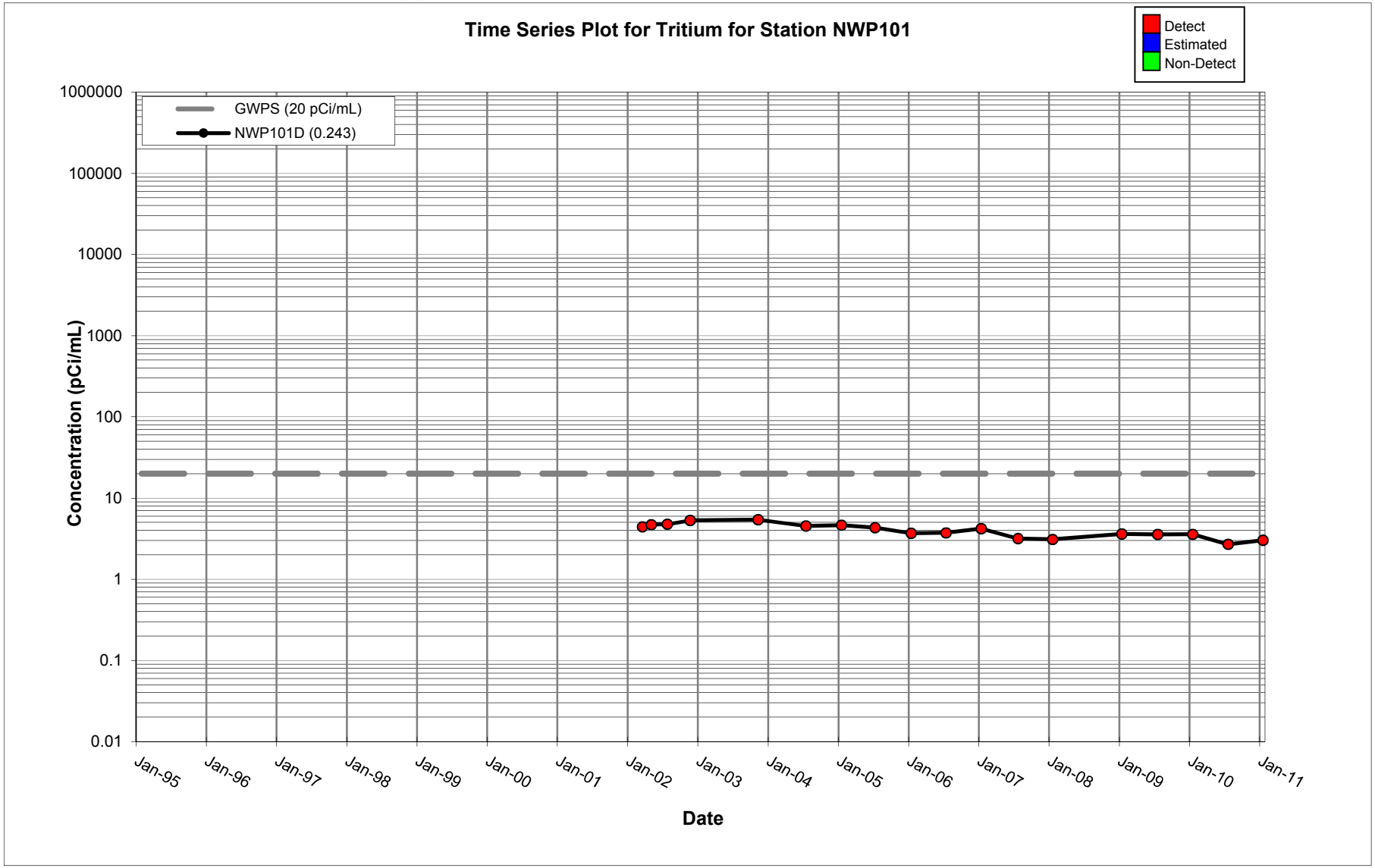

Time Series Plot for Tritium for Station HSB151
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
HSB151C
HSB151D
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

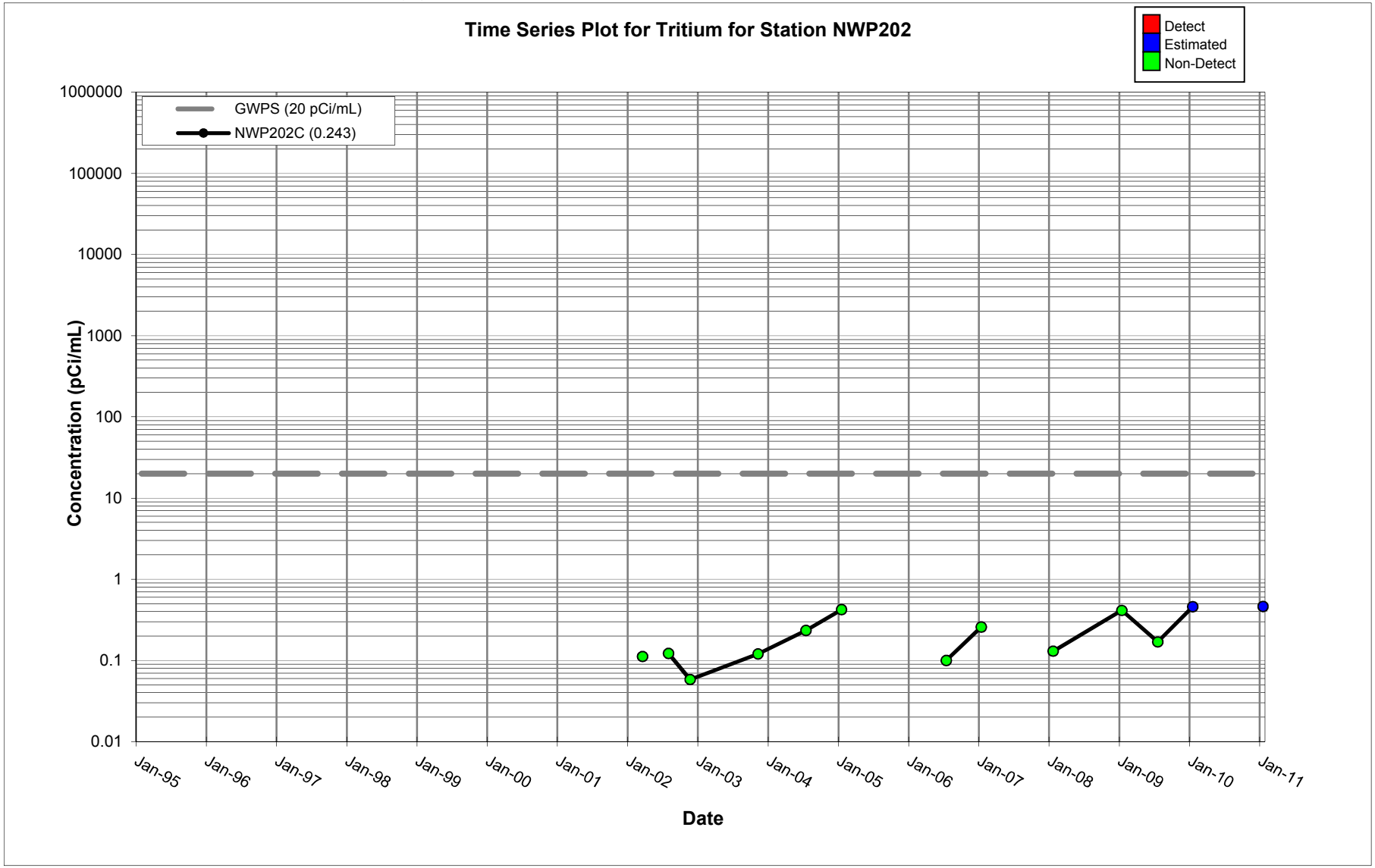

Time Series Plot for Tritium for Station NEP 1
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NEP 1D (0.243)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

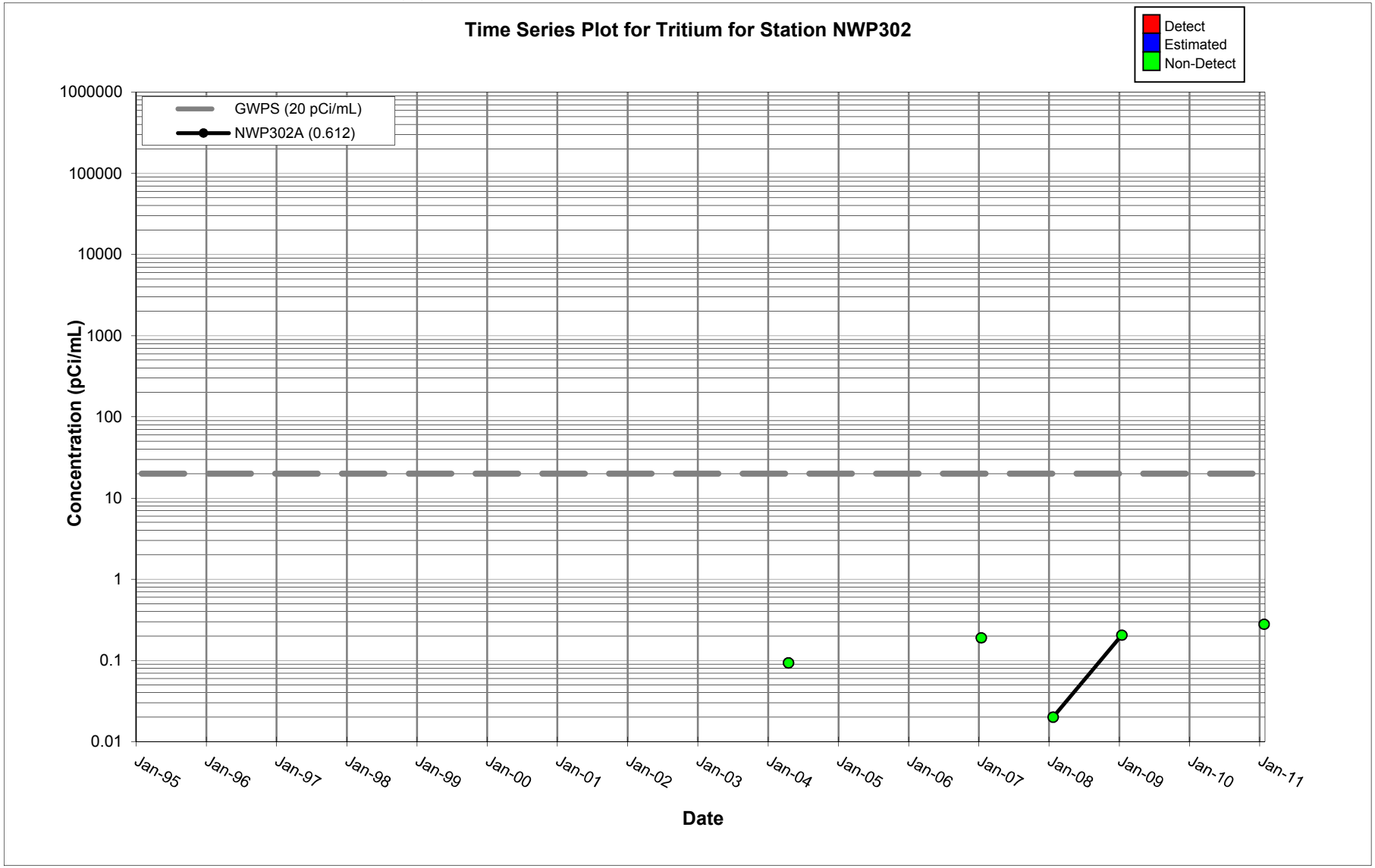

Time Series Plot for Tritium for Station NEP 2
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NEP 2D (0.243)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

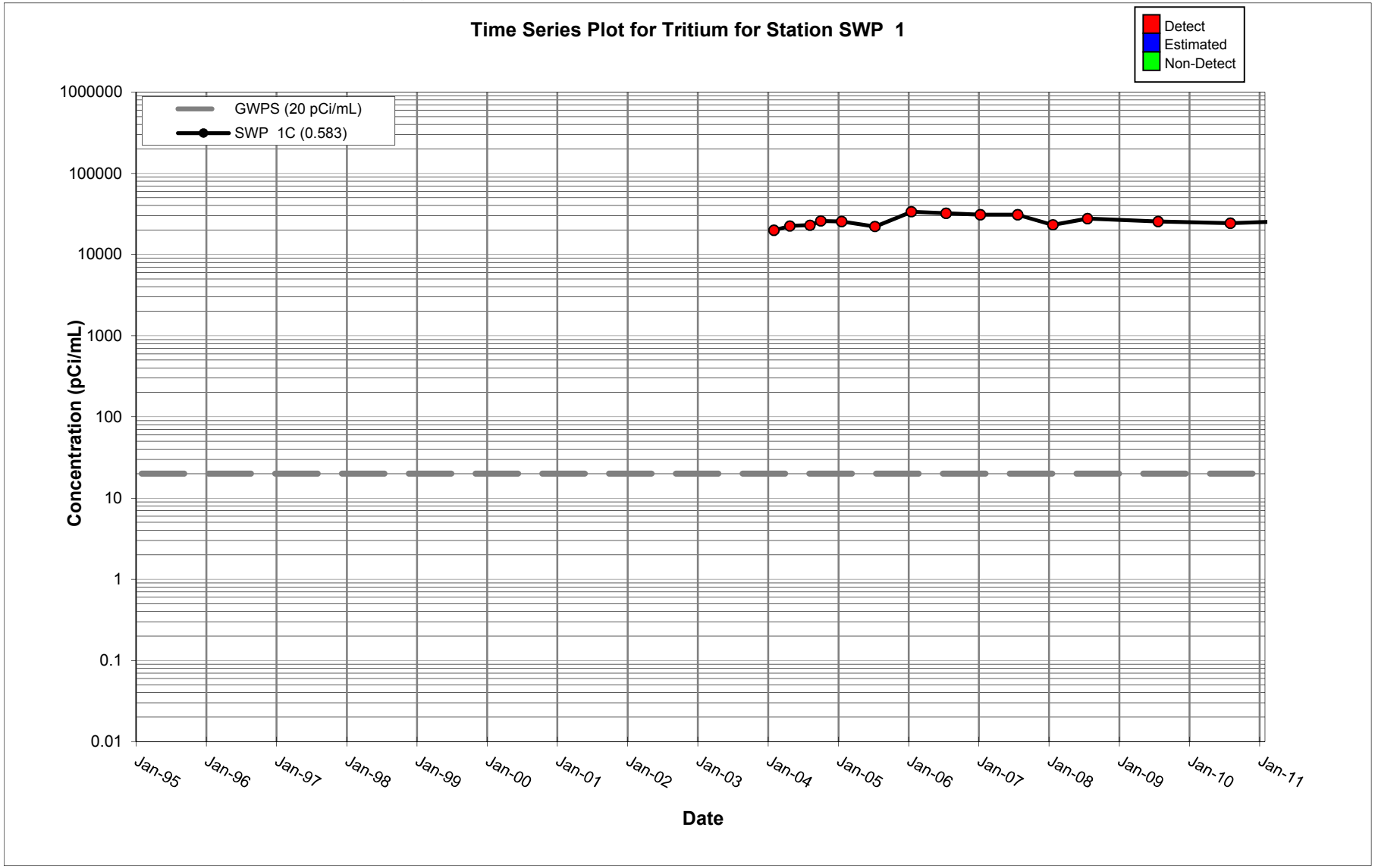

Time Series Plot for Tritium for Station NEP 3
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NEP 3D (0.243)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

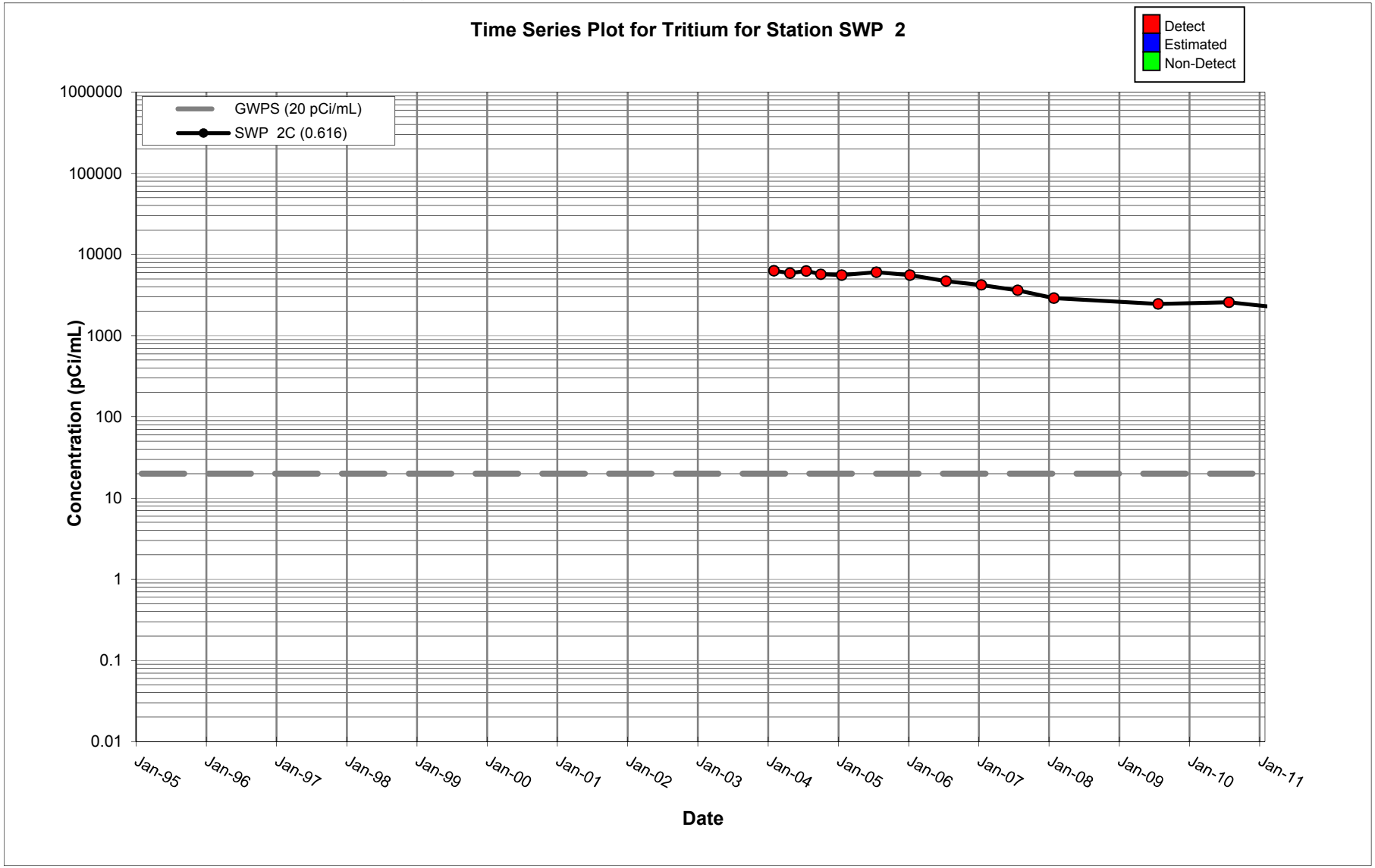

Time Series Plot for Tritium for Station NEP 4
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NEP 4D (0.243)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

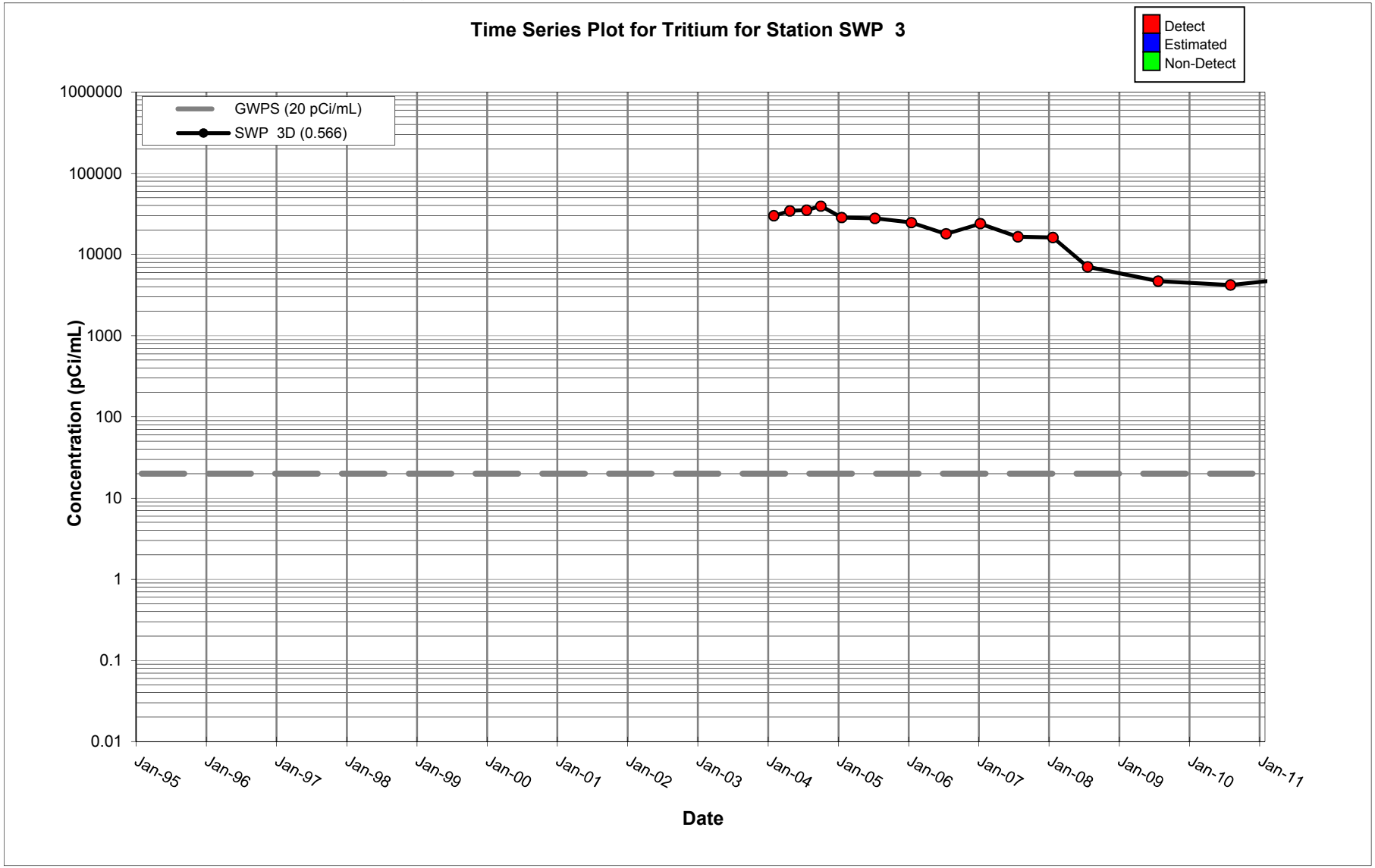

Time Series Plot for Tritium for Station NWP101
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NWP101D (0.243)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

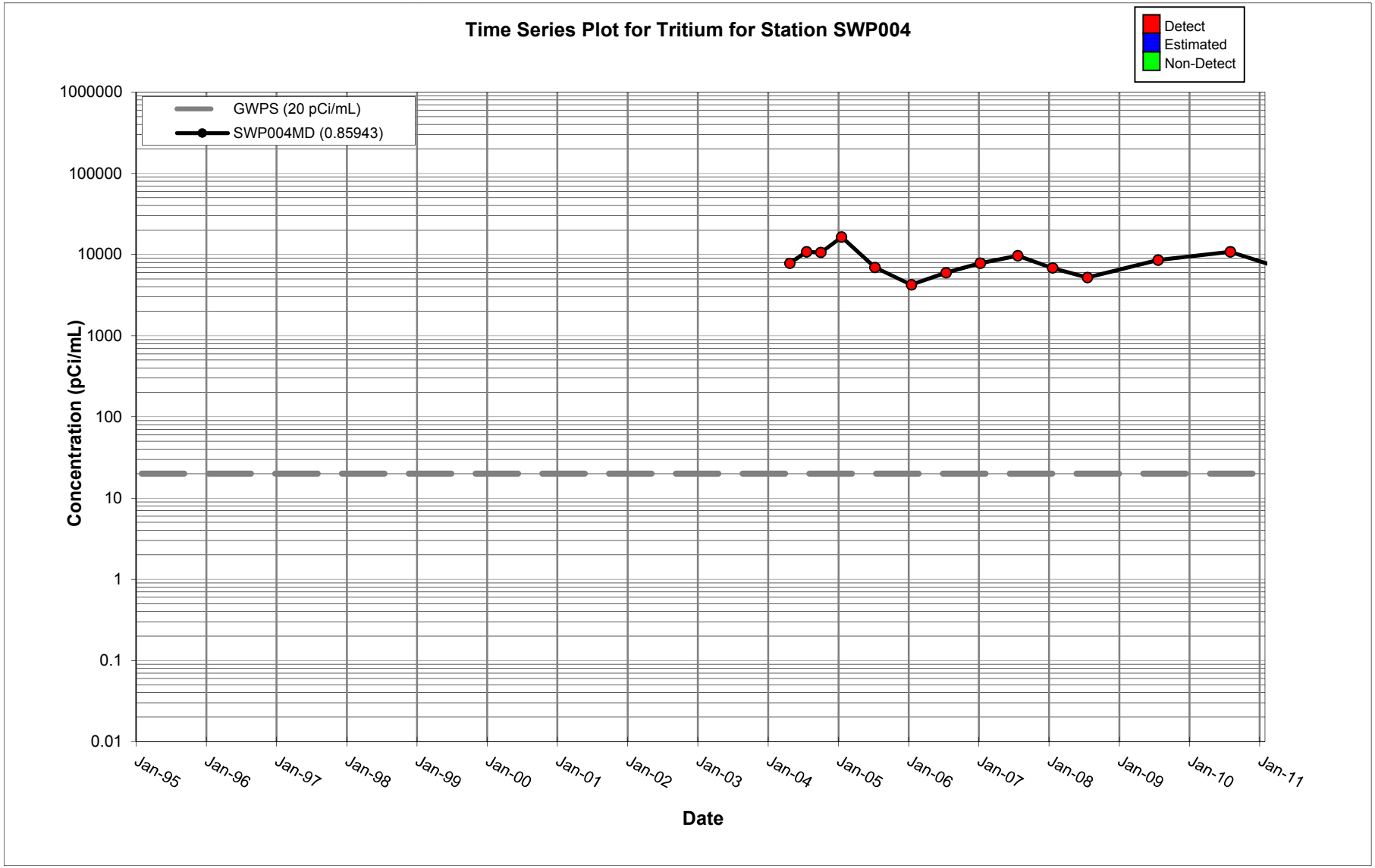

Time Series Plot for Tritium for Station NWP202
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NWP202C (0.243)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

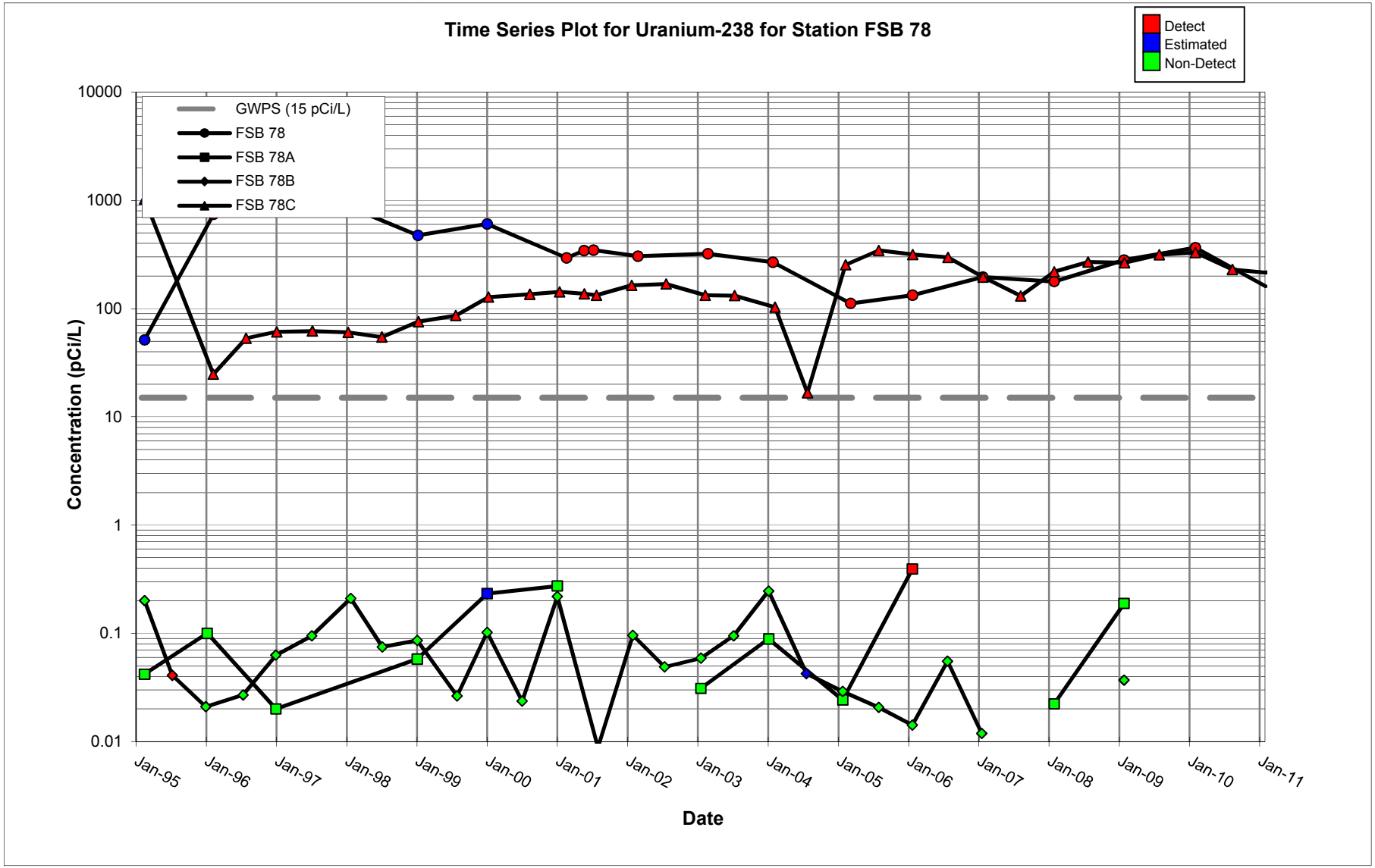

Time Series Plot for Tritium for Station NWP302
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
NWP302A (0.612)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

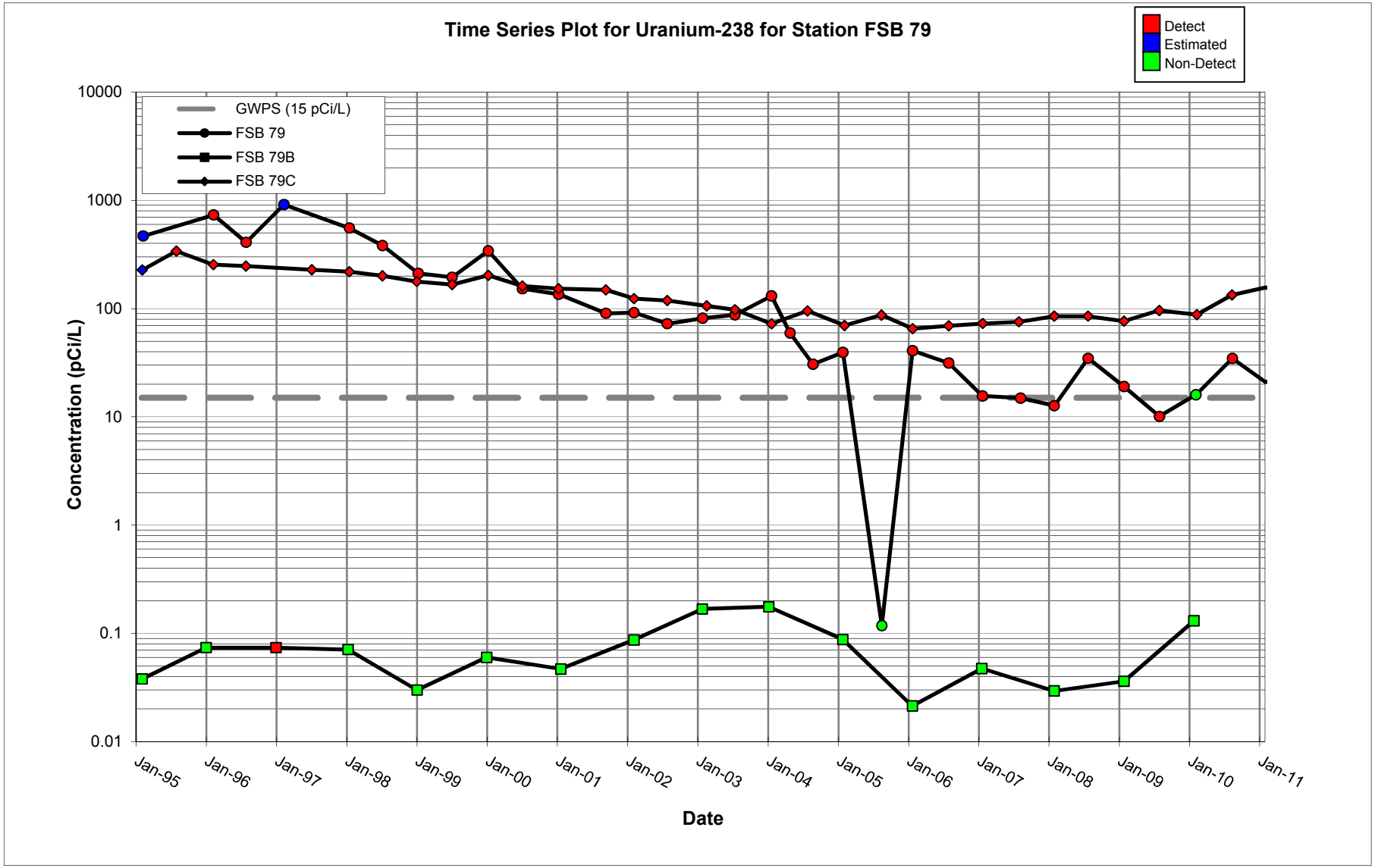

Time Series Plot for Tritium for Station SWP 1
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
SWP 1C (0.583)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

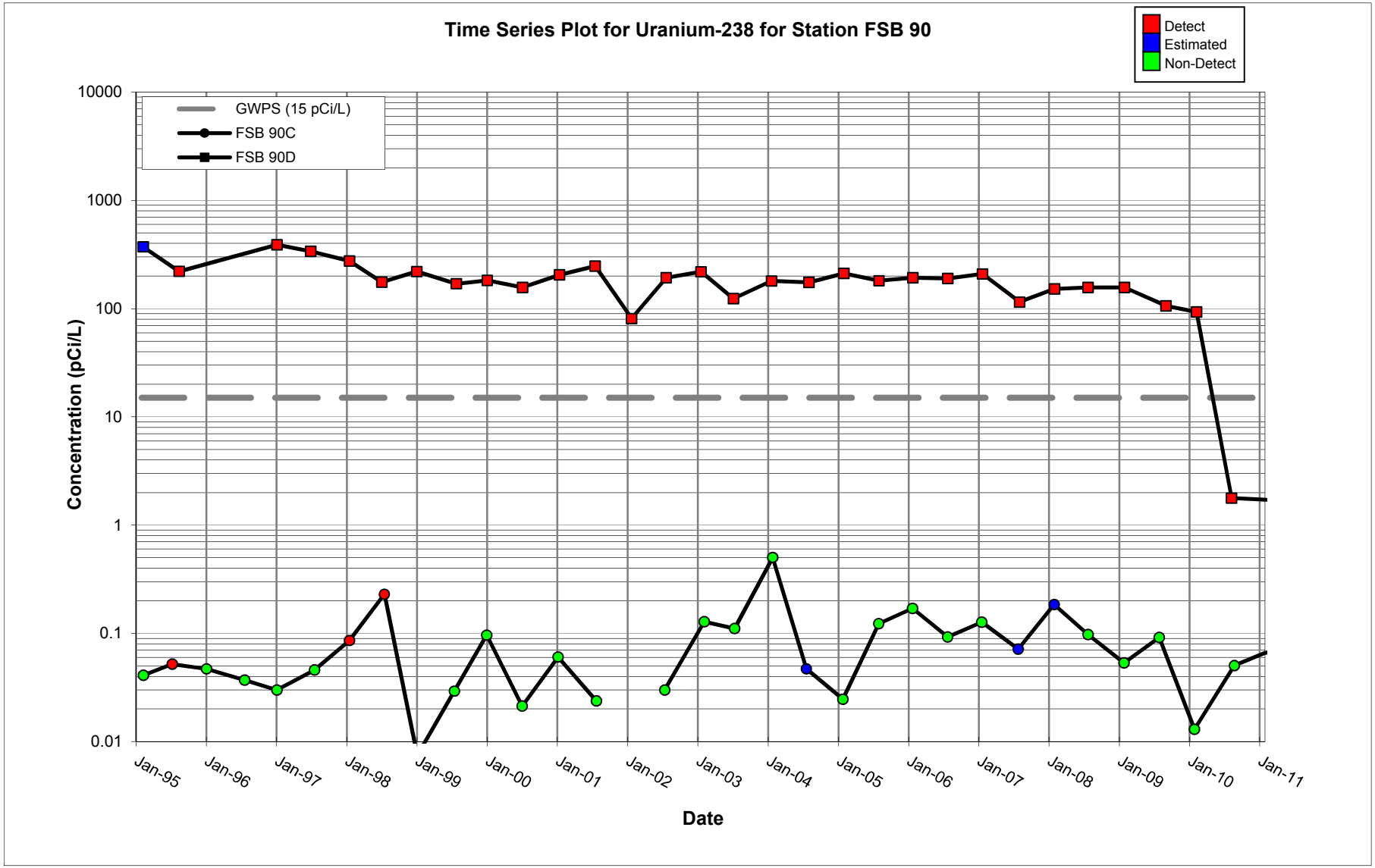

Time Series Plot for Tritium for Station SWP 2
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
SWP 2C (0.616)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

