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Lawrence Livermore National Laboratory
Experimental Test Site 300

Compliance Monitoring Program for
Closed Landfill Pits 1 and 7

Fourth Quarter/Annual Report 2009

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LLNL Experimental Test Site 300 Compliance Monitoring Program for Closed Landfill Pits 1 and 7

Fourth Quarter/Annual Report 2009

Summary

This combined fourth quarter and annual 2009 report summarizes compliance activities performed at two Lawrence Livermore National Laboratory (LLNL) Site 300 landfills known as Pits 1 and 7 following monitoring and reporting provisions of WDR 93-100, Resource Conservation and Recovery Act (RCRA) closure and post closure plans, and California Code of Regulations (CCR) title 23, Chapter 15. The pits were closed under the LLNL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Federal Facility Agreement (FFA) following the California Department of Health Services, now Department of Toxic Substances Control-approved RCRA closure and post closure plans. Compliance activities at the pits consist of ground water sampling and analysis, pit cap inspections, annual subsidence surveys, and reporting of analytical results. Ground water measurements for the fourth quarter of 2009 are contained in **Appendix A, Tables A-1 to A-4**.

No new releases of constituents of concern to ground water from either Pit 1 or Pit 7 are evident in the fourth quarter monitoring data. During this quarter uranium, tritium, and barium continued to be detected above their statistical limits (SLs) as in the previous quarters in some ground water samples at the pits and are discussed in the "Summary of Analytical Results" section in this report.

This quarter, LLNL staff performed the required post-closure visual inspections of the caps at Pits 1 and 7. These inspections demonstrated the continued functional and structural integrity of the caps, vegetation cover, and drainage. No deficiencies were noted in the condition of the pit caps during these inspections and the pit caps and drainage structures continue to function adequately at both pits.

Introduction

This 2009 fourth quarter/annual report summarizes compliance monitoring results for two closed landfills known as Pit 1 and Pit 7 at the LLNL Experimental Test Site (Site 300). Site 300 is a 30.3 square kilometers (km²) (11.8 square miles [mi²]) site, located in the Altamont Hills approximately 10.5 km (6.5 mi) southwest of downtown Tracy, California (**Figure 1**). The landfills are located in the northern portion of the site (**Figure 2**). Closure of these unlined Class I waste management units was completed with waste in place in December 1992 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) following a California Department of Health Services (now Department of Toxic Substances Control, or DTSC) approved Resource Conservation and Recovery Act (RCRA) Closure and Post-Closure Plans (PCP). Site 300 is owned by the United States Department of Energy (DOE) and is operated by the Lawrence Livermore National Security, LLC.



Figure 1. Location of LLNL Site 300.

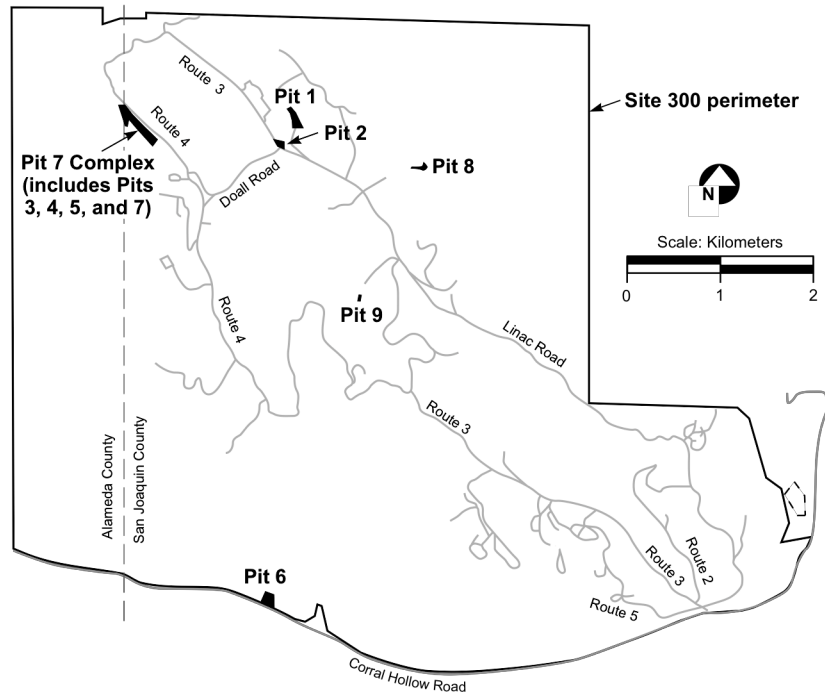


Figure 2. Locations of closed landfill Pits 1 and 7 at LLNL Site 300.

Pit 1 is located in the Elk Ravine drainage area, about 300 meters (m) or 984 feet (ft) above mean sea level (MSL). Ground water generally flows in an east-northeast direction beneath Pit 1, following the inclination (dip) of underlying Miocene-age sedimentary rocks (Webster-Scholten, 1994).

Figure 3 shows the locations of the eight compliance monitoring wells that are used to sample the ground water in the vicinity of Pit 1. Wells K1-01C and K1-07 are hydrologically upgradient from Pit 1. Wells K1-02B, W-PIT1-2326, K1-04, and K1-05 are downgradient. Wells K1-08 and K1-09 are crossgradient. Well K1-03 has an inoperative pump that is stuck in the casing and cannot be removed. As shown on **Figure 3**, Well K1-03 has a red line through the well posting indicating that the well is no longer in use. Well W-Pit1-2326 was installed to replace K1-03 (**Figure 3**). Samples from W-Pit1-2326 were first collected starting the second quarter 2008. The wells are screened in the uppermost water-bearing zone in the Neroly Formation lower blue sandstone unit (Tnbs₁). The Neroly Formation contains the main aquifer beneath Site 300. Pit 2, which was closed before RCRA was enacted, is hydrologically upgradient from Pit 1. In 1992, a 2.4 m (8 ft) thick RCRA cap, containing an impermeable layer of clay, 0.6 m (2 ft) thick, was constructed over Pit 1. The cap prevents rainwater from percolating through the waste buried in the pit. A water diversion channel was constructed around the pit cap to remove storm water runoff. The diversion channel empties into the adjacent arroyo, the headwater of Elk Ravine.

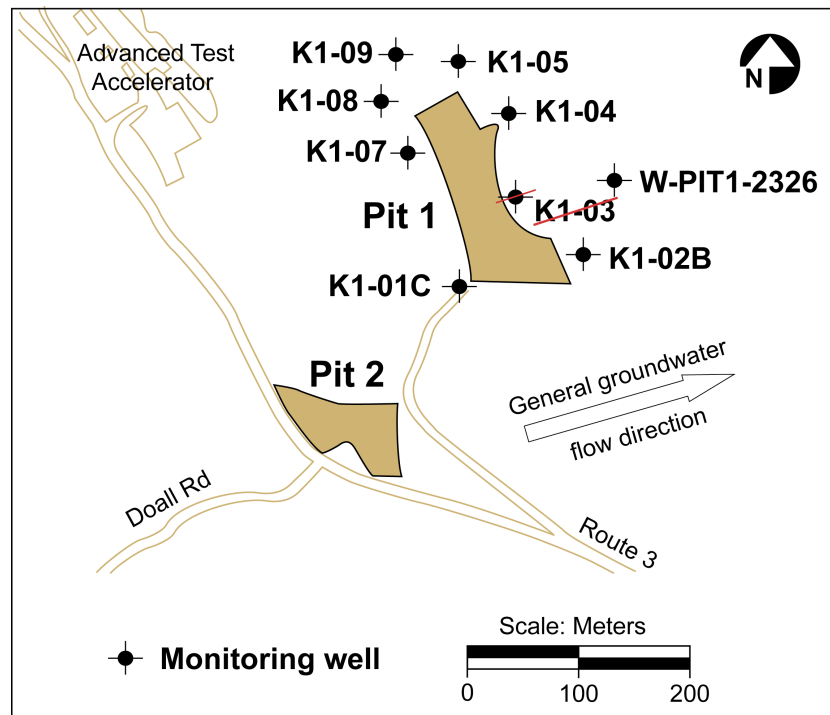


Figure 3. Locations of Pit 1 compliance monitoring wells.

Pit 7 is located in a valley 1.5 km (0.9 miles) west of Pit 1, at an elevation of about 400 m (1,312 ft) above mean sea level (MSL). The Pit 7 Complex comprises Pits 3, 4, 5, and 7. Pits 3, 4, and 5 ceased receiving waste before 1980, when RCRA was enacted. Ground water in bedrock flows 5 to 15 meters per year (m/yr) (16-49 ft/yr) in a generally east-northeast direction beneath the Pit 7 Complex, following the dip of the underlying Neroly Formation basal sandstone ($Tnbs_0$) (Webster-Scholten, 1994). With sufficient seasonal rainfall, unconfined ground water can rise from bedrock into the more permeable valley-fill alluvium on the northeast side of the Pit 7 Complex and flow southeastward at velocities of up to 40 m/yr (131 ft/yr). Surface water from the area may also flow southeastward towards Doall Ravine and quickly infiltrate into the sandy soils.

Figure 4 shows the locations of the nine compliance monitoring wells that are used to sample the ground water in the vicinity of Pit 7. Well K7-06 is hydrologically upgradient from Pit 7. Wells K7-01, K7-03, NC7-25, NC7-26, NC7-47, and NC7-48 are downgradient. Wells K7-09 and K7-10 are crossgradient. Eight of the nine wells are screened in the Qal/weathered bedrock or $Tnbs_0$ water-bearing zones. Well K7-09 samples a deeper water-bearing zone within the Neroly Formation basal silty claystone unit ($Tnsc_0$).

In 1992, a RCRA cap, similar to the Pit 1 cap, was constructed over Pit 7. It, too, contains a layer of impermeable clay, 0.6 m (2 ft) thick, to prevent rain water infiltration. The RCRA cap also covers Pit 4 and about 30% of Pit 3. RCRA construction included surface water diversion channels around the cap and a shallow interflow interceptor trench on the west side (upgradient) of Pit 7. During the latter half of 2007 and early 2008, a drainage diversion system was installed in the Pit 7 Complex. The drainage diversion system intercepts and diverts surface and shallow subsurface water flow to prevent ground water rise into the unlined landfills.

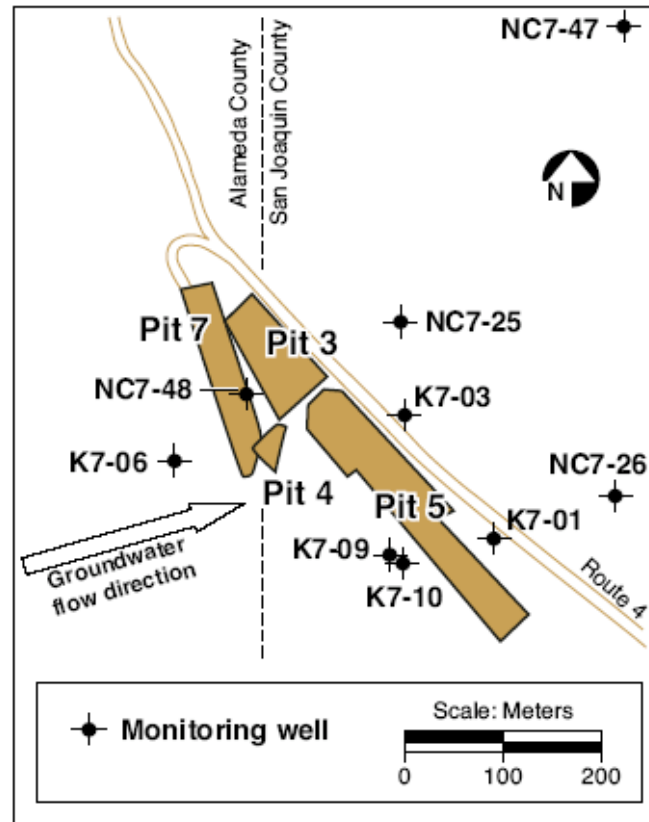


Figure 4. Locations of Pit 7 compliance monitoring wells.

Compliance Monitoring Program Overview

This report fulfills quarterly and annual requirements set forth in the following two documents: (1) *Waste Discharge Requirements Order 93-100 (WDR 93-100)*, and *Revision 2 Monitoring and Reporting Program No. 93-100*, administered by the California Central Valley Regional Water Quality Control Board (CVRWQCB) (CVRWQCB 1993 and 1998); and (2) *LLNL Site 300 RCRA Closure and Post-Closure Plans, Landfill Pits 1 and 7* (Rogers/Pacific Corporation 1990). The post-closure plan (PCP) was approved by the California Department of Health Services (currently the California Department of Toxic Substances Control).

The Compliance Monitoring Program for Pits 1 and 7 combines PCP and WDR 93-100 requirements. The combined requirements include quarterly ground water sampling and analyses to detect potential releases of constituents of concern from landfills, quarterly visual inspections of pit cap integrity, repairs as necessary to maintain the integrity of the landfills and their water-diversion systems, annual measurements of cap survey markers to detect subsidence, an annual inspection of the caps by an independent engineer, and quarterly written monitoring reports.

Quality Assurance

To ensure quality data, we work within the established Quality Assurance (QA) program of the LLNL Environmental Protection Department (EPD). We use protocols and procedures that cover all aspects of ground water sampling, sample tracking, and

data management. These written protocols and procedures are contained in the *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures (SOPs)* (Goodrich and Lorega, 2009) and the *Environmental Monitoring Plan* (Woods, 2005). SOPs are used to minimize inadvertent sample contamination and maintain sample integrity from the well to the analytical laboratory. Data management SOPs ensure that all laboratory measurements are received, accurately recorded, and properly stored both in a computer database and in hardcopy format.

Each quarter, a duplicate (collocated) set of ground water samples is collected from each monitoring network and a set of blank samples is prepared from a randomly chosen well. Results of quality assurance duplicate analyses are in **Appendix C**. In addition, equipment blanks are prepared and analyzed to ensure that sampling equipment is properly cleaned before use. Each day when samples are collected for volatile organic compound (VOC) analysis, a trip blank (prepared at the analytical laboratory) is carried into the field. It is returned unopened to the analytical laboratory for VOC analysis. If VOCs are detected in a trip blank and in any of the routine samples obtained that day, sample results may be discounted and new sampling may be performed.

As required by DOE Order 241.1, our measurements are reported in *Système Internationale* (SI) units. The SI unit for radioactivity is the becquerel (Bq), equal to 1 nuclear disintegration per second. The more commonly used unit, picocurie (pCi), is equal to 1 nuclear disintegration per 27 seconds. As a convenience, maximum contaminant levels (MCLs) for radioactivity in drinking water are given in both becquerels per liter (Bq/L) and picocuries per liter (pCi/L) in **Table 1** below. Note that MCLs are provided for reference only, because this report does not involve wells used for potable domestic, livestock, or industrial water supply.

Table 1. MCLs for radioactivity in drinking water.

Radiological parameter	MCL (Bq/L)	MCL (pCi/L)
Gross alpha	0.555	15
Gross beta	1.85	50
Tritium	740	20,000
Radium (total)	0.185	5
Uranium (total)	0.74	20

Description of Report Contents

The **Summary of Analytical Results** section reviews any constituents of concern detected in ground water during the fourth quarter 2009. Constituents of concern measurements that exceeded SLs or MCLs in drinking water are discussed, as are all detections of organic constituents of concern.

Appendix A contains the ground water analytical measurements for the third quarter 2009. Pit 1 data are in **Tables A-1** and **A-2**. Pit 7 data are in **Tables A-3** and **A-4**. **Table A-5** shows the sample dates for both Pits 1 and 7. Note that the **Appendix A** tables may include some small negative values for radioactivity measurements. These are below the method reporting limits (RLs) and are calculated values. They simply indicate that the radioactivity for that ground water sample is close to zero.

Appendix B explains the methods we use to determine the statistical limit of concentration (SL) for a constituent of concern. Requirements for statistical treatment of ground water data are established in the *California Code of Regulations* (CCR), Title 23, Division 3, Chapter 15, Section 2550.7. The statistical methods we use, prediction intervals (PI) and control charts (CC), are consistent with CCR requirements. If a routine quarterly constituent of concern measurement exceeds its SL and is confirmed by retesting, it is reported to the CVRWQCB as statistically significant evidence of a release. **Table B-1** lists the constituents of concern for metals and radioisotopes that have exceeded SLs since Pits 1 and 7 were officially closed in February 1993. Additional studies covering the Pits 1 and 7 areas have been completed for barium, tritium, uranium, and vanadium (Taffet *et al.* 1996; 2005). **Appendix C** contains the results for quality assurance (QA) sample analyses performed during the fourth quarter of 2009 at Pit 1 (**Table C-1**) and Pit 7 (**Table C-2**).

Appendix D consists of **Table D-1** summarizing constituents of concern and the sampling frequencies in the monitoring networks for both pits. The regulatory drivers for each constituent of concern are also included in **Table D-1**.

Appendix E contains graphs of ground water measurements, and **Table E-1** contains the analytical results from 2009 that were omitted from the graphs contained in **Appendix E** plots due to the use of specially reduced y-axis plot limits. **Table E-2** provides proposed revised SLs for W-Pit-1-2326 as well as the proposed SLs submitted by letter in May 2009 for the remaining Pit 1 wells.

Summary of Analytical Results

As mentioned in the last quarterly report, there continue to be on-going issues for the Pit 1 and 7 compliance program networks that have and will potentially continue to impact monitoring in the future. The major issue is the remediation activities being conducted by LLNL's Environmental Restoration Department (ERD). These activities are scheduled to begin in 2010 and will include pumping, treatment, and re-injection of ground water at the Pit 7 Complex. Starting in 2008, and continuing during the first four quarters of 2009, ERD conducted verification testing of the treatment facility equipment. However, due to a malfunction in the compressor for the Pit 7-Source ground water extraction and treatment system, verification testing was discontinued. Other issues were also identified during testing and verification that are being addressed through system design modifications. These system modifications are in the process of being implemented. Once the system modifications are complete, the system will be re-tested and verified. Following testing and verification, the official start up will be conducted in accordance with the extraction well field startup plan. When remediation activity commences, it has the potential, especially during full-scale operation, to significantly alter hydrologic conditions and equilibrium background chemistry in the ground water in the vicinity of the monitoring wells. These potential changes in hydrologic conditions and background ground water chemistry may result in exceedance of the SLs that are not indicative of releases from the pit. Because of this potential impact on the existing compliance-monitoring network, all monitoring at Pit 7 will be conducted under the CERCLA monitoring program while remediation is taking place. An alternative monitoring program for Pit 7 was approved in the *Revised Site-Wide Compliance Monitoring Plan/Contingency Plan* (Dibley, 2009). In accordance with agreements with the

CVRWQCB and other regulators, the monitoring of Pit 7 under the *Revised Site-Wide Compliance Monitoring Plan/Contingency Plan* will commence in the First Quarter of 2010.

As was discussed last quarter, well W-PIT1-2326 was drilled and completed in 2007 as a replacement well for K1-03 at Pit 1. The well continues to be sampled, and SLs were provided to the CVRWQCB in the May 2009 letter proposing new SLs for the Pit 1 monitoring wells and is presented in Appendix E, Table E-2. This table includes new SLs for W-Pit1-2326 that incorporates the additional monitoring events since first quarter 2009 and reflects all the proposed revisions to the Pit 1 SLs.

No evidence of a new release of constituents of concern from either Pit 1 or Pit 7 is indicated by fourth quarter measurements. At Pit 1 this quarter, tritium exceeded SLs in ground water samples and is consistent with past quarters (**Table A-1**). Tritium activities exceeded SLs in ground water samples from downgradient wells K1-04 (19.2 Bq/L [519 pCi/L], SL=3.7 Bq/L [100 pCi/L]) and K1-05 (9.21 Bq/L [249 pCi/L], SL=3.7 Bq/L [100 pCi/L]), and crossgradient wells K1-08 (8.7 Bq/L [235 pCi/L], SL=3.7 Bq/L [100 pCi/L]) and K1-09 (8.36 Bq/L [226 pCi/L], SL=4.4 Bq/L [119 pCi/L]). All of these activities are slightly higher than reported in the last quarterly report, but are less than the activities seen in upgradient well K1-01C. The observed tritium activities are likely related to a tritium plume that extends beneath Pit 1 from an upgradient source at the Building 850 firing table (Taffet *et al.*, 1996; Ziagos and Reber-Cox, 1998; Taffet *et al.*, 2008; and Dibley *et al.*, 2009).

Total uranium in ground water samples at Pit 1 during the fourth quarter exceeded the SL in crossgradient well K1-09 (0.118 Bq/L [3.19 pCi/L], SL=0.109 Bq/L [2.95 pCi/L]) as previously reported and was slightly higher than last quarter (**Table A-1**). Evidence of SL exceedance for total uranium in ground water samples from well K1-09 was previously reported to the CVRWQCB (Goodwin, 2007b), and the evaluation has been closed as shown on Table B-1. Because uranium activities are increasing in other crossgradient and upgradient wells near Pit 1, it does not appear that these exceedances of the statistical limits are indicative of a release of uranium from Pit 1 (Blake, 2009). In addition, the total uranium activities detected in these wells are within the range of total uranium background levels in Site 300 ground water.

For Pit 1, the concentrations of all VOCs detected in ground water samples from monitoring wells are summed and presented as Total VOCs (TVOCs) (**Table A-2**). TVOC concentrations were detected in the ground water samples at Pit 1 wells, downgradient K1-05 (17 $\mu\text{g/L}$), and crossgradient well K1-08 (16 $\mu\text{g/L}$). The only VOC in these samples was freon-113. The freon-113 arises from a source at Building 865, about 300 m (984 ft) west of Pit 1 (Ferry and Holtzapple, 2006).

At Pit 7 this quarter, the total uranium activity exceeded its SL in the ground water samples collected from monitoring wells K7-01 (0.700 Bq/L [18.9 pCi/L], SL=0.636 Bq/L [17.1 pCi/L]), and K7-03 (0.289 Bq/L [7.8 pCi/L], SL=0.224 Bq/L [6.05 pCi/L]). LLNL has previously reported elevated total uranium activities in the ground water at Pit 7 to be statistical evidence for a release of depleted uranium from Pit 7 (**Table B-1**). For additional information on the spatial and temporal extent of total uranium and depleted uranium in ground water monitoring wells within the Pit 7 Complex, see Taffet *et al.*, 2005. Depleted uranium has been released in the past from Pits 3, 5, and 7.

Although no SLs for tritium at Pit 7 were exceeded during the fourth quarter 2009, tritium activities continue to exceed the drinking water MCL of 740 Bq/L in the ground water at monitoring wells K7-01 (1910.0 Bq/L [51,621 pCi/L]) and K7-03 (4330 Bq/L [11,702 pCi/L]). In both wells, tritium activities were slightly higher than reported last quarter. CERCLA investigations have linked the tritium activity in the ground water at monitoring wells K7-01 and K7-03 to releases of tritium from Pits 3 and 5 or underlying sediments during the winter of 1992–93, and continuing during the successive winters of 1994–95, 1995–96, 1996–97, and 1997–98. Generally, the highest water levels in the Pit 7 Complex monitoring wells were observed in 1997–98, when these pits were partially inundated from beneath by rising ground water (Taffet *et al.*, 1996 and 2005; Ziagos and Reber-Cox, 1998). CERCLA modeling studies indicate that given tritium's short half-life of 12.3 years, the relatively slow rate of ground water flow (5-40 m/yr) and the long flow path to the Site 300 boundary, tritium activity in ground water will decrease to below background activities of <3.7 Bq/L (<100 pCi/L) before it can travel off site (Taffet *et al.*, 1996 and 2005).

At Pit 7 this quarter, the SL for barium was exceeded in one well, K7-03 (88 µg/L, SL=85 µg/L). This well is downgradient from the pit and barium in this well is occasionally slightly above the SL but is similar in value to K7-06 (84 µg/L, no SL) that is located hydraulically upgradient from Pit 7. Barium was also reported in the 2006 Pit 7 annual report (Campbell, 2006) indicating that barium background concentrations were increasing slightly in ground water in the vicinity of Pit 1. The increase is also occurring in monitoring wells upgradient of Pit 7 and appears to be unrelated to any releases from the pit.

For Pit 7, as described above, a CERCLA Site-Wide Record of Decision (U.S. DOE, 2008) was signed in 2008 that described the selected remedy for the Pit 7 Complex including monitoring, risk and hazard management, monitored natural attenuation, ground water extraction and treatment, and source control. Also in 2008, a hydraulic drainage diversion system was constructed to control contaminant sources by preventing ground water from rising into the pit waste and underlying contaminated bedrock. In addition, a ground water extraction and treatment system was constructed to treat uranium, nitrate, perchlorate, and VOCs in ground water, and is scheduled to begin operation in 2010, as described above. Tritium in ground water is naturally attenuating to meet cleanup standards.

For Pit 7, the concentrations of all VOCs detected in ground water samples from monitoring wells are summed and presented as Total VOCs (TVOCs) (**Table A-4**). The TVOC concentrations were detected in the ground water at Pit 7 wells K7-01 (1.5 µg/L), and K7-03 (2.1 µg/L). The only VOC in wells K7-01 and K7-03 was trichloroethylene. The VOCs in these samples (mainly Trichloroethylene) are associated with historical releases from Pit 5, not Pit 7 (Webster-Scholten, 1994; Taffet *et al.*, 1996).

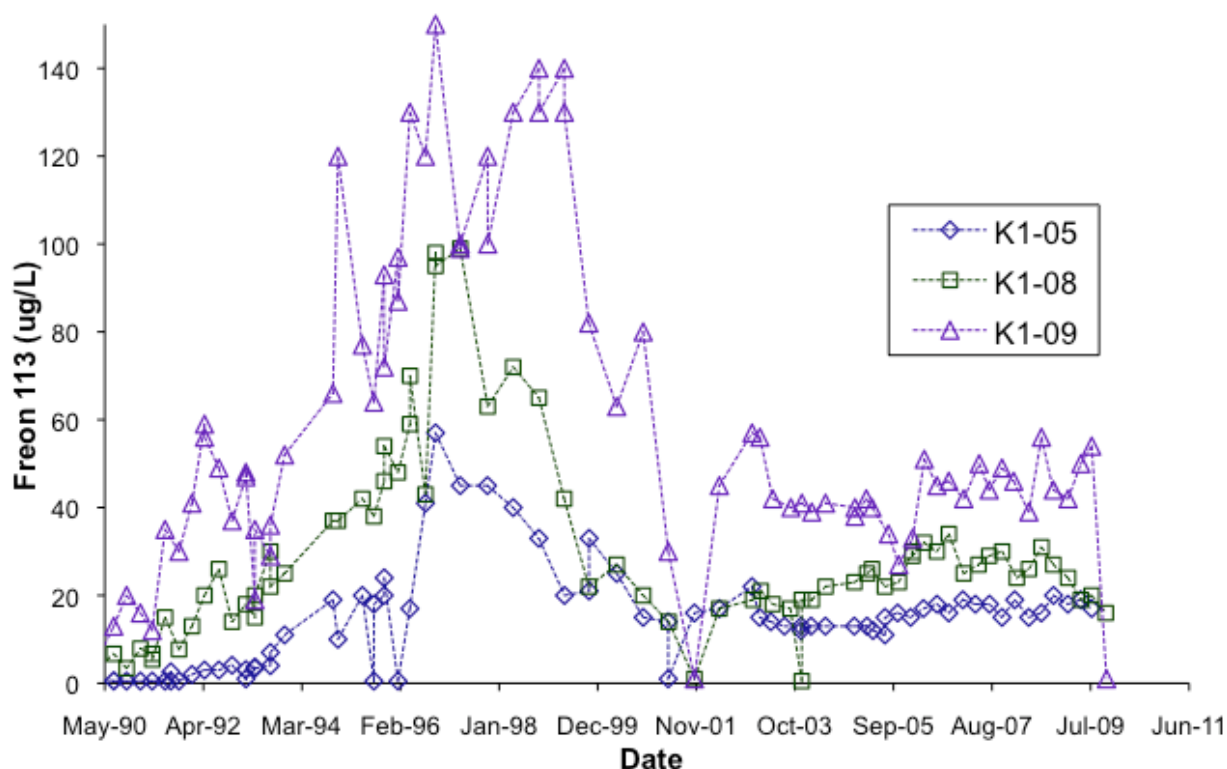


Figure 5. Freon-113 concentrations in water samples collected from ground water monitoring wells around Pit 1.

In addition to the normal reporting on constituents of concern with statistical limits, this report evaluates additional constituents that historically have elevated concentrations and are monitored under the post closure plan or under LLNL's surveillance monitoring program under DOE Order 450.1.

For this annual report, freon-113 results for ground water samples collected from monitoring wells K1-05, K1-08, and K1-09 are plotted (**Figure 5**). The values for the fourth quarter 2009 are shown on **Table A-2**. As mentioned above, the freon-113 arises from a source at Building 865, about 300 m (984 ft) west of Pit 1 (Ferry and Holtzapple, 2006). While freon-113 is not a constituent of concern for Pit 1, there have been measurable historic concentrations that have been decreasing. In the past few years, the concentrations appear to be generally stable.

In addition to reporting on freon, perchlorate was added to the monitoring program in 1998 as part of the EPD surveillance monitoring program required at that time under DOE Order 5400.1 and is reported annually in the LLNL Annual Environmental Report (Mathews et. al., 2008). Perchlorate concentrations for this quarter are shown in **Table A-2** and **Table A-4**. For Pit 7, historical trends of perchlorate concentrations in samples collected from ground water monitoring wells K7-01 and K7-03 are shown in **Figure 6**. While perchlorate has been observed above the detection limit ($4 \mu\text{g/L}$) in ground water samples from these wells, concentrations do not appear to be significantly increasing.

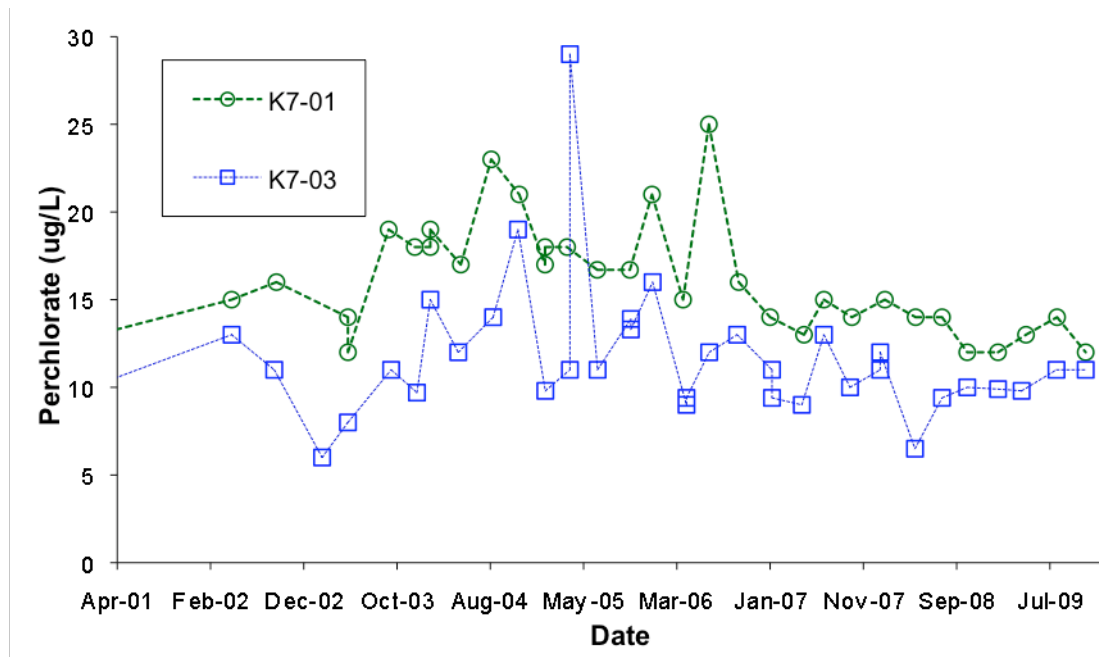


Figure 6. Perchlorate concentrations in water samples collected from ground water monitoring wells around Pit 7.

Nitrate is another constituent that is monitored but is not identified as a constituent of concern for Pit 7. Concentrations in samples collected from ground water monitoring wells K7-01, K7-03, NC7-25, and NC7-47 this quarter (**Table A-4**) are presented in **Figure 7** as historical concentrations. Other than a few concentrations from samples collected in the early 1990s from well K7-01, nitrate concentrations appear to be stable with no obvious trend.

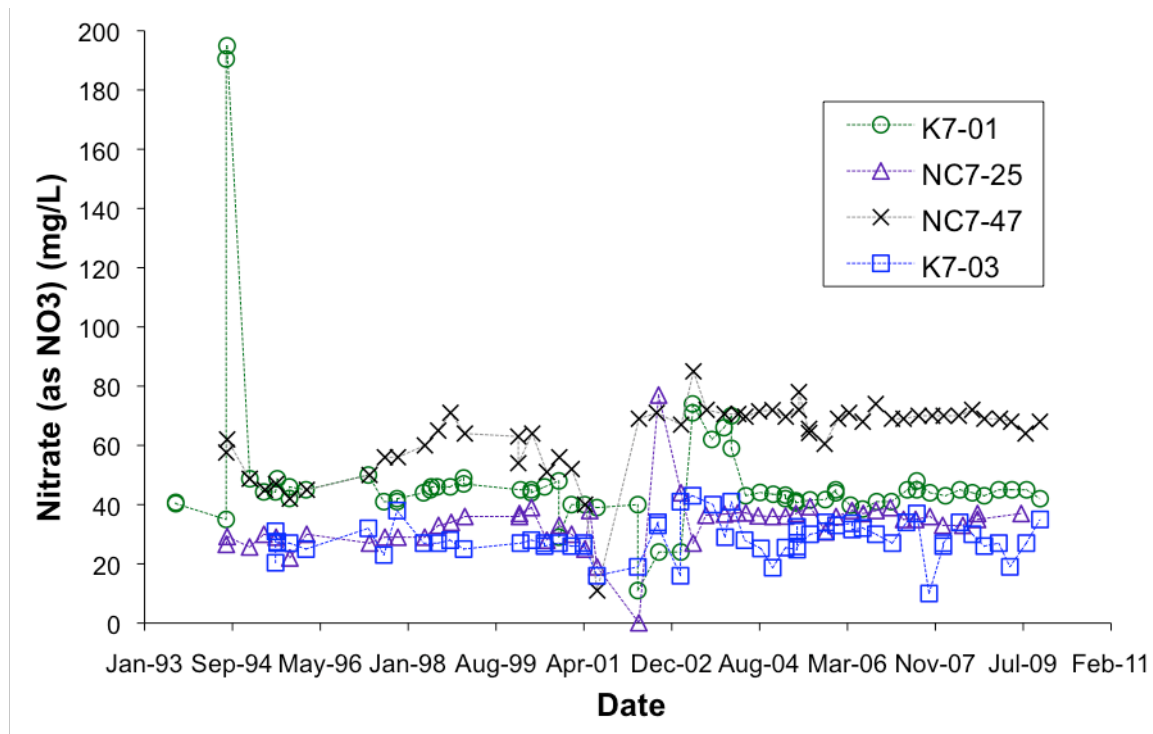


Figure 7. Nitrate concentrations in water samples collected from ground water monitoring wells around Pit 7.

Inspection and Maintenance Summary

This quarter, LLNL staff performed the required post-closure visual inspections of the caps at both Pits 1 and 7. These inspections demonstrated the continued functional and structural integrity of the caps, vegetation cover, and drainage. No deficiencies were noted in the condition of the pit caps during these inspection and the pit caps and drainage structures continue to function adequately at both pits.

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Abbreviations and Acronyms

1,1-DCE	1,1-dichloroethene
Bq	becquerel (SI unit of radioactivity)
Cal EPA	California Environmental Protection Agency
CC	control chart (statistical method)
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CVRWQCB	Central Valley Regional Water Quality Control Board
DOE	U.S. Department of Energy
DTSC	Department of Toxic Substances Control (California)
EPA	U.S. Environmental Protection Agency
EPD	Environmental Protection Department (LLNL)
ft	foot
GWE	ground water elevation (in feet above MSL)
km	kilometer
L	liter
LLNL	Lawrence Livermore National Laboratory
m	meter
MCL	maximum contaminant level (for drinking water)
mg	milligram
MSL	mean sea level (datum for elevation measurements)
m/yr	ground water seepage rate in meters per year
μ g	microgram
nd	no detections above reporting limits
nd (exc)	no detections, except as listed
pCi	picocurie (unit of radioactivity equal to 0.037 Bq)
PCP	post-closure plan
PE	Professional Engineer
PI	prediction interval (statistical method)
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RL	reporting limit (contractual concentration near zero)
RPM	Remedial Program Manager
SI	<i>Système Internationale</i> (units of measurement)
Site 300	Experimental Test Site, LLNL
SL	statistically determined concentration limit
SOP	standard operating procedure
TCE	trichloroethene
Tnbs ₀	Neroly Formation basal sandstone
Tnbs ₁	Neroly Formation lower blue sandstone
Tnsc ₀	Neroly Formation basal silty claystone
TVOC	total volatile organic compounds
VOC	volatile organic compound
WDR	Waste Discharge Requirements (permit)

Appendix A

Constituents of Concern and Monitoring Results

Table A-1. Pit 1 constituents of concern, monitoring wells, SLs, and quarterly analytical results for 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Arsenic ($\mu\text{g/L}$)	K1-01C	– ^(a)	11	12	11	12
	K1-07	– ^(a)	12	11	13	12
	K1-02B	20	11	12	12	11
	K1-04	19	11	9.7	9.3	11
	K1-05	24	8	14	15	11
	K1-08	21	13	13	13	13
	K1-09	19	13	14	14	13
	W-PIT1-2326	–	11	11	11	12
Barium ($\mu\text{g/L}$)	K1-01C	–	<25	<25	25	<25
	K1-07	–	38	27	26	29
	K1-02B	25	<25, 28, 25	<25	<25	25
	K1-04	32	29	27	28	28
	K1-05	41	28	38	39	39
	K1-08	51	44	42	40	41
	K1-09	46	46	44	45	44
	W-PIT1-2326	–	25	36	32	35
Beryllium ($\mu\text{g/L}$)	K1-01C	–	<0.5	<0.5	<2.5	<2.5
	K1-07	–	<2.5	<0.5	<0.5	<0.5
	K1-02B	0.5	<0.5	<0.5	<0.5	<2.5
	K1-04	0.5	<0.5	<0.5	<2.5	<0.5
	K1-05	0.5	<2.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	–	<0.5	<0.5	<2.5	<0.5
Cadmium ($\mu\text{g/L}$)	K1-01C	–	<0.5	<0.5	<0.5	<0.5
	K1-07	–	<0.5	<0.5	<0.5	<0.5
	K1-02B	0.5	<0.5	<0.5	<0.5	<0.5
	K1-04	0.5	<0.5	<0.5	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	–	<0.5	<0.5	<0.5	<0.5
Cobalt ($\mu\text{g/L}$)	K1-01C	–	<25	<25	<25	<25
	K1-07	–	<25	<25	<25	<25
	K1-02B	25	<25	<25	<25	<25
	K1-04	25	<25	<25	<25	<25
	K1-05	25	<25	<25	<25	<25
	K1-08	25	<25	<25	<25	<25
	K1-09	25	<25	<25	<25	<25
	W-PIT1-2326	–	<25	<25	<25	<25
Copper ($\mu\text{g/L}$)	K1-01C	–	<10	<10	<10	<10
	K1-07	–	<10	<10	<10	<10
	K1-02B	34	18	<10	<10	<10
	K1-04	34	<10	<10	<10	<10
	K1-05	34	<10	<10	<10	<10
	K1-08	34	<10	<10	<10	<10
	K1-09	34	<10	<10	<10	<10
	W-PIT1-2326	–	<10	<10	<10	<10

Table A-1. Pit 1 constituents of concern, monitoring wells, SLs, and quarterly analytical results for 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Lead ($\mu\text{g/L}$)	K1-01C	–	<2	<2	<2	<2
	K1-07	–	<2	<2	<2	<2
	K1-02B	2	<2	<2	<2	<2
	K1-04	2	<2	<2	<2	<2
	K1-05	2	<2	<2	<2	<2
	K1-08	2	<2	<2	<2	<2
	K1-09	2	<2	<2	<2	<2
	W-PIT1-2326	–	<2	<2	<2	<2
Nickel ($\mu\text{g/L}$)	K1-01C	–	<5	<5	<5	<5
	K1-07	–	<5	17	8.5	<5
	K1-02B	12	<5	<5	<5	<5
	K1-04	12	<5	<5	<5	<5
	K1-05	12	10	<5	<5	<5
	K1-08	12	<5	<5	<5	<5
	K1-09	12	<5	<5	<5	<5
	W-PIT1-2326	–	<5	<5	<5	<5
Vanadium ($\mu\text{g/L}$)	K1-01C	–	66	66	69	71
	K1-07	–	68	66	68	72
	K1-02B	78	53	54	51	50
	K1-04	48	36	34	35	37
	K1-05	97	62	67	67	64
	K1-08	100	63	63	66	67
	K1-09	92	58	59	60	60
	W-PIT1-2326	–	53	50	45	50
Zinc ($\mu\text{g/L}$)	K1-01C	–	<20	47	<20	<20
	K1-07	–	<20	34	170	<20
	K1-02B	94	22	<20	<20	<20
	K1-04	94	<20	46	31	<20
	K1-05	94	<20	<20	<20	<20
	K1-08	94	<20	33	39	<20
	K1-09	94	<20	32	<20	<20
	W-PIT1-2326	–	<20	36	<20	<20
Radium 226 (Bq/L) ^c	K1-01C	–	0.003	0	0.005	0.006
	K1-07	–	0.003	0.005	0.001	0.007
	K1-02B	0.044	0.007	0.005	0.004	0.002
	K1-04	0.044	-0.001	0.005	0	0.003
	K1-05	0.044	0.001	0.002	0.007	0.002
	K1-08	0.044	0.001	0	0	0.002
	K1-09	0.044	0.011	0	0.003	0.009
	W-PIT1-2326	–	0.000	0.004	0.006	0.013
Tritium (Bq/L)	K1-01C	–	29.5	30.5	30.4	39.6
	K1-07	–	1.24	4.4	0.607	2.22
	K1-02B	– ^(b)	137	138	140	158
	K1-04	3.7	9.62	16.8	13	19.2
	K1-05	3.7	3.88	10.9	7.92	9.21
	K1-08	3.7	5.48	9.29	7.1	8.7
	K1-09	4.44	7.36	10	4.85	8.36
	W-PIT1-2326	–	103	101	100	116

Table A-1. Pit 1 constituents of concern, monitoring wells, SLs, and quarterly analytical results for 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Uranium (total, Bq/L)	K1-01C	–	0.144	0.162	0.148	0.143
	K1-07	–	0.102	0.098	0.1	0.087
	K1-02B	0.192	0.125	0.12	0.131	0.129
	K1-04	0.124	0.056	0.075	0.066	0.074
	K1-05	0.109	0.108	0.109	0.106	0.097
	K1-08	0.120	0.118, 0.106	0.105	0.112	0.101
	K1-09	0.109	0.115	0.113	0.112	0.118
	W-PIT1-2326	–	0.098	0.103	0.104	0.101
Uranium (Bq/L)	W-PIT1-2326	–	–	0.104	–	–
Thorium 228 (Bq/L)	K1-01C	–	0	0	0	0
	K1-07	–	-0.001	0	-0.001	0
	K1-02B	0.023	0	0	-0.001	-0.001
	K1-04	0.023	-0.001	0.001	-0.001	0
	K1-05	0.023	0.001	-0.001	-0.001	0
	K1-08	0.023	0	-0.001	0	0
	K1-09	0.023	0	-0.001	0	0
	W-PIT1-2326	–	-0.001	0.001	0.002	-0.001
Thorium 230 (Bq/L)	K1-01C	–	0.001	0.003	0	0.001
	K1-07	–	0.001	0.002	-0.004	0
	K1-02B	–	0.001	0.002	-0.001	0.001
	K1-04	–	0.001	0.002	-0.003	0
	K1-05	–	0.003	0.001	0.003	0.001
	K1-08	–	0	0	0.001	0
	K1-09	–	0	0.001	-0.003	0
	W-PIT1-2326	–	0.001	0.006	0	0.001
Thorium 232 (Bq/L)	K1-01C	–	0	0	0.001	0.001
	K1-07	–	0	0	0	0
	K1-02B	0.009	0	0	-0.001	0
	K1-04	0.009	0	0	-0.001	0
	K1-05	0.009	0	0	0	0
	K1-08	0.009	0	0	0	0
	K1-09	0.009	0	0	0	0.001
	W-PIT1-2326	–	0	0	0	0
HMX (µg/L)	K1-01C	–	<1	<1	<1	<1
	K1-07	–	<1	<1	<1	<1
	K1-02B	5	<1	<1	<1	<1
	K1-04	5	<1	<1	<1	<1
	K1-05	5	<1	<1	<1	<1
	K1-08	5	<1	<1	<1	<1
	K1-09	5	<1	<1	<1	<1
	W-PIT1-2326	–	<1	<1	<1	<1
RDX (µg/L)	K1-01C	–	<1	<1	<1	<1
	K1-07	–	<1	<1	<1	<1
	K1-02B	5	<1	<1	<1	<1
	K1-04	5	<1	<1	<1	<1
	K1-05	5	<1	<1	<1	<1
	K1-08	5	<1	<1	<1	<1
	K1-09	5	<1	<1	<1	<1
	W-PIT1-2326	–	<1	<1	<1	<1

^(a) Wells K1-01C and K1-07 have no release detection SLs for COCs, because they are upgradient of Pit 1.

^(b) K1-02B is an exempt well (deemed to be insensitive to the detection of a tritium release from Pit 1).

^(c) Radioactivity measurements are corrected for the background radioactivity inside the measurement chamber. A negative result for radioactivity indicates that the sample measured lower than the background by the amount shown. Radioactivity values shown as 0.000 measured less than 0.0005 Bq/L.

Table A-2. Pit 1 additional PCP constituents and fourth quarter 2009 analytical results.

Constituent (units)	Monitoring Well								
	K1-01C	K1-07	K1-02B	K1-02B	K1-04	K1-05	K1-08	K1-09	W-PIT1-2326
Dates Sampled	28-Oct	22-Oct	26-Oct	28-Oct	27-Oct	22-Oct	22-Oct	27-Oct	27-Oct
Depth to water (ft)	107.73	141.9	135.82	135.9	157.05	171.8	156.19	162.71	179.72
Ground water elevation (ft above MSL)	974.21	967.73	971.41	971.33	965.62	959.06	966.55	963.97	968.07
Field pH (Units)	7.65	7.44	7.29	7.39	7.71	7.4	7.43	7.6	7.39
Field Specific Conductance (umhos/cm)	698	607	734	751	588	634	646	648	706
Field Temperature (Degrees C)	21.3	21.8	21	20	22.1	22	21.7	21.8	21.1
Gross alpha (Bq/L)	0.123	0.119	0.084	-	0.034	0.1	0.056	0.098	0.088
Gross beta (Bq/L)	0.104	0.071	0.097	-	0.07	0.102	0.145	0.076	0.093
Nitrate (as NO ₃) (mg/L)	36	31	-	35	33	36	35	35	33
Perchlorate (µg/L)	<4	<4	-	5.9	<4	<4	<4	<4	5.1
Total VOCs (µg/L)	<1000	<1000	-	<1000	<1000	17	16	<1000	<1000
Freon 113	<0.5	<0.5	-	<0.5	<0.5	17	16	<0.5	<0.5

Table A-3. Pit 7 constituents of concern, monitoring wells, SLs, and quarterly analytical results for fourth quarter 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Arsenic ($\mu\text{g/L}$)	K7-06	— ^(a)	17	19	18	19
	K7-01	14	8.9	9.1	8.4	8.9
	K7-03	3.2	2	<2	<2	<2
	K7-09	2.0	<2	<2	<2, 3.4	<2
	K7-10	4.2	3.8	<2	2.2, 5.6	<2
	NC7-26	3.6	<2	<2	<2, 5.5	<2
	NC7-47	17	11	11	11	12
	NC7-48	19	5.5	4.9	5.8	5.4
Barium ($\mu\text{g/L}$)	K7-06	—	84	80	87	84
	K7-01	230	200	190	190	190
	K7-03	85	71	68	79	88
	K7-09	25	30	<25	27, 26	<25
	K7-10	120	81	80	59, 40	73
	NC7-26	39	26	25	25, 30	27
	NC7-47	63	60	54	60	55
	NC7-48	400	120	110	120	150
Beryllium ($\mu\text{g/L}$)	K7-06	—	<0.5	<0.5	<0.5	<2.5
	K7-01	0.5	<2.5	<0.5	<0.5	<2.5
	K7-03	0.5	<2.5	<0.5	<0.5	<2.5
	K7-09	0.5	<2.5	<0.5	<0.5, <2.5	<2.5
	K7-10	0.5	<2.5	<2.5	<0.5, <2.5	<2.5
	NC7-26	0.5	<0.5	<0.5	<0.5, <2.5	<2.5
	NC7-47	0.5	<0.5	<2.5	<0.5	<2.5
	NC7-48	0.5	<0.5	<2.5	<0.5	<2.5
Cadmium ($\mu\text{g/L}$)	K7-06	—	3.2	2.6	1.5	0.52
	K7-01	0.5	<0.5	<0.5	<0.5	<0.5
	K7-03	0.5	<0.5	<0.5	<0.5	<0.5
	K7-09	0.5	<0.5	<0.5	<0.5, <0.5	<0.5
	K7-10	1.6	<0.5	<0.5	<0.5, <0.5	<0.5
	NC7-26	0.5	<0.5	<0.5	<0.5, <0.5	<0.5
	NC7-47	0.5	<0.5	<0.5	<0.5	<0.5
	NC7-48	1.2	<0.5	<0.5	<0.5	<0.5
Cobalt ($\mu\text{g/L}$)	K7-06	—	<25	<25	<25	<25
	K7-01	25	<25	<25	<25	<25
	K7-03	25	<25	<25	<25	<25
	K7-09	25	<25	<25	<25, <25	<25
	K7-10	25	<25	<25	<25, <25	<25
	NC7-26	25	<25	<25	<25, <25	<25
	NC7-47	25	<25	<25	<25	<25
	NC7-48	25	<25	<25	<25	<25

Table A-3. Pit 7 constituents of concern, monitoring wells, SLs, and quarterly analytical results for fourth quarter 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Copper ($\mu\text{g/L}$)	K7-06	—	<10	<10	<10	<10
	K7-01	40	<10	<10	<10	<10
	K7-03	140	16	21	25	11
	K7-09	10	<10	<10	<10, <10	<10
	K7-10	10	<10	<10	<10, <10	<10
	NC7-26	10	<10	<10	<10, <10	<10
	NC7-47	10	<10	<10	<10	<10
	NC7-48	10	<10	<10	<10	<10
Lead ($\mu\text{g/L}$)	K7-06	—	<2	<2	<2	<2
	K7-01	6	<2	<2	<2	<2
	K7-03	6.1	<2	<2	<2	<2
	K7-09	5.9	<2	<2	<2, <2	<2
	K7-10	2	<2	<2	<2, <2	<2
	NC7-26	5.1	<2	<2	<2, <2	<2
	NC7-47	7.6	<2	<2	<2	<2
	NC7-48	2	<2	<2	<2	<2
Nickel ($\mu\text{g/L}$)	K7-06	—	<5	<5	<5	<5
	K7-01	25	<5	<5	<5	<5
	K7-03	26	13	13	16	17
	K7-09	29	<5	<5	<5, <5	<5
	K7-10	13	<5	<5	<5, <5	<5
	NC7-26	5	<5	<5	<5, <5	<5
	NC7-47	14	<5	<5	<5	<5
	NC7-48	48	<5	<5	<5	<5
Vanadium ($\mu\text{g/L}$)	K7-06	—	41	43	39	42
	K7-01	25	<25	<25	<25	<25
	K7-03	25	<25	<25	<25	<25
	K7-09	25	<25	<25	<25, <25	<25
	K7-10	25	<25	<25	<25, <25	<25
	NC7-26	25	<25	<25	<25, <25	<25
	NC7-47	79	66	61	57	60
	NC7-48	110	<25	<25	<25	<25
Zinc ($\mu\text{g/L}$)	K7-06	—	<20	61	<20	<20
	K7-01	52	<20	38	<20	<20
	K7-03	72	<20	45	<20	<20
	K7-09	20	<20	39, <20, <20	<20, <20	<20
	K7-10	20	<20	38, <20, <20	<20, <20	<20
	NC7-26	20	<20	48, <20, <20	<20, <20	<20
	NC7-47	50	<20	36	<20	<20
	NC7-48	44	<20	39	<20	<20

Table A-3. Pit 7 constituents of concern, monitoring wells, SLs, and quarterly analytical results for fourth quarter 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Radium 226 (Bq/L) ^(b)	K7-06	—	0.014	0.015	0.02	0.017
	K7-01	0.08	0.04	0.035	0.036	0.037
	K7-03	0.03	0.005	0.006	0.007	0.008
	K7-09	0.023	0.005	0	0.004	0.004
	K7-10	0.032	0.009	0.009	0.006	0.006
	NC7-26	0.034	0.007	0.012	0.008	0.013
	NC7-47	0.022	0.008	0	0.002	0.002
	NC7-48	0.04	0.01	0.017	0.021	0.025
Tritium (Bq/L)	K7-06	—	-1.86	-0.414	-1.47	1.08
	K7-01	— ^(c)	1710	1700	1610	1910
	K7-03	— ^(c)	3650	3430	3700	4330
	K7-09	4.8	1.15	1.31	-1.85	1.28
	K7-10	4.8	-0.35	1.86	-1.62	2.1
	NC7-25	—	9770	—	—	-
	NC7-26	— ^(c)	91.8	85.8	75.8	90.6
	NC7-47	4.8	-2.04	1.54	-0.0944	0.636
NC7-48	16.4	1.68	0.973	-0.618	2.05	
Uranium (total, Bq/L)	K7-06	—	0.033	0.031	0.026	0.025
	K7-01	0.636	0.641	0.728	0.689	0.7
	K7-03	0.224	0.195	0.232	0.218	0.289
	K7-09	0.035	0.003	0.001	0.004	0.001
	K7-10	0.083	0.017	0.011	0.017	0.024
	NC7-26	0.034	0.007	0.011	0.008	0.006
	NC7-47	0.178	0.078	0.072	0.066	0.06
	NC7-48	2.327	0.241	0.294	0.247	0.198
Thorium 228 (Bq/L)	K7-06	—	-0.001	-0.001	0.002	0
	K7-01	0.024	0	0.002	0.001	0.001
	K7-03	0.024	0.001	0.001	0	0.002
	K7-09	0.024	0	0	0.005	0
	K7-10	0.024	0.001	0	0.001	0
	NC7-26	0.024	-0.002	0	0.001	0.001
	NC7-47	0.024	0.001	0.001	0.001	-0.001
	NC7-48	0.024	0.001	0.001	0.002	0.001
Thorium 230 (Bq/L)	K7-06	—	0.001	0.004	0	0
	K7-01	—	0.002	0	0.002	0.002
	K7-03	—	0.001	0.002	-0.002	0.002
	K7-09	—	0.002	-0.001	0	0
	K7-10	—	0	0.001	0.004	0
	NC7-26	—	0.002	-0.001	-0.005	0
	NC7-47	—	-0.001	0.008	-0.004	0
	NC7-48	—	0	0.002	-0.007	0

Table A-3. Pit 7 constituents of concern, monitoring wells, SLs, and quarterly analytical results for fourth quarter 2009.

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Thorium 232 (Bq/L)	K7-06	—	0	0	0	0
	K7-01	0.014	0	0	0	0
	K7-03	0.014	0	0	0.001	-0.001
	K7-09	0.014	0	0	-0.001	-0.001
	K7-10	0.014	0	0	0.001	0
	NC7-26	0.014	0	0	0	0.001
	NC7-47	0.014	0.001	-0.001	0	-0.001
	NC7-48	0.014	-0.001	0	0	0
HMX ($\mu\text{g/L}$)	K7-06	—	<1	<1	<1	<1
	K7-01	5	<1	<1	<1	<1
	K7-03	5	<1	<1	<1	<1
	K7-09	5	<1	<1	<1	<1
	K7-10	5	<1	<1	<1	<1
	NC7-26	5	<0.73	<1	<0.89	<1
	NC7-47	5	<1	<1	<1	<1
	NC7-48	5	<1	<1	<1	<1
RDX ($\mu\text{g/L}$)	K7-06	—	<1	<1	<1	<1
	K7-01	5	<1	<1	<1	<1
	K7-03	5	<1	<1	<1	<1
	K7-09	5	<1	<1	<1	<1
	K7-10	5	<1	<1	<1	<1
	NC7-26	5	<0.73	<1	<0.89	<1
	NC7-47	5	<1	<1	<1	<1
	NC7-48	5	<1	<1	<1	<1

^(a) Well K7-06 has no SLs for COCs, because it is upgradient from Pit 7.

^(b) Radioactivity measurements are corrected for the background radioactivity inside the measurement chamber.

A negative result for radioactivity indicates that the sample measured lower than the background by the amount shown.

Radioactivity values shown as 0.000 are less than 0.0005 Bq/L.

^(c) Exempt well (insensitive to further detection of tritium releases).

Table A-4. Pit 7 additional PCP constituents and fourth quarter 2009 analytical results.

Constituent (units)	K7-06^(a)	K7-01	K7-03	K7-09	K7-10	NC7-26	NC7-47	NC7-47	NC7-48
Dates Sampled	12-Oct	29-Oct	29-Oct	12-Oct	12-Oct	29-Oct	26-Oct	28-Oct	12-Oct
Depth to water (ft)	27.78	28.23	30.63	50.79	37.28	72.07	63.12	63.08	49.11
Ground water elevation (ft above MSL)	1386.17	1290.79	1308.46	1294.51	1306.03	1256.6	1205.39	1205.43	1343.71
Field pH (Units)	8.02	7.1	7.13	8.1	7.94	7.6	7.62	7.92	7.64
Field Specific Conductance (μ mhos/cm)	443	745	769	763	1018	662	648	650	768
Field Temperature (Degrees C)	18	20.7	20.4	20.1	19	20.6	19.9	17.1	19.8
Gross alpha (Bq/L)	0.077	0.622	0.158	-0.023	0.02	0.021	0.088	-	0.144
Gross beta (Bq/L)	0.067	0.235	0.073	0.755	0.147	0.057	0.09	-	0.165
Nitrate (as NO ₃) (mg/L)	15	42	34	<0.5	1.6	<0.5	-	68	18
Perchlorate (μ g/L)	<4	12	11	<4	<4	<4	-	<4	<4
VOCs (Total) (μ g/L)	<1000	1.5	2.1	<1000	<1000	<1000	-	<1000	<1000
Trichloroethene (μ g/L)	<0.5	1.5	2.1	<0.5	<0.5	<0.5	-	<0.5	<0.5

^(a) Upgradient well.

Table A-5. Pits 1 and 7 groundwater well sampling dates.

Pit	Quarter	Location	Sample Date
1	1	K1-01C	29-Jan-2009
1	2	K1-01C	30-Apr-2009
1	3	K1-01C	21-Jul-2009
1	4	K1-01C	28-Oct-2009
1	1	K1-02B	29-Jan-2009
1	2	K1-02B	27-Apr-2009
1	3	K1-02B	14-Jul-2009
1	4	K1-02B	26-Oct-2009
1	1	K1-04	27-Jan-2009
1	2	K1-04	27-Apr-2009
1	3	K1-04	21-Jul-2009
1	4	K1-04	27-Oct-2009
1	1	K1-05	26-Jan-2009
1	2	K1-05	27-Apr-2009
1	3	K1-05	14-Jul-2009
1	4	K1-05	22-Jul-2009
1	1	K1-07	26-Jan-2009
1	2	K1-07	28-Apr-2009
1	3	K1-07	13-Jul-2009
1	4	K1-07	22-Oct-2009
1	1	K1-08	27-Jan-2009
1	2	K1-08	28-Apr-2009
1	3	K1-08	13-Jul-2009
1	4	K1-08	22-Oct-2009
1	1	K1-09	27-Jan-2009
1	2	K1-09	28-Apr-2009
1	3	K1-09	14-Jul-2009
1	4	K1-09	27-Oct-2009
1	1	K1-09	29-Jan-2009
1	2	W-PIT1-2326	29-Apr-2009
1	3	W-PIT1-2326	21-Jul-2009
1	4	W-PIT1-2326	27-Oct-2009
7	1	K7-01	20-Jan-2009
7	2	K7-01	20-Apr-2009
7	3	K7-01	29-Jul-2009
7	4	K7-01	29-Oct-2009
7	1	K7-03	20-Jan-2009
7	2	K7-03	6-Apr-2009
7	3	K7-03	27-Jul-2009
7	4	K7-03	29-Oct-2009
7	1	K7-06	28-Jan-2009
7	2	K7-06	20-Apr-2009
7	3	K7-06	28-Jul-2009
7	4	K7-06	12-Oct-2009
7	1	K7-09	20-Jan-2009
7	2	K7-09	6-Apr-2009

Table A-5. Pits 1 and 7 groundwater well sampling dates.

Pit	Quarter	Location	Sample Date
7	3	K7-09	28-Aug-2009
7	3	K7-09	5-Aug-2009
7	4	K7-09	12-Oct-2009
7	1	K7-10	20-Jan-2009
7	2	K7-10	8-Apr-2009
7	3	K7-10	28-Jul-2009
7	3	K7-10	5-Aug-2009
7	4	K7-10	12-Oct-2009
7	2	NC7-25	22-Jun-2009
7	1	NC7-26	28-Jan-2009
7	2	NC7-26	6-Apr-2009
7	3	NC7-26	5-Aug-2009
7	4	NC7-26	29-Oct-2009
7	1	NC7-47	28-Jan-2009
7	2	NC7-47	15-Apr-2009
7	3	NC7-47	22-Jul-2009
7	4	NC7-47	28-Oct-2009
7	1	NC7-48	28-Jan-2009
7	2	NC7-48	28-Apr-2009
7	3	NC7-48	28-Jul-2009
7	4	NC7-48	12-Oct-2009

Appendix B

Statistical Methods for Release Detection

Appendix B

Statistical Methods for Release Detection

Monitoring and reporting provisions of the RCRA closure and post-closure plan (PCP) for landfill Pits 1 and 7 require the use of U.S. EPA-approved statistical methods to evaluate the monitoring data. Waste Discharge Requirements (WDR) Order 93-100 requires statistical methods from the California Code of Regulations (CCR), Title 23. LLNL applies statistical methods from CCR, Title 23, Division 3, Chapter 15, Section 2550.7, as they are also consistent with U.S. EPA guidance.

We use statistical limits (SLs) to detect potential releases of constituents of concern to ground water from solid wastes contained in closed landfills. We employ two statistical methods, prediction intervals (PIs) and control charts (CCs), to generate SLs. Both methods are sensitive to constituents of concern concentration increases. Both methods are cost-effective, requiring only one measurement of a constituent of concern per quarter per monitoring well.

We prefer the PI method when constituents of concern concentrations in ground water are similar upgradient and downgradient from the monitored unit. We use parametric PI methods when the upgradient constituents of concern concentration data are all above the detection limit and the data are approximately normally distributed. Analysts also use parametric methods on log-transformed data, if the transformed data follow a normal distribution. PI methods are more effective when the data cannot be transformed to a normal distribution, or when they contain nondetections.

When the concentration of a constituent of concern is spatially variable in the vicinity of a monitored unit, we develop a control chart for each downgradient monitoring well. The control chart compares each new quarterly COC measurement with its concentration history for that well.

Wherever sufficient historical detections of a constituent of concern exist, we calculate an SL such that a single future measurement has approximately a 1-in-100 chance of exceeding the SL, when no change in average concentration has actually occurred. This yields a statistical test with a significance level of approximately 0.01. Where historical detections exist, but nondetections constitute part of the data, we set the SL equal to the highest concentration measured. If historical analyses show all nondetections of a constituent of concern, then we select the contract reporting limit (RL) as the SL. To test for false-positive results, we employ a verification procedure containing two discrete retests, in accordance with CCR Title 23, Chapter 15, Section 2550.7.

Table B-1 lists all constituents of concern that have indicated statistically significant evidence of release to ground water from Pit 1 or Pit 7, the date when the CVRWQCB was notified by letter, and the status of any further investigation.

Table B-1. Reported WDR 93-100 constituents of concern showing statistical evidence of release.

Constituents of Concern	Pit	Reported to CVRWQCB	Status of Release Investigation
Metals			
Arsenic	1	06/03/94	Closed ^(a)
Arsenic	7	10/17/95	Transferred to CERCLA ^(b)
Barium	1	10/17/95	Closed ^(a)
Barium	1	06/14/96	Closed ^(a)
Barium	1	10/25/00	Closed ^(a)
Barium	7	11/09/93	Closed ^(c)
Barium	7	07/10/97	Closed ^(d)
Barium	7	08/03/00	Closed ^(d)
Barium	7	10/25/00	Closed ^(d)
Barium	7	02/08/01	Closed ^(d)
Cadmium	7	10/17/95	Transferred to CERCLA ^(b)
Copper	1	02/08/01	Closed ^(a)
Copper	7	10/17/95	Transferred to CERCLA ^(b)
Lead	1	04/01/99	Closed ^(a)
Nickel	7	10/17/95	Transferred to CERCLA ^(b)
Nickel	7	05/03/96	Transferred to CERCLA ^(b)
Nickel	7	07/10/01	Transferred to CERCLA ^(b)
Vanadium	7	06/03/94	Closed ^(c)
Zinc	7	10/17/95	Transferred to CERCLA ^(b)
Zinc	7	04/19/99	Transferred to CERCLA ^(b)
Zinc	7	04/02/08	Transferred to CERCLA ^(b)
Radioisotopes			
Radium-226	7	10/17/95	Transferred to CERCLA ^(b)
Tritium	1	10/21/96	Additional Evaluation ^(e)
Tritium	1	01/14/99	Additional Evaluation ^(e)
Tritium	7	11/09/93	Completed under CERCLA ^(f)
Uranium	1	02/17/94	Closed ^(c)
Uranium	1	10/21/96	Closed ^(a)
Uranium	7	09/10/93	Completed under CERCLA ^(f)
Uranium	7	11/10/98	Completed under CERCLA ^(f)
Uranium	1	04/26/07	Closed ^(a)

^(a) Determined not to be indicative of a release from Pit 1 (Blake, 2009).