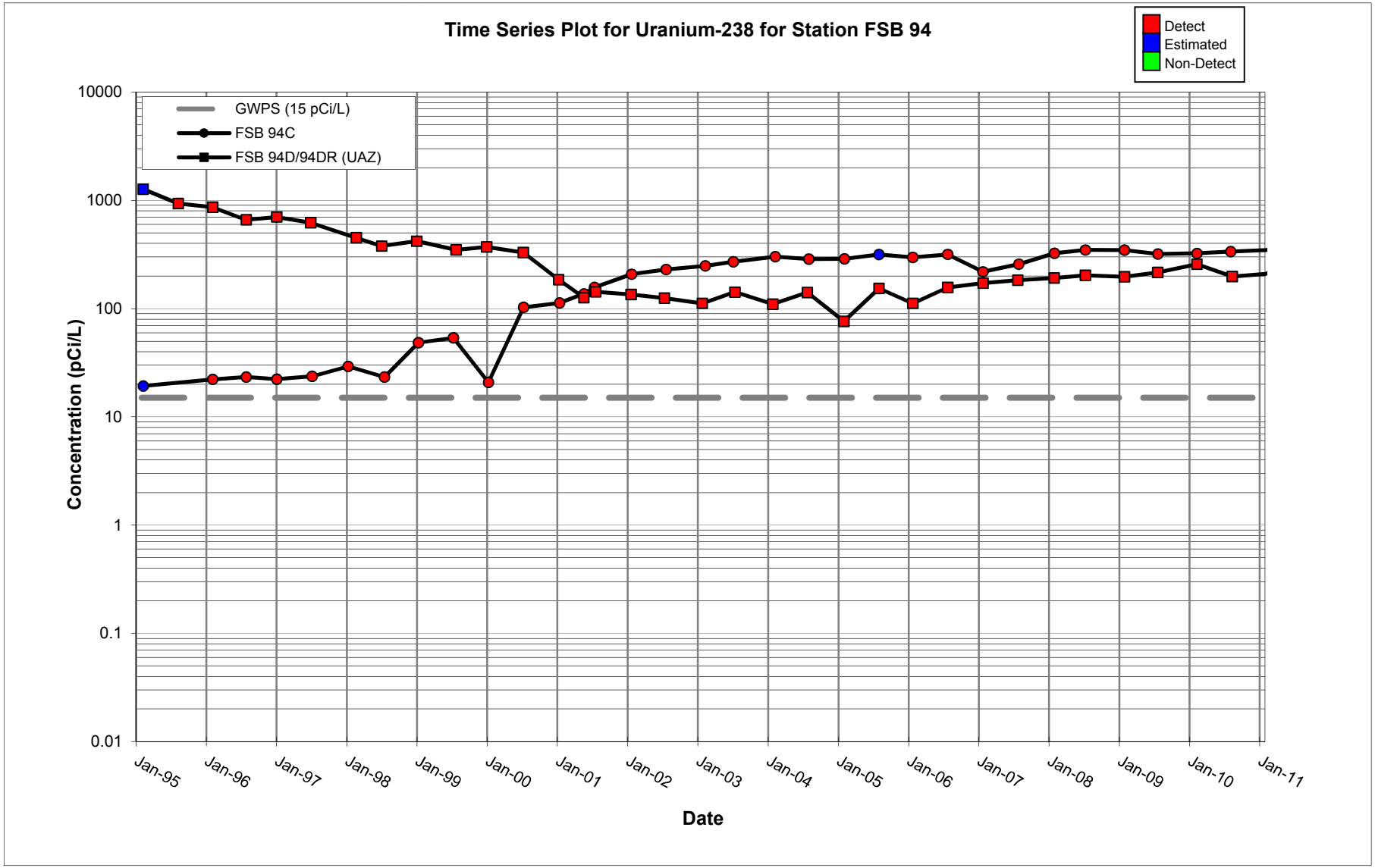

Time Series Plot for Tritium for Station SWP 3
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
SWP 3D (0.566)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

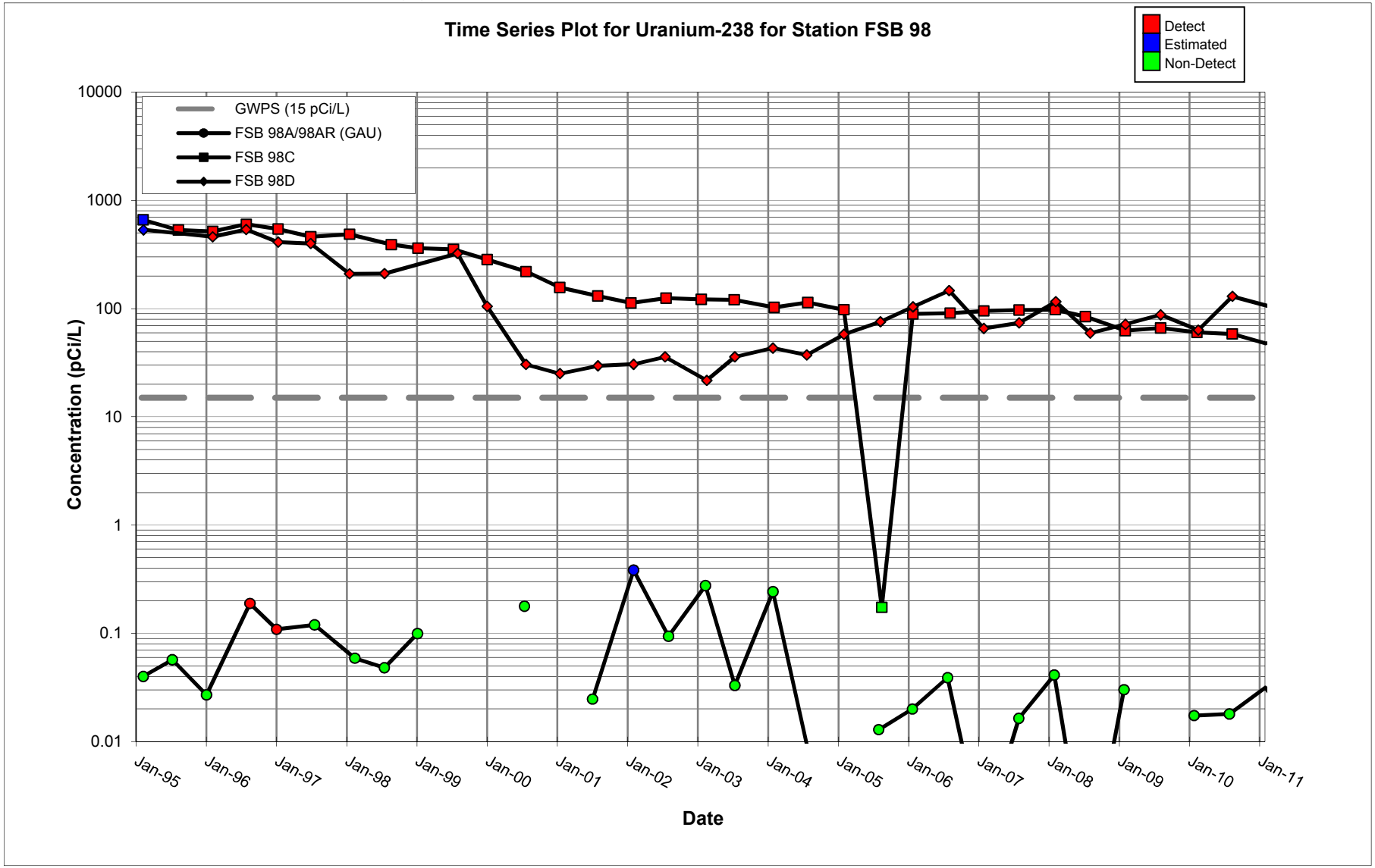

Time Series Plot for Tritium for Station SWP004
Detect
Estimated
Non-Detect
GWPS (20 pCi/mL)
SWP004MD (0.85943)
Concentration (pCi/mL)
1000000
100000
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

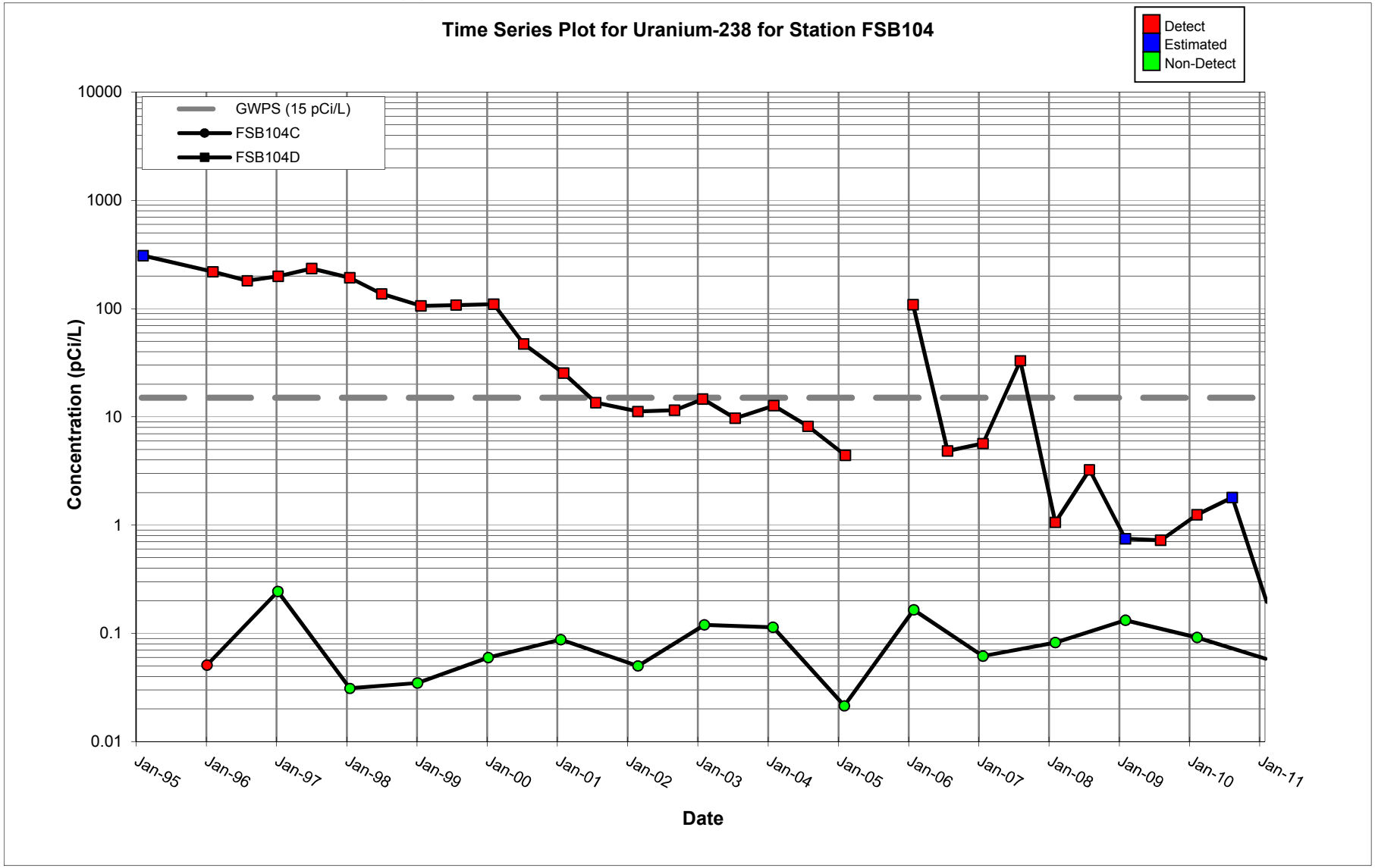

Time Series Plot for Uranium-238 for Station FSB 78
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 78
FSB 78A
FSB 78B
FSB 78C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

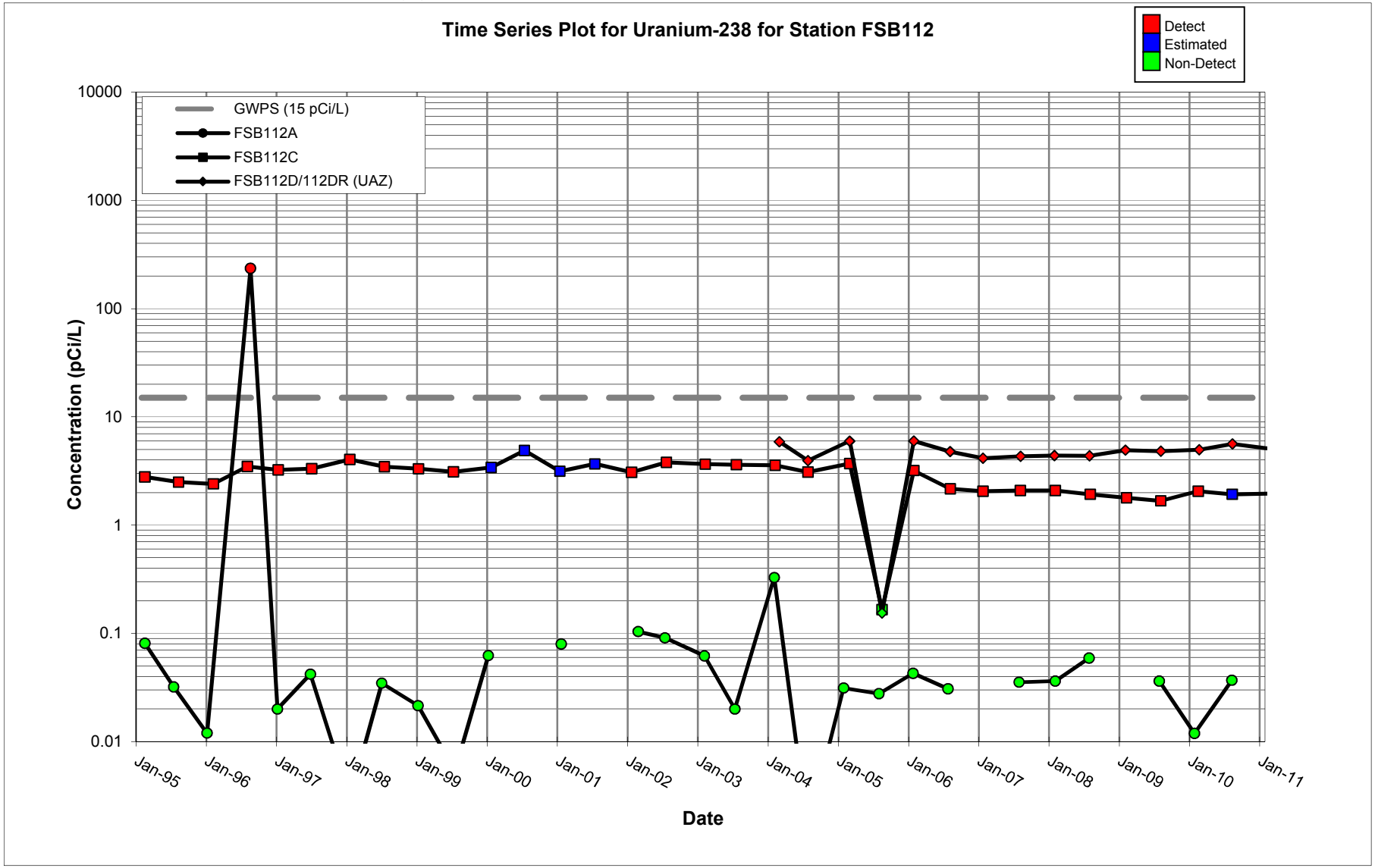

Time Series Plot for Uranium-238 for Station FSB 79
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 79
FSB 79B
FSB 79C
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

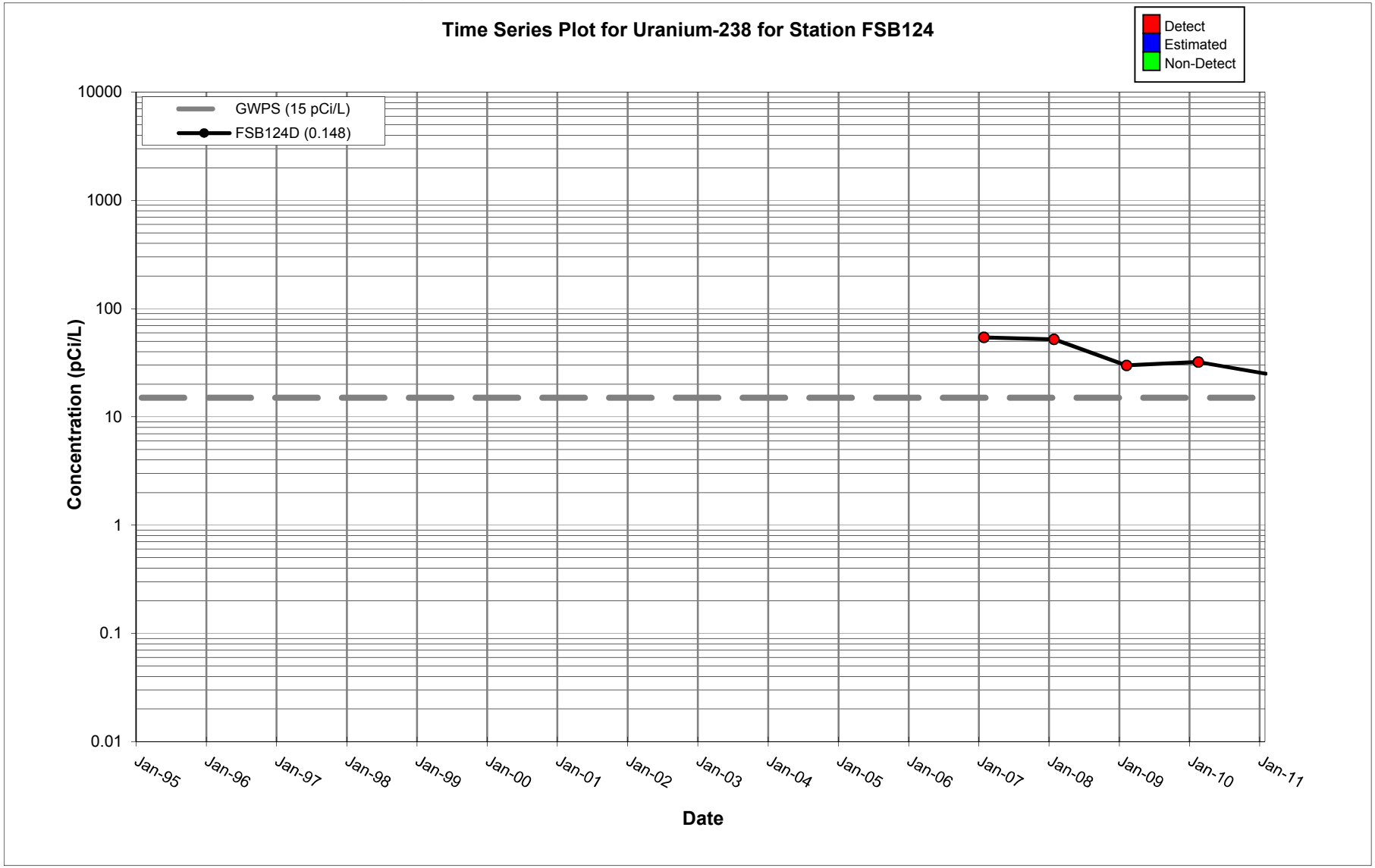

Time Series Plot for Uranium-238 for Station FSB 90
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 90C
FSB 90D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

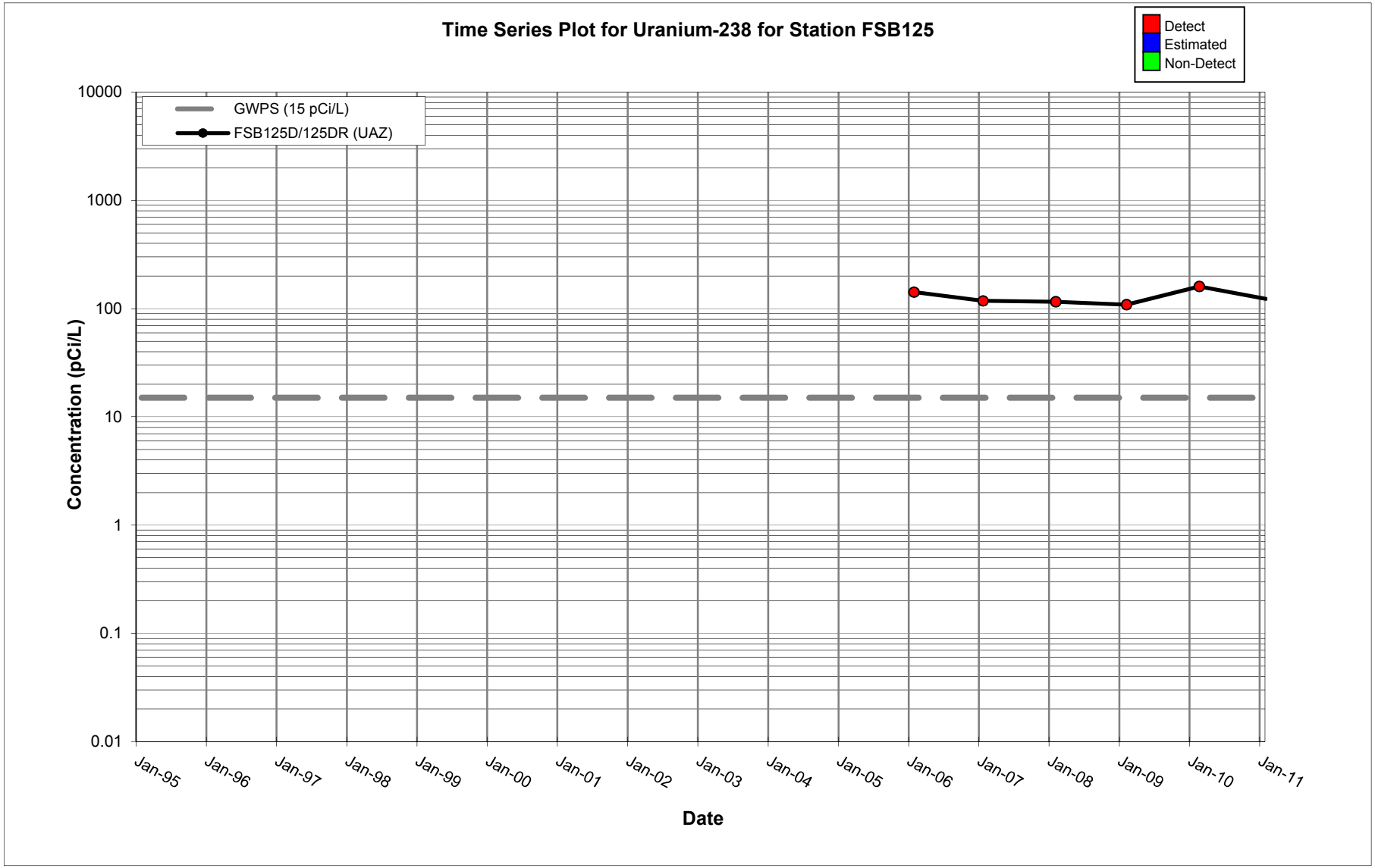

Time Series Plot for Uranium-238 for Station FSB 94
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 94C
FSB 94D/94DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

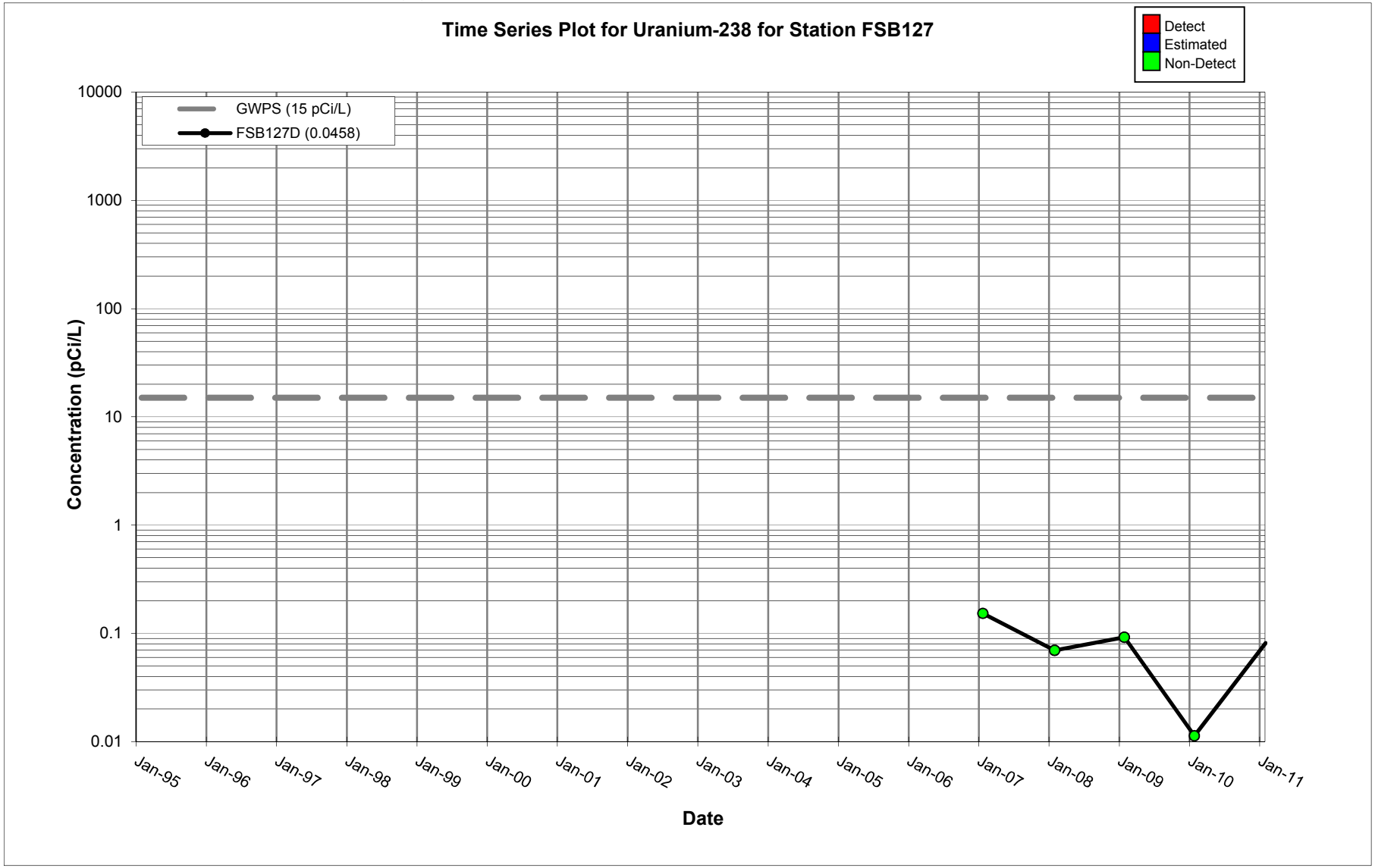

Time Series Plot for Uranium-238 for Station FSB 98
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB 98A/98AR (GAU)
FSB 98C
FSB 98D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

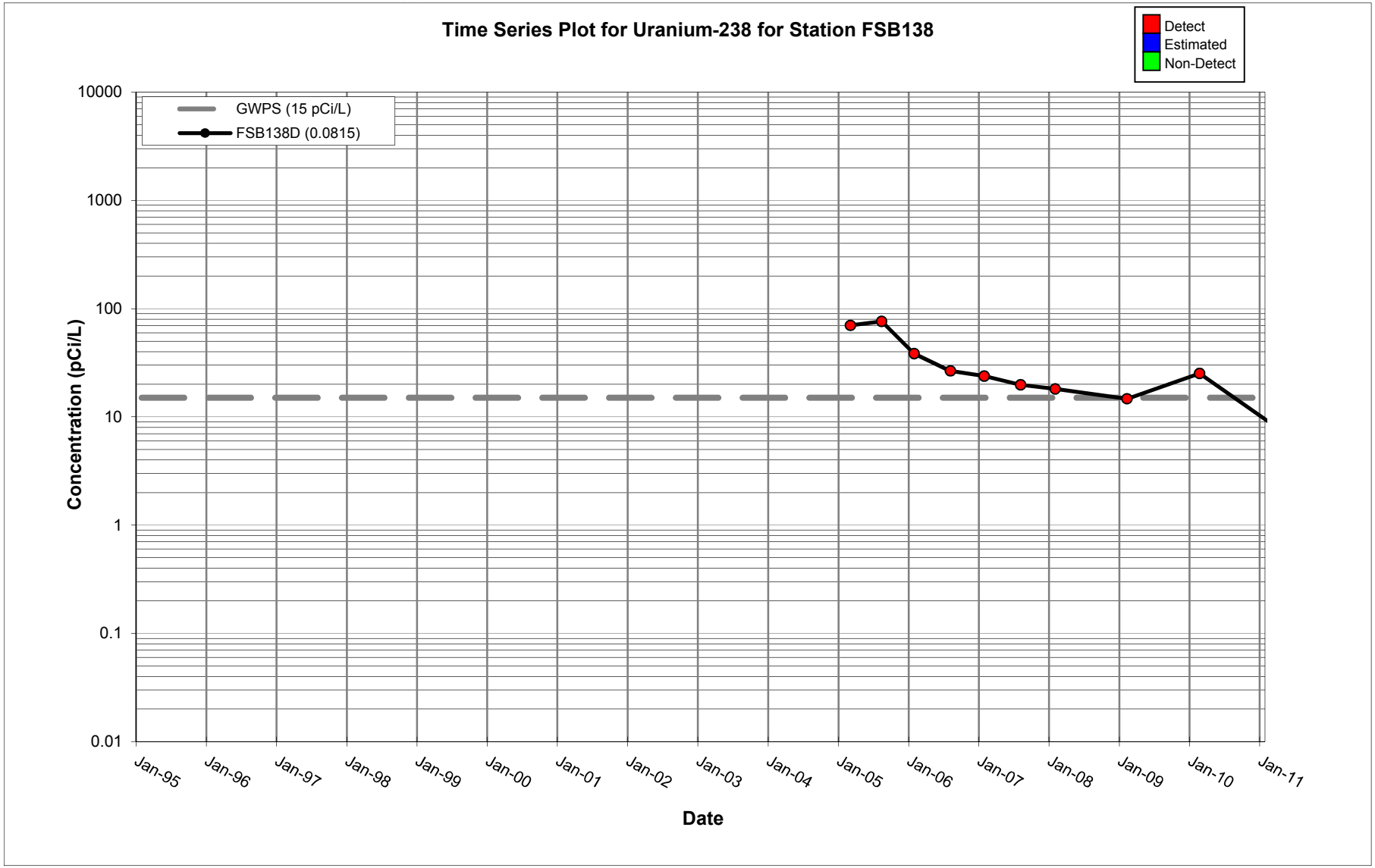

Time Series Plot for Uranium-238 for Station FSB104
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB104C
FSB104D
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date


Time Series Plot for Uranium-238 for Station FSB112
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB112A
FSB112C
FSB112D/112DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date


Time Series Plot for Uranium-238 for Station FSB124
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB124D (0.148)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date


Time Series Plot for Uranium-238 for Station FSB125
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB125D/125DR (UAZ)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date


Time Series Plot for Uranium-238 for Station FSB127
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB127D (0.0458)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date


Time Series Plot for Uranium-238 for Station FSB138
Detect
Estimated
Non-Detect
GWPS (15 pCi/L)
FSB138D (0.0815)
Concentration (pCi/L)
10000
1000
100
10
1
0.1
0.01
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Date

This Page Left Blank Intentionally

APPENDIX F

F-AREA AND H-AREA HAZARDOUS WASTE MANAGEMENT FACILITIES STATISTICAL EVALUATION

THIS PAGE INTENTIONALLY LEFT BLANK

To statistically assess the impact of the barrier walls and base injection, a simple hypothesis test was performed on water level (F- and H-Areas) and pH (F-Area only) data from select wells. To assess water level changes across the barriers, gradients were calculated for select well pairs as shown in Figures 1 and 2. Figure 3 shows the individual wells selected for assessment of pH changes. A brief summary of the statistical analysis follows.

For purposes of these tests, it was assumed that the before/after cutoffs were 2/1/2004 (F-Base injection), 8/1/2004 (F-Barrier), and 9/1/2004 (H-Barrier). The data was averaged by month. The two-tailed hypothesis test used a null hypothesis that the difference between the means (before/after) was zero. A t-statistic was used at a confidence of 95%.

A t-test statistic was calculated using:

$$t = \frac{\bar{x}_b - \bar{x}_a}{\sqrt{s_t^2\left(\frac{1}{n_b} + \frac{1}{n_a}\right)}}$$

where

$$s_t^2 = \frac{(n_b - 1)s_b^2 + (n_a - 1)s_a^2}{n_b + n_a - 2}$$

and $\bar{x}_b$, s_b, and n_b refer to the sample mean, standard deviation, and number (data count) for the *before* dataset, and $\bar{x}_a$, s_a, and n_a refer to the sample mean, standard deviation, and number (data count) for the *after* dataset. At a α=95% confidence level (two-tailed), the test rejects the null hypothesis if either $t > t_{\alpha/2}$ or $t < -t_{\alpha/2}$.

The null hypothesis for the water level gradient statistical test was that the difference between the mean water level gradients for each well pair before and after the installation of the barrier was zero. The null hypothesis for the pH statistical tests was that the difference in well average pH before and after the base injection was zero.

The results of the statistical tests are given in Tables 1 through 3, and Figures 4 through 6. The results summaries indicate: when insufficient data is available for the test, when there is no statistical difference, and when there is a statistical difference.

There are many points within the F Area pH and water level gradient data where there is not enough data to make the statistical test. This is often times a function of the relatively short period of time that the monitoring points have been available for data collection. Under these circumstances it is expected that statistical differences will become more widespread, especially for the water level gradient analyses. The pH differences are a location specific and chemical buffering issue. It maybe that the best locations for monitoring pH change during the base injection TA were not monitored, that more base was required, or that additional time is needed to eventually see changes at the down-gradient locations. Also the down-gradient path of the injected base in several areas was somewhat different than initially expected.

The water level gradient statistical evaluation for the H Area shows three well pairs that have statistical differences in gradient even though the barrier has been in place for a relatively short period of time. There are three well pairs with no statistical difference. It is thought that statistical differences will eventually become apparent for two of the pairs, but not the HSB147D to HSB138D pairs (located outside of the barrier system).

Table 1. F-Area pH Statistical Test Results Summary

Not enough data to test.	No statistically significant indication that the before/after means are different.	Statistically significant indication that the before/after means are different.
FB I13D, FB I14D, FB I16D, FEX 1, FEX 2, FEX 3, FEX 5, FEX 6, FEX 7, FOB 1D, FOB 13D, FOB 14D, FOB 16D, FPZ 2A, FPZ 5A, FPZ 5B, FPZ 6A, FPZ 6B, FPZ 7A, FPZ 7B, FSB 106D, FSB 112D, FSB 112DR, FSB 124D, FSB 125D, FSB 125DR, FSB 126D, FSB 127D, FSB 128D, FSB 129D, FSB 130D, FSB 131D, FSB 132D, FSB 133D, FSB 134D, FSB 135D, FSB 136D, FSB 137D, FSB 138D, FSP 2A, FSP 2B, FSP 47A, FSP 12A, FSP 204A, FSP 226A, FSP 249A, FSP 249B	FEX 4, FSB 78, FSB 110D, FSB 117D, FSB 121DR, FSB 122D	FB I15D, FB I17D, FSB 79, FSB 104D, FSB 118D

Table 2. F-Area Water Level Gradient Statistical Test Results Summary

Not enough data to test.	No statistically significant indication that the before/after means are different.	Statistically significant indication that the before/after means are different.
FIB 8 to FBI 15D FIT 5 to FSB 135D FIT 5 to FSB 136D FOB 2D to FOB 14D	FSB 110D to FS B79, FSB 112DR to FSB 136D	FSB 126D to FSB 79

Table 3. H-Area Water Level Gradient Statistical Test Results Summary

Not enough data to test.	No statistically significant indication that the before/after means are different.	Statistically significant indication that the before/after means are different.
--	HSB 153D to HSB 68DR, HSB 66D to HSB 69, HSB 147D to HSB 138D	HSB 154D to HSB 115D, HSB 153D to HSB 108D, HSB 112D to HSB 69

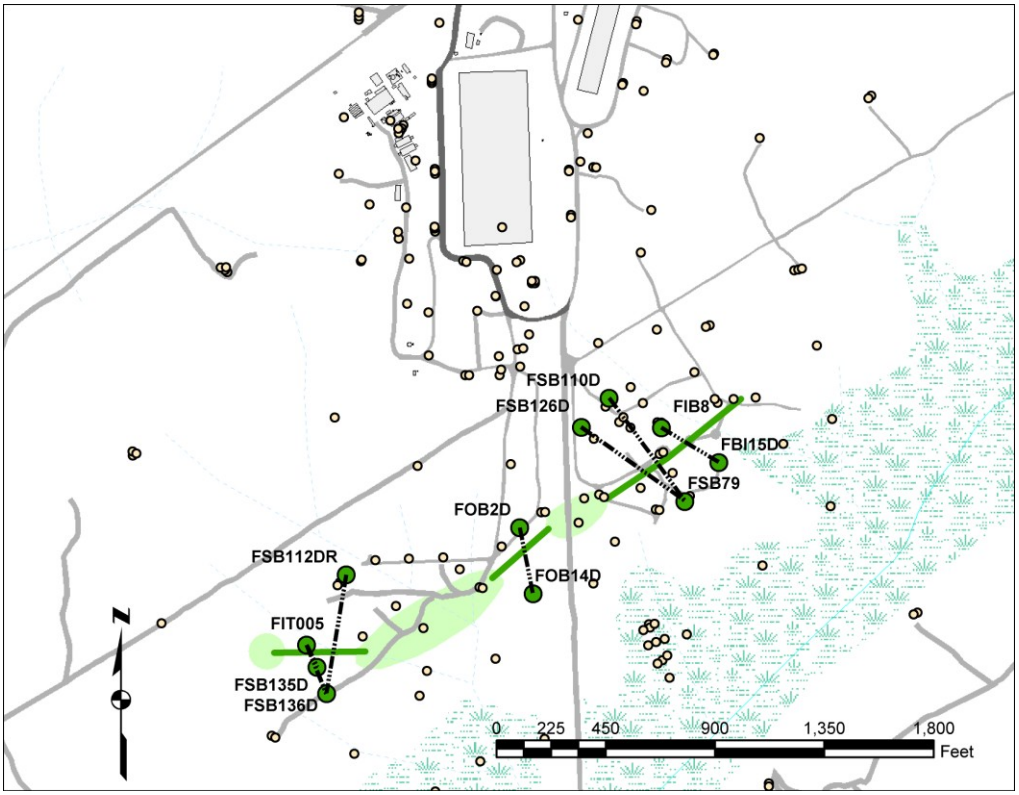


Figure 1. F-Area Well Pairs used for Statistical Analysis of Gradient

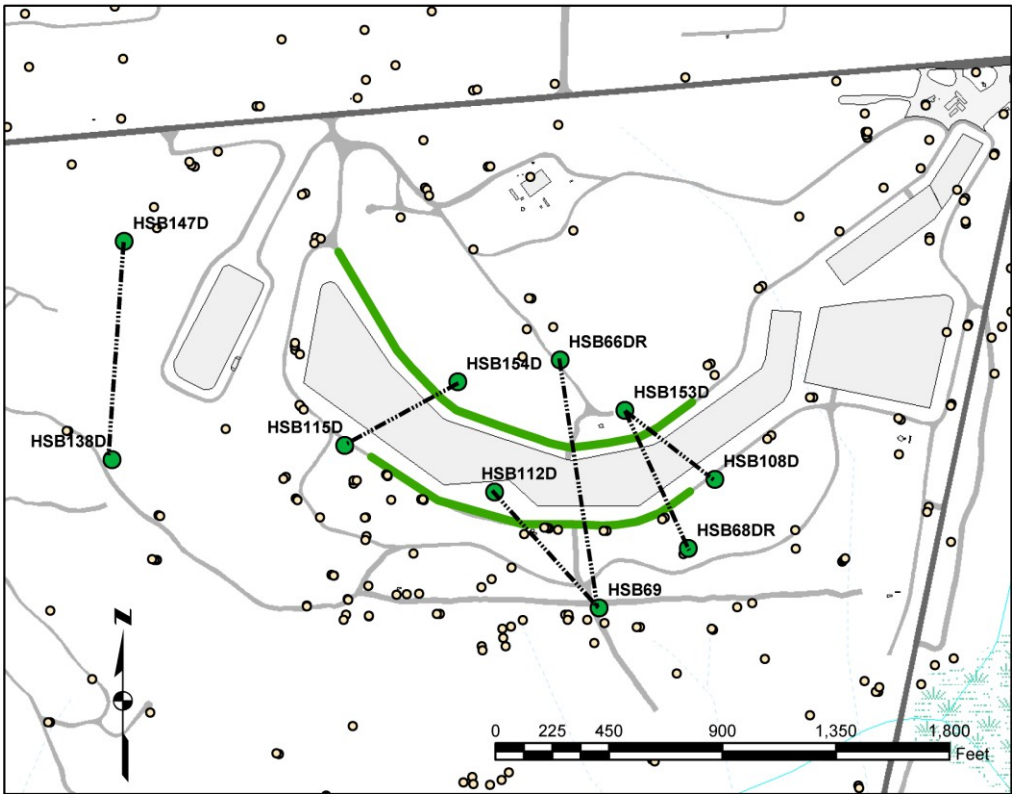


Figure 2. H-Area Well Pairs used for Statistical Analysis of Gradient

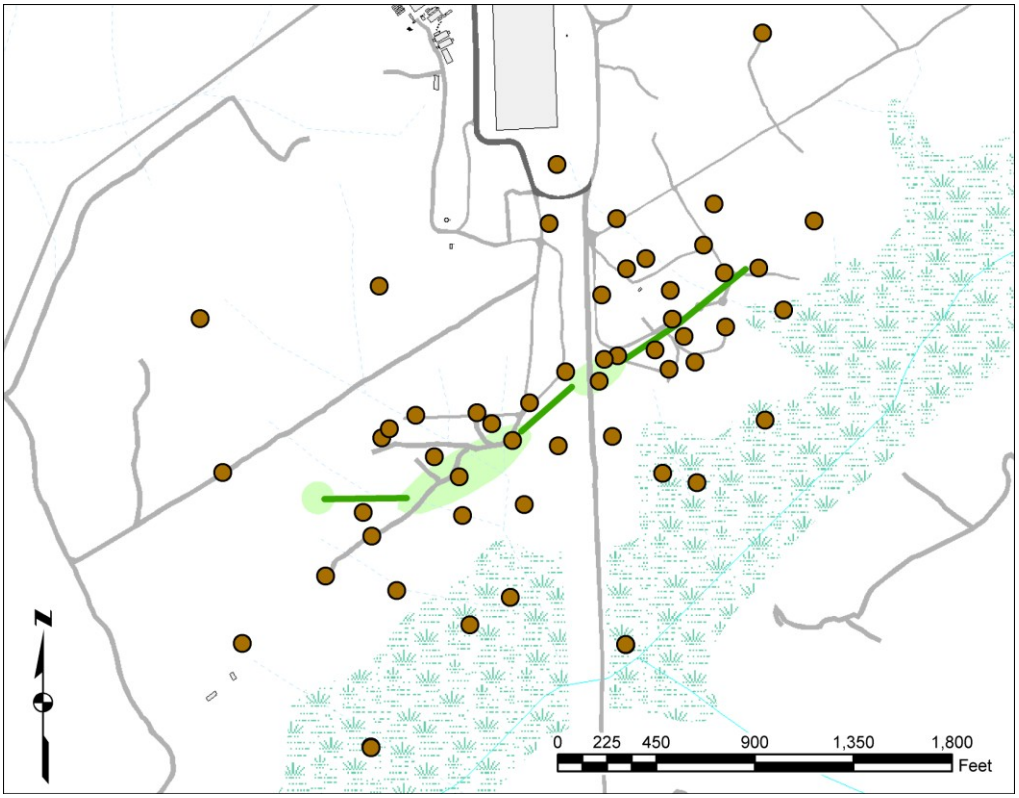


Figure 3. F-Area Wells used for Statistical Analysis of pH

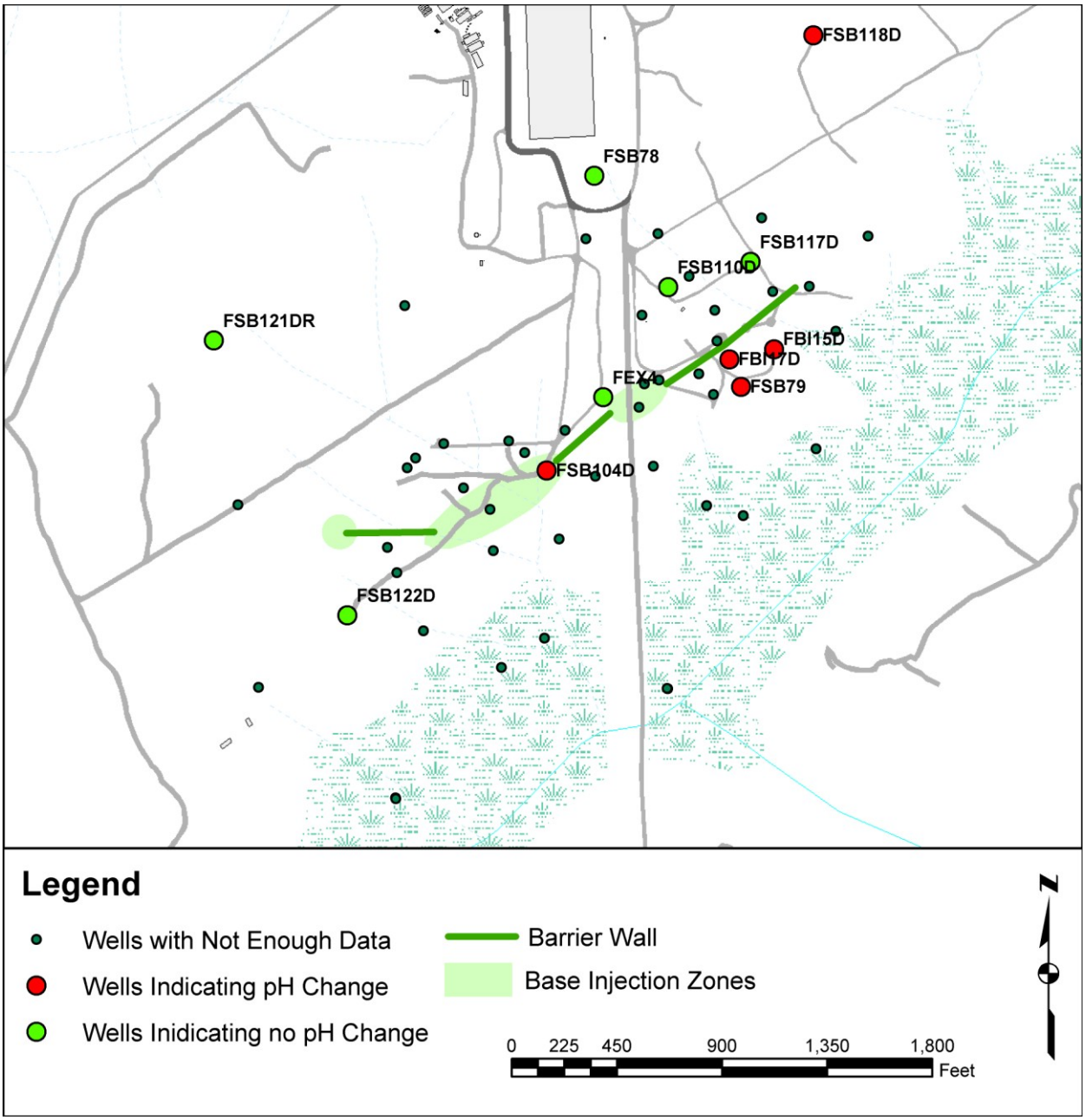


Figure 4. Statistical Analysis of pH Results

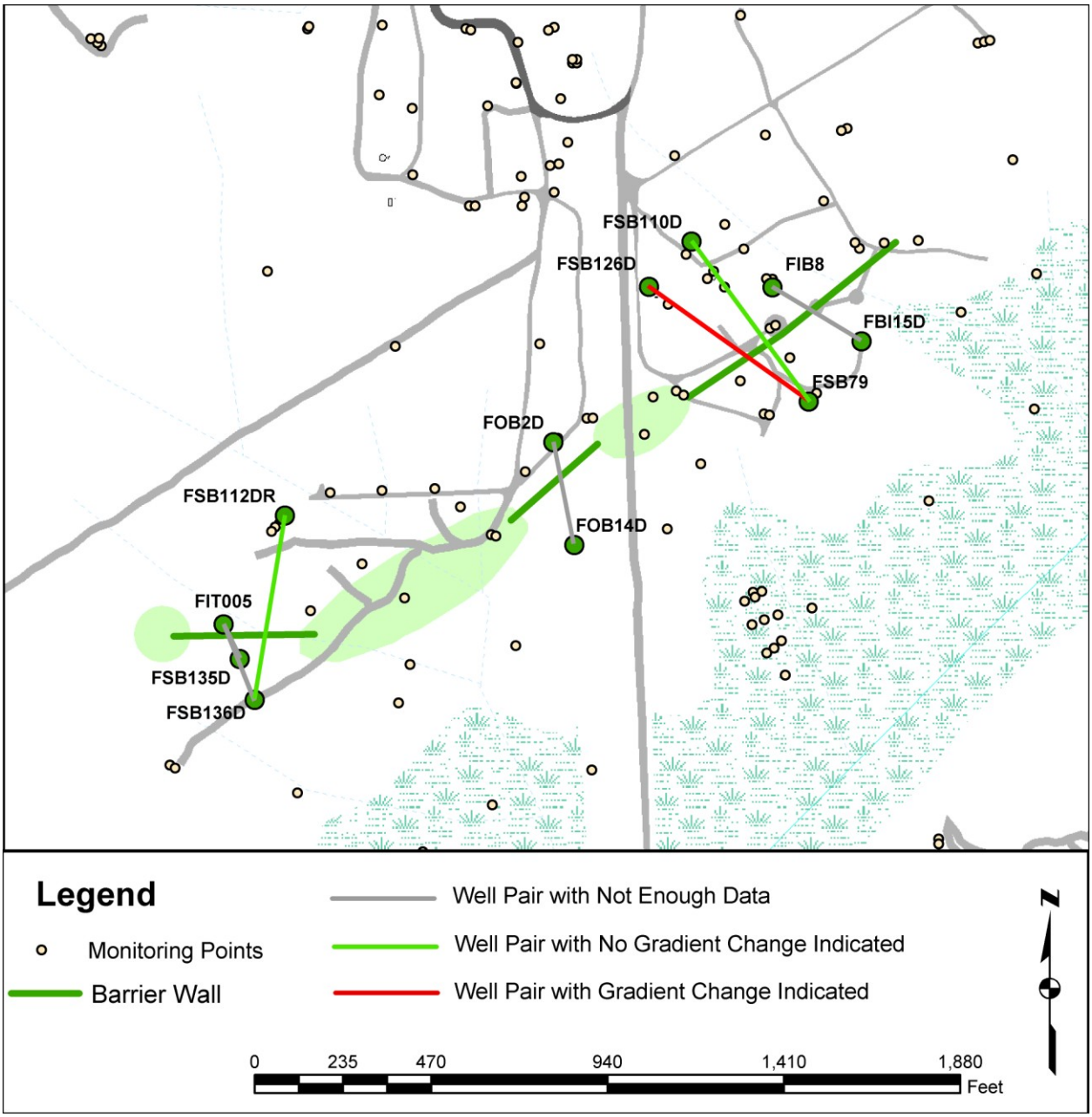


Figure 5. Statistical Analysis of F-Area Water Level Gradients Results

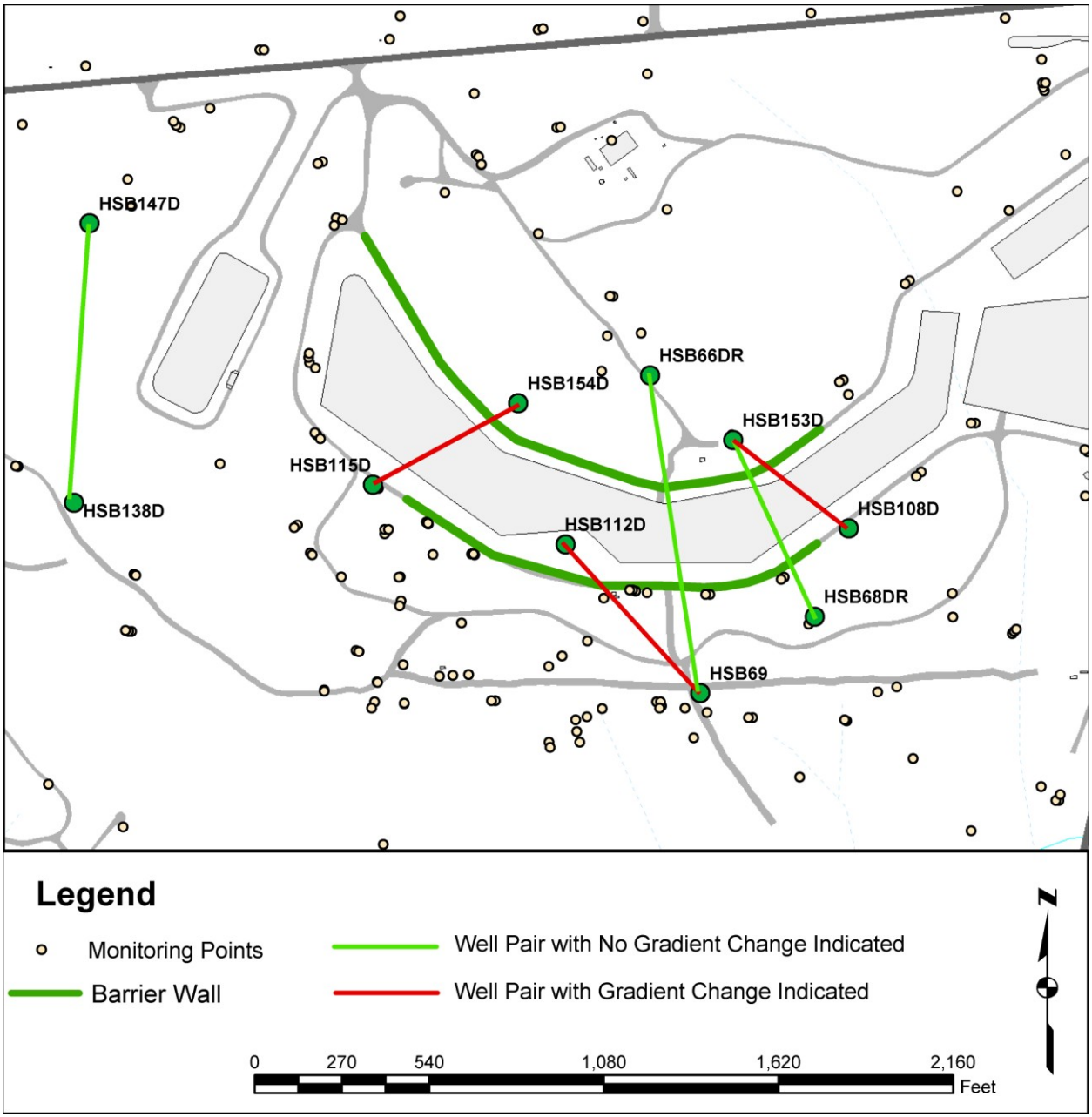


Figure 6. Statistical Analysis of H-Area Water Level Gradients Results

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX G

SREL EVAPOTRANSPIRATION STUDY

THIS PAGE INTENTIONALLY LEFT BLANK

Rev. JHS
March 2, 2012

Key Words: Tritium
Phytoremediation
Old Rad Waste Burial Ground (ORWBG)
Mixed-Waste Management Facility (MWMF)
Evapotranspiration

Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2011 End of Year Summary Report

By

J.H. Singer* and J.C. Seaman**

*Graduate Assistant Doctoral Candidate
**Senior Research Scientist
Savannah River Ecology Laboratory
The University of Georgia
Drawer E
Aiken, SC 29802
TEL: (803) 725-0977
FAX: (803) 725-3309
E Mail: "seaman@srel.edu"

_____

Principal Investigator

_____

Secondary Investigator

The University of Georgia
Savannah River Ecology Laboratory

Summary

A series of tritium mass balance calculations were conducted in support of the Mixed Waste Management Facility (MWMF) to estimate the efficiency of the irrigation system based on soil cores that were collected in June and October/November 2011. Results generated using the Cornell 1D model are provided for comparison. Prior to 2003, monitoring data indicated that tritium leaching was largely restricted to the instrumented sampling depth of 3 meters. Starting in 2003, an effort was made to account for tritium movement below the monitoring zone based on water balance calculations for each month of operation that considered irrigation rate, precipitation, and estimated evapo-transpiration. To assess tritium use efficiency for the Eastern Expansion Area, SREL collected and analyzed an additional two sets of 4 soil cores, the results of which are included in this report. The Cornell model was also modified to account for the expanded irrigation area.

When leaching was neglected in the tritium mass balance calculations, evapo-transpiration efficiency at the MWMF was estimated to be greater than 99% based on soil core data collected in June and October/November 2011. When taking leaching into account, the estimated efficiency for individual irrigation plots based on the most recent soil cores ranged from ≈ 81 to 95%, with an average efficiency of approximately 88.4 ± 4.6 %. Efficiency results derived from the Cornell 1D model were consistent with the soil-based calculations, ranging from 83.7.0 % to 88.2 % between plots, with a yearly average of 85.3 ± 1.3 % for all plots**.**

Introduction

Starting in 2001, the Savannah River Ecology Laboratory (SREL) has conducted a series of tritium mass balance calculations in support of the Mixed Waste Management Facility (MWMF) to estimate the effectiveness of evapo-transpiration in volatilizing tritium associated with irrigation water applied to a series of forested plots (Seaman and Aburime, 2002; Seaman and Singer, 2005a; Seaman and Singer, 2006; Seaman and Singer, 2007; Seaman et al., 2003; Seaman et al., 2004a; Seaman et al., 2004b; Seaman et al., 2007; Seaman et al., 2008; Seaman and Singer, 2009). Such calculations require estimates of the amount of tritium applied to each of the irrigation plots, as well as the tritium levels and moisture contents throughout the soil profile, without specifically considering the evapo-transpiration potential. An important assumption underlying such an approach is that significant amounts of tritium have not leached below the deepest soil monitoring depth, i.e., 3 meters. Despite some evidence for leaching in a limited number of monitoring clusters that was attributed to leaks in the irrigation system and preferential flow resulting from various monitoring activities, soil data through December 2002 generally supported the assumption that very little of the applied tritium had leached below 3 meters (Seaman and Aburime, 2002; Seaman et al., 2003).

In 2003, however, significant tritium levels were observed in the deepest sampling depths for many of the instrumented monitoring clusters. Therefore, a simple conceptual model was developed to account for tritium losses below the monitoring depth. TDR data was used to estimate water storage and leaching from the top 3 m of the soil profile. Tritium losses due to evapo-transpiration (ET) were based on the Penman-Monteith (PM) method, as calculated by the SRFS, assuming a crop factor of 0.90 (Riha and Rebel, 2003). When precipitation plus the applied irrigation water minus evapo-transpiration for a given sampling interval exceeded the residual water content in the soil profile, leaching below the 3 meter depth was included in the calculations. The tritium concentration in the pore-water moving below the sampling zone was

assumed to be the average tritium level observed at the deepest sampling depth for that sampling interval.

Monthly sampling of the lysimeters and vapor wells, and monitoring of the TDRs (i.e., soil moisture content) was suspended in December 2003 in favor of semi-annual soil core sampling for estimating residual soil tritium within the six instrumented irrigation plots. In 2011, the monitoring effort was expanded to include the Eastern Expansion Area, with soil cores collected from within four of the ## new irrigation plots. Therefore, ten cores were collected in June and another ten in October/November 2011 from various irrigation plots at the MWMF. For the purpose of this report, only the original six instrumented irrigation plots are included in the efficiency calculations (i.e., plots 4, 13, 16, 19, 22 and 27). The cores were transported to the lab and analyzed for tritium and water content to estimate residual soil tritium. As noted above, estimates of tritium leaching, including the expanded irrigation area, were based on a simplified water balance assessment that accounted for precipitation, irrigation, and evapo-transpiration estimates for each individual month.

In addition to the analytical model described above, the Cornell one dimensional bucket-type (Cornell 1D) model was developed to estimate tritium use efficiencies based on plot specific water balances and tritium application rates (Riha and Rebel, 2003). The Cornel 1D model was optimized using 30 years of climate data as well as soil physical characteristics specific to each plot, vegetation type, soil moisture content, and tritium concentrations from lysimeter and vapor well sampling.

Mass Balance Calculations for Applied Tritium

Cumulative irrigation volumes for each plot were estimated based on SRFS application logs for each month of operation starting in May 2001 and continuing through December 2011. Application totals for 2011 are summarized in Table 1A. For example, given the gallons applied each month and the area of a specific plot (e.g., September 2011 for plot 27, see Table 1A):

$$\frac{18{,}610\ gallons}{0.75\ acres} \times \frac{1\ acre}{4050\ m^2} \times \frac{3.78\ l}{gallon} = \frac{23.2\ l}{m^2}$$

Application depth in cm for unit plot area (i.e., cm^2) is then calculated as (Table 1C):

$$\frac{23.2\ l}{m^2} \times \frac{1\ m^2}{10{,}000\ cm^2} \times \frac{1000\ cm^3}{1\ l} = 2.32\ cm$$

The average tritium level for pond samples collected within the month (Table 1B; 4,270 pCi mL^{-1}) of interest is then used to estimate total tritium applied to each plot (Table 1D):

$$2.32\ cm\ applied \times \frac{4{,}270\ pCi}{mL} = \frac{9{,}889\ pCi}{cm^2}$$

The cumulative amount of tritium applied is then determined by summing the above calculation for each month up to the point when the evapo-transpiration efficiency is being calculated (Table 1D).

Estimating Residual Soil Tritium Based on Soil Core Data

Residual soil tritium was calculated using the tritium concentration extracted from soil cores sampled at depths of 100, 200, and 300 cm. The soil pore water was extracted for tritium analysis by sublimation (i.e., freeze drying) using the procedure described by WSRC 3Q 1-4. The resulting solution was analyzed for tritium by liquid scintillation with an estimated detection limit of 0.020 pCi/L and a counting error below 2% for elevated tritium concentrations (Minaxi Tri-Carb 4000, Packard Instru. Co), using a procedure outlined by WSRC (WSRC-EPD, 2001), with the exception of adjusting the sample and scintillation cocktail ratios to reduce the amount of waste in a manner consistent with SREL QA/QC protocols.

To estimate total tritium in the soil profile, the gravimetric water content for each soil core sample (gm water/(gm water + gm soil) was converted to a volumetric basis (example data from the 100 cm depth of Plot 4, December 2011 data; Table 3A):

$$100\,gm\,moist\,soil - 6.6\,gm\,water = 93.4\,gm\,dry\,soil$$

The soil volume for a given sample is calculated using the soil bulk density, assumed to be 1.59 gm cm^{-3} for the sandy soils of the SRS (Looney et al., 1990).

$$93.4\,gm\,dry\,soil \times \frac{1\,cm^3\,soil}{1.59\,gm\,dry\,soil} = 58.74\,cm^3\,soil$$

The volumetric water content for the specific sampling depth is then estimated,

$$\theta = \frac{11\,cm^3\,water}{58.74\,cm^3\,soil} = 0.112$$

As an example, the values for plot 4 derived from soil cores collected in October/November 2011 are given below, with all soil data summarized in Table 3.

Residual soil tritium for plot 4 based on soil samples collected October/November 2011. The mid-year and year-end data for all plots is given in Table 3.

Sampling Depth (cm)	Depth Span	*Tritium Level pCi/mL	Gravimetric Water Content (%)	Volumetric Water	Tritium Sum
100	0 to 100	351	6.6	0.112	3.93×10^3
200	100 to 200	162	9.6	0.169	2.73×10^3
300	200 to 300	397	11.0	0.197	7.81×10^3
			Total Soil Tritium (pCi cm^2) =		1.45×10^4

The tritium concentration (pC_i cm^{-3}) is multiplied by the representative depth interval and the volumetric water content to provide an estimate of total tritium within a given soil volume.

$$\frac{351\,pCi}{cm^3} \times 100\,cm \times \frac{0.112\,cm^3\,water}{cm^3\,soil} = \frac{3.93 \times 10^3\,pCi}{cm^2}$$

Note that the resulting units are the same as those for tritium applied to a unit plot area. Therefore, for a given unit area of an irrigation plot, the amount of water with a given tritium concentration is equal to the depth span (cm) for the sample in question multiplied by the volumetric water content, θ. The same calculation is then completed for each representative sampling depth and the values are summed to estimate the total residual tritium in the profile at that sampling location (Table 2B). For the June 2011 and October/November 2011 soil core data, each sample was assumed to represent a 100 cm interval from the sampling depth to the surface for the 100 cm samples, or to the next shallowest sampling depth for the 200 and 300 cm sampling depths. An example of the residual tritium results for plot 4 is given above, with the cumulative summary for all plots given in Table 2B.

Evapo-Transpiration Efficiency: No Leaching

If leaching is insignificant, the total residual tritium within plot 27 in 2011 can now be calculated by (Table 2; Plot 27):

$$\frac{2.10\times10^{4}\ pCi\ cm^{-2}}{3.60\times10^{6}\ pCi\ cm^{-2}}=0.0058\times100=0.58\%$$

The evapo-transpiration efficiency for plot 27 through December 2011 is then defined as total applied minus residual:

$$100\%-0.58\%=99.42\%$$

Obviously this approach yields unrealistically high efficiency rates because it fails to account for tritium leaching below the root zone when precipitation + irrigation exceeds the evapo-transpiration and the soil moisture storage capacity.

Water Balance Calculations

Environmental data used in the water balance calculations is provided in the Table below.

Precipitation data for the MWMF and evapo-transpiration estimates derived from the Priestly-Taylor (PT) method (cm). *PTx0.9

Month	Precipitation	PT	ET-CF*
2011			
January	6.0	3.2	2.9
February	6.8	6.0	5.4
March	12.6	8.9	8.0
April	7.4	16.1	14.5
May	4.1	20.9	18.8
June	8.6	28.1	25.3
July	6.1	24.5	22.1
August	6.6	23.8	21.4
September	8.4	15.8	14.2
October	2.9	9.8	8.8
November	4.1	5.8	5.2
December	3.6	3.9	3.5

Prior to 2004 (Seaman et al., 2004a), the water balance for each sampling interval was calculated as follows:

$$Moisture\,balance\,(cm) = soil\,moisture\,t_i + irrig. + precip. - ET - soil\,moisture\,t_f$$

The initial (t_i) and final (t_f) moisture content values were based on TDR data for the initial and subsequent monitoring dates, respectively. Tritium losses due to evapo-transpiration (ET) were based on the average monthly estimates using the Priestly-Taylor (PT) and Penman-Monteith (PM) methods, as calculated by the SRFS, assuming a crop factor of 0.90 (Riha and Rebel, 2003). For example, a positive value is indicative of leaching, while negative value means uptake and evaporation exceeded water inputs.

$$52.18\,cm + 2.29\,cm + 18.61\,cm - 3.06\,cm - 63.22\,cm = 6.8\,cm$$

Therefore, 6.8 cm of water leached below the 3 meter sampling profile between two given monitoring intervals, typically a period of 1 month between sampling events during the first few years of operation. Tritium leached below the profile for that monitoring period was then calculated as the leaching depth times the pore-water tritium concentration within soil samples from the deepest sampling depth for a given plot.

$$6.8\,cm \times \frac{1607\,pCi}{mL} = \frac{1.09 \times 10^4\,pCi}{cm^2}$$

The same approach could not be used with more-recent data because TDR measurements are not available to estimate initial and final moisture contents within the soil profile. One simple approach would be to use the gravimetric soil moisture data from soil cores collected at the beginning and end of a given monitoring period to represent the initial and final moisture contents, respectively, with the cumulative precipitation, irrigation volumes and evapo-transpiration estimates for the intermediate monitoring period. Although the approach seems reasonable, it fails to account for the episodic nature of precipitation events and seasonal variations in evapo-transpiration. In this simplified approach, any potential leaching can be

offset by high ET rates at some point during the monitoring interval, with typically wetter months offset by the high ET rates of the summer.

As an alternative, a monthly water balance was calculated using an estimated soil pedon field capacity (FC) based on an idealized soil typical of the irrigation site (Riha and Rebel, 2003). In the current context, FC is defined as the total amount of moisture that can be retained against gravity within the upper 3 meters of the soil profile, i.e., 62.8 cm of water, and therefore subject to continued evapo-transpiration. For this approach, the water balance equation is modified as:

$$Moisture\,balance\,(cm) = soil\,moisture\,t_i + irrig. + precip. - ET - FC$$

with each of the values representing monthly estimates rather than the cumulative values for the entire monitoring time span, typically 5-7 months.

The initial soil moisture content for each monitoring period was based on soil core data from December 2010 and June 2011, Tables 3C and 3B respectively. As before, a positive moisture value is indicative of leaching for that month, and the initial soil moisture content (t_i) is then set at FC for the subsequent month. If the monthly moisture balance (cm) is positive, the value is then multiplied by the average tritium concentration (pCi/mL) in the soil profile to estimate the amount of tritium having been leached (pCi/cm^2) for that month. A negative moisture balance result is indicative of the added storage capacity within the soil profile during drier months, and the moisture content for the next month is equivalent to the FC with the moisture deficit subtracted from it. Using this approach, storage capacity can accumulate for dry months when the FC and ET is not exceeded by precipitation plus irrigation. To some degree this approach fails to fully account for episodic events, as moisture balance calculations are based on monthly inputs. Leaching estimates for each plot for January 2011 through December 2011 are summarized in Table 4A. Similar to much of 2010, no significant leaching below the root zone was observed because of the low precipitation rate and the low irrigation water application rates.

Evapo-Transpiration Efficiency: With Leaching

Tritium loss due to evapo-transpiration and leaching is then calculated as the ratio of residual soil tritium plus cumulative tritium lost to leaching divided by the total amount that has been applied to a given plot. Using June 2011 data for Plot 4 as an example (Table 4):

$$\frac{2.63\times10^4\ pCi\,cm^{-2} + 4.73\times10^5\ pCi\,cm^{-2}}{4.73\times10^6\ pCi\,cm^{-2}} = \frac{5.00\times10^5\ pCi\,cm^{-2}}{4.73\times10^6\ pCi\,cm^{-2}} = 0.105\times100 = 10.5\%$$

Evapo-transpiration efficiency is then defined as total applied minus leaching plus residual:

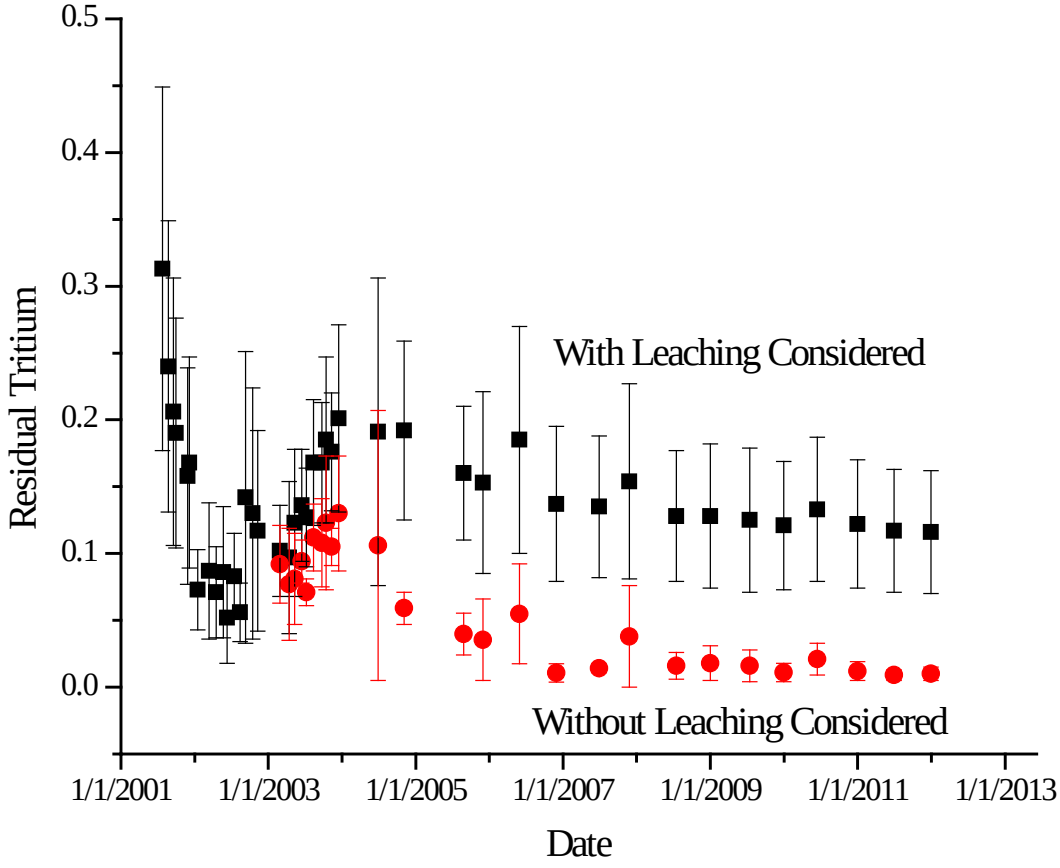
$$100\% - 10.5\% = 89.5\%$$

For Plot 4, 10% of the applied tritium remained in the soil profile or leached below the monitoring zone through December 2011, with approximately 90% presumably having been evapo-transpired (Table 4E). When leaching was neglected in the tritium mass balance, evapo-transpiration efficiencies at the MWMF through were approximately 99 % (Table 2C).

However, when taking leaching into account, the estimated efficiency ranged from 80.6 to 94.3%, with an average efficiency of approximately 88.4 ± 4.6 %, consistent with general efficiency trends observed over the last few sampling intervals (Table 4D).

General trends with respect to residual tritium estimates are presented in Figure 1 and Table 5. Starting in 2003, residual tritium estimates with and without considering leaching are provided. In general, the efficiency of the system initially increased as tritium became more thoroughly distributed within the soil profile and subject to plant uptake, reaching a plateau of approximately 95% during the drought of 2002. Throughout 2003, the efficiency decreased somewhat under more normal precipitation conditions. As expected, the difference between the two estimates has generally increased as the potential for leaching continues with extended operation. The continued high efficiencies observed in the latter half of 2005 through 2007 are likely attributed to the suspension of irrigation from September 2005 through March 2006, decreasing the level of residual tritium in the soil cores, and generally drier conditions throughout 2007 that reduced tritium leaching within the soil profile.

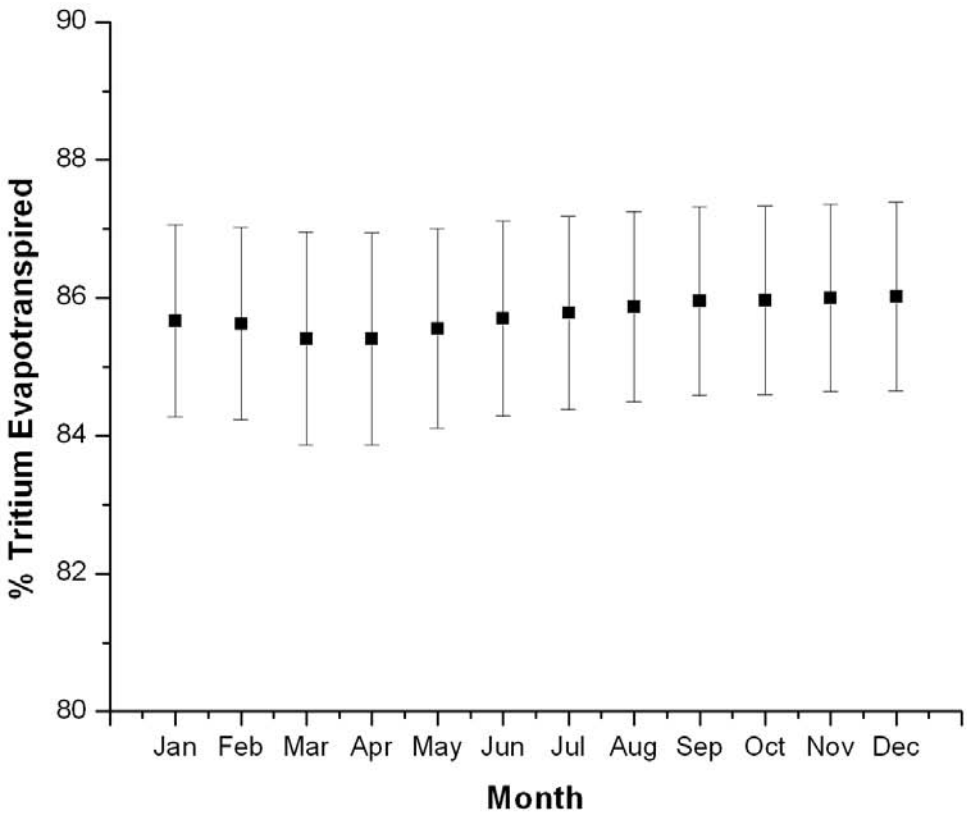
Figure 1. Residual soil tritium from May 2001 through December 2011, including estimates of tritium leached below the 3 meter sampling depth. Error bars reflect standard deviation of the means for irrigation plots 4, 13, 16, 19, 22 and 27.



Cornell 1D Model Results for 2011

For comparison, the Cornell 1D model was used to estimate the efficiency of tritium removed through evapo-transpiration at the site (Riha and Rebel, 2003). Water budget estimates were modeled using weather data, irrigation volumes, and Penman-Monteith estimates for evapo-transpiration. These data were compiled for daily estimates of the water deficit/surplus. Tritium concentrations were sampled at the pond three times per week. A linear regression was used to obtain daily estimates of tritium concentration for those days not directly sampled. The Cornell 1D model uses the water budget, tritium concentration, soil profile data specific to each plot, and a cropping factor to estimate tritium movement up or down through the soil profile. The monthly averages of daily efficiency estimates of tritium removal through evapo-transpiration for the monitored plots are included in Table 6 and presented in Figure 2. The model derived efficiencies ranged from 83.7.0 % to 88.2 % between plots, with a yearly average of 85.3 $\pm$ 1.3 % for all plots, consistent with the estimates based on the soil core data.

Figure 2. Average monthly evapo-transpiration efficiency estimates for 2011 derived from the Cornell 1D model for plots 4, 13, 16, 19, 22, and 27. Error bars reflect the standard deviation of the means from the average ET efficiency for the 6 instrumented irrigation plots.



Important Units and Conversion Factors
1 acre = 4,050 m^2
1 m^2 = 10,000 cm^2
1 gallon = 3.78 l
1 gallon = 3,780 cm^3
1 inch = 2.54 cm

Acknowledgements

The authors would like to acknowledge the assistance of B. Moyer with tritium extraction, analysis, and data archiving; and D. Strawbridge (SR-FS), Marsue Lloyd, and Stephanie Smith-Frizzell in coordinating and assisting with all field sampling activities.