^(b) Status to be evaluated under CERCLA and will be reported in the 1st Semester 2010 CERCLA Compliance Monitoring Report.

^(c) Determined not to be indicative of a release from Pits 1 or 7 (Taffet et al., 1996).

^(d) Determined not to be indicative of a release from Pits 1 or 7 (Campbell, 2006).

^(e) Additional evaluation required (Blake, 2009).

^(f) Investigation completed under CERCLA; remediation, and monitoring conducted under CERCLA and reported semi-annually in CERCLA Compliance Monitoring Reports.

Appendix C

Quality Assurance Samples

Table C-1. Pit 1 quality assurance for routine, duplicate, and field blank samples for fourth quarter 2009.

Constituent	K1-01C routine (28-Oct)	K1-01C duplicate (28-Oct)	PIT 1 field blank (26-Oct)	PIT 1 field blank (28-Oct)	units
Arsenic	12	12	-	<2	µg/L
Barium	<25	<25	-	<25	µg/L
Beryllium	<2.5	<2.5	-	<2.5	µg/L
Cadmium	<0.5	<0.5	-	<0.5	µg/L
Cobalt	<25	<25	-	<25	µg/L
Copper	<10	<10	-	<10	µg/L
Lead	<2	<2	-	<2	µg/L
Nickel	<5	<5	-	<5	µg/L
Vanadium	71	71	-	<25	µg/L
Zinc	<20	<20	-	<20	µg/L
Nitrate (as NO ₃)	36	36	-	0.54	mg/L
Perchlorate	<4	<4	-	<4	µg/L
He compounds					
HMX	<1	<1	-	<1	µg/L
RDX	<1	<1	-	<1	µg/L
Radioactivity					
Radium 226 ^(a)	0.006 ± 0.005	0.010 ± 0.005	0.001 ± 0.003	-	Bq/L
Tritium	39.6 ± 8.10	35.2 ± 7.29	0.444 ± 1.41	-	Bq/L
Uranium (total)	0.143 ± 0.023	0.137 ± 0.022	0.000 ± 0.001	-	Bq/L
Thorium 228	0.000 ± 0.002	0.001 ± 0.001	0.000 ± 0.001	-	Bq/L
Thorium 230	0.001 ± 0.001	0.000 ± 0.001	0.000 ± 0.001	-	Bq/L
Thorium 232	0.001 ± 0.001	0.000 ± 0.001	0.000 ± 0.001	-	Bq/L
Gross alpha	0.123 ± 0.066	0.079 ± 0.054	-0.015 ± 0.016	-	Bq/L
Gross beta	0.104 ± 0.043	0.100 ± 0.037	-0.004 ± 0.024	-	Bq/L

^(a) Radioactivity is corrected for the background radioactivity inside the measurement apparatus. Negative activity indicates that the sample contained less than the background activity by the amount shown. Radioactivity equal to or less than the 2-sigma uncertainty shown is considered to be a nondetection.

Table C-2. Pit 7 quality assurance for routine, duplicate, and field blank samples for fourth quarter 2009.

Constituent	K7-10	K7-10	PIT 7	units
	routine (12-Oct)	duplicate (12-Oct)	field blank (29-Oct)	
Arsenic	<2	<2	<2	µg/L
Barium	73	110	<25	µg/L
Beryllium	<2.5	<2.5	<2.5	µg/L
Cadmium	<0.5	<0.5	<0.5	µg/L
Cobalt	<25	<25	<25	µg/L
Copper	<10	<10	<10	µg/L
Lead	<2	<2	<2	µg/L
Nickel	<5	<5	<5	µg/L
Vanadium	<25	<25	<25	µg/L
Zinc	<20	<20	<20	µg/L
Radium 226 ^(a)	0.006 ± 0.005	0.009 ± 0.005	0.001 ± 0.003	Bq/L
Tritium	2.10 ± 1.79	0.648 ± 1.64	1.76 ± 1.97	Bq/L
Uranium (calculated total)	0.024 ± 0.006	0.024 ± 0.007	0.005 ± 0.004	Bq/L
Thorium 228	0.000 ± 0.001	0.000 ± 0.000	0.001 ± 0.002	Bq/L
Thorium 230	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.001	Bq/L
Thorium 232	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.001	Bq/L
HMX	<1	<1	<1	µg/L
RDX	<1	<1	<1	µg/L
Gross alpha	0.020 ± 0.042	0.025 ± 0.043	-0.015 ± 0.013	Bq/L
Gross beta	0.147 ± 0.043	0.144 ± 0.047	0.025 ± 0.028	Bq/L
Nitrate (as NO ₃)	1.6	1.5	<0.5	mg/L
Perchlorate	<4	<4	<4	µg/L
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	µg/L
1,1,2,2-Tetrachloroethane	<0.5	<0.5	<0.5	µg/L
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	µg/L
1,1-Dichloroethane	<0.5	<0.5	<0.5	µg/L
1,1-Dichloroethene	<0.5	<0.5	<0.5	µg/L
1,2-Dichloroethane	<0.5	<0.5	<0.5	µg/L
1,2-Dichloroethene (total)	<1	<1	<1	µg/L
1,2-Dichloropropane	<0.5	<0.5	<0.5	µg/L
2-Chloroethylvinylether	<10	<10	<10	µg/L
Bromodichloromethane	<0.5	<0.5	<0.5	µg/L
Bromoform	<0.5	<0.5	<0.5	µg/L
Bromomethane	<0.5	<0.5	<0.5	µg/L
Carbon tetrachloride	<0.5	<0.5	<0.5	µg/L
Chlorobenzene	<0.5	<0.5	<0.5	µg/L
Chloroethane	<0.5	<0.5	<0.5	µg/L
Chloroform	<0.5	<0.5	<0.5	µg/L
Chloromethane	<0.5	<0.5	<0.5	µg/L
cis-1,3-Dichloropropene	<0.5	<0.5	<0.5	µg/L
Dibromochloromethane	<0.5	<0.5	<0.5	µg/L
Dichlorodifluoromethane	<0.5	<0.5	<0.5	µg/L
Freon 113	<0.5	<0.5	<0.5	µg/L
Methylene chloride	<1	<1	<1	µg/L
Tetrachloroethene	<0.5	<0.5	<0.5	µg/L
trans-1,3-Dichloropropene	<0.5	<0.5	<0.5	µg/L
Trichloroethene	<0.5	<0.5	<0.5	µg/L
Trichlorofluoromethane	<0.5	<0.5	<0.5	µg/L
Vinyl chloride	<0.5	<0.5	<0.5	µg/L

^(a) Radioactivity is corrected for the background radioactivity inside the measurement apparatus.

Negative activity indicates that the sample contained less than the background activity by the amount shown.

Radioactivity equal to or less than the 2-sigma uncertainty shown is considered to be a nondetection.

Appendix D

Constituents of Concern and Monitoring Frequencies

Table D-1. Pits 1 and 7 constituents of concern and monitoring frequencies.^(a)

Constituent	WDR ^(b)	PCP ^(c)	Pit 1	Pit 7
Arsenic	X		Q	Q
Barium	X		Q	Q
Beryllium	X		Q	Q
Cadmium	X		Q	Q
Chloride		X	A	
Chromium		X	SA	
Cobalt	X		Q	Q
Copper	X		Q	Q
Iron		X	SA	
Lead	X		Q	Q
Manganese		X	SA	
Mercury		X	SA	
Nickel	X		Q	Q
Nitrate		X	SA	
Selenium		X	SA	
Silver		X	SA	
Sodium		X	SA	
Sulfate		X	A	
Vanadium	X		Q	Q
Zinc	X		Q	Q
Total organic carbon (TOC)		X	A	
Total organic halides (TOX)		X	A	
EPA Method 601		X		Q
EPA Method 624		X	A	
EPA Method 625		X	A	
EPA Method 608		X	A	
Gross alpha and gross beta		X	SA	Q
Radium 226	X		Q	Q
Thorium 228	X		Q	Q
Thorium 232	X		Q	Q
Tritium	X		Q	Q
Uranium (total)	X		Q	Q
HMX	X		Q	Q
RDX	X		Q	Q
Ground water elevation		X	SA	Q
Ground water temperature		X	SA	
pH		X	SA	
Specific conductance		X	SA	

^(a) Monitoring frequencies are: Q (quarterly); SA (semiannually); A (annually).

^(b) Constituents of concern required to be monitored by WDR 93-100 Rev. 2 (CVRWQCB, 1998).

^(c) Additional constituents of concern required to be monitored by the post-closure plan (Rogers/Pacific Corporation, 1990).

Appendix E

Statistical Limits and Graphs of Ground Water Measurements

Table E-1. Analytical results from 2009 that were omitted from the Appendix E plots due to the use of specially reduced y-axis plot limits.

Pit Area	Constituent	Monitoring Well	Date Sampled	RL (<) or		Units
				Hit (h) ^(a)	Concentration	
Pit 7	Arsenic	K7-10	36431	<	1000	ug/L
Pit 7	Arsenic	NC7-26	37265	<	50	ug/L
Pit 7	Arsenic	NC7-26	37272	<	50	ug/L
Pit 7	Arsenic	NC7-26	37274	<	50	ug/L
Pit 7	Copper	K7-01	37187	h	193	ug/L
Pit 7	Copper	K7-09	36984	<	50	ug/L
Pit 7	Copper	K7-09	36197	h	20	ug/L
Pit 7	Copper	K7-10	36984	<	50	ug/L
Pit 7	Copper	NC7-25	38226	<	50	ug/L
Pit 7	Copper	NC7-25	36986	<	50	ug/L
Pit 7	Copper	NC7-26	36986	<	50	ug/L
Pit 7	Copper	NC7-26	37644	h	41	ug/L
Pit 7	Copper	NC7-48	35545	<	50	ug/L
Pit 7	Copper	NC7-48	35914	<	50	ug/L
Pit 7	Copper	NC7-48	36285	<	50	ug/L
Pit 7	Copper	NC7-48	36986	<	50	ug/L
Pit 7	Nickel	K7-01	36985	<	100	ug/L
Pit 7	Nickel	K7-03	36125	h	60	ug/L
Pit 7	Nickel	K7-03	36994	<	100	ug/L
Pit 7	Nickel	K7-03	36994	<	100	ug/L
Pit 7	Nickel	K7-03	36545	h	79	ug/L
Pit 7	Nickel	K7-03	36635	h	70	ug/L
Pit 7	Nickel	K7-06	36985	<	100	ug/L
Pit 7	Nickel	K7-09	36984	<	100	ug/L
Pit 7	Nickel	K7-10	36984	<	100	ug/L
Pit 7	Nickel	NC7-25	38226	<	100	ug/L
Pit 7	Nickel	NC7-25	36986	<	100	ug/L
Pit 7	Nickel	NC7-26	36986	<	100	ug/L
Pit 7	Nickel	NC7-47	37006	<	100	ug/L

Table E-1. Analytical results from 2009 that were omitted from the Appendix E plots due to the use of specially reduced y-axis plot limits.

Pit Area	Constituent	Monitoring Well	Date Sampled	RL (<) or		Units
				Hit (h) ^(a)	Concentration	
Pit 7	Zinc	K7-01	36741	h	110	ug/L
Pit 7	Zinc	K7-03	35536	h	180	ug/L
Pit 7	Zinc	K7-03	35590	h	110	ug/L
Pit 7	Zinc	K7-03	36994	h	110	ug/L
Pit 7	Zinc	K7-03	37071	h	162	ug/L
Pit 7	Zinc	K7-03	37644	h	110	ug/L
Pit 7	Zinc	NC7-25	37988	h	200	ug/L
Pit 7	Zinc	NC7-25	38035	h	480	ug/L
Pit 7	Zinc	NC7-26	37644	h	110	ug/L

^(a) Values labeled as "<" had high reporting limits (RLs) for that particular analytical result. These values were not included in the plots. The "h" indicates values that, if plotted, would have significantly altered the y-axis scale. These values have been addressed in past reports and are not an indication of a problem at a well.

Table E-2. Detection monitoring constituents of concern, monitoring wells, statistical methods, concentration limits, and statistical limits at Pit 1.

Constituents of Concern (units)	Well	Statistical Method	Concentration Limit ¹	Statistical Limit ^a
Metals ($\mu\text{g/L}$)				
Arsenic	K1-02B	Intrawell Prediction Limit	12	15
	K1-04	Intrawell Prediction Limit	10	16
	K1-05	Intrawell Prediction Limit	14	18
	K1-08	Intrawell Prediction Limit	14	17
	K1-09	Intrawell Prediction Limit	13	16
	W-PIT1-2326 ^b	Intrawell Prediction Limit	12	14
Barium	K1-02B	Intrawell Prediction Limit	24	26
	K1-04	Intrawell Prediction Limit	27	32
	K1-05	Intrawell Prediction Limit	36	43
	K1-08	Intrawell Prediction Limit	40	49
	K1-09	Intrawell Prediction Limit	43	51
	W-PIT1-2326	Intrawell Prediction Limit	33	46
Beryllium	K1-02B	Reporting Limit	NA ²	0.5
	K1-04	Reporting Limit	NA	0.5
	K1-05	Reporting Limit	NA	0.5
	K1-08	Reporting Limit	NA	0.5
	K1-09	Reporting Limit	NA	0.5
	W-PIT1-2326	Reporting Limit	0.5	0.5
Cadmium	K1-02B	Intrawell Prediction Limit	0.40	0.52
	K1-04	Reporting Limit	NA	0.50
	K1-05	Reporting Limit	NA	0.50
	K1-08	Reporting Limit	NA	0.50
	K1-09	Reporting Limit	NA	0.50
	W-PIT1-2326	Reporting Limit	0.50	0.50
Cobalt	K1-02B	Reporting Limit	NA	25
	K1-04	Reporting Limit	NA	25
	K1-05	Reporting Limit	NA	25
	K1-08	Reporting Limit	NA	25
	K1-09	Reporting Limit	NA	25
	W-PIT1-2326	Reporting Limit	25	25
Copper	K1-02B	Intrawell Prediction Limit	16	60
	K1-04	Reporting Limit	NA	10
	K1-05	Intrawell Prediction Limit	8	30
	K1-08	Reporting Limit	NA	10
	K1-09	Reporting Limit	NA	10
	W-PIT1-2326	Reporting Limit	10	10
Lead	K1-02B	Reporting Limit	NA	2
	K1-04	Reporting Limit	NA	2
	K1-05	Reporting Limit	NA	2
	K1-08	Reporting Limit	NA	2
	K1-09	Reporting Limit	NA	2
	W-PIT1-2326	Reporting Limit	2	2
Nickel	K1-02B	Intrawell Prediction Limit	4	9
	K1-04	Reporting Limit	NA	5
	K1-05	Intrawell Prediction Limit	3	13
	K1-08	Reporting Limit	NA	5
	K1-09	Reporting Limit	NA	5
	W-PIT1-2326	Reporting Limit	5	5

Table E-2. Detection monitoring constituents of concern, monitoring wells, statistical methods, concentration limits, and statistical limits at Pit 1.

Constituents of Concern (units)	Well	Statistical Method	Concentration Limit ¹	Statistical Limit ^a
Vanadium	K1-02B	Intrawell Prediction Limit	52	59
	K1-04	Intrawell Prediction Limit	37	46
	K1-05	Intrawell Prediction Limit	69	79
	K1-08	Intrawell Prediction Limit	68	78
	K1-09	Intrawell Prediction Limit	61	69
	W-PIT1-2326	Intrawell Prediction Limit	50	63
Zinc	K1-02B	Intrawell Prediction Limit	24	98
	K1-04	Intrawell Prediction Limit	12	51
	K1-05	Intrawell Prediction Limit	9	24
	K1-08	Reporting Limit	NA	20
	K1-09	Reporting Limit	NA	20
	W-PIT1-2326	Reporting Limit	15	48
Perchlorate and Energetic Materials ($\mu\text{g/L}$)				
Perchlorate	K1-02B	Intrawell Prediction Limit	7	10
	K1-04	Reporting Limit	NA	4
	K1-05	Reporting Limit	NA	4
	K1-08	Reporting Limit	NA	4
	K1-09	Reporting Limit	NA	4
	W-PIT1-2326	Intrawell Prediction Limit	6	8
HMX	K1-02B	Reporting Limit	NA	1
	K1-04	Reporting Limit	NA	1
	K1-05	Reporting Limit	NA	1
	K1-08	Reporting Limit	NA	1
	K1-09	Reporting Limit	NA	1
	W-PIT1-2326	Reporting Limit	1	1
RDX	K1-02B	Reporting Limit	NA	1
	K1-04	Reporting Limit	NA	1
	K1-05	Reporting Limit	NA	1
	K1-08	Reporting Limit	NA	1
	K1-09	Reporting Limit	NA	1
	W-PIT1-2326	Reporting Limit	1	1
Radioisotopes (pCi/L)				
Radium 226	K1-02B	Intrawell Prediction Limit	0.111	0.315
	K1-04	Intrawell Prediction Limit	0.070	0.313
	K1-05	Intrawell Prediction Limit	0.114	0.331
	K1-08	Intrawell Prediction Limit	0.056	0.240
	K1-09	Intrawell Prediction Limit	0.078	0.335
	W-PIT1-2326	Intrawell Prediction Limit	0.118	0.511
Thorium 228	K1-02B	Intrawell Prediction Limit	0.016	0.076
	K1-04	Intrawell Prediction Limit	0.009	0.090
	K1-05	Intrawell Prediction Limit	0.011	0.133
	K1-08	Intrawell Prediction Limit	0.015	0.086
	K1-09	Intrawell Prediction Limit	0.025	0.098
	W-PIT1-2326	Intrawell Prediction Limit	0.012	0.145
Thorium 232	K1-02B	Intrawell Prediction Limit	0.012	0.121
	K1-04	Intrawell Prediction Limit	0.006	0.037
	K1-05	Intrawell Prediction Limit	0.014	0.109
	K1-08	Intrawell Prediction Limit	0.014	0.116
	K1-09	Intrawell Prediction Limit	0.005	0.049
	W-PIT1-2326	Intrawell Prediction Limit	-0.0026	0.023

Table E-2. Detection monitoring constituents of concern, monitoring wells, statistical methods, concentration limits, and statistical limits at Pit 1.

Constituents of Concern (units)	Well	Statistical Method	Concentration Limit¹	Statistical Limit^a
Tritium	K1-02B	Intrawell Prediction Limit	3940	4280
	K1-04	Intrawell Prediction Limit	280	520
	K1-05	Intrawell Prediction Limit	157	307
	K1-08	Intrawell Prediction Limit	174	288
	K1-09	Intrawell Prediction Limit	145	234
	W-PIT1-2326	Intrawell Prediction Limit	2940	3590
Uranium (calculated total)	K1-02B	Intrawell Prediction Limit	1.83	2.43
	K1-04	Intrawell Prediction Limit	0.97	1.51
	K1-05	Intrawell Prediction Limit	1.55	2.13
	K1-08	Intrawell Prediction Limit	1.96	2.61
	K1-09	Intrawell Prediction Limit	1.93	2.40
	W-PIT1-2326	Intrawell Prediction Limit	1.71	2.00

^a All SL values revised in May 2009

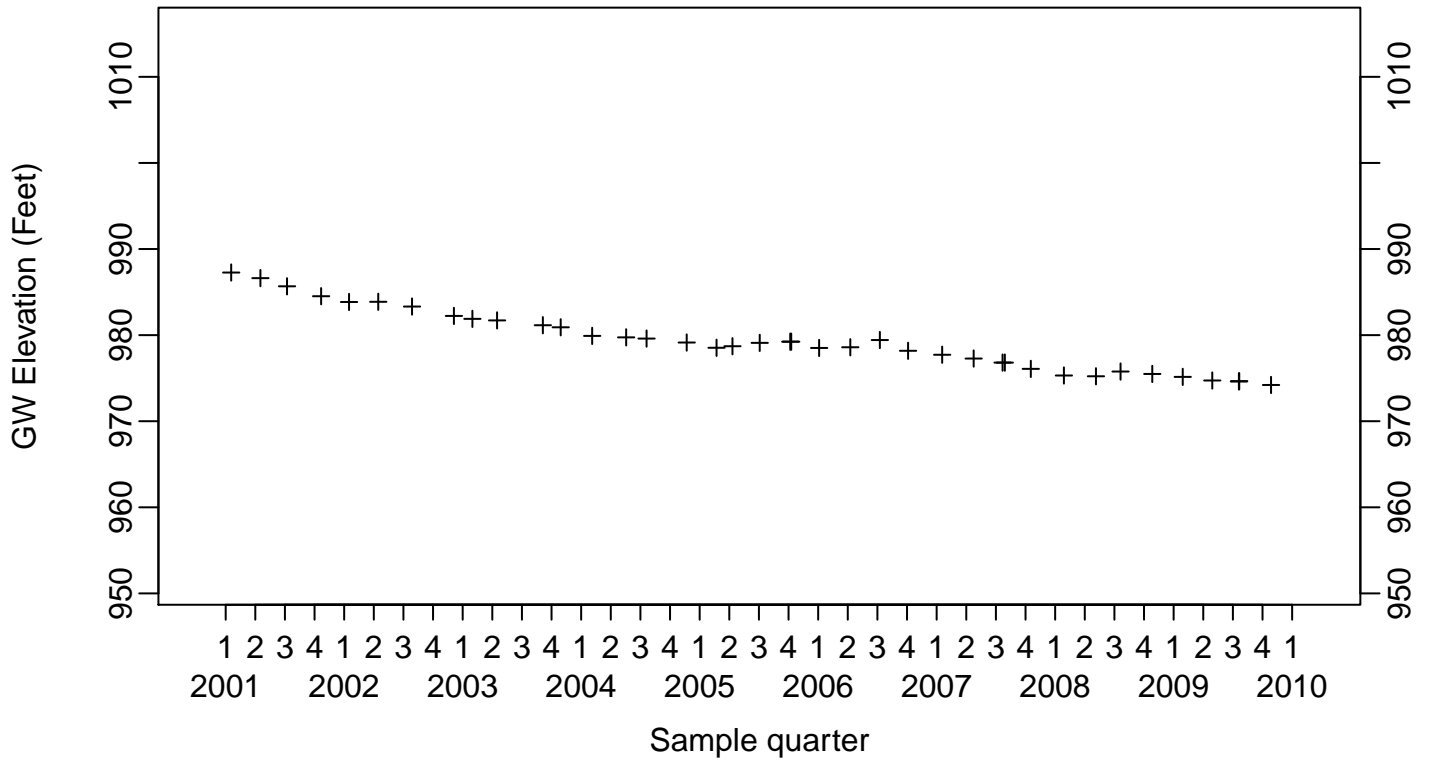
^b For W-Pit1-2326, all SL's were revised for this report.

Note: Values have been rounded in a manner consistent with previous SLs from WDR No. 93-100.

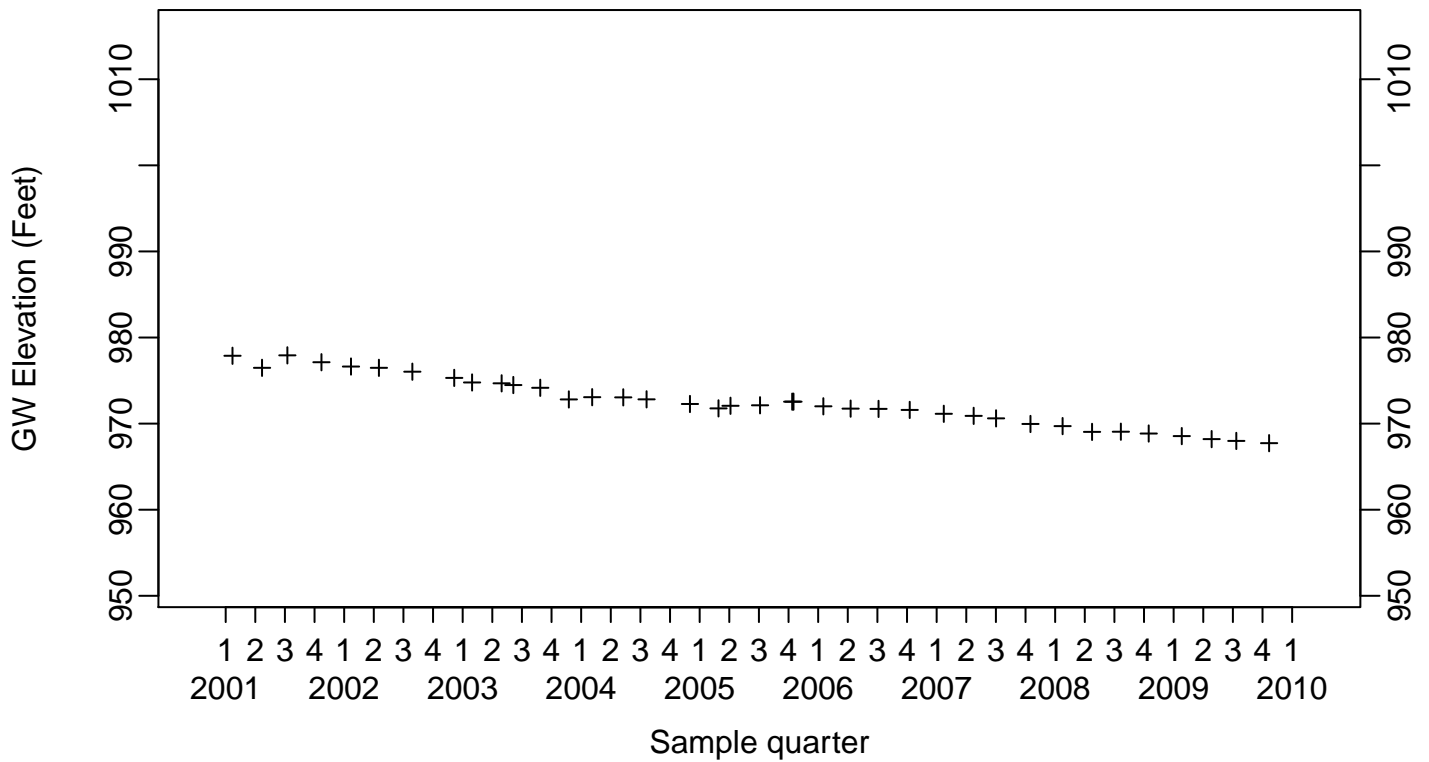
1. Concentration limit refers to observed mean value for historical data.
2. NA – not applicable.

Pit 1 Area GW Elevation (Feet)

Background Monitoring Point K1-01C

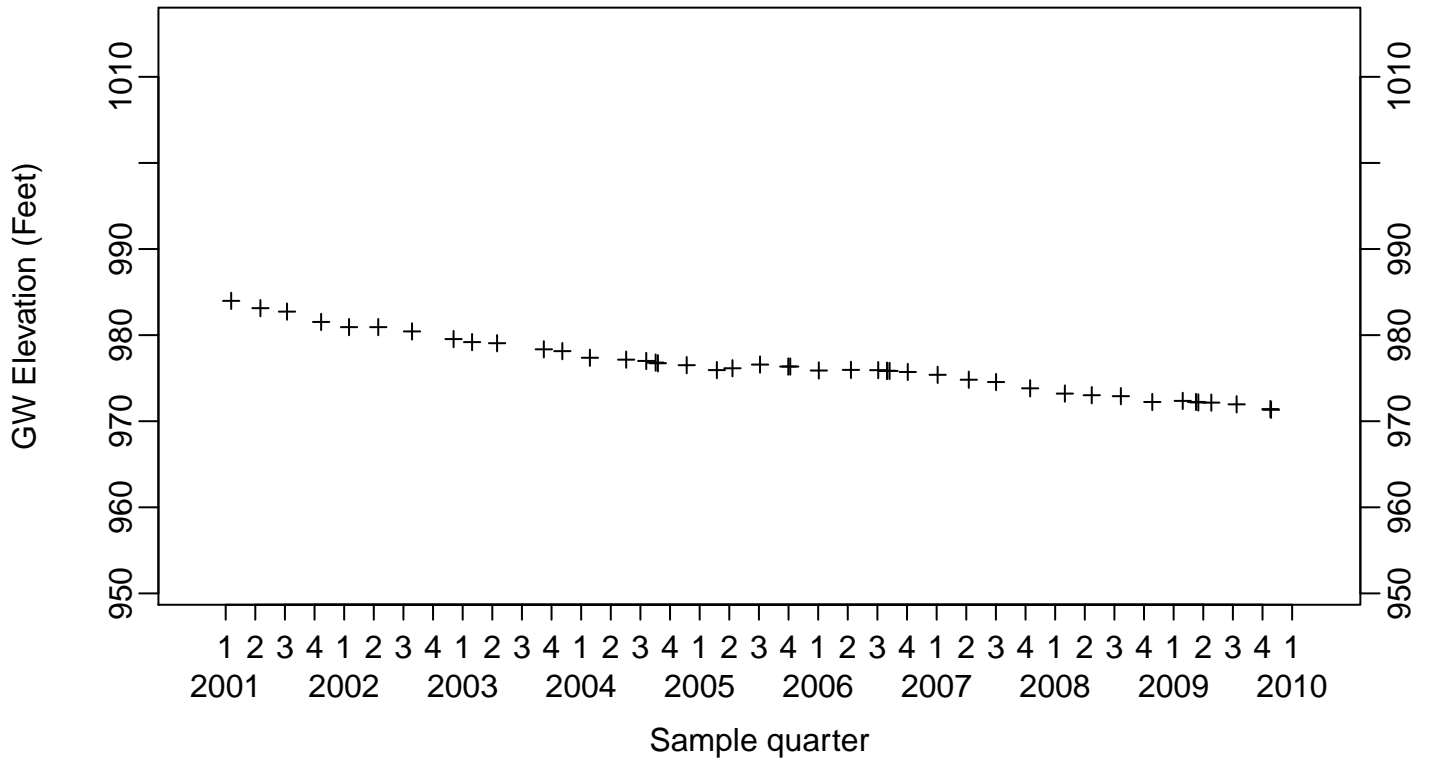


Background Monitoring Point K1-07

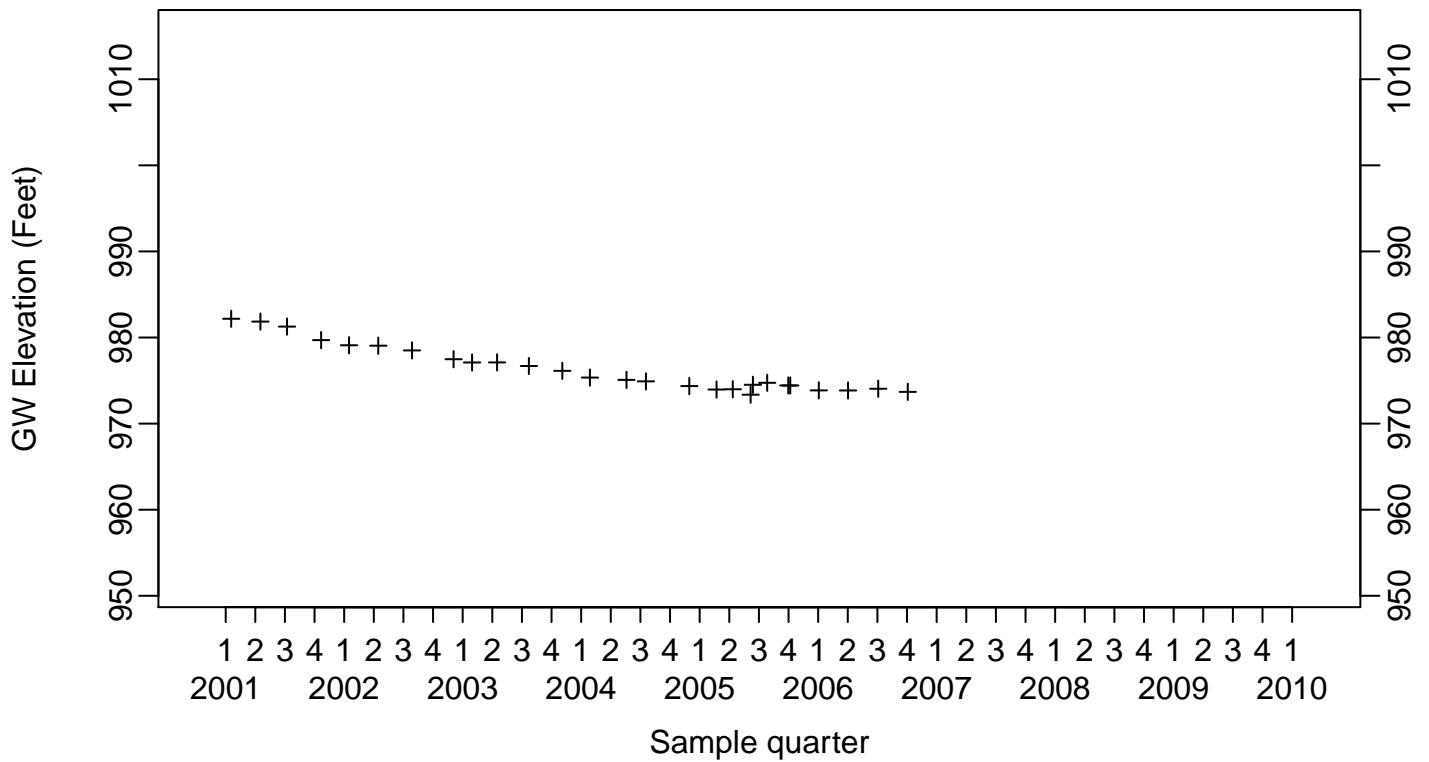


Pit 1 Area GW Elevation (Feet)

Compliance Monitoring Point K1-02B

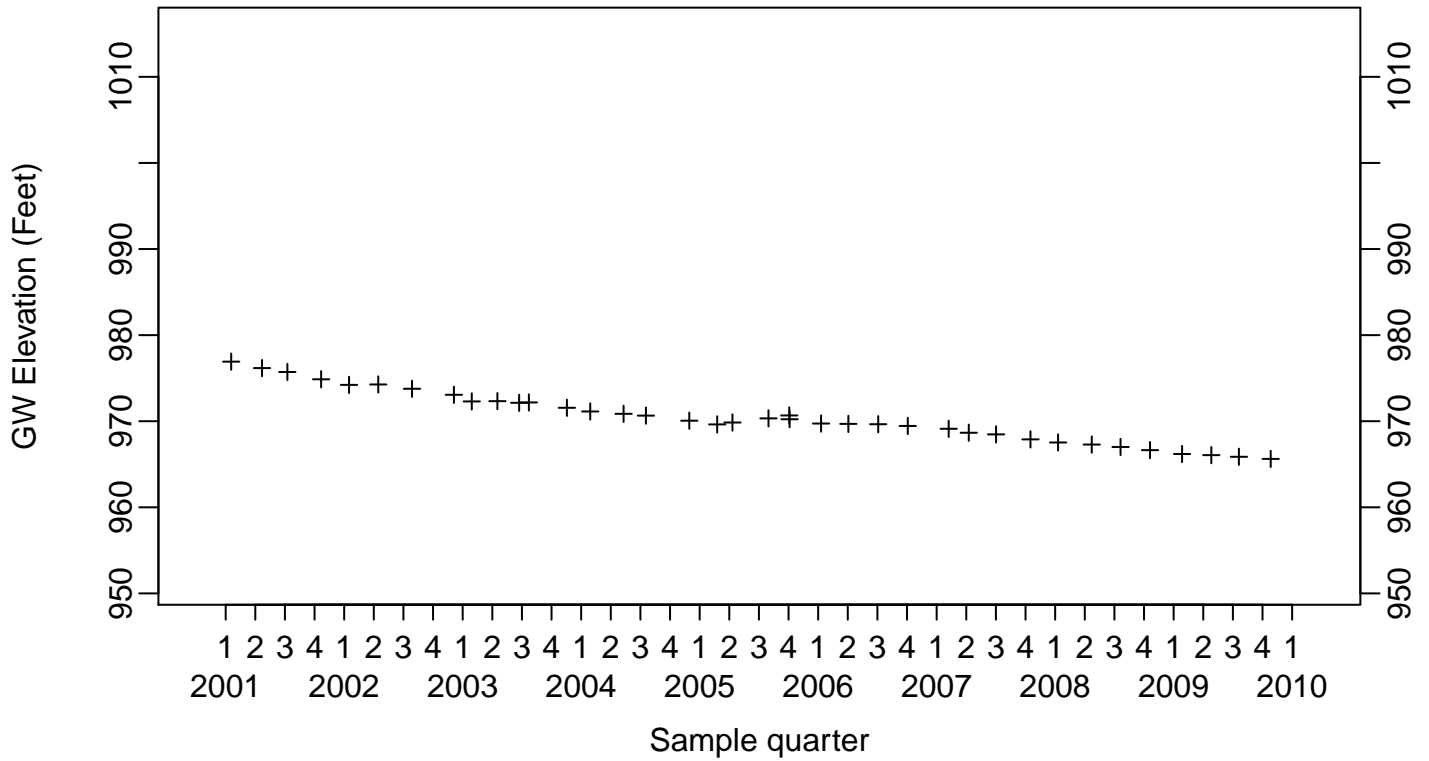


Compliance Monitoring Point K1-03

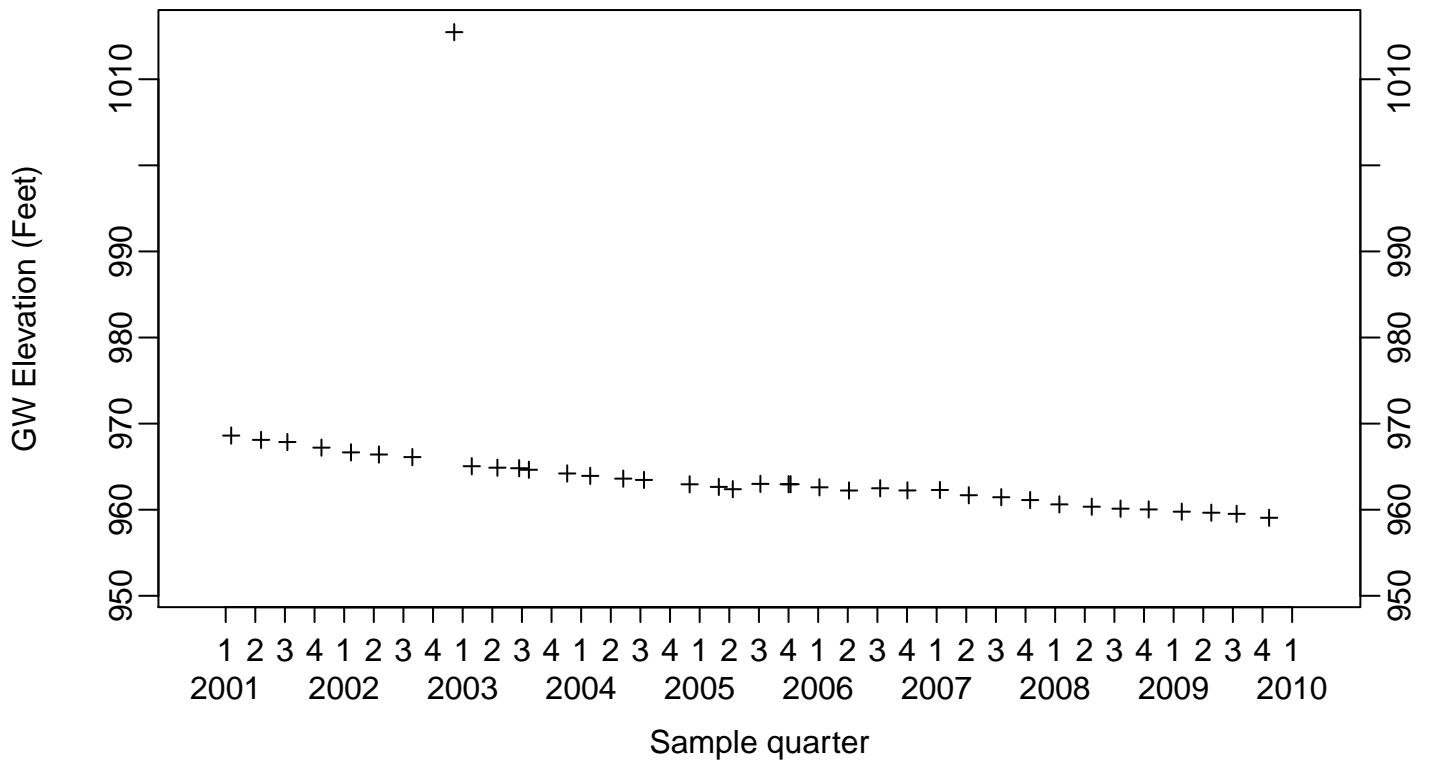


Pit 1 Area GW Elevation (Feet)

Compliance Monitoring Point K1-04

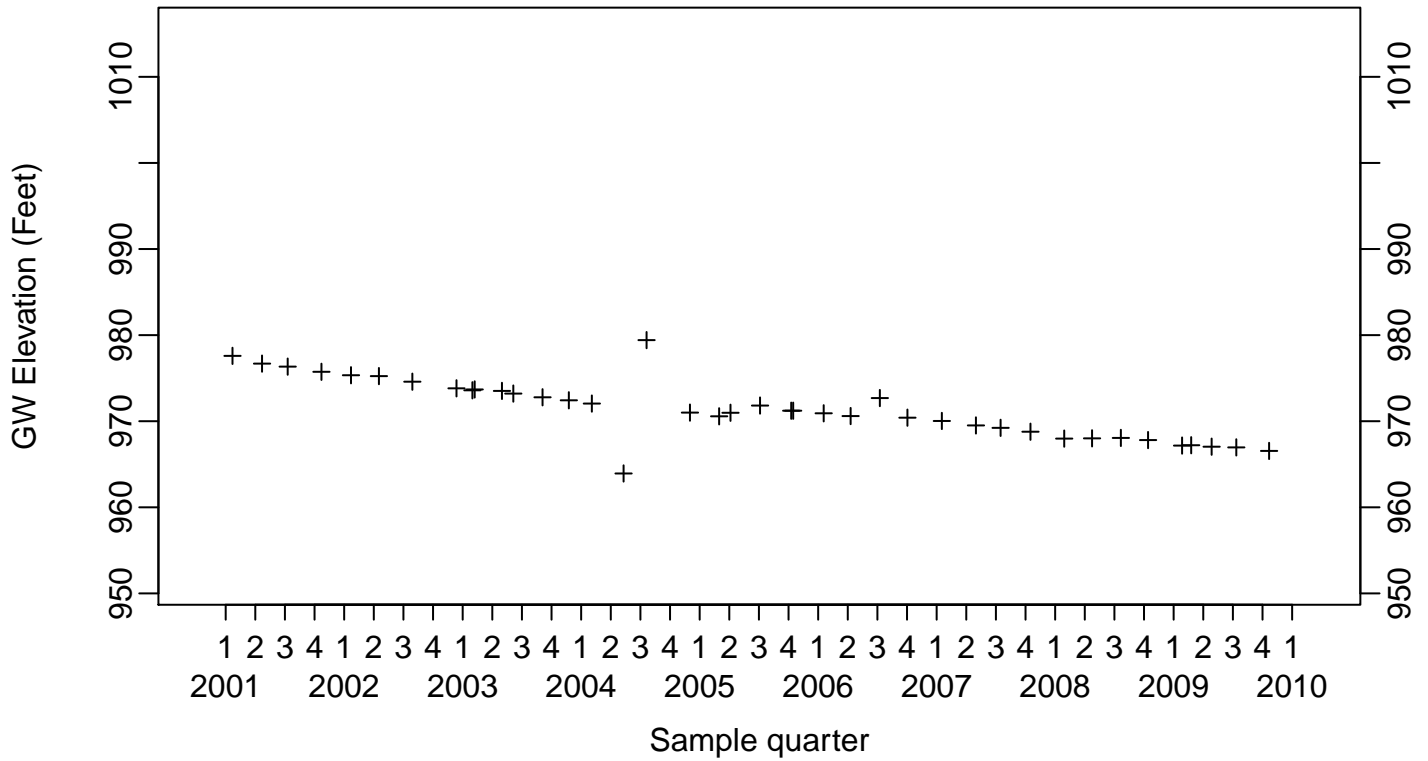


Compliance Monitoring Point K1-05

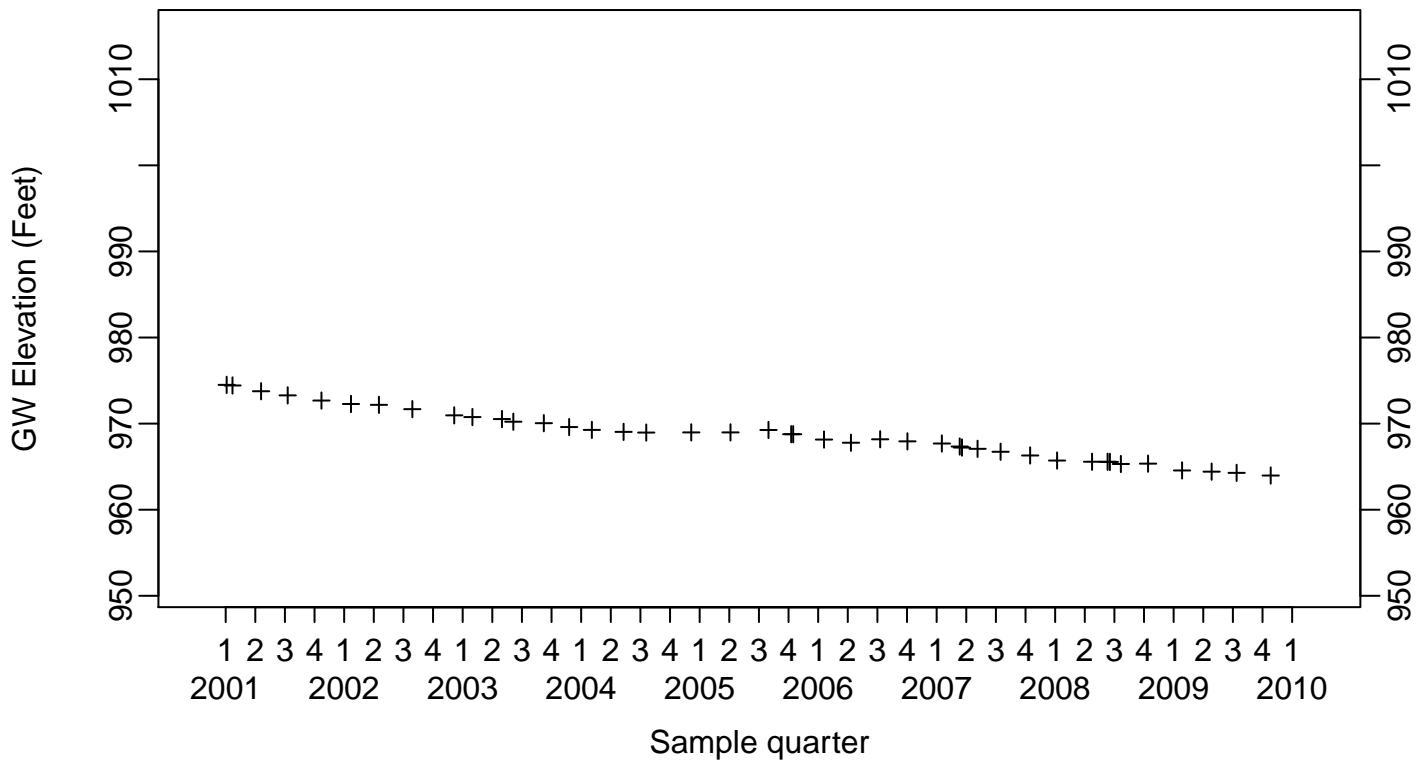


Pit 1 Area GW Elevation (Feet)

Compliance Monitoring Point K1-08

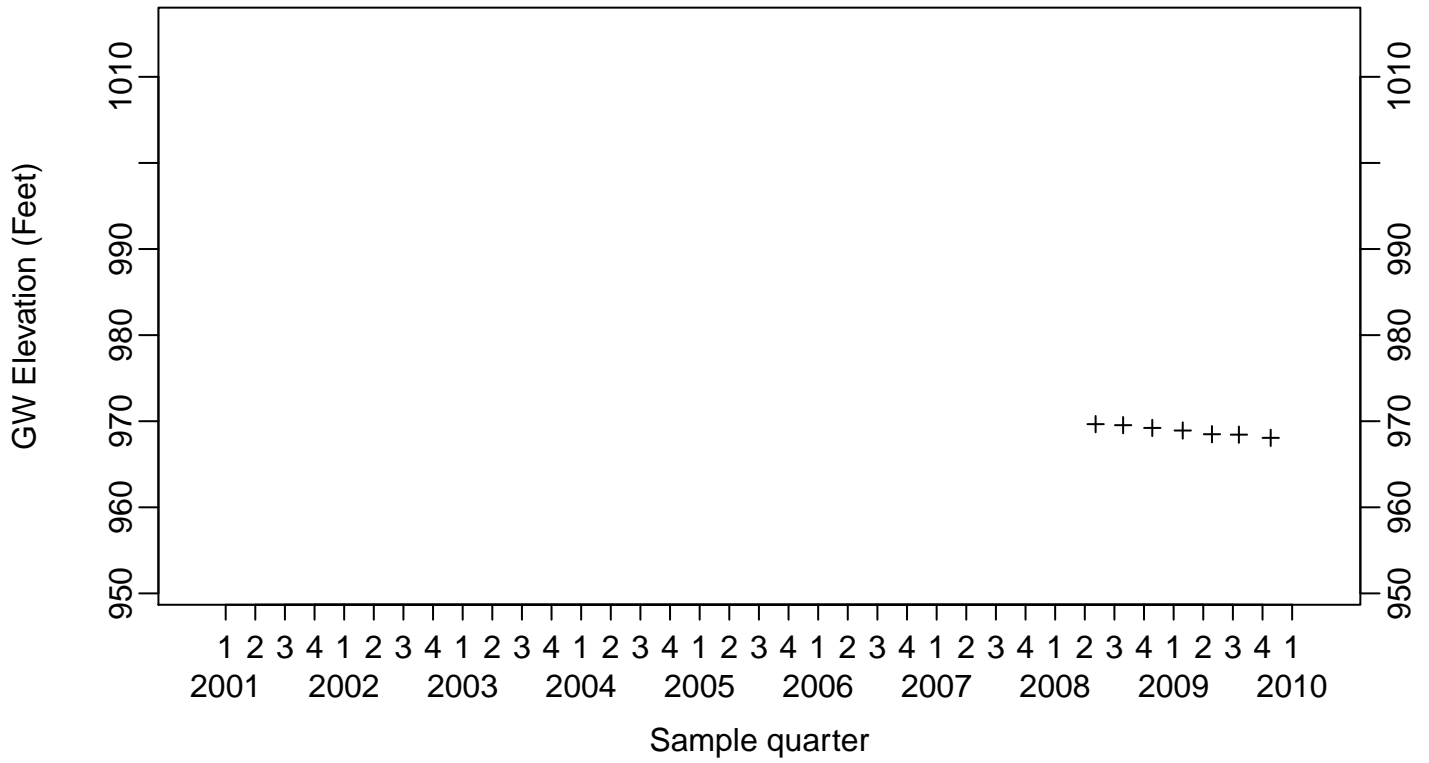


Compliance Monitoring Point K1-09



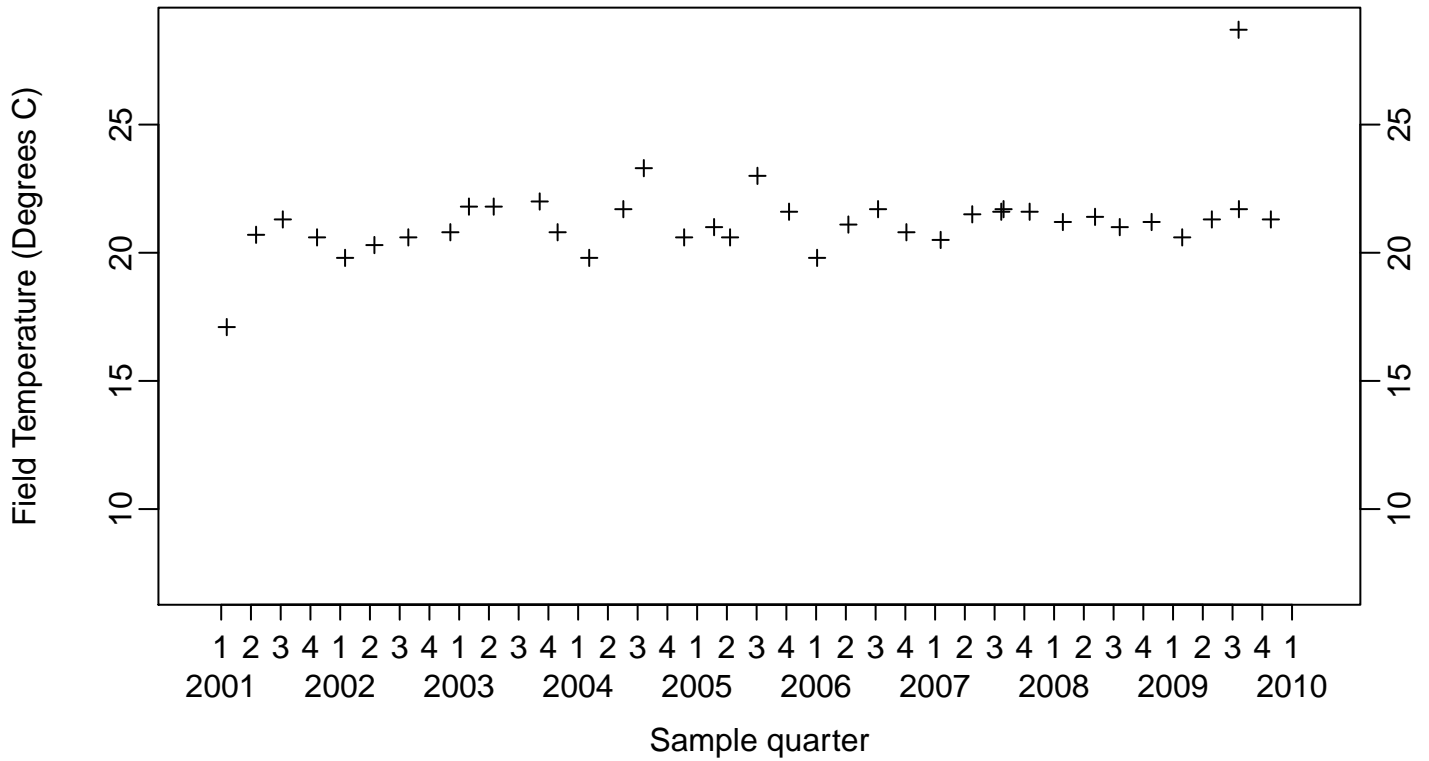
Pit 1 Area GW Elevation (Feet)

Compliance Monitoring Point W-PIT1-2326

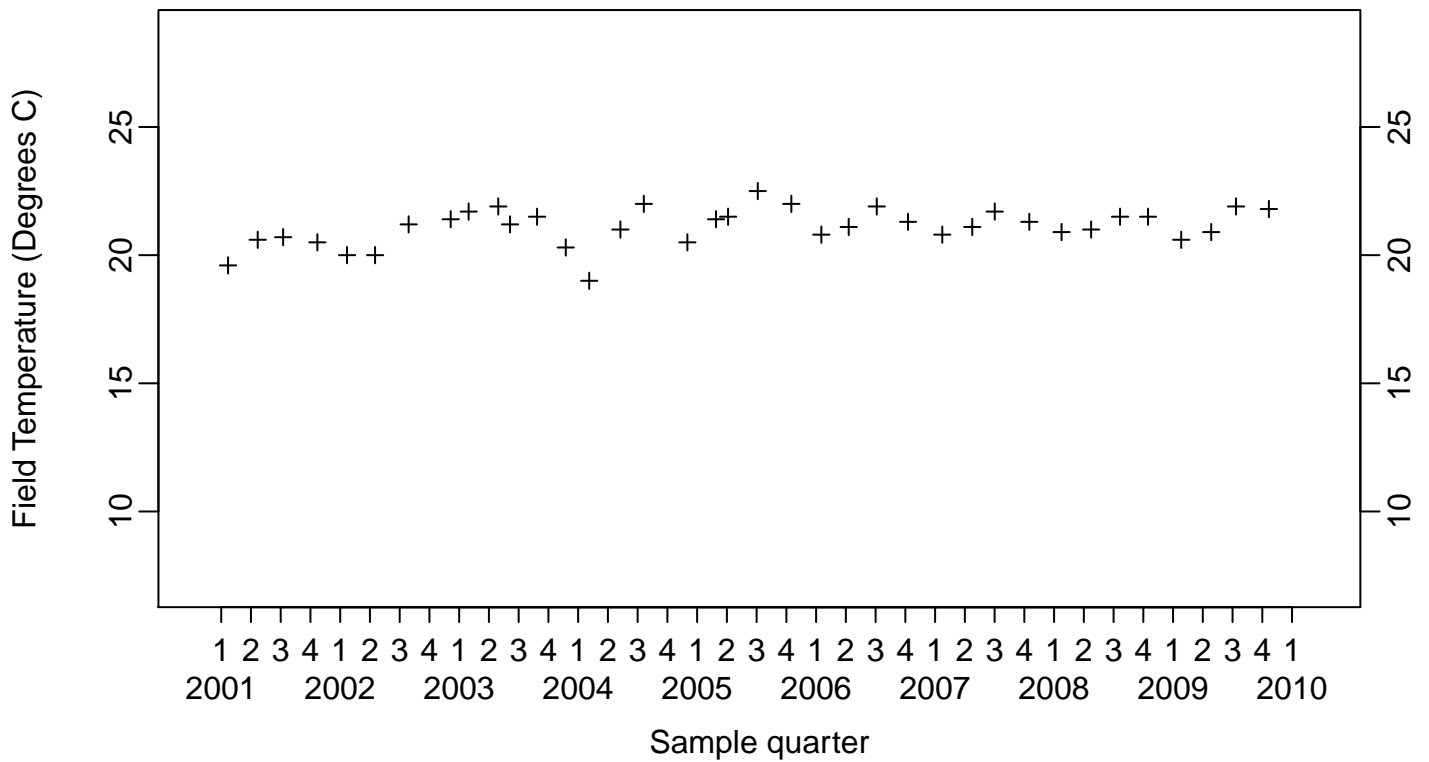


Pit 1 Area
Field Temperature (Degrees C)

Background Monitoring Point K1-01C

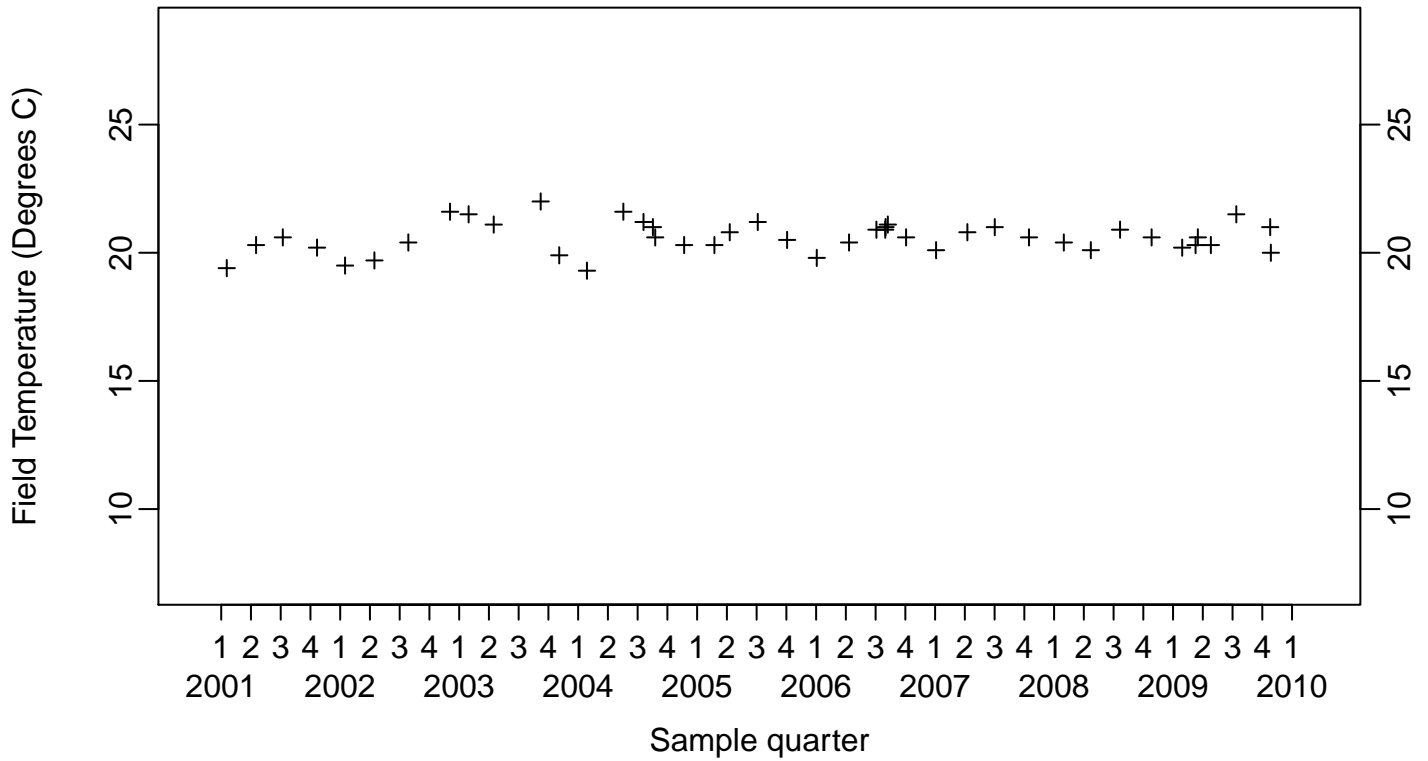


Background Monitoring Point K1-07

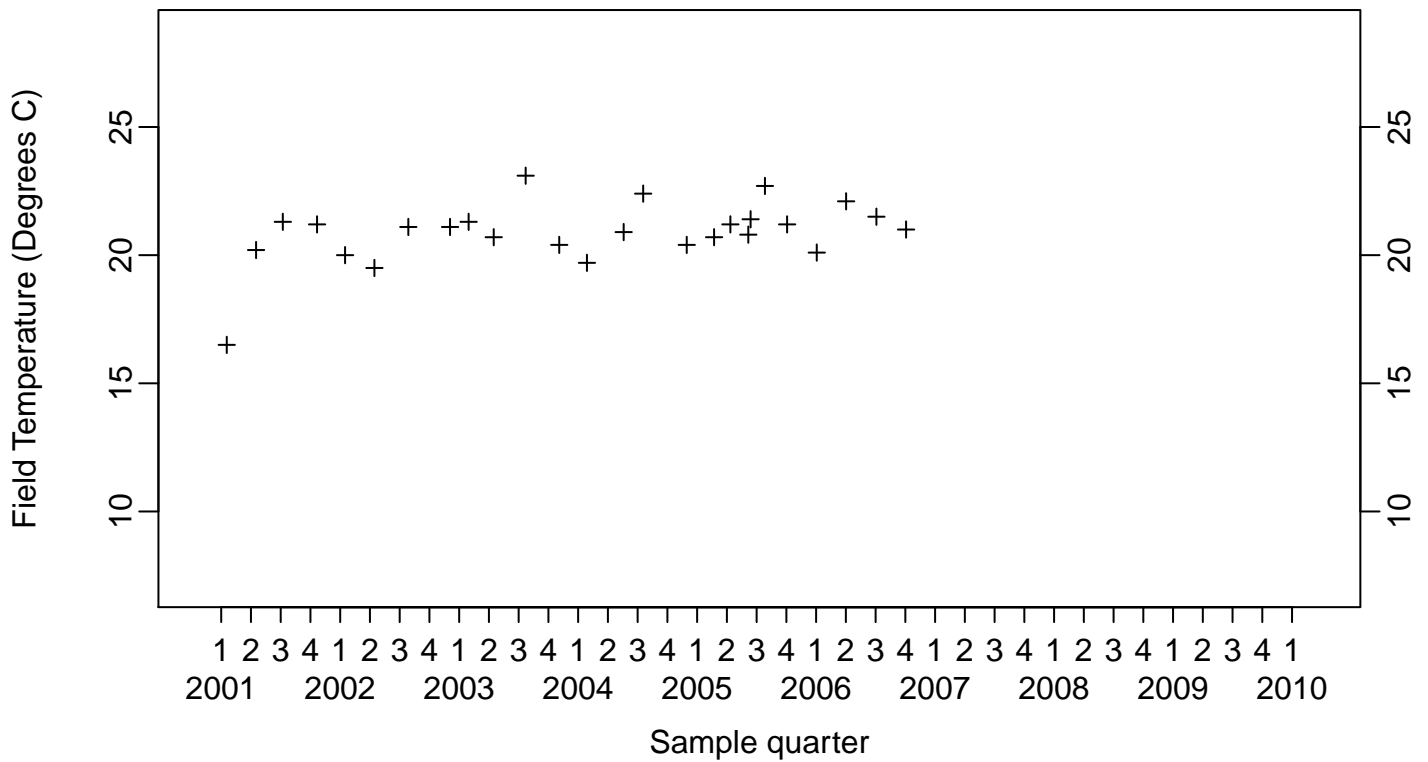


Pit 1 Area Field Temperature (Degrees C)