References

Looney, B.B., C.A. Eddy, M. Ramdeen, J. Pickett, V. Rogers, M.T. Scott, and P.A. Shirley. 1990. Geochemical and physical properties of soils and shallow sediments at the Savannah River Site WSRC-RP-90-1031. Westinghouse Savannah River Company, Aiken, SC 29802.

Riha, S., and K. Rebel. 2003. Evaluating irrigation management strategies over 25 years. Cornell University, Cornell, NY.

Seaman, J.C., and S.A. Aburime. 2002. Estimating Evapotranspiration Losses for Tritium at the MWMF: 2001. Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., and J.H. Singer. 2005a. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2004 End of Year Data. Savannah River Ecology Lab, Aiken, SC.

Seaman, J.C., and J.H. Singer. 2005b. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2005 Mid-Year Data

Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., and J.H. Singer. 2006. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2005 End of Year Data

Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., and J.H. Singer. 2007. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2007 End of Year Data

Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., J.H. Singer, and S.A. Aburime. 2003. Estimating Evapotranspiration Losses for Tritium at the MWMF: 2002 Data. SREL, Aiken, SC.

Seaman, J.C., J. Singer, and S.A. Aburime. 2004a. Estimating Evapotranspiration Losses for Tritium at the MWMF: 2003 Data. Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., J.H. Singer, and S.A. Aburime. 2004b. Estimating Evapo-Transpiration Losses for Tritium at the MWMF:

2004 Mid Year Data.

Seaman, J.C., J.H. Singer, and S.A. Aburime. 2007. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2007 Mid-Year Data. Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., J.H. Singer, and S.A. Aburime. 2008. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2007 End of Year Data. Savannah River Ecology Laboratory, Aiken, SC.

Seaman, J.C., and J.H. Singer. 2009. Estimating Evapo-Transpiration Losses for Tritium at the MWMF: 2008 End of Year Report.

WSRC-EPD. 2001. Determination of tritium in water WSRC 3Q1-4, 2670 Rev. 2. Westinghouse Savannah River Company, Aiken, SC 29808.

Rev. JHS
March 2, 2012

Table 1. Application rates (gallons and cm irrigation depth) and tritium concentrations for each of the instrumented clusters from January through December 2011 (Data given in bold used as examples cited in discussion).

Table 1. Application Summary through December 2011.

1A Plot	Acreage	Cummulative December 2010	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Sum (gallons)
4	0.62	2.31E+06	7,346	13,246	17,302	22,172	33,811	42,841	30,355	32,541	21,204	20,077	8,451	6,632	2.56E+06
13	0.95	2.89E+06	8,491	16,476	22,121	21,061	33,666	27,805	32,350	36,474	20,153	23,290	8,807	9,390	3.15E+06
16	0.63	1.74E+06	5,895	10,640	13,381	18,992	24,440	36,148	25,067	25,523	22,187	17,510	6,254	5,125	1.95E+06
19	0.8	2.40E+06	7,912	14,280	16,707	27,507	32,801	47,549	34,302	34,477	30,361	16,807	6,634	5,395	2.68E+06
22	1.07	2.46E+06	8,096	14,597	19,068	25,429	37,261	47,213	33,453	35,862	23,368	22,126	8,359	7,309	2.74E+06
27	0.75	1.98E+06	6,321	11,575	15,905	19,878	26,190	28,953	25,823	28,120	**18,610**	16,255	5,685	6,164	2.19E+06
		1.38E+07												Total	1.53E+07
1B Monthly Tritium (pCi/mL)			4,010	3,107	3,875	3,465	4,099	4,450	4,027	4,010	**4,270**	3,998	3,589	3,393	

1C Irrigation Depth (cm)

Plot	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Sum (cm)
4	1.11	1.99	2.60	3.34	5.09	6.45	4.57	4.90	3.19	3.02	1.27	1.00	38.53
13	0.83	1.62	2.17	2.07	3.31	2.73	3.18	3.58	1.98	2.29	0.87	0.92	25.55
16	0.87	1.58	1.98	2.81	3.62	5.36	3.71	3.78	3.29	2.59	0.93	0.76	31.28
19	0.92	1.67	1.95	3.21	3.83	5.55	4.00	4.02	3.54	1.96	0.77	0.63	32.05
22	0.71	1.27	1.66	2.22	3.25	4.12	2.92	3.13	2.04	1.93	0.73	0.64	24.61
27	0.79	1.44	1.98	2.47	3.26	3.60	3.21	3.50	**2.32**	2.02	0.71	0.77	26.07

Monthly Tritium Applied (pCi/cm^2)

1D Plot	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Sum
4	4435	6195	10093	11565	20865	28696	18402	19643	13630	12083	4566	3388	1.54E+05
13	3345	5029	8421	7170	13559	12155	12799	14369	8454	9148	3106	3130	1.01E+05
16	3502	4897	7682	9749	14843	23829	14955	15163	14035	10371	3325	2576	1.25E+05
19	3701	5176	7553	11120	15687	24683	16116	16129	15124	7839	2778	2136	1.28E+05
22	2832	3956	6445	7686	13324	18324	11751	12544	8703	7716	2617	2163	9.81E+04
27	3154	4475	7670	8571	13361	16032	12941	14032	**9889**	8087	2539	2603	1.03E+05

Rev. JHS
March 2, 2012

Table 2. Cumulative tritium application totals and residual soil tritium for cores collected June 2011 and October/November 2011.

Cummulative Tritium Application

2A Plot	Through December 2010	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
4	4.64E+06	4.65E+06	4.66E+06	4.67E+06	4.68E+06	4.70E+06	4.73E+06	4.74E+06	4.76E+06	4.78E+06	4.79E+06	4.79E+06	4.80E+06
13	3.66E+06	3.66E+06	3.67E+06	3.68E+06	3.68E+06	3.70E+06	3.71E+06	3.72E+06	3.74E+06	3.74E+06	3.75E+06	3.76E+06	3.76E+06
16	3.40E+06	3.40E+06	3.41E+06	3.42E+06	3.43E+06	3.44E+06	3.46E+06	3.48E+06	3.49E+06	3.51E+06	3.52E+06	3.52E+06	3.53E+06
19	4.00E+06	4.00E+06	4.01E+06	4.02E+06	4.03E+06	4.04E+06	4.07E+06	4.08E+06	4.10E+06	4.11E+06	4.12E+06	4.12E+06	4.13E+06
22	3.20E+06	3.21E+06	3.21E+06	3.22E+06	3.23E+06	3.24E+06	3.26E+06	3.27E+06	3.28E+06	3.29E+06	3.30E+06	3.30E+06	3.30E+06
27	3.49E+06	3.50E+06	3.50E+06	3.51E+06	3.52E+06	3.53E+06	3.55E+06	3.56E+06	3.57E+06	3.58E+06	3.59E+06	3.59E+06	**3.60E+06**

Residual Soil Tritium (pCi/cm^2)

2B Plot	December 2010	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
4	9.98E+04						2.63E+04						1.45E+04
13	2.25E+04						1.74E+04						4.87E+04
16	5.94E+04						5.06E+04						3.36E+04
19	1.49E+04						3.86E+04						4.30E+04
22	4.99E+04						3.59E+04						5.25E+04
27	3.08E+04						3.62E+04						**2.10E+04**

Residual tritium fraction without accounting for leaching.

2C Plot	December 2010	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
4	0.021						0.006						0.003
13	0.006						0.005						0.013
16	0.017						0.015						0.010
19	0.004						0.010						0.010
22	0.016						0.011						0.016
27	0.009						**0.010**						**0.006**
	0.012 Avg					Avg	0.009					Avg	0.010
	0.007 Std Dev					Std Dev	0.004					Std Dev	0.005

Table 3. Tritium concentrations and water content data for soil samples collected in October/November 2011 (A), June 2011 (B), and December 2010 (C).

3A October/November 2011 Soil Data

Plot ID	Depth (cm)	Gravimetric Moisture (%)	Tritium (pCi/mL)	Volumetric Soil Moisture
4	**100**	**6.6**	**351**	**0.112**
4	**200**	**9.6**	**162**	**0.169**
4	**300**	**11.0**	**397**	**0.197**
13	100	11.9	558	0.215
13	200	10.5	856	0.186
13	300	9.1	1311	0.159
16	100	14.9	349	0.278
16	200	12.3	443	0.223
16	300	12.9	599	0.235
19	100	13.1	702	0.239
19	200	12.7	548	0.231
19	300	11.2	676	0.200
22	100	10.1	751	0.179
22	200	10.4	1028	0.185
22	300	12.1	920	0.219
27	100	9.4	104	0.165
27	200	15.2	139	0.285
27	300	14.7	561	0.274

3B June 2011 Soil Data

Plot ID	Depth (cm)	Gravimetric Moisture (%)	Tritium (pCi/mL)	Volumetric Soil Moisture
4	100	10.3	73	0.182
4	200	13.4	299	0.246
4	300	9.9	1003	0.175
13	100	15.6	134	0.293
13	200	14.8	244	0.276
13	300	10.8	350	0.193
16	100	11.1	371	0.199
16	200	13.9	749	0.256
16	300	15.1	853	0.282
19	100	8.2	466	0.142
19	200	13.4	697	0.246
19	300	13.1	619	0.241
22	100	9.6	465	0.169
22	200	9.7	803	0.171
22	300	10.6	763	0.188
27	100	14.0	197	0.259
27	200	12.6	871	0.229
27	300	7.7	848	0.132

3C December 2010 Soil Data

Plot ID	Depth (cm)	Gravimetric Moisture (%)	Tritium (pCi/mL)	Volumetric Soil Moisture
4	100	11.0	3421	0.196
4	200	10.2	631	0.181
4	300	10.0	1217	0.176
13	100	8.2	510	0.143
13	200	8.0	597	0.138
13	300	9.1	442	0.158
16	100	12.2	529	0.221
16	200	12.7	783	0.232
16	300	14.6	1089	0.272
19	100	3.3	109	0.054
19	200	13.2	53	0.242
19	300	11.5	630	0.206
22	100	13.0	488	0.237
22	200	11.3	717	0.202
22	300	11.8	1119	0.213
27	100	11.8	352	0.212
27	200	9.4	659	0.165
27	300	8.8	818	0.152

Table 4. Efficiency estimates for June 2011 and October/November 2011 including the leaching fraction.

4A Plot	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
4												
13												
16												
19												
22												
27												

Cumulative Leaching (pCi/cm^2)

4B Plot	Total Tritium leached through Dec January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
4	4.73E+05					4.73E+05						4.73E+05
13	5.48E+05					5.48E+05						5.48E+05
16	6.01E+05					6.01E+05						6.01E+05
19	3.60E+05					3.60E+05						3.60E+05
22	2.97E+05					2.97E+05						2.97E+05
27	1.70E+05					1.70E+05						1.70E+05

Leachate plus residual soil tritium

4C Plot	Soil Tritium June 2011	Total (Soil + Leachate)	Soil Tritium December 2011	Total (Soil + Leachate)
4	2.63E+04	5.00E+05	1.45E+04	4.88E+05
13	1.74E+04	5.65E+05	4.87E+04	5.96E+05
16	5.06E+04	6.52E+05	3.36E+04	6.35E+05
19	3.86E+04	3.98E+05	4.30E+04	4.02E+05
22	3.59E+04	3.33E+05	5.25E+04	3.49E+05
27	3.62E+04	2.06E+05	2.10E+04	1.91E+05

Total applied tritium

4D Plot	June 2011	December 2011
4	4.73E+06	4.80E+06
13	3.71E+06	3.76E+06
16	3.46E+06	3.53E+06
19	4.07E+06	4.13E+06
22	3.26E+06	3.30E+06
27	3.55E+06	3.60E+06

Efficiency

4E Plot	Residual Tritium		Residual Tritium	
4	0.11		0.10	
13	0.15		0.16	
16	0.19		0.18	
19	0.10		0.10	
22	0.10		0.11	
27	0.06	Overall Efficiency	0.05	Overall Efficiency
Avg.	**0.117**	88.26	**0.116**	88.39
St. Dev.	**0.046**	4.58	**0.046**	4.59

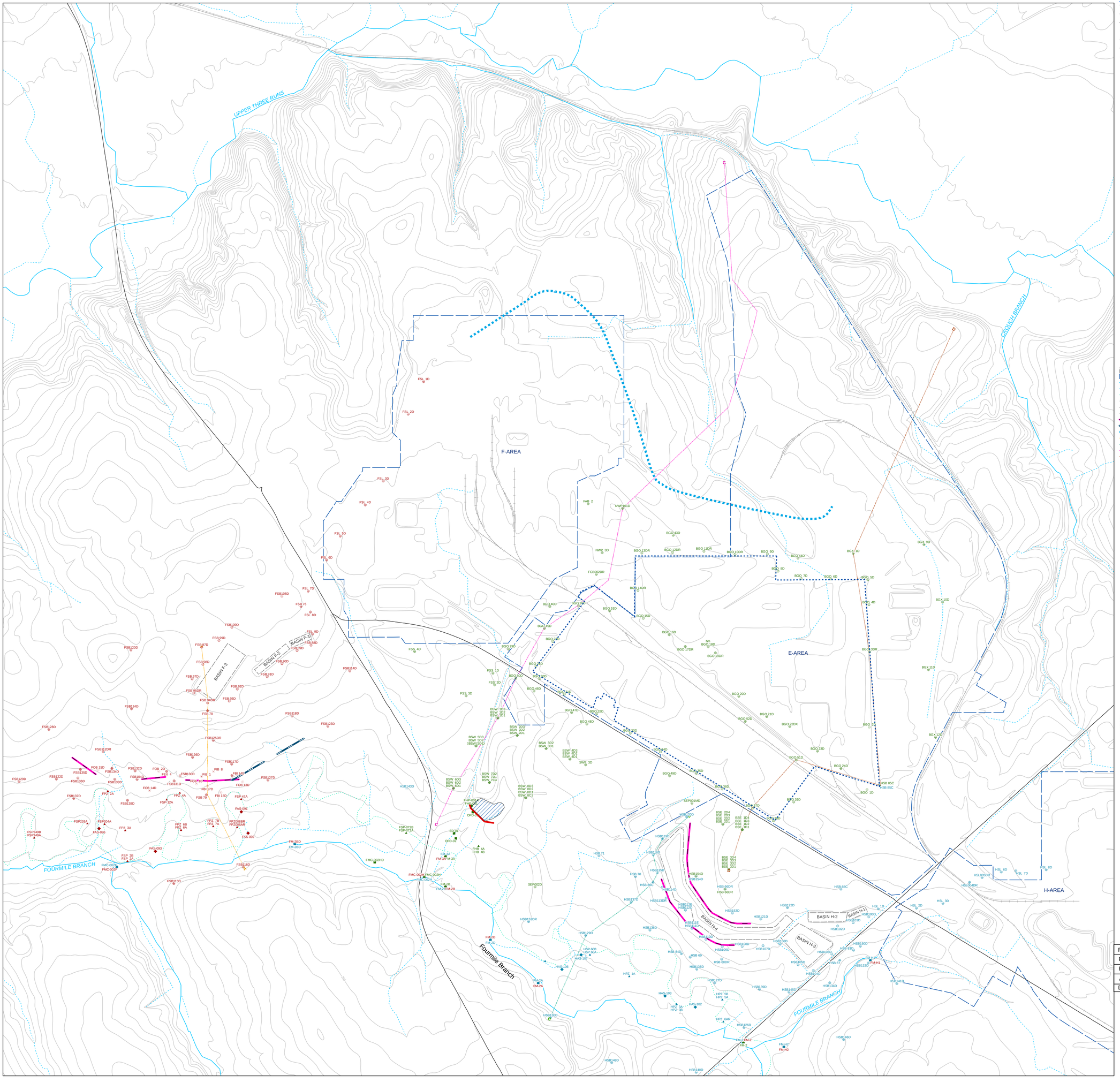
Table 5. Estimated residual soil tritium throughout the operation history of the MWMF.

Date	Vapor/TDR Data*	Corrected Vapor Data**	Lysimeter Data	Soil Cores
2001 Data				
26-Jul	0.313 (±0.136)		0.446	
24-Aug	0.204 (±0.109)			
17-Sep	0.206 (±0.100)			
1-Oct	0.190 (±0.086)	0.163		
27-Nov	0.158 (±0.081)			
7-Dec	0.168 (±0.079)			
2002 Data				
16-Jan	0.073 (±0.030)			
10-Feb				
13-March	0.087 (±0.051)			
19-April	0.071 (±0.034)			
23-May	0.086 (±0.049)			
12-June	0.052 (±0.034)			
17-July	0.083 (±0.032)			
1-Aug				0.047 (±0.015)[#]
14-Aug	0.056 (±0.022)			
11-Sep	0.142 (±0.109)			
17-Oct	0.130 (±0.094)			
9-Nov	0.117 (±0.075)			0.049 (±0.039)[##]
2003 Data	Leaching not included	Vapor Data including Leaching		
28-Feb	0.092 (±0.029)	0.102 (±0.034)		
16-April	0.077 (±0.042)	0.097 (±0.057)		
13-May	0.081 (±0.034)	0.123 (±0.055)		
17-June	0.094 (±0.016)	0.136 (±0.042)		
9-July	0.071 (±0.010)	0.127 (±0.037)		
13-August	0.112 (±0.025)	0.168 (±0.047)		
24-September	0.108 (±0.033)	0.168 (±0.045)		
16-Oct.	0.123 (±0.050)	0.185 (±0.062)		
12-November	0.105 (±0.014)	0.176 (±0.044)		
17-December	0.137 (±0.058)	0.201 (±0.070)		
	Soil Core data, leaching not included	Soil Core data including leaching		
June 2004	0.106 (±0.101)[###]	0.191 (±0.115)[###]		
November 2004	0.059 (±0.012)[###]	0.192 (±0.067)[###]		
August 2005	0.040 (±0.016)[###]	0.158 (±0.152)[###]		
November 2005	0.036 (±0.030)[###]	0.153 (±0.068)[###]		
May/June 2006	0.055 (±0.037)[###]	0.185 (±0.085)[###]		
November 2006	0.011 (±0.007)[###]	0.137 (±0.056)[###]		
July 2007	0.014 (±0.003)[###]	0.135 (±0.058)[###]		
December 2007	0.038 (±0.038)[###]	0.154 (±0.073)[###]		
June/Aug 2008	0.016 (±0.010)[###]	0.128 (±0.049)[###]		
December 2008	0.018 (±0.013)[###]	0.128 (±0.054)[###]		
June/Aug 2009	0.016 (±0.012)[###]	0.128 (±0.049)[###]		
December 2009	0.011 (±0.007)[###]	0.121 (±0.048)[###]		
June 2010	0.021 (±0.012)[###]	0.133 (±0.054)[###]		
December 2010	0.012 (±0.007)[###]	0.122 (±0.048)[###]		
June 2011	0.009 (±0.004)[###]	0.117 (±0.046)[###]		
December 2011	0.010 (±0.005)[###]	0.116 (±0.046)[###]		

*residual moisture content based on TDR results.
**suspect vapor data replaced with tritium levels from extracted soil cores.
[#]tritium data based on three cores collected to a depth of 4 meters and sectioned at ~ 15 cm intervals.
[##]tritium data based on soil samples collected from select specified depths (50, 150, 200, and 300 cm)
[###]tritium data based on soil samples collected from select specified depths (100, 200, and 300 cm)

Table 6. 2011 Monthly ET efficiencies for 6 plots estimated with the Cornell 1D model.

	Plot							
	4	13	16	19	22	27	Total	
Month	avg	avg	avg	avg	avg	avg	avg	st dev
January	83.88	85.81	87.84	86.53	85.10	84.85	85.67	1.39
February	83.83	85.78	87.79	86.51	85.07	84.79	85.63	1.40
March	83.78	85.75	87.75	86.48	83.96	84.74	85.41	1.55
April	83.74	85.72	87.75	86.47	84.05	84.71	85.41	1.53
May	83.88	85.73	87.86	86.48	84.59	84.81	85.56	1.45
June	84.04	85.83	87.98	86.57	84.82	84.97	85.70	1.42
July	84.14	85.93	88.02	86.63	84.91	85.07	85.78	1.40
August	84.24	86.01	88.09	86.71	85.01	85.18	85.87	1.38
September	84.33	86.04	88.15	86.78	85.11	85.28	85.95	1.37
October	84.33	86.09	88.14	86.84	85.15	85.24	85.96	1.37
November	84.38	86.10	88.17	86.84	85.21	85.28	86.00	1.36
December	84.37	86.15	88.17	86.91	85.23	85.28	86.02	1.37



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

PERMIT

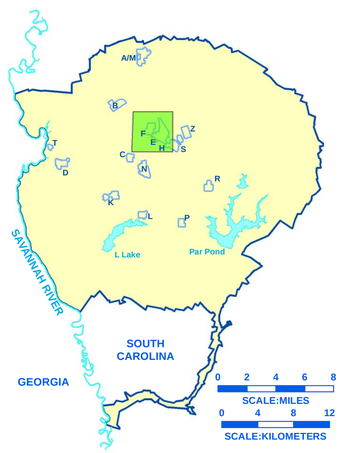
- F-AREA
- H-AREA
- MWMF

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



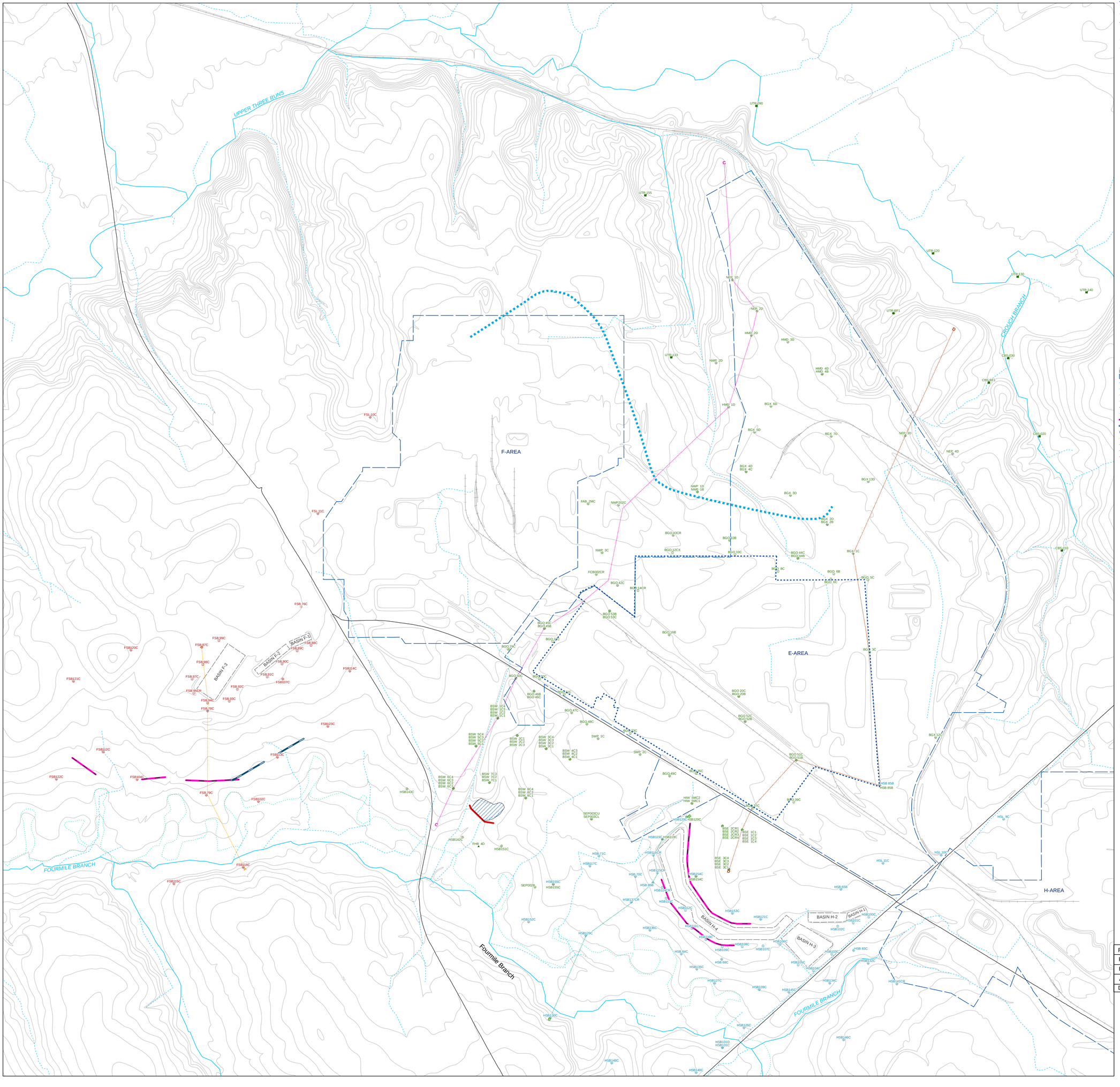
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 01A.
GSA Corrective Action Report,
General Separations Area
Location Map,
UAZ of the UTRA

Map 01A. GSA Corrective Action Report, General Separations Area Location Map, UAZ of the UTRA

MAP01A



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

PERMIT

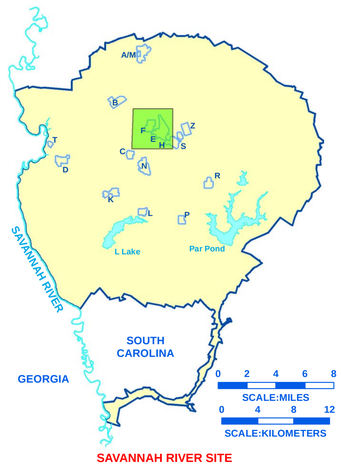
- F-AREA
- H-AREA
- MWMF

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH



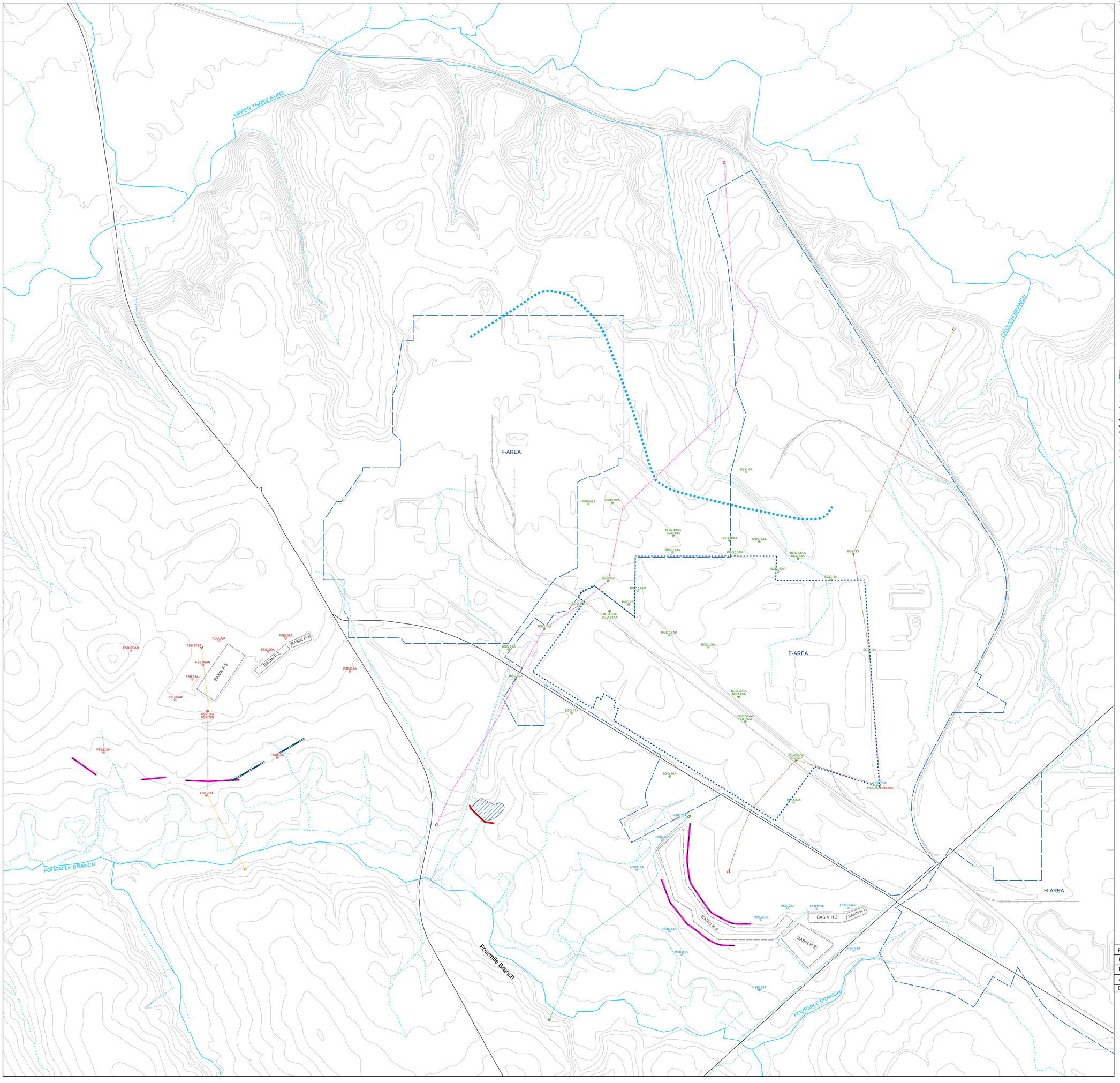
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 01B.
GSA Corrective Action Report, General Separations Area Location Map, LAZ of the UTRA

Map 01B. GSA Corrective Action Report, General Separations Area Location Map, LAZ of the UTRA

MAP01B



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

PERMIT

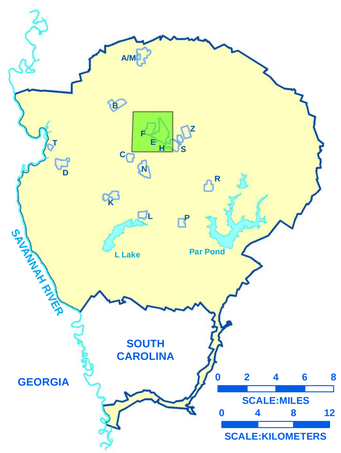
- F-AREA
- H-AREA
- MWMF

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



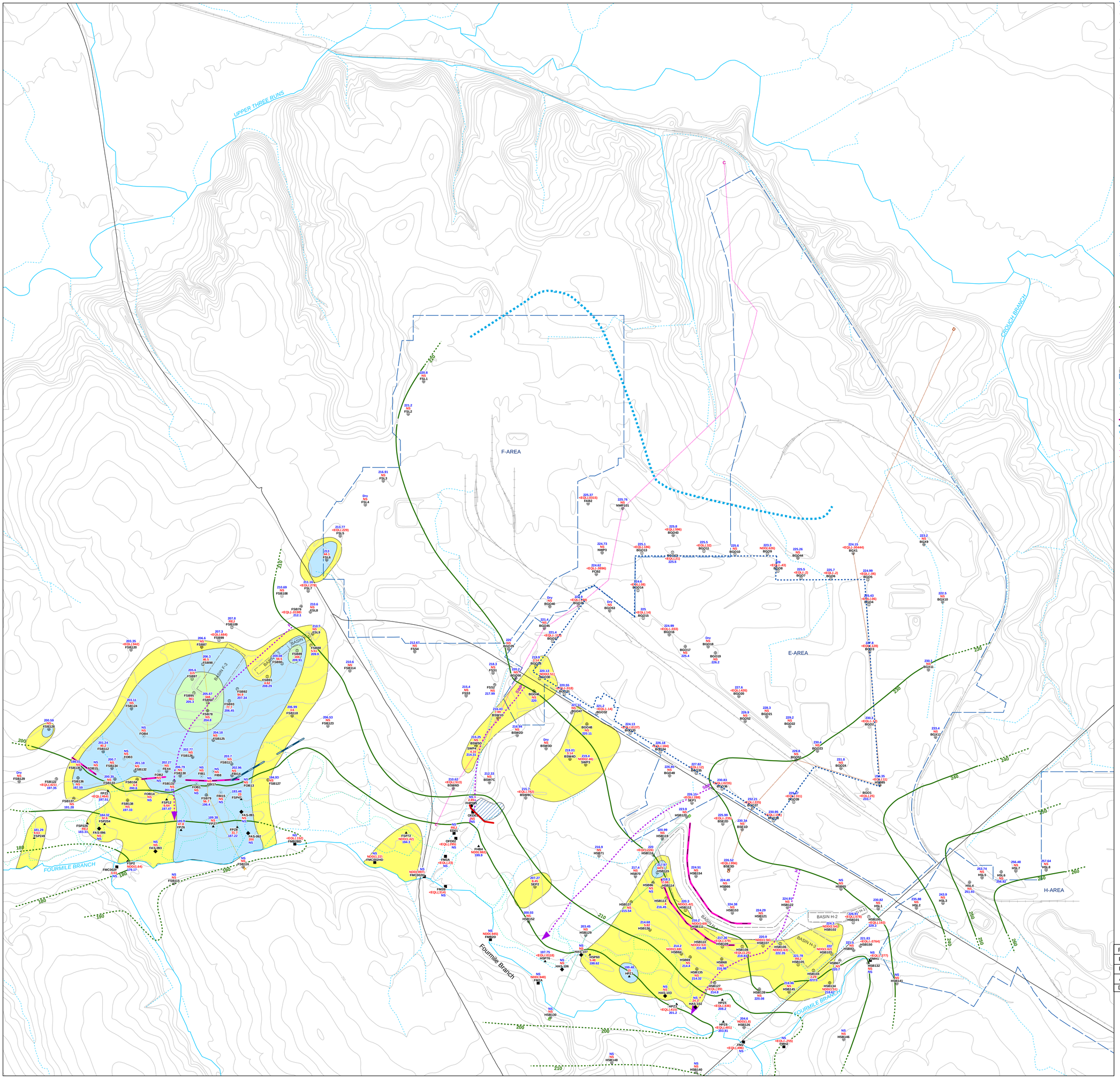
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 01C.
GSA Corrective Action Report, General Separations Area Location Map, Gordon Aquifer

Map 01C. GSA Corrective Action Report, General Separations Area Location Map, Gordon Aquifer

MAP01C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	IODINE-129 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

1 - 10 pCi/L
GROUNDWATER PROTECTION STANDARD = 1 pCi/L

10 - 100 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

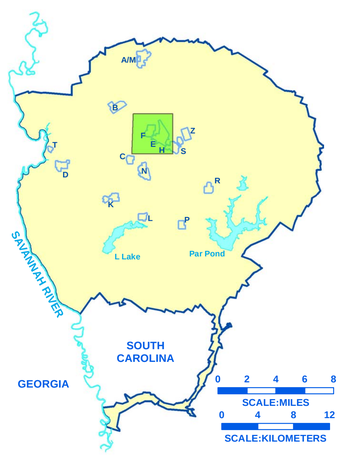
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH



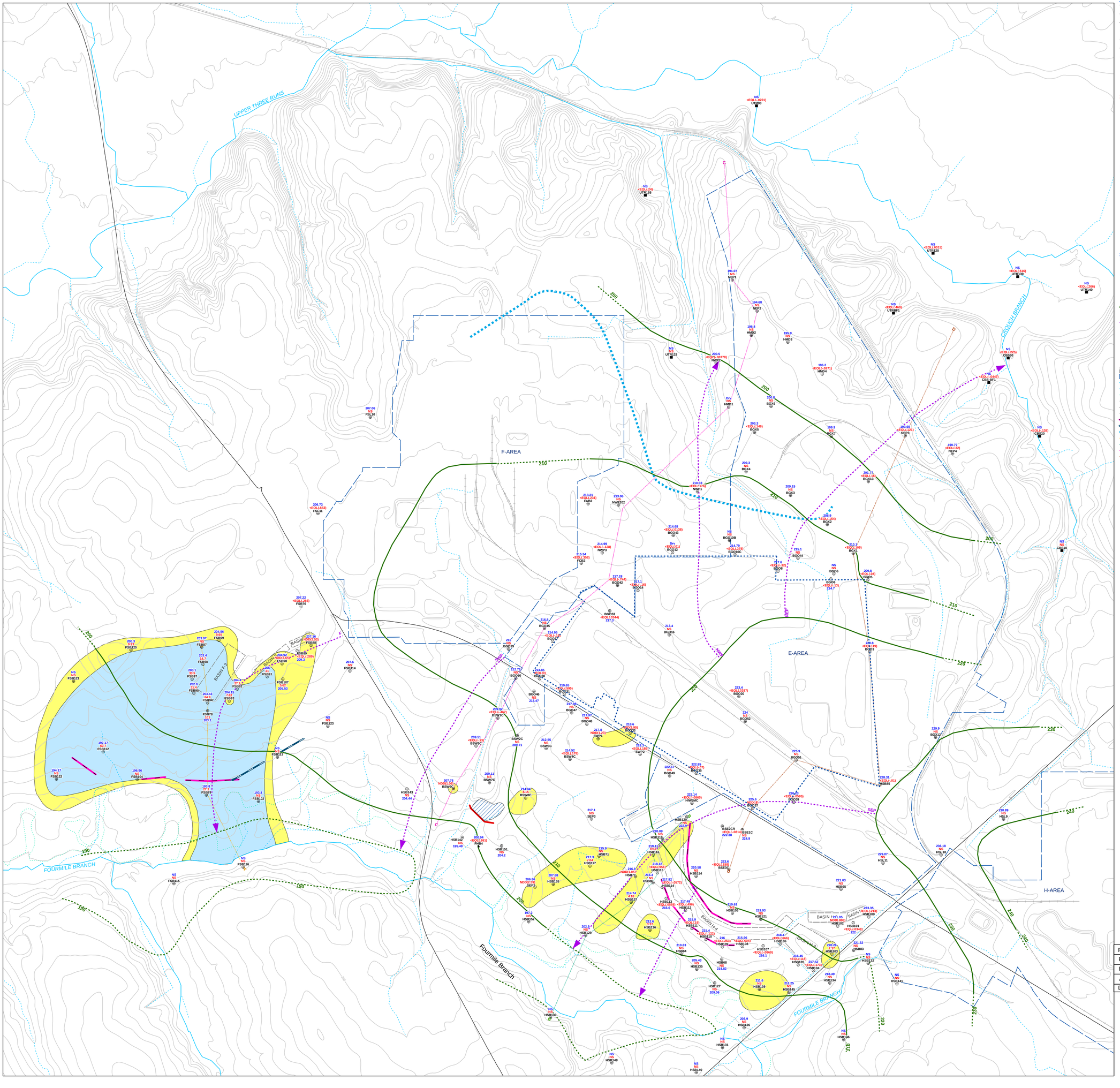
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 02A.
GSA Corrective Action Report, Iodine-129 Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

Map 02A. GSA Corrective Action Report, Iodine-129 Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP02A



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	IODINE-129 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 1 - 10 pCi/L
  GROUNDWATER PROTECTION STANDARD = 1 pCi/L
- 10 - 100 pCi/L
- >100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

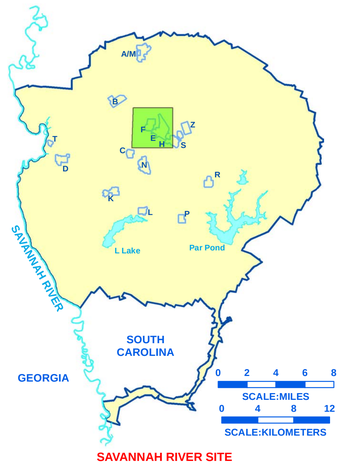
- POTENTIOMETRIC SURFACE CONTOUR
  CONTOUR INTERVAL = 10 FEET
  DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



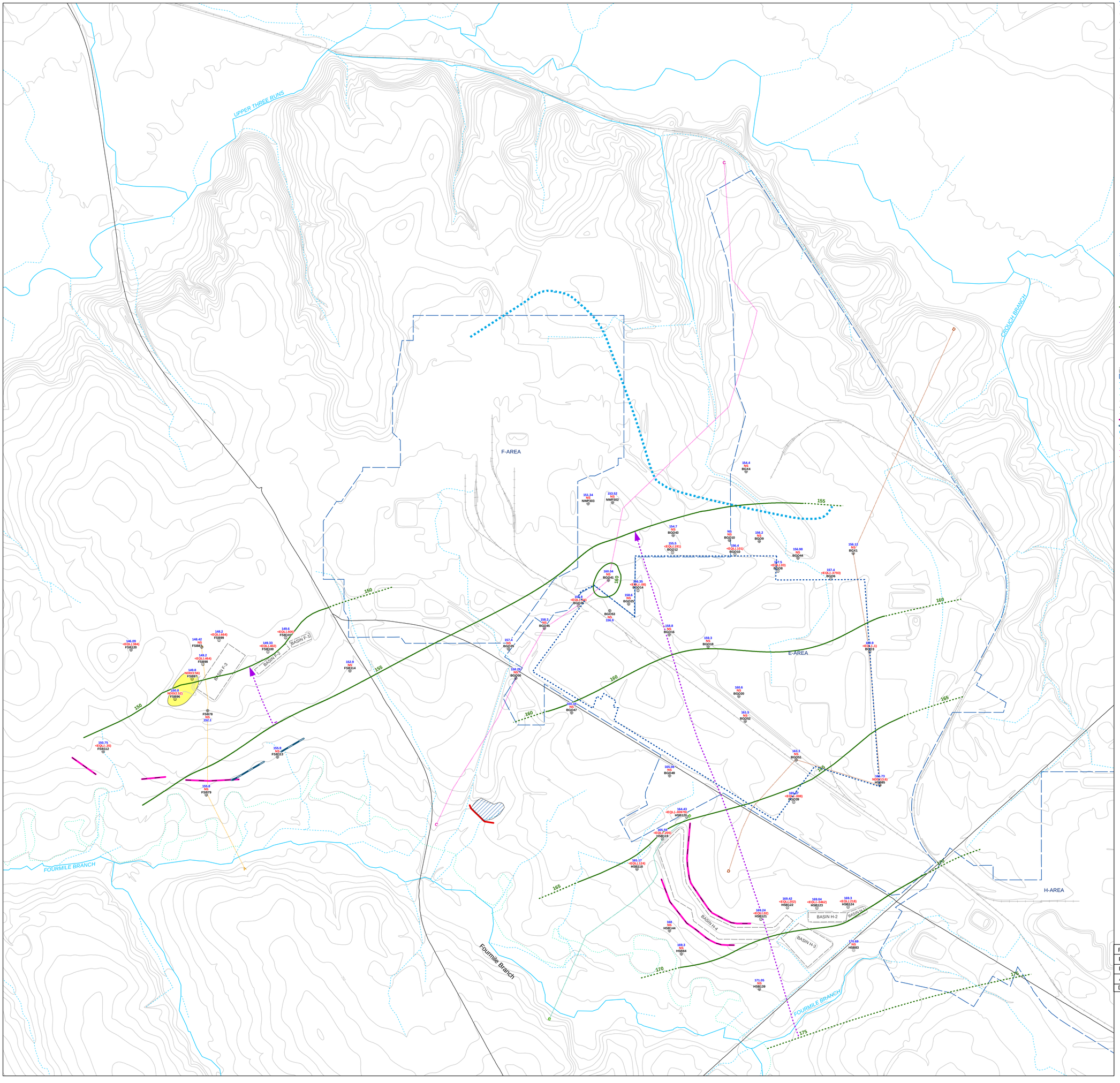
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 02B.
GSA Corrective Action Report, Iodine-129 Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

Map 02B. GSA Corrective Action Report, Iodine-129 Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP02B



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	IODINE-129 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

1 - 10 pCi/L
GROUNDWATER PROTECTION STANDARD = 1 pCi/L

10 - 100 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

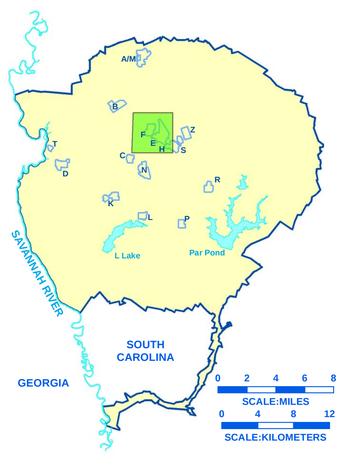
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



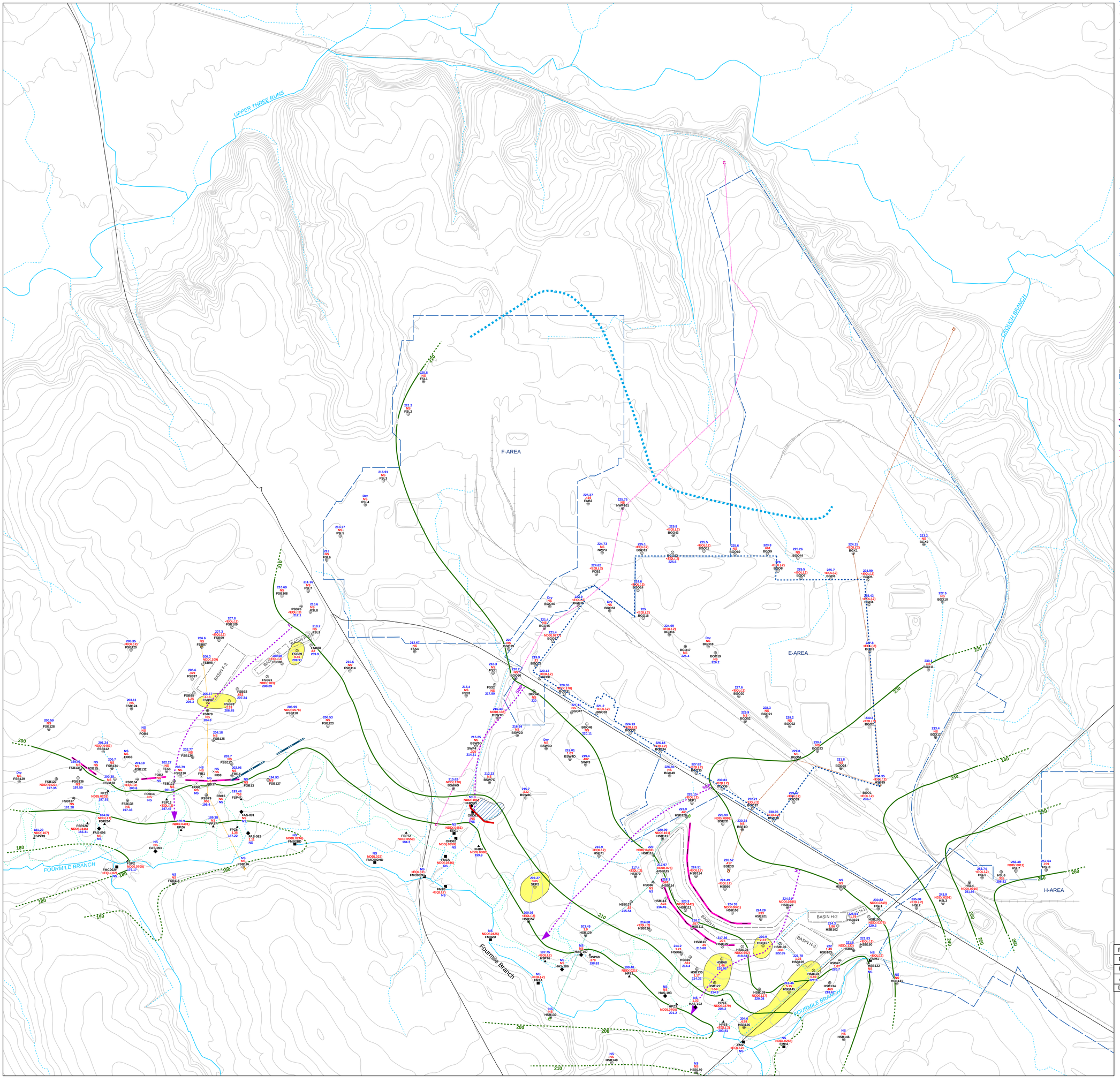
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 02C.
GSA Corrective Action Report, Iodine-129 Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 02C. GSA Corrective Action Report, Iodine-129 Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP02C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	MERCURY VALUE (3Q11) ug/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

2 - 10 ug/L
GROUNDWATER PROTECTION STANDARD = 2 ug/L

>10 ug/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

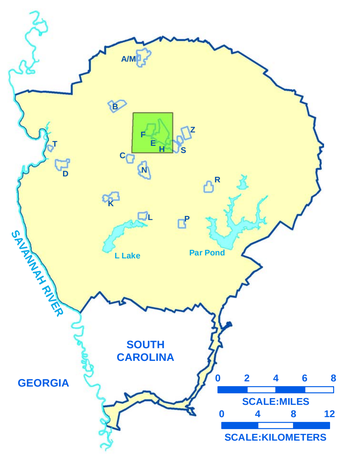
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



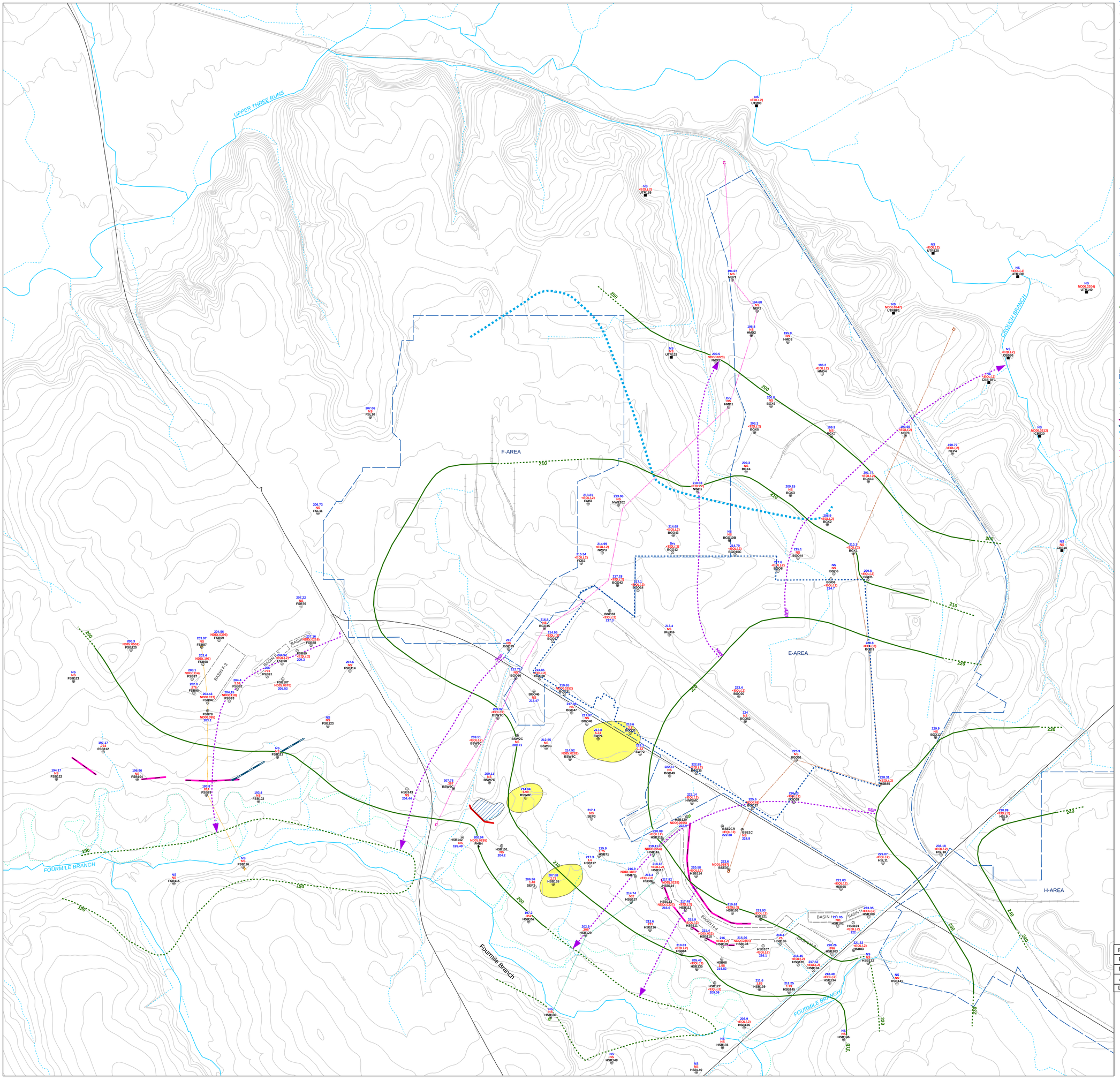
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 03A.
GSA Corrective Action Report, Mercury Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP03A

Map 03A. GSA Corrective Action Report, Mercury Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	MERCURY VALUE (3Q11) ug/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

2 - 10 ug/L
GROUNDWATER PROTECTION STANDARD = 2 ug/L

>10 ug/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

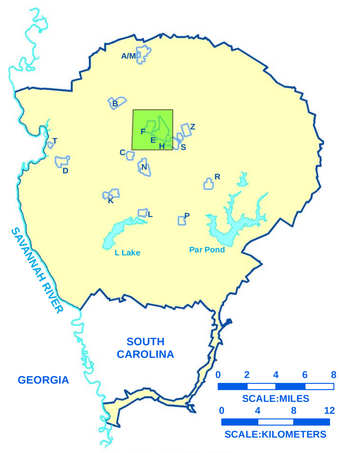
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



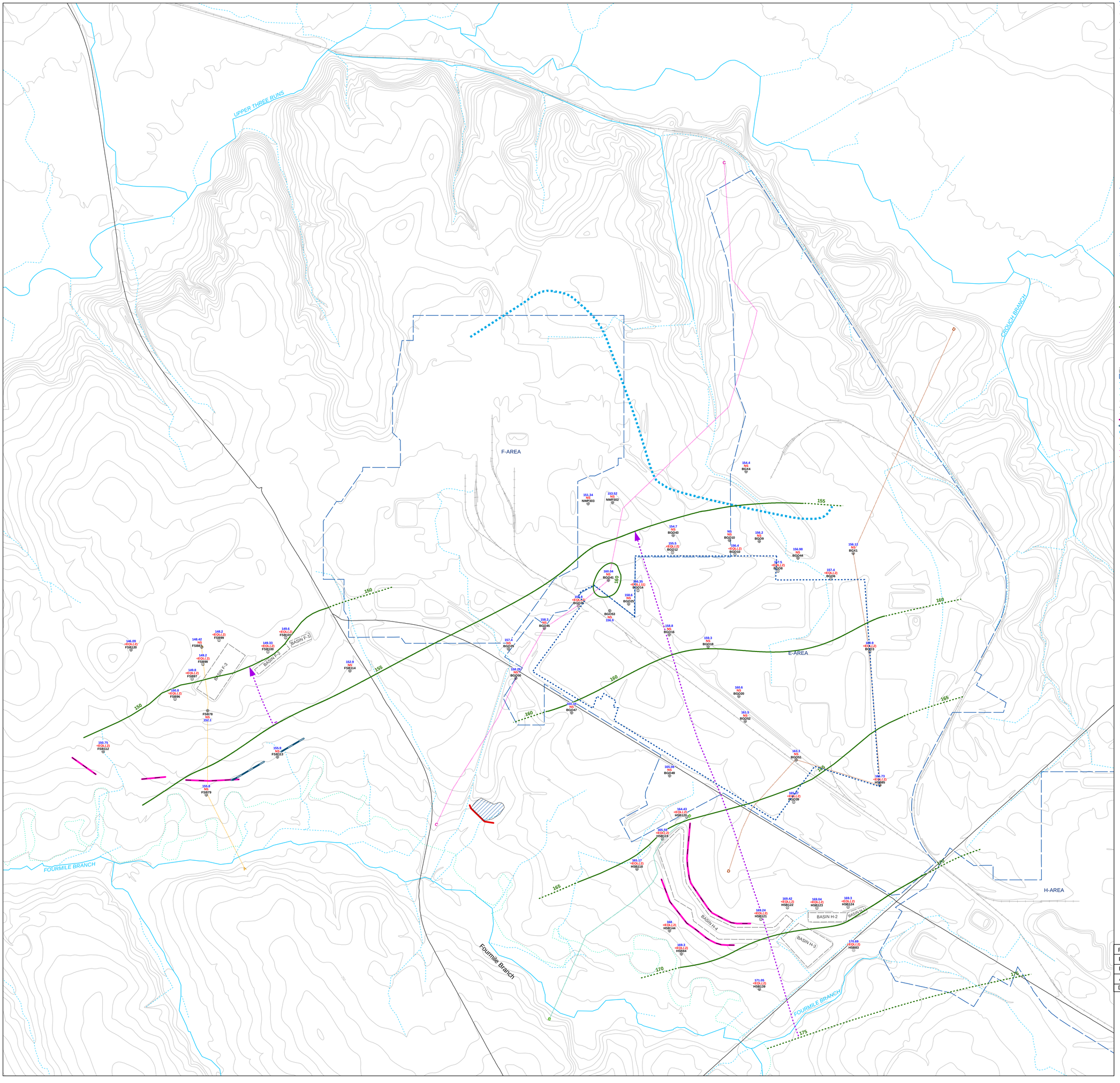
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 03B.
GSA Corrective Action Report, Mercury Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP03B

Map 03B. GSA Corrective Action Report, Mercury Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	MERCURY VALUE (3Q11) ug/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

2 - 10 ug/L
GROUNDWATER PROTECTION STANDARD = 2 ug/L

>10 ug/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

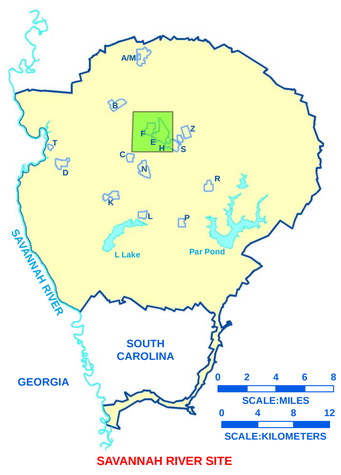
GROUNDWATER FLOW PATH

BASIN CLOSURE BOUNDARY
FACILITY AREA BOUNDARY
STREAM
OTHER SURFACE FLOW PATTERN
SEEPLINE
TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
MAIN/PAVED ROAD
RAILROAD
BARRIER WALL
BARRIER WALL EXTENSION
WATER TABLE TRANSITION FROM UAZ TO LAZ
A-A' CROSS SECTION KEY PLAN
B-B' CROSS SECTION KEY PLAN
C-C' CROSS SECTION KEY PLAN
D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



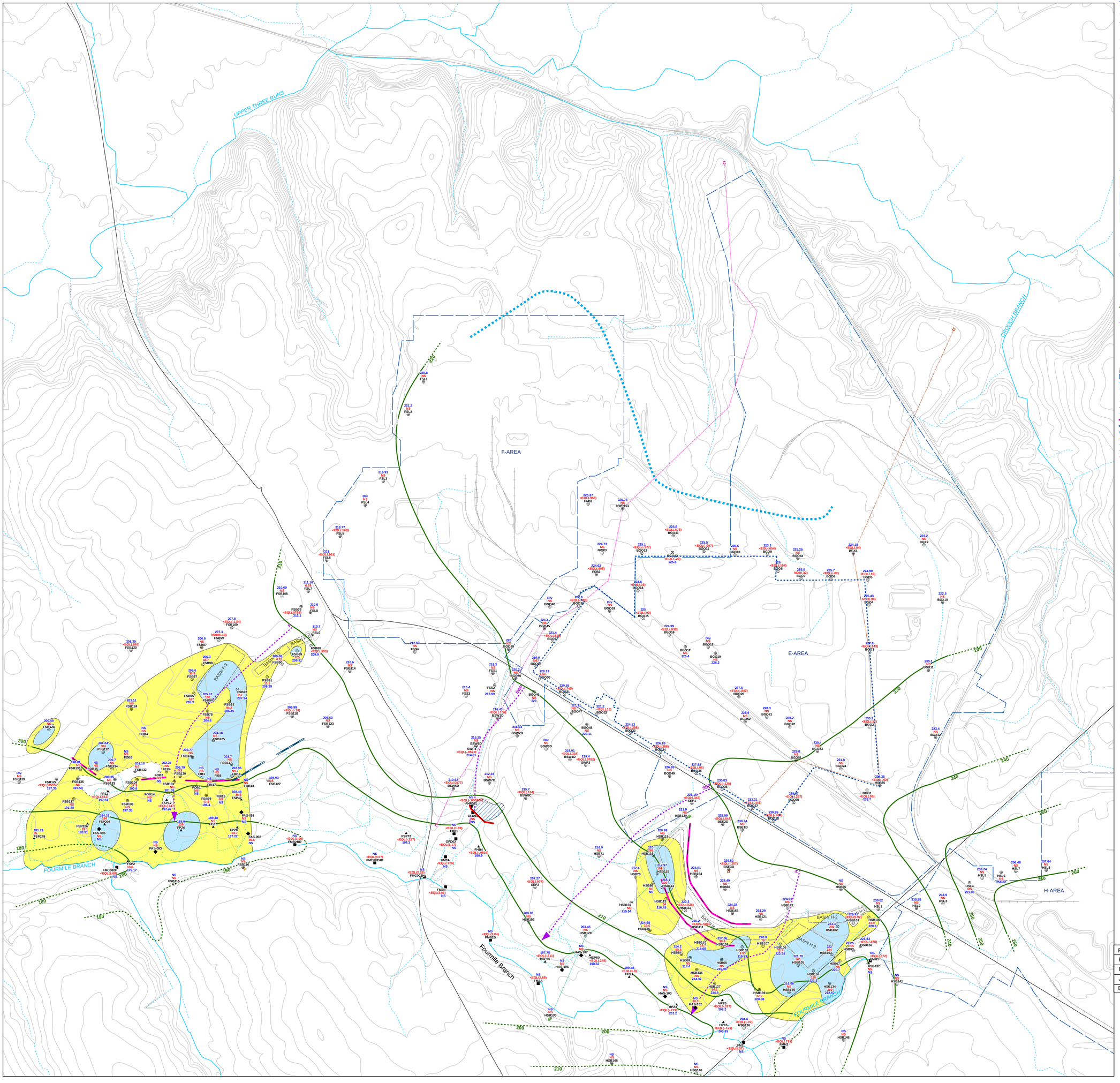
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 03C.
GSA Corrective Action Report, Mercury Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 03C. GSA Corrective Action Report, Mercury Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP03C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	STRONTIUM-90 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 8 - 100 pCi/L GROUNDWATER PROTECTION STANDARD = 8 pCi/L
- 100 - 1000 pCi/L
- >1000 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

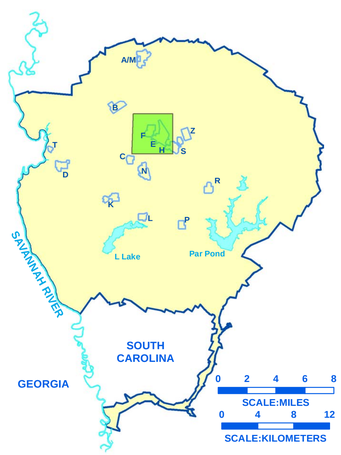
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH TRUE NORTH



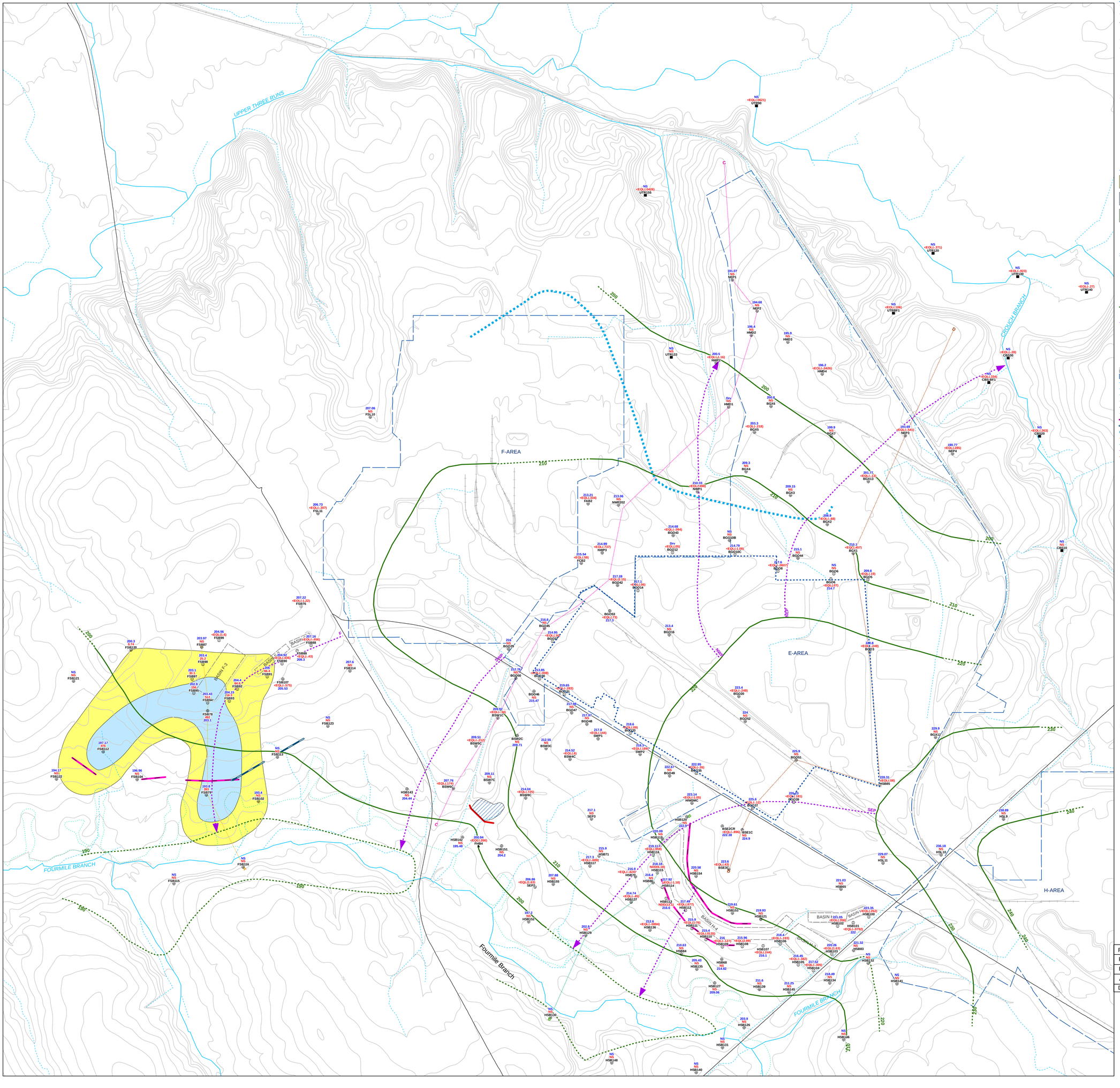
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 04A. GSA Corrective Action Report, Strontium-90 Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP04A

Map 04A. GSA Corrective Action Report, Strontium-90 Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	STRONTIUM-90 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 8 - 100 pCi/L GROUNDWATER PROTECTION STANDARD = 8 pCi/L
- 100 - 1000 pCi/L
- >1000 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

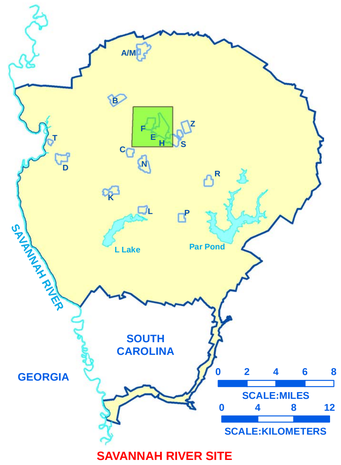
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH TRUE NORTH



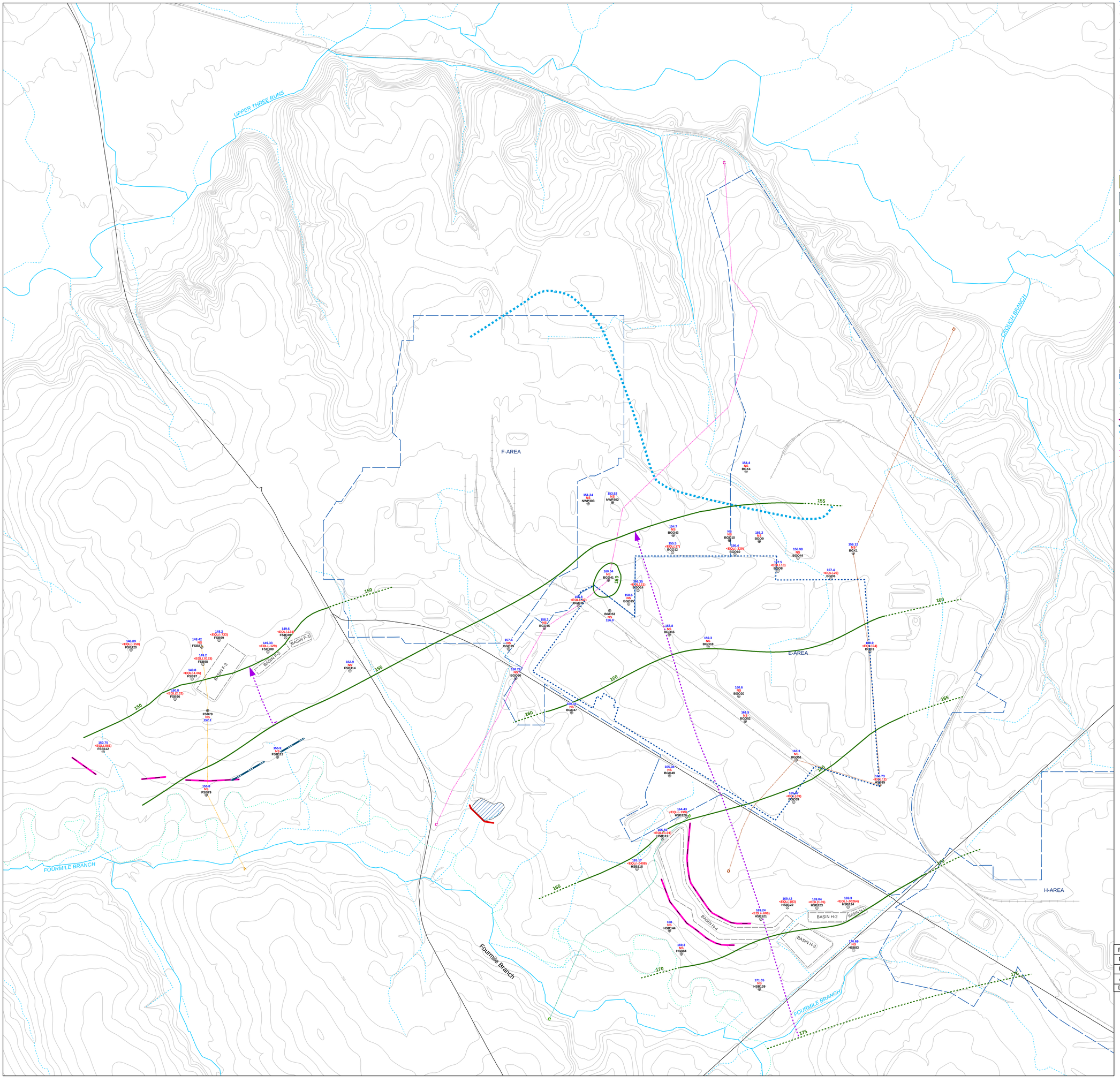
SAVANNAH RIVER SITE

Report Number:	SRNS-RP-2012-00045
Prepared By:	Jeffrey Thibault
Reviewed By:	Ashley Shull
Approved By:	Gerald Blount
Date:	April 30, 2012

Map 04B. GSA Corrective Action Report, Strontium-90 Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP04B

Map 04B. GSA Corrective Action Report, Strontium-90 Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	STRONTIUM-90 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 8 - 100 pCi/L GROUNDWATER PROTECTION STANDARD = 8 pCi/L
- 100 - 1000 pCi/L
- >1000 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

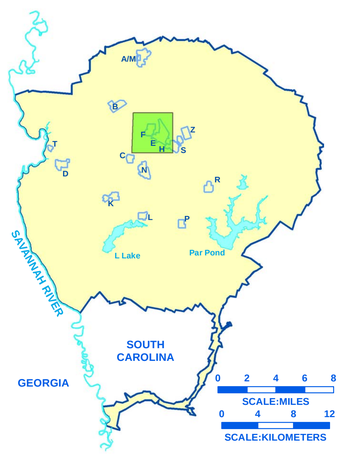
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH TRUE NORTH
N
3 6 - 2 2



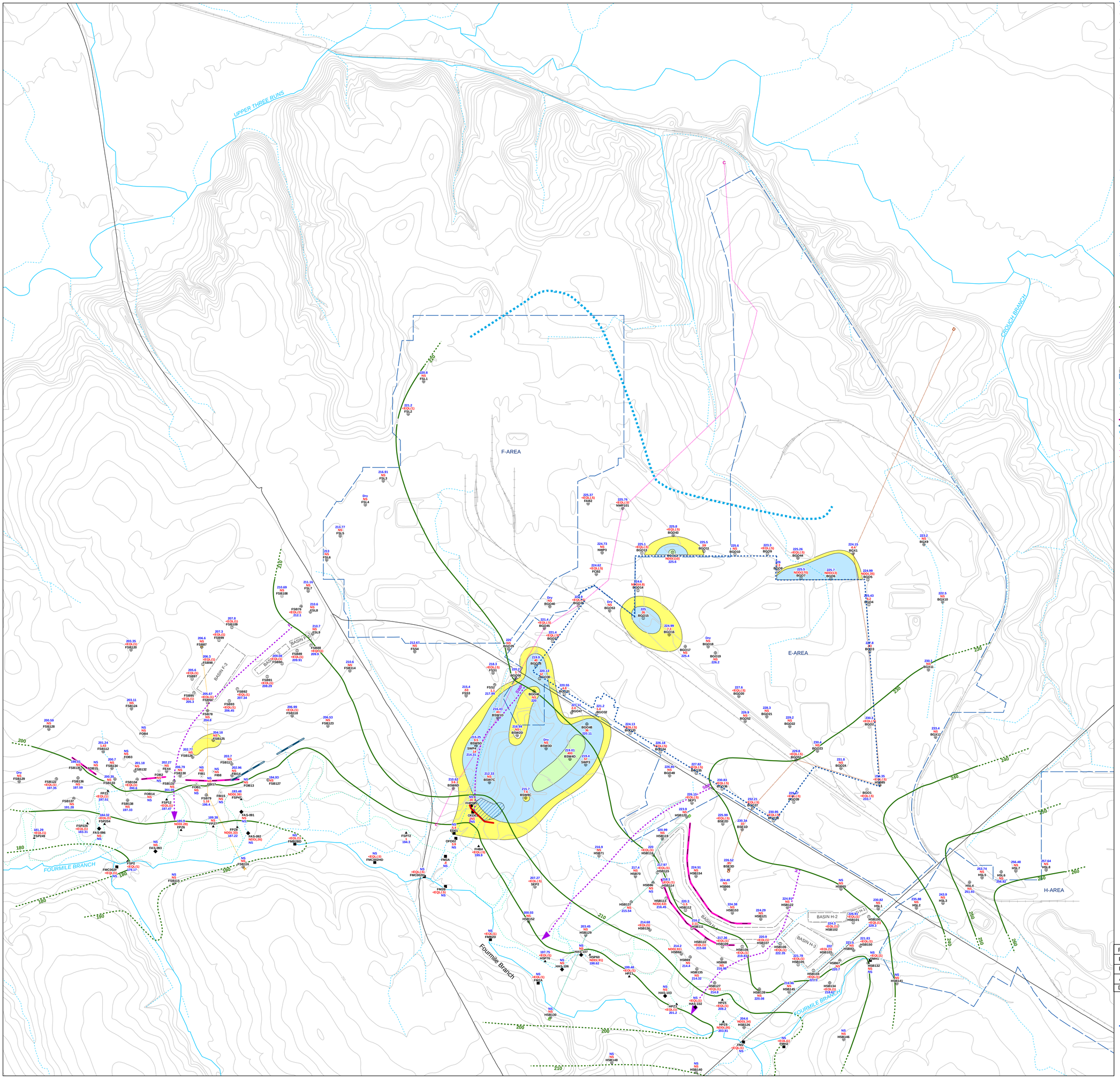
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 04C. GSA Corrective Action Report, Strontium-90 Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 04C. GSA Corrective Action Report, Strontium-90 Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP04C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	TRICHLOROETHYLENE VALUE (3Q11) ug/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

5 - 10 ug/L
GROUNDWATER PROTECTION STANDARD = 5 ug/L

10 - 100 ug/L

>100 ug/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

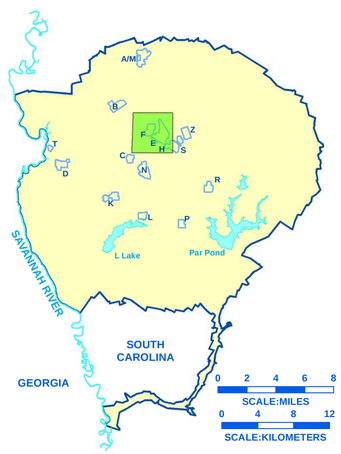
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