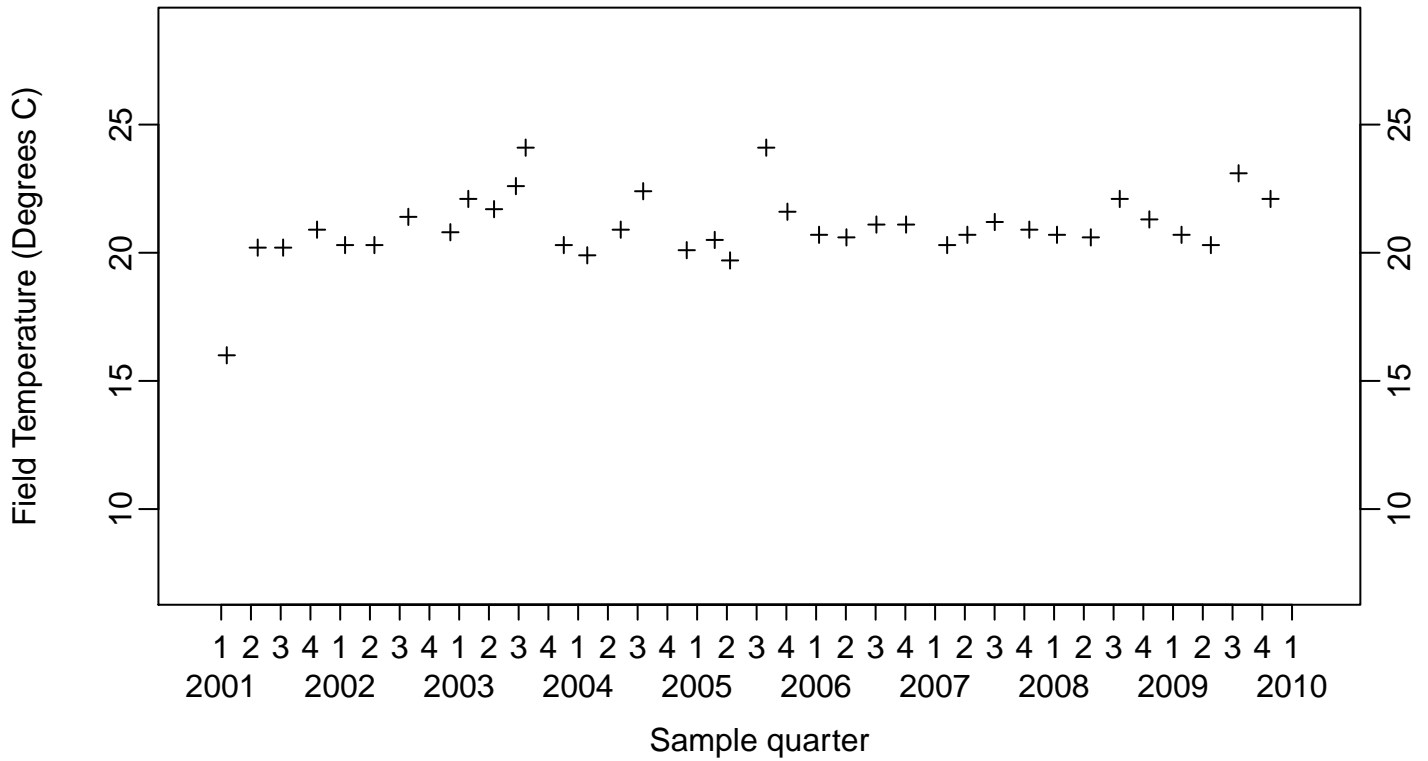
Compliance Monitoring Point K1-02B



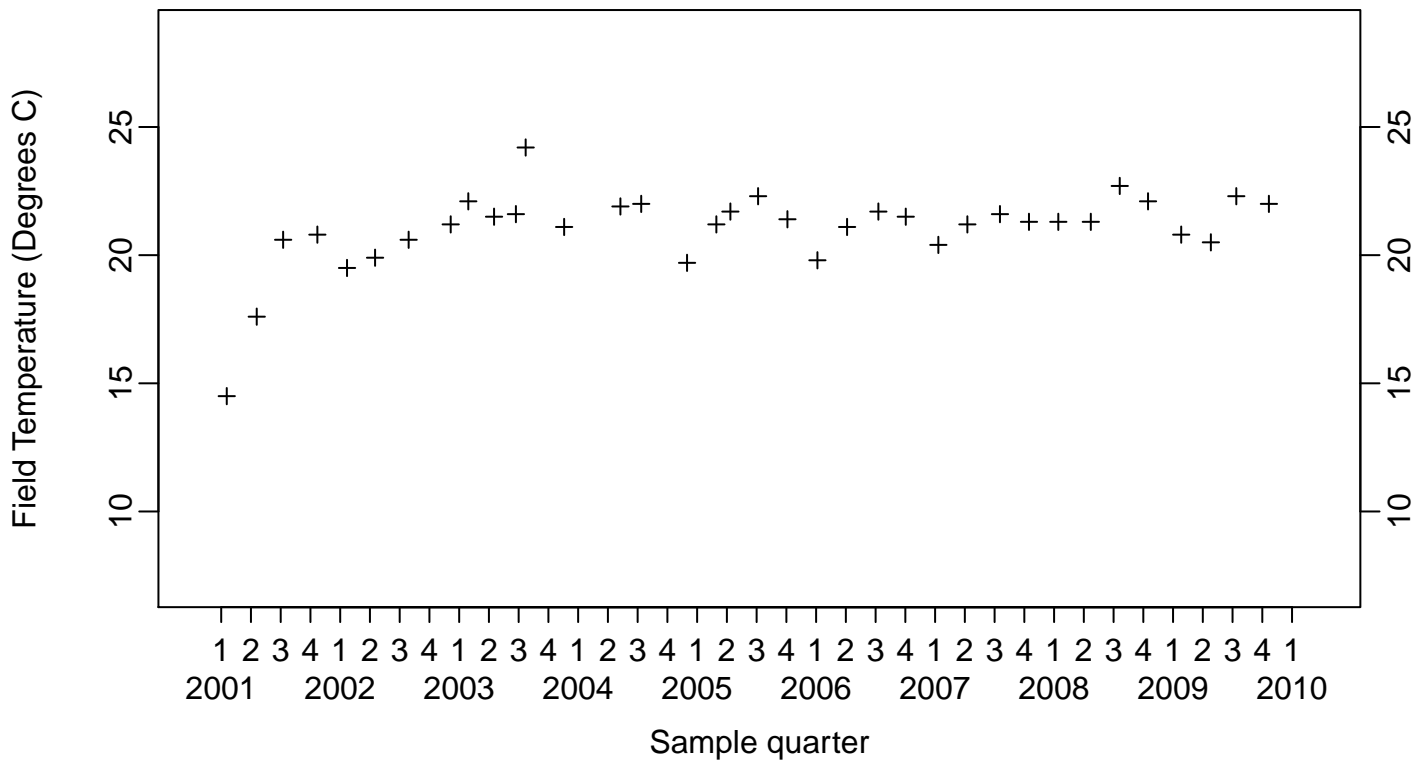
Compliance Monitoring Point K1-03



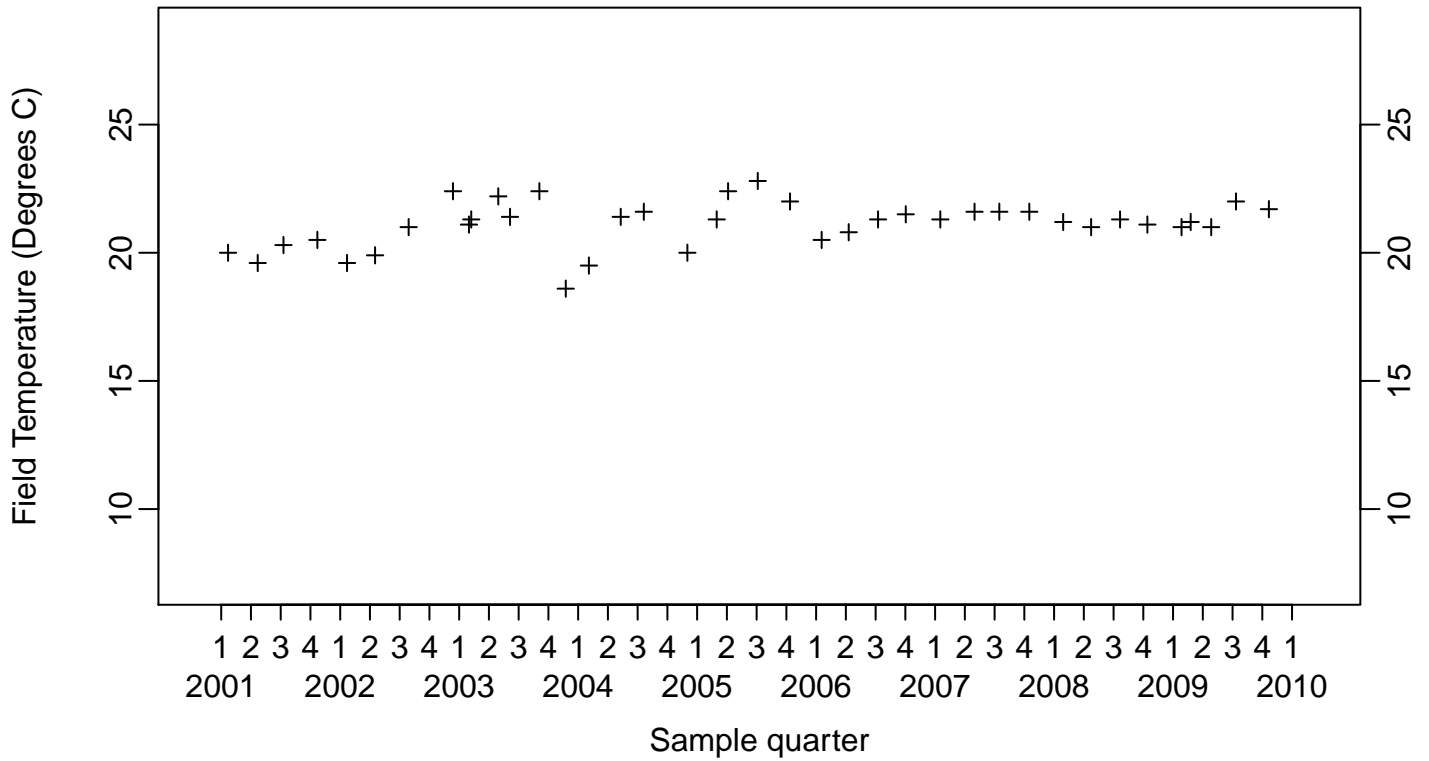
Pit 1 Area Field Temperature (Degrees C) Compliance Monitoring Point K1-04



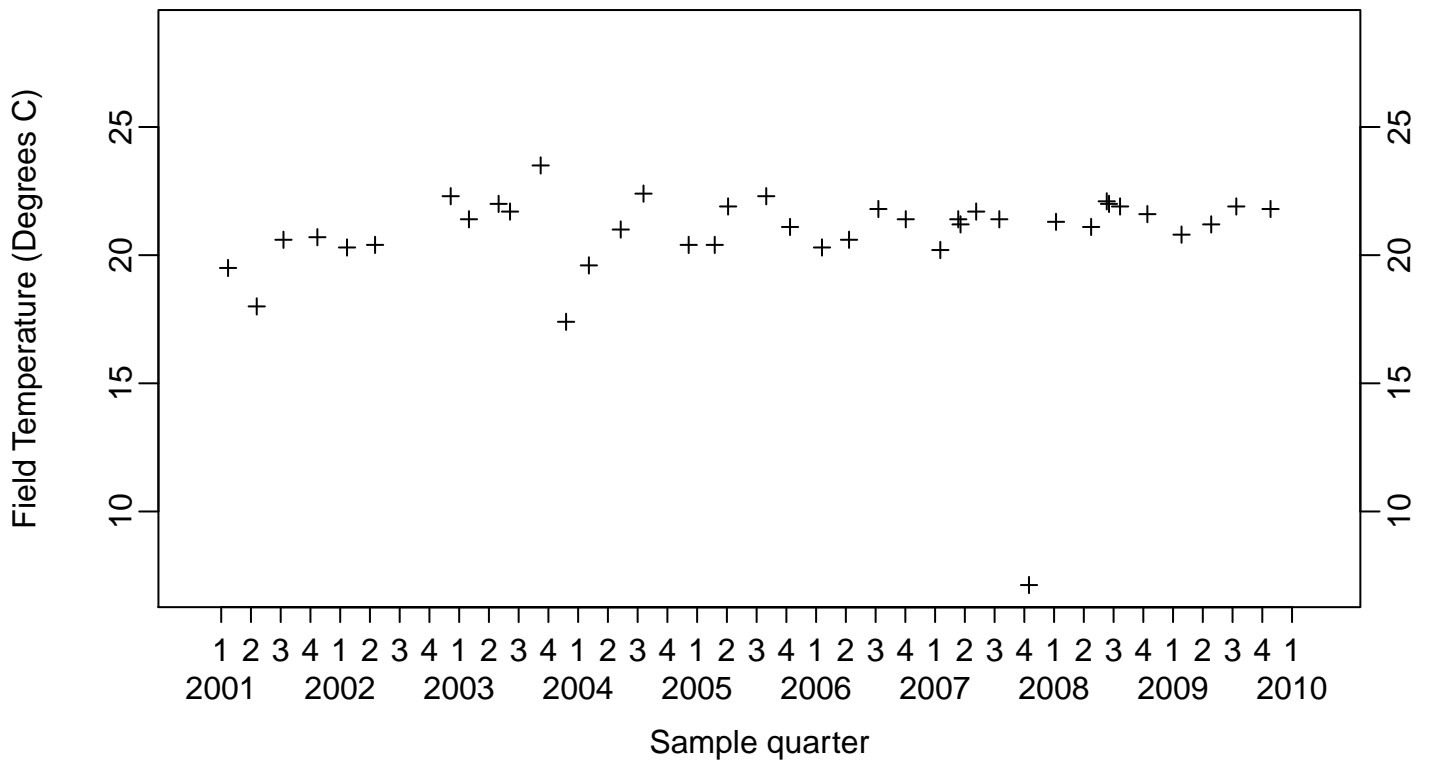
Compliance Monitoring Point K1-05



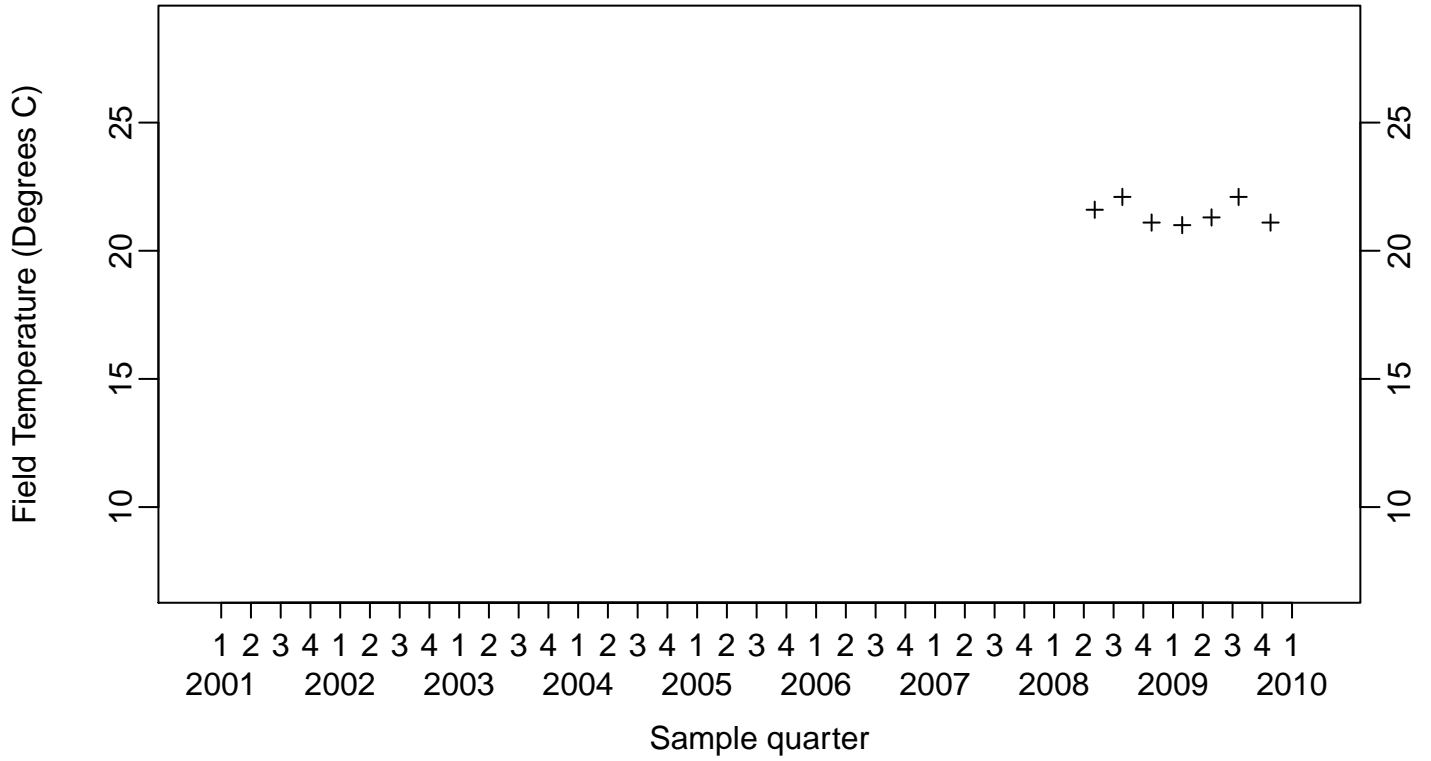
Pit 1 Area Field Temperature (Degrees C) Compliance Monitoring Point K1-08



Compliance Monitoring Point K1-09



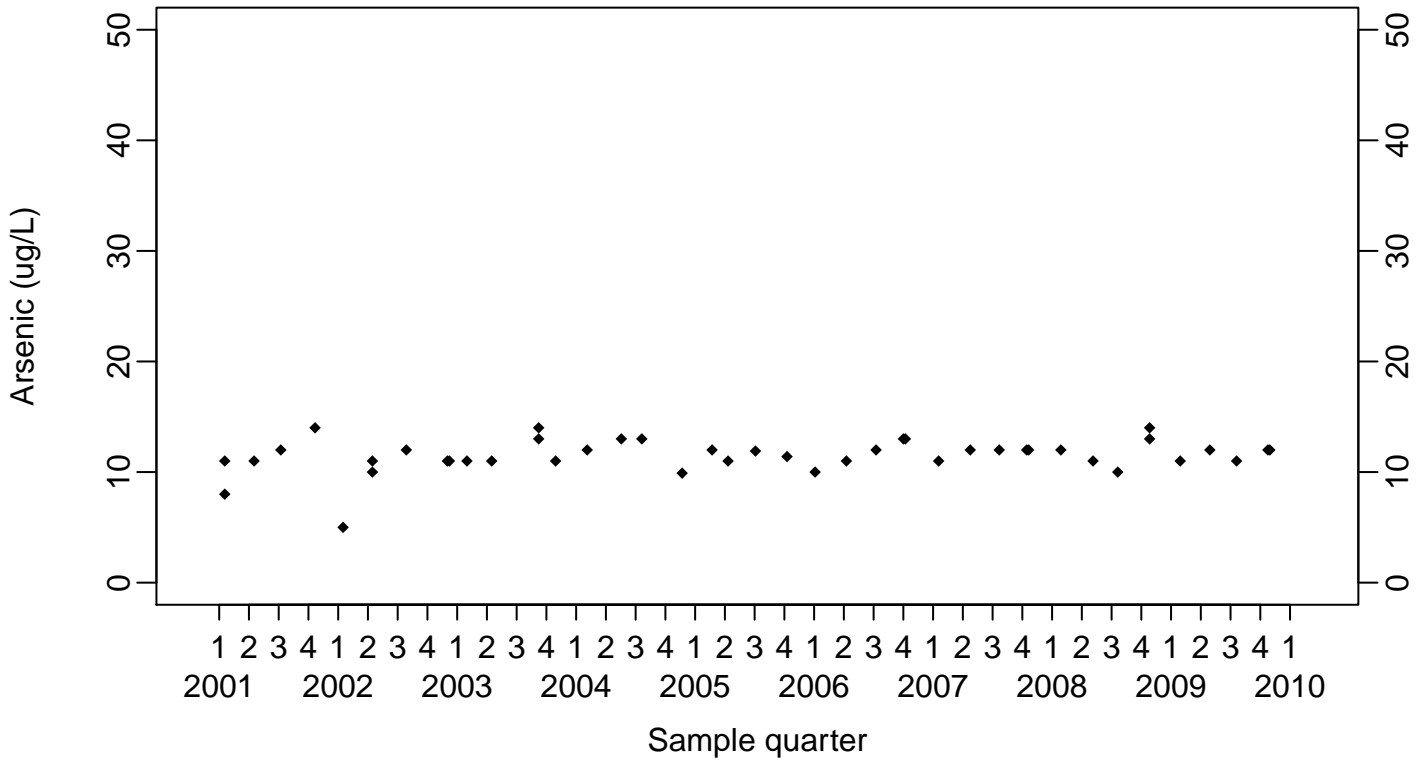
Pit 1 Area
Field Temperature (Degrees C)
Compliance Monitoring Point W-PIT1-2326



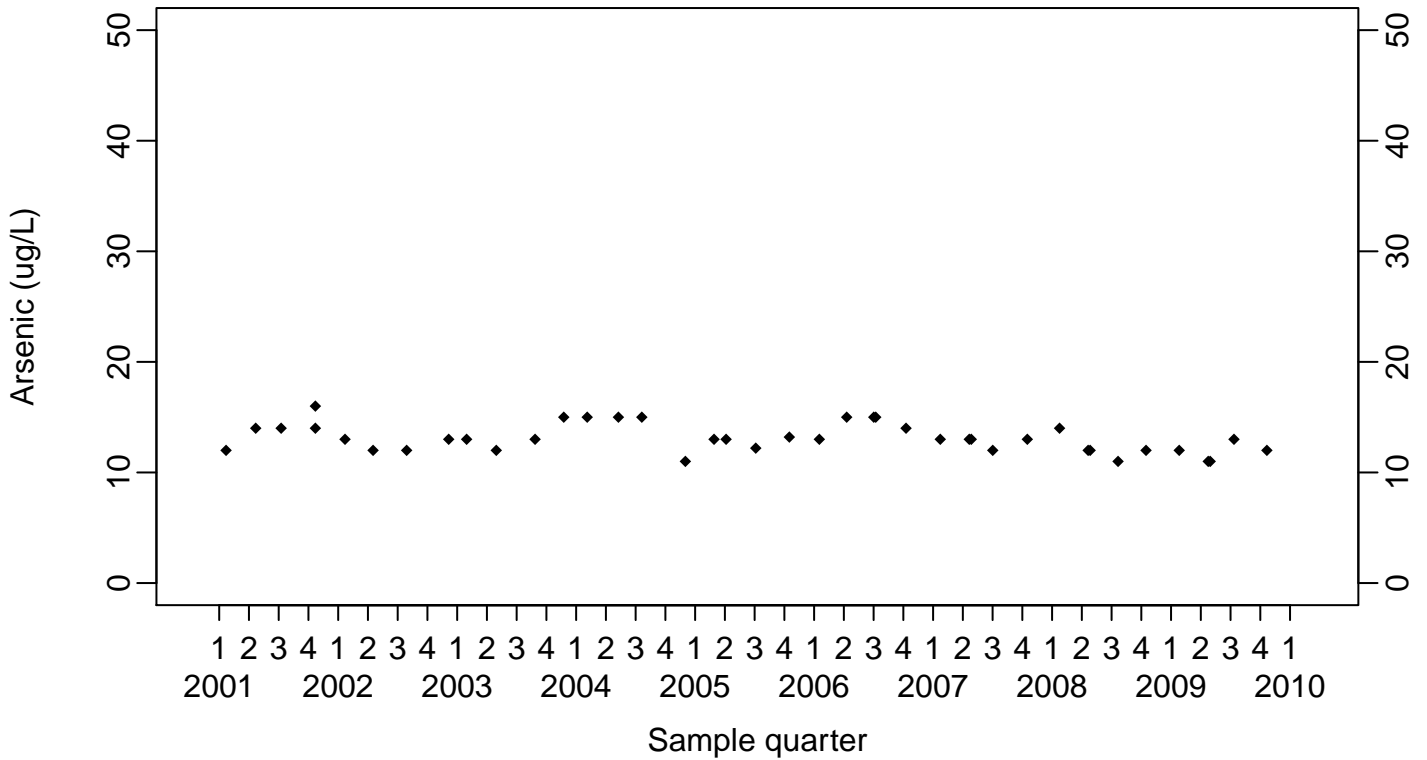
Pit 1 Area Arsenic (ug/L)

Background Monitoring Point K1-01C

◆ Above RL
▽ Below RL



Background Monitoring Point K1-07

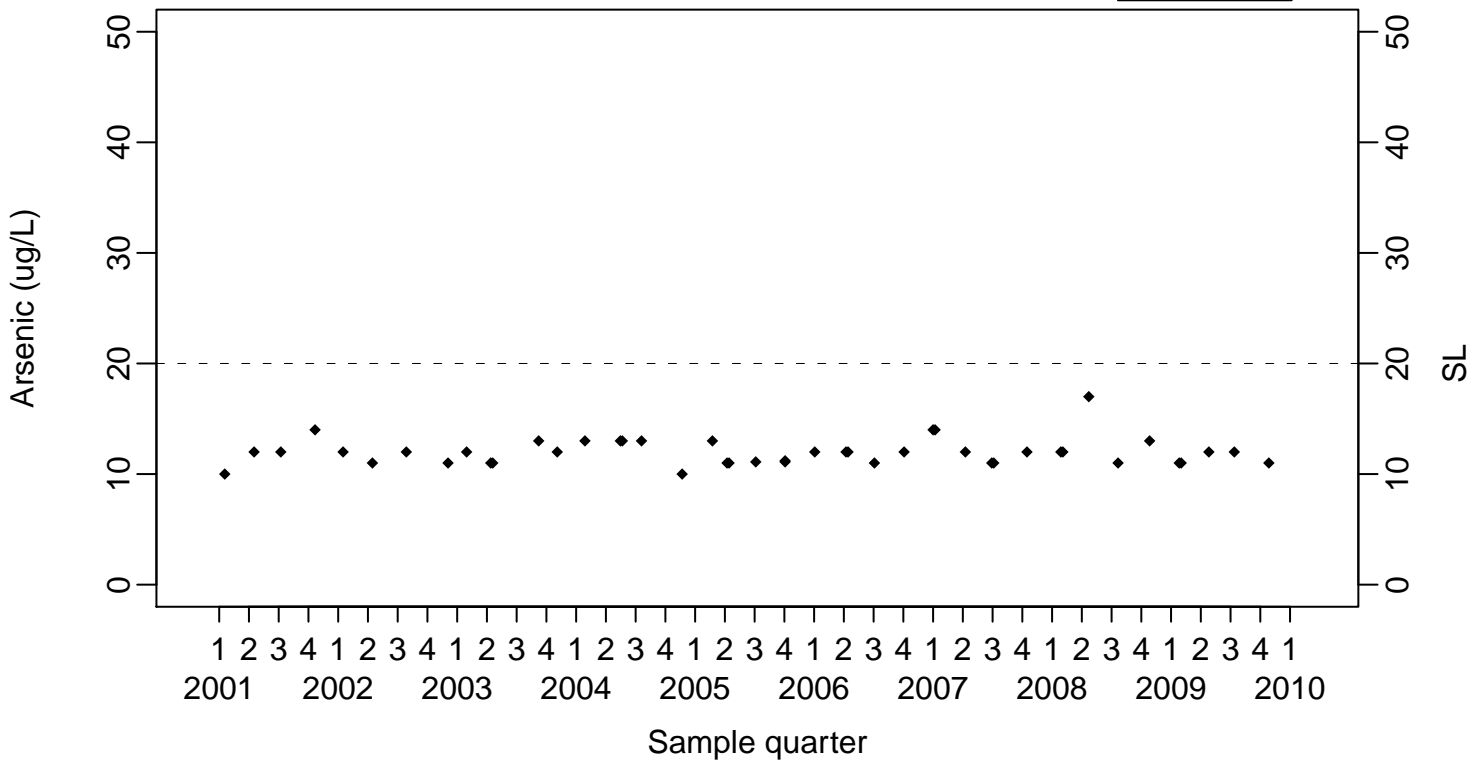


Pit 1 Area Arsenic (ug/L)

Compliance Monitoring Point K1-02B

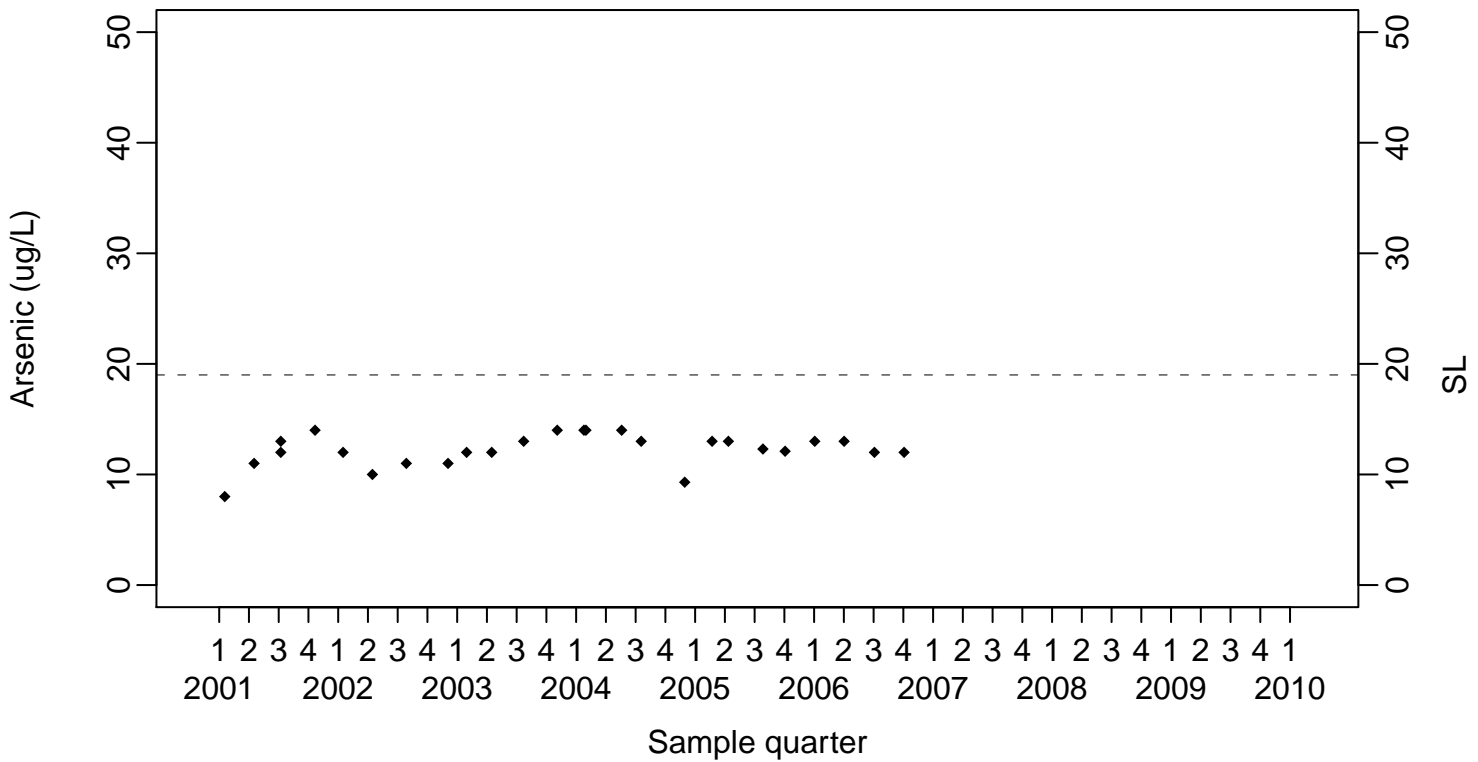
SL=20

◆ Above RL
▽ Below RL



SL=19

Compliance Monitoring Point K1-03

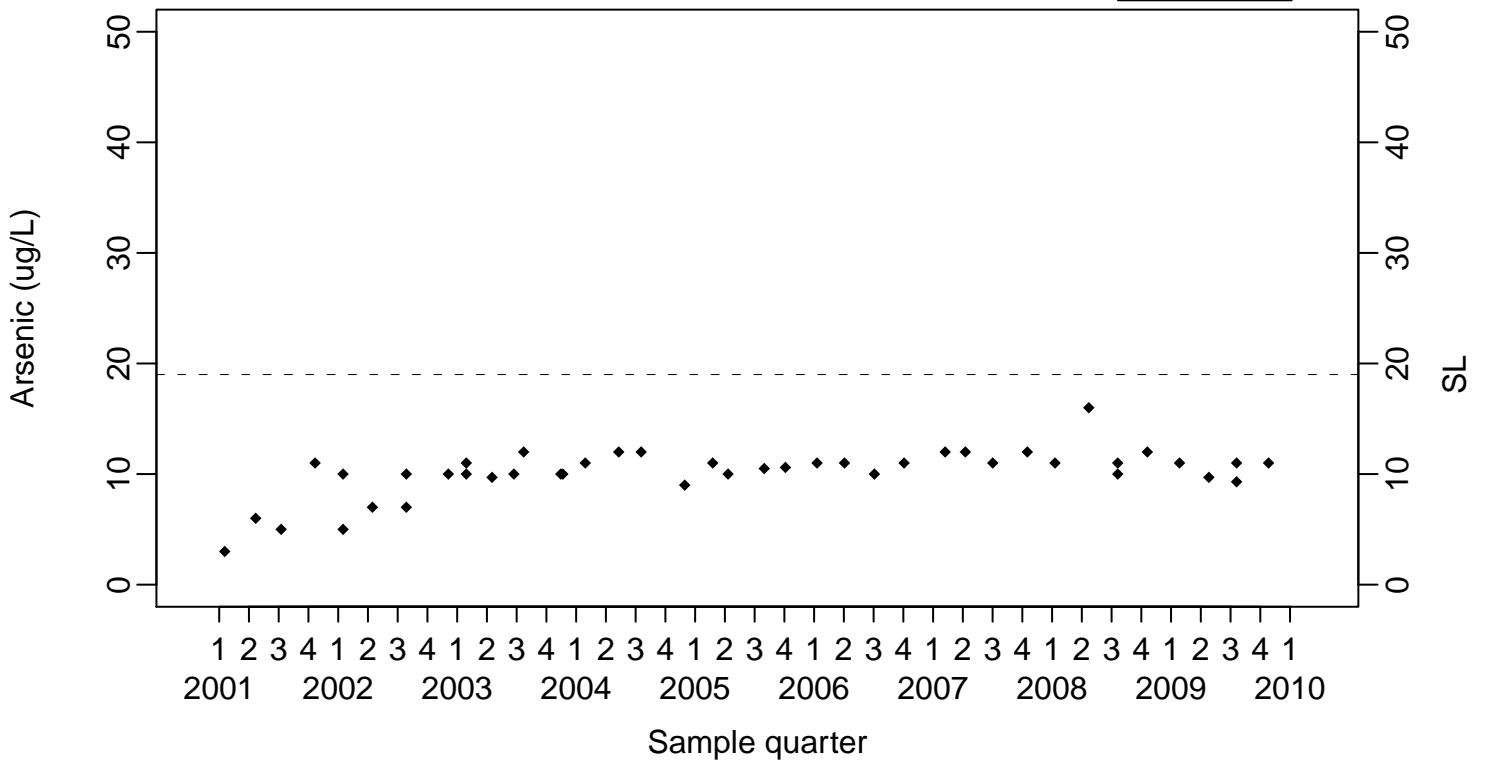


Pit 1 Area Arsenic (ug/L)

SL=19

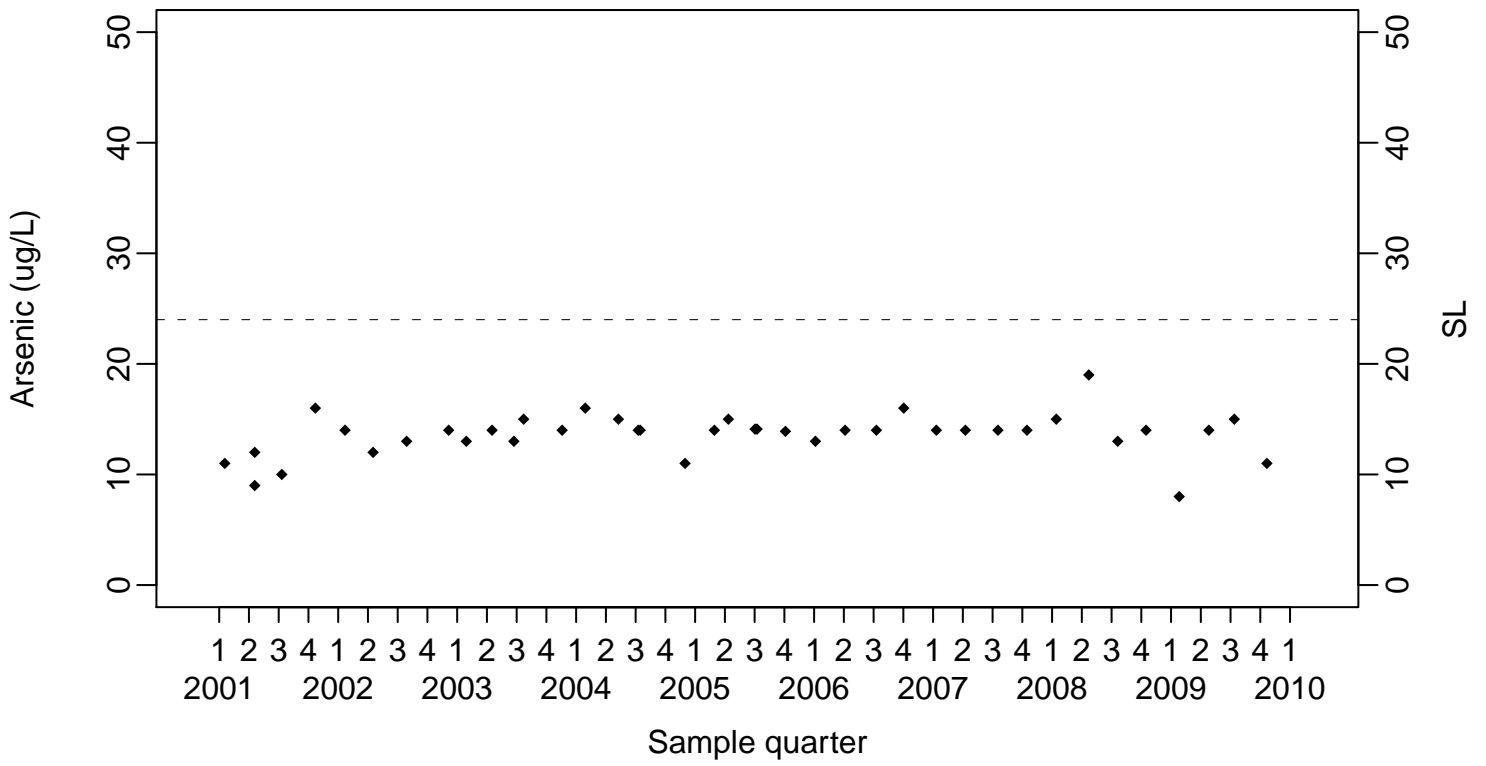
Compliance Monitoring Point K1-04

◆ Above RL
▽ Below RL



SL=24

Compliance Monitoring Point K1-05

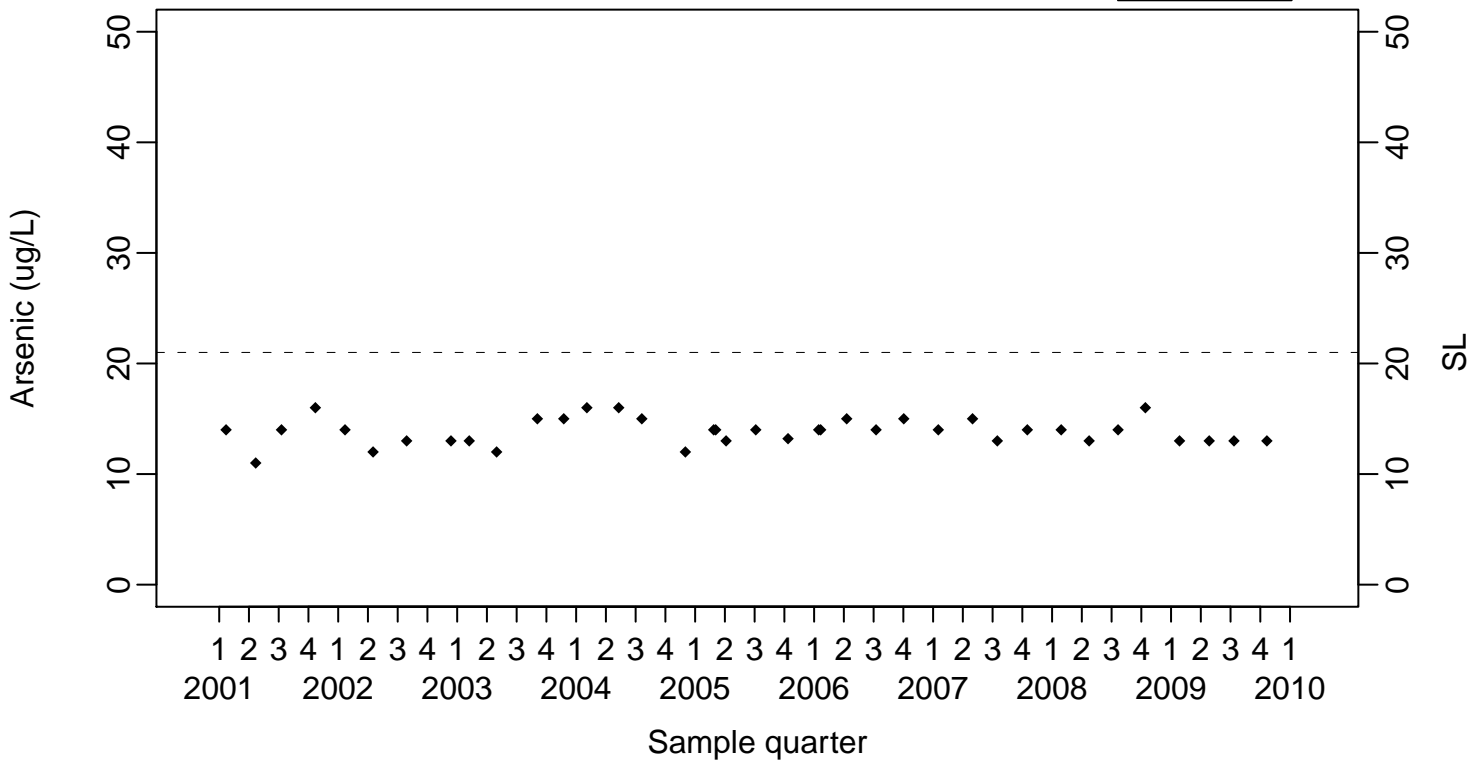


Pit 1 Area
Arsenic (ug/L)

SL=21

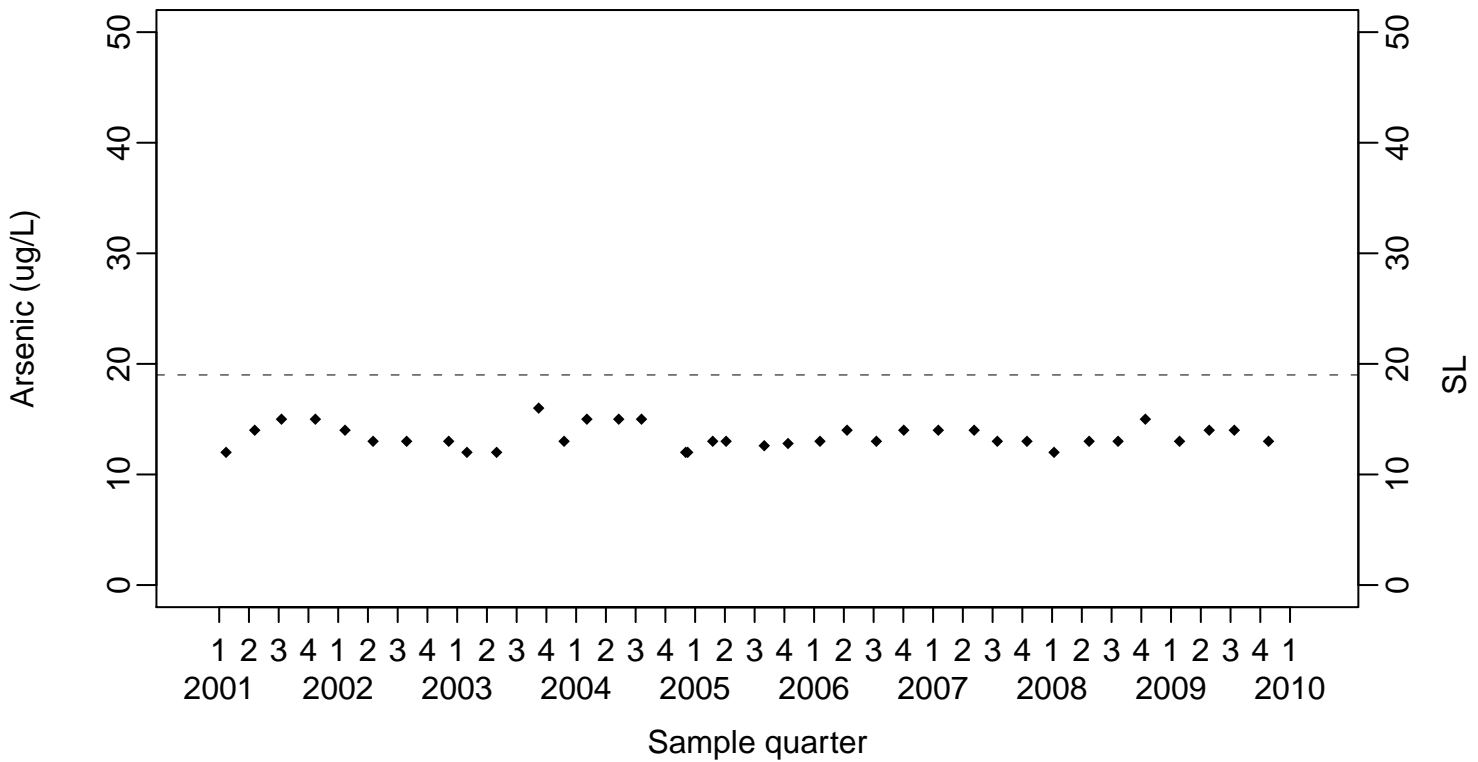
Compliance Monitoring Point K1-08

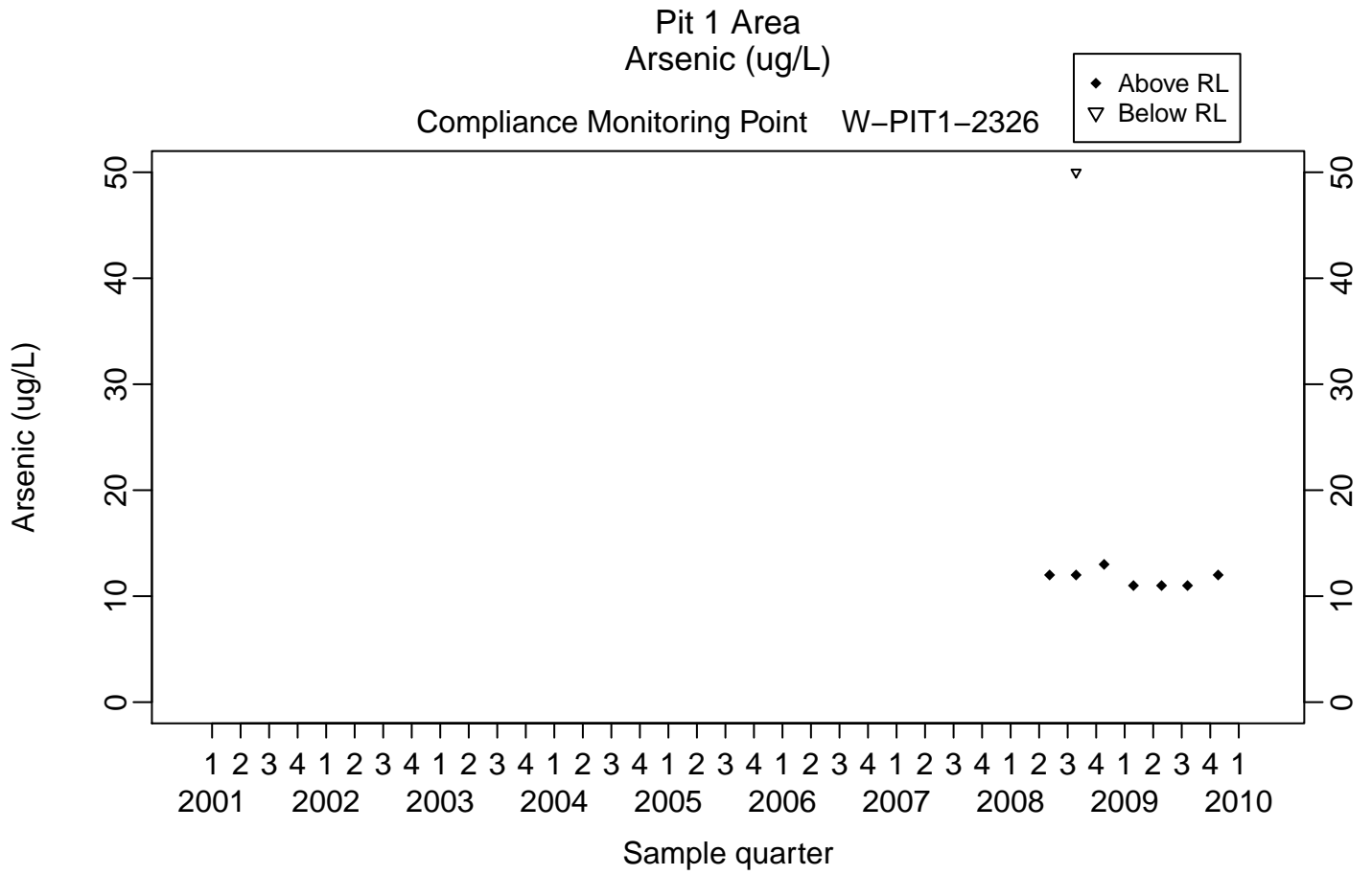
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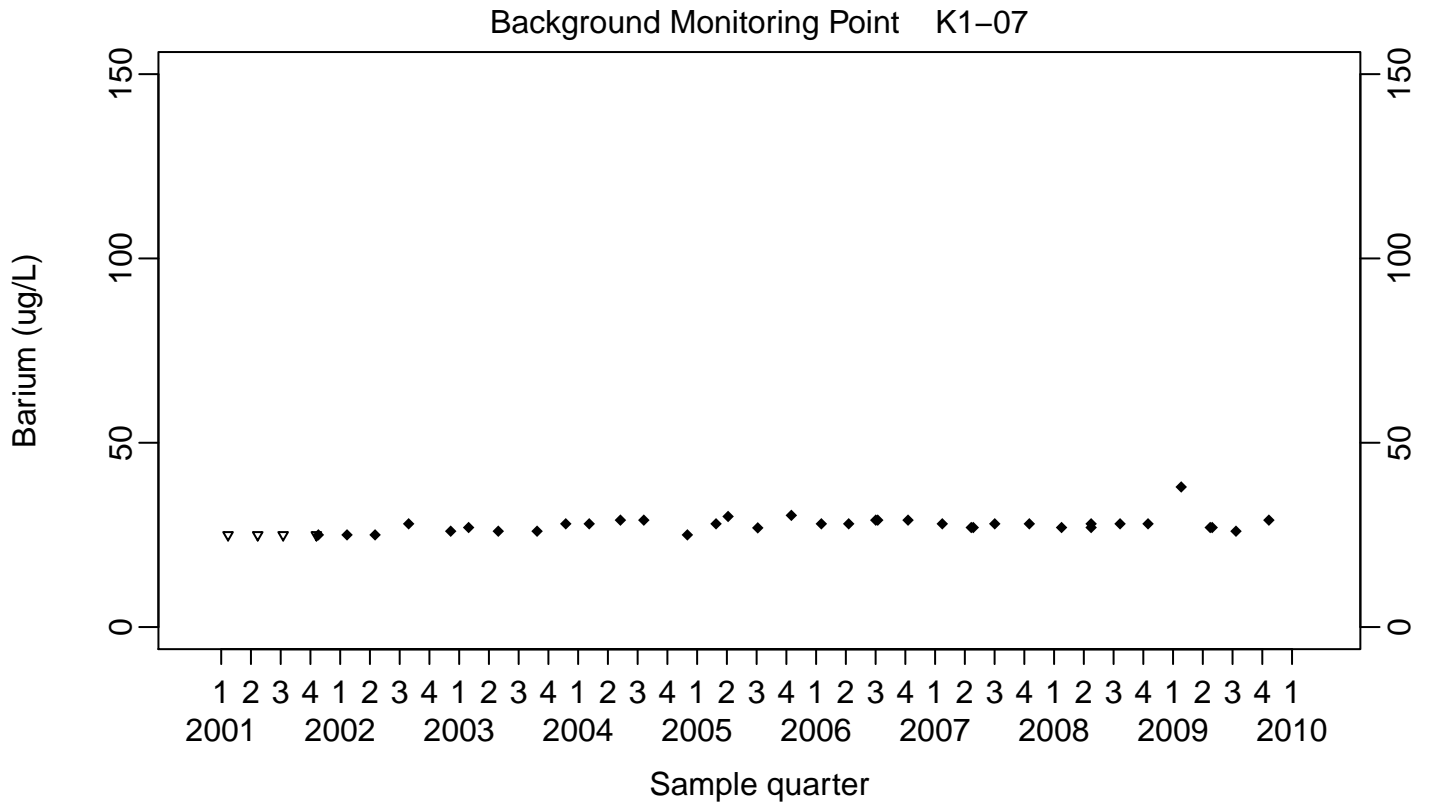
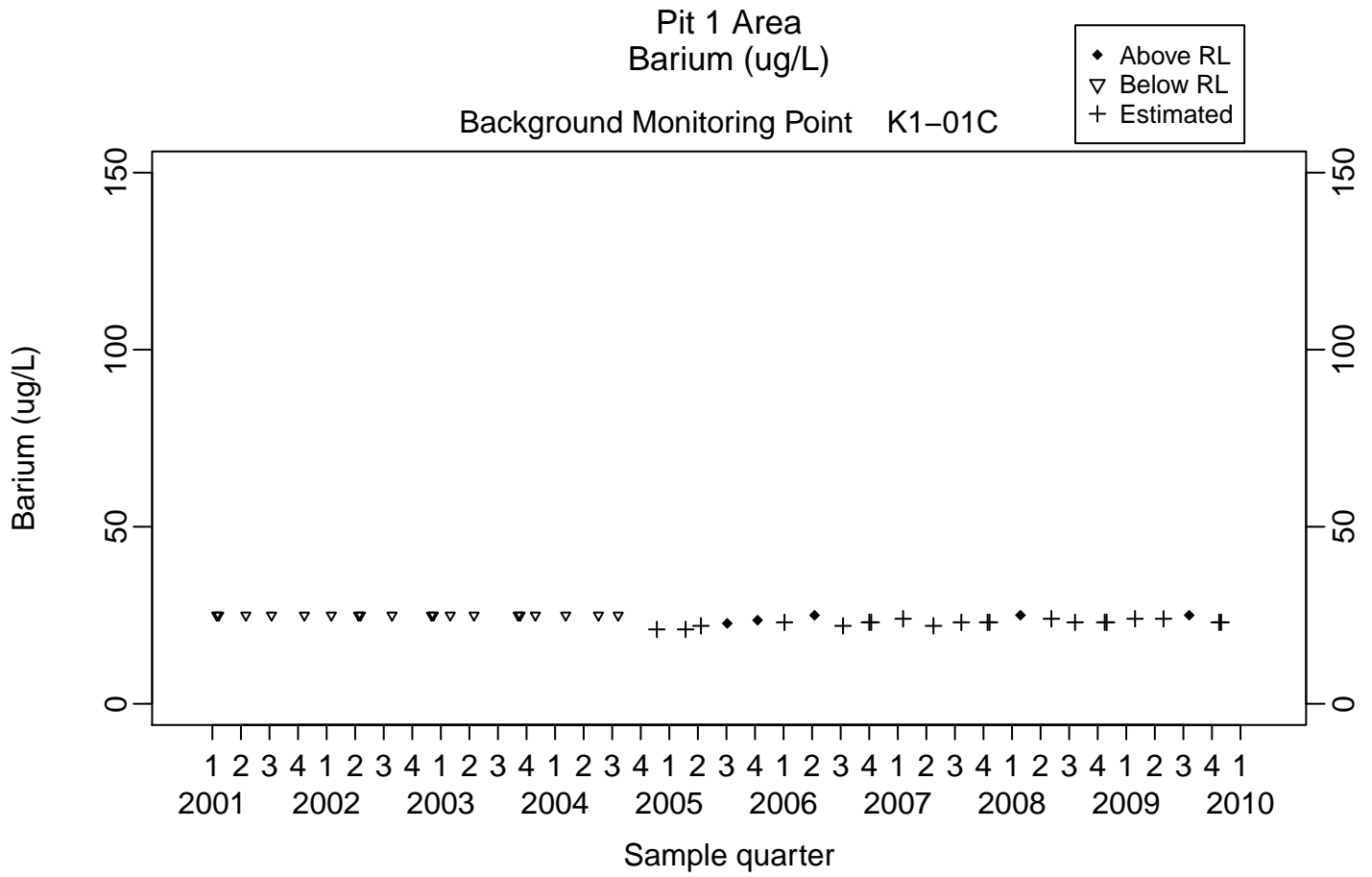


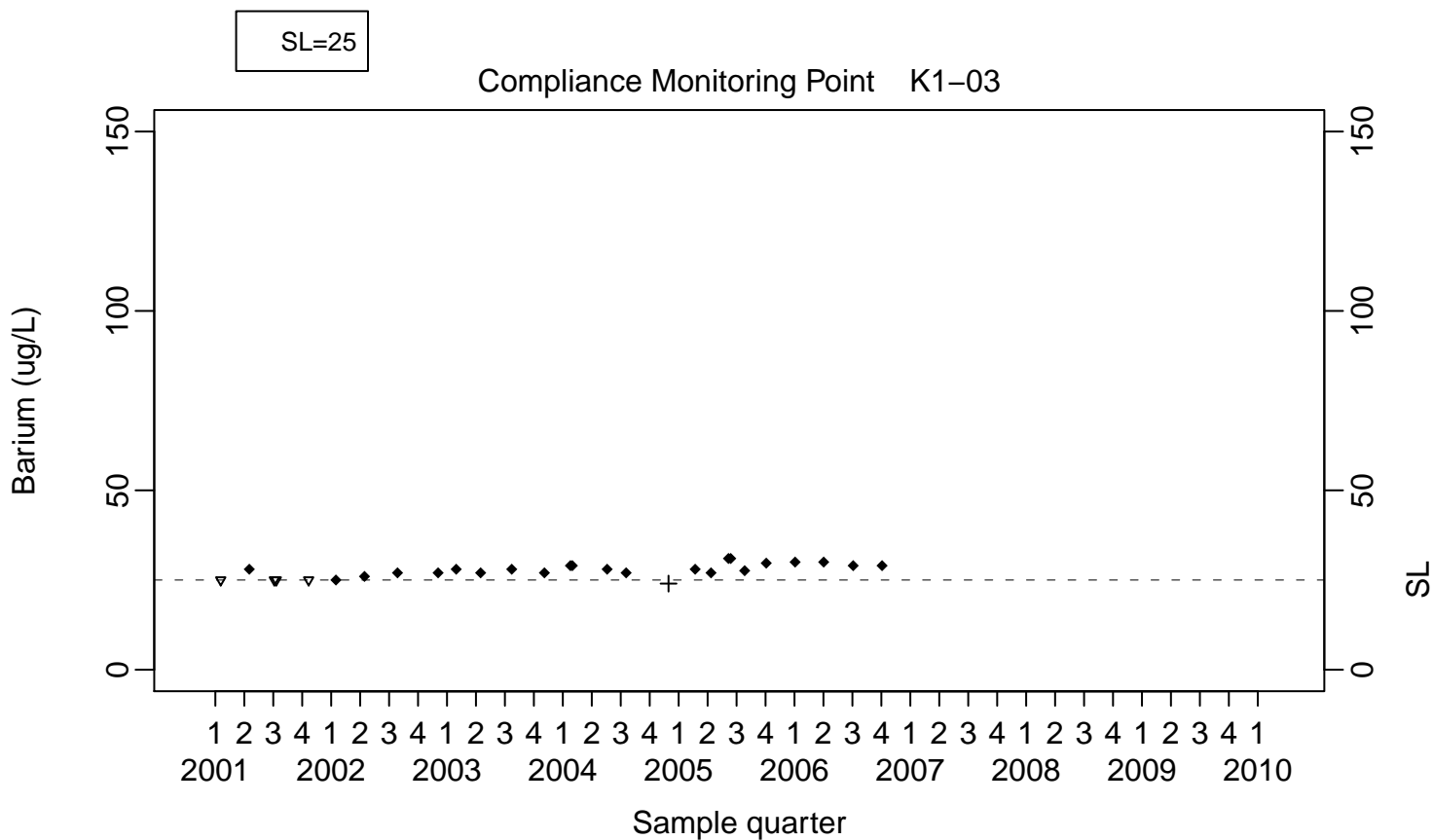
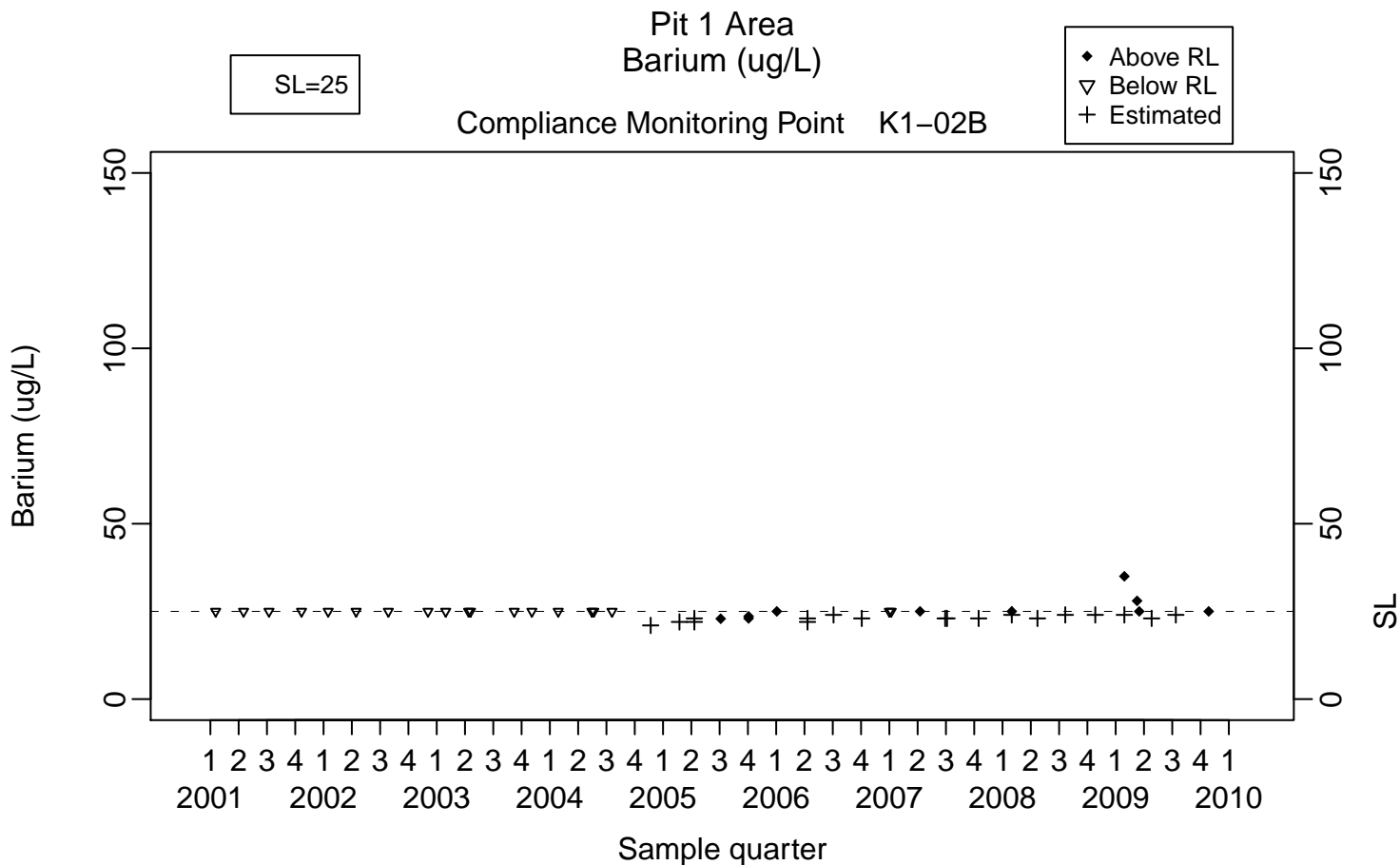
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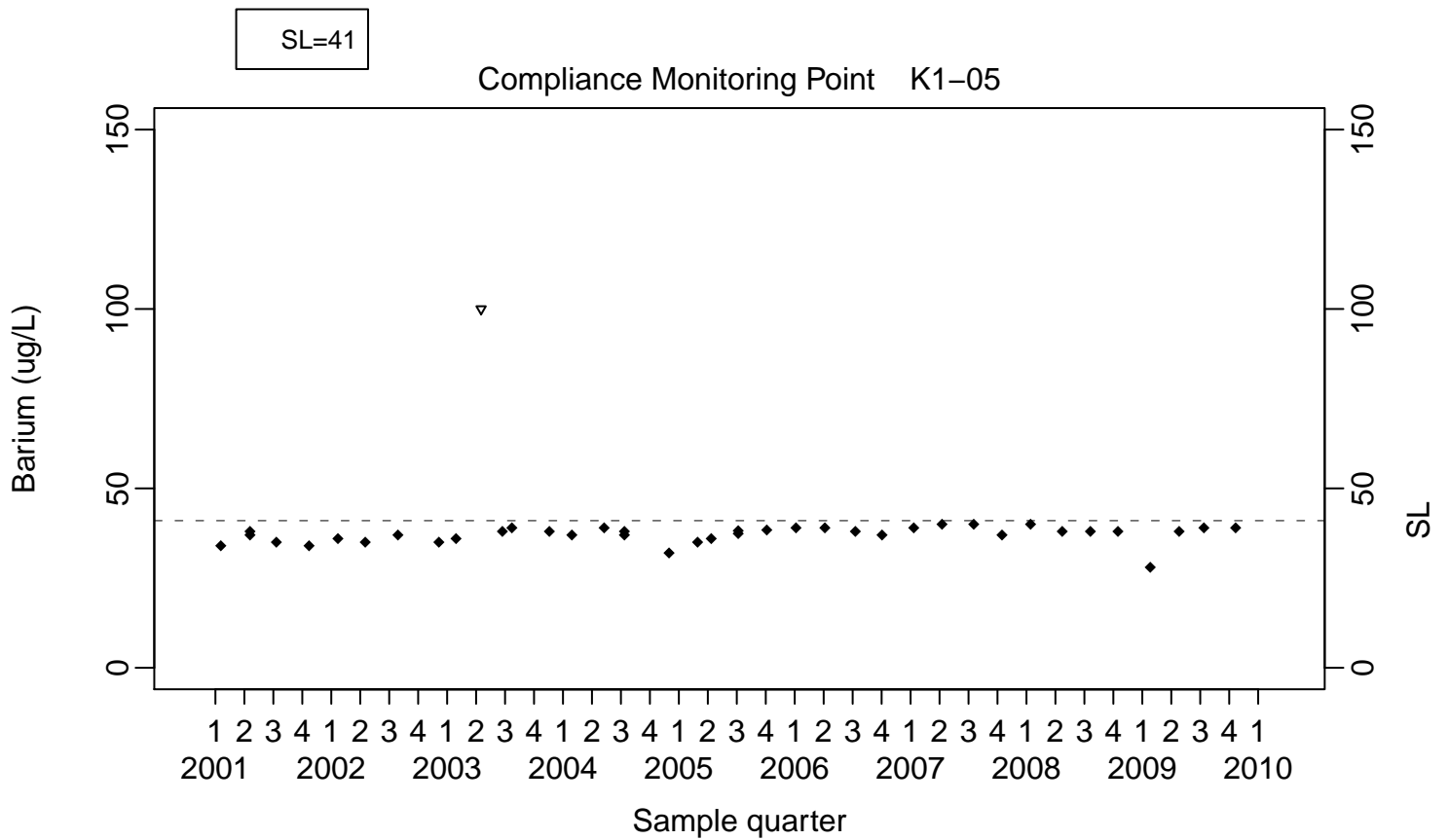
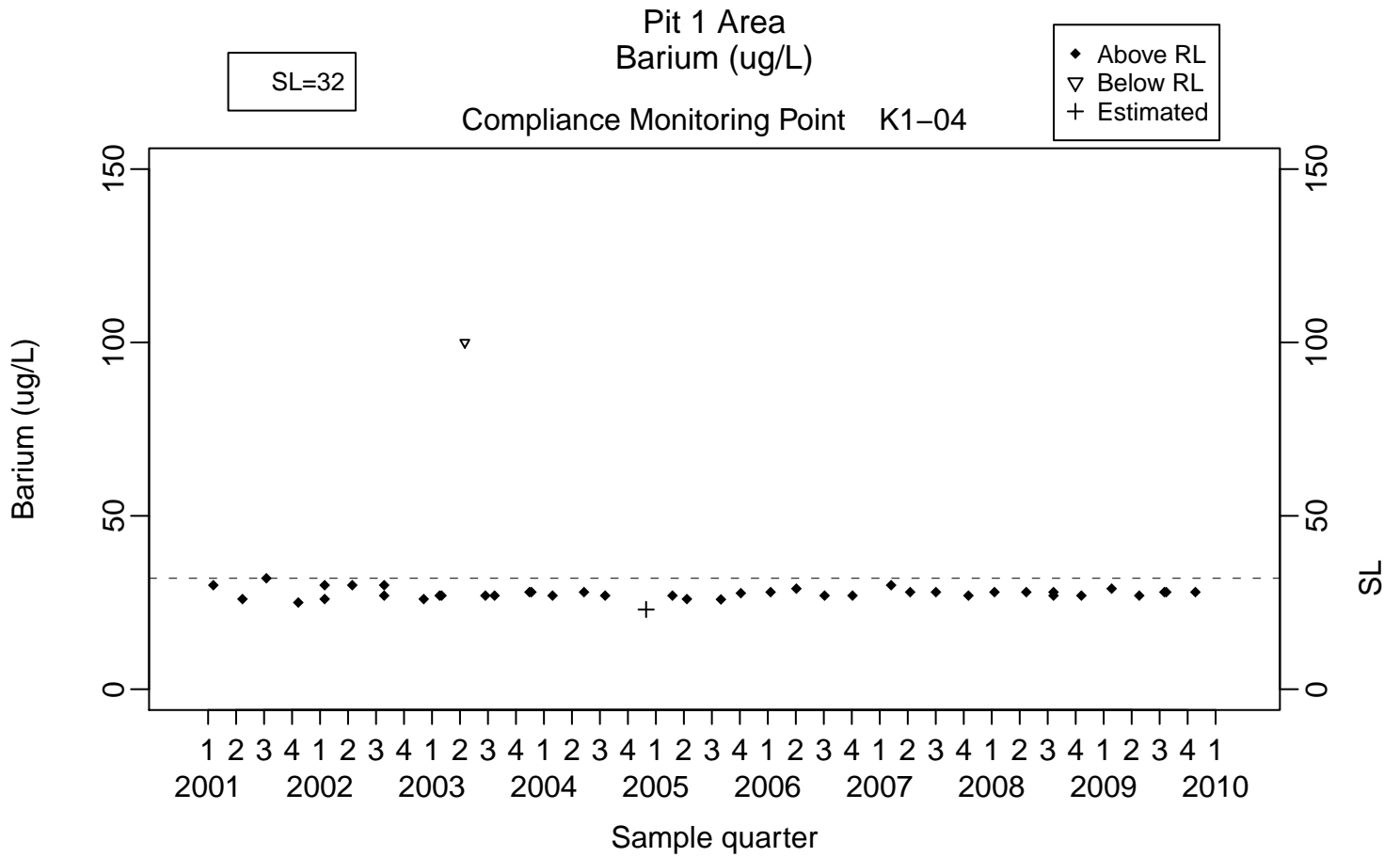
Compliance Monitoring Point K1-09

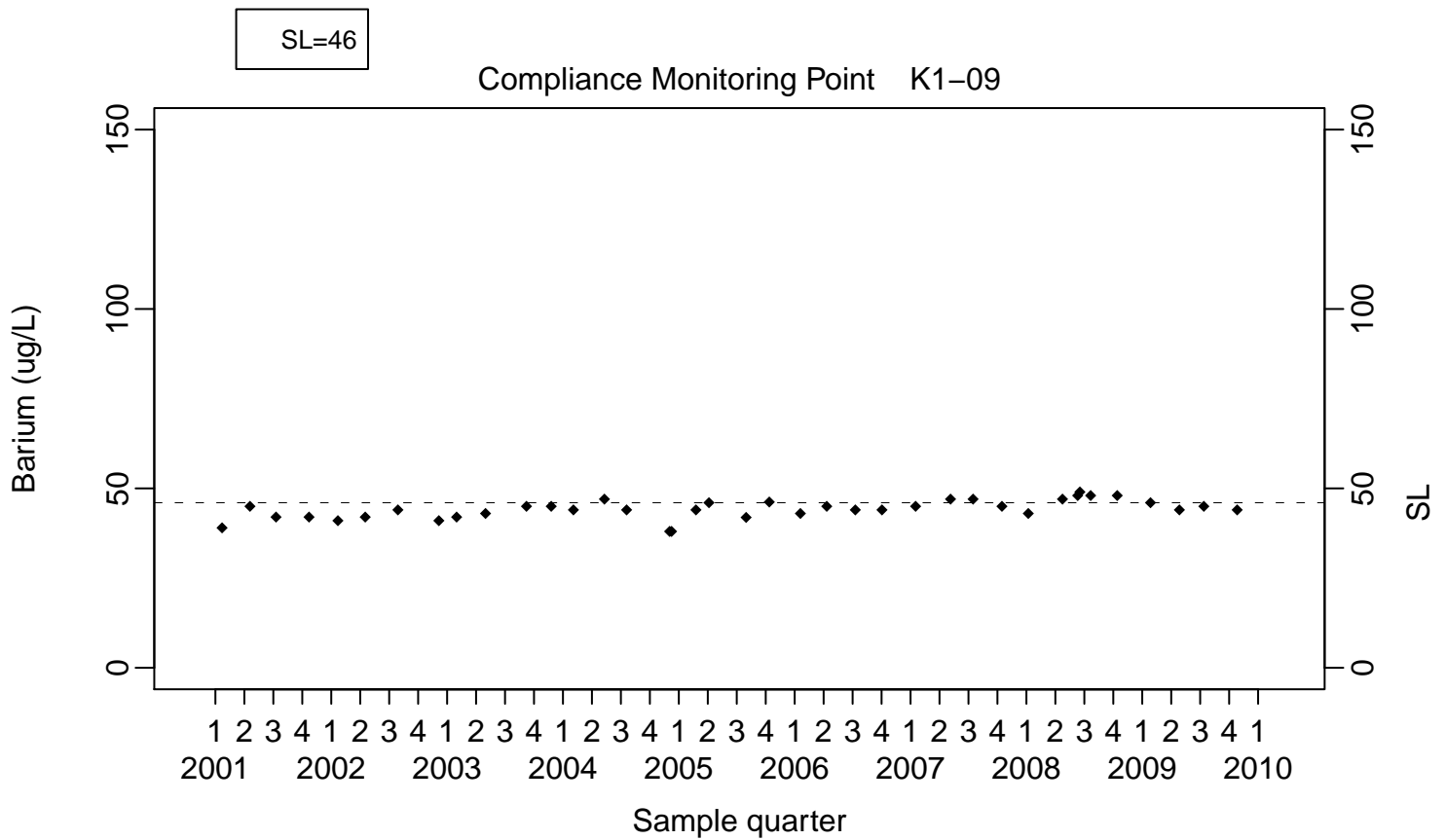
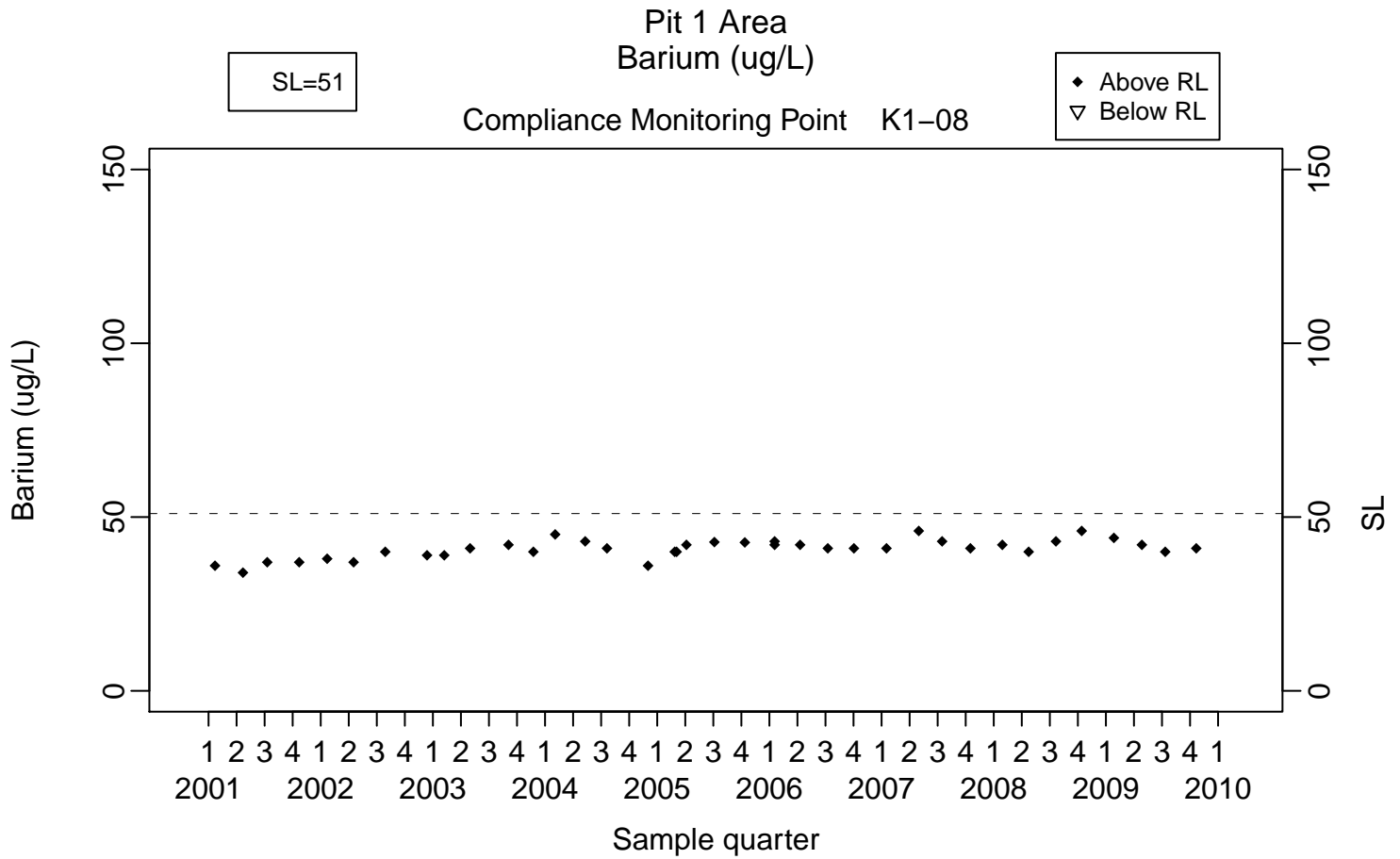


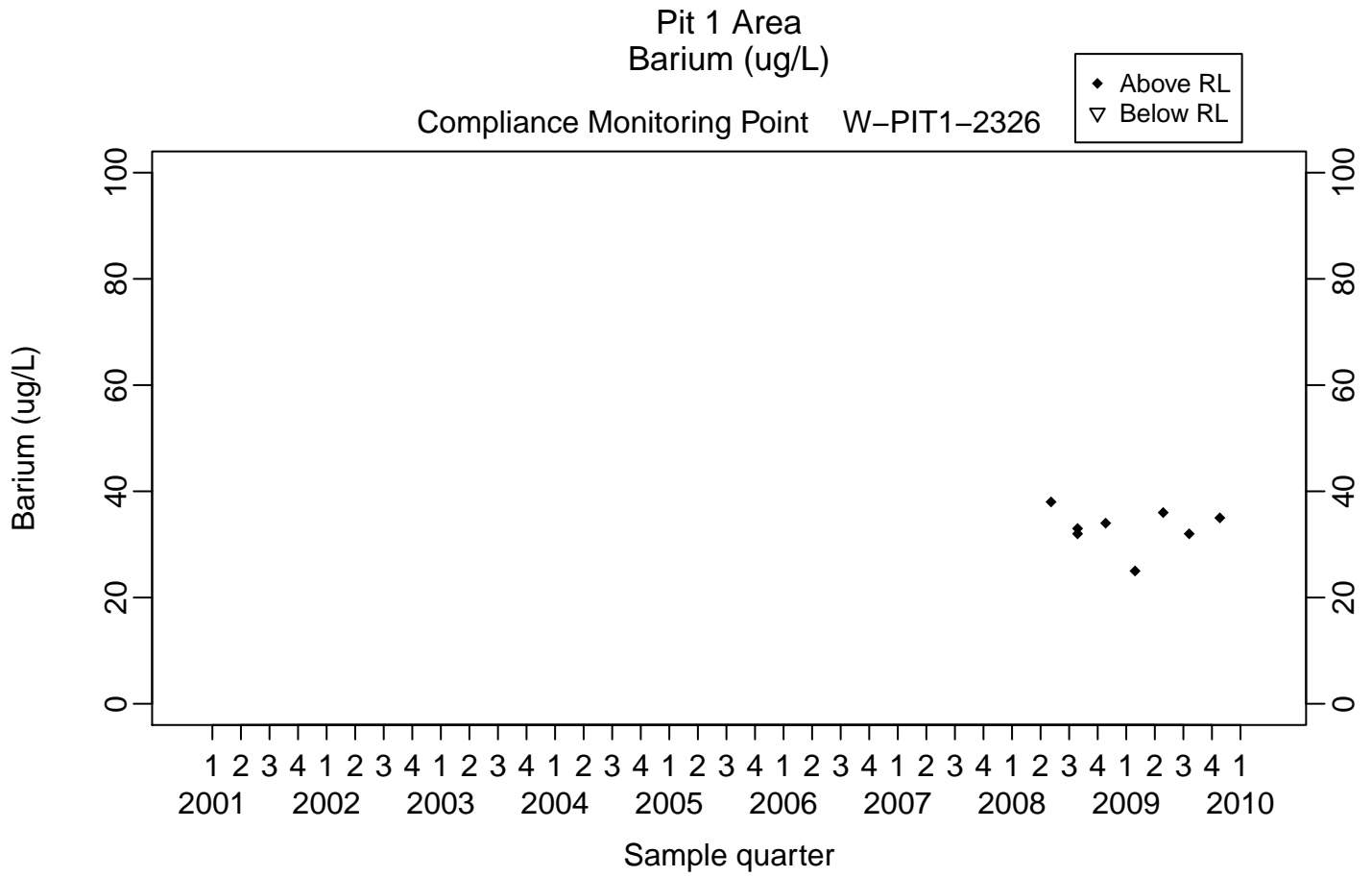








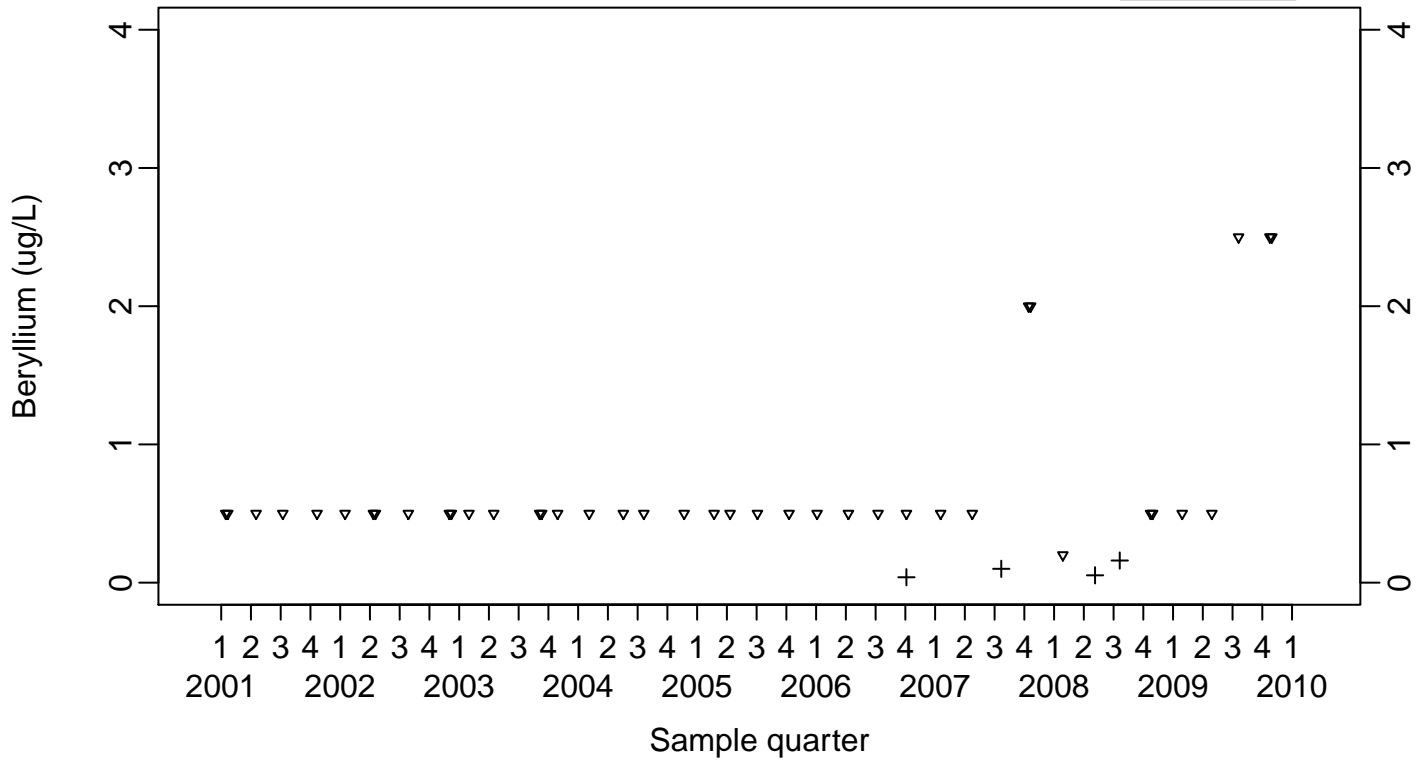




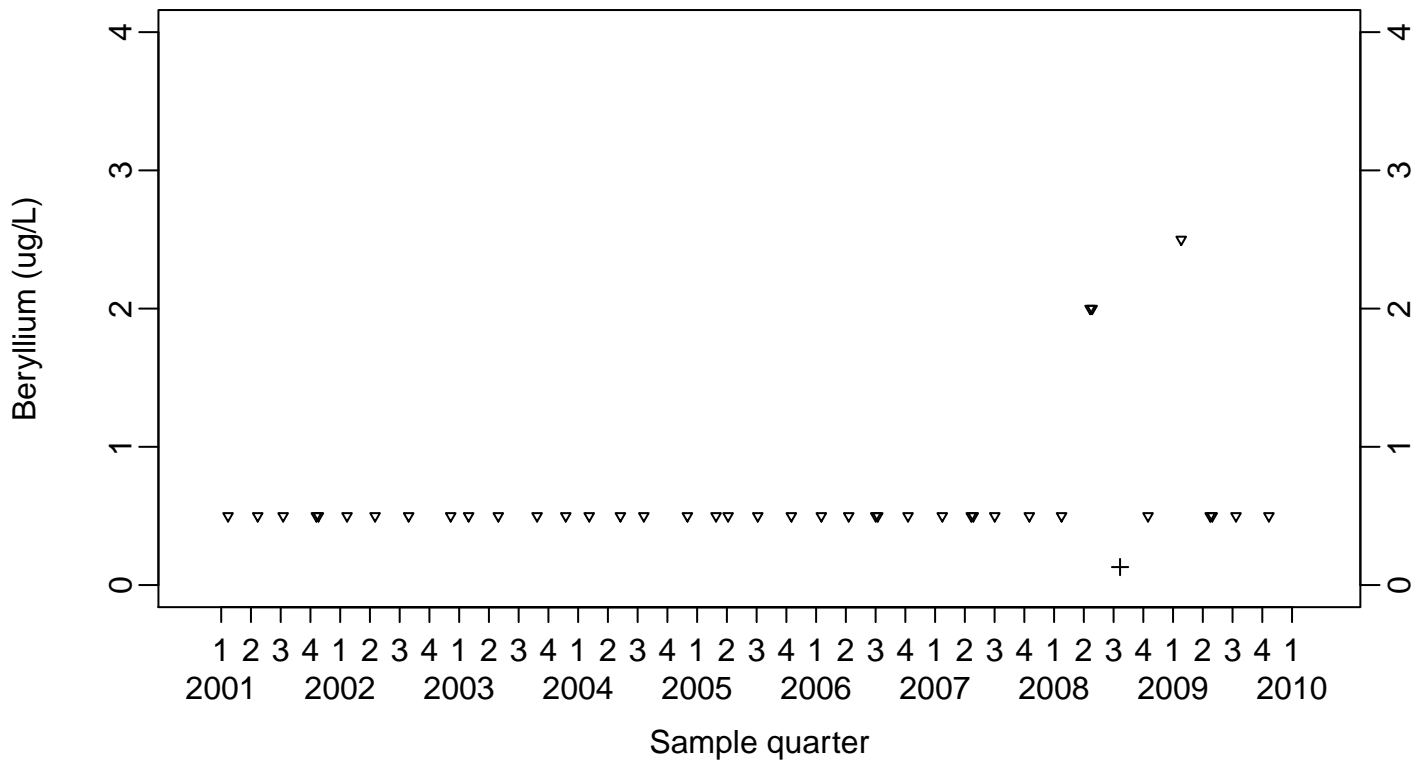
Pit 1 Area
Beryllium (ug/L)

Background Monitoring Point K1-01C

- ◆ Above RL
- ▽ Below RL
- + Estimated



Background Monitoring Point K1-07

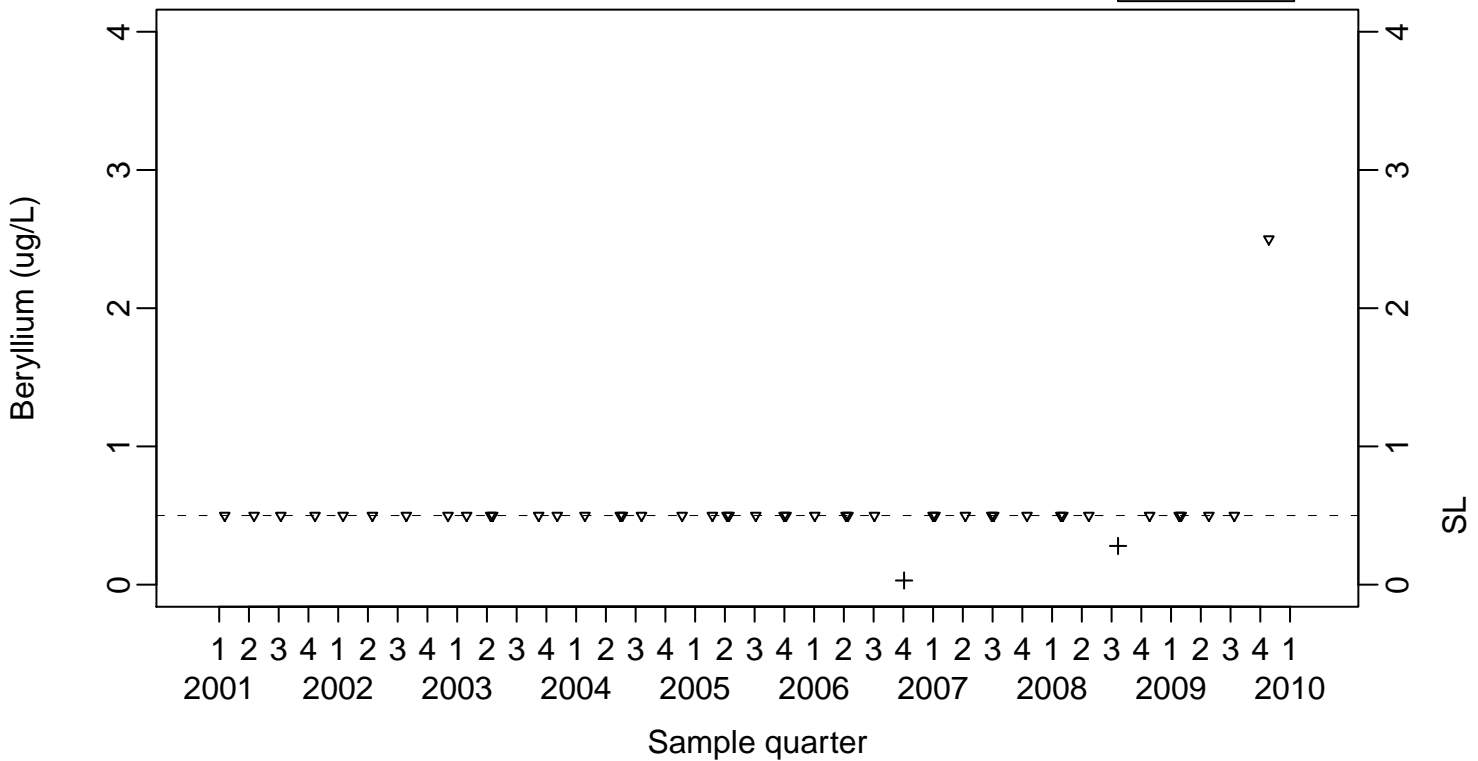


Pit 1 Area Beryllium (ug/L)

Compliance Monitoring Point K1-02B

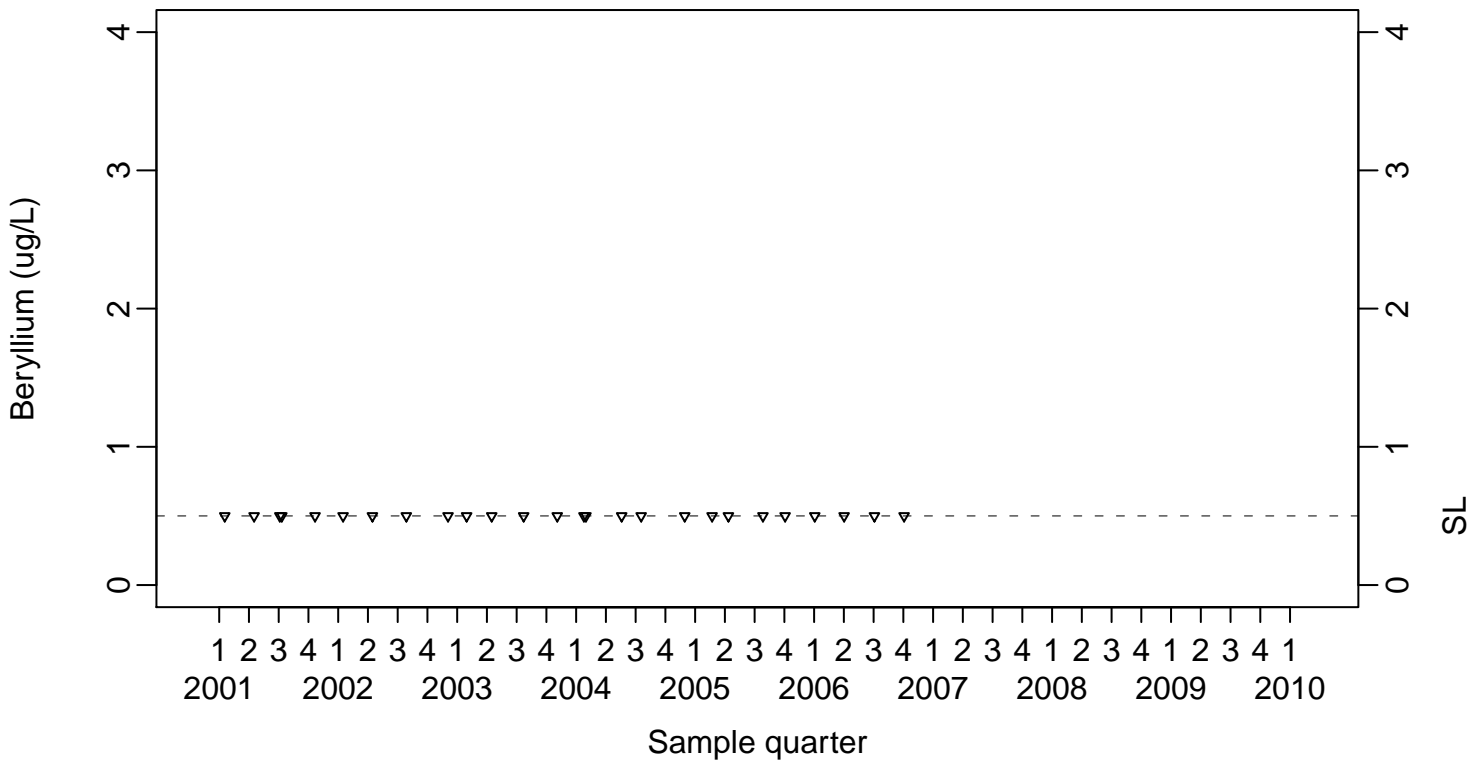
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- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K1-03

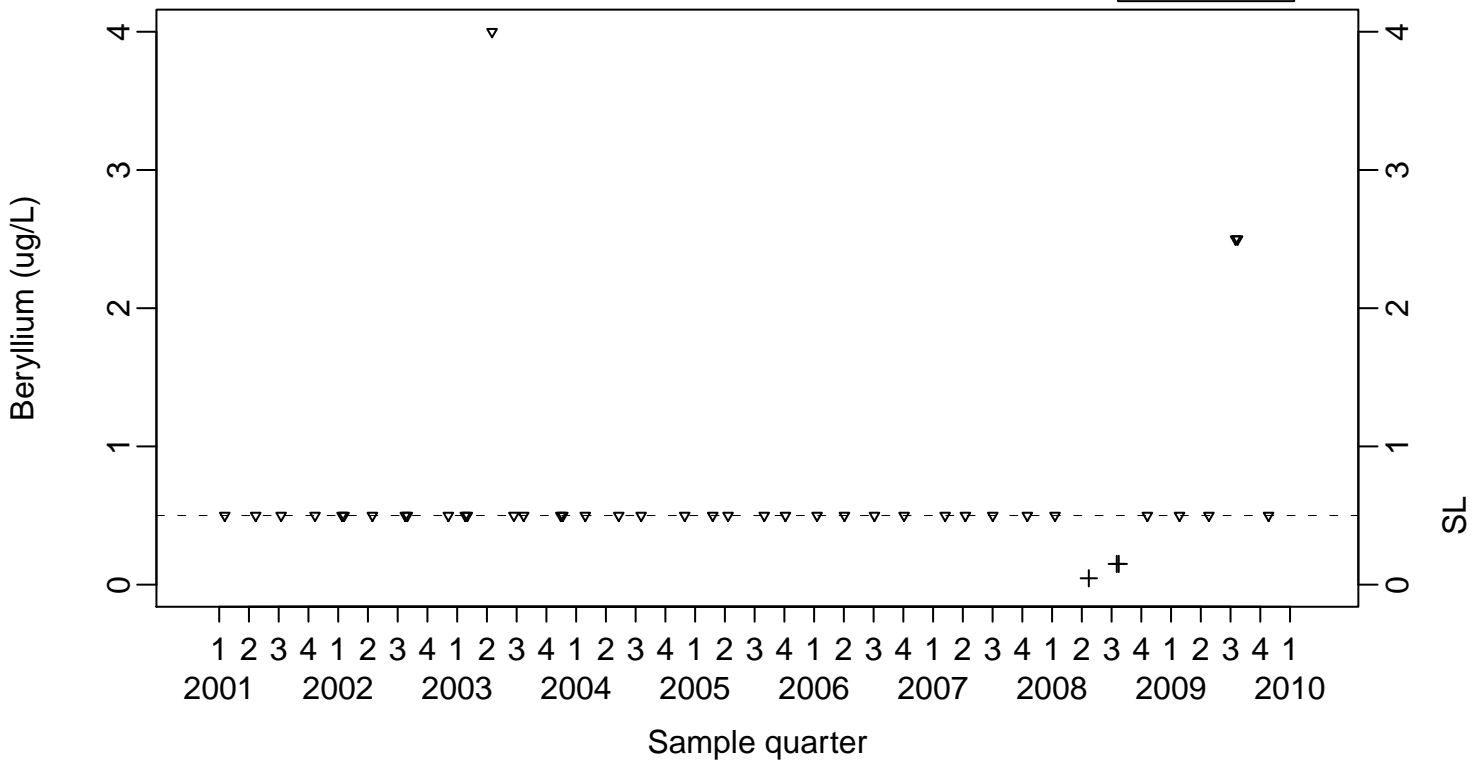


Pit 1 Area
Beryllium (ug/L)

Compliance Monitoring Point K1-04

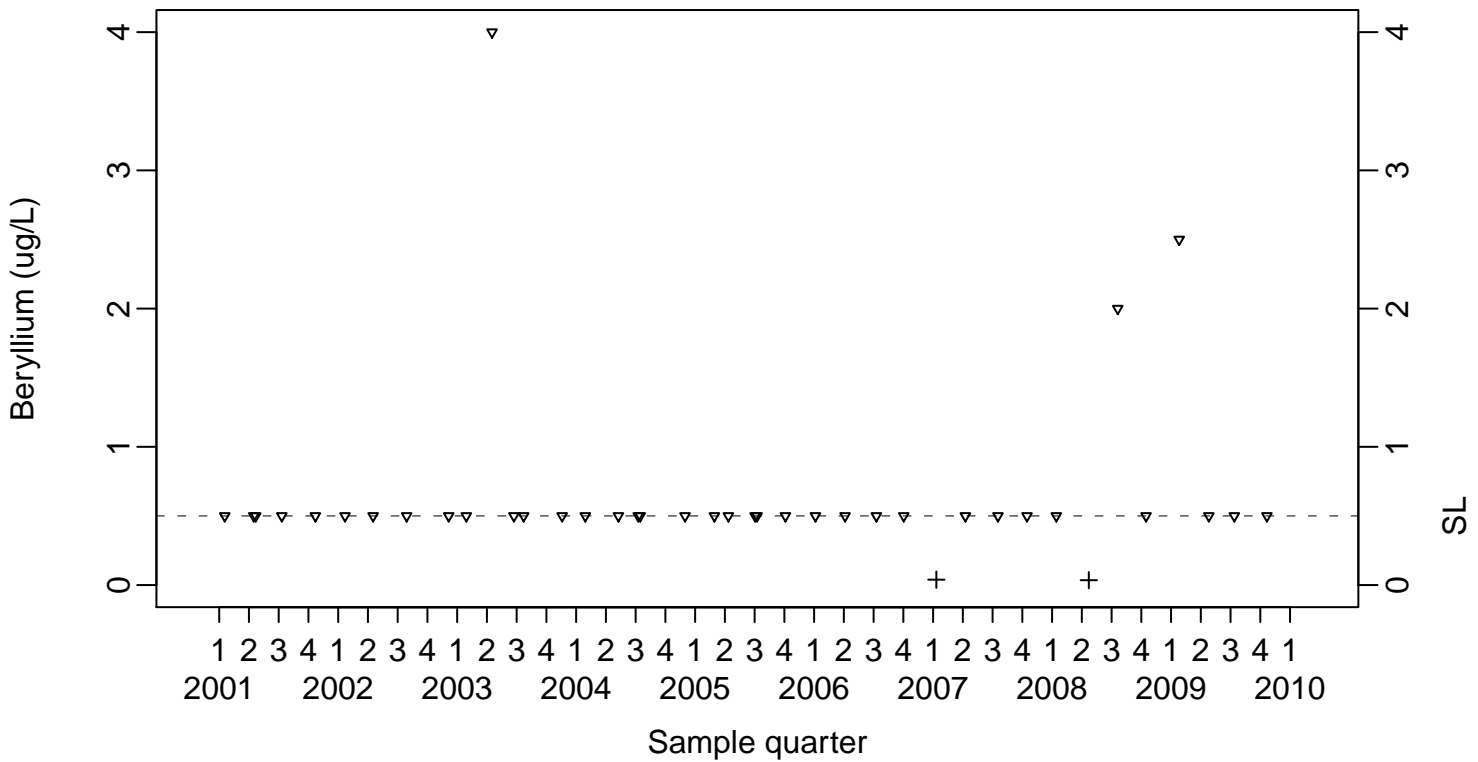
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- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K1-05

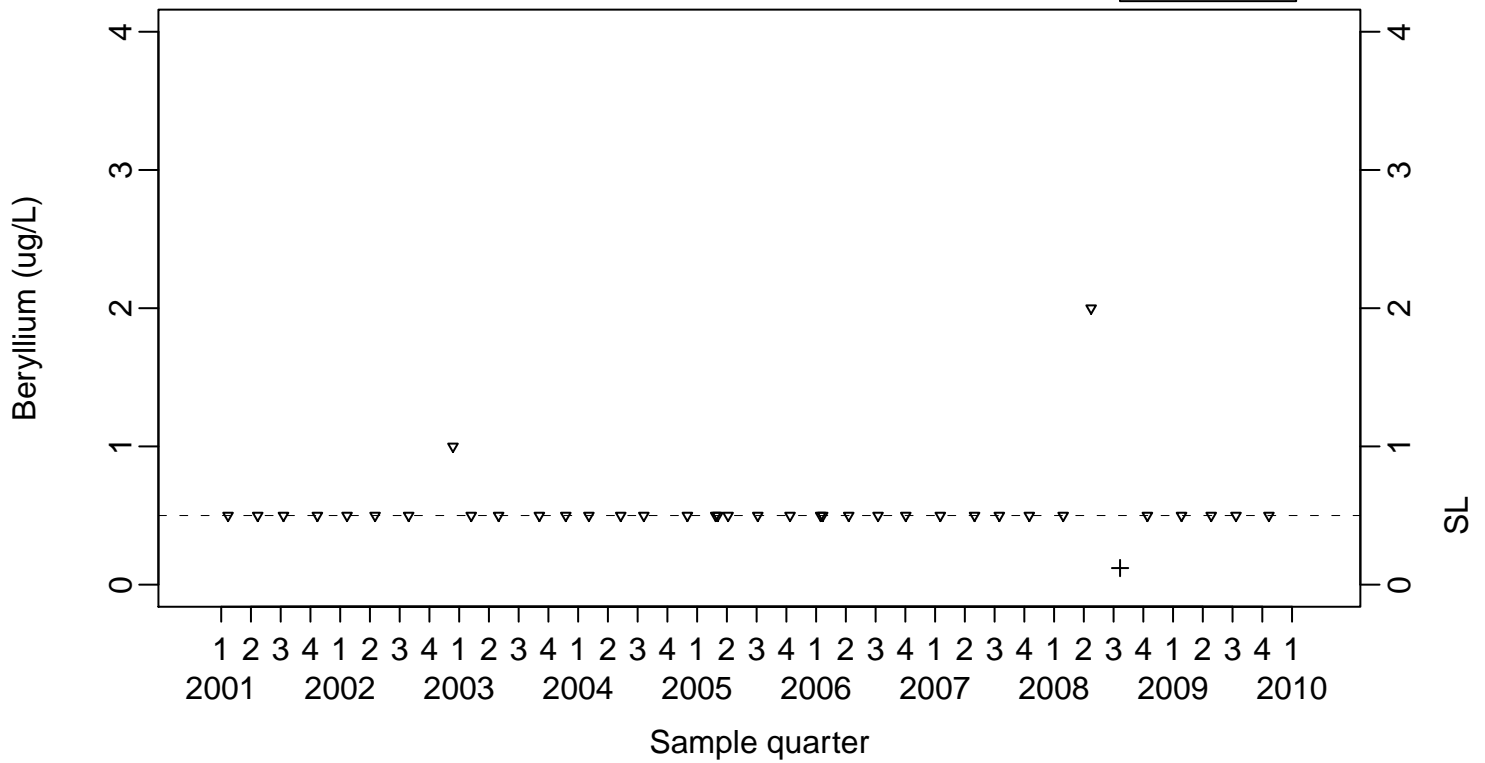


Pit 1 Area Beryllium (ug/L)

Compliance Monitoring Point K1-08

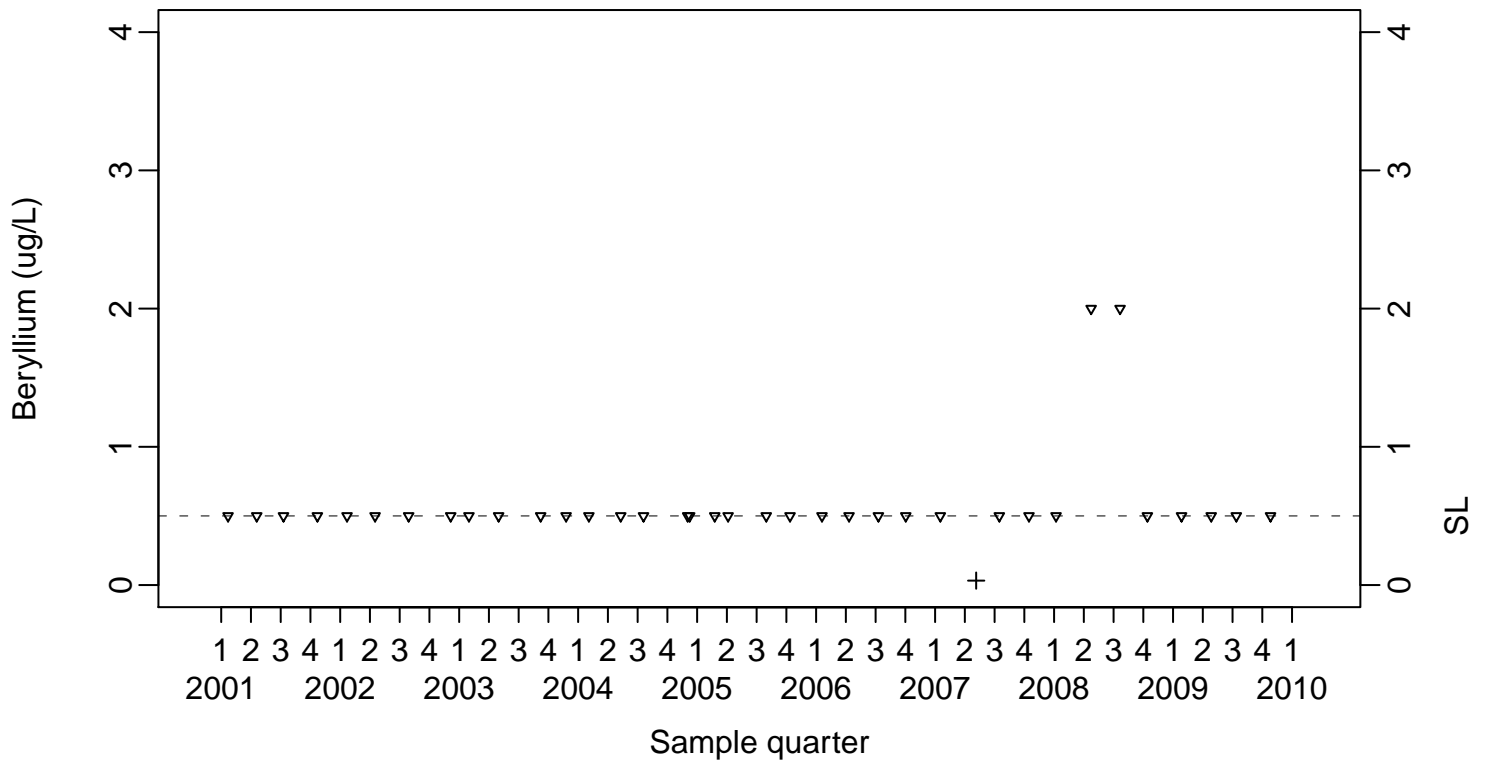
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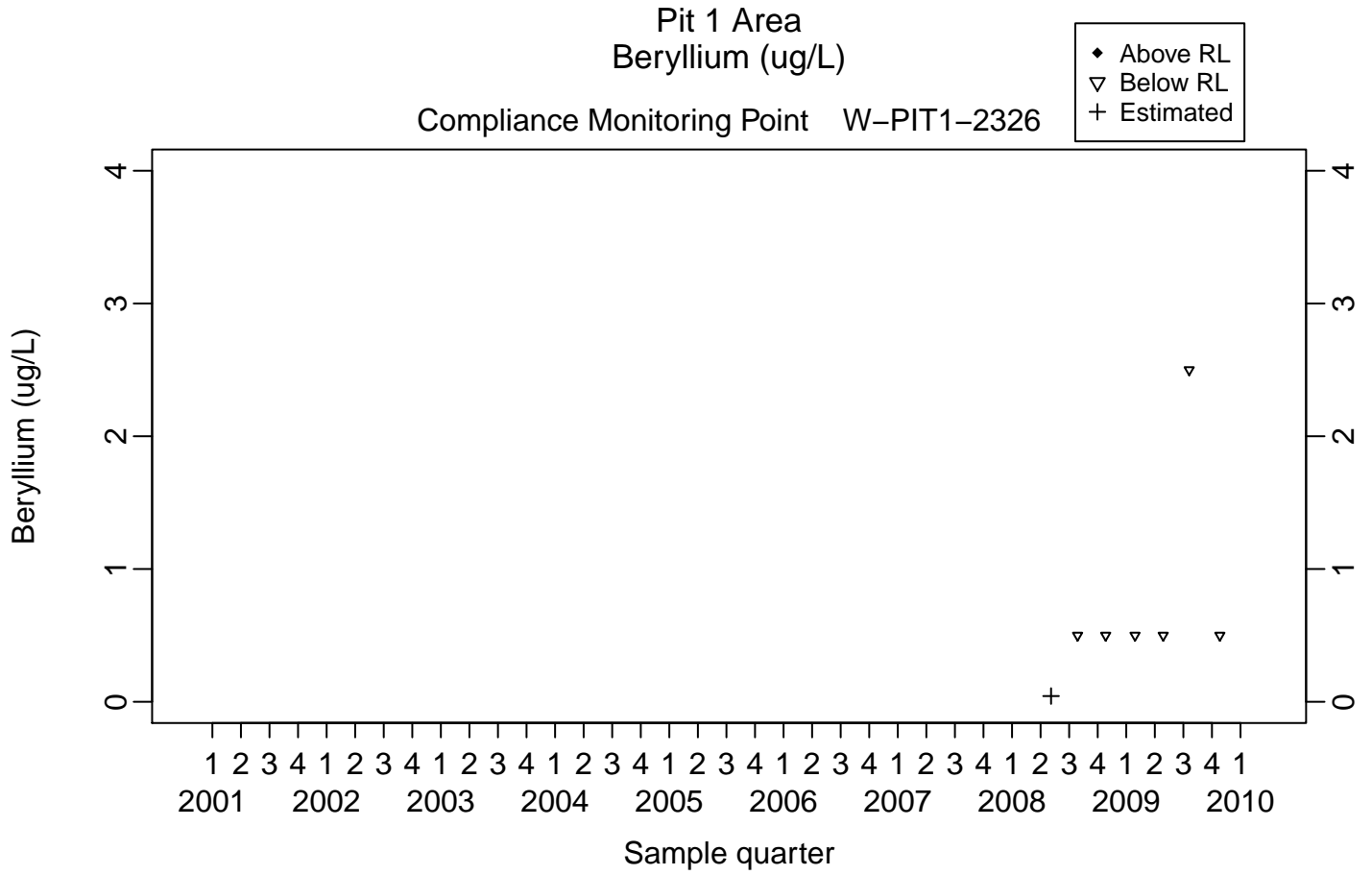
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K1-09

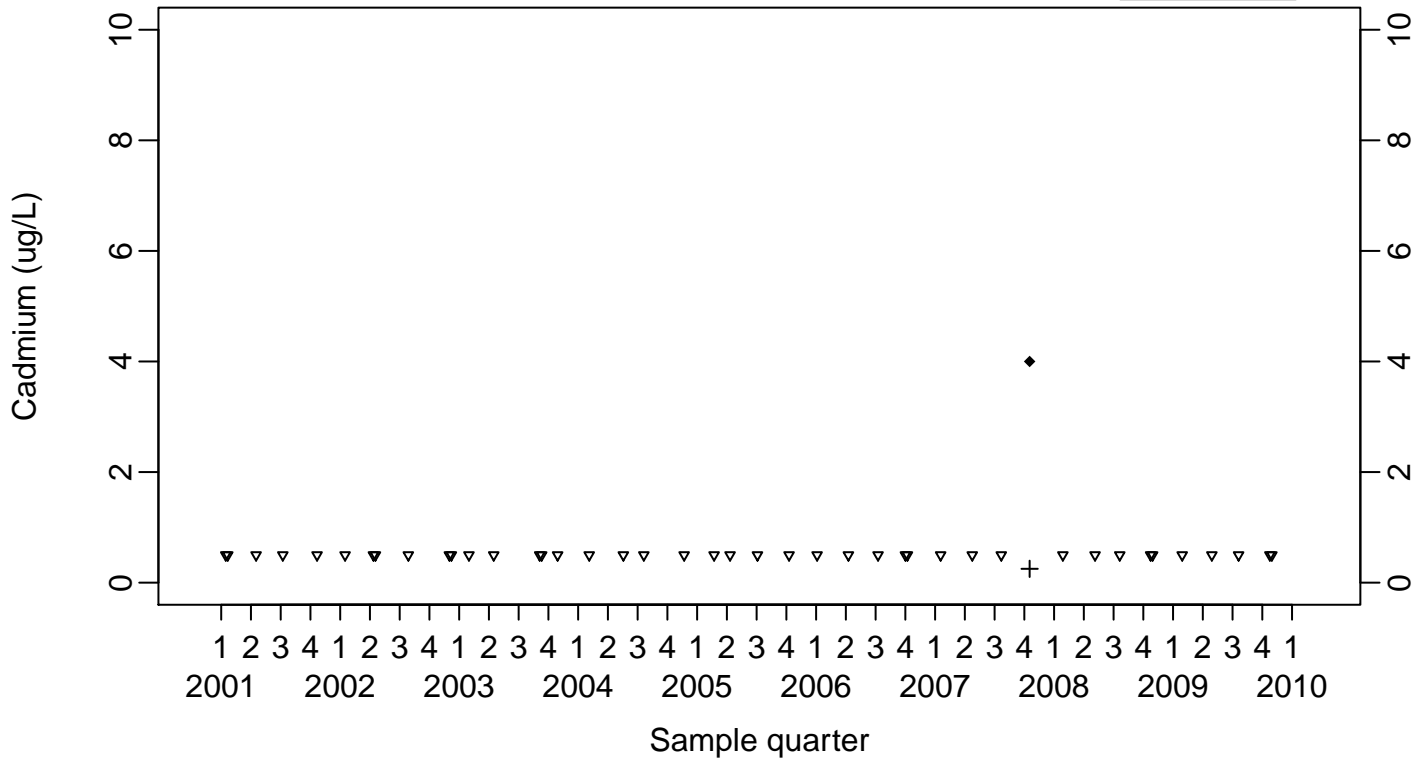




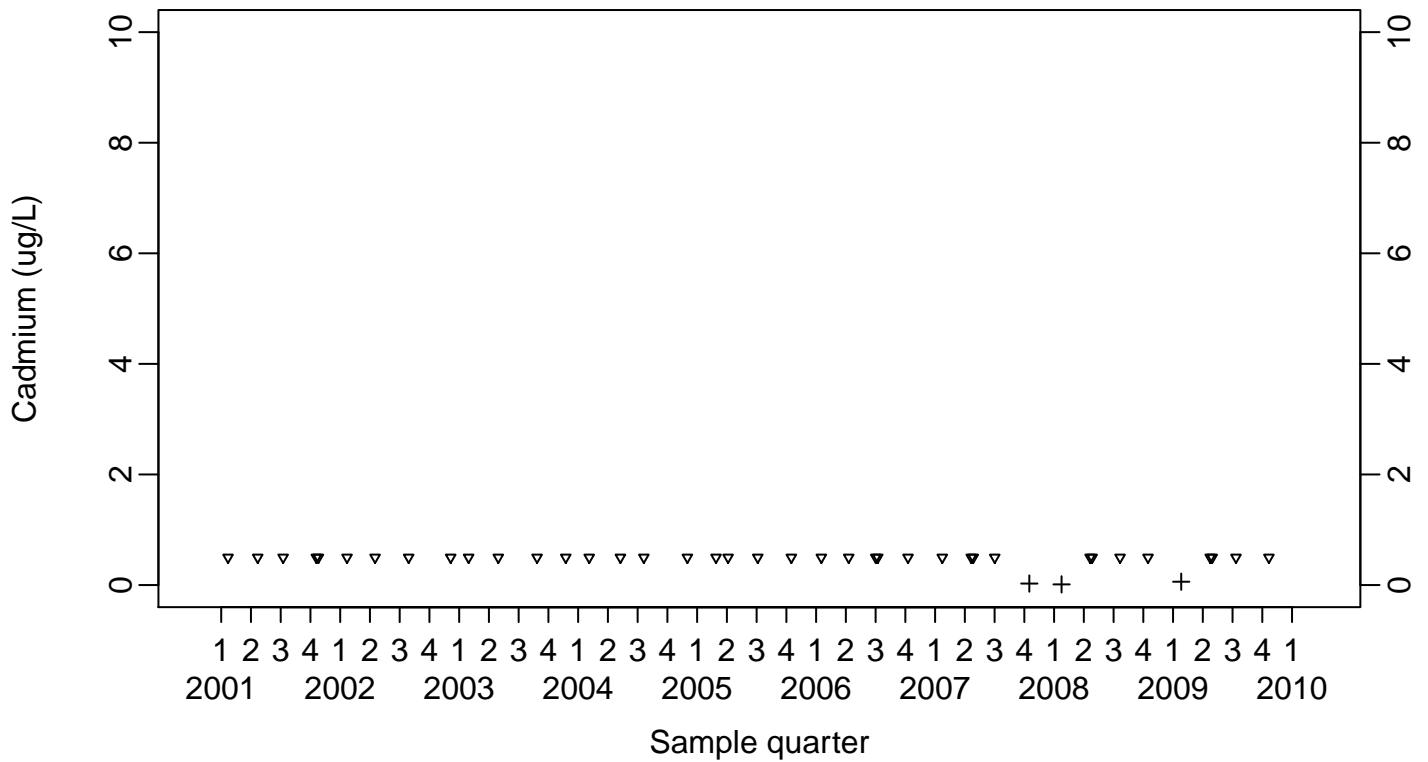
Pit 1 Area
Cadmium (ug/L)

Background Monitoring Point K1-01C

- ◆ Above RL
- ▽ Below RL
- + Estimated



Background Monitoring Point K1-07

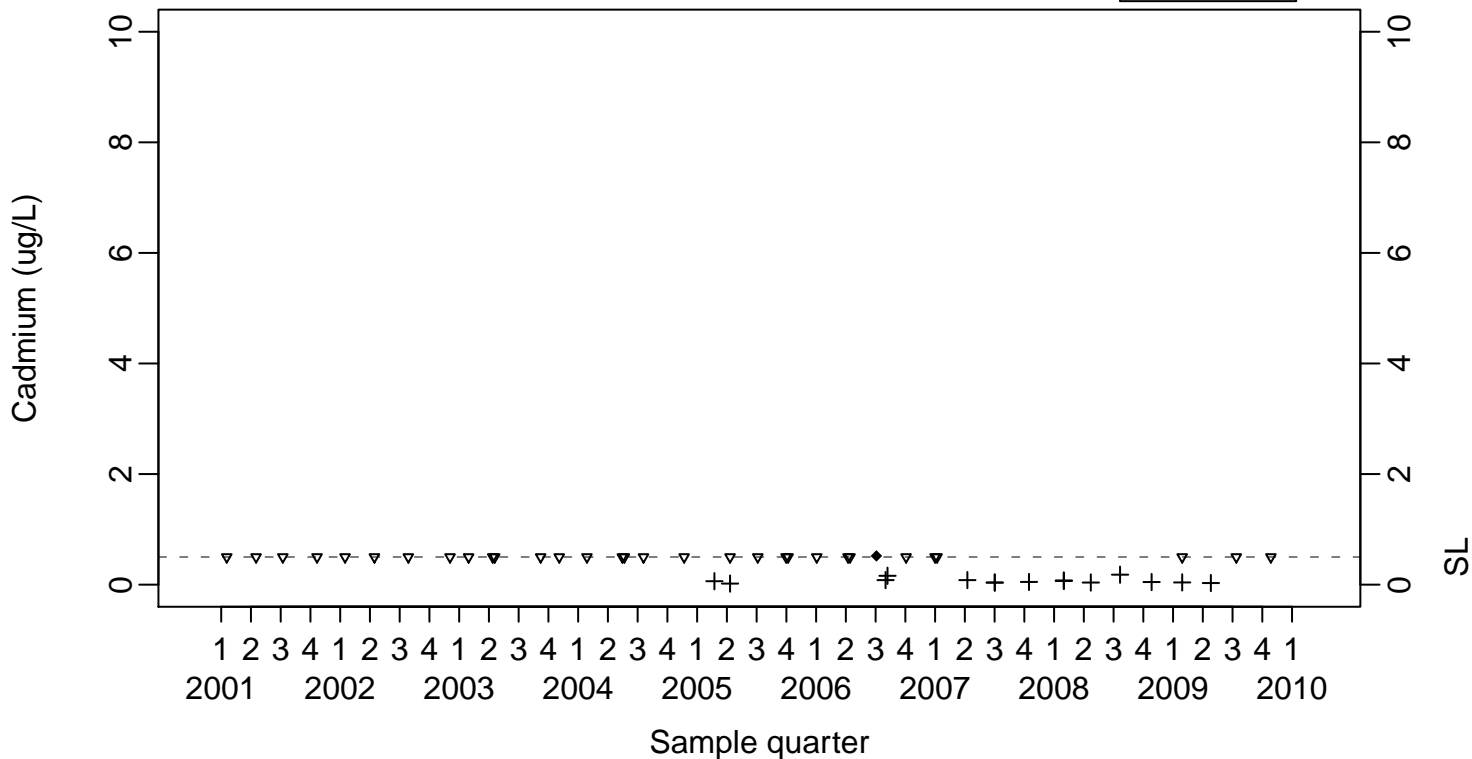


Pit 1 Area Cadmium (ug/L)