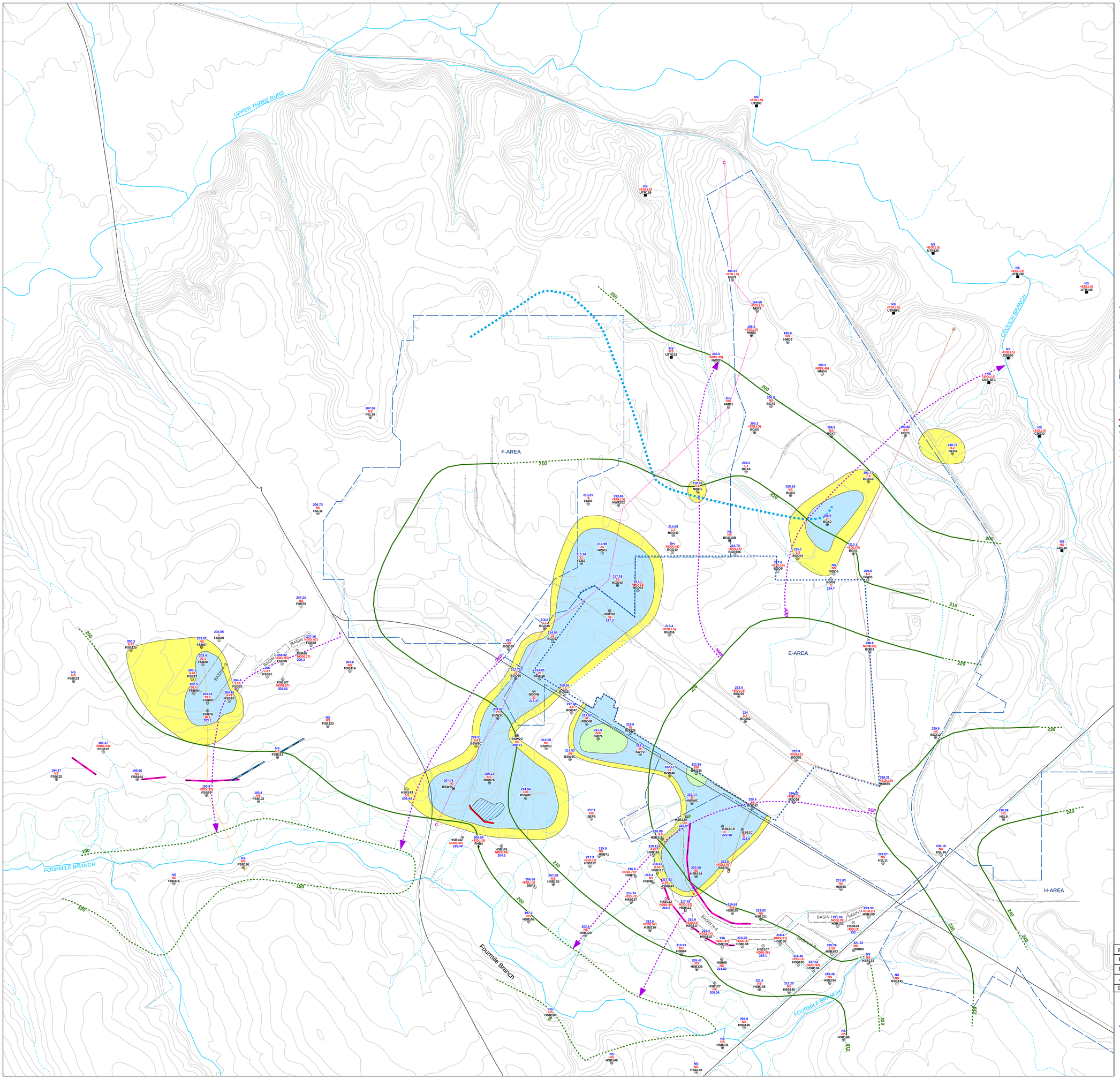
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 05A.
GSA Corrective Action Report, Trichloroethylene Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP05A

Map 05A. GSA Corrective Action Report, Trichloroethylene Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	TRICHLOROETHYLENE VALUE (3Q11) ug/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 5 - 10 ug/L GROUNDWATER PROTECTION STANDARD = 5 ug/L
- 10 - 100 ug/L
- >100 ug/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

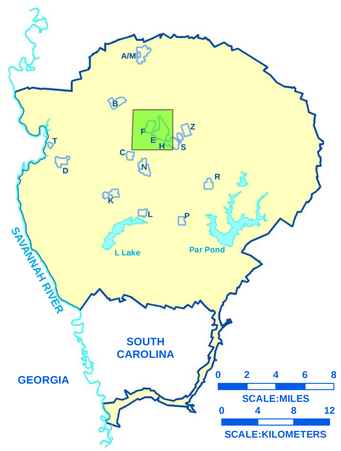
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 ' 2 2



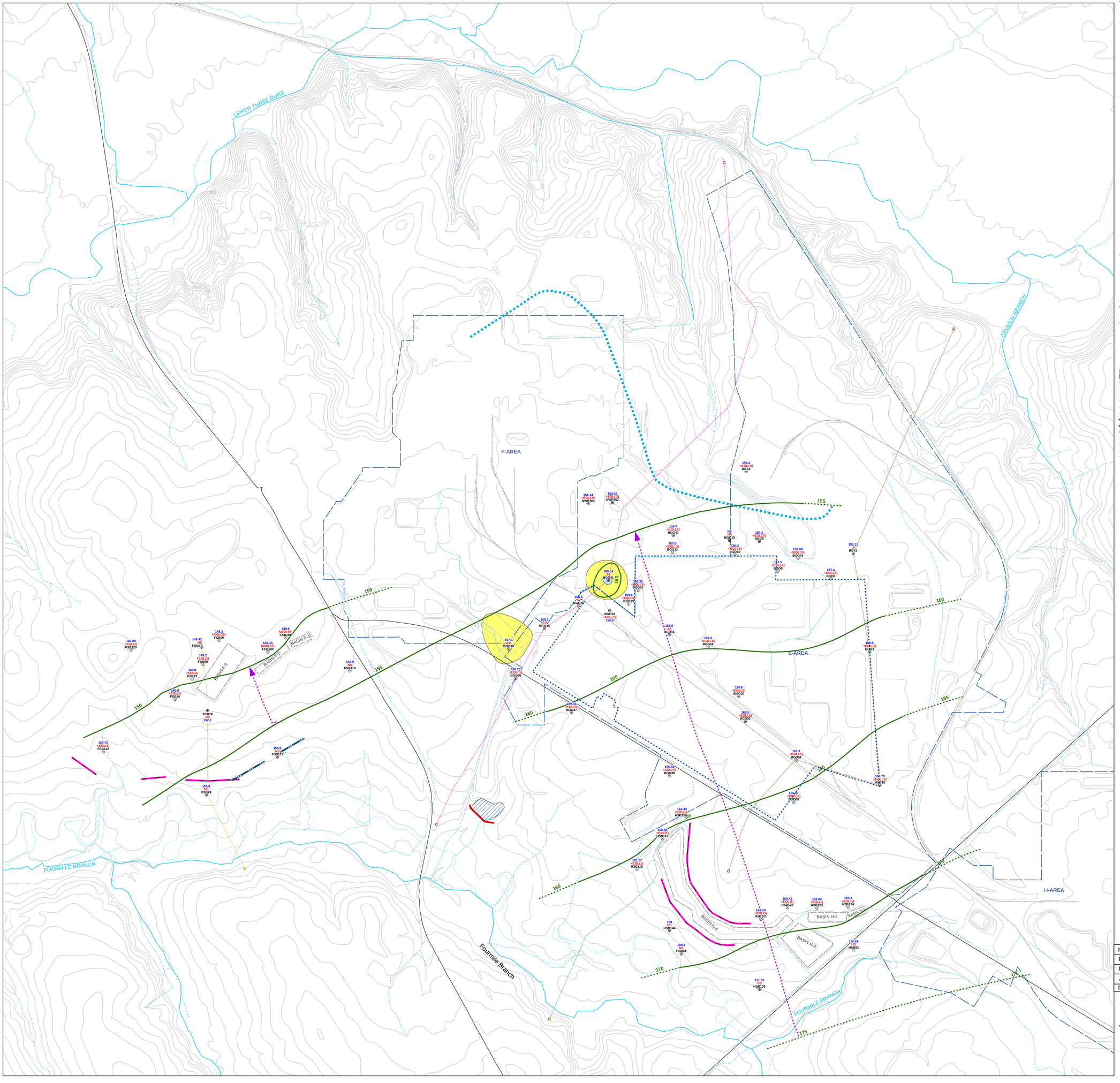
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 05B. GSA Corrective Action Report, Trichloroethylene Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

Map 05B. GSA Corrective Action Report, Trichloroethylene Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP05B



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	TRICHLOROETHYLENE VALUE (3Q11) ug/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 5 - 10 ug/L — GROUNDWATER PROTECTION STANDARD = 5 ug/L
- 10 - 100 ug/L
- >100 ug/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

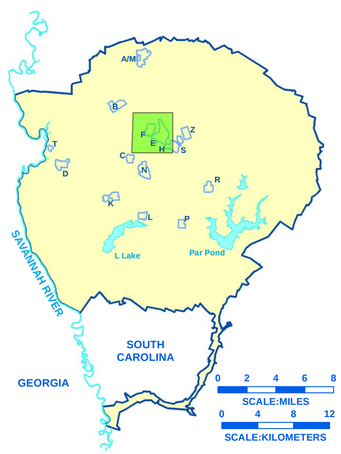
- POTENTIOMETRIC SURFACE CONTOUR — CONTOUR INTERVAL = 10 FEET — DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



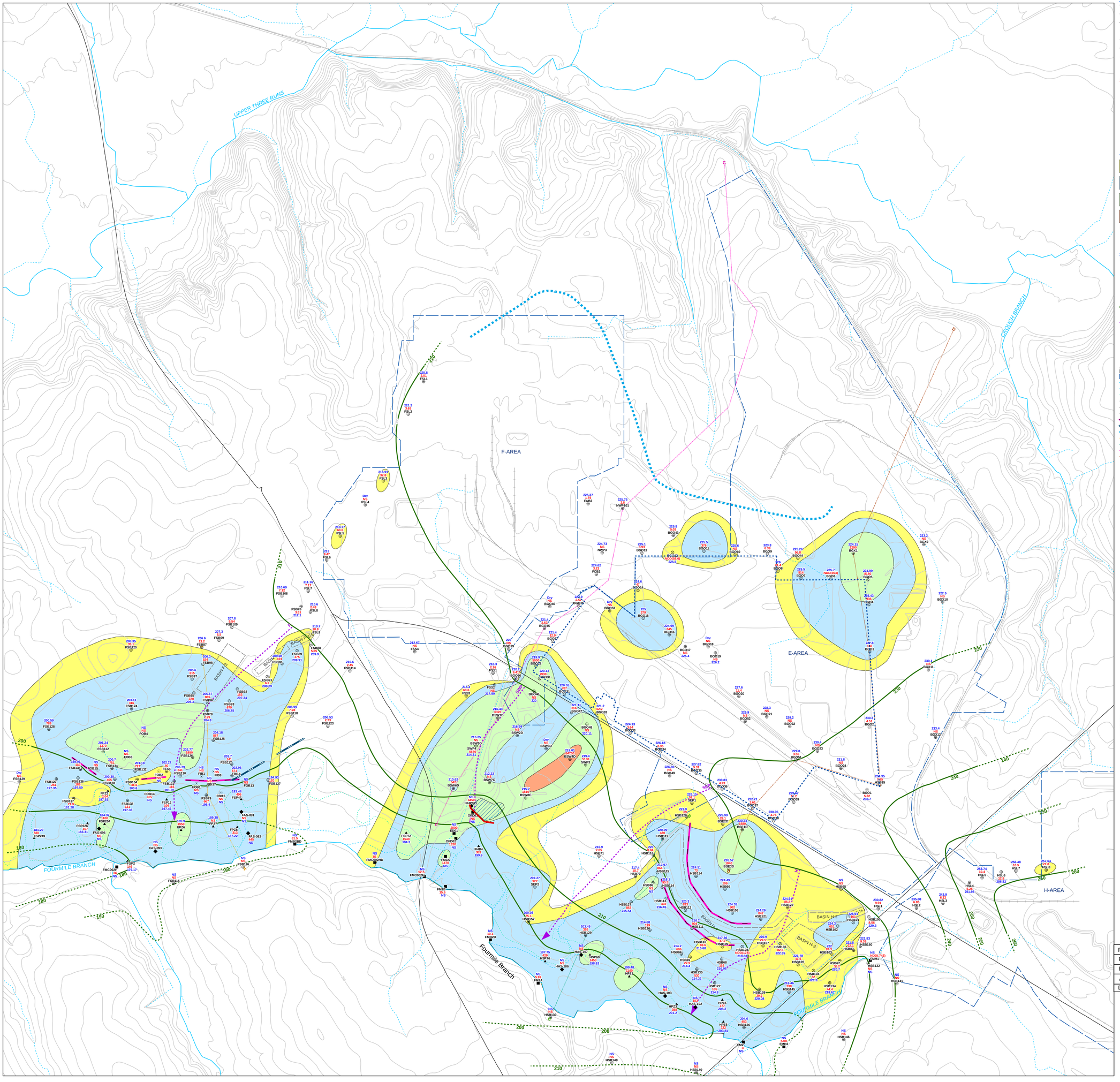
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 05C. GSA Corrective Action Report, Trichloroethylene Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 05C. GSA Corrective Action Report, Trichloroethylene Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP05C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	TRITIUM VALUE (3Q11) pCi/mL
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 20 - 100 pCi/mL
  GROUNDWATER PROTECTION STANDARD = 20 pCi/mL
- 100 - 1000 pCi/mL
- 1000 - 10000 pCi/mL
- >10000 pCi/mL

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

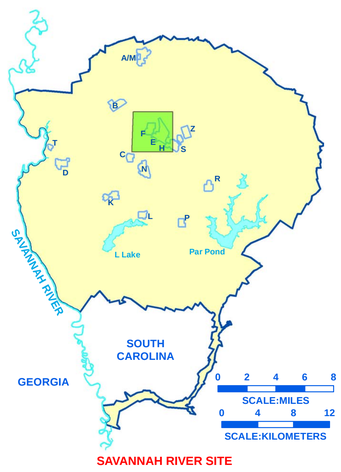
- POTENTIOMETRIC SURFACE CONTOUR
  CONTOUR INTERVAL = 10 FEET
  DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



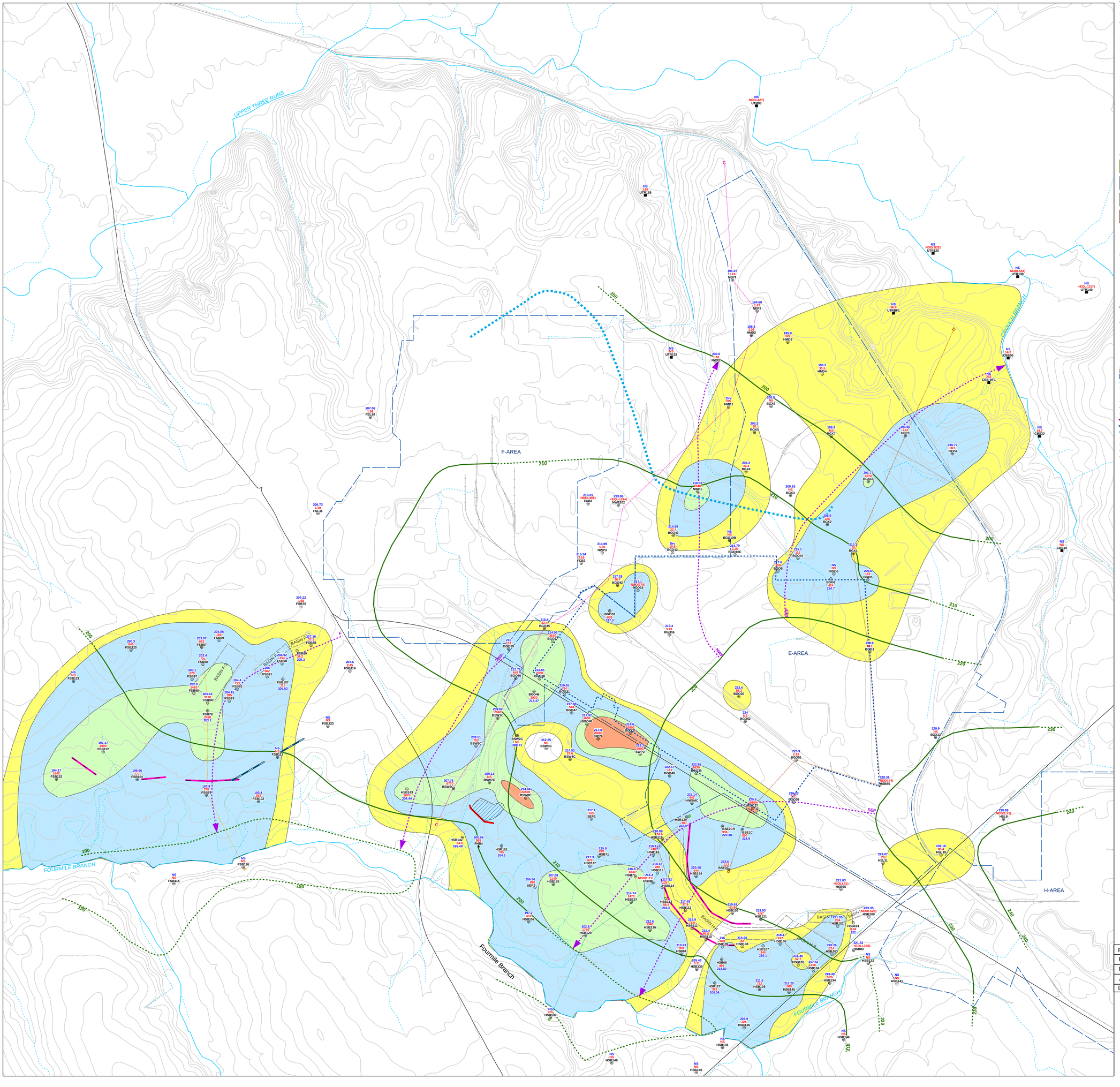
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 06A.
GSA Corrective Action Report, Tritium Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP06A

Map 06A. GSA Corrective Action Report, Tritium Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	TRITIUM VALUE (3Q11) pCi/mL
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 20 - 100 pCi/mL GROUNDWATER PROTECTION STANDARD = 20 pCi/mL
- 100 - 1000 pCi/mL
- 1000 - 10000 pCi/mL
- >10000 pCi/mL

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

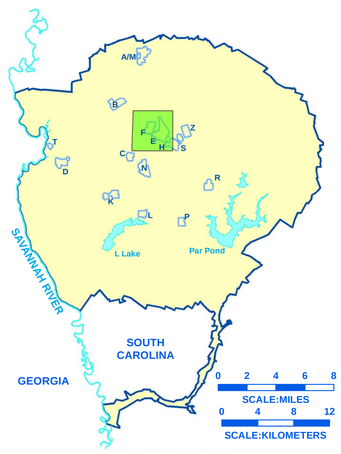
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH



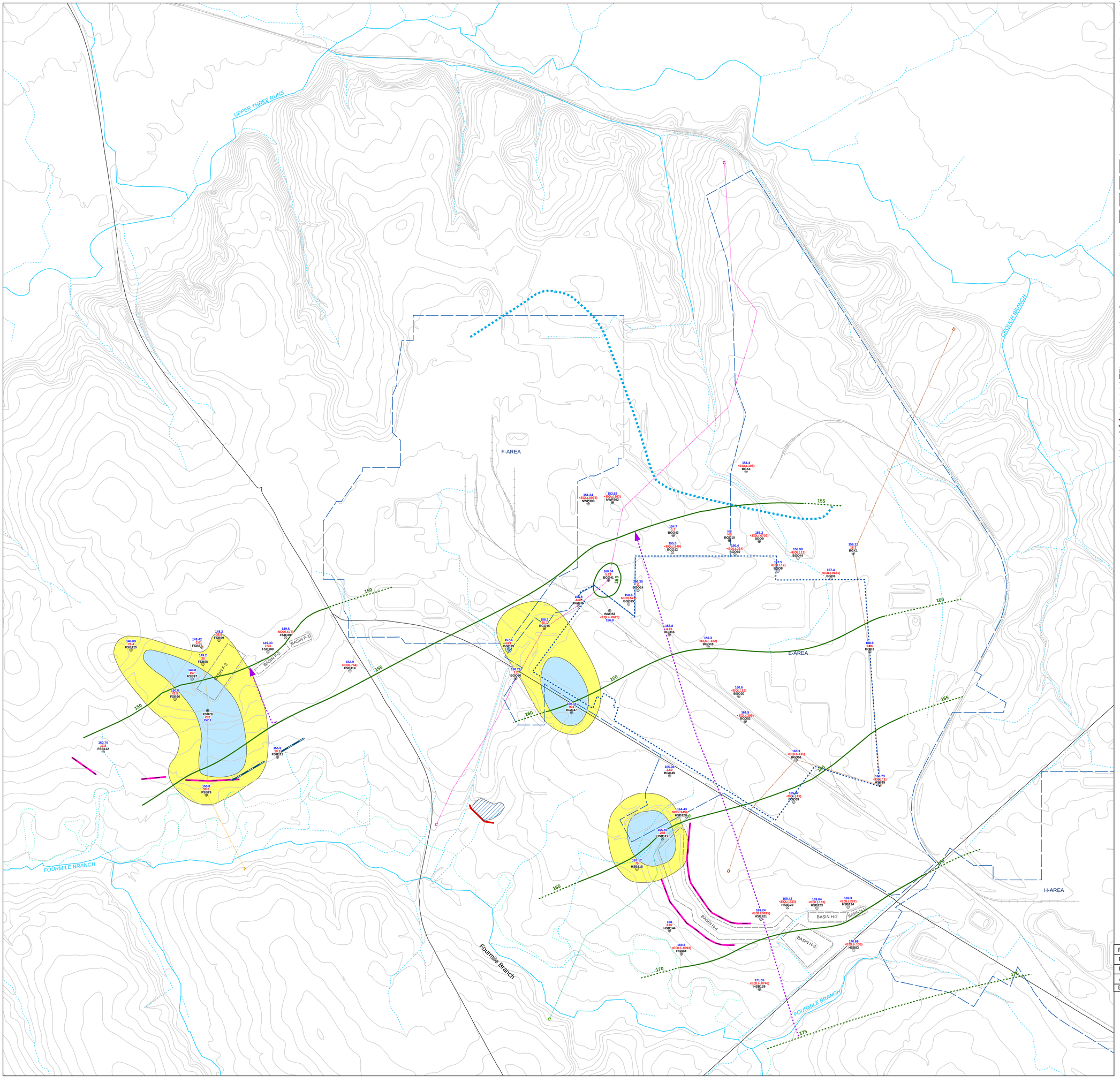
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 06B. GSA Corrective Action Report, Tritium Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP06B

Map 06B. GSA Corrective Action Report, Tritium Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	TRITIUM VALUE (3Q11) pCi/mL
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 20 - 100 pCi/mL GROUNDWATER PROTECTION STANDARD = 20 pCi/mL
- 100 - 1000 pCi/mL
- 1000 - 10000 pCi/mL
- >10000 pCi/mL

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

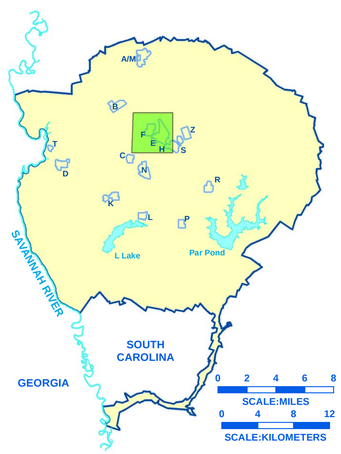
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH TRUE NORTH
N
3 6 - 2 2



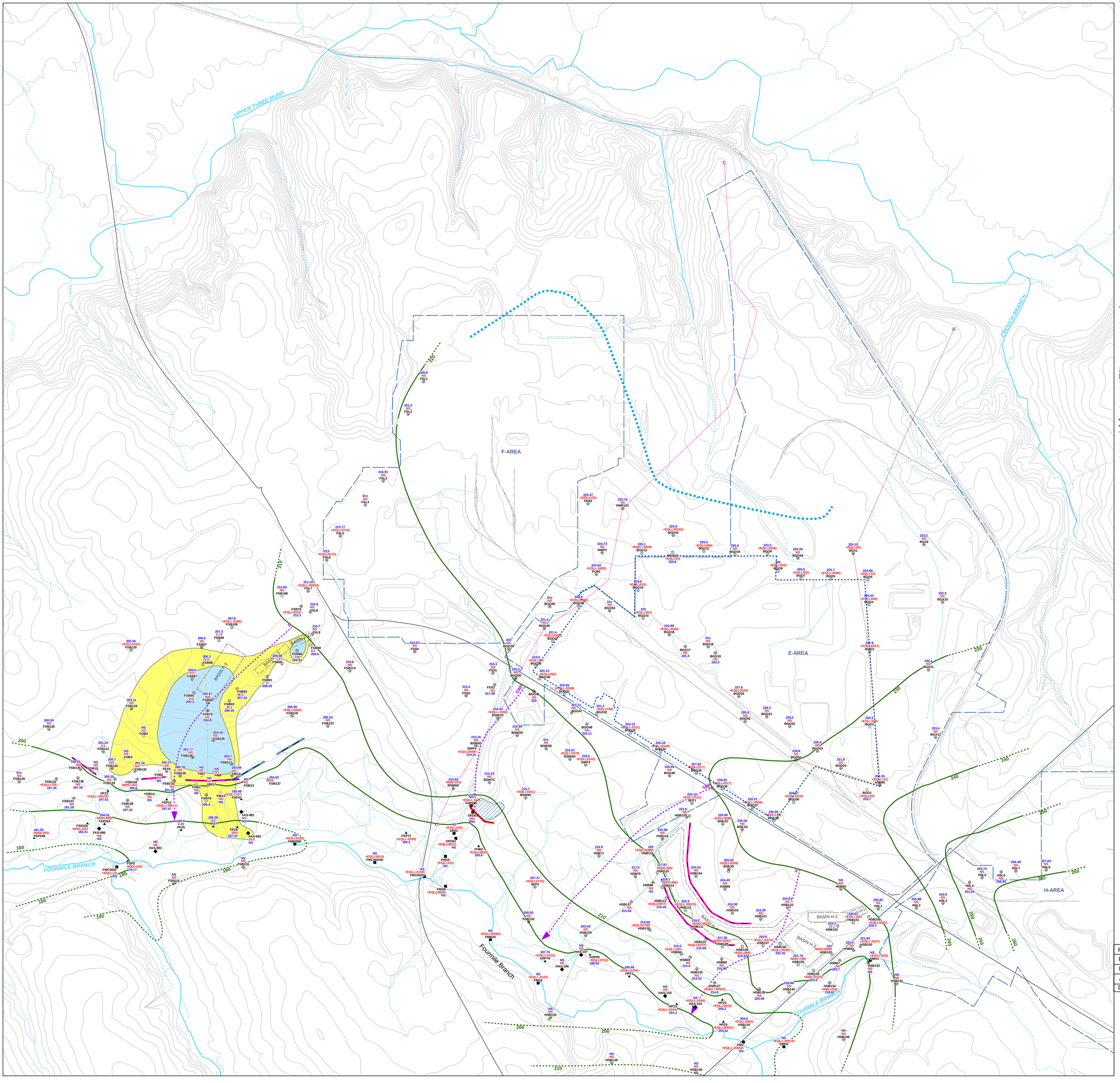
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 06C. GSA Corrective Action Report, Tritium Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 06C. GSA Corrective Action Report, Tritium Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP06C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	URANIUM-238 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

15 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 15 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

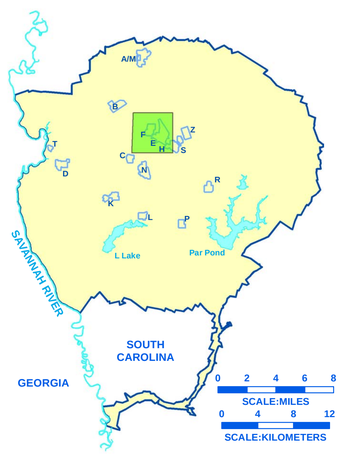
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



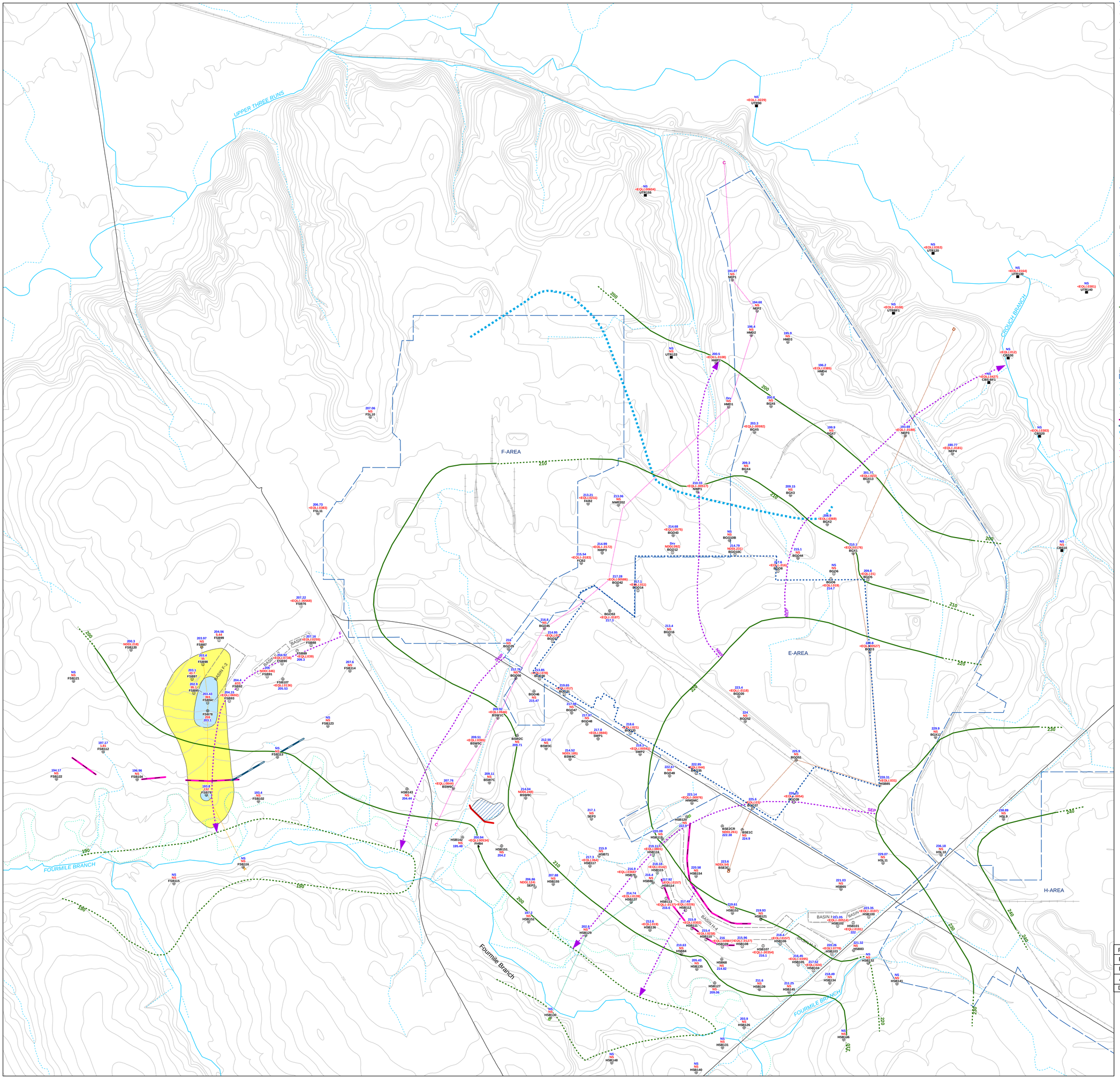
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 07A.
GSA Corrective Action Report, Uranium-238 Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP07A

Map 07A. GSA Corrective Action Report, Uranium-238 Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	URANIUM-238 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

15 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 15 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

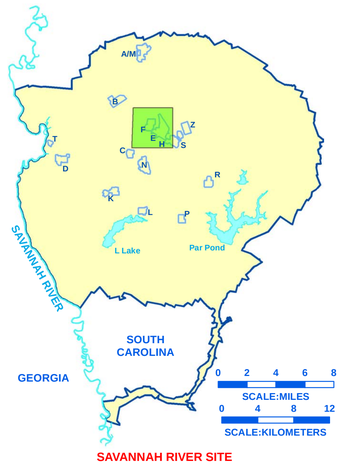
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



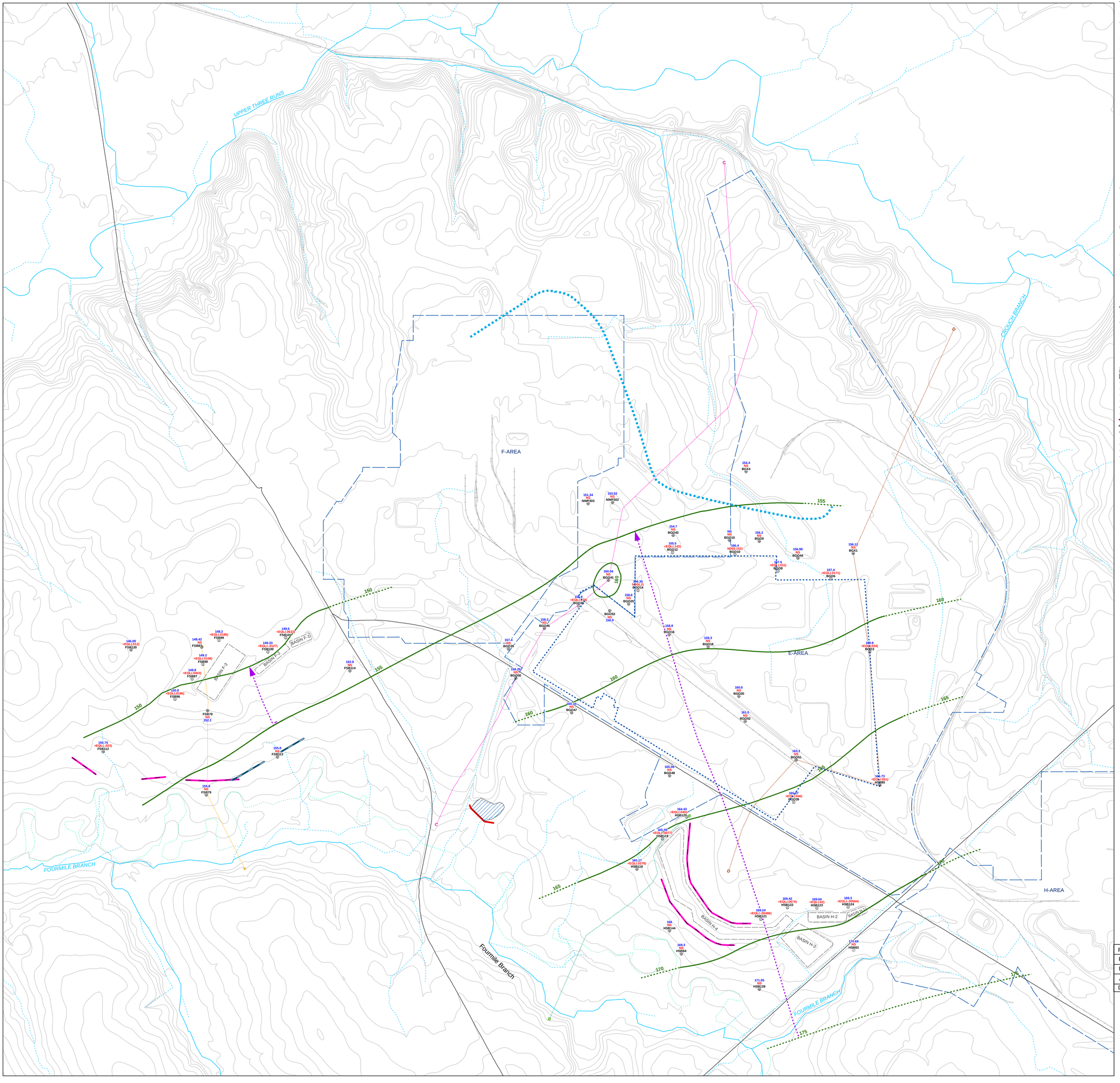
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 07B.
GSA Corrective Action Report, Uranium-238 Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP07B

Map 07B. GSA Corrective Action Report, Uranium-238 Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	URANIUM-238 VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

15 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 15 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

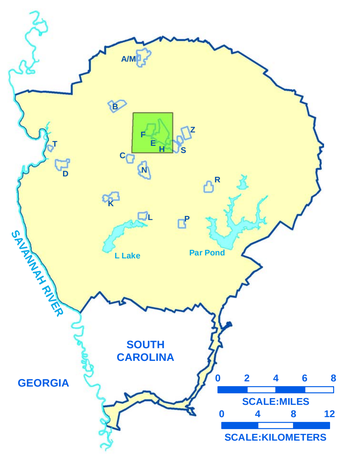
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



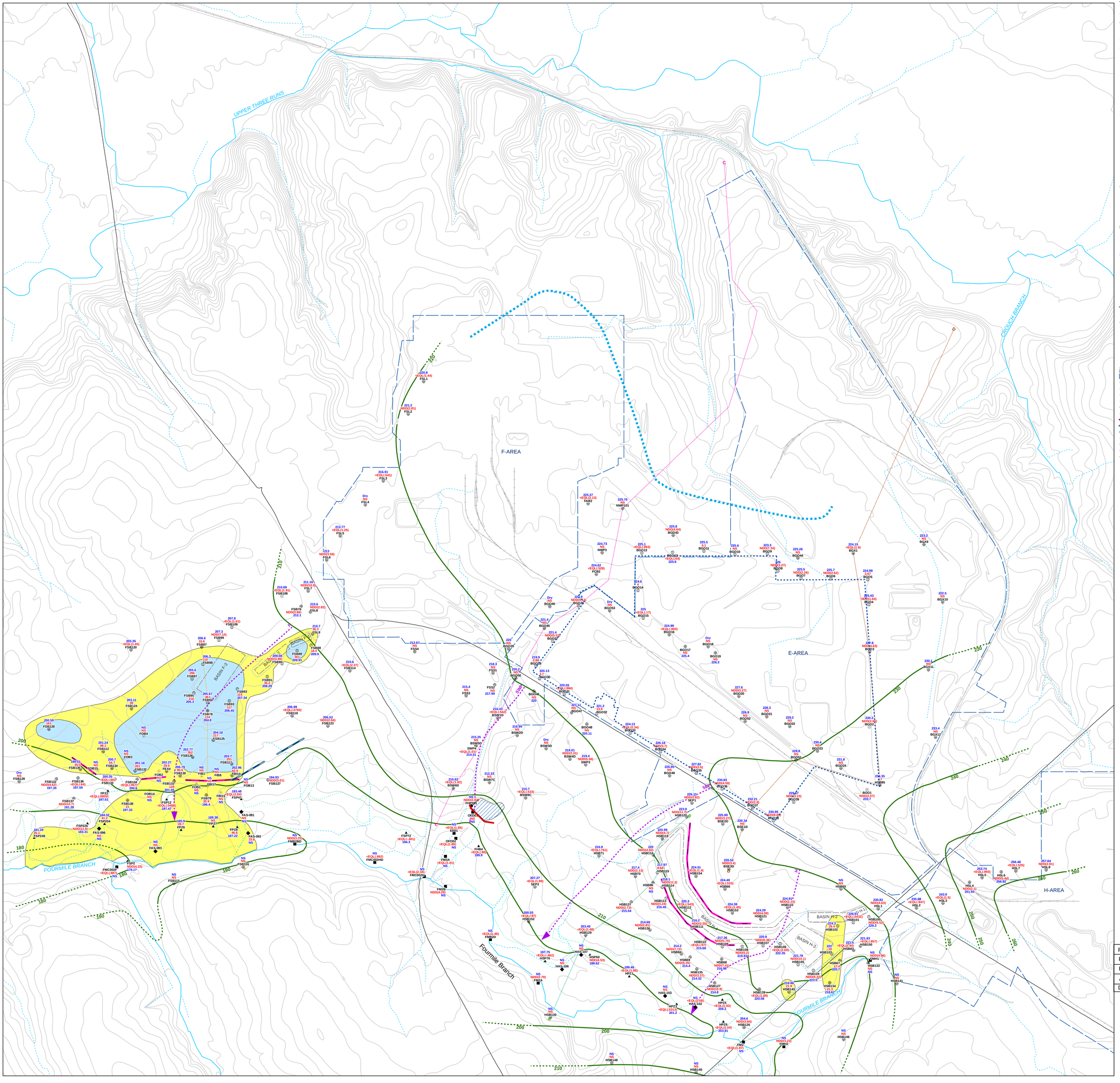
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 07C.
GSA Corrective Action Report, Uranium-238 Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 07C. GSA Corrective Action Report, Uranium-238 Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP07C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	GROSS ALPHA VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

15 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 15 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

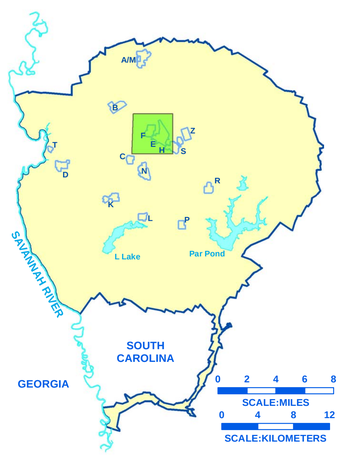
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH



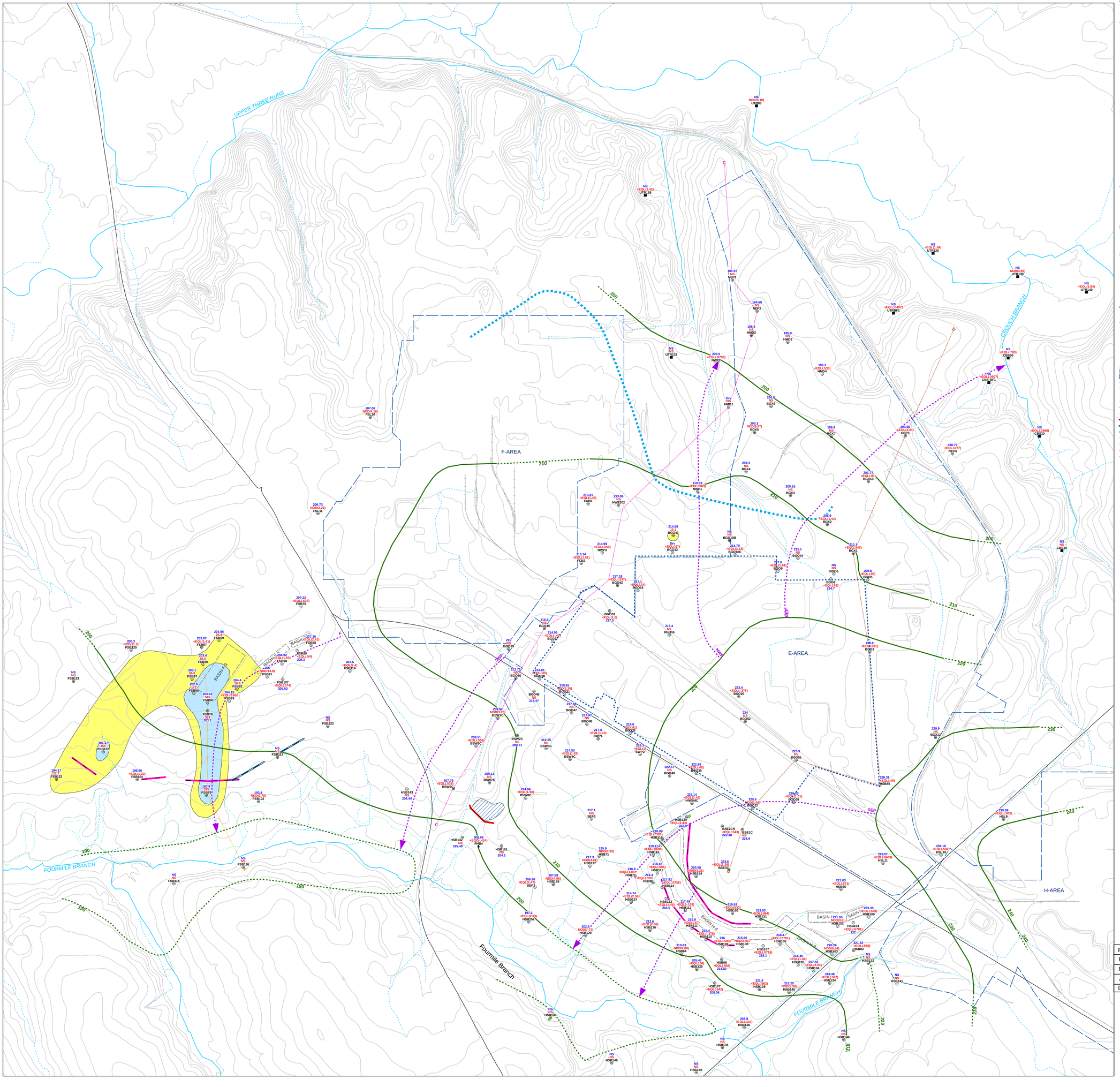
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 08A. GSA Corrective Action Report, Gross Alpha Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP08A

Map 08A. GSA Corrective Action Report, Gross Alpha Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	GROSS ALPHA VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

15 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 15 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

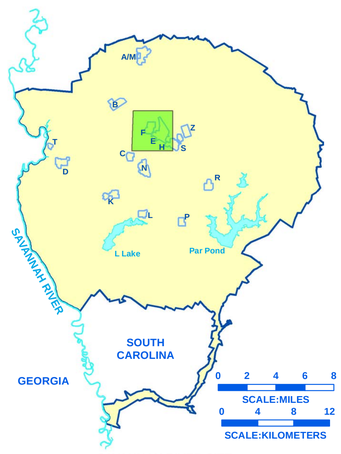
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH



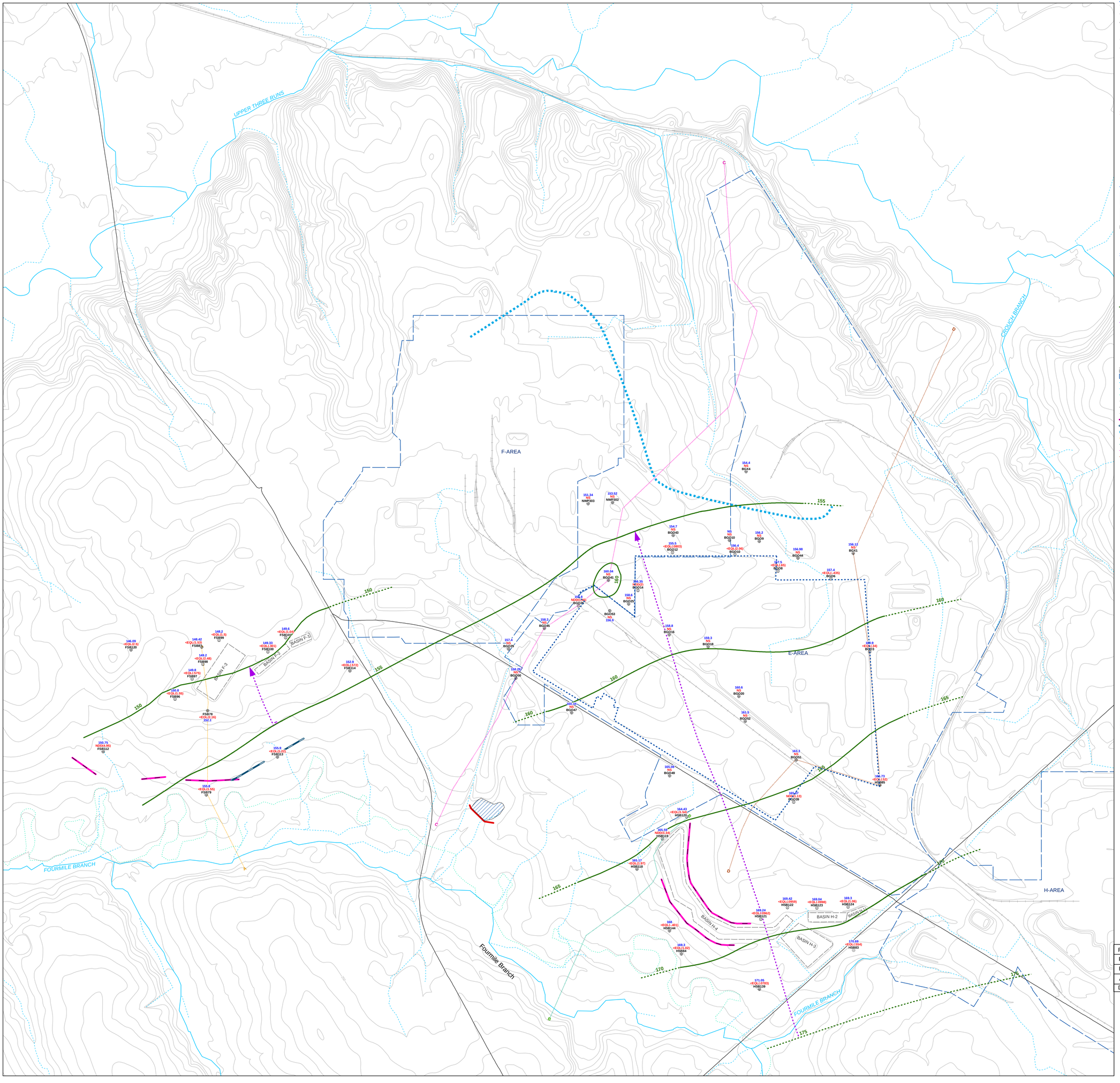
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 08B.
GSA Corrective Action Report, Gross Alpha Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP08B

Map 08B. GSA Corrective Action Report, Gross Alpha Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	GROSS ALPHA VALUE (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

15 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 15 pCi/L

>100 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

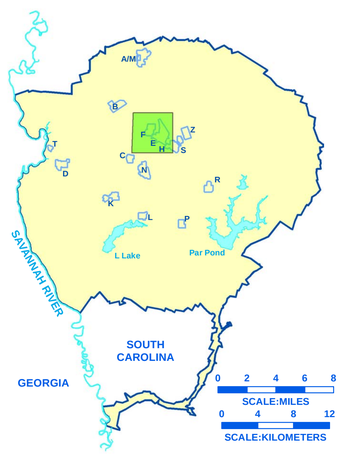
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



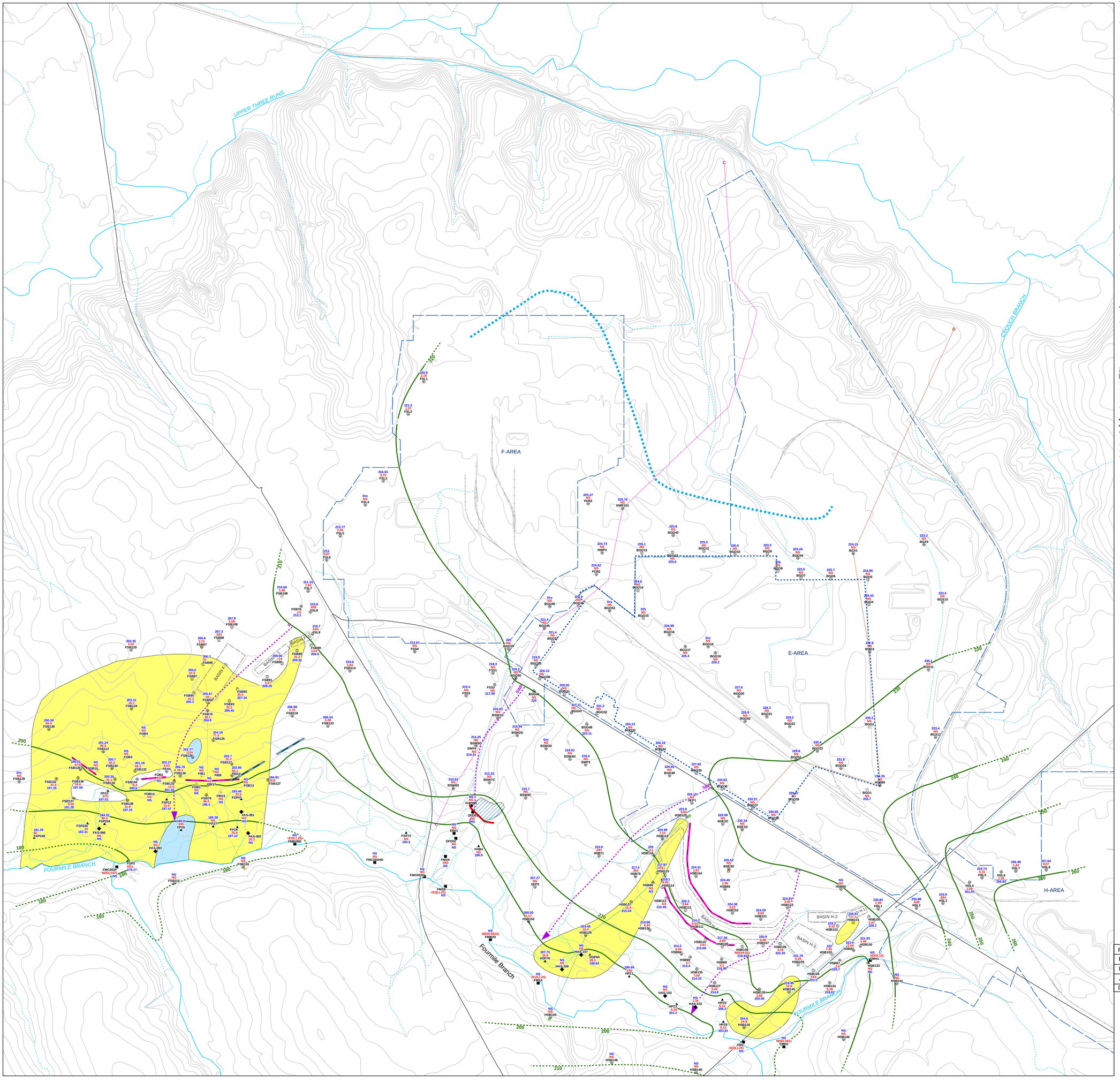
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 08C.
GSA Corrective Action Report, Gross Alpha Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 08C. GSA Corrective Action Report, Gross Alpha Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP08C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	NITRATE-NITRITE (3Q11) mg/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

10 - 100 mg/L
GROUNDWATER PROTECTION STANDARD = 10 mg/L

>100 mg/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

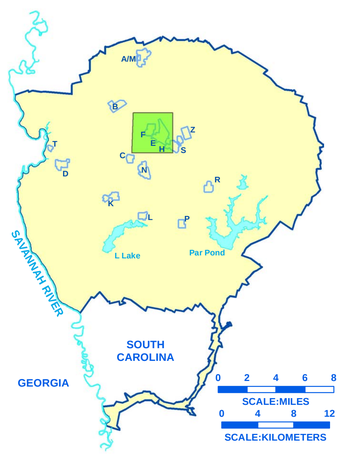
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



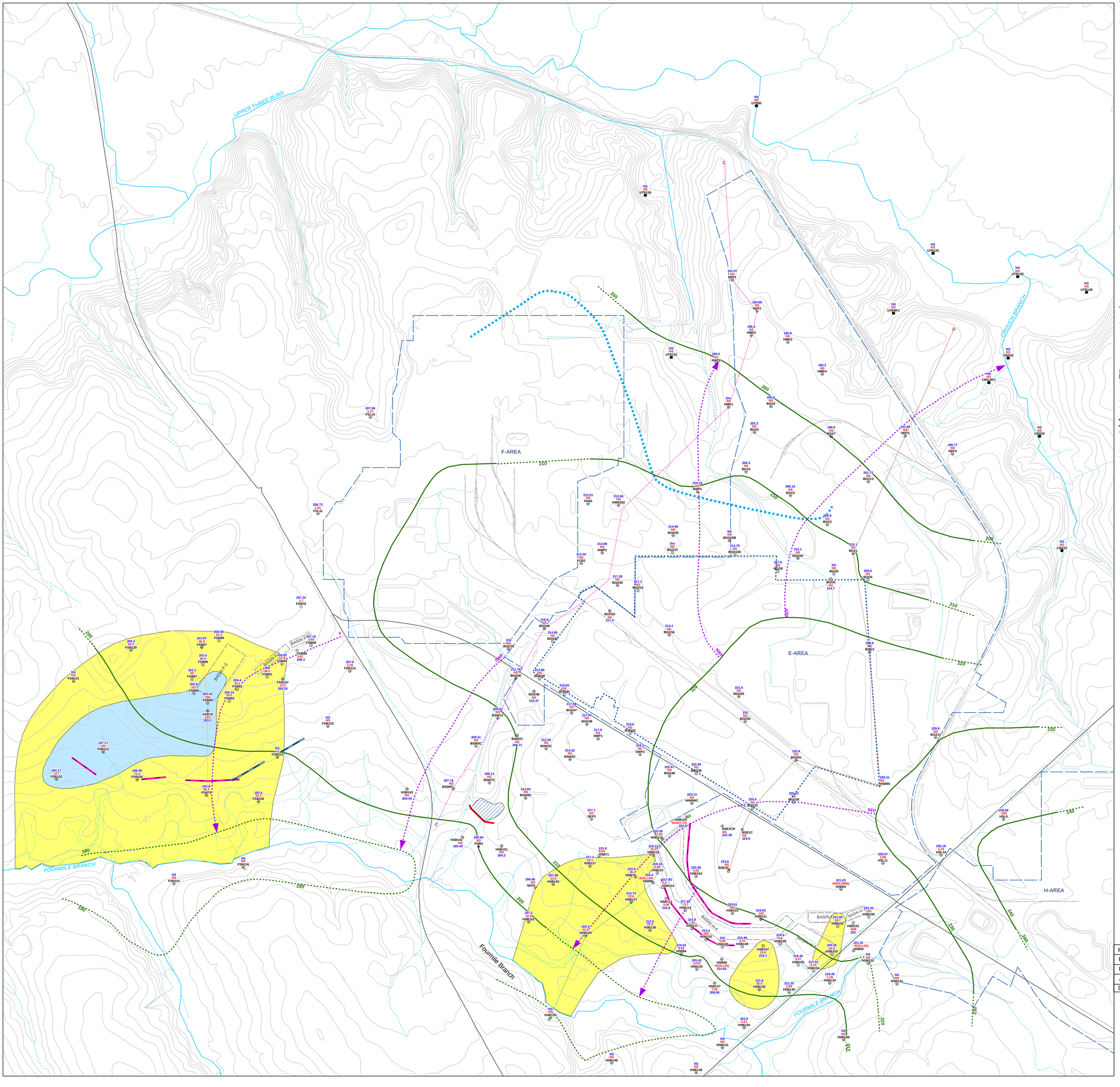
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 09A.
GSA Corrective Action Report, Nitrate-Nitrite Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP09A

Map 09A. GSA Corrective Action Report, Nitrate-Nitrite Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	NITRATE-NITRITE (3Q11) mg/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

10 - 100 mg/L
GROUNDWATER PROTECTION STANDARD = 10 mg/L

>100 mg/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

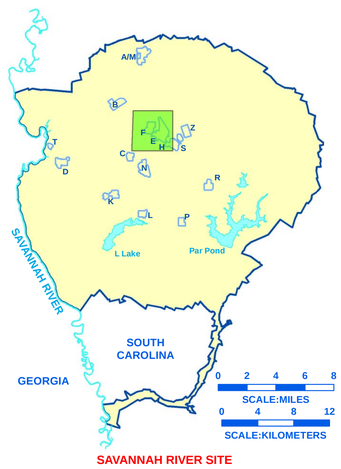
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH



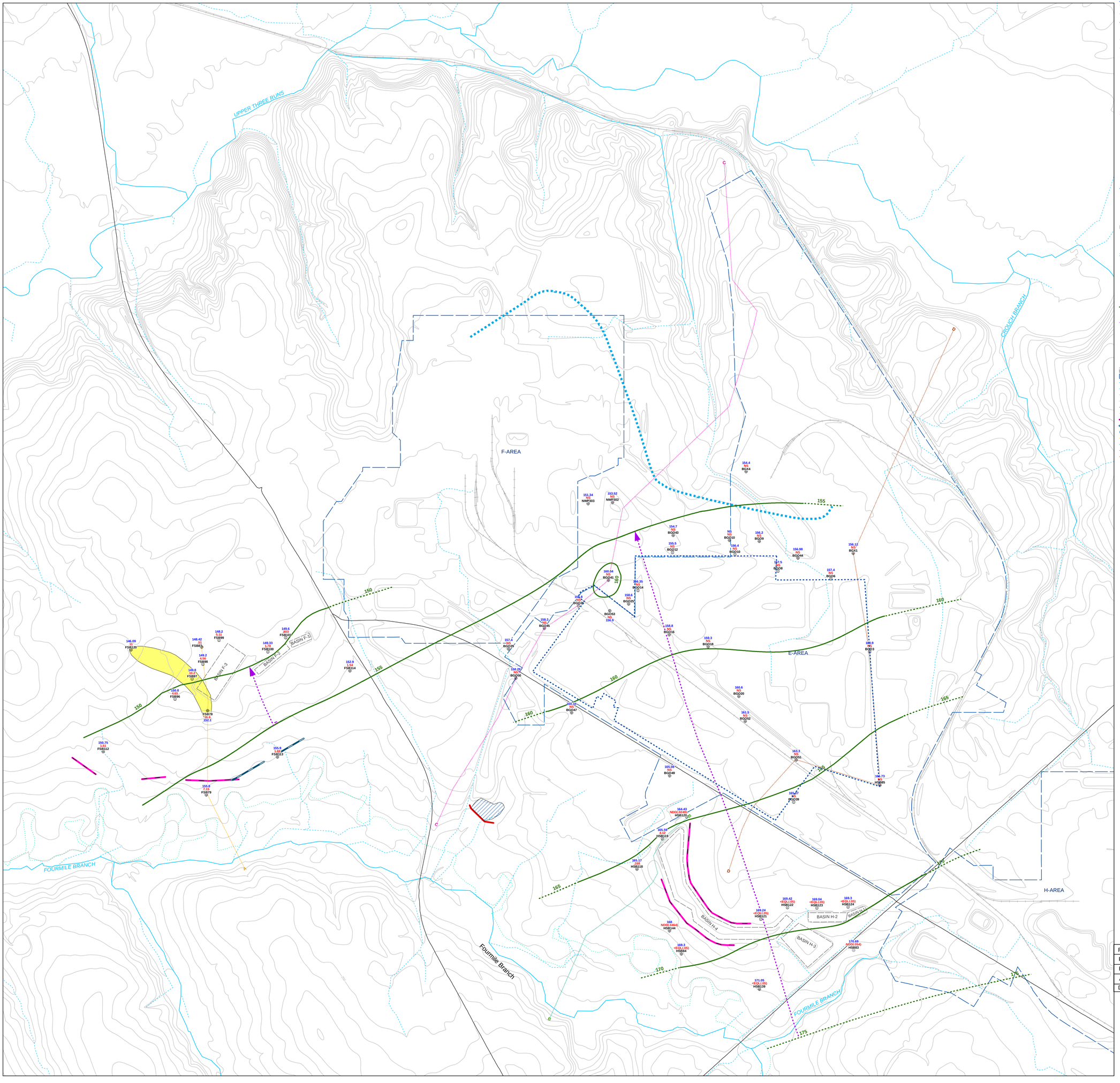
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 09B.
GSA Corrective Action Report, Nitrate-Nitrite Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

Map 09B. GSA Corrective Action Report, Nitrate-Nitrite Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP09B



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	NITRATE-NITRITE (3Q11) mg/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

10 - 100 mg/L
GROUNDWATER PROTECTION STANDARD = 10 mg/L

>100 mg/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

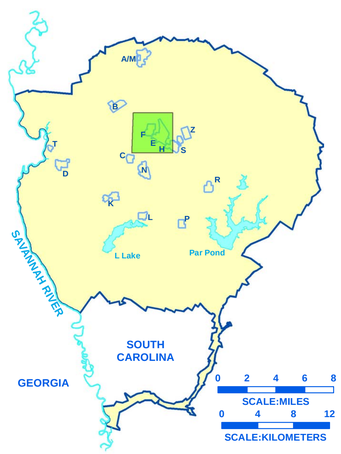
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



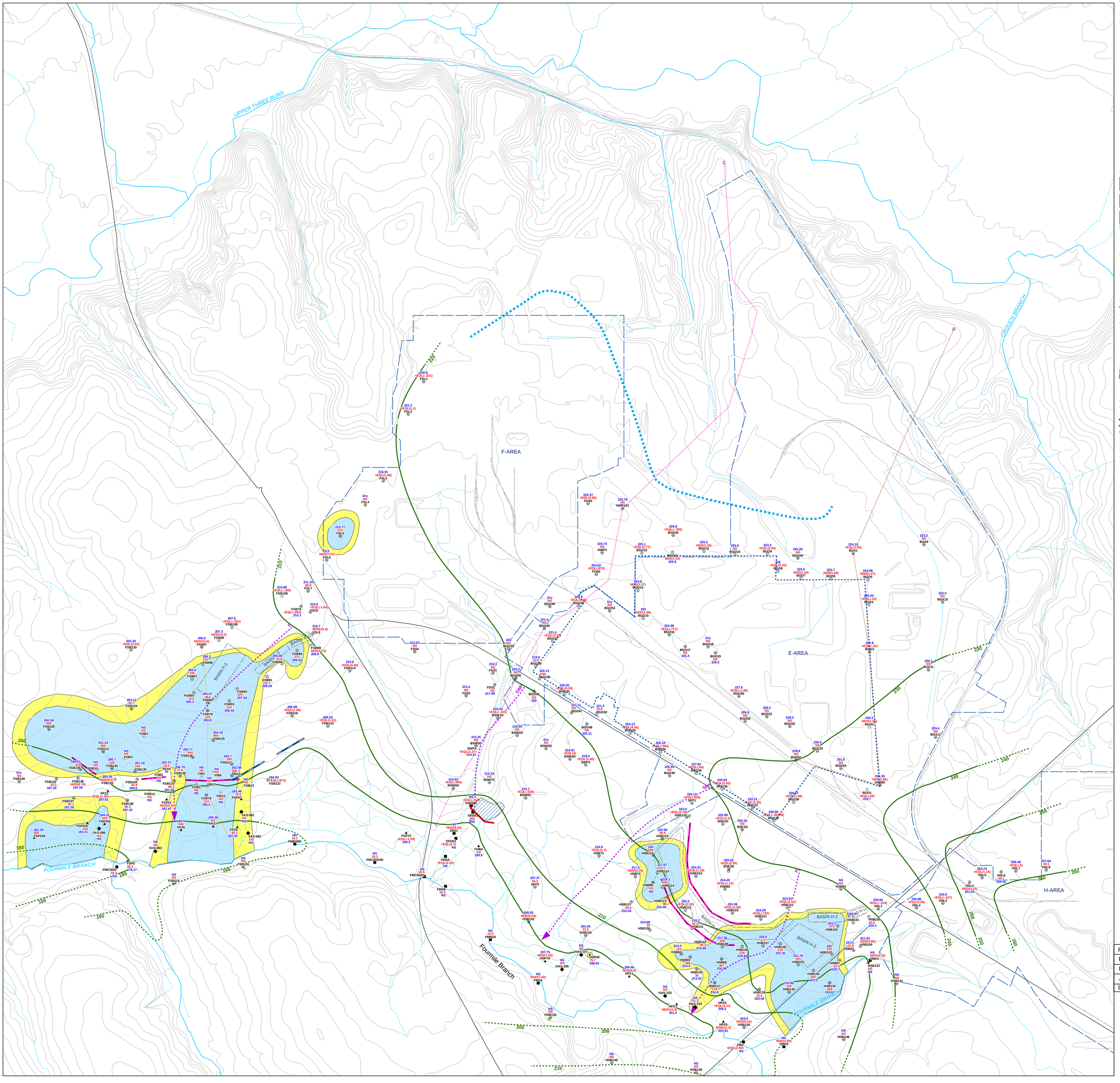
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 09C.
GSA Corrective Action Report, Nitrate-Nitrite Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 09C. GSA Corrective Action Report, Nitrate-Nitrite Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP09C



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	NONVOLATILE BETA (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

50 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 50 pCi/L

100 - 1000 pCi/L

>1000 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

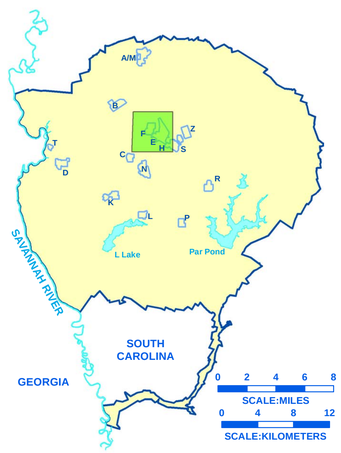
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



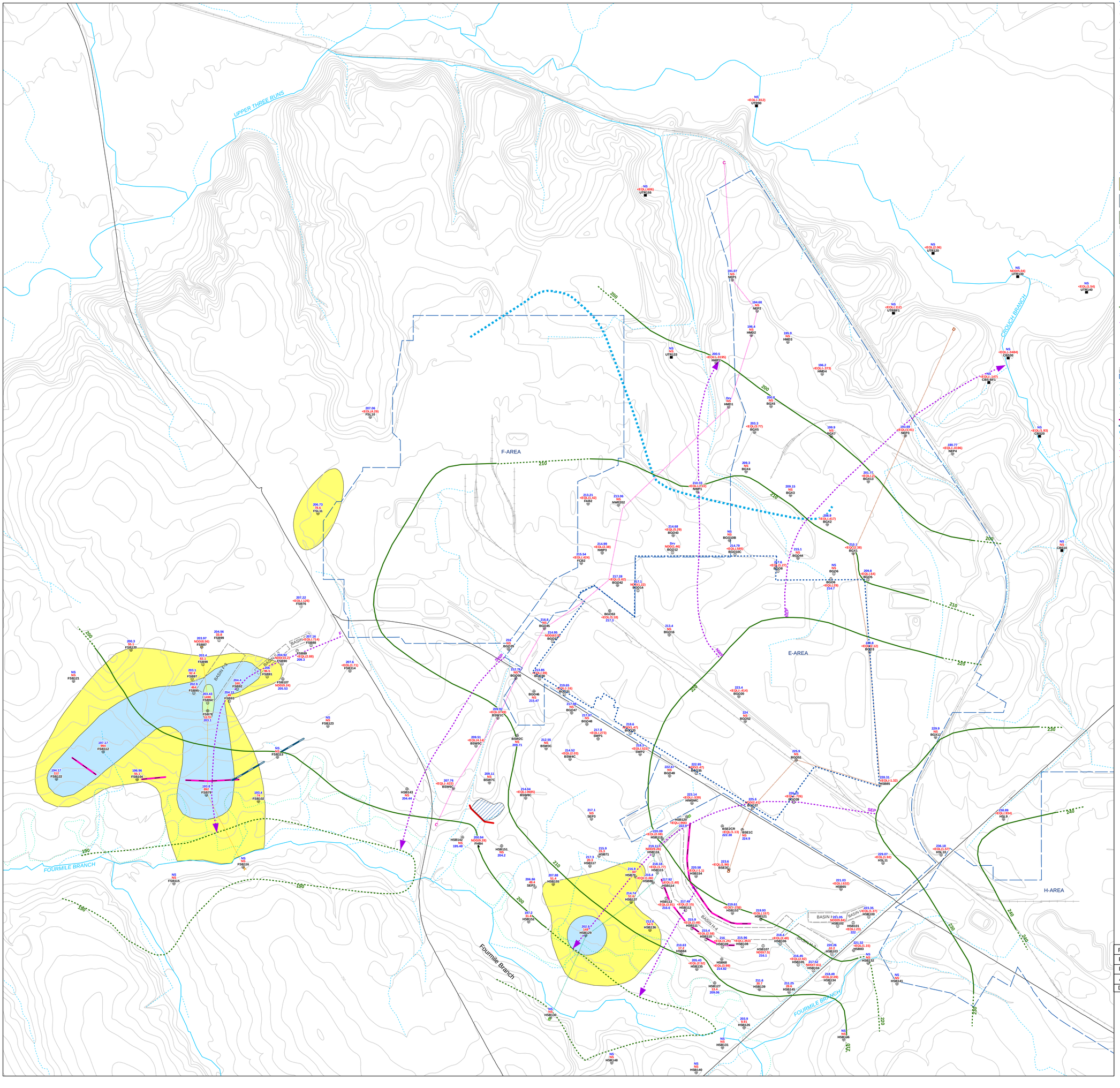
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 10A.
GSA Corrective Action Report, Nonvolatile Beta Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

Map 10A. GSA Corrective Action Report, Nonvolatile Beta Concentrations and Potentiometric Surface in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP10A



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	NONVOLATILE BETA (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

- 50 - 100 pCi/L GROUNDWATER PROTECTION STANDARD = 50 pCi/L
- 100 - 1000 pCi/L
- >1000 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

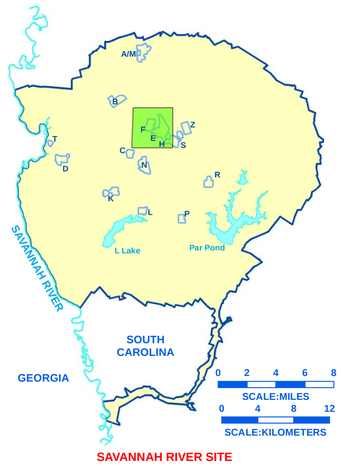
- POTENTIOMETRIC SURFACE CONTOUR CONTOUR INTERVAL = 10 FEET DASHED WHERE INFERRED
- GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH TRUE NORTH



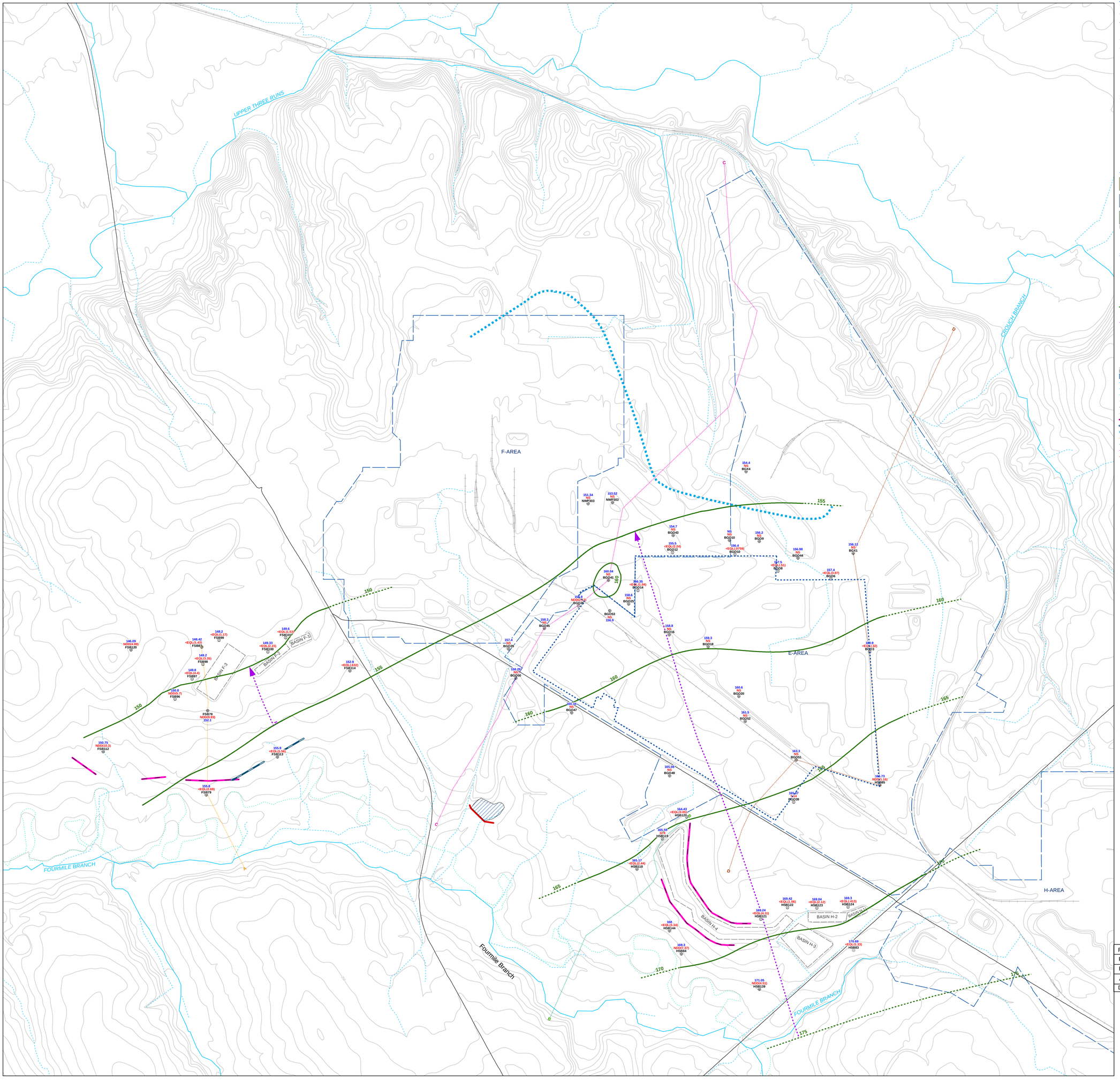
SAVANNAH RIVER SITE

Report Number:	SRNS-RP-2012-00045
Prepared By:	Jeffrey Thibault
Reviewed By:	Ashley Shull
Approved By:	Gerald Blount
Date:	April 30, 2012

Map 10B. GSA Corrective Action Report, Nonvolatile Beta Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011

MAP10B

Map 10B. GSA Corrective Action Report, Nonvolatile Beta Concentrations and Potentiometric Surface in the Lower Aquifer Zone of the Upper Three Runs Aquifer at the GSA, Third Quarter 2011



WELL USE

- AUXILIARY / AUXILIARY OBSERVATION
- BACKGROUND WELL
- SEEPLINE SURFACE WATER LOCATION
- SURFACE WATER LOCATION
- PLUME ASSESSMENT WELL
- POINT OF COMPLIANCE WELL
- WETLAND PIEZOMETER

100.5	NONVOLATILE BETA (3Q11) pCi/L
EQL	ESTIMATED QUANTITATION LIMIT
NDD	NOT DECISION DATA
REJ	REJECTED VALUE
DRY	WELL DRY
NS	NOT SAMPLED

SUSPECT VALUES ARE NOT IDENTIFIED ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

PLUME LEGEND

50 - 100 pCi/L
GROUNDWATER PROTECTION STANDARD = 50 pCi/L

100 - 1000 pCi/L

>1000 pCi/L

DASHED WHERE INFERRED

200.5	POTENTIOMETRIC SURGACE ELEVATION (3Q11) MSL
EQL	ESTIMATED QUANTITATION LIMIT
NS	NOT SAMPLED
SV	SUSPECT VALUES
DRY	WELL DRY

SUSPECT VALUES ARE IDENTIFIED AS SV ON THIS FIGURE AND ARE NOT CONSIDERED IN THE CONTOURING. THESE SUSPECT VALUES ARE IDENTIFIED IN THE DATA TABLES OF APPENDIX B.