Compliance Monitoring Point K1-02B

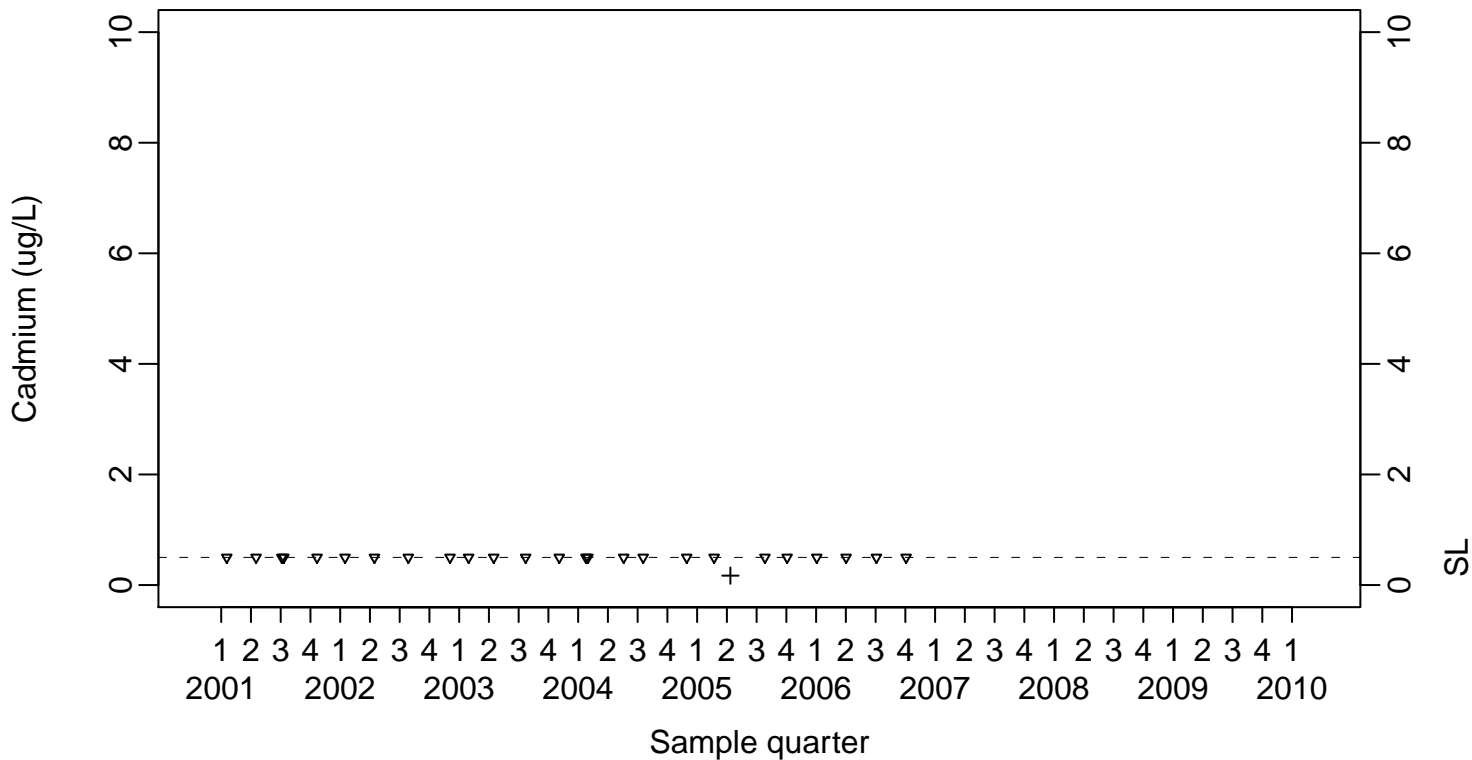
SL=0.5

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K1-03

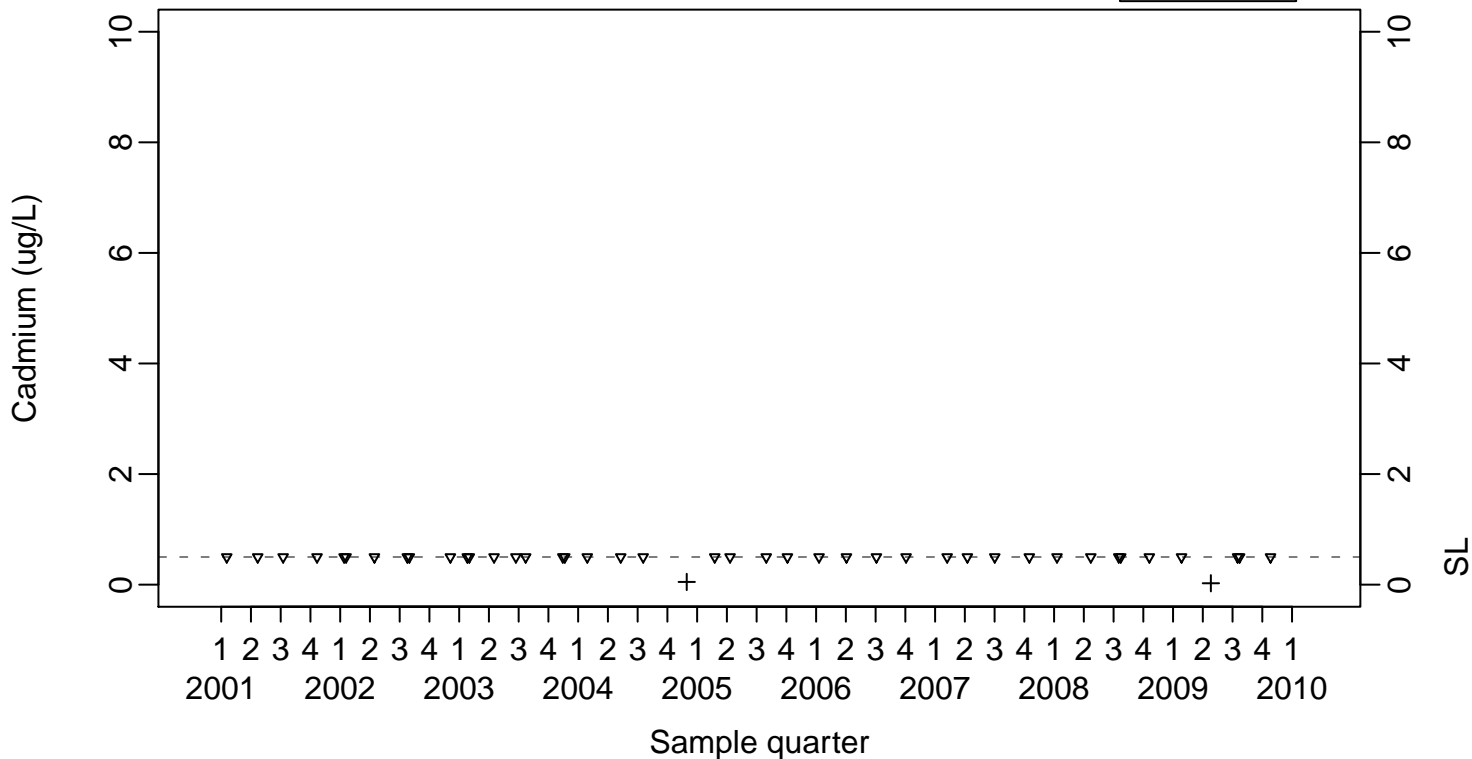


Pit 1 Area Cadmium (ug/L)

Compliance Monitoring Point K1-04

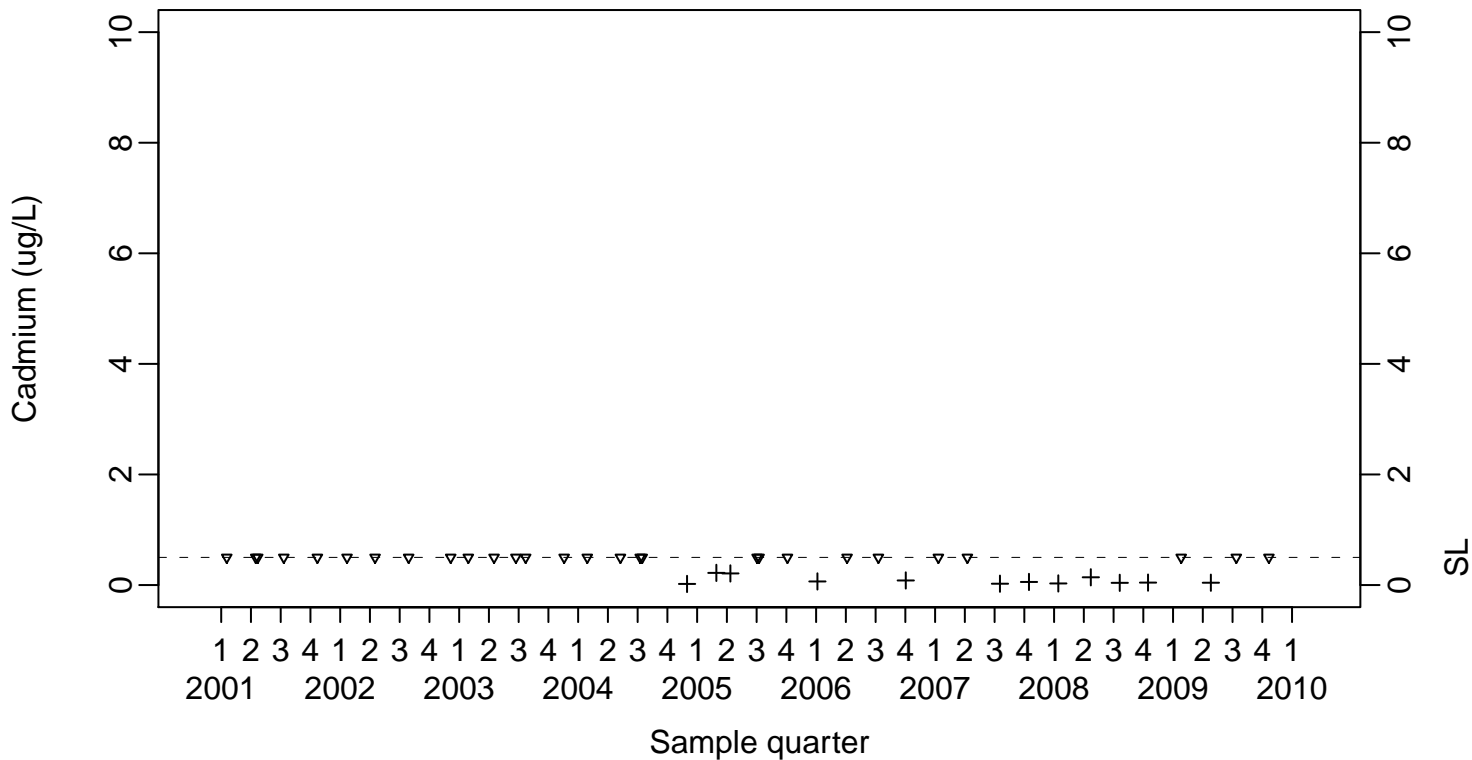
SL=0.5

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K1-05

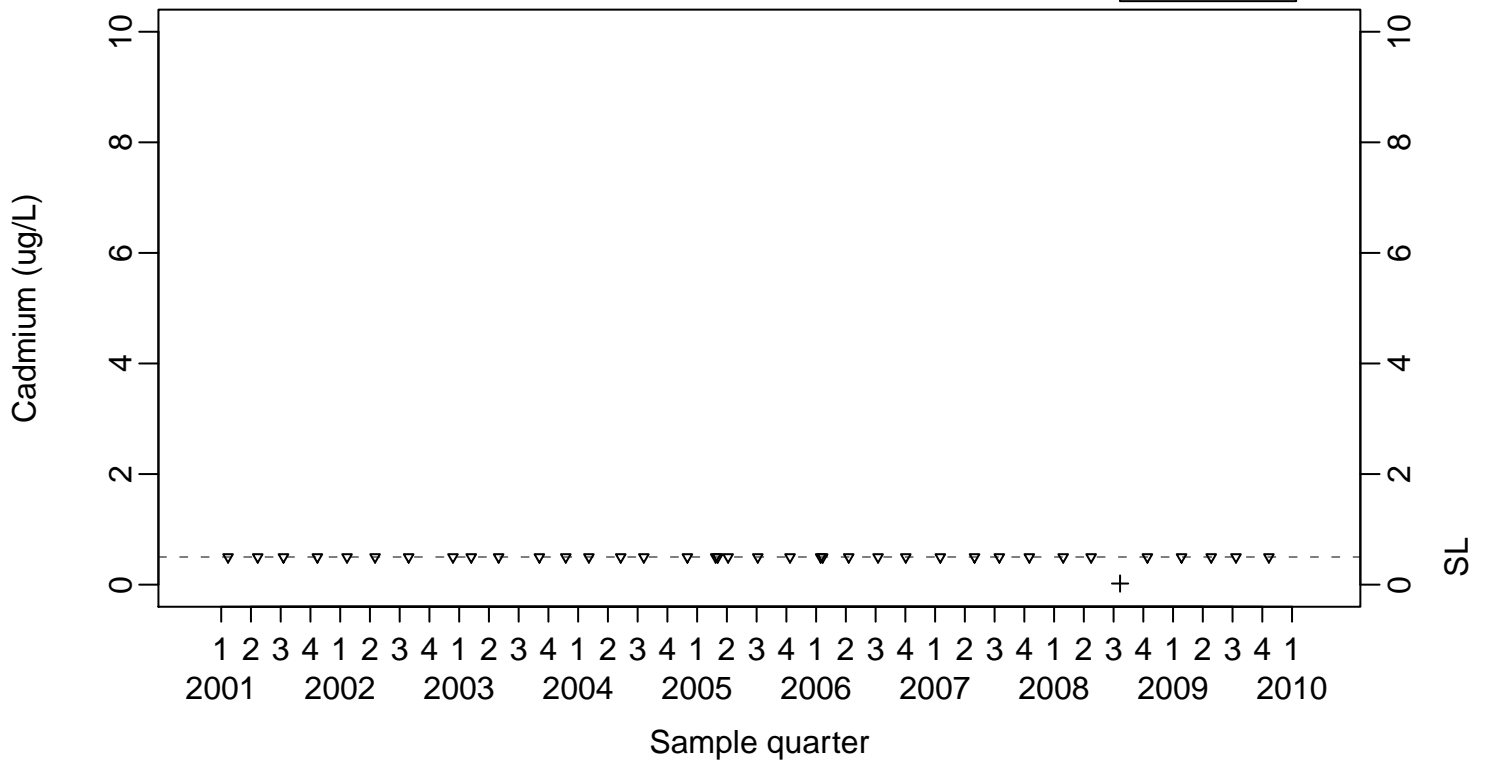


Pit 1 Area Cadmium (ug/L)

Compliance Monitoring Point K1-08

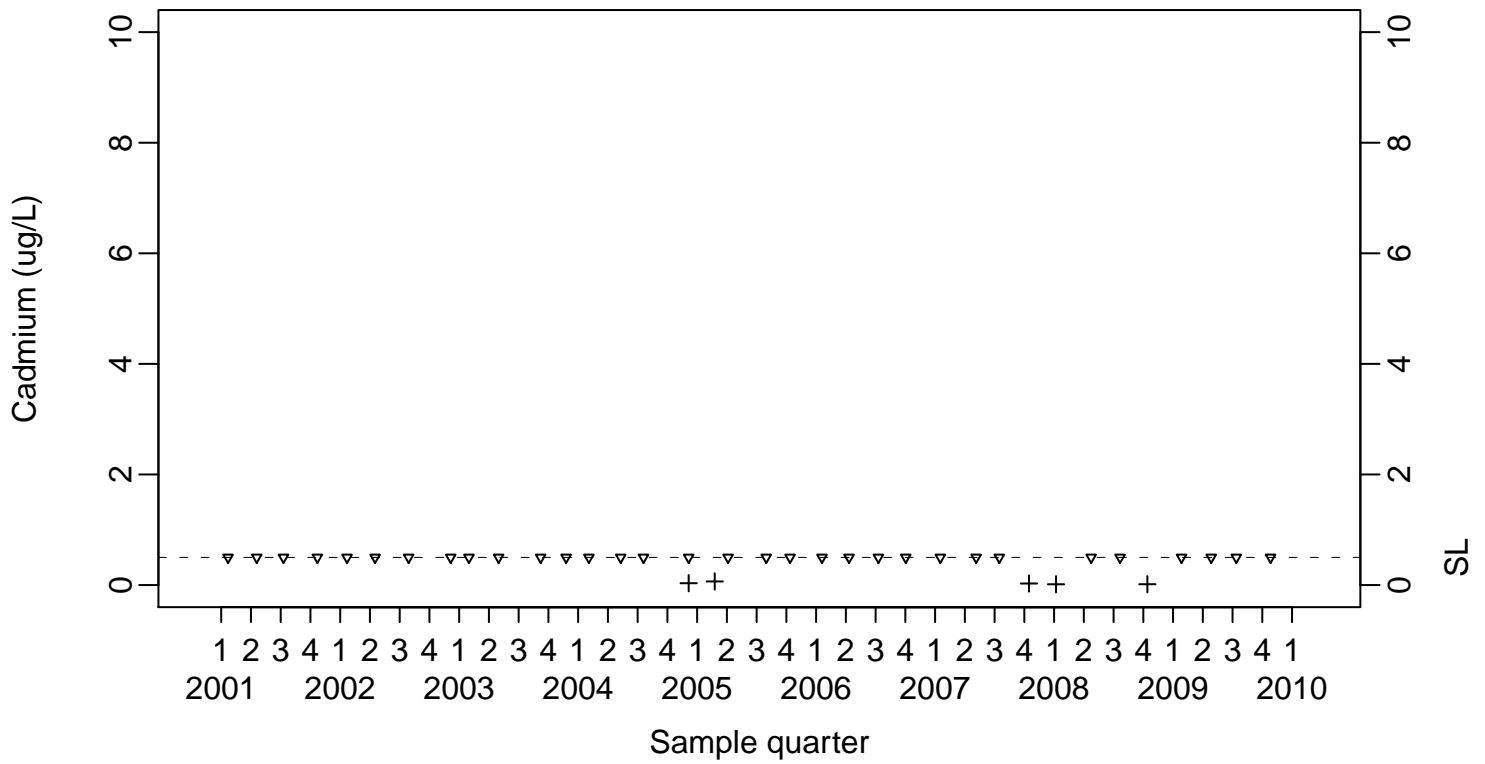
SL=0.5

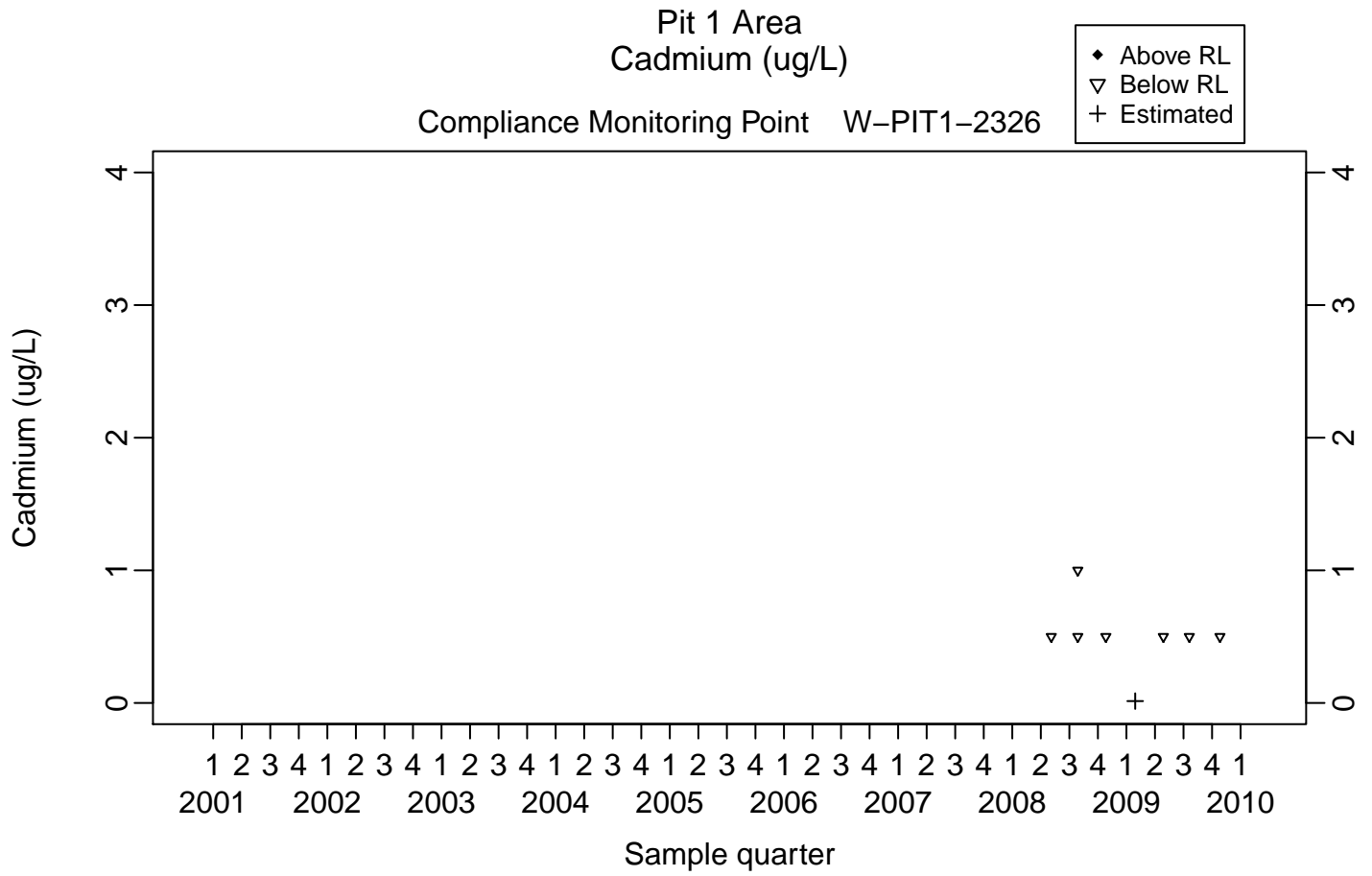
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K1-09

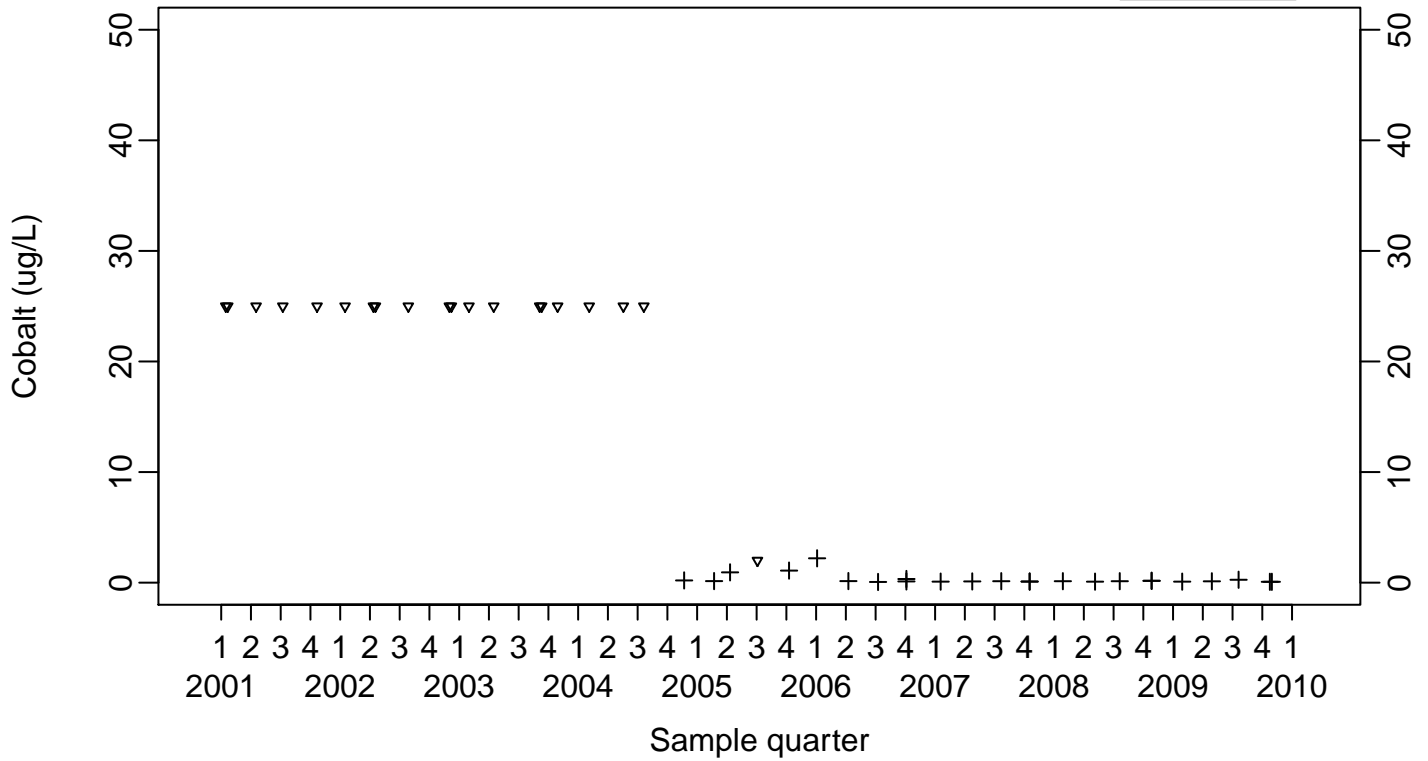




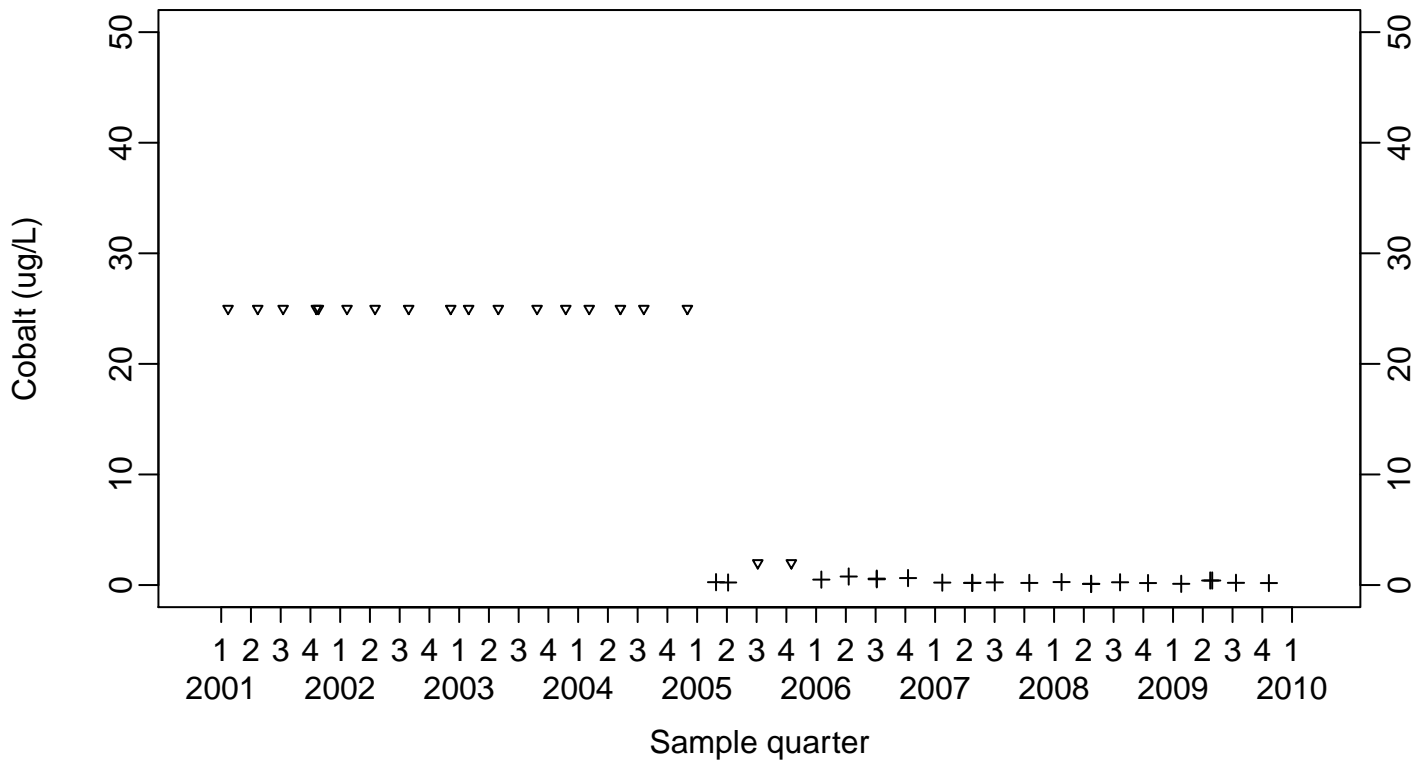
Pit 1 Area
Cobalt (ug/L)

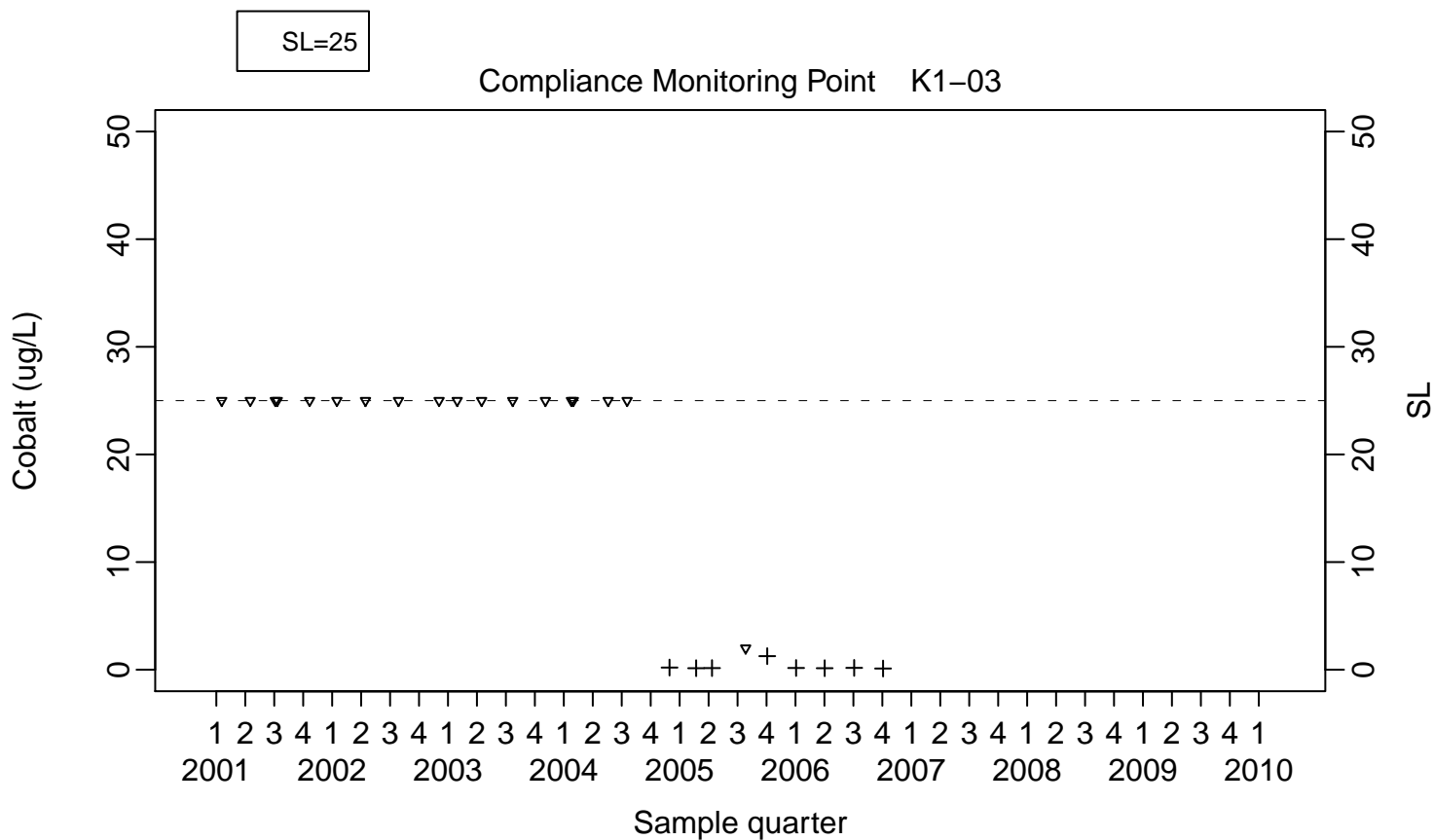
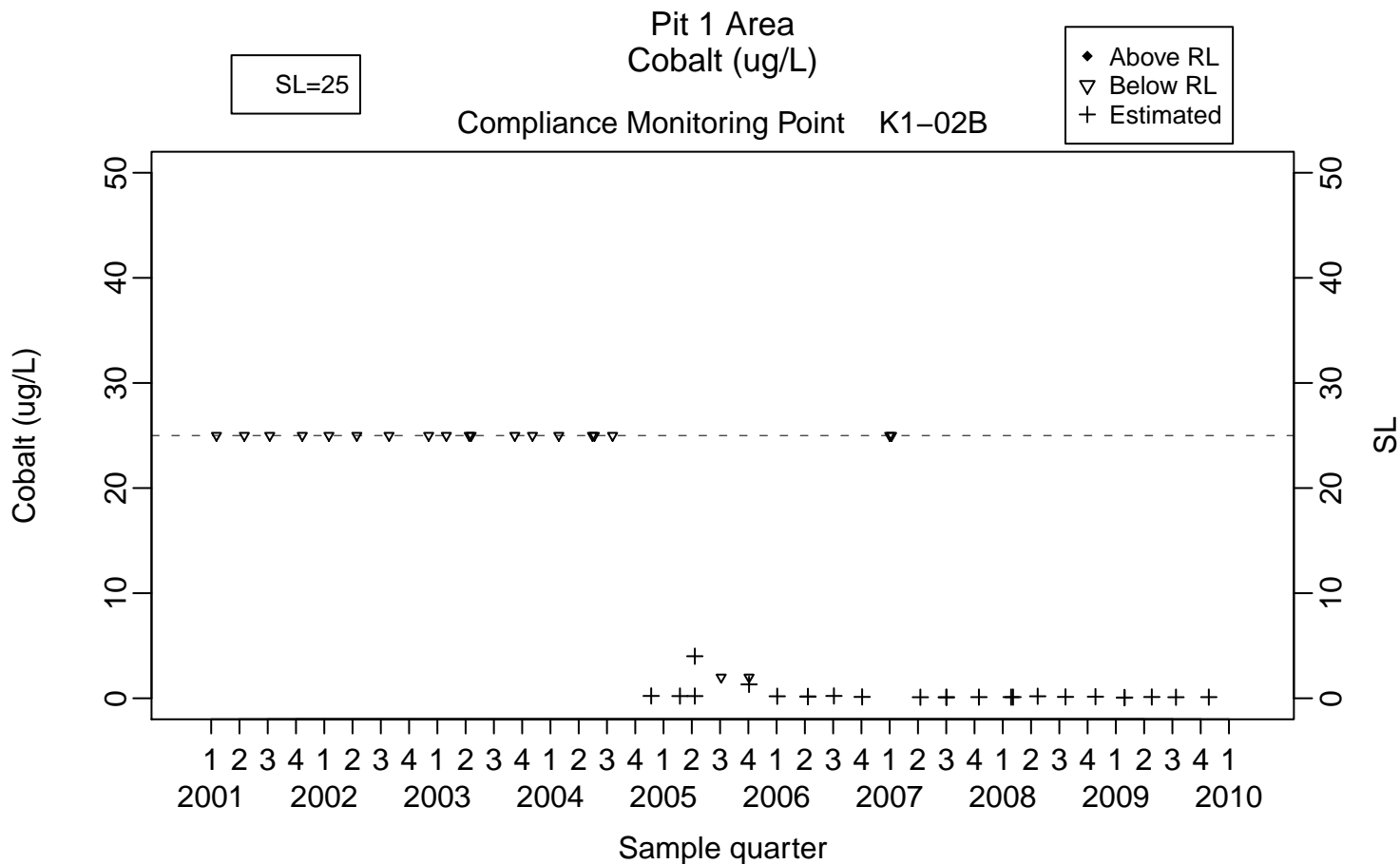
Background Monitoring Point K1-01C

- ◆ Above RL
- ▽ Below RL
- + Estimated



Background Monitoring Point K1-07



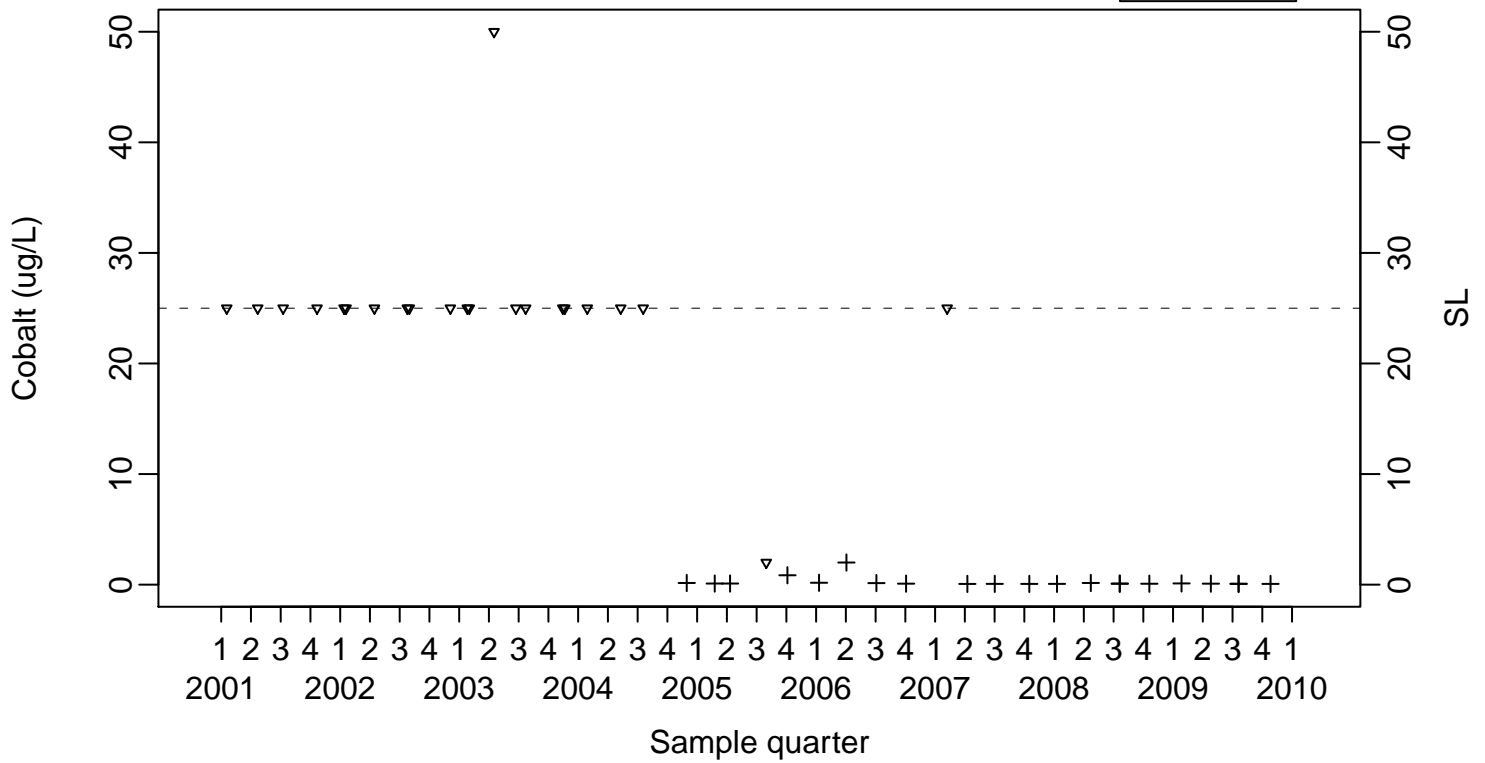


Pit 1 Area Cobalt (ug/L)

Compliance Monitoring Point K1-04

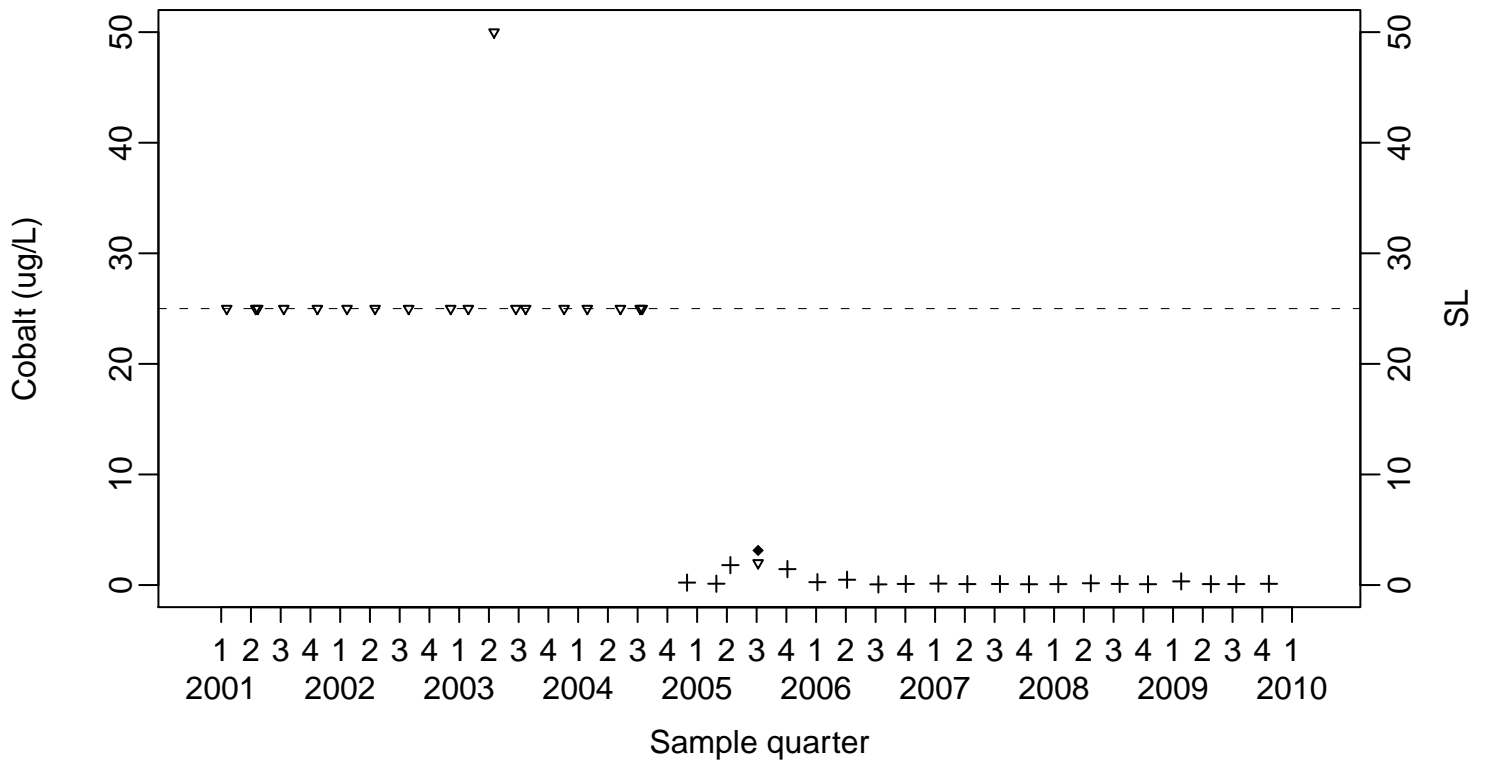
SL=25

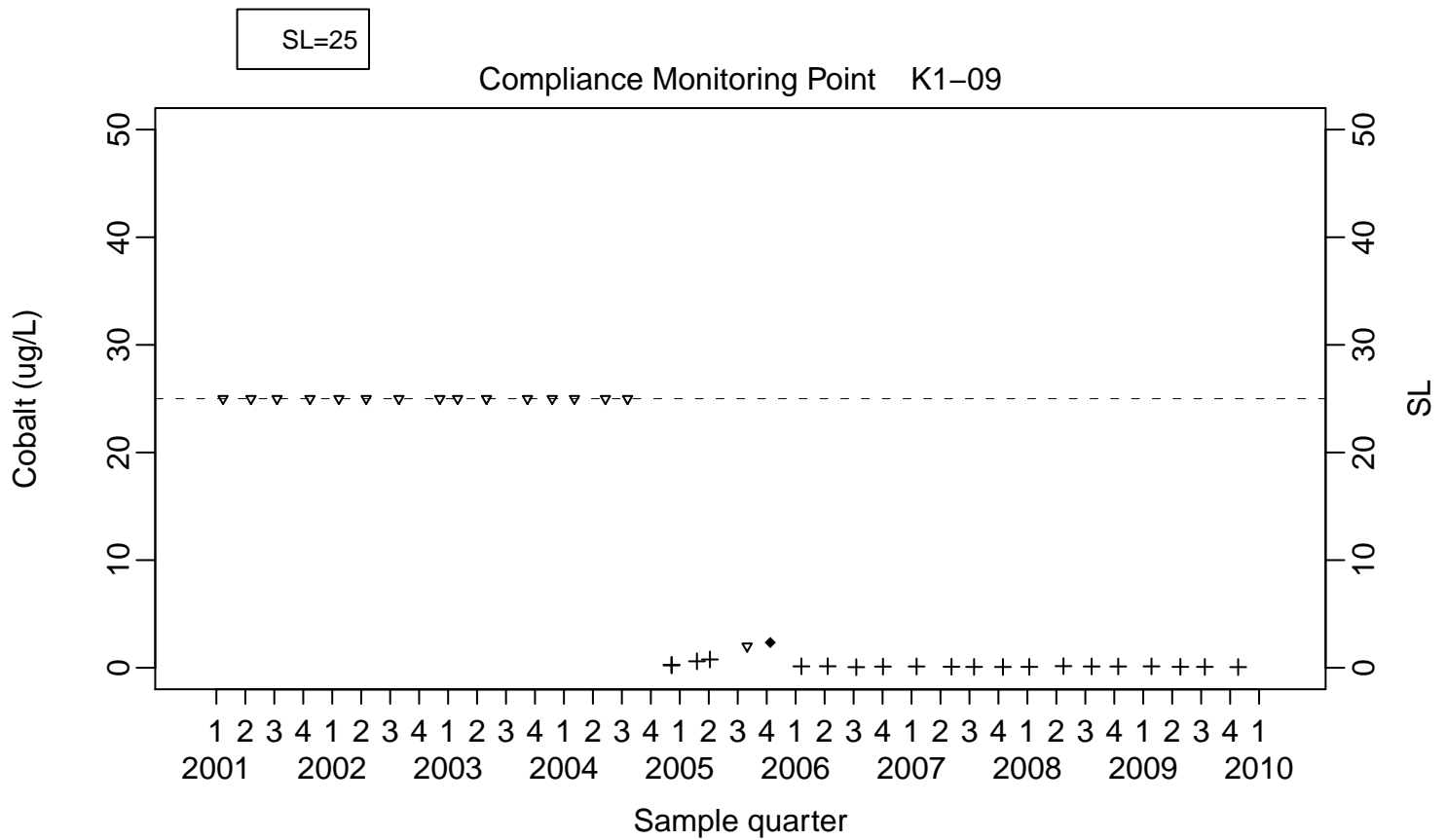
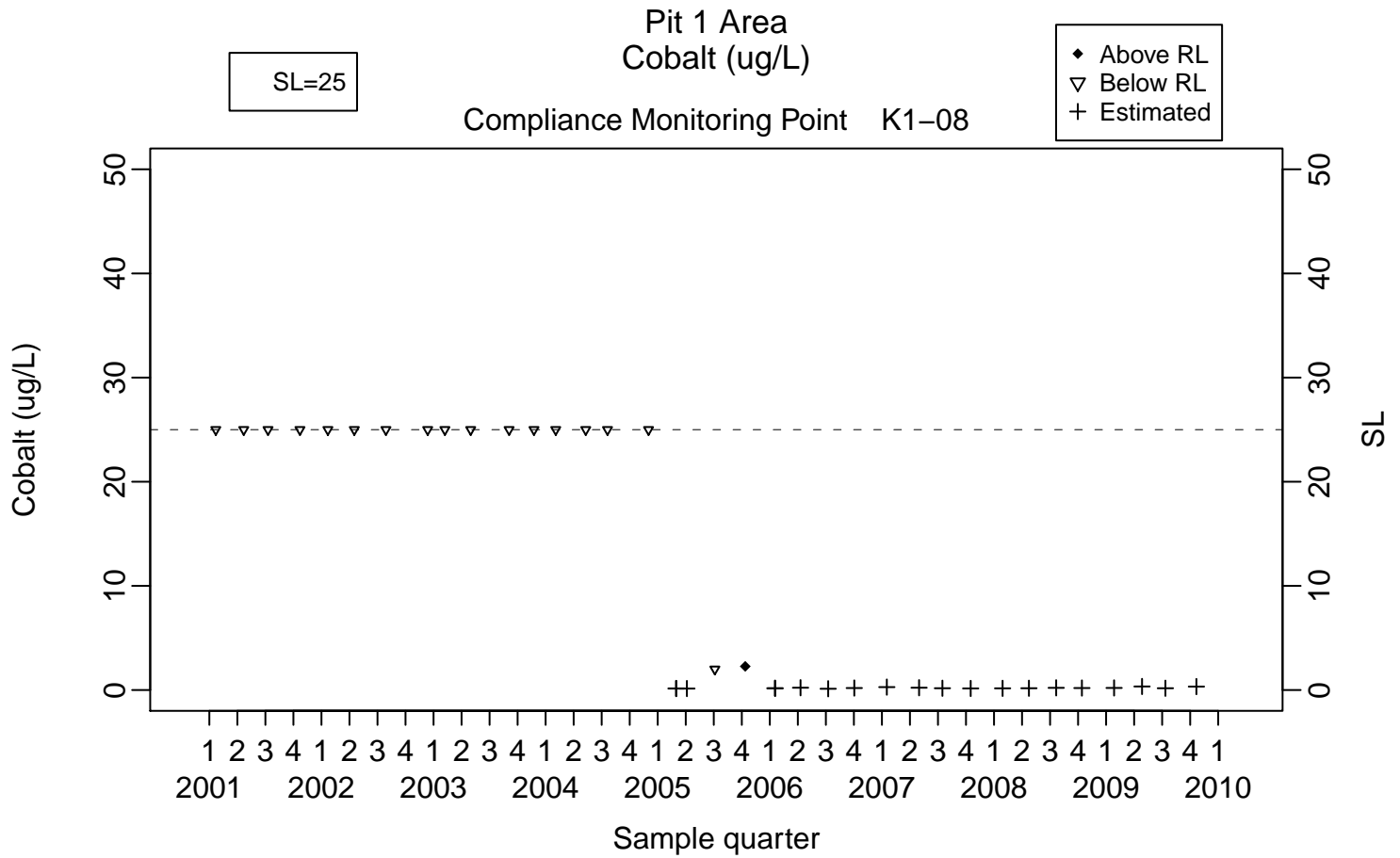
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=25

Compliance Monitoring Point K1-05

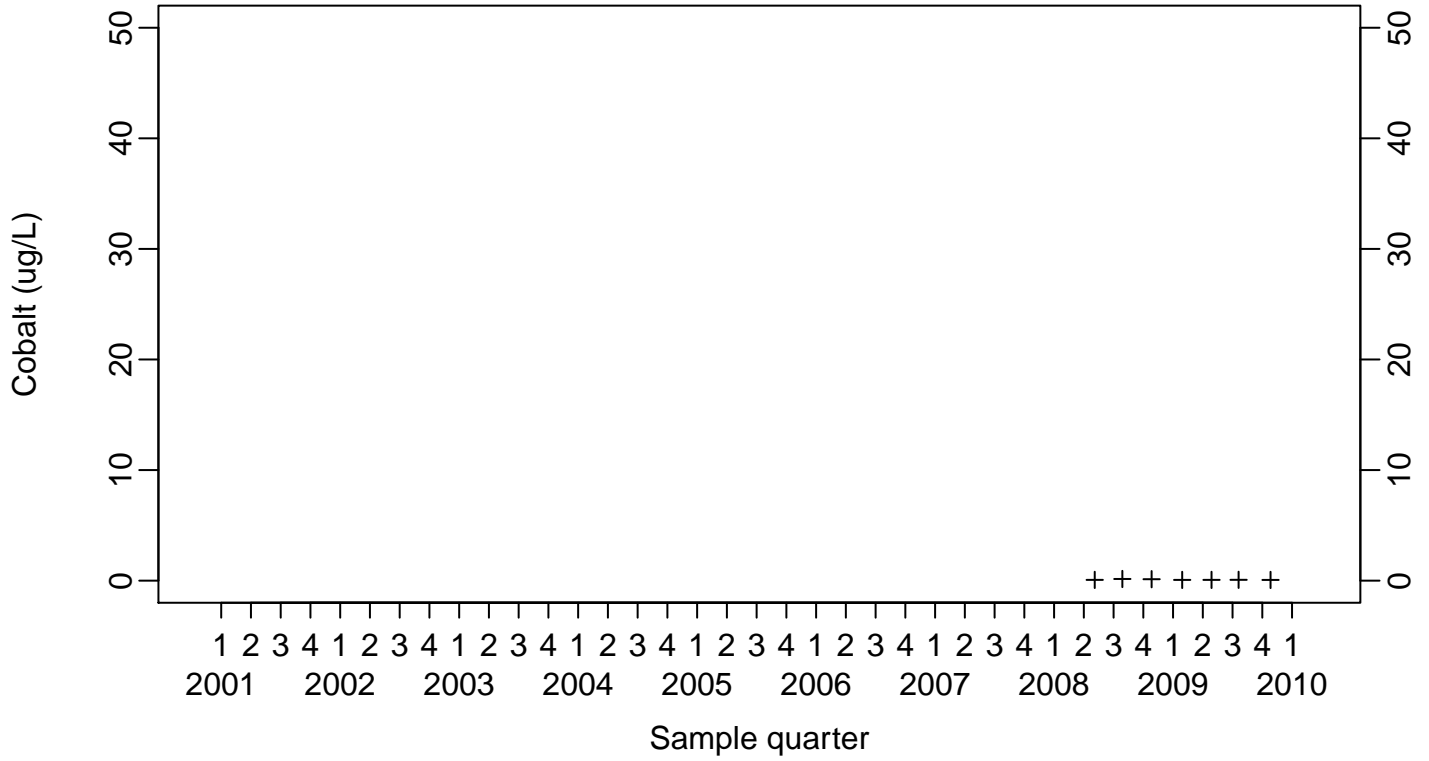




Pit 1 Area Cobalt (ug/L)

Compliance Monitoring Point W-PIT1-2326

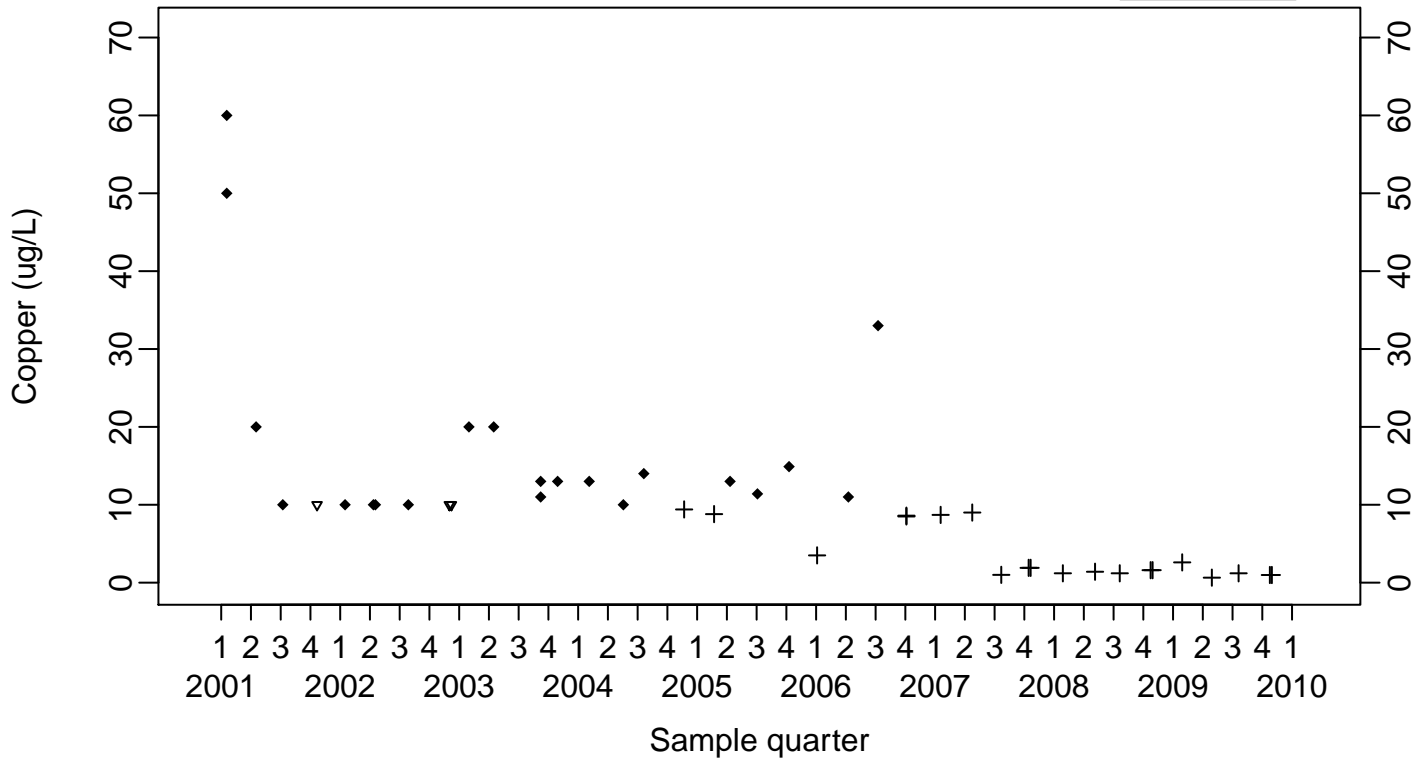
◆ Above RL
+ Estimated



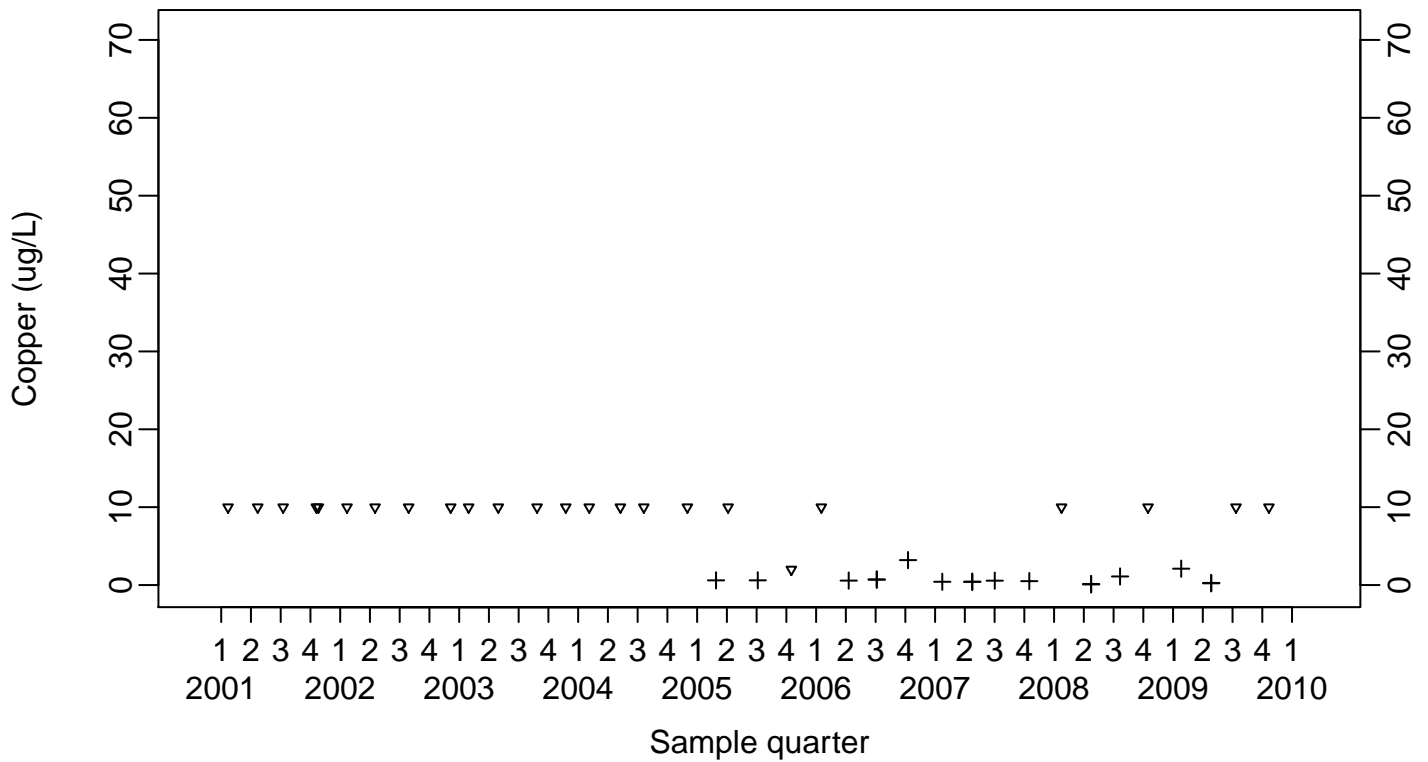
Pit 1 Area
Copper (ug/L)

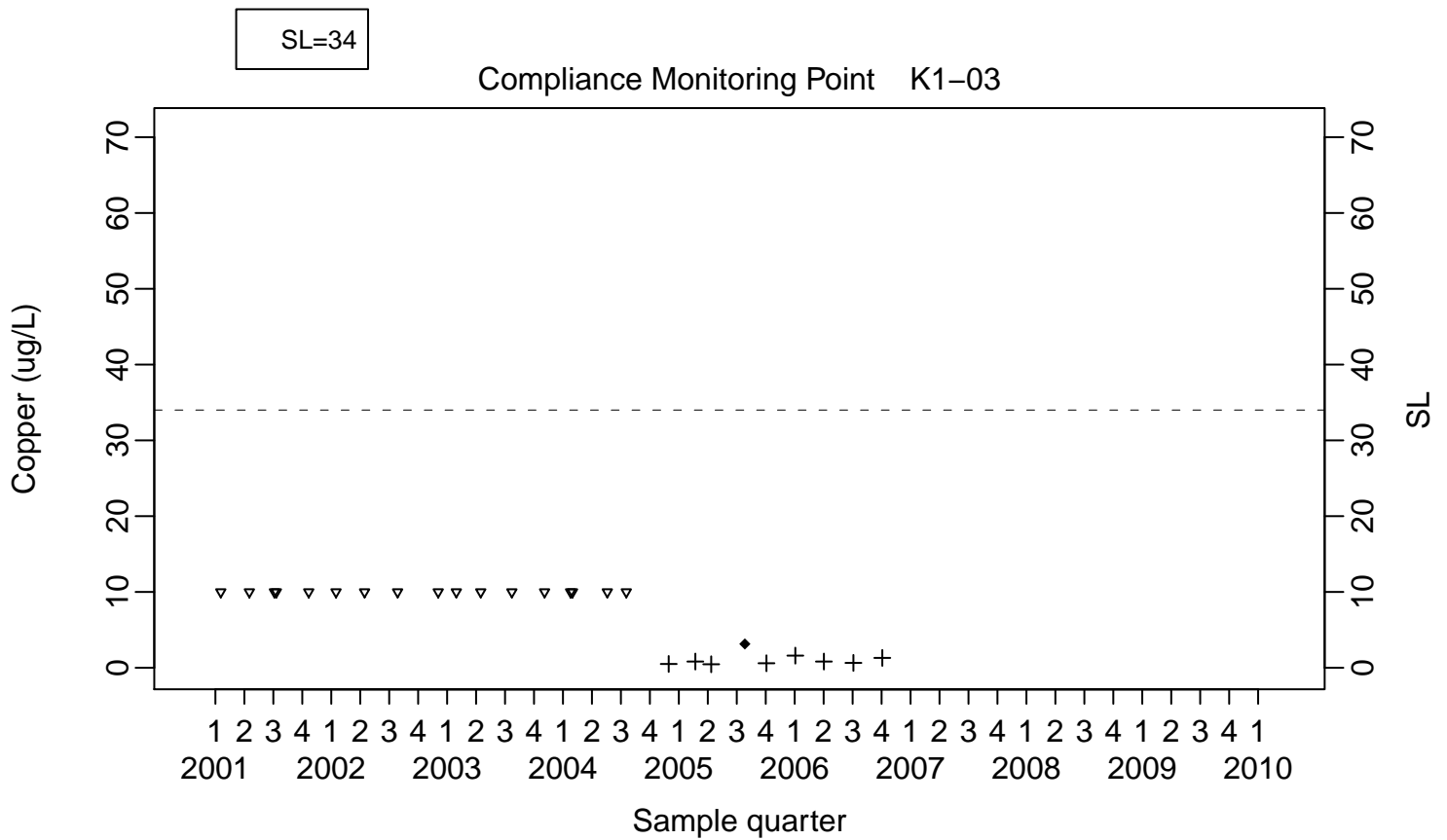
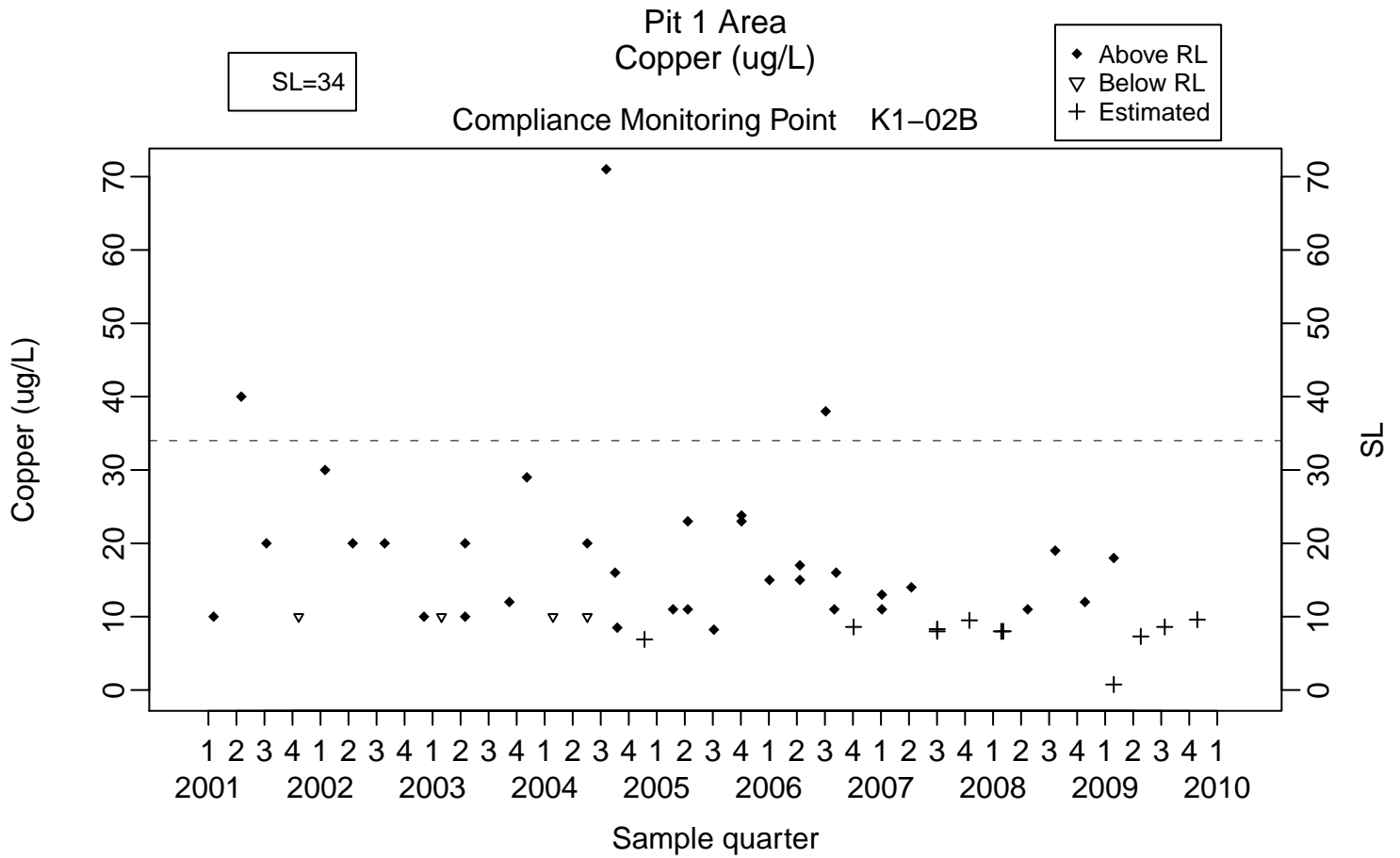
Background Monitoring Point K1-01C

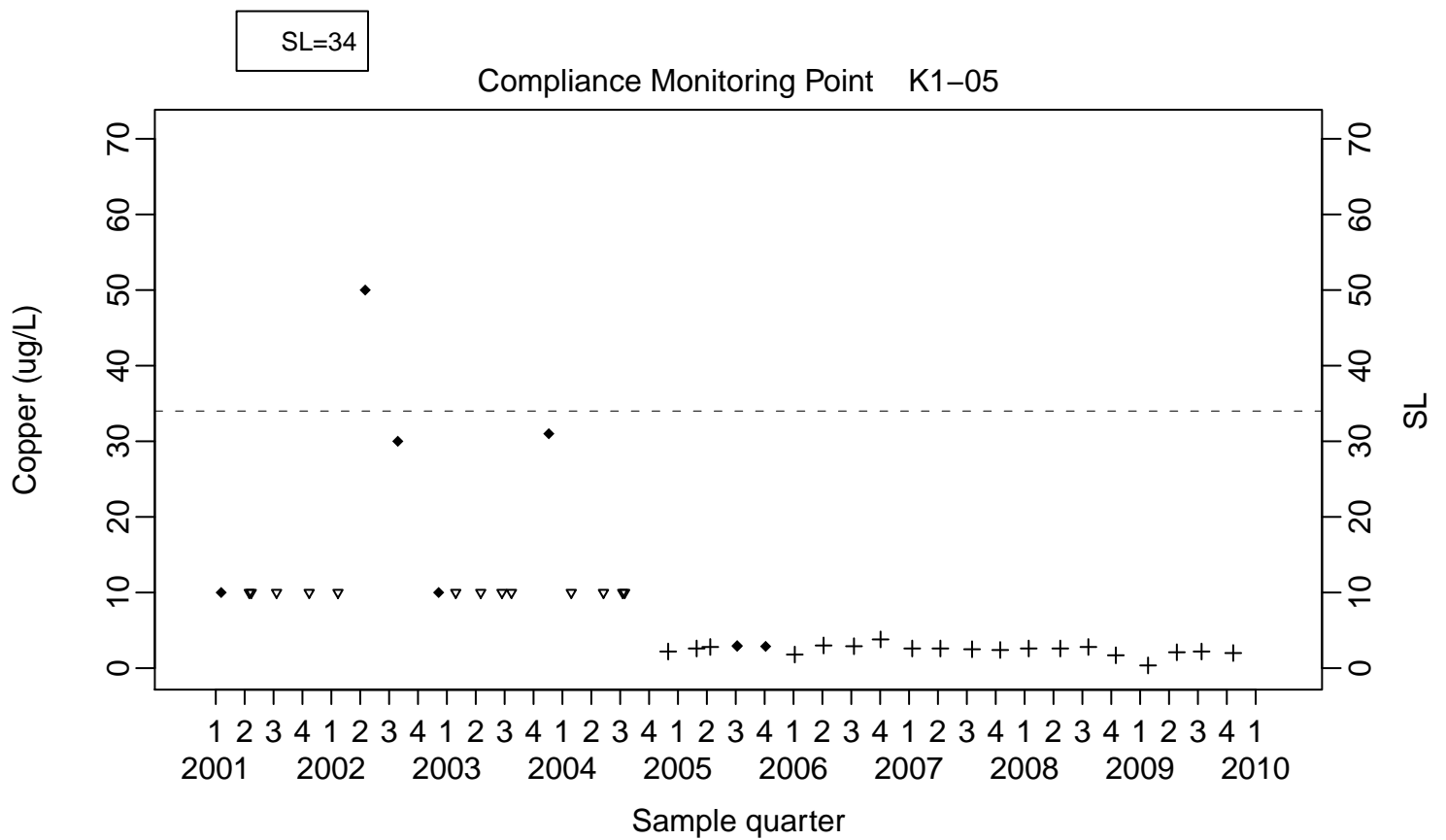
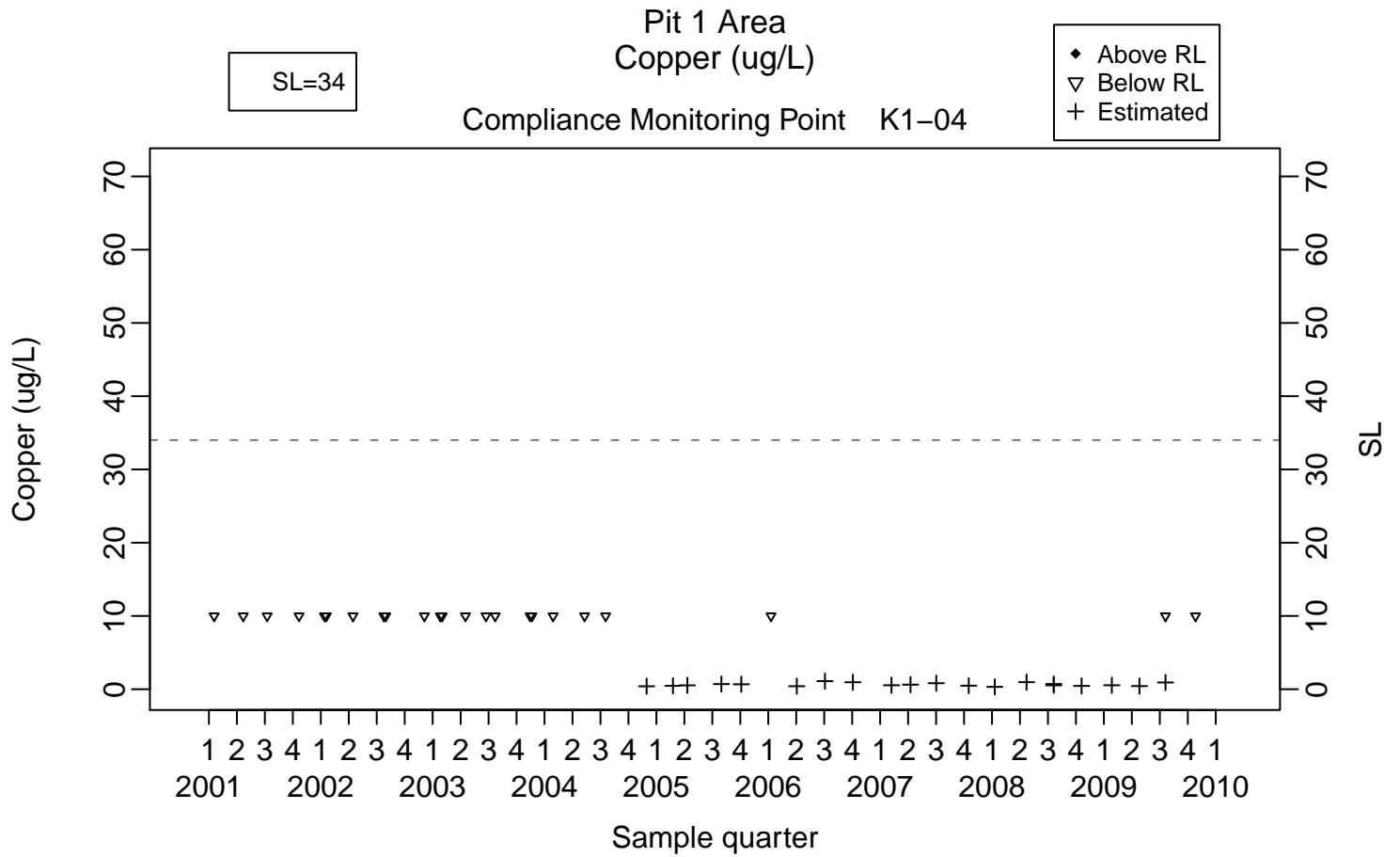
- ◆ Above RL
- ▽ Below RL
- + Estimated

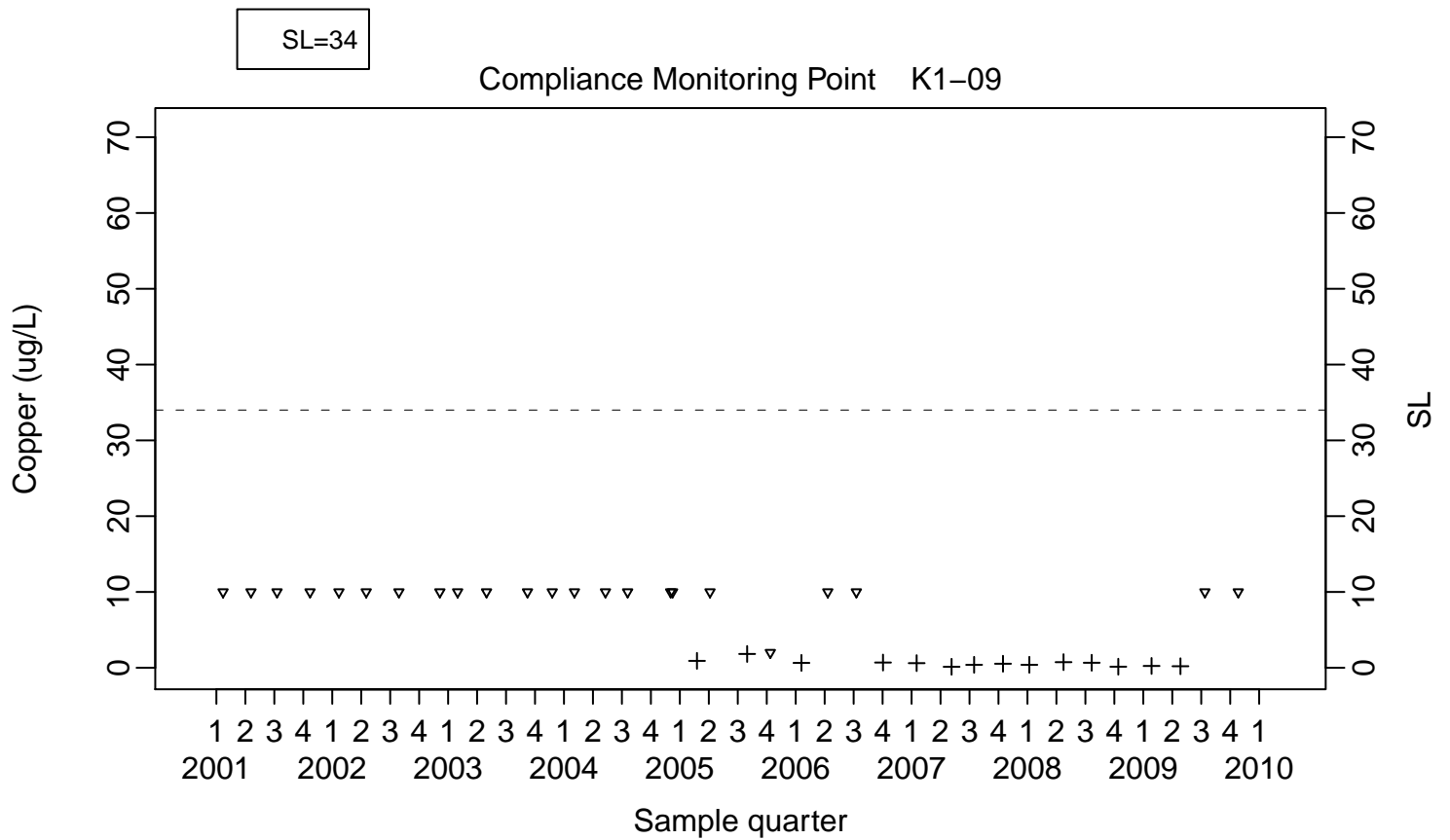


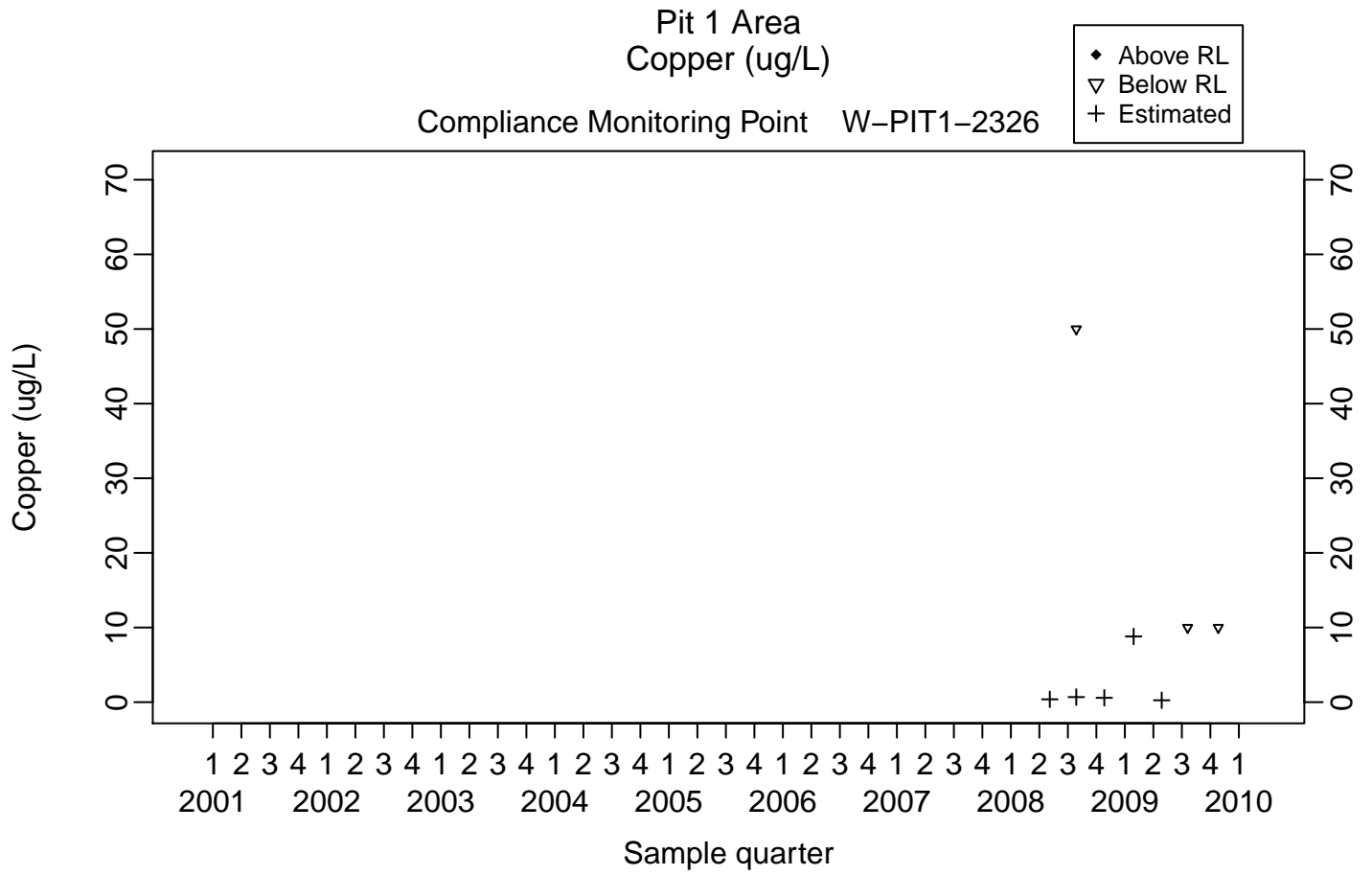
Background Monitoring Point K1-07







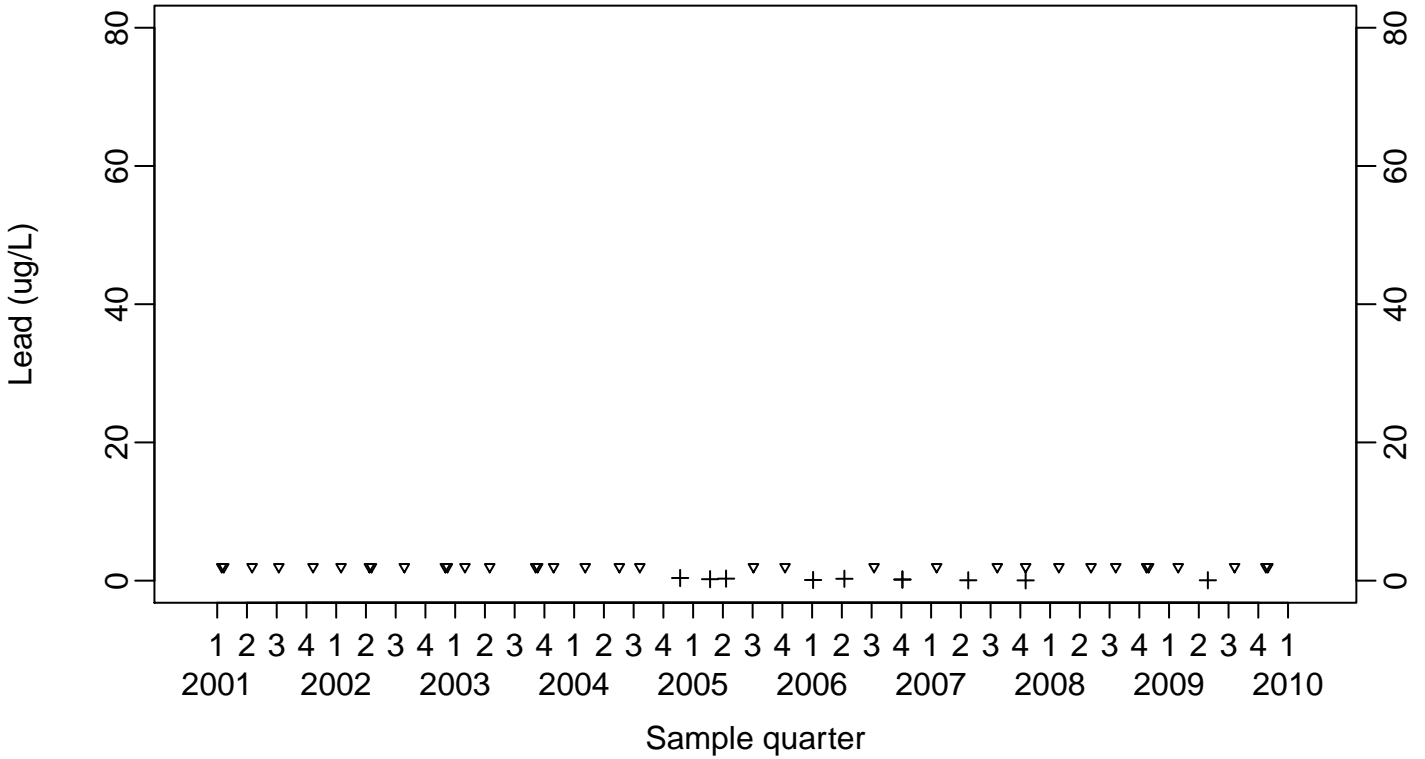




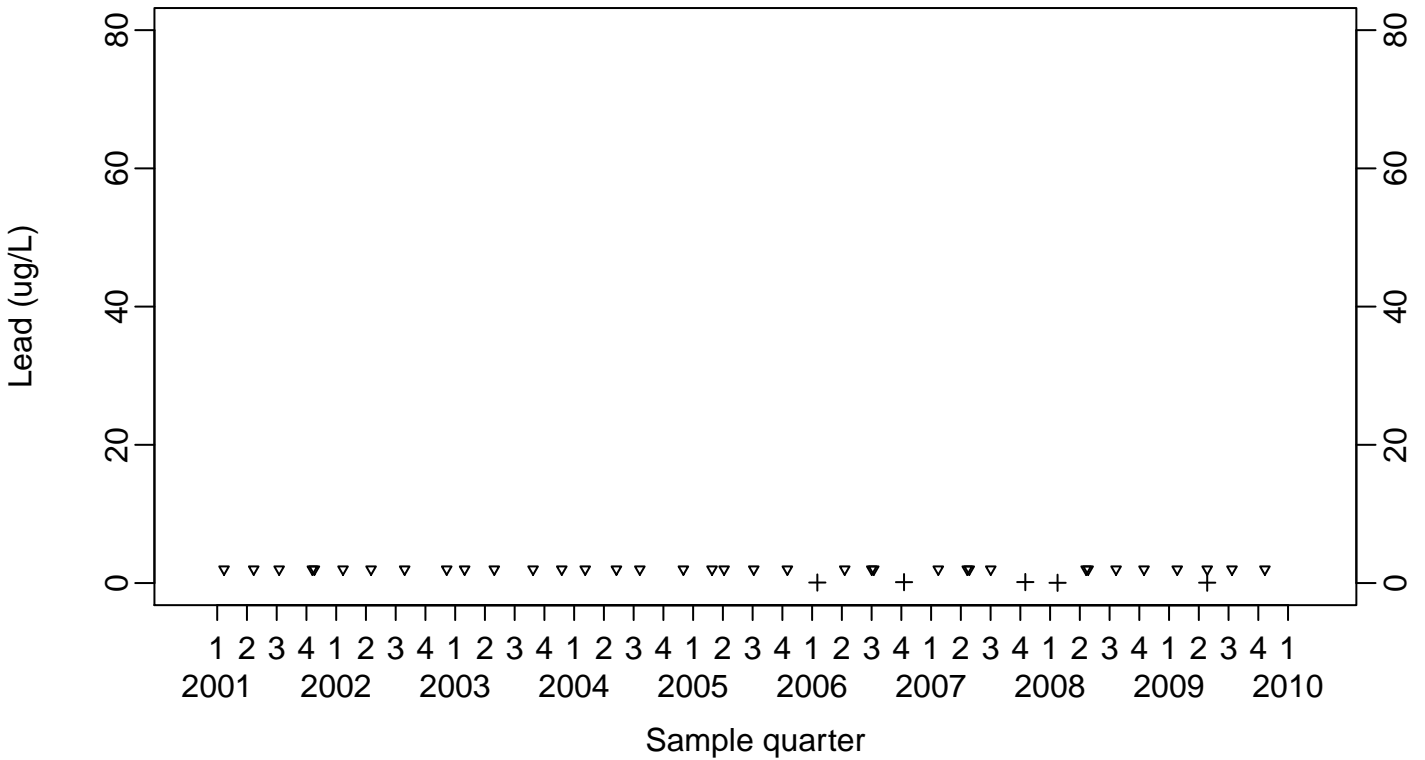
Pit 1 Area
Lead (ug/L)

Background Monitoring Point K1-01C

- ◆ Above RL
- ▽ Below RL
- + Estimated



Background Monitoring Point K1-07

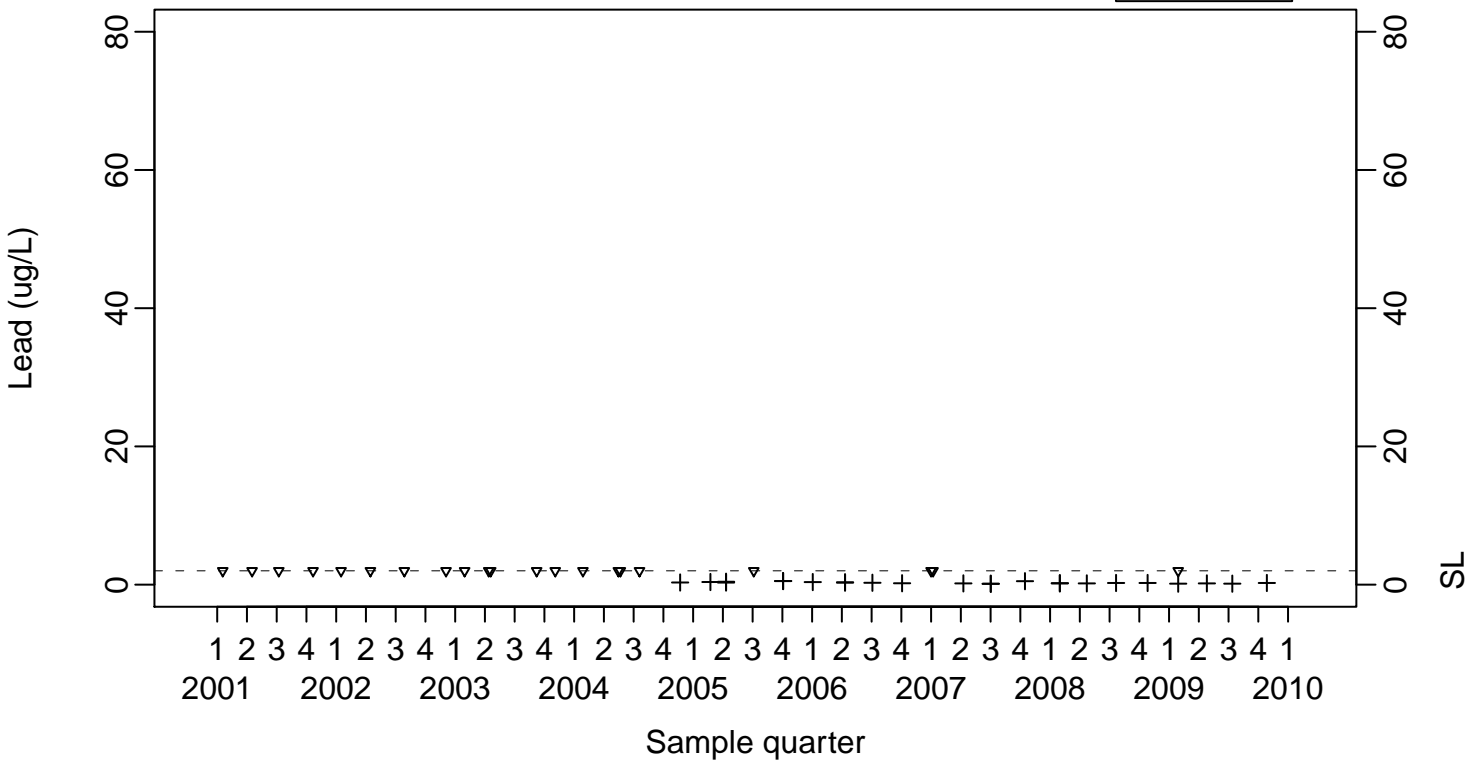


Pit 1 Area Lead (ug/L)

Compliance Monitoring Point K1-02B

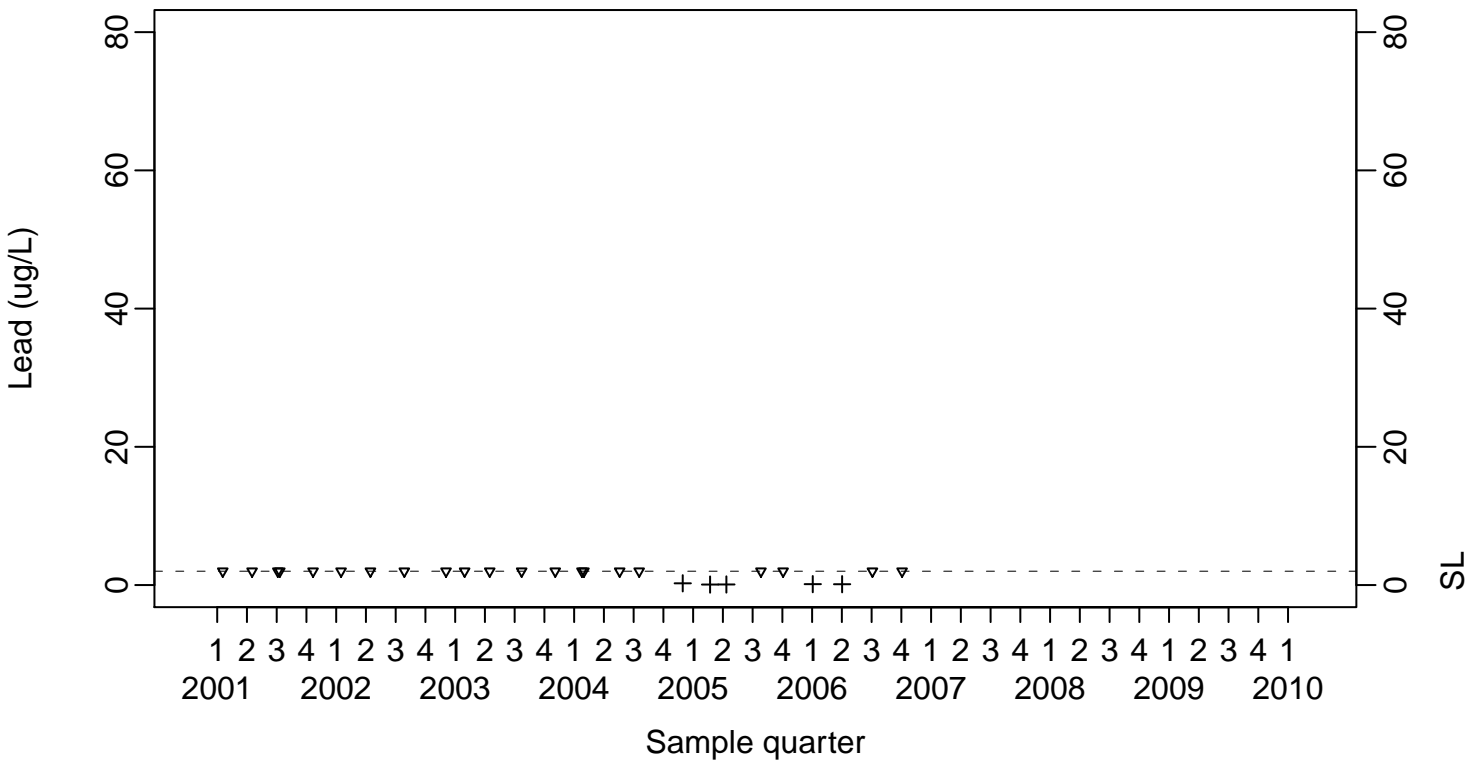
SL=2

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=2

Compliance Monitoring Point K1-03

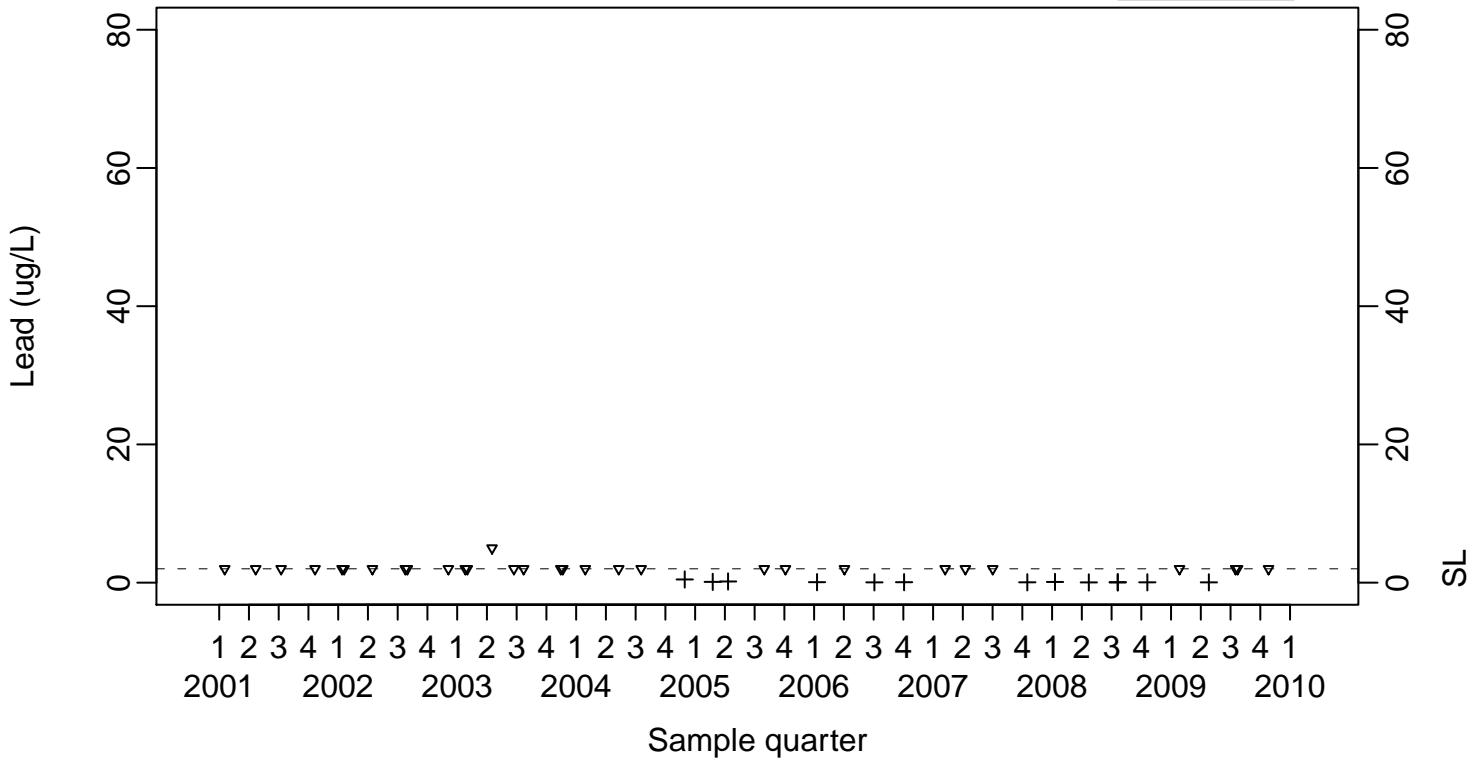


Pit 1 Area Lead (ug/L)

SL=2

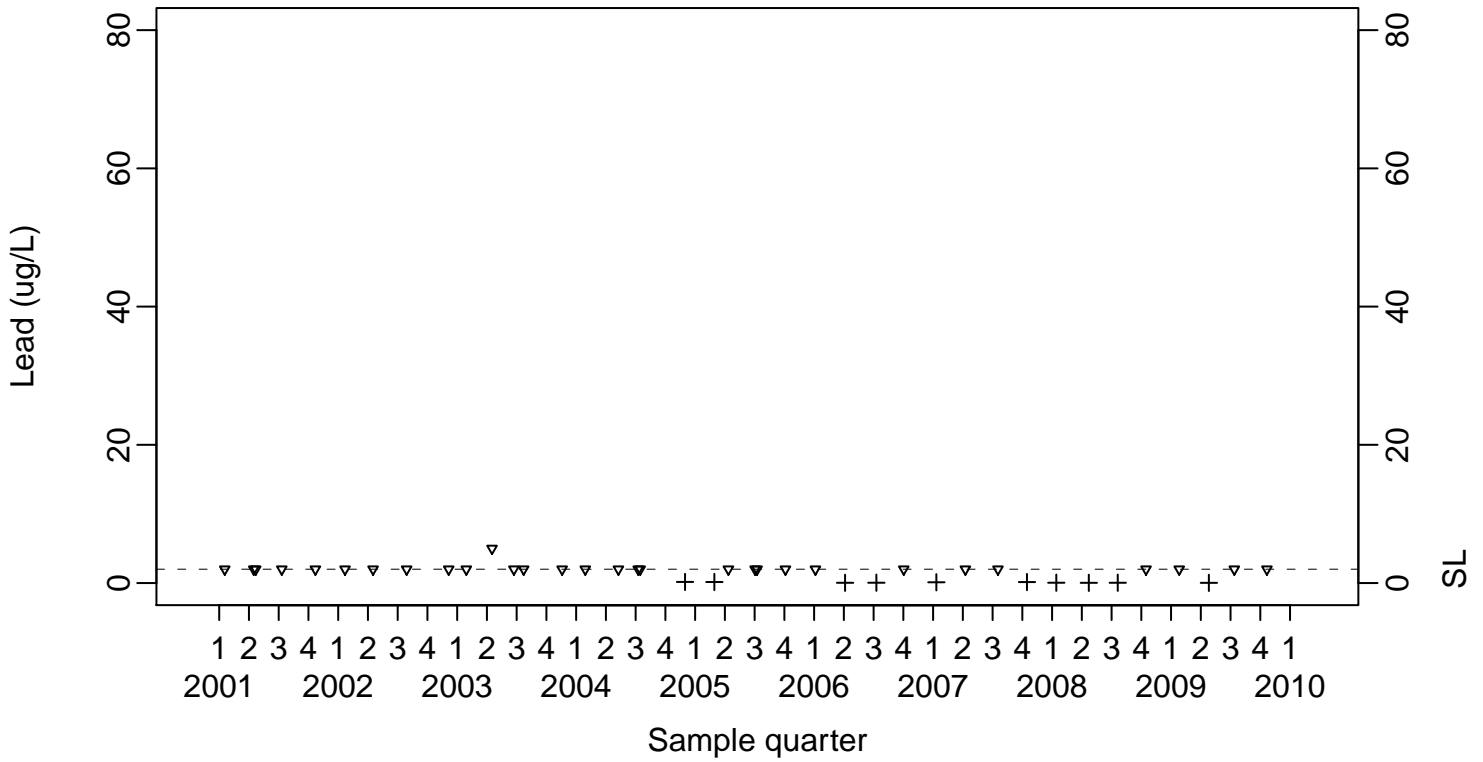
Compliance Monitoring Point K1-04

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=2

Compliance Monitoring Point K1-05

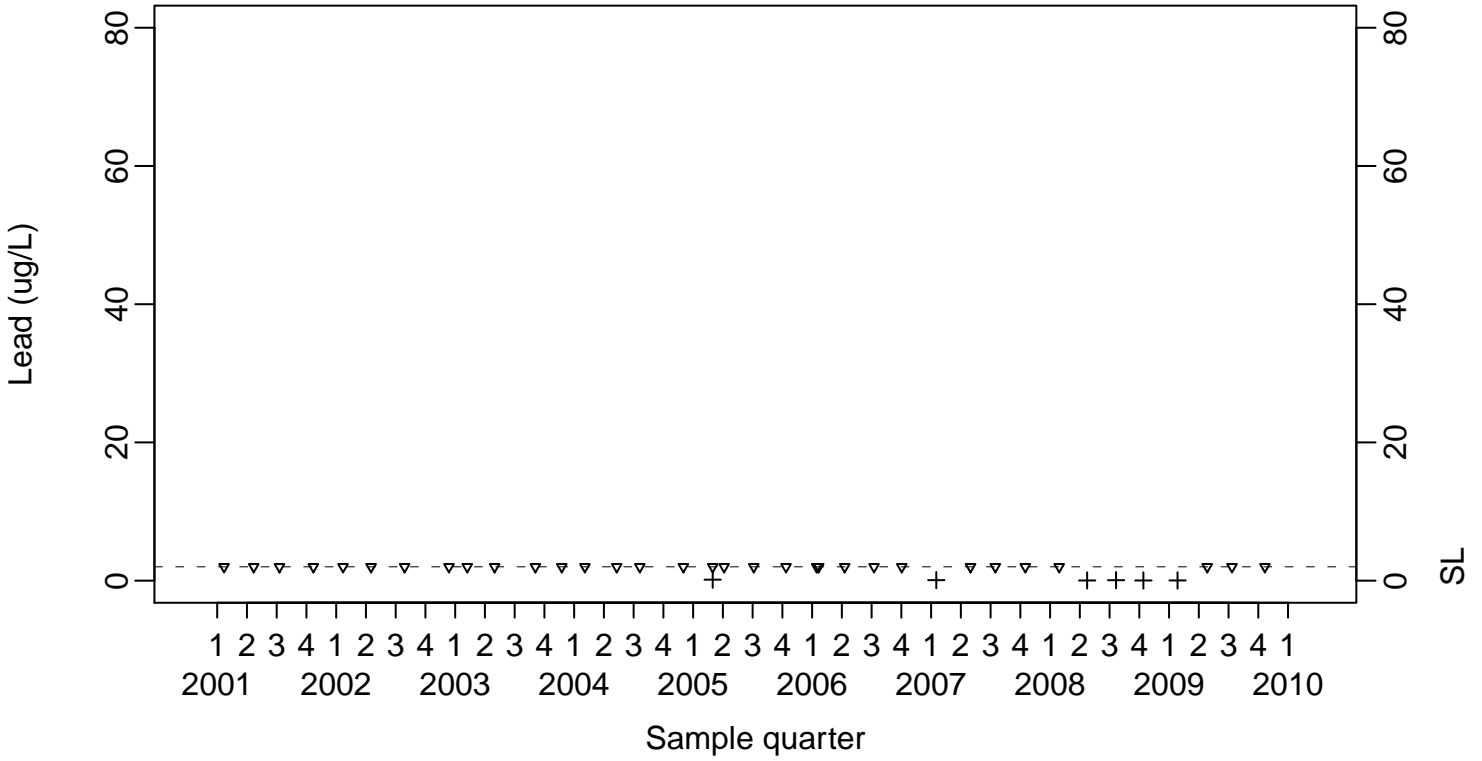


Pit 1 Area Lead (ug/L)

Compliance Monitoring Point K1-08

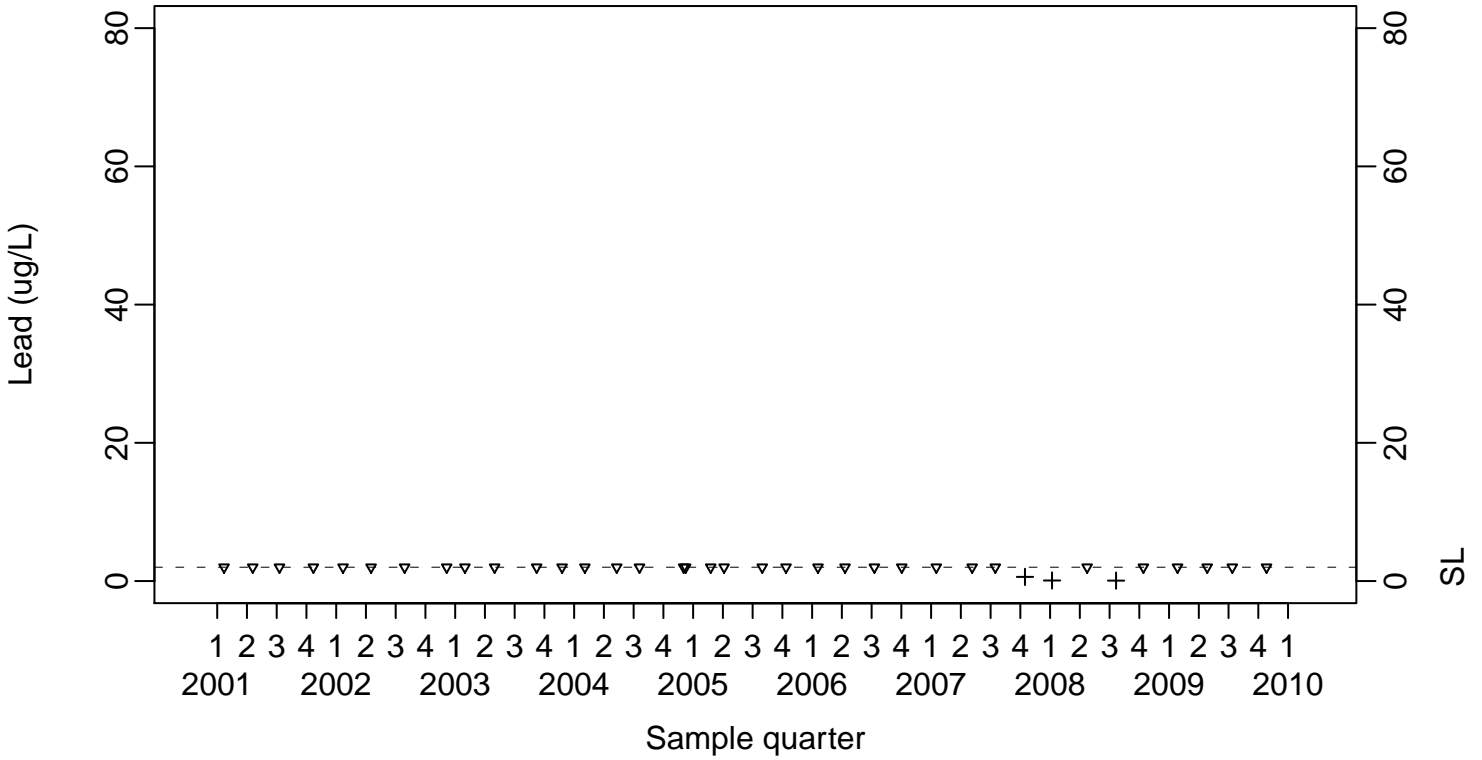
SL=2

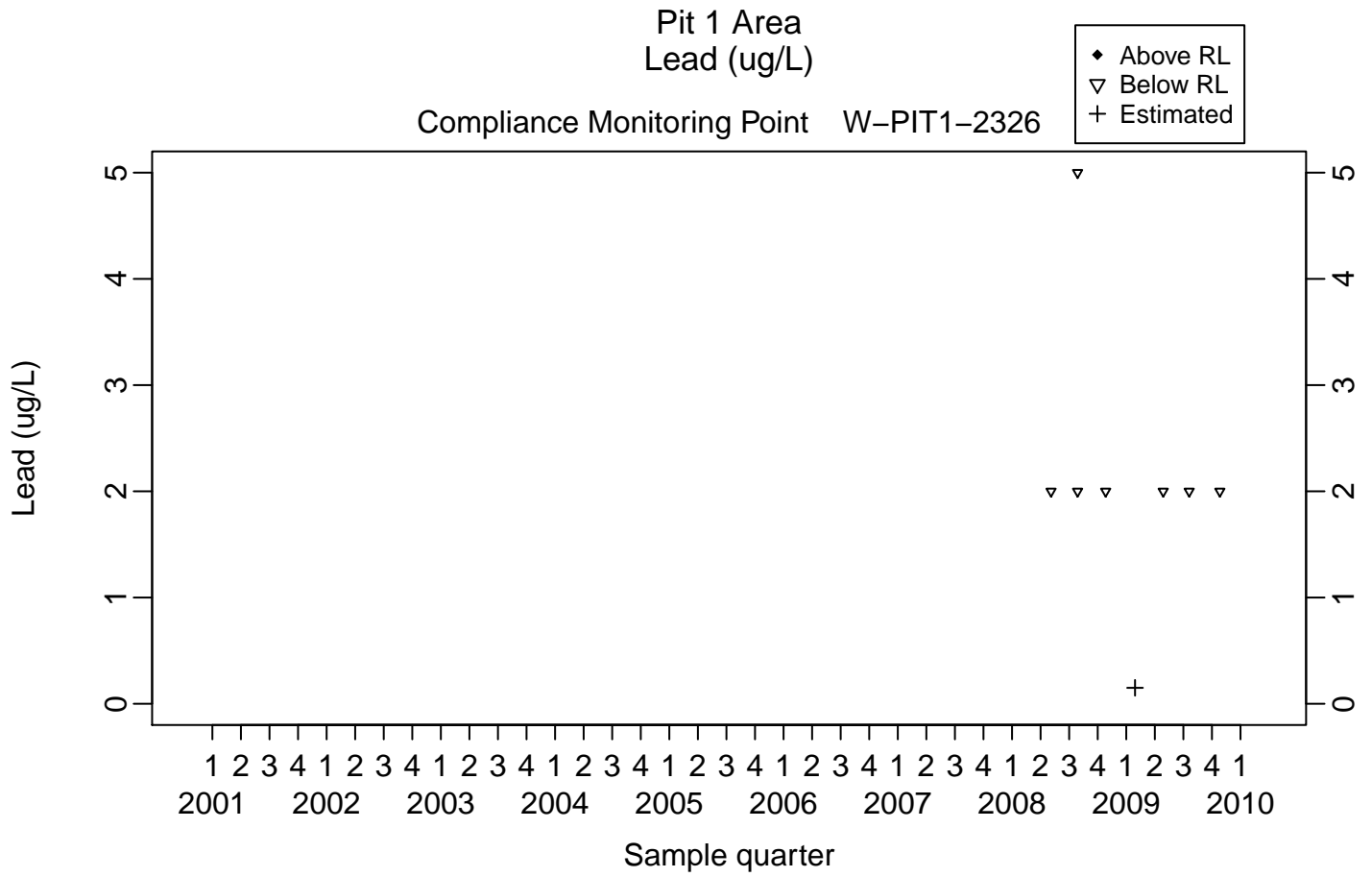
- ◆ Above RL
- ▽ Below RL
- + Estimated

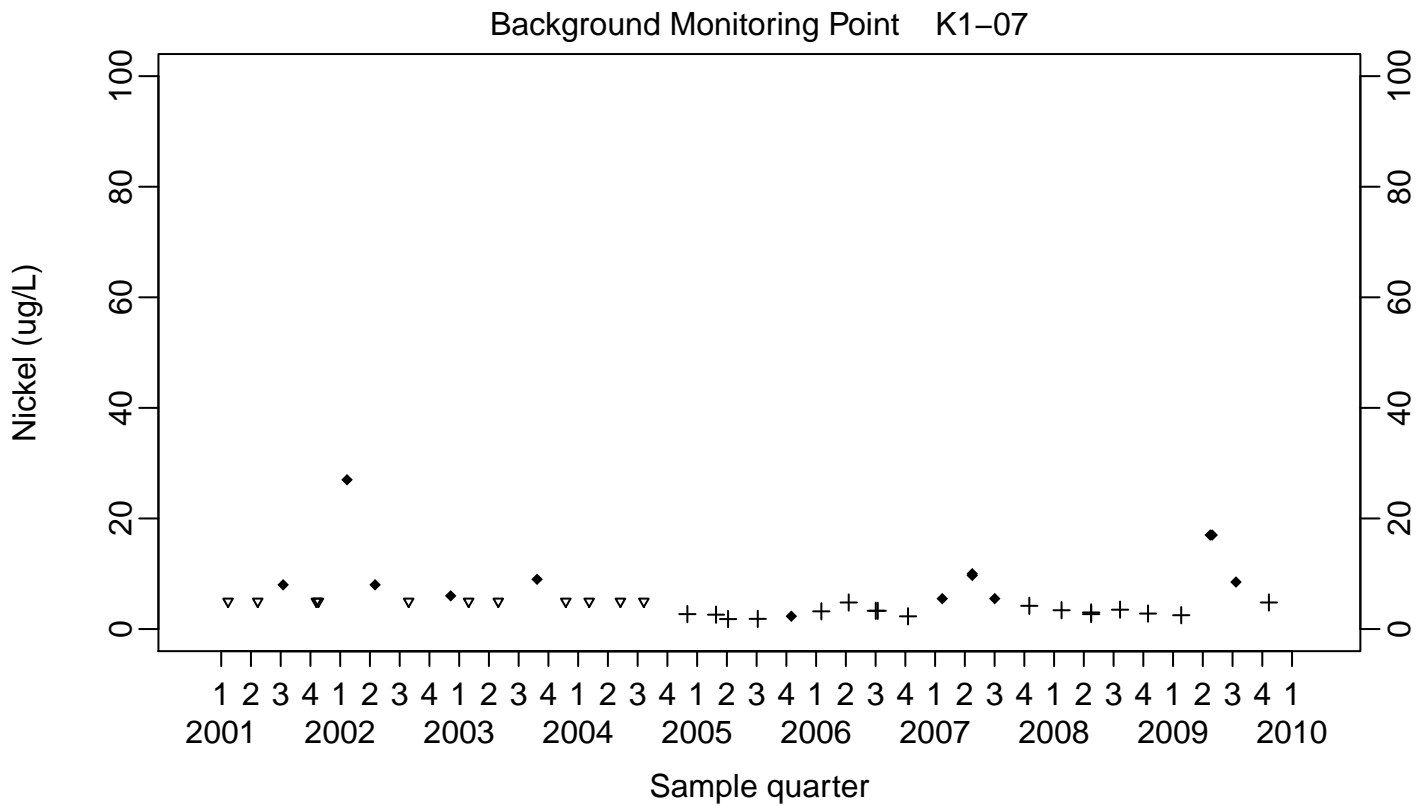
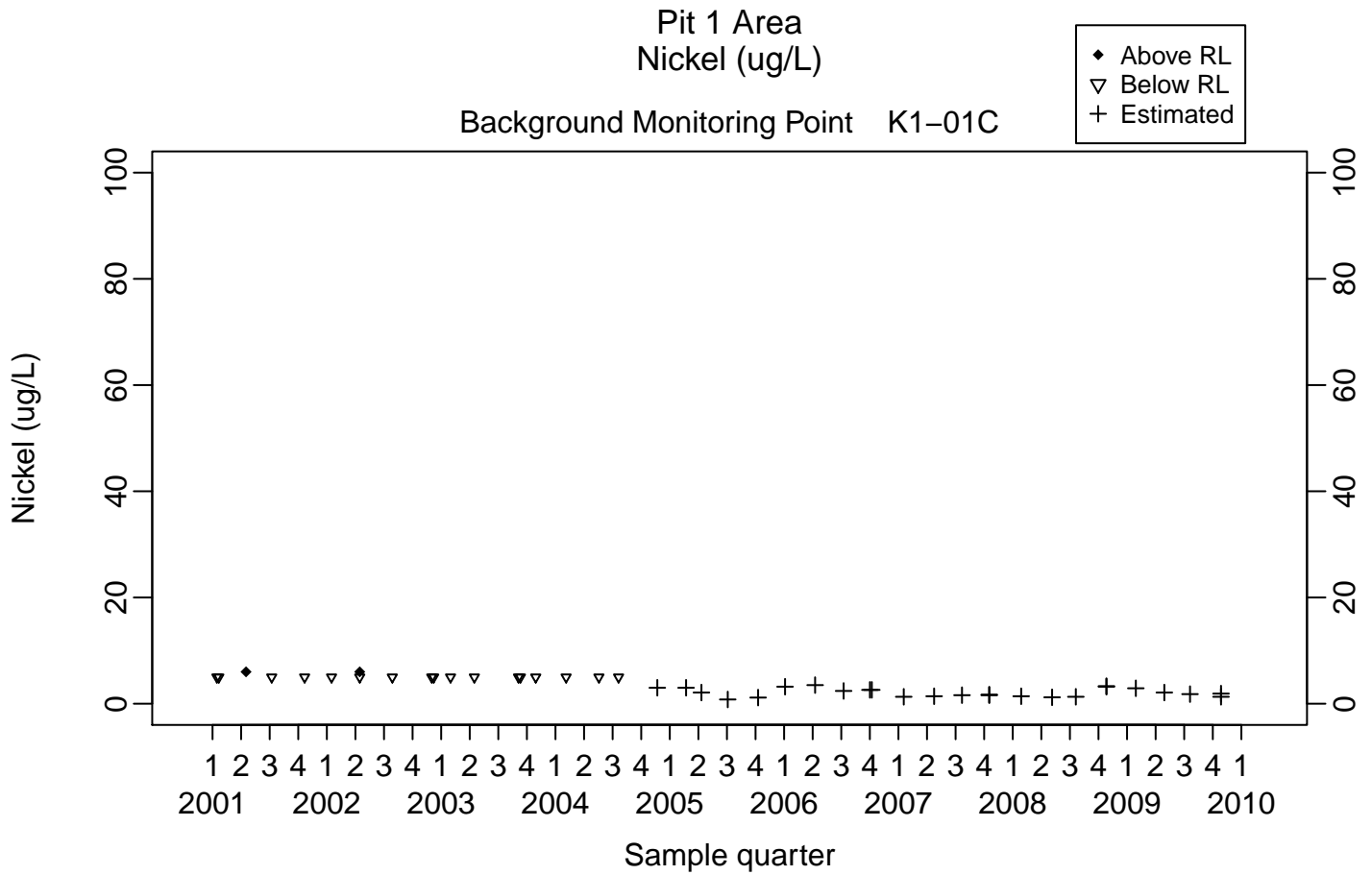


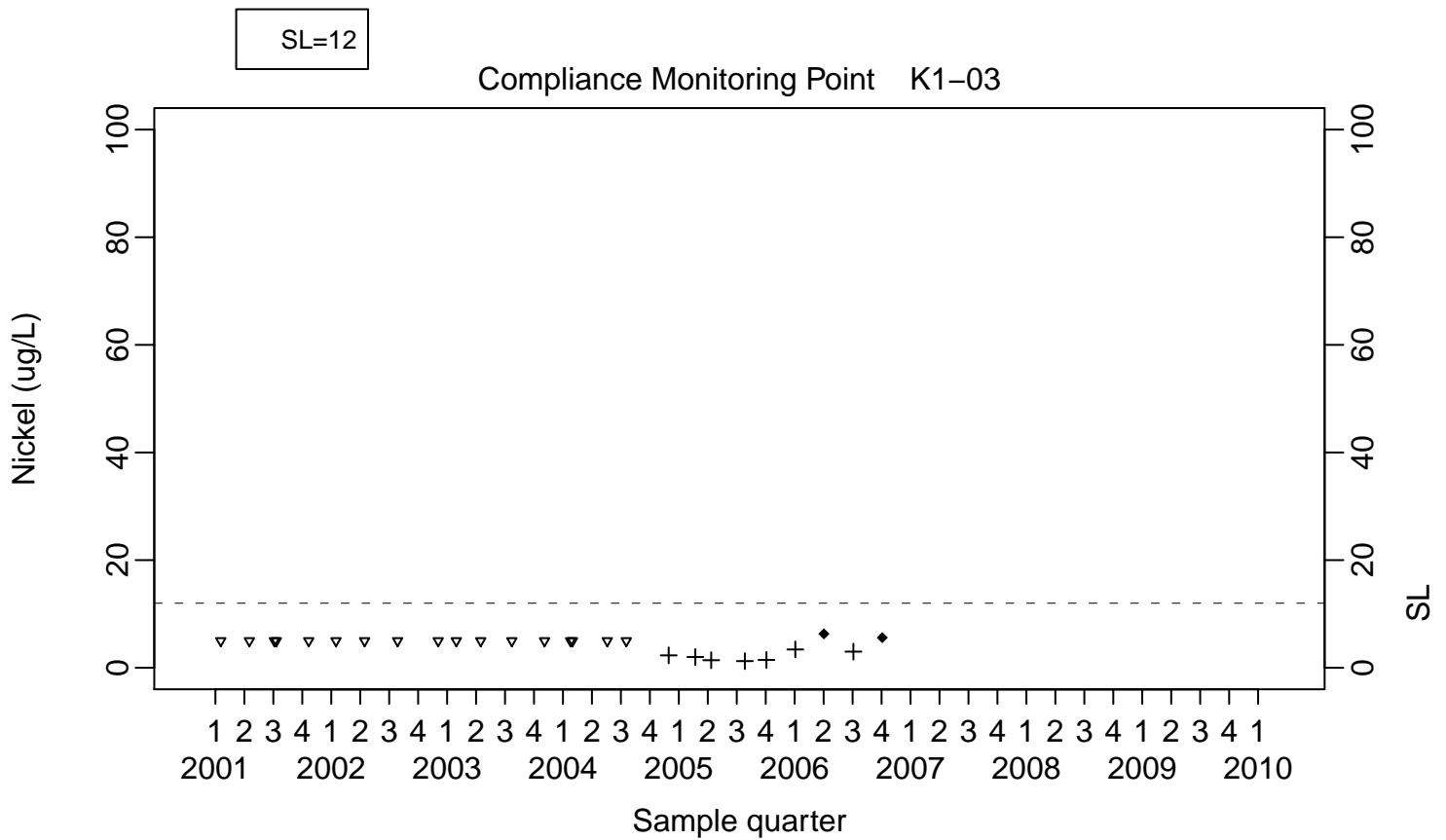
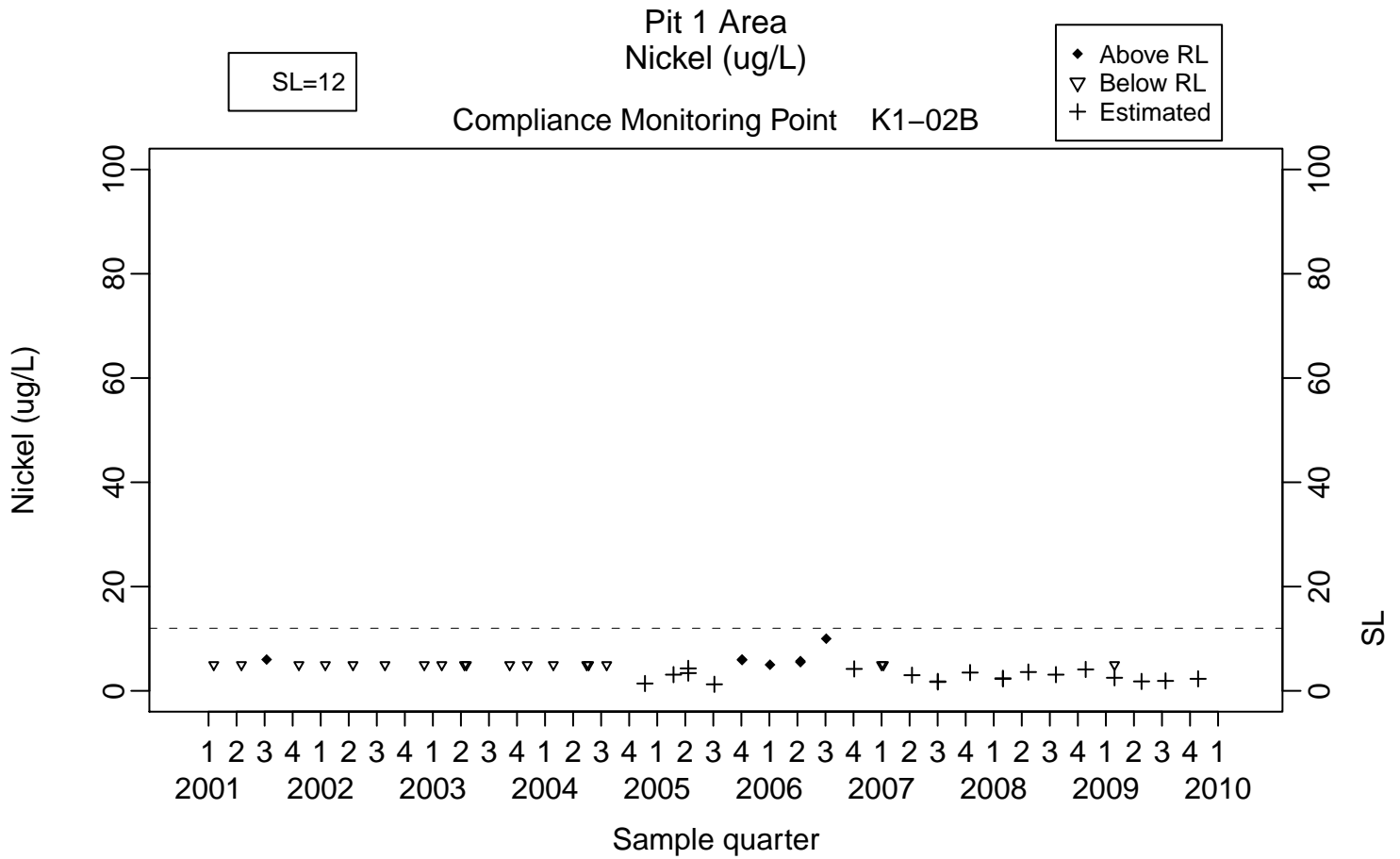
SL=2

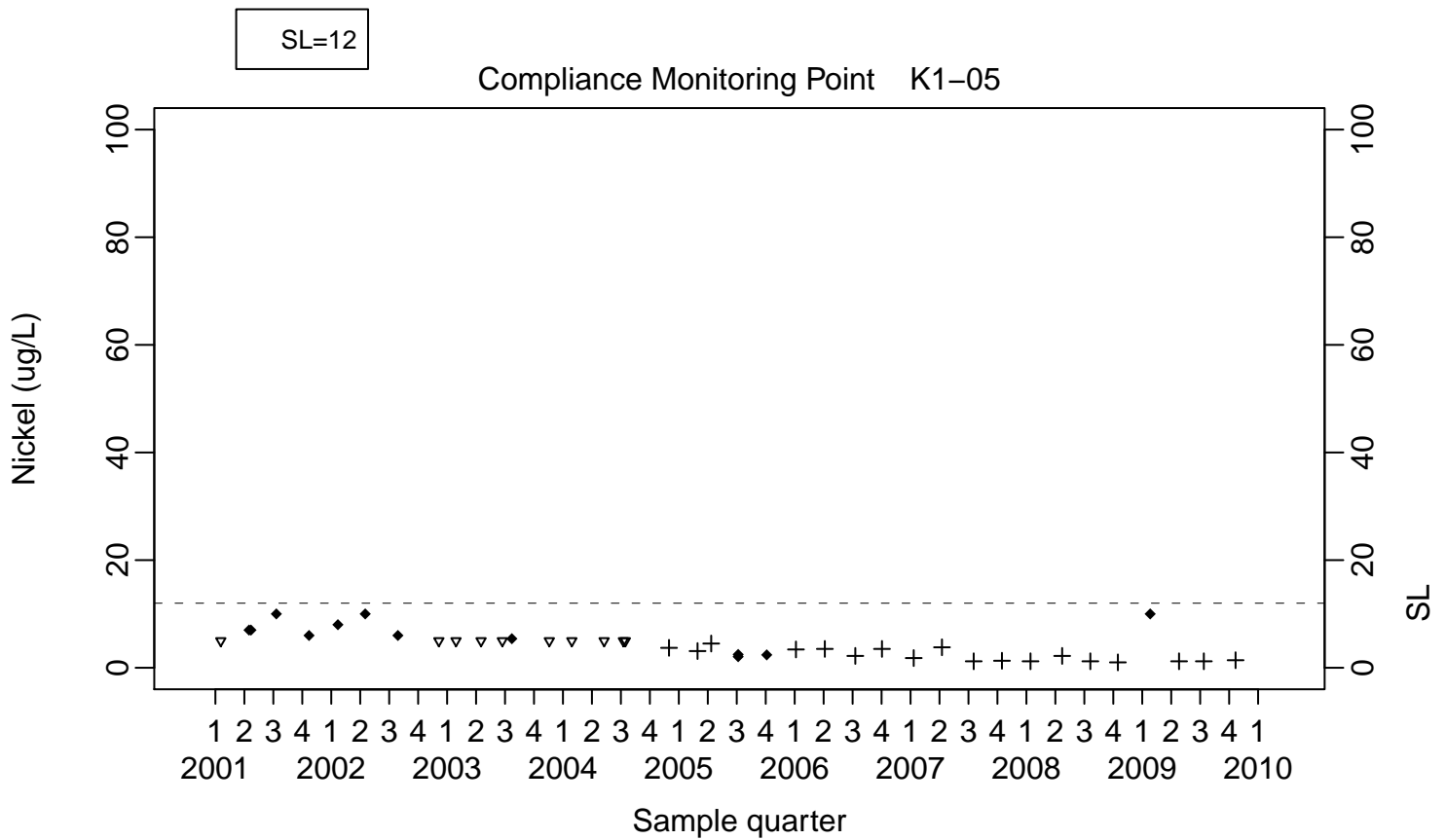
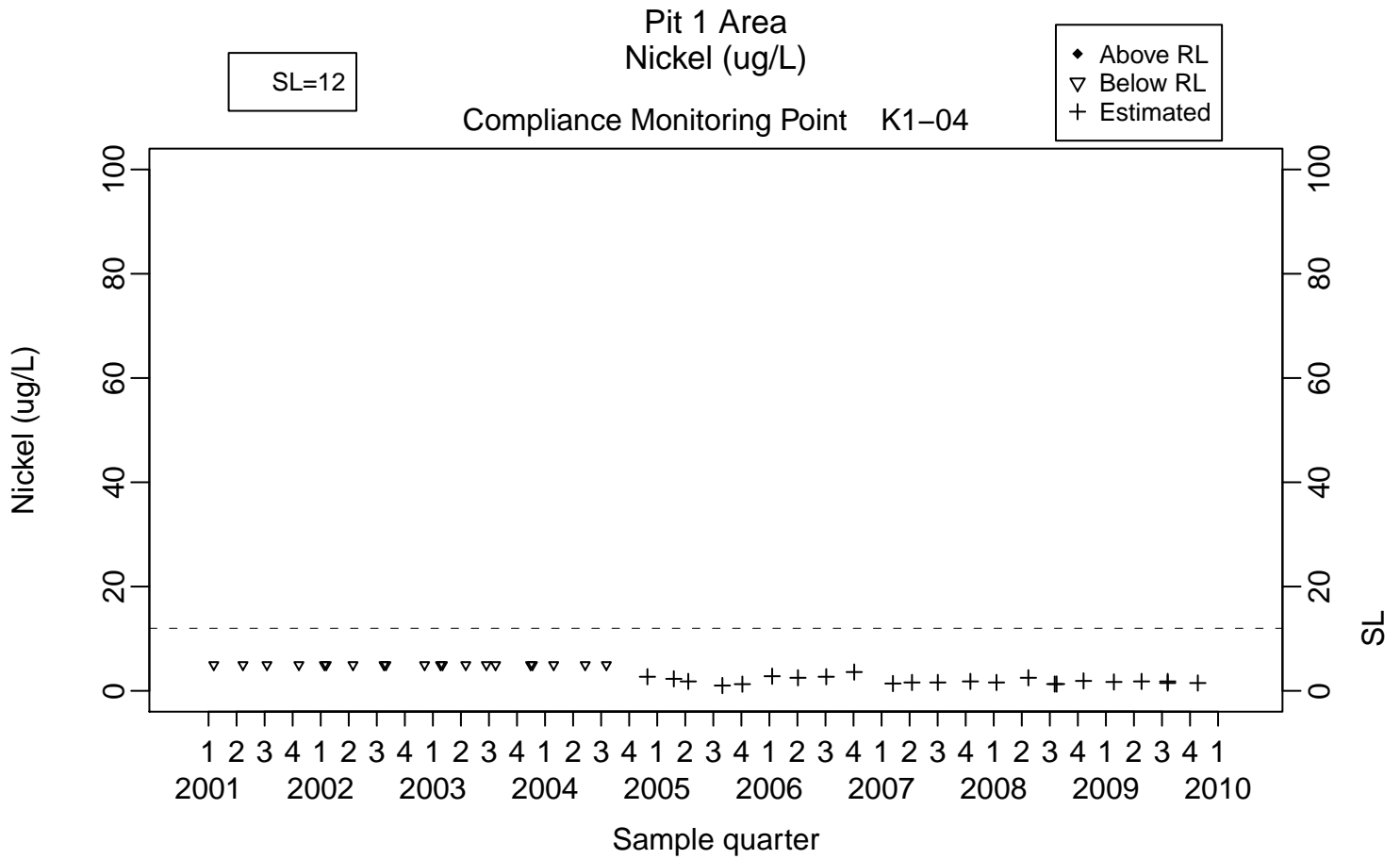
Compliance Monitoring Point K1-09

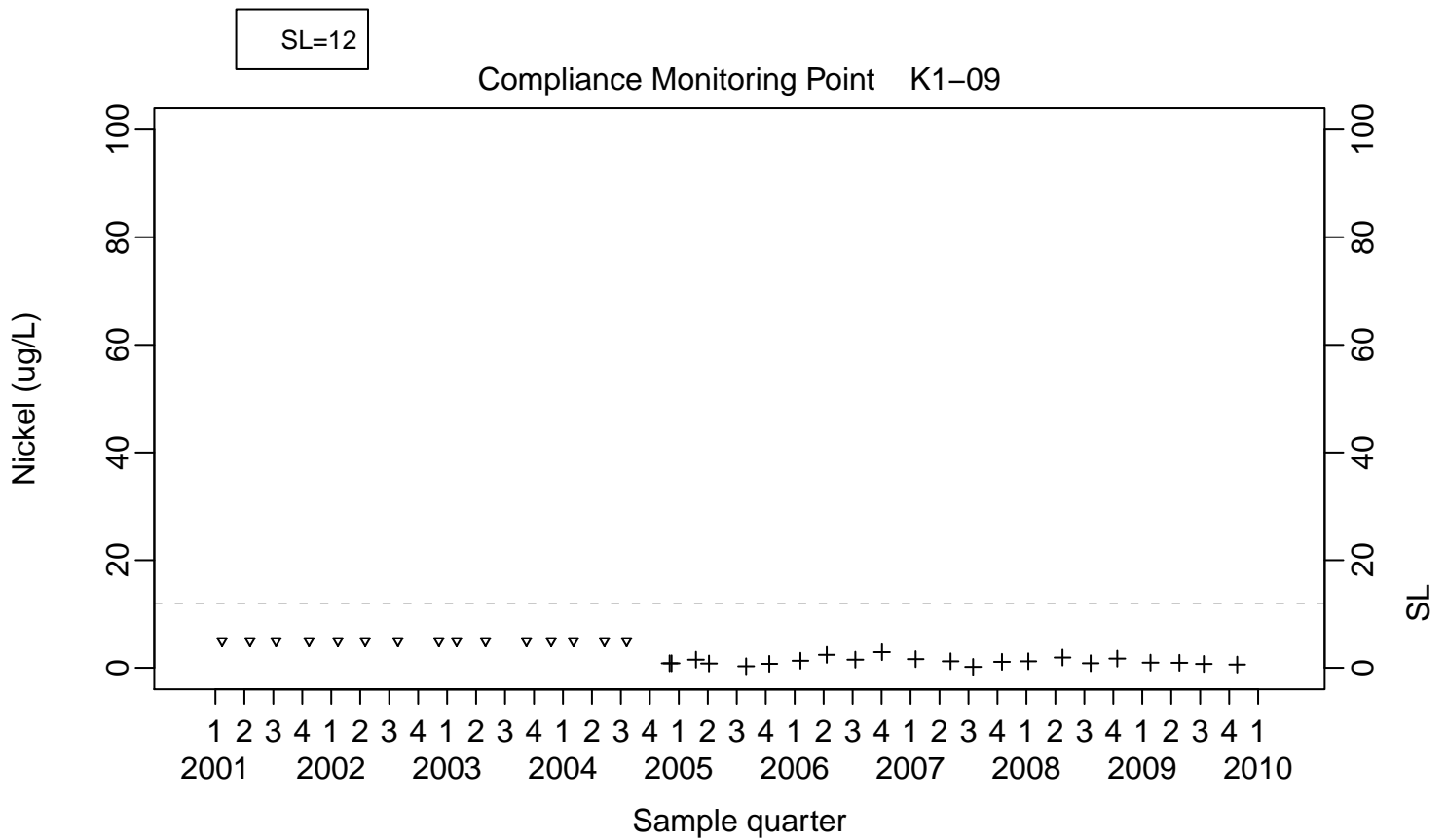
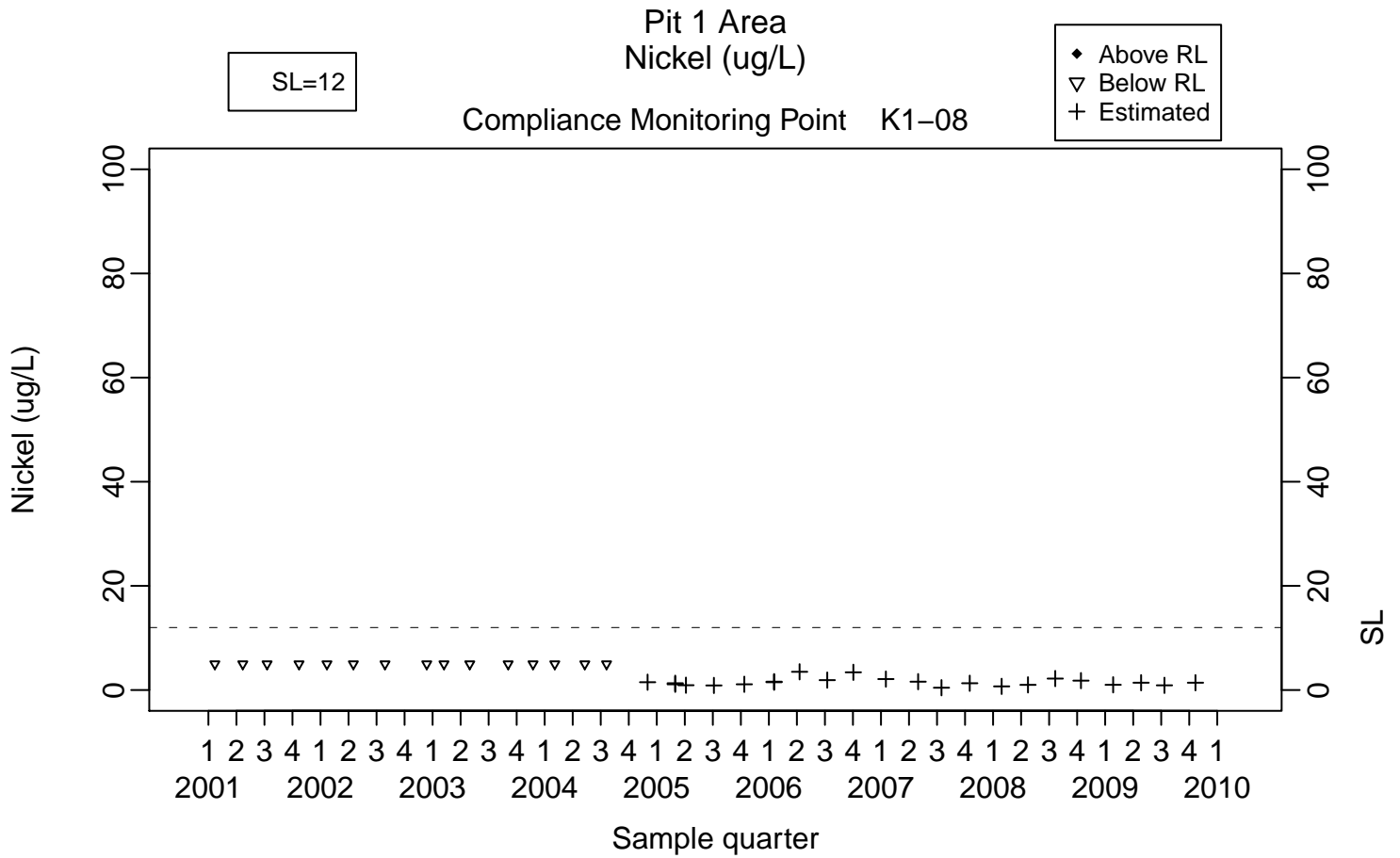


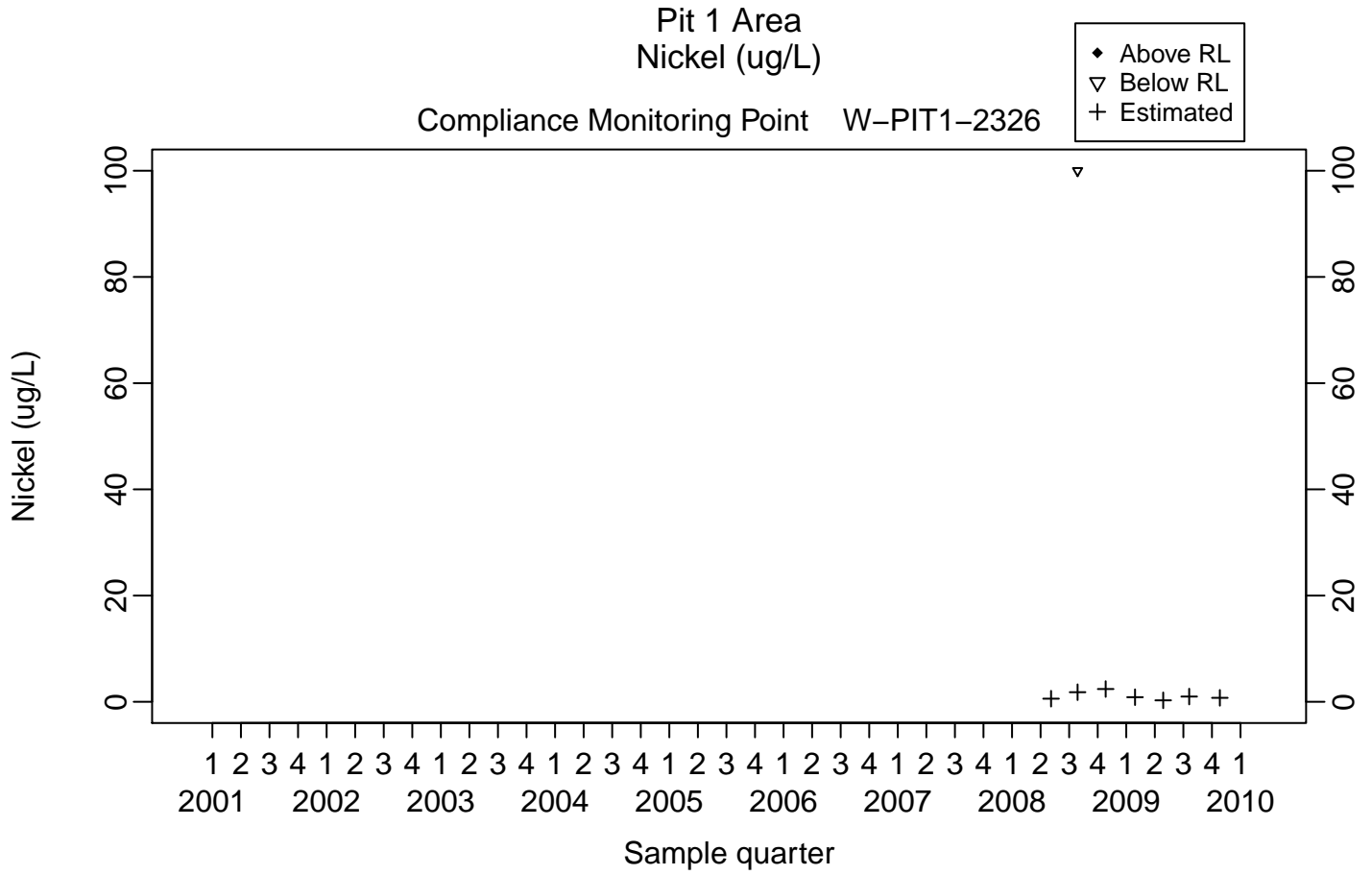








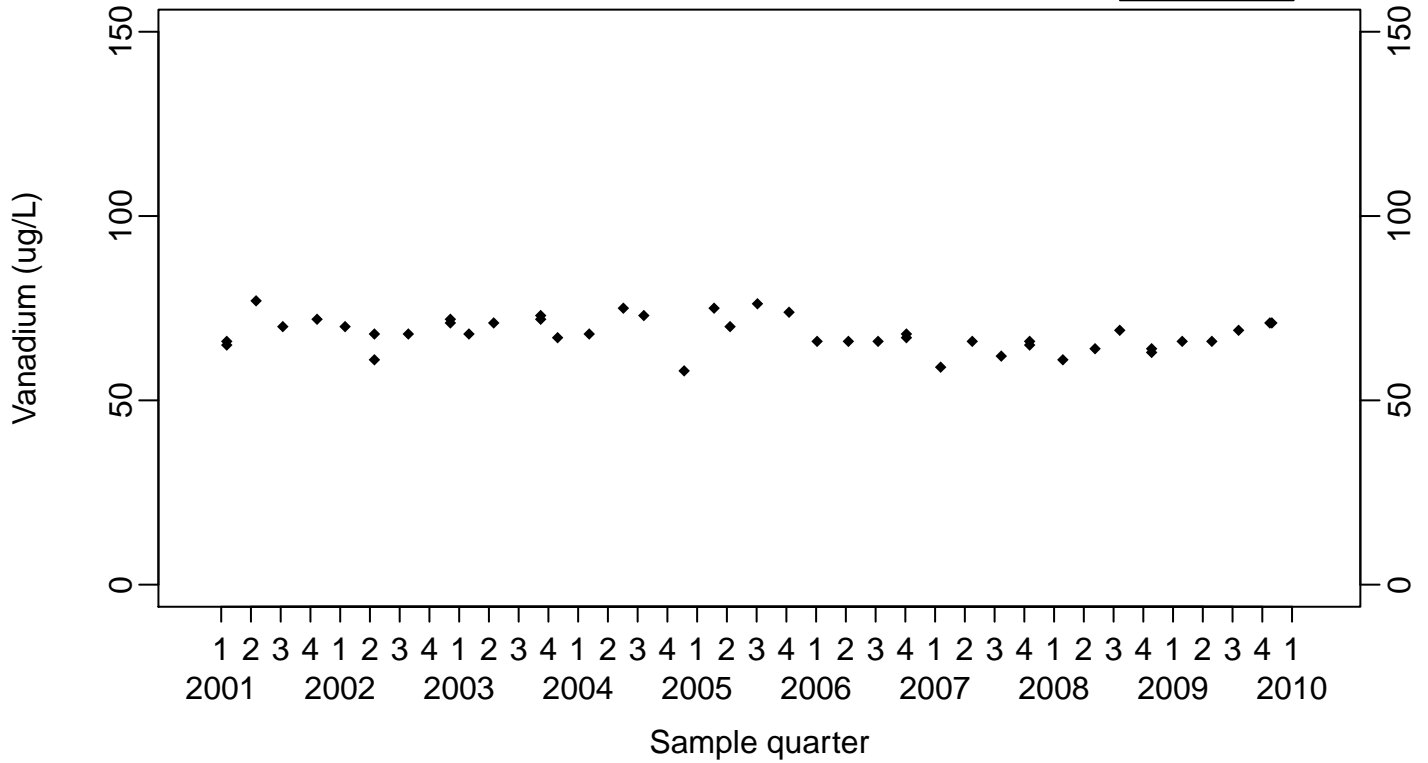




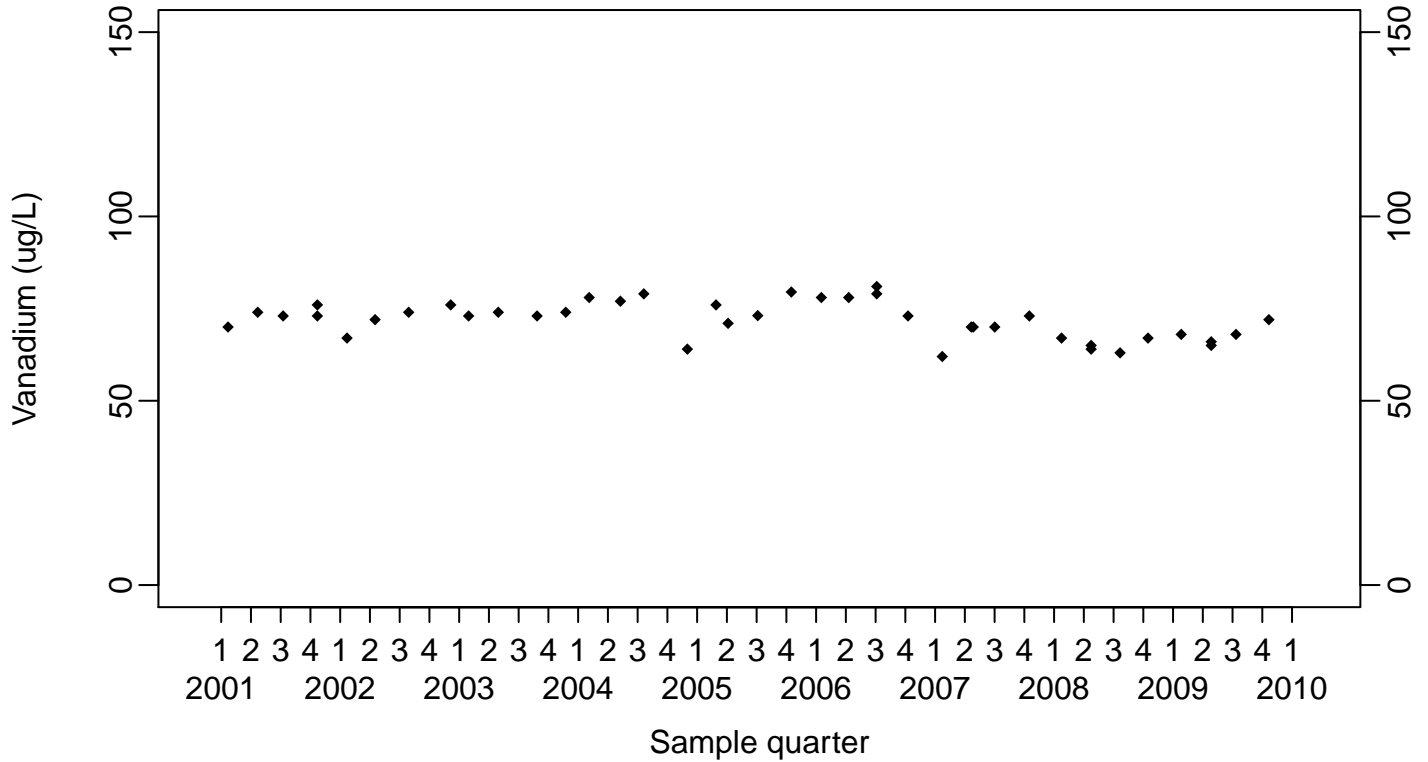
Pit 1 Area Vanadium (ug/L)

Background Monitoring Point K1-01C

◆ Above RL
▽ Below RL



Background Monitoring Point K1-07

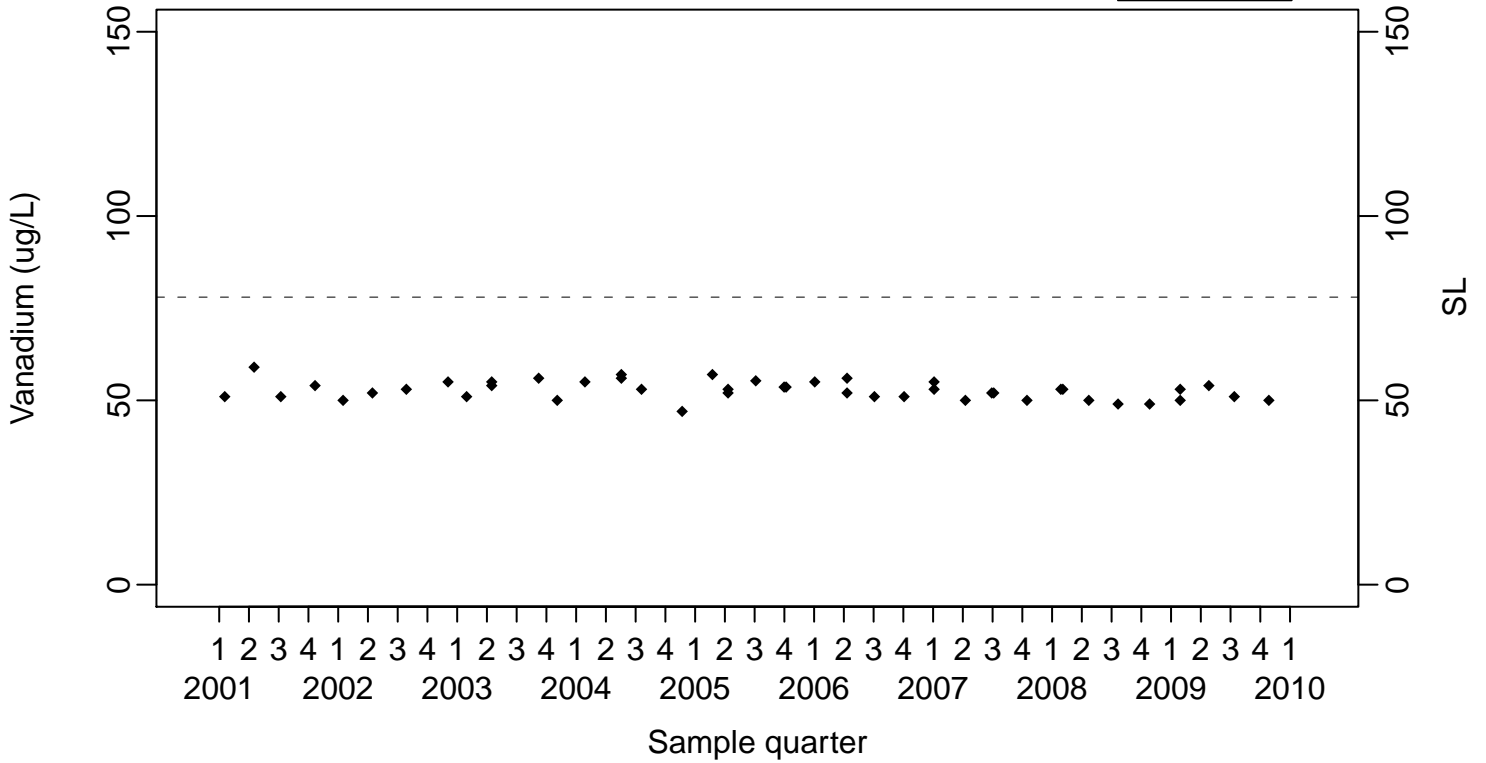


Pit 1 Area Vanadium (ug/L)

Compliance Monitoring Point K1-02B

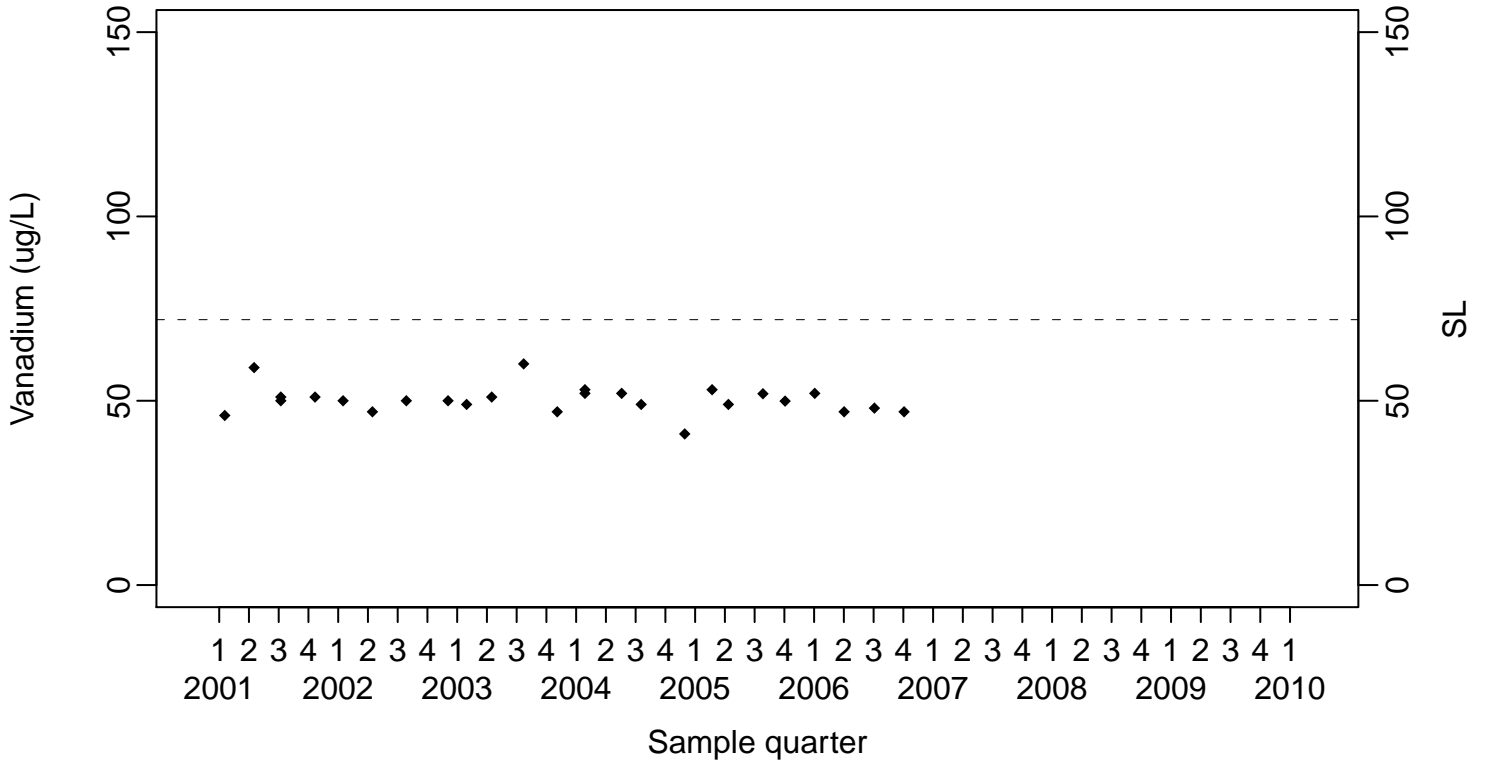
SL=78

◆ Above RL
▽ Below RL



SL=72

Compliance Monitoring Point K1-03

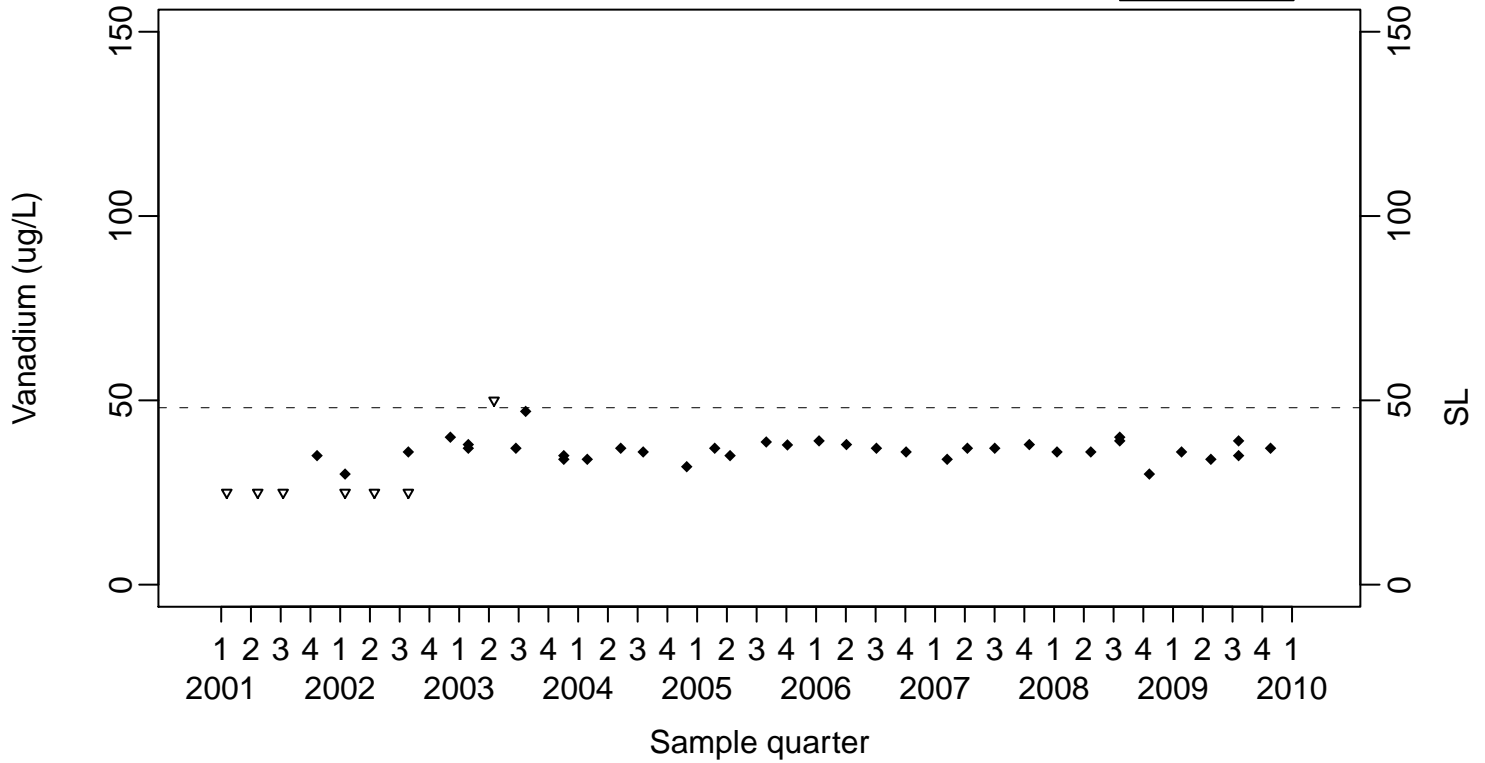


Pit 1 Area Vanadium (ug/L)

SL=48

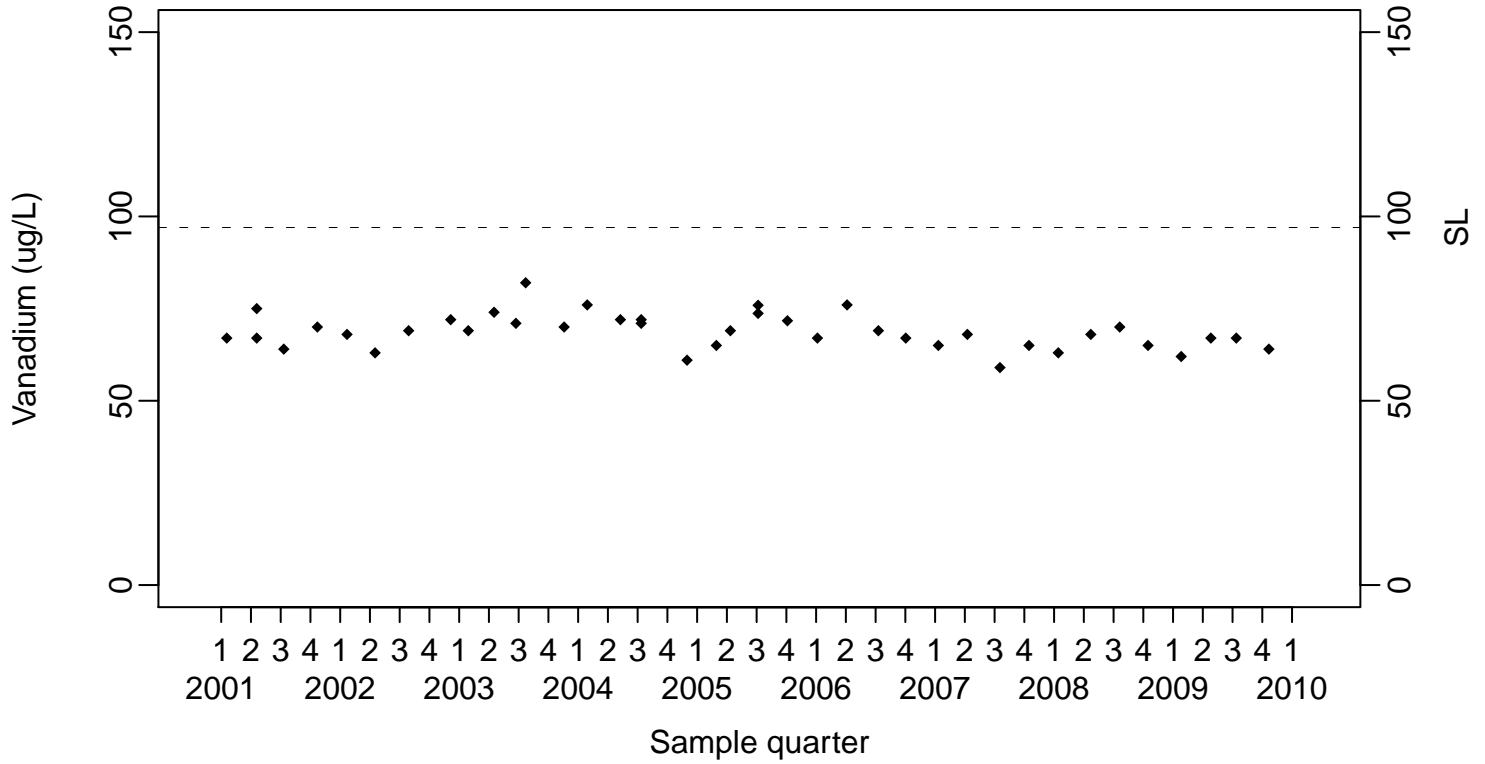
◆ Above RL
▽ Below RL

Compliance Monitoring Point K1-04



SL=97

Compliance Monitoring Point K1-05

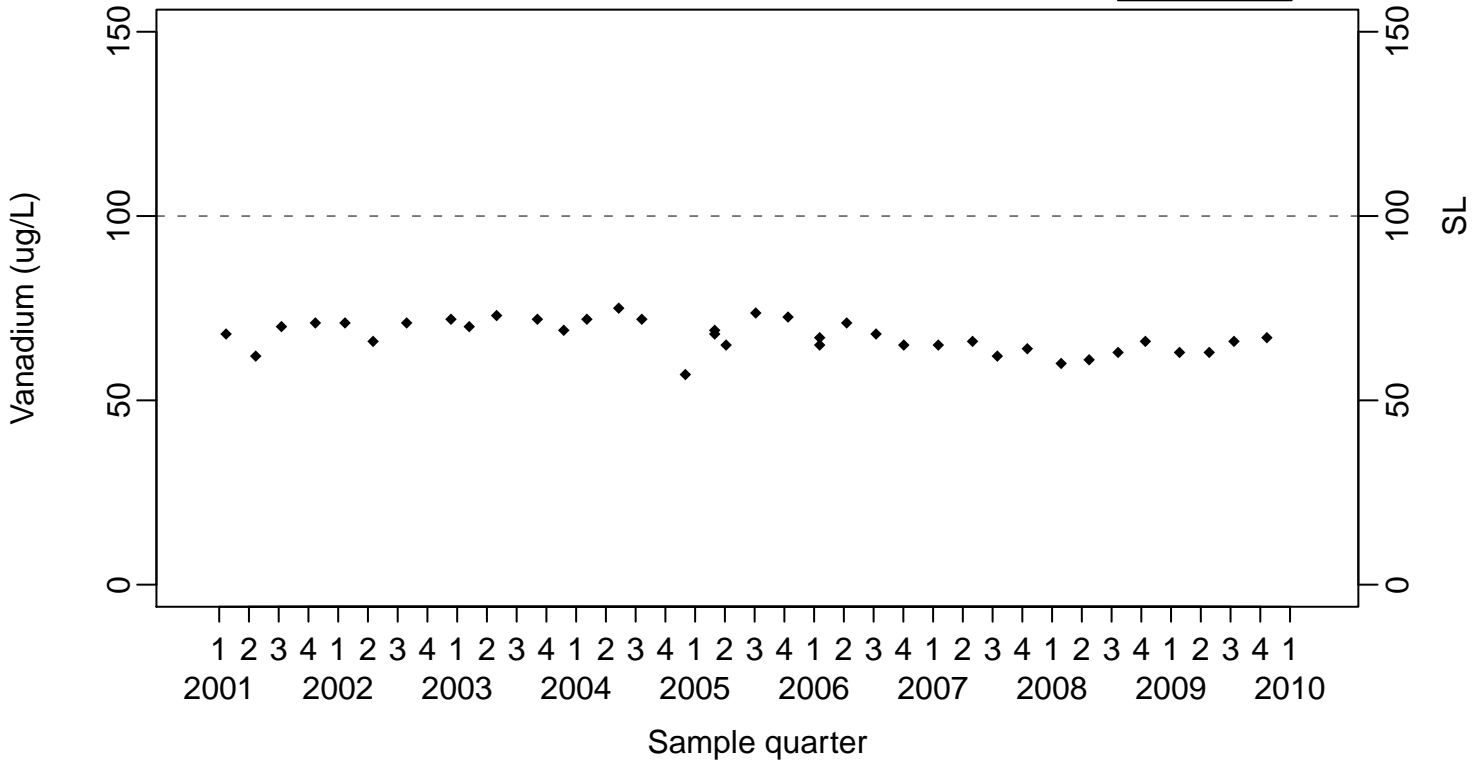


Pit 1 Area Vanadium (ug/L)

SL=100

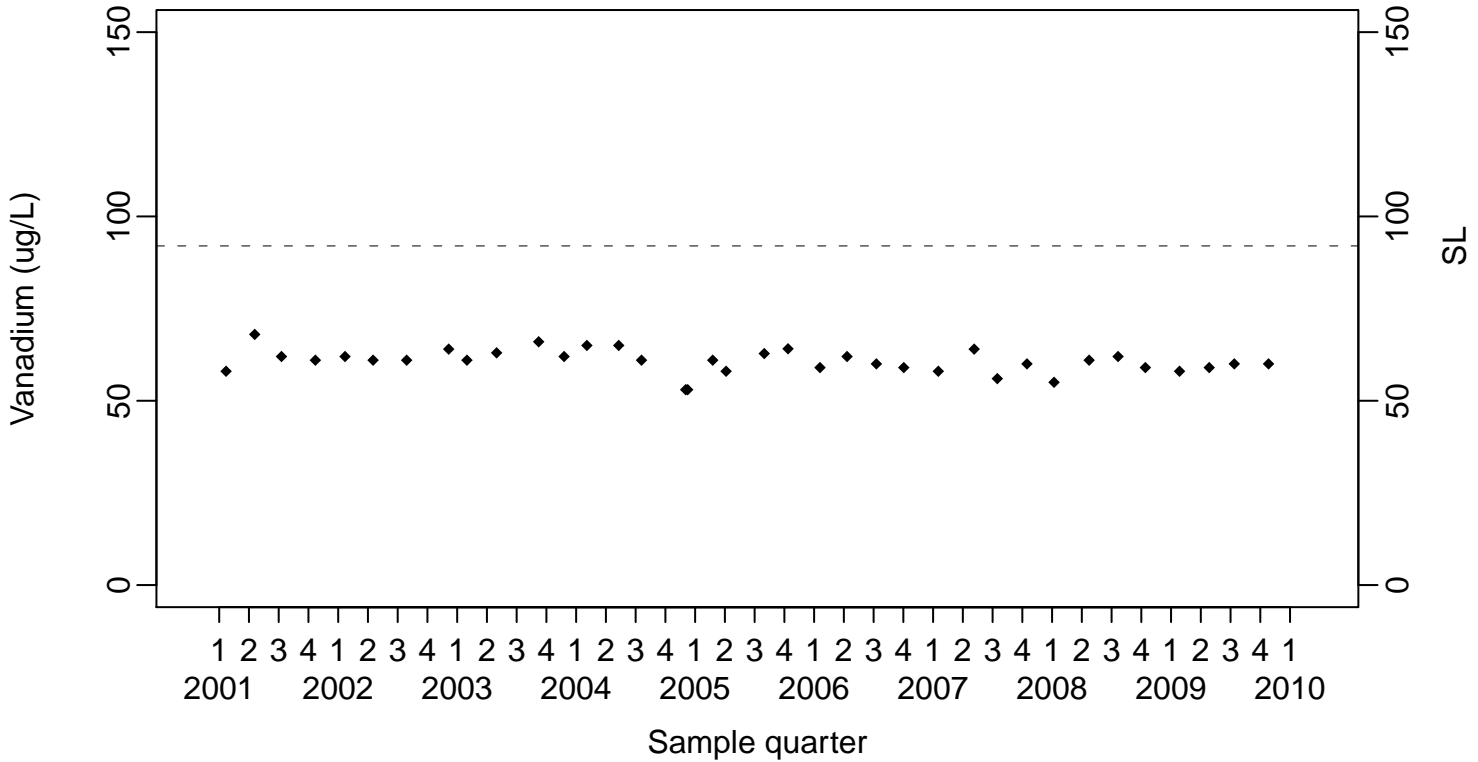
◆ Above RL
▽ Below RL

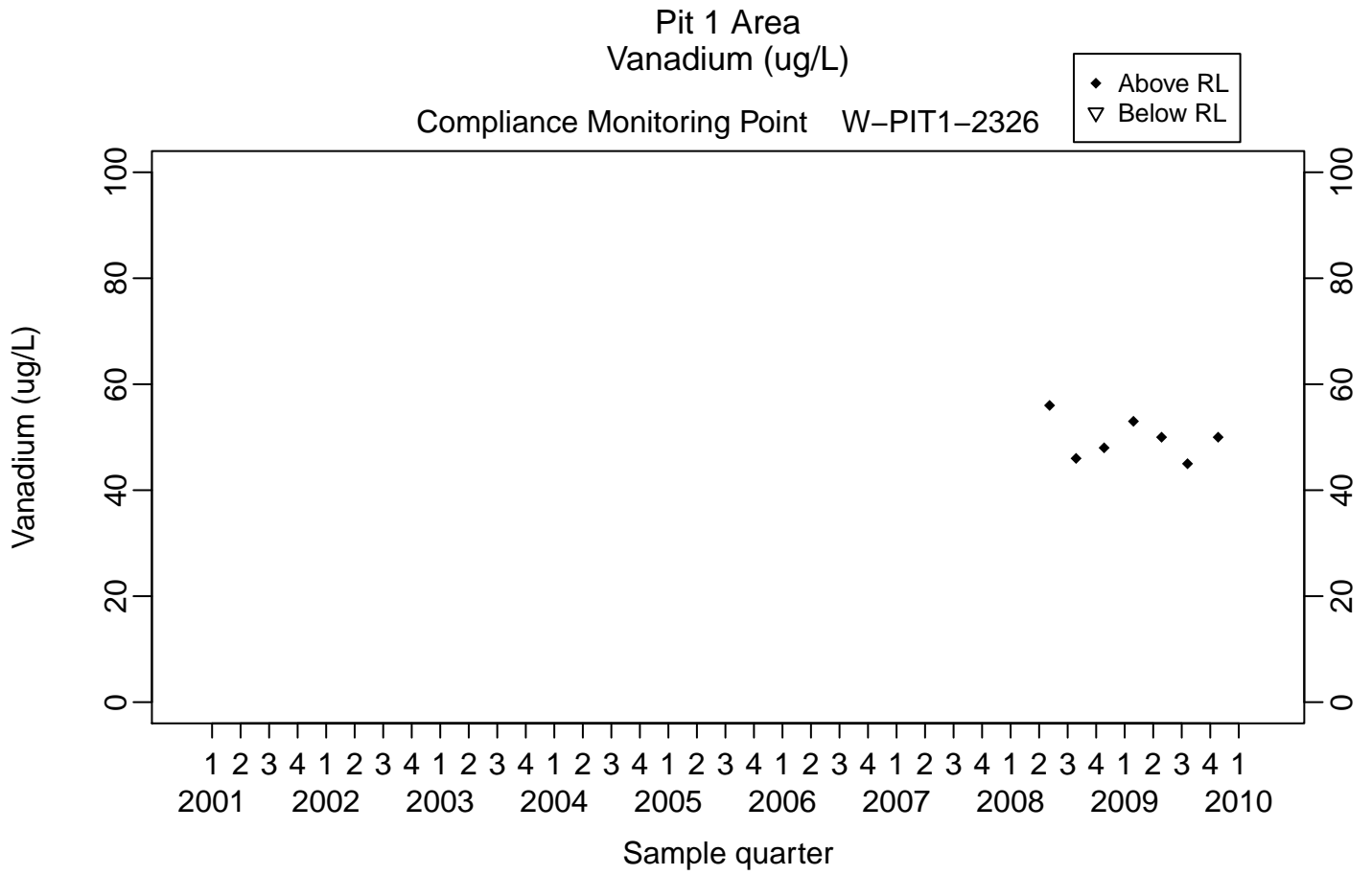
Compliance Monitoring Point K1-08

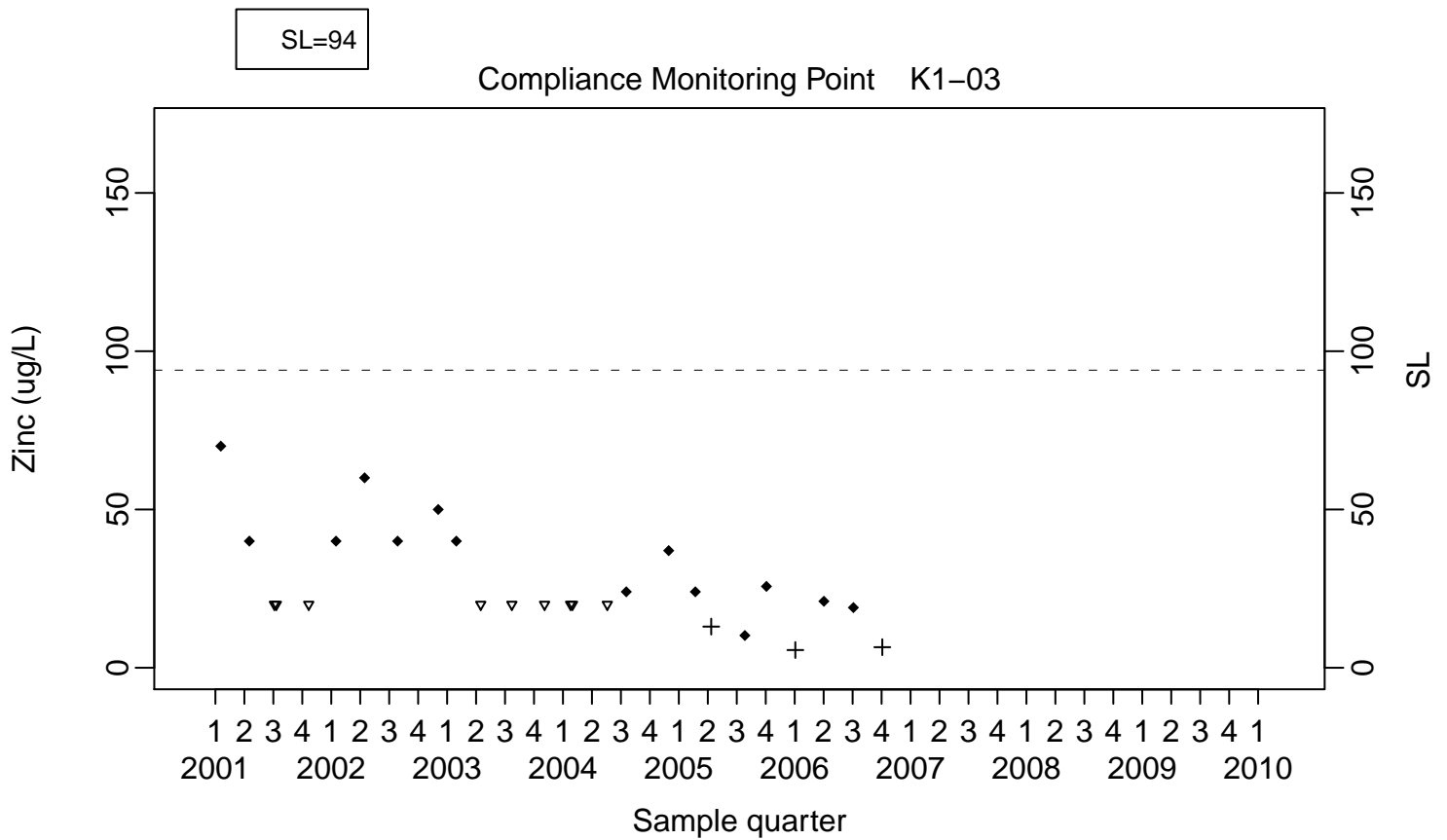
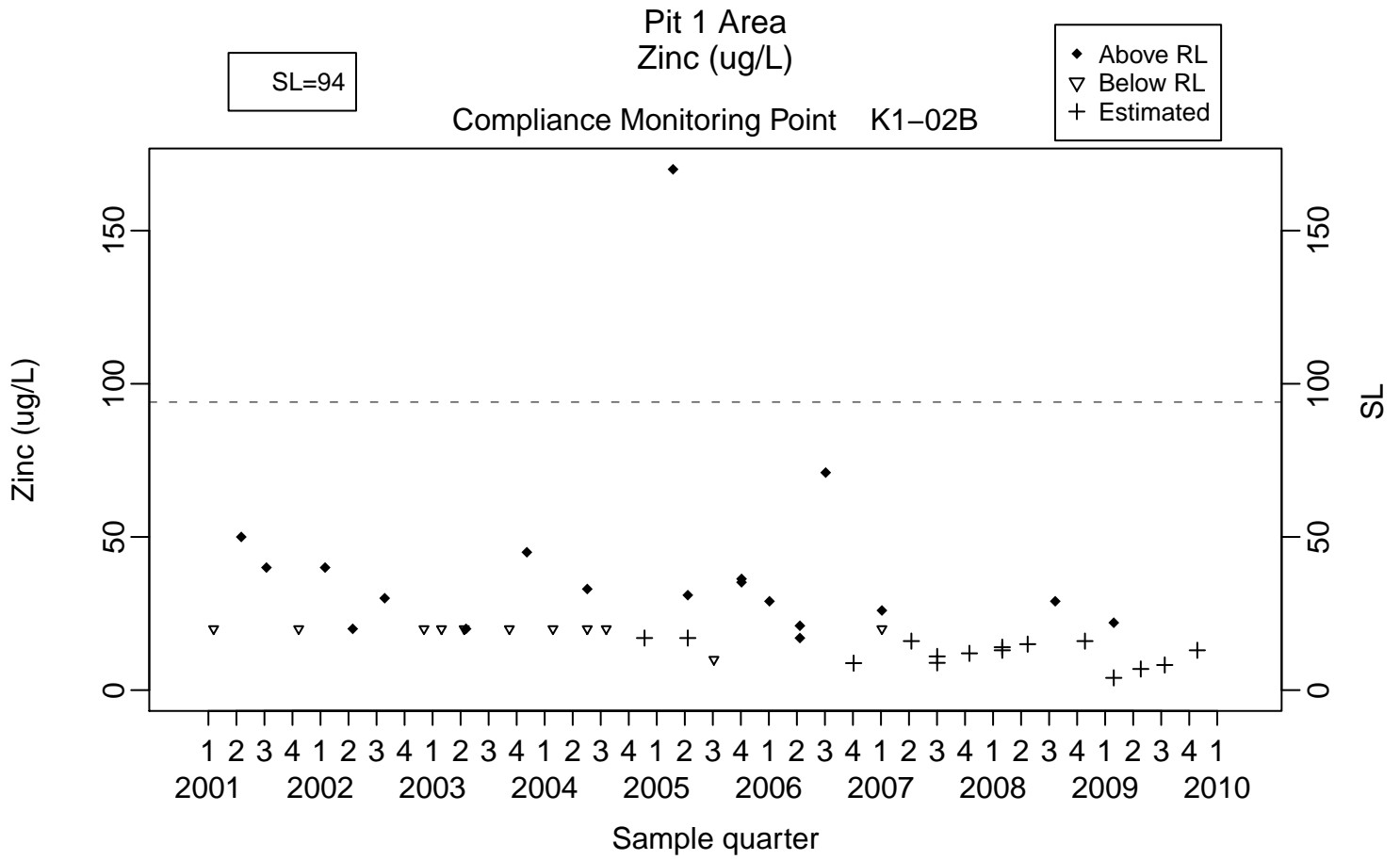


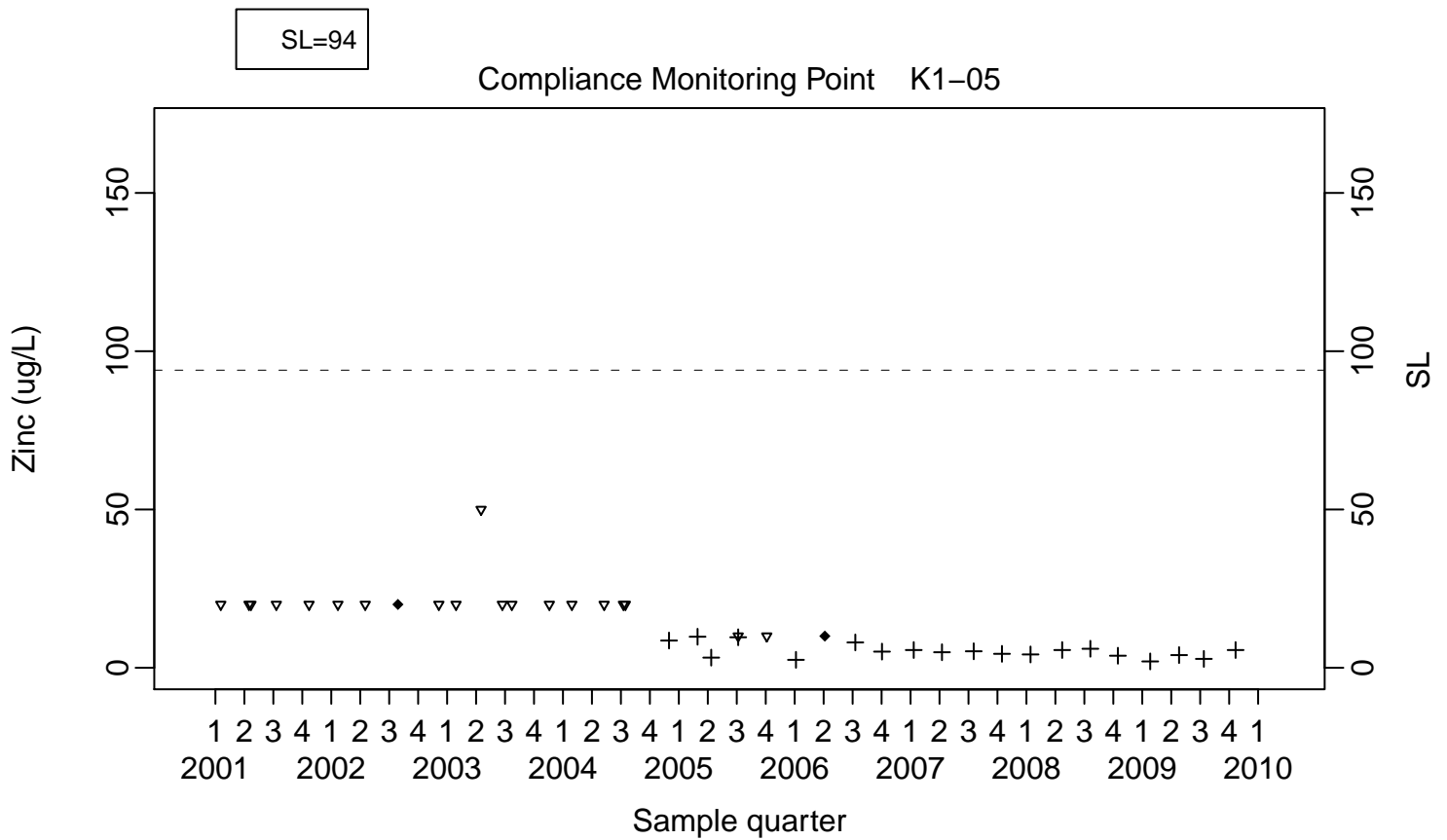
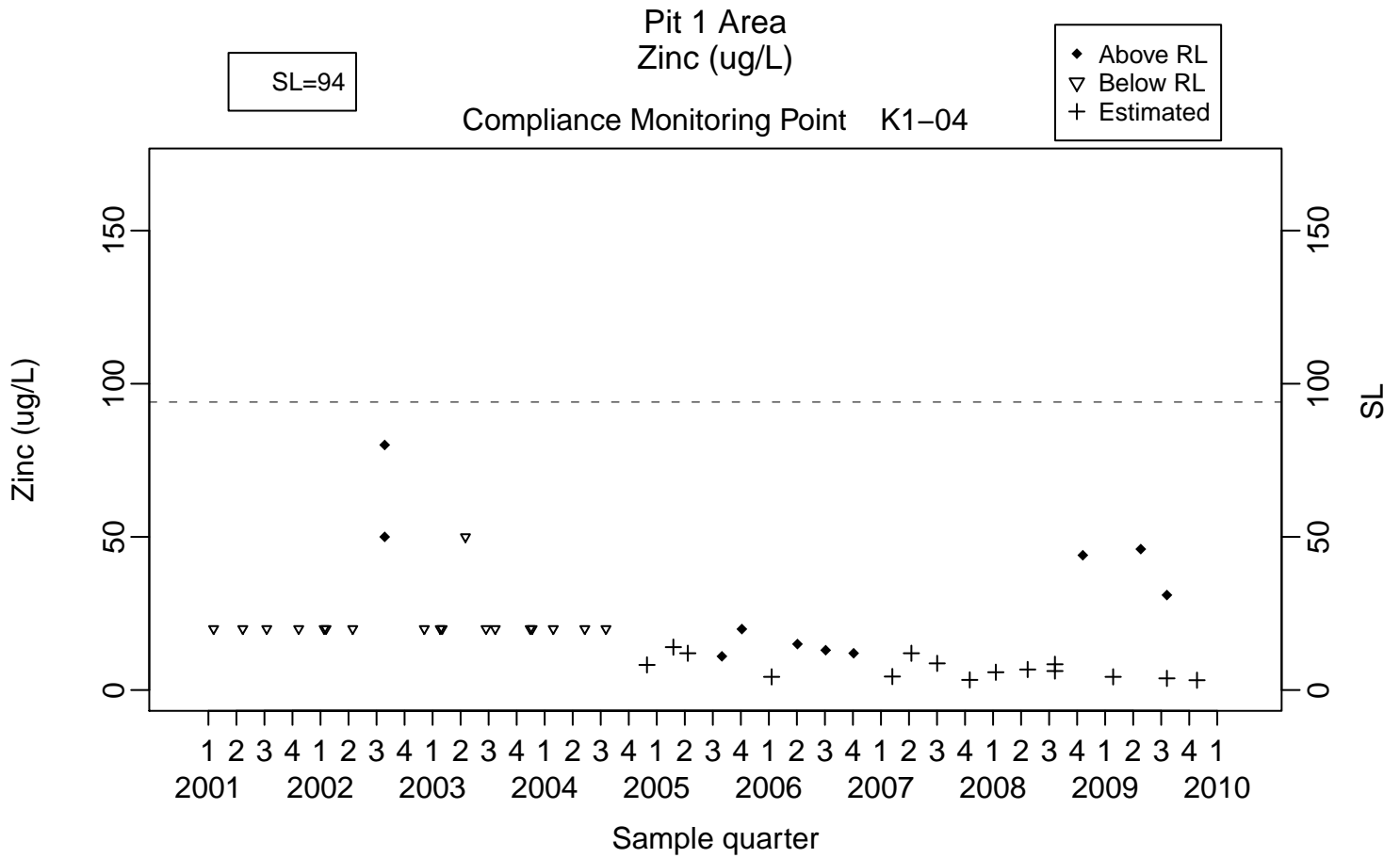
SL=92

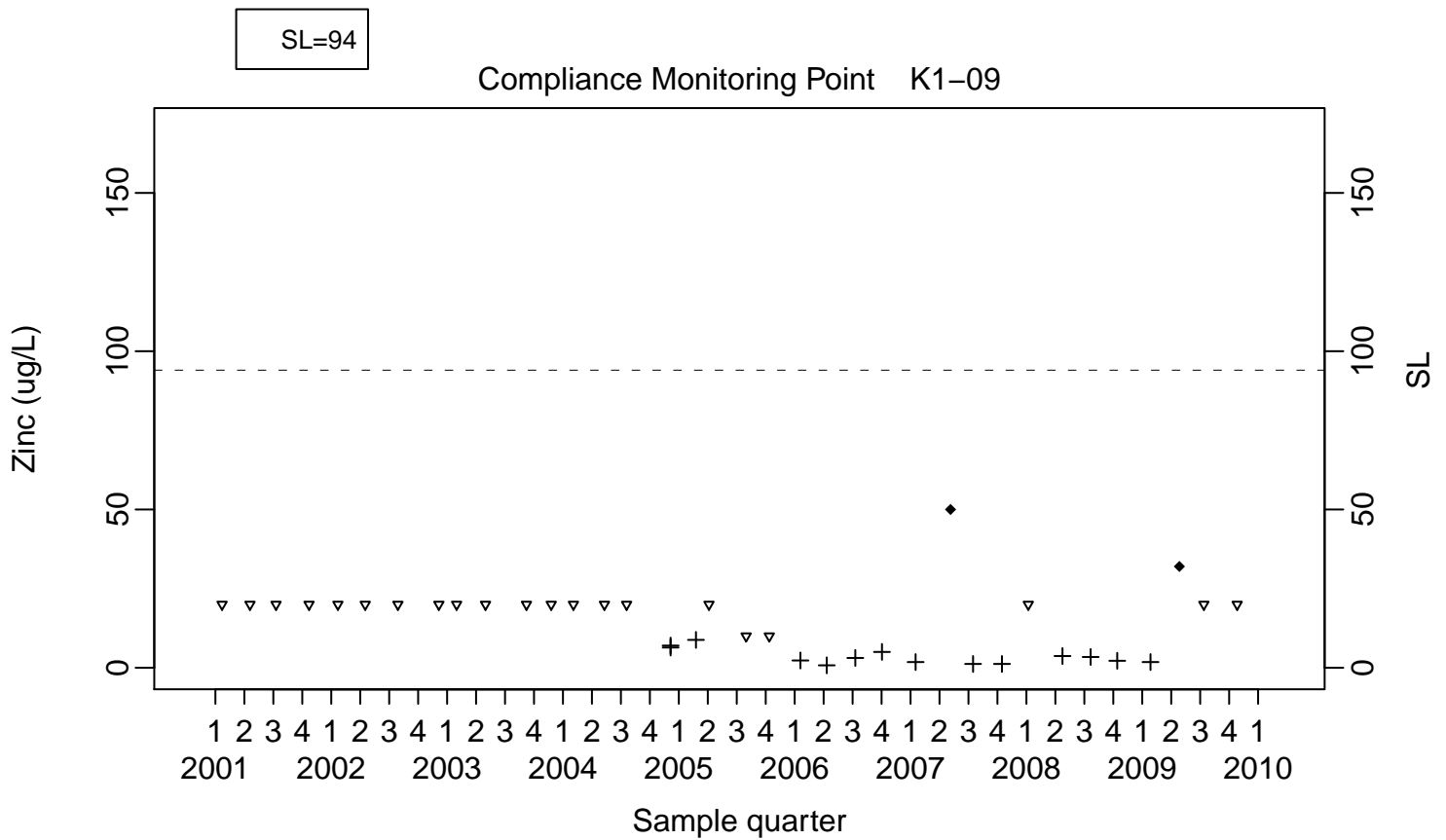
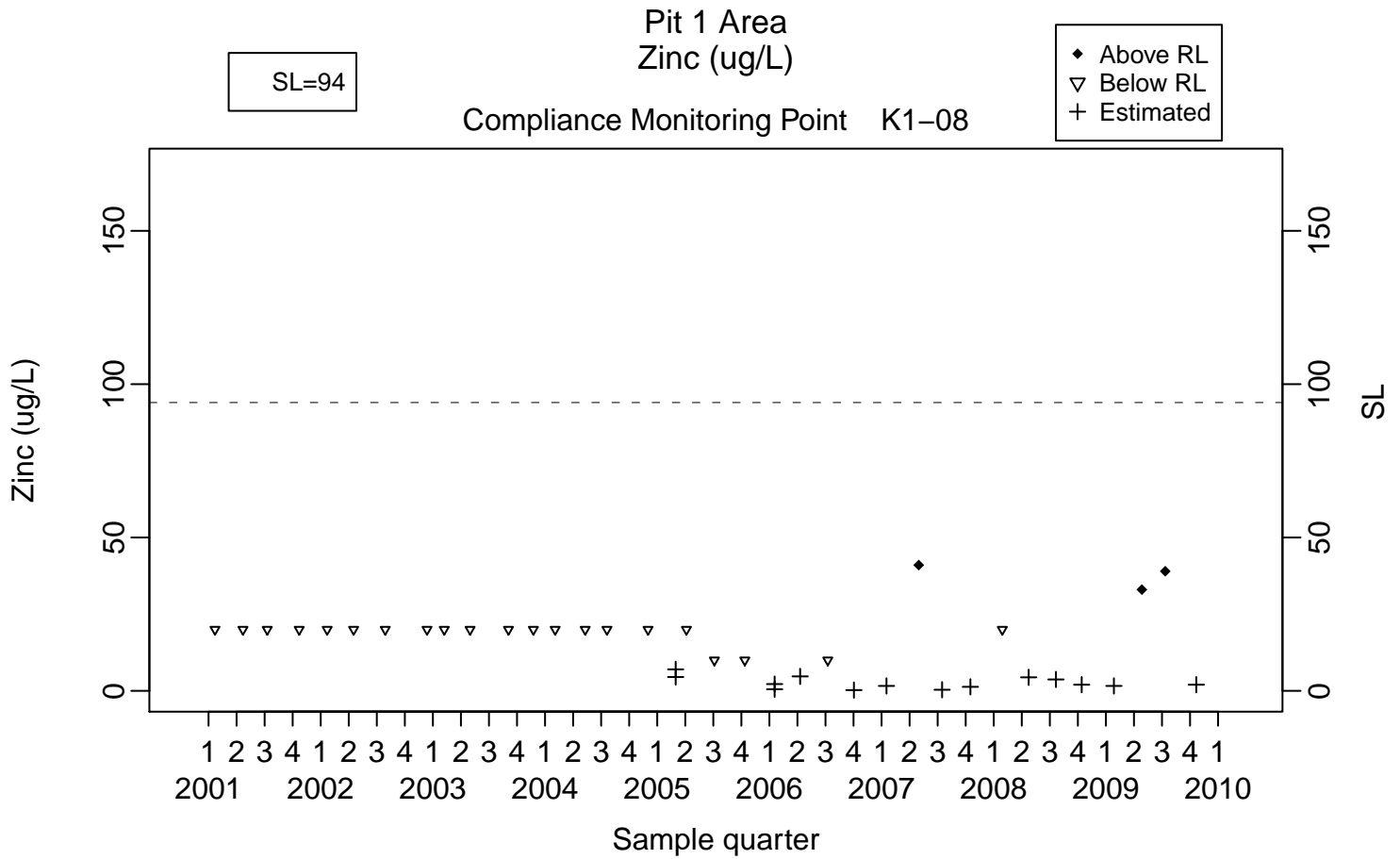
Compliance Monitoring Point K1-09

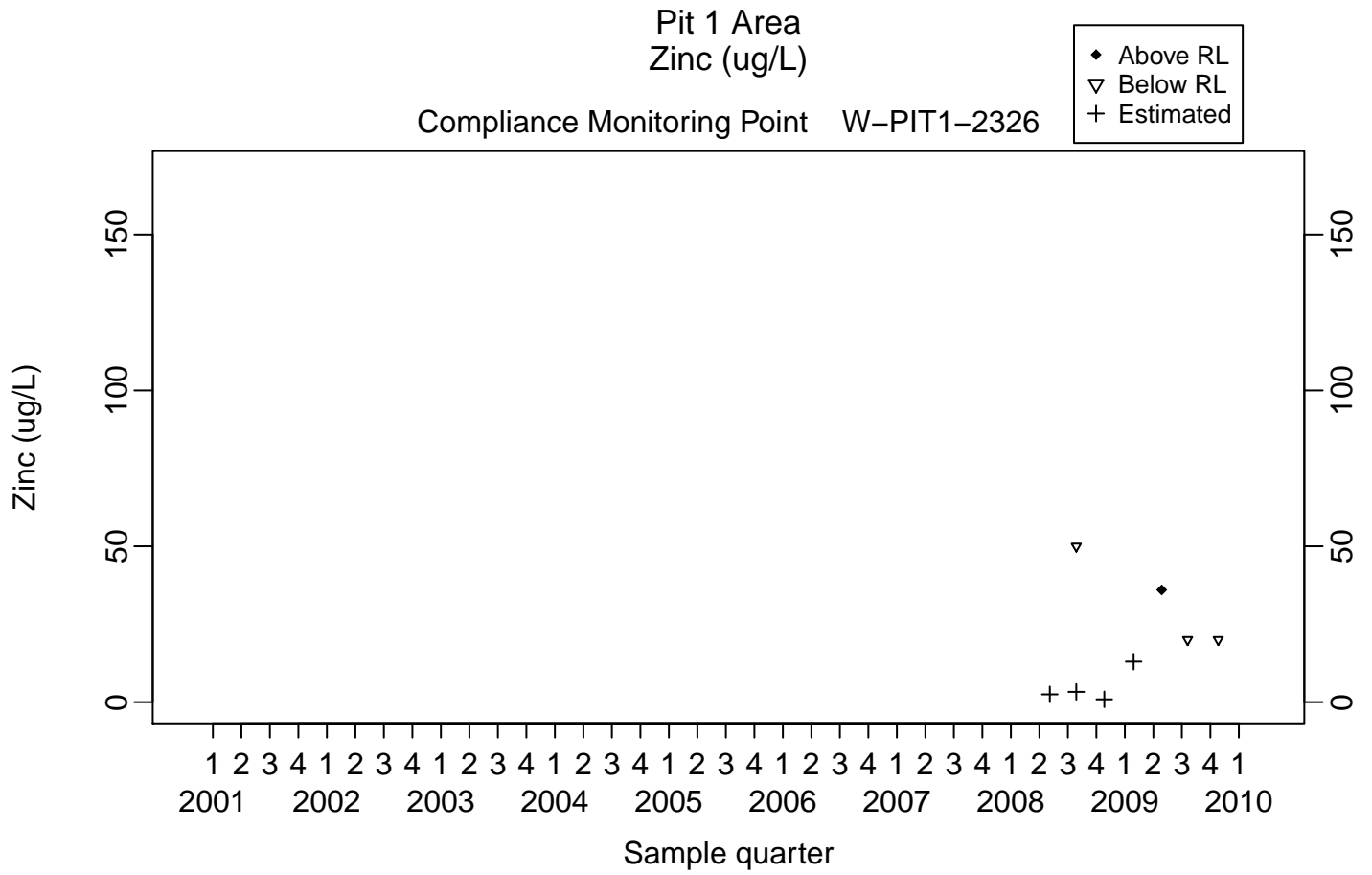








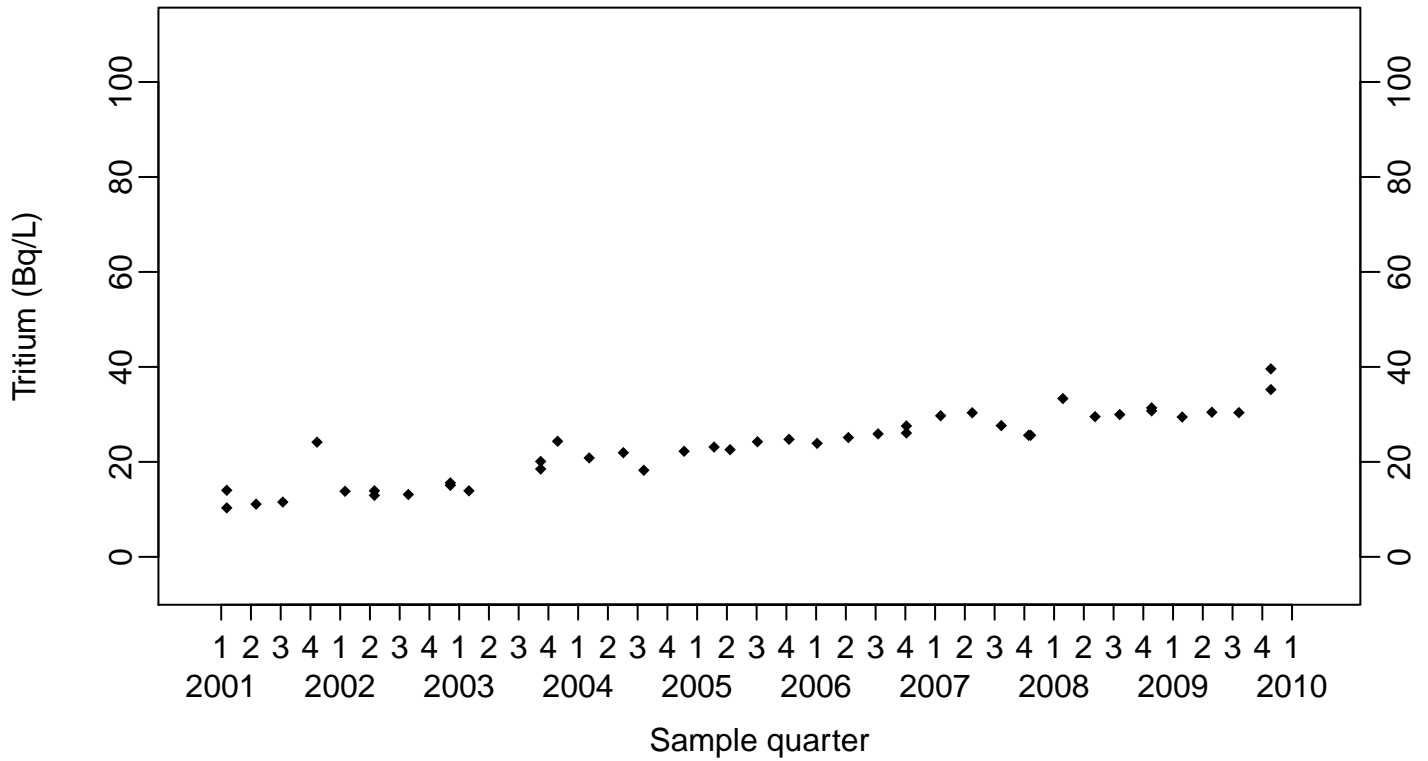




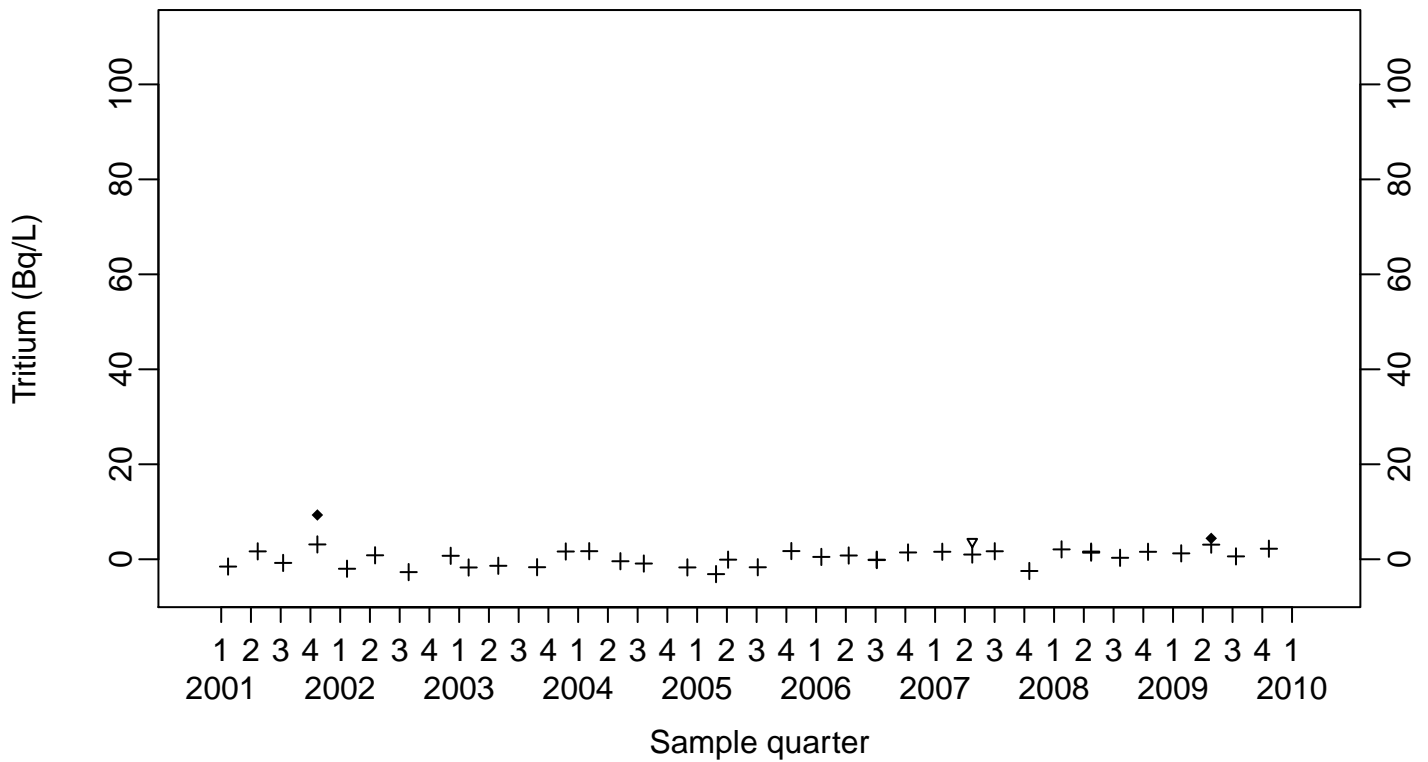
Pit 1 Area
Tritium (Bq/L)

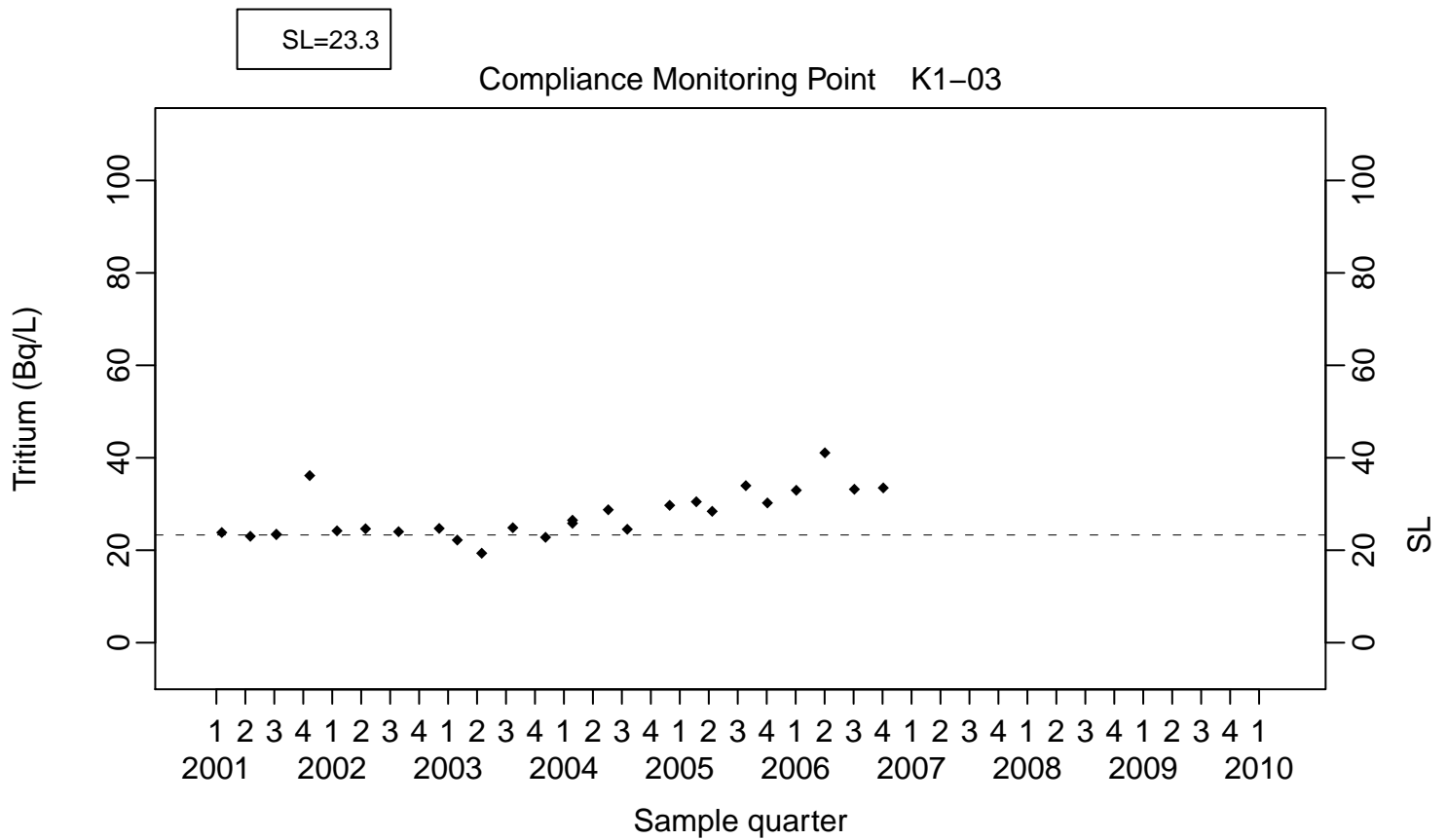
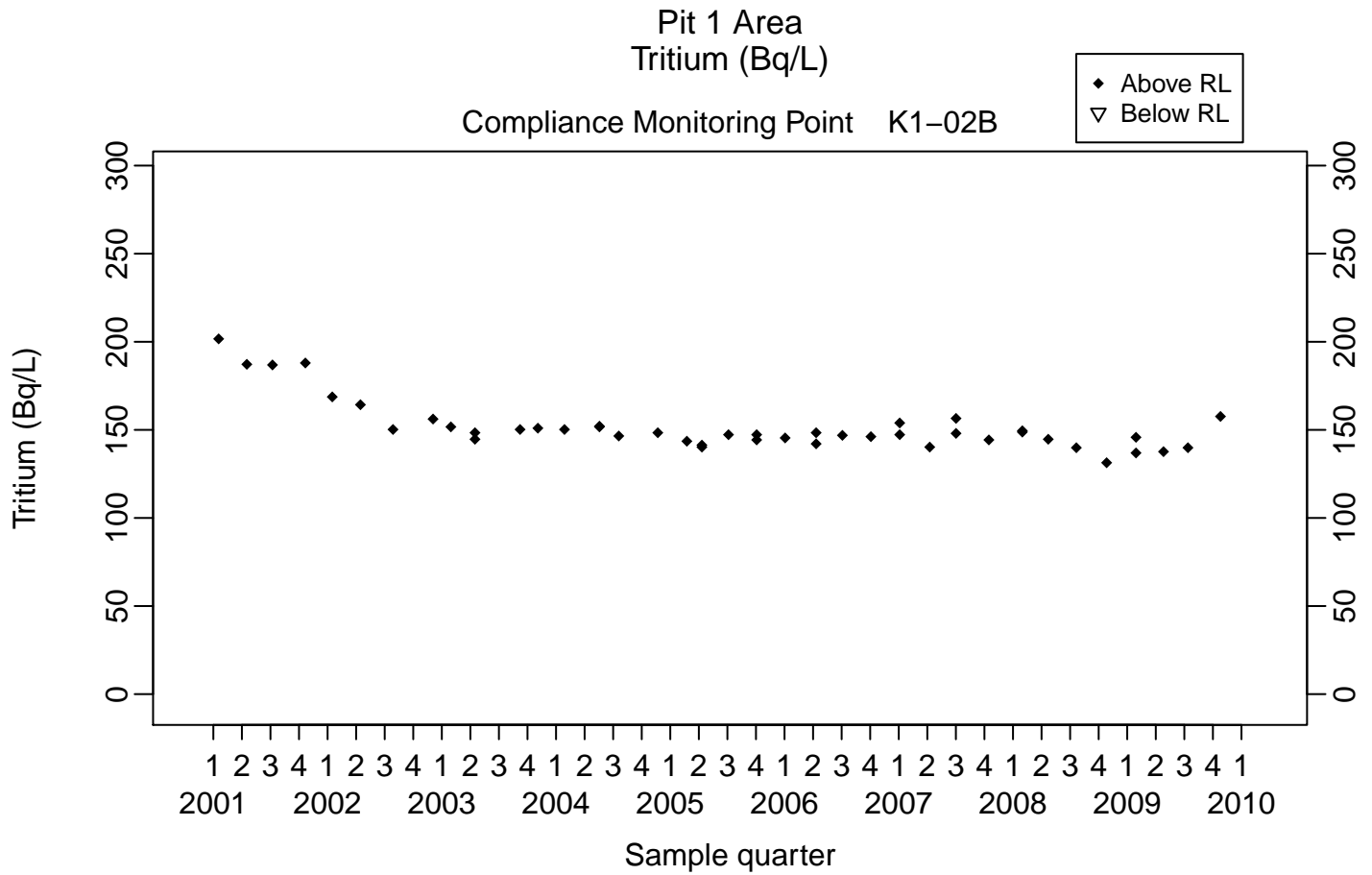
Background Monitoring Point K1-01C

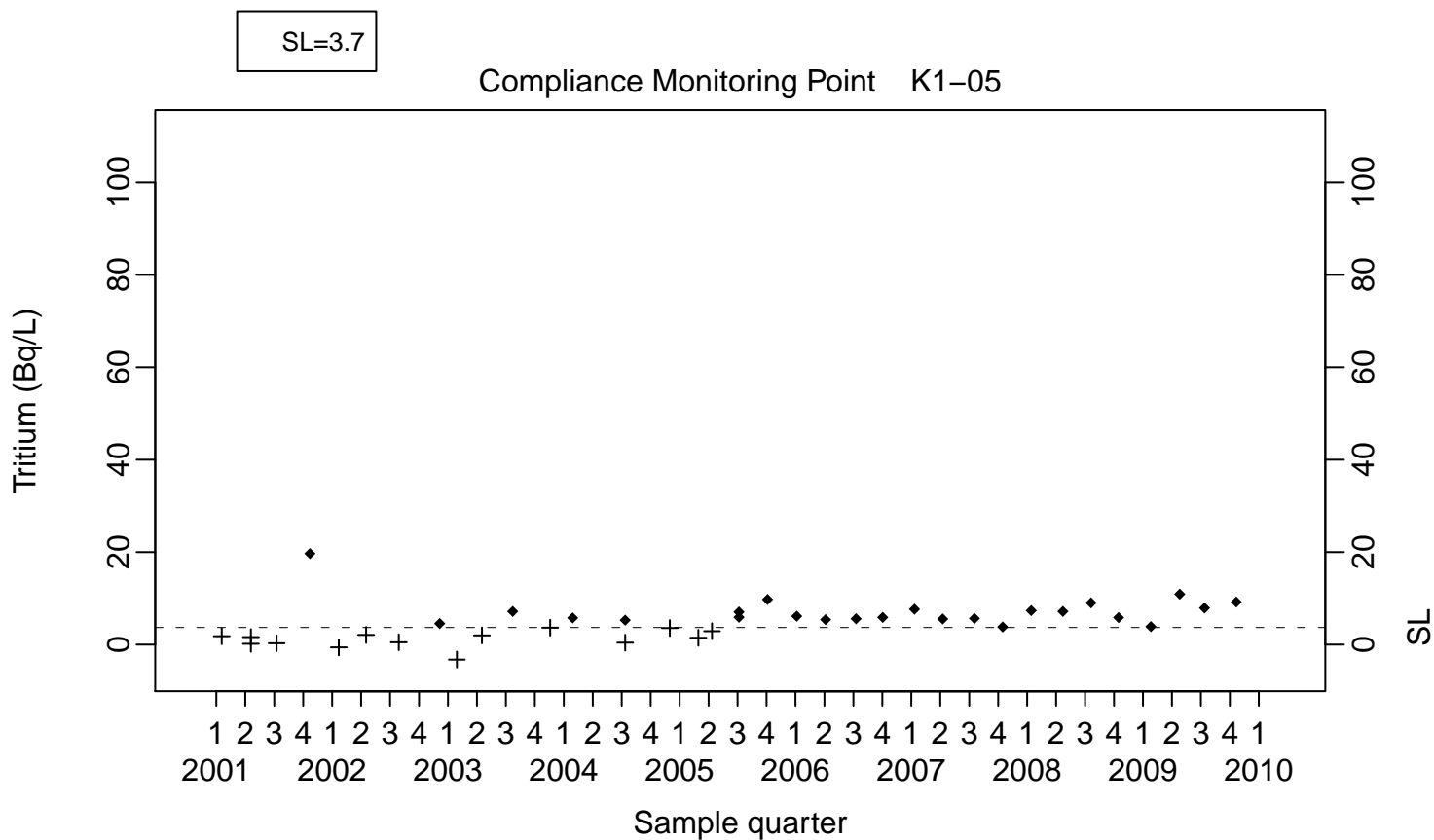
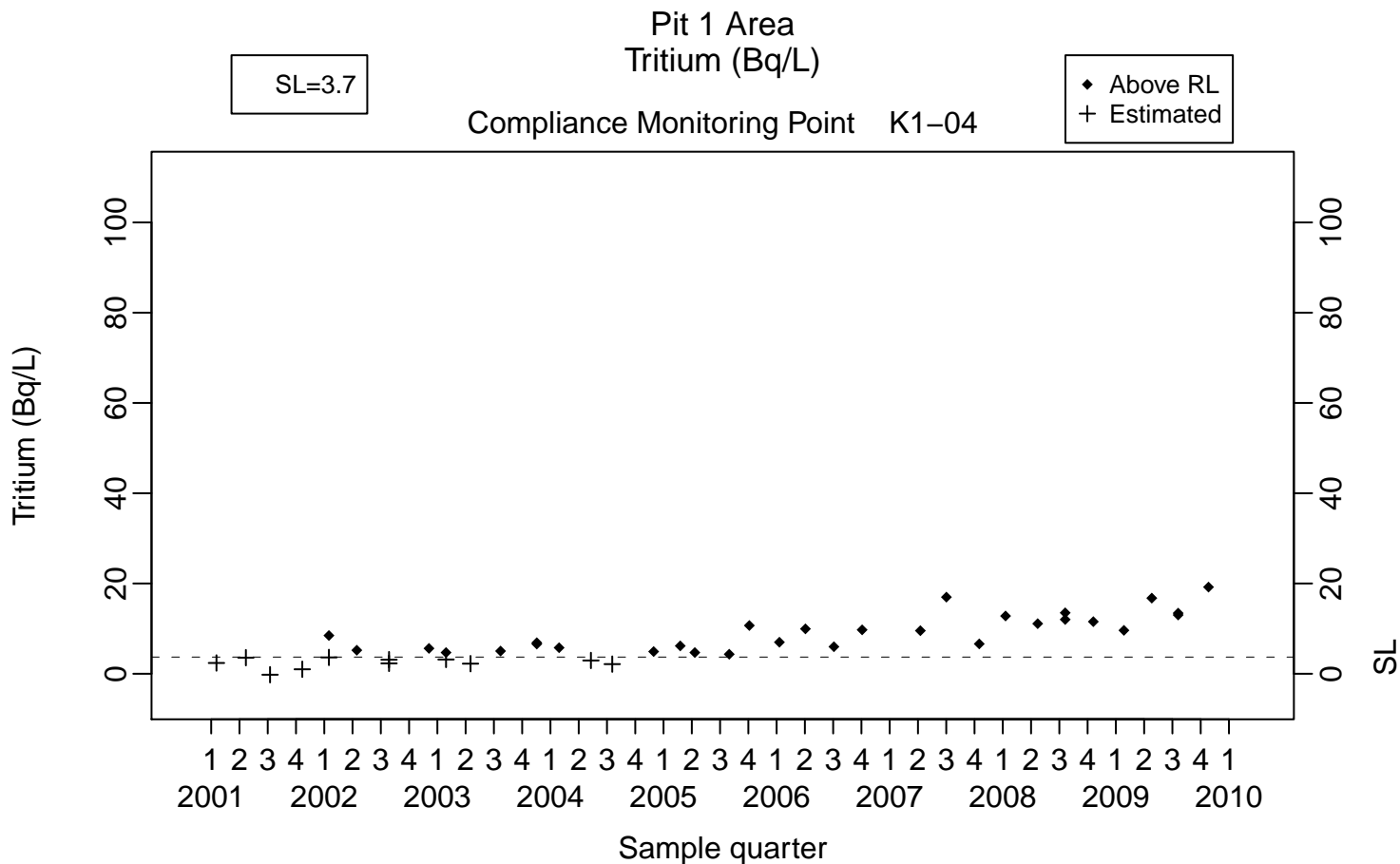
◆ Above RL
▽ Below RL

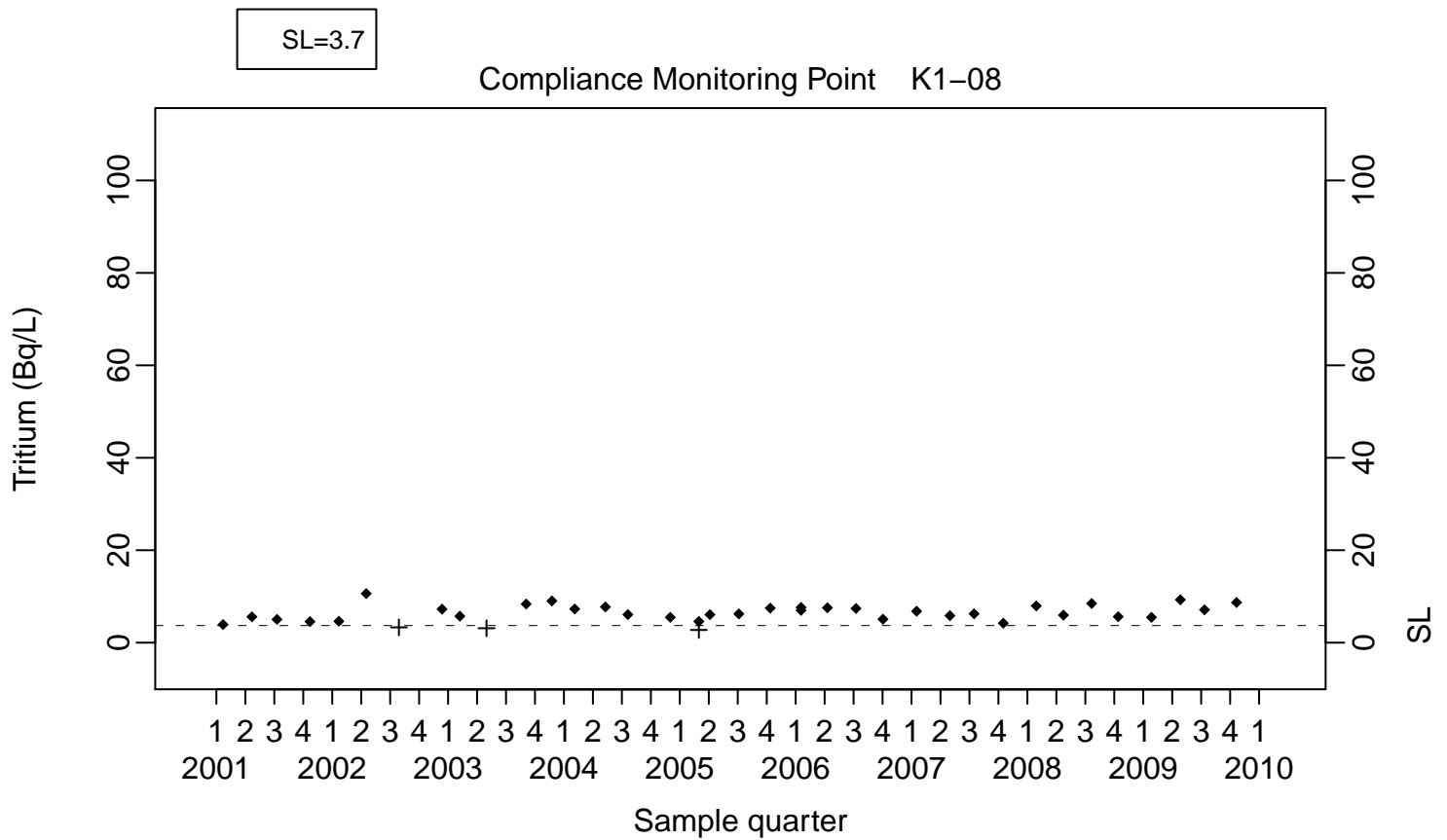
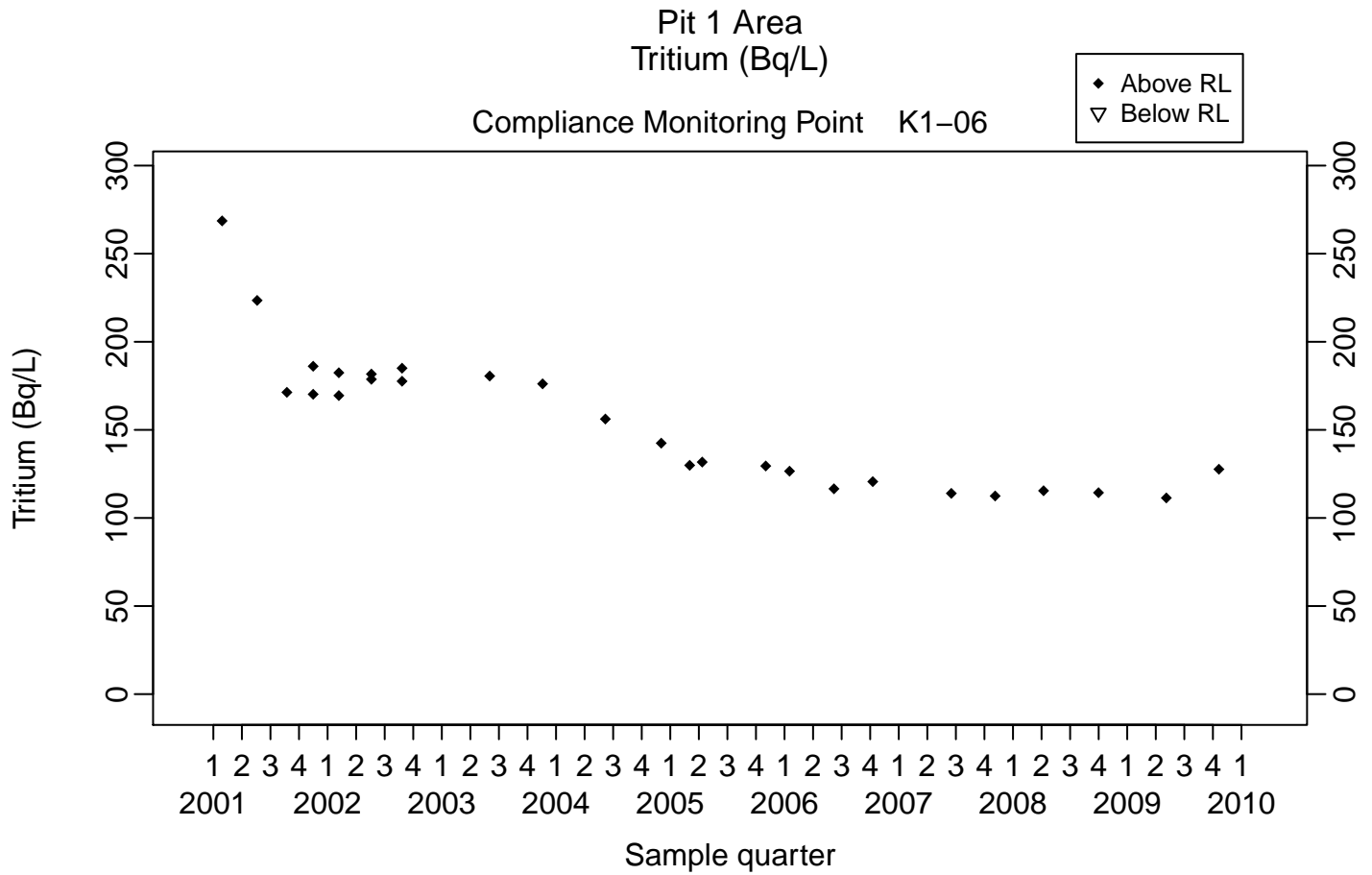


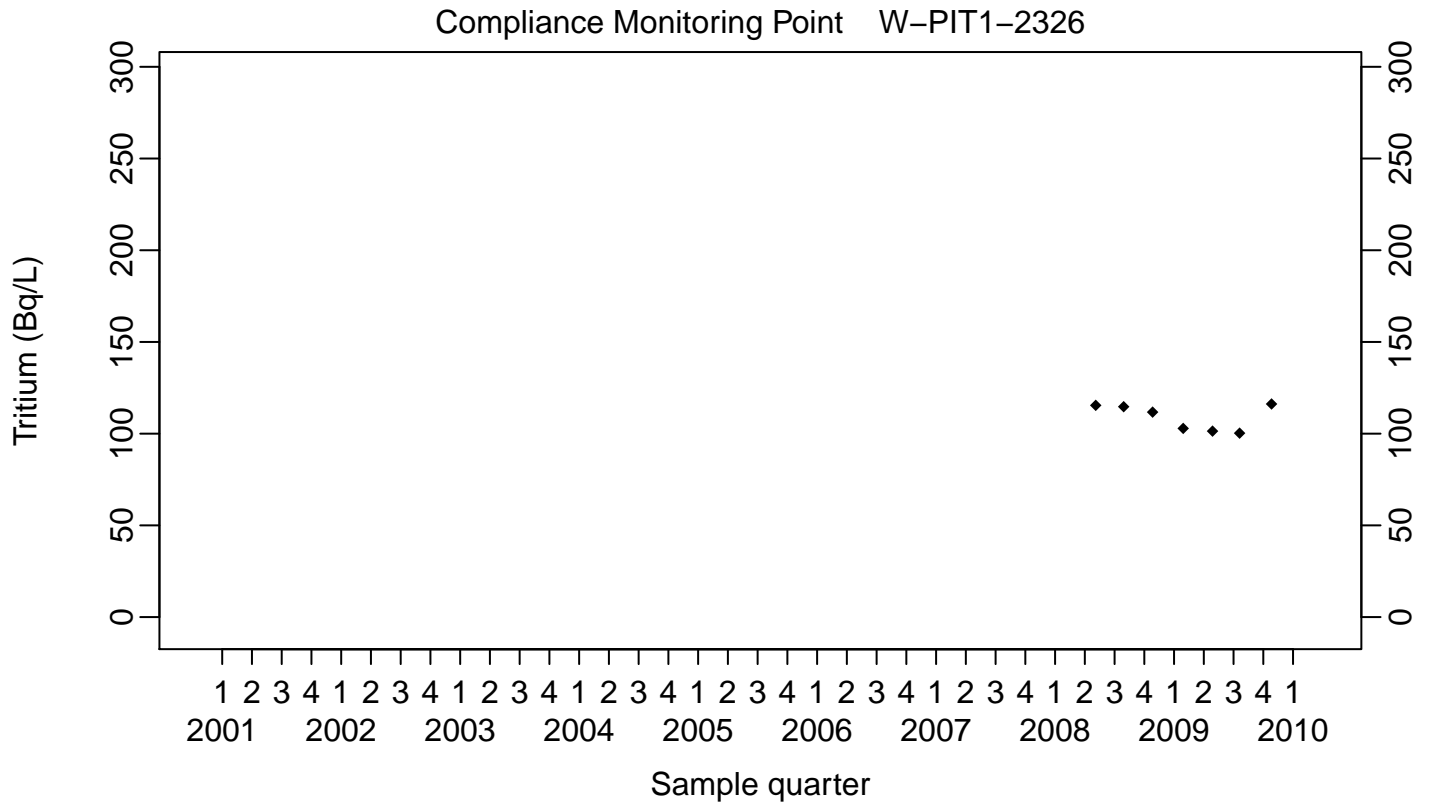
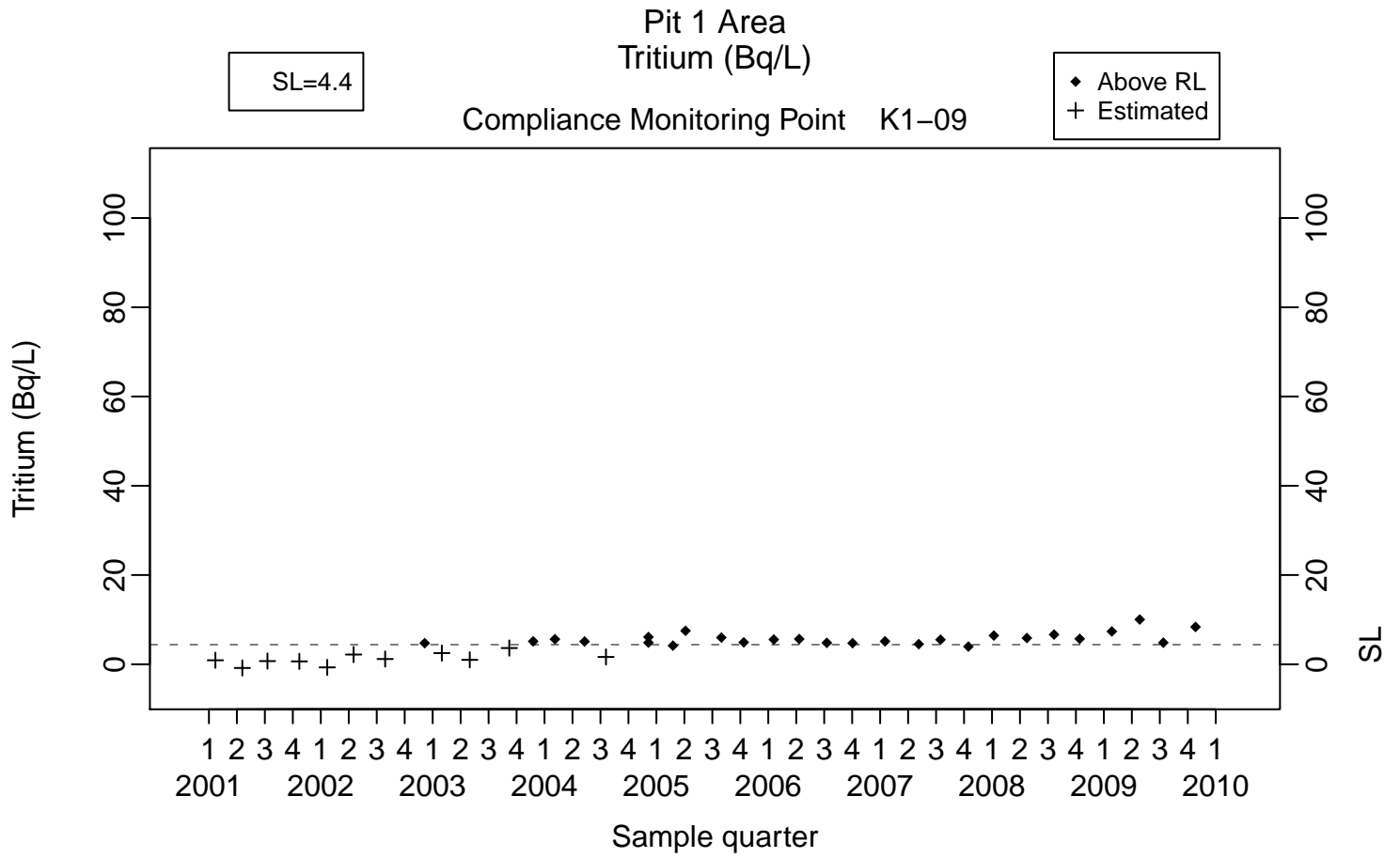
Background Monitoring Point K1-07







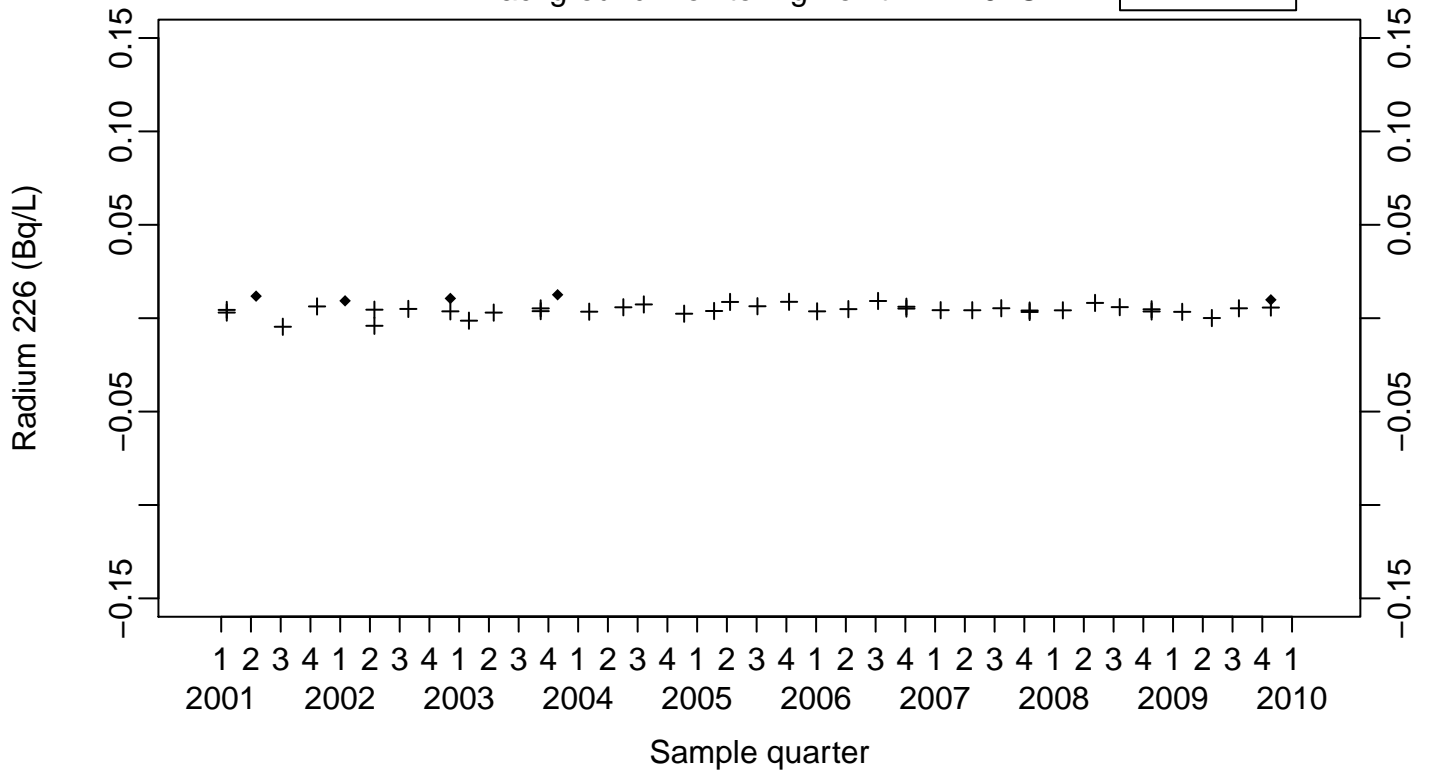




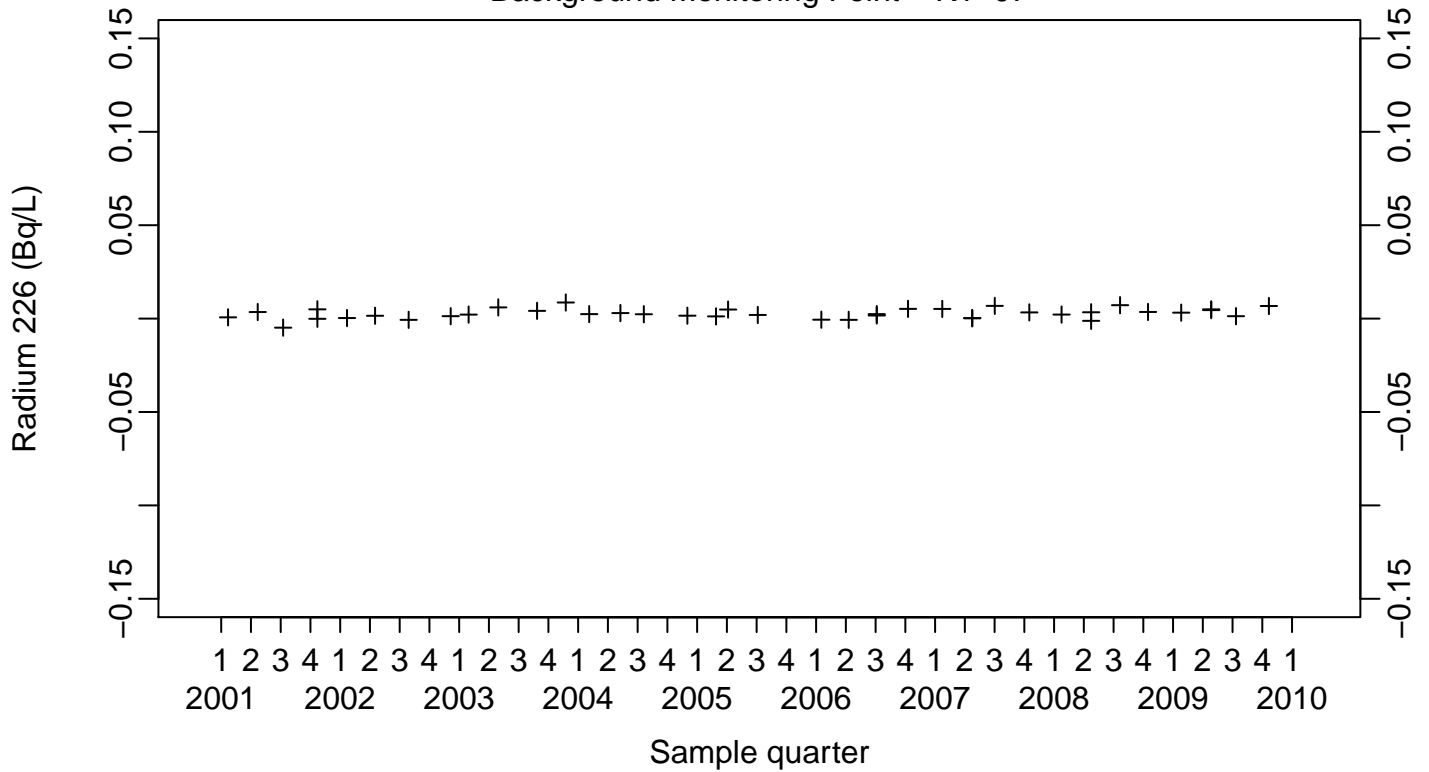
Pit 1 Area Radium 226 (Bq/L)

Background Monitoring Point K1-01C

◆ Above RL
+ Estimated



Background Monitoring Point K1-07

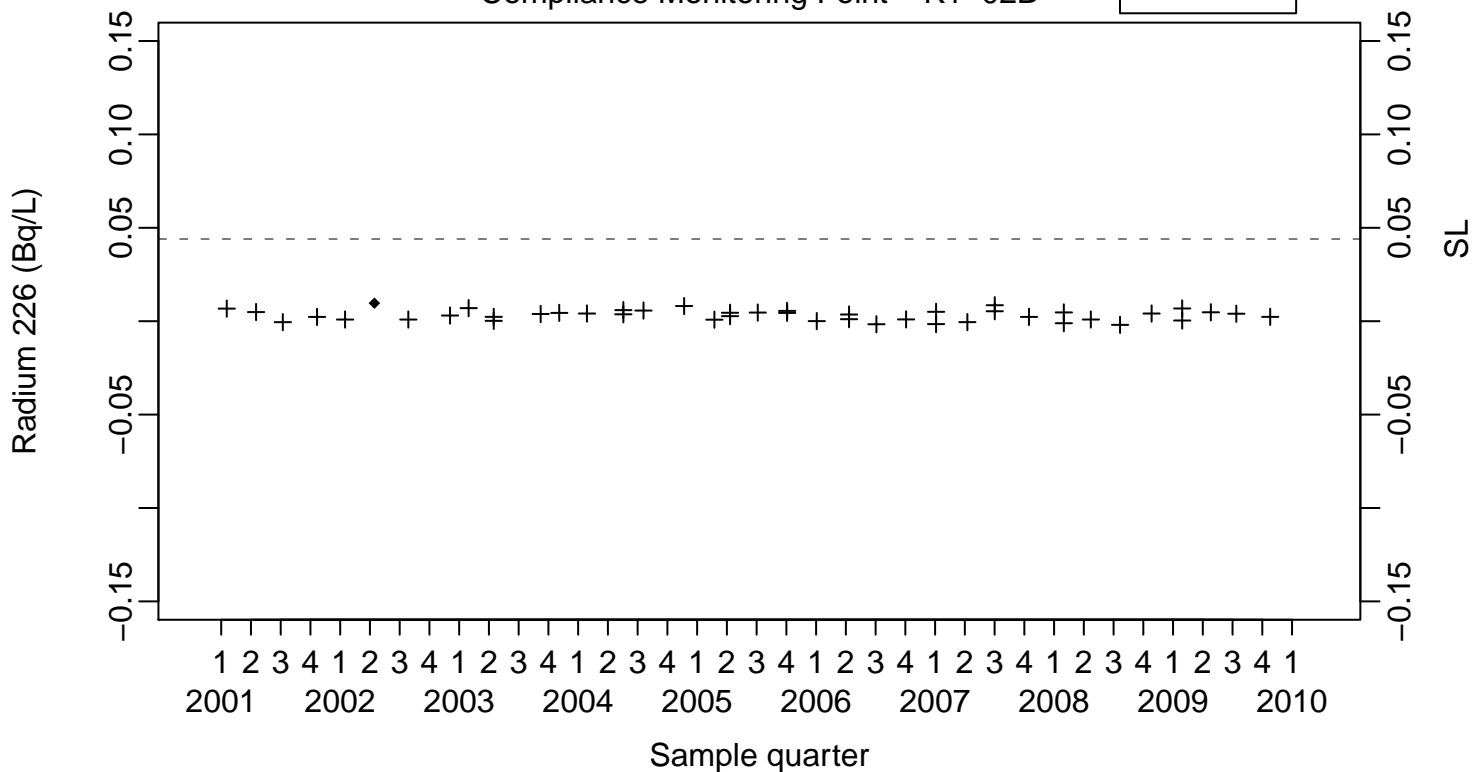


Pit 1 Area
Radium 226 (Bq/L)

Compliance Monitoring Point K1-02B

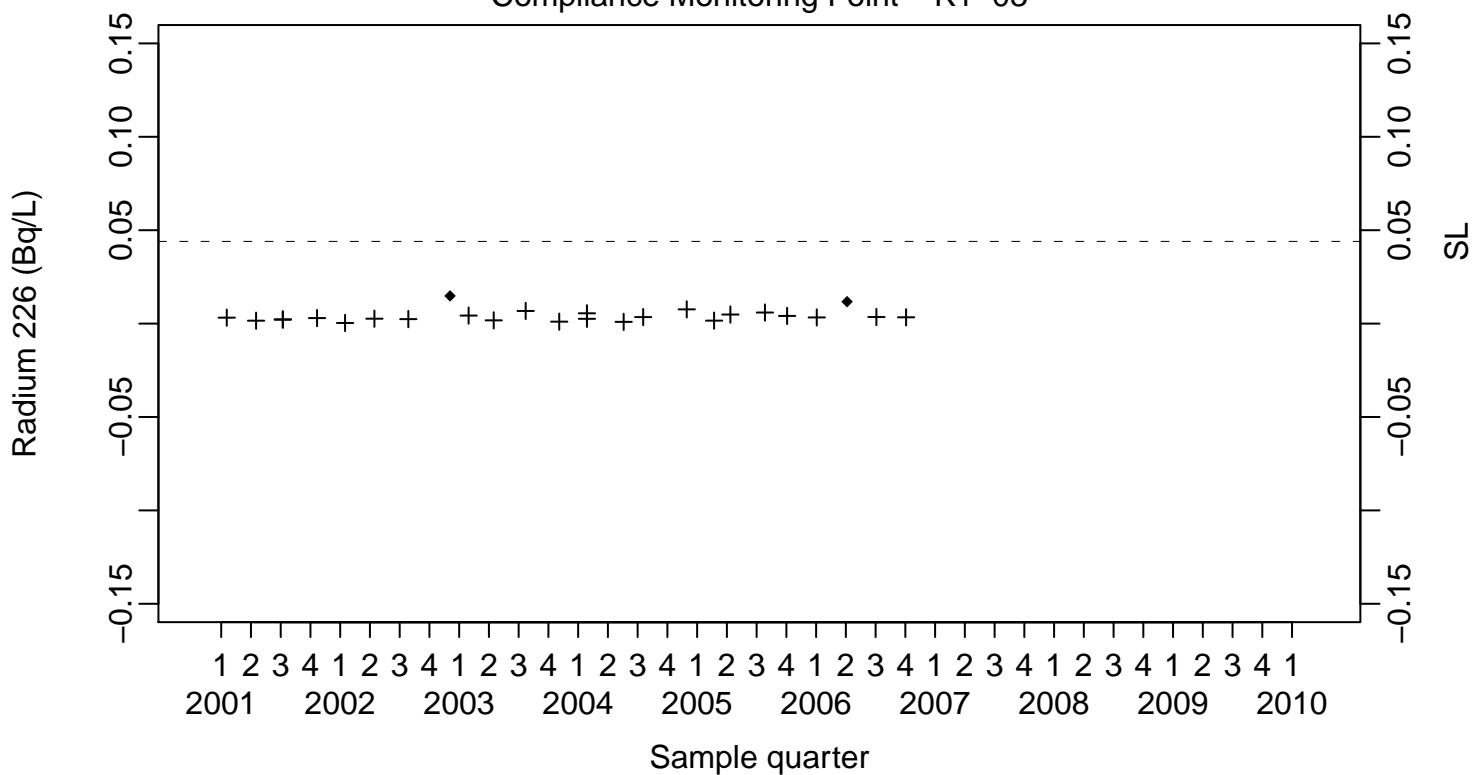
SL=0.044

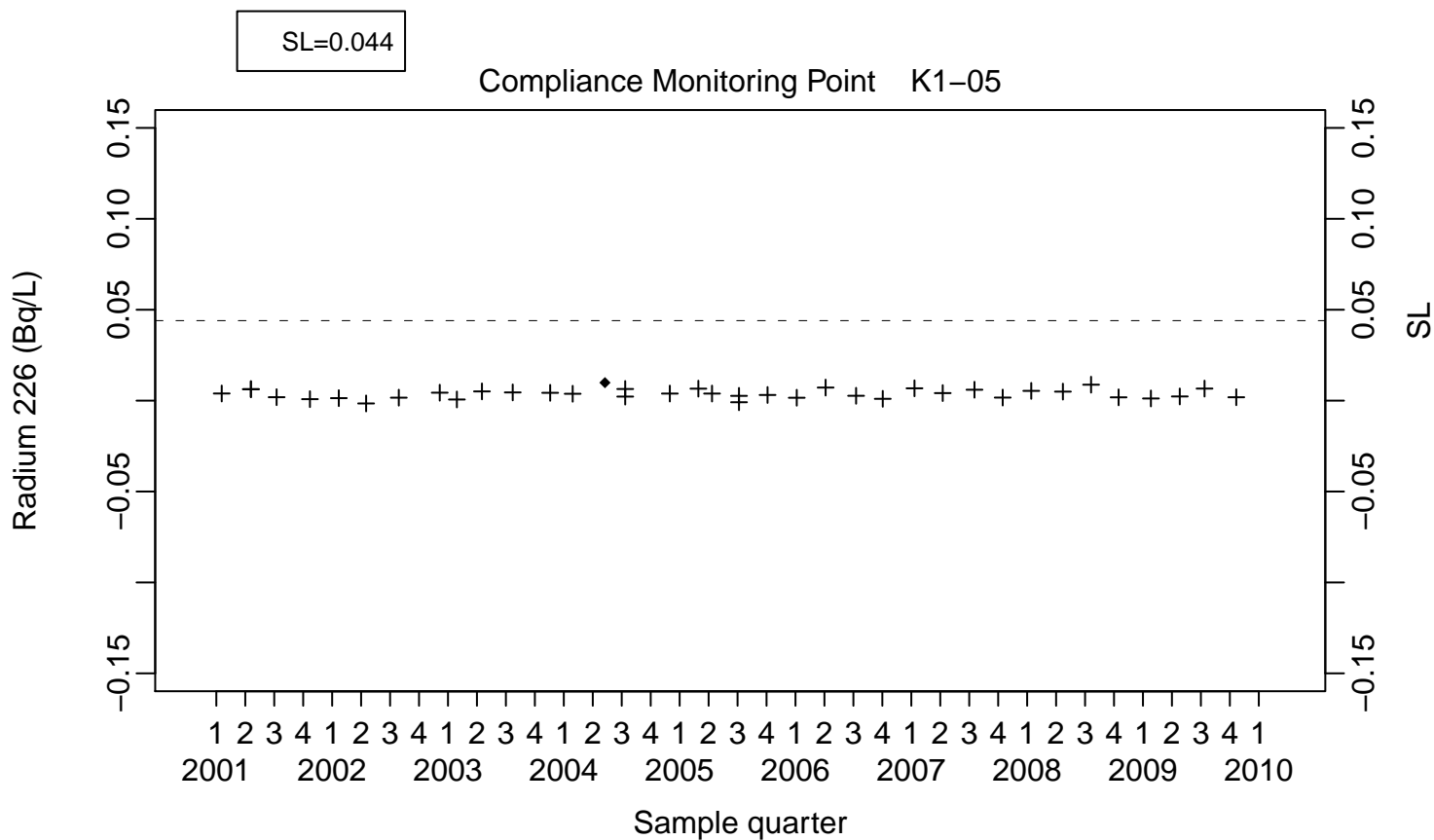