POTENTIOMETRIC SURFACE CONTOUR
CONTOUR INTERVAL = 10 FEET
DASHED WHERE INFERRED

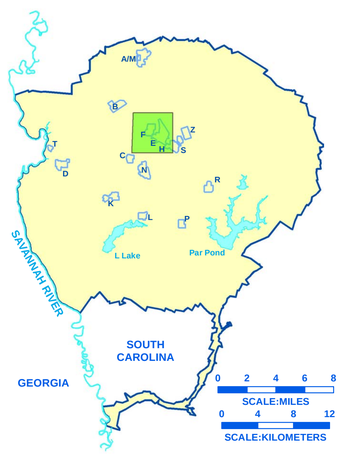
GROUNDWATER FLOW PATH

- BASIN CLOSURE BOUNDARY
- FACILITY AREA BOUNDARY
- STREAM
- OTHER SURFACE FLOW PATTERN
- SEEPLINE
- TOPOGRAPHIC CONTOUR (10 FOOT INTERVAL)
- MAIN/PAVED ROAD
- RAILROAD
- BARRIER WALL
- BARRIER WALL EXTENSION
- WATER TABLE TRANSITION FROM UAZ TO LAZ
- A-A' CROSS SECTION KEY PLAN
- B-B' CROSS SECTION KEY PLAN
- C-C' CROSS SECTION KEY PLAN
- D-D' CROSS SECTION KEY PLAN

0 500 1,000 1,500
SCALE:FEET

0 250 500
SCALE:METERS

PLANT NORTH
TRUE NORTH
N
3 6 - 2 2



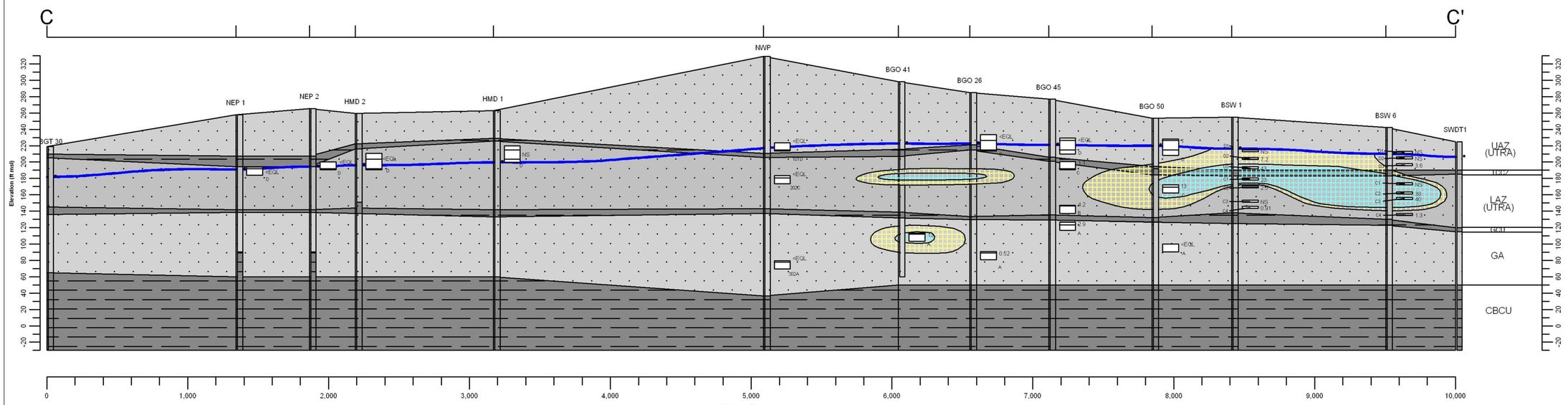
SAVANNAH RIVER SITE

Report Number: SRNS-RP-2012-00045	
Prepared By: Jeffrey Thibault	
Reviewed By: Ashley Shull	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 10C.
GSA Corrective Action Report, Nonvolatile Beta Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

Map 10C. GSA Corrective Action Report, Nonvolatile Beta Concentrations and Potentiometric Surface in the Gordon Aquifer at the GSA, Third Quarter 2011

MAP10C



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Trichloroethylene Value (3Q11) ug/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

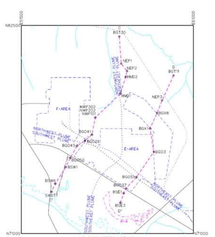
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

5 - 10 ug/L (GWPS = 5 ug/L)

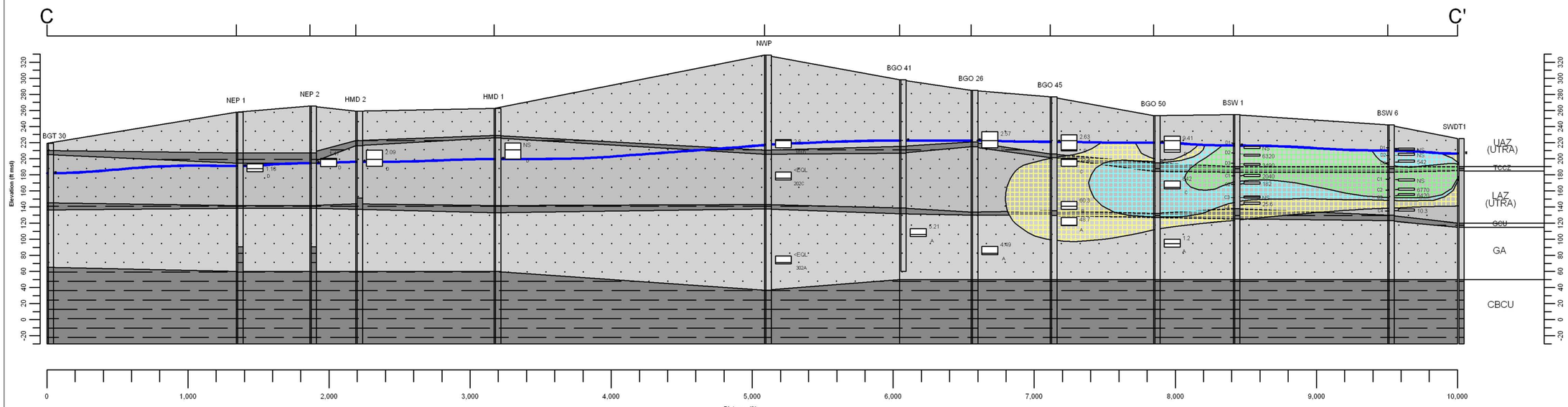
> 10 - 100 ug/L



Report Number:	SRNS-RP-2012-00045
Prepared By:	Branden Kramer
Reviewed By:	Jeff Thibault
Approved By:	Gerald Blount
Date:	April 30, 2012

Map 11A.
Trichloroethylene F-Area HWMF
Hydrostratigraphic Cross Section C-C'
Third Quarter 2011

Map_11A



LEGEND

UAZ TCCZ LAZ GCU

GA CBCU

SCREEN

Water Table

100.1 Tritium Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

NS Not Sampled

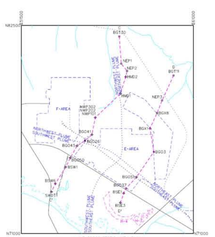
SV Suspect Value - Not used in Contouring

PLUME LEGEND

20 - 100 pCi/L (GWPS = 20 pCi/L)

> 100 - 1000 pCi/L

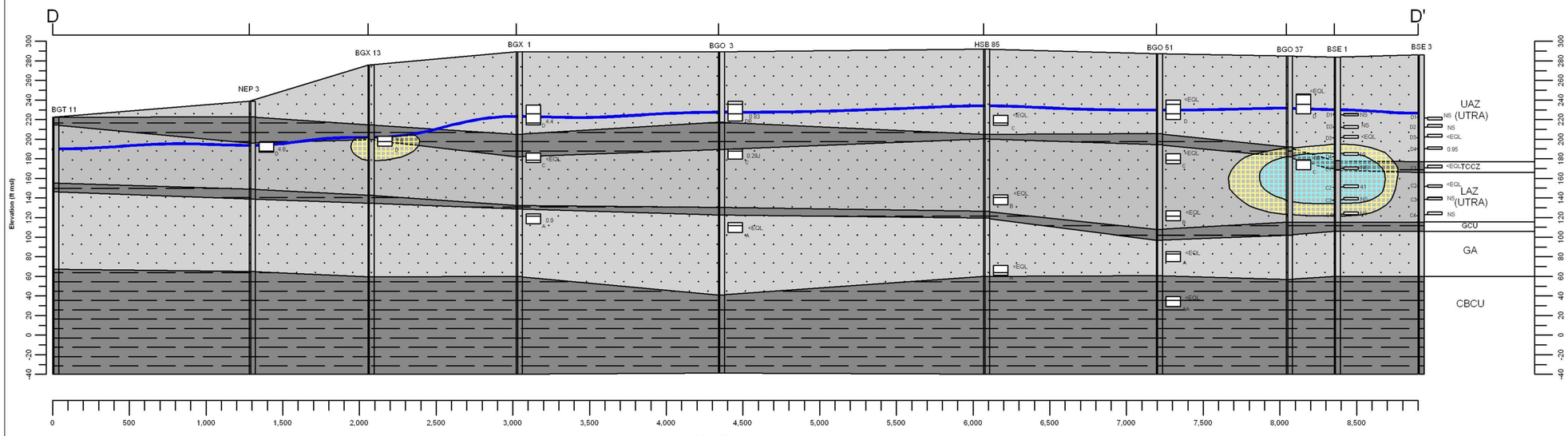
> 1000 - 10000 pCi/L



Report Number:	SRNS-RP-2012-00045
Prepared By:	Branden Kramer
Reviewed By:	Jeff Thibault
Approved By:	Gerald Blount
Date:	April 30, 2012

Map 11B.
Tritium F-Area HWMF
Hydrostratigraphic Cross Section C-C'
Third Quarter 2011

Map_11B



LEGEND

UAZ | TCCZ | LAZ | GCU

GA | CBCU

SCREEN

Water Table

100.1 Trichloroethylene Value (3Q11) ug/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

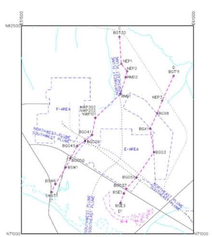
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

5 - 10 ug/L (GWPS = 5 ug/L)

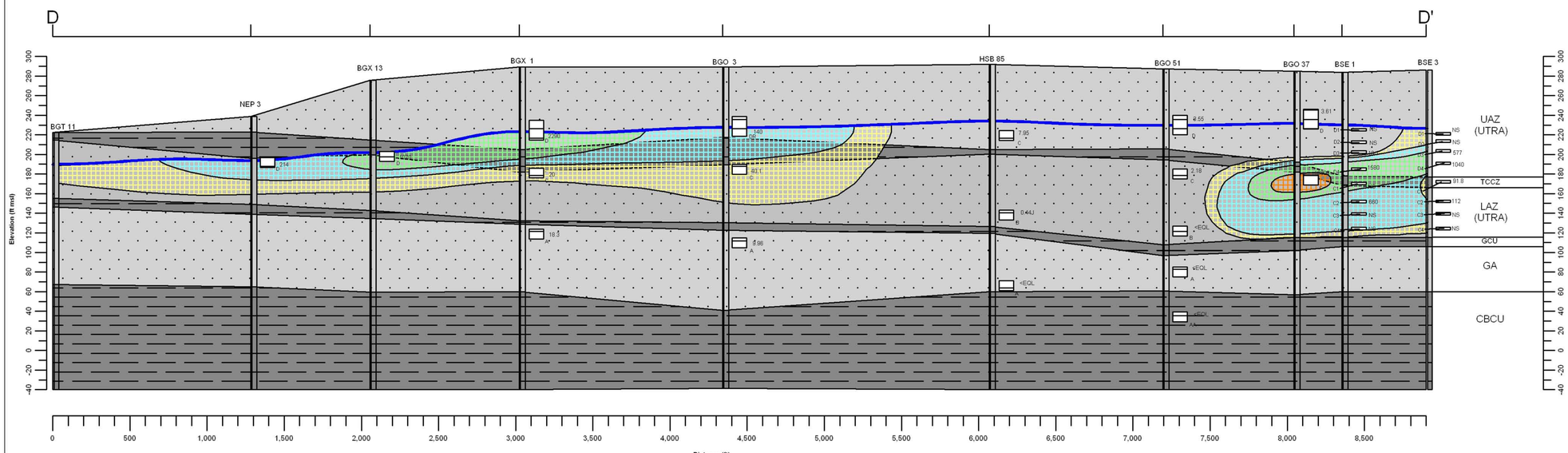
> 10 - 100 ug/L



Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 12A.
Trichloroethylene F-Area HWMF
Hydrostratigraphic Cross Section D-D'
Third Quarter 2011

Map_12A



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU

SCREEN

Water Table

100.1 Tritium Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

20 - 100 pCi/L (GWPS = 20 pCi/L)

> 100 - 1000 pCi/L

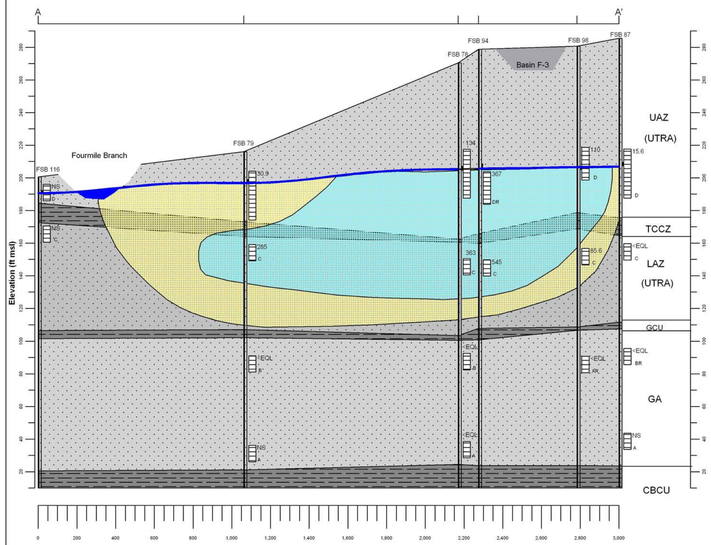
> 1000 - 10000 pCi/L

> 10000 pCi/L

Report Number:	SRNS-RP-2012-00045
Prepared By:	Branden Kramer
Reviewed By:	Jeff Thibault
Approved By:	Gerald Blount
Date:	April 30, 2012

Map 12B.
Tritium F-Area HWMF
Hydrostratigraphic Cross Section D-D'
Third Quarter 2011

Map_12B



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Gross Alpha Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

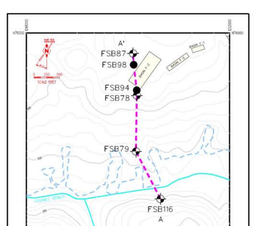
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

15 - 100 pCi/L (GWPS = 15 pCi/L)

> 100 pCi/L

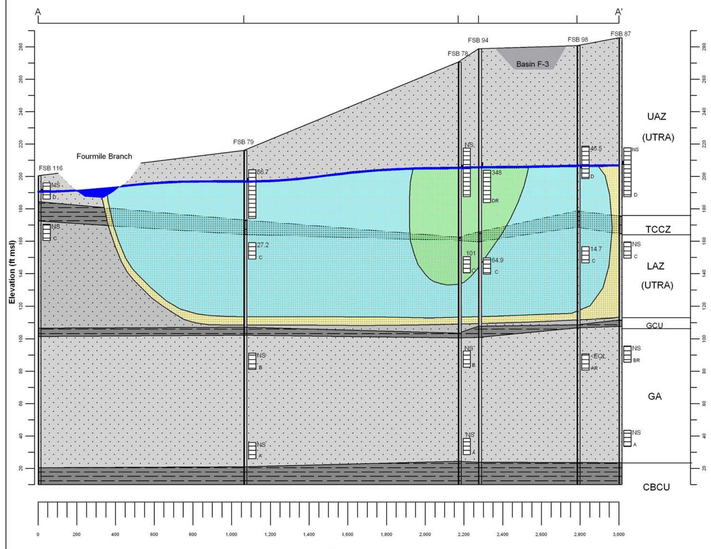


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13A.
Gross Alpha F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13A



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU

SCREEN

Water Table

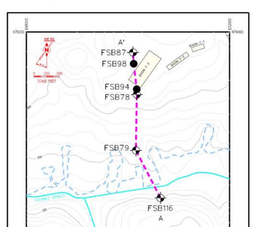
100.1	Iodine-129 Value (3Q11) pCi/L
EQL	Estimated Quantitation Limit
NDD	Not Decision Data
REJ	Rejected Data
NS	Not Sampled
SV	Suspect Value - Not used in Contouring

PLUME LEGEND

1 - 10 pCi/L (GWPS = 1 pCi/L)

> 10 - 100 pCi/L

> 100 pCi/L

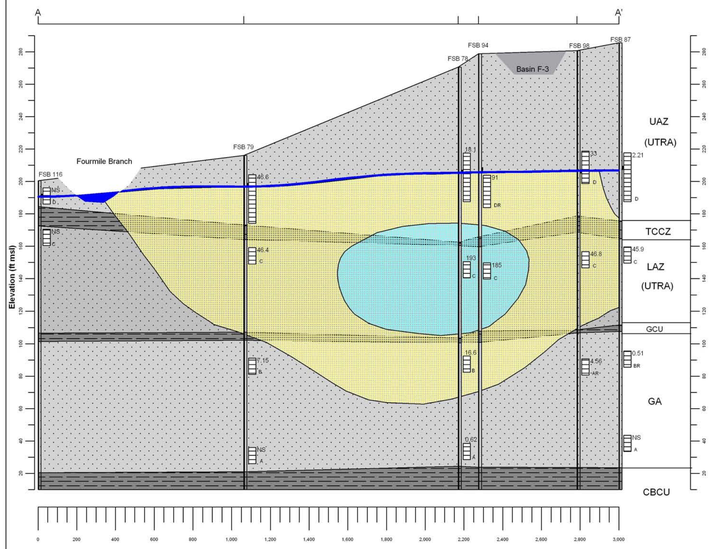


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13B.
Iodine-129 F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13B



LEGEND

UAZ | TCCZ | LAZ | GCU

GA | CBCU

SCREEN

Water Table

100.1 Nitrate-Nitrite Value (3Q11) mg/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

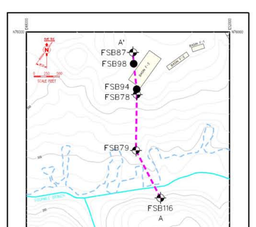
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

10 - 100 mg/L (GWPS = 10 mg/L)

> 100 mg/L

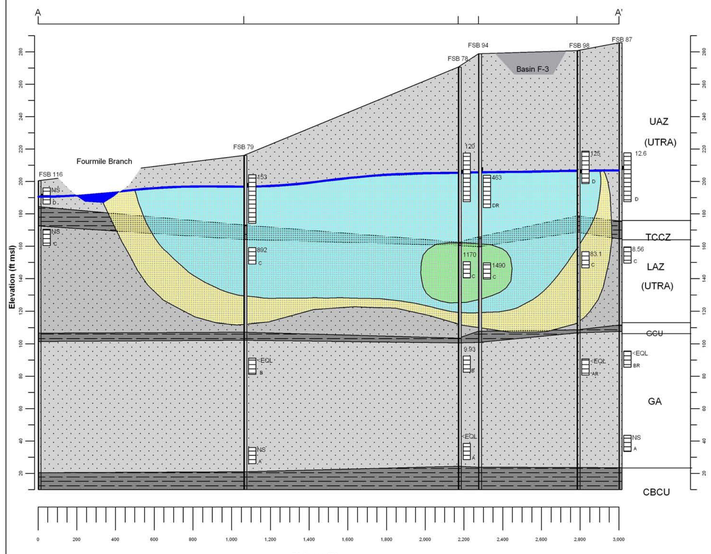


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13C.
Nitrate-Nitrite F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13C



LEGEND

UAZ TCCZ LAZ GCU

GA CBCU

SCREEN

Water Table

100.1 Nonvolatile Beta Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

NS Not Sampled

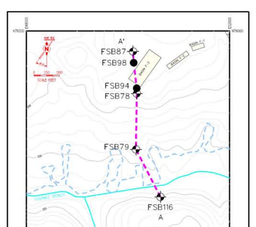
SV Suspect Value - Not used in Contouring

PLUME LEGEND

50 - 100 pCi/L (GWPS = 50 pCi/L)

> 100 - 1000 pCi/L

> 1000 pCi/L

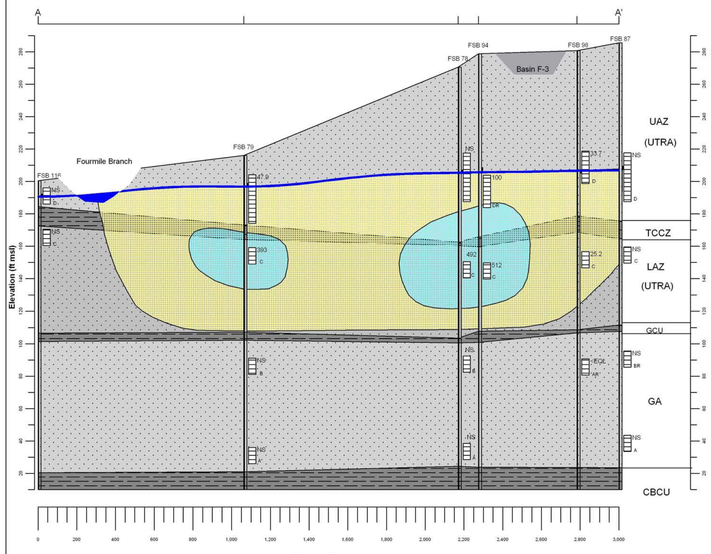


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13D.
Nonvolatile Beta F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13D



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Strontium-90 Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

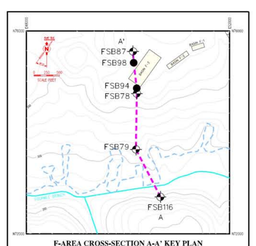
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

8 - 100 pCi/L (GWPS = 8 pCi/L)

> 100 pCi/L

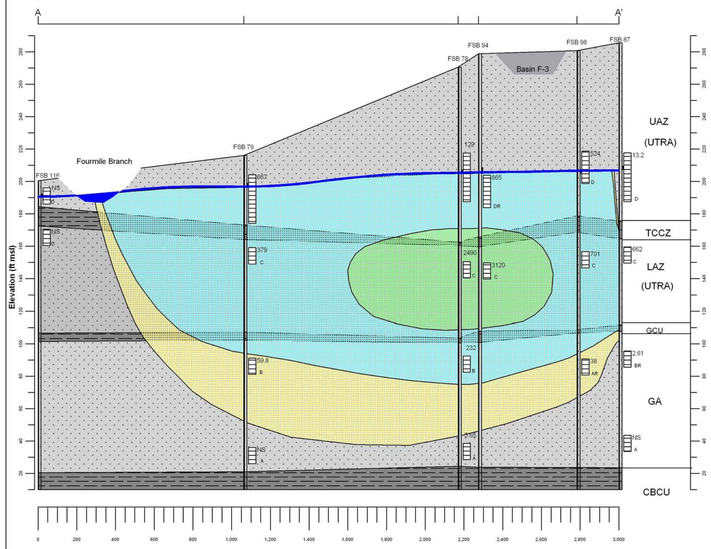


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13E.
Strontium-90 F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13E



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU

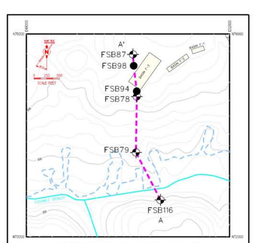
SCREEN

Water Table

100.1	Tritium Value (3Q11) pCi/L
EQL	Estimated Quantitation Limit
NDD	Not Decision Data
REJ	Rejected Data
NS	Not Sampled
SV	Suspect Value - Not used in Contouring

PLUME LEGEND

- 20 - 100 pCi/L (GWPS = 20 pCi/L)
- > 100 - 1000 pCi/L
- > 1000 pCi/L

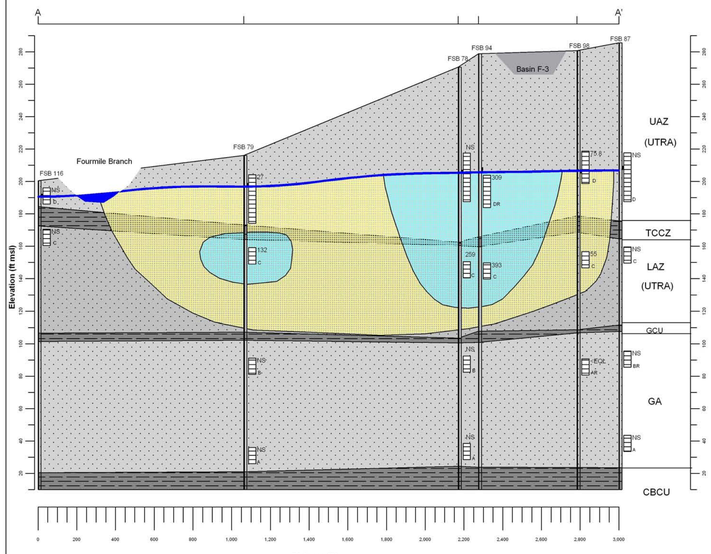


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13F.
Tritium F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13F



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Uranium-238 Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

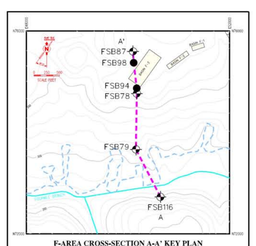
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

15 - 100 pCi/L (GWPS = 15 pCi/L)

> 100 pCi/L

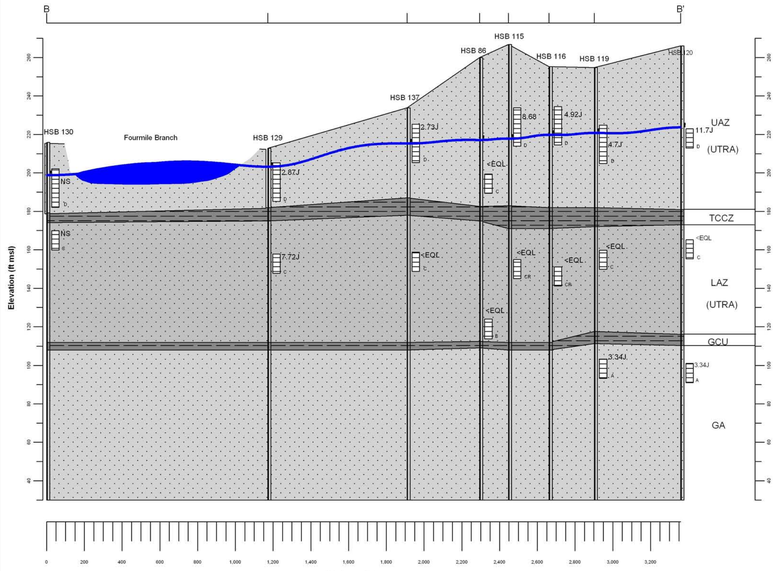


F-AREA CROSS-SECTION A-A' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 13G.
Uranium-238 F-Area HWMF
Hydrostratigraphic Cross Section A-A'
Third Quarter 2011

Map_13G



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Gross Alpha Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

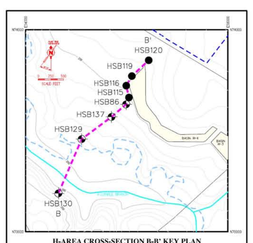
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

15 - 100 pCi/L (GWPS = 15 pCi/L)

> 100 pCi/L

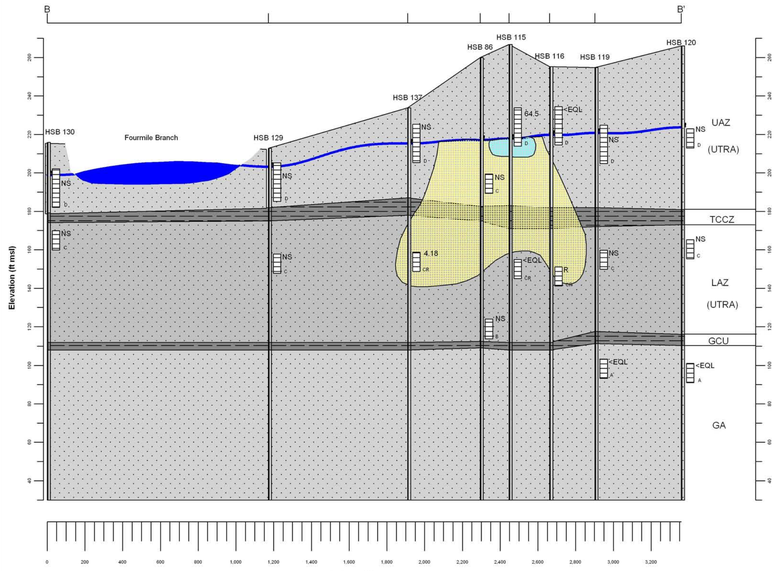


H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14A.
Gross Alpha F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

Map_14A



LEGEND

UAZ TCCZ LAZ GCU

GA CBCU

SCREEN

Water Table

100.1 Iodine-129 Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

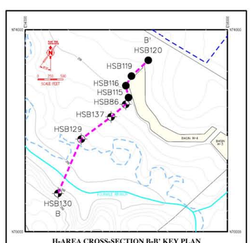
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

1 - 10 pCi/L (GWPS = 1 pCi/L)

> 10 pCi/L

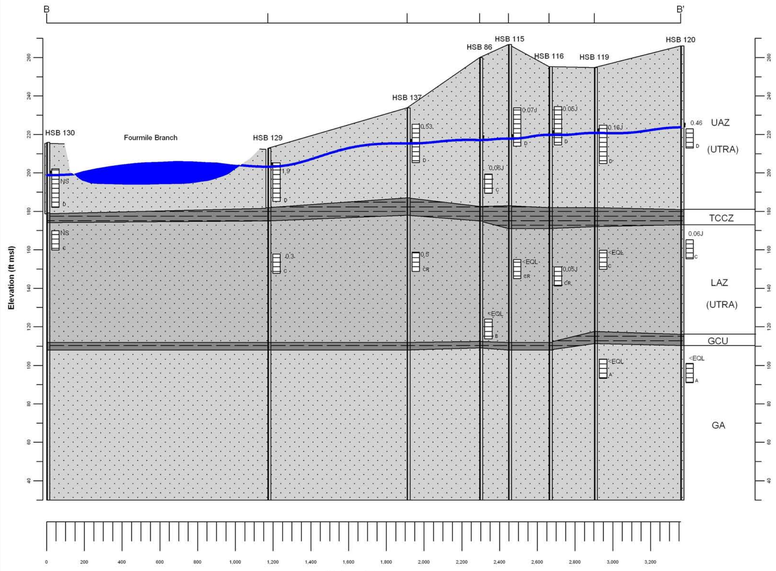


H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14B.
Iodine-129 F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

MAP_14B



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Mercury Value (3Q11) ug/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

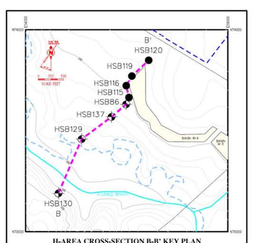
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

2 - 10 ug/L (GWPS = 2 ug/L)

> 10 ug/L

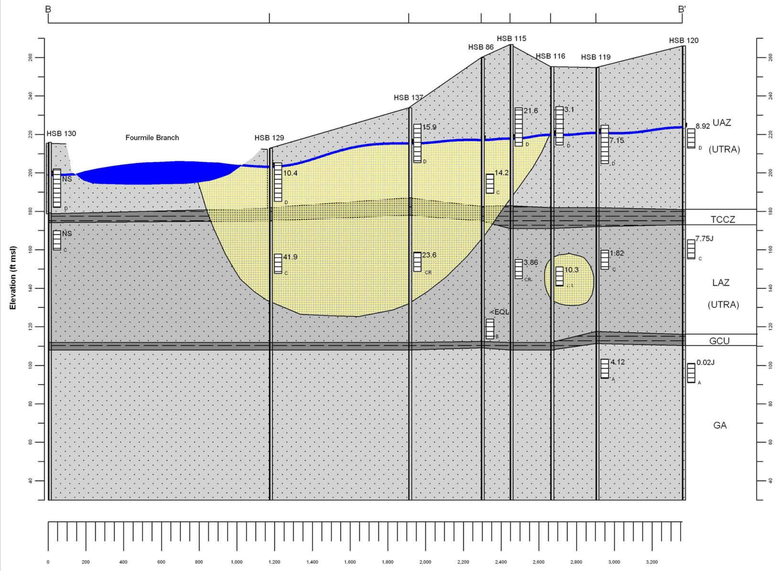


H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14C.
Mercury F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

Map_14C



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Nitrate-Nitrite Value (3Q11) mg/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

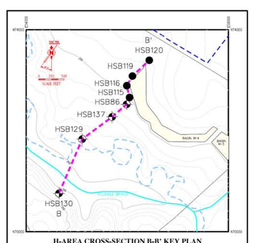
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

10 - 100 mg/L (GWPS = 10 mg/L)

> 100 mg/L

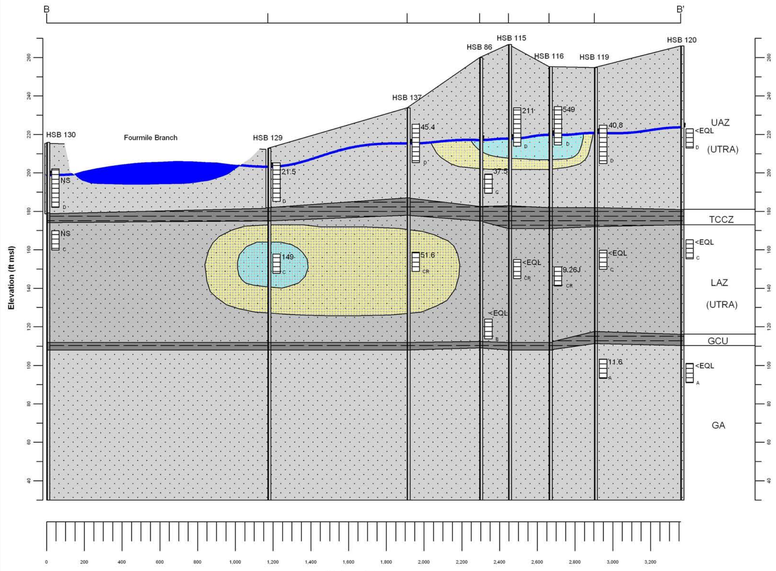


H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14D.
Nitrate-Nitrite F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

Map_14D



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU

SCREEN

Water Table

100.1 Nonvolatile Beta Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

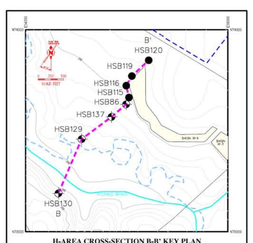
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

50 - 100 pCi/L (GWPS = 50 pCi/L)

> 100 pCi/L

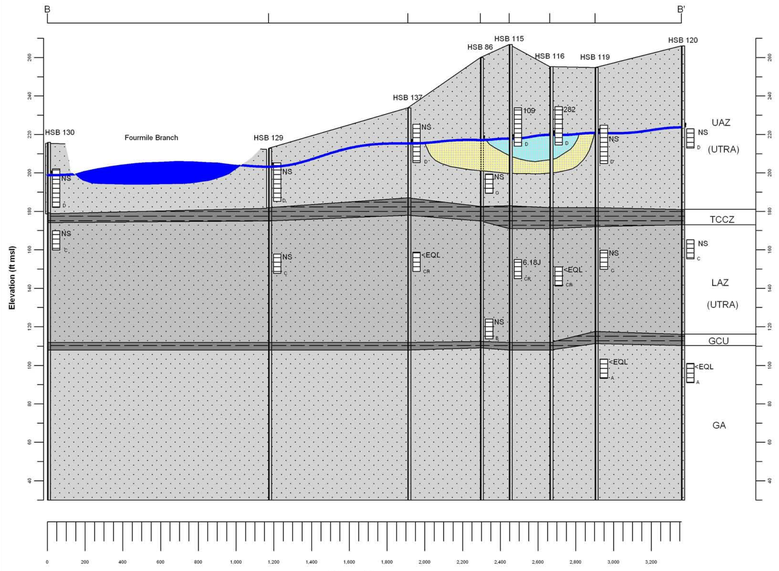


H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14E.
Nonvolatile Beta F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

Map_14E



LEGEND

UAZ TCCZ LAZ GCU

GA CBCU

SCREEN

Water Table

100.1 Strontium-90 Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

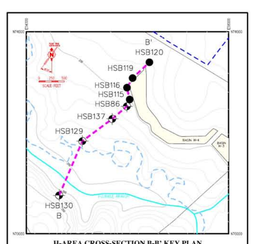
NS Not Sampled

SV Suspect Value - Not used in Contouring

PLUME LEGEND

8 - 100 pCi/L (GWPS = 8 pCi/L)

> 100 pCi/L

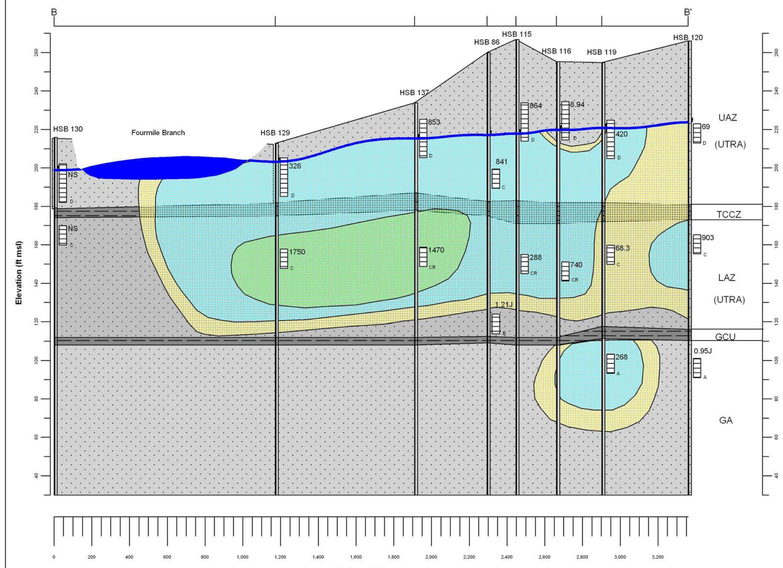


H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14F.
Strontium-90 F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

Map_14F



LEGEND

UAZ, TCCZ, LAZ, GCU, GA, CBCU, SCREEN

Water Table

100.1 Tritium Value (3Q11) pCi/L

EQL Estimated Quantitation Limit

NDD Not Decision Data

REJ Rejected Data

NS Not Sampled

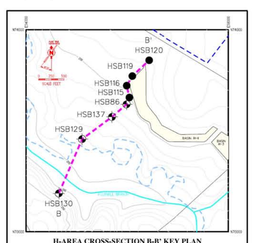
SV Suspect Value - Not used in Contouring

PLUME LEGEND

20 - 100 pCi/L (GWPS = 20 pCi/L)

> 100 - 1000 pCi/L

> 1000 - 10000 pCi/L



H-AREA CROSS-SECTION B-B' KEY PLAN

Report Number: SRNS-RP-2012-00045	
Prepared By: Branden Kramer	
Reviewed By: Jeff Thibault	
Approved By: Gerald Blount	
Date: April 30, 2012	

Map 14G.
Tritium F-Area HWMF
Hydrostratigraphic Cross Section B-B'
Third Quarter 2011

Map_14G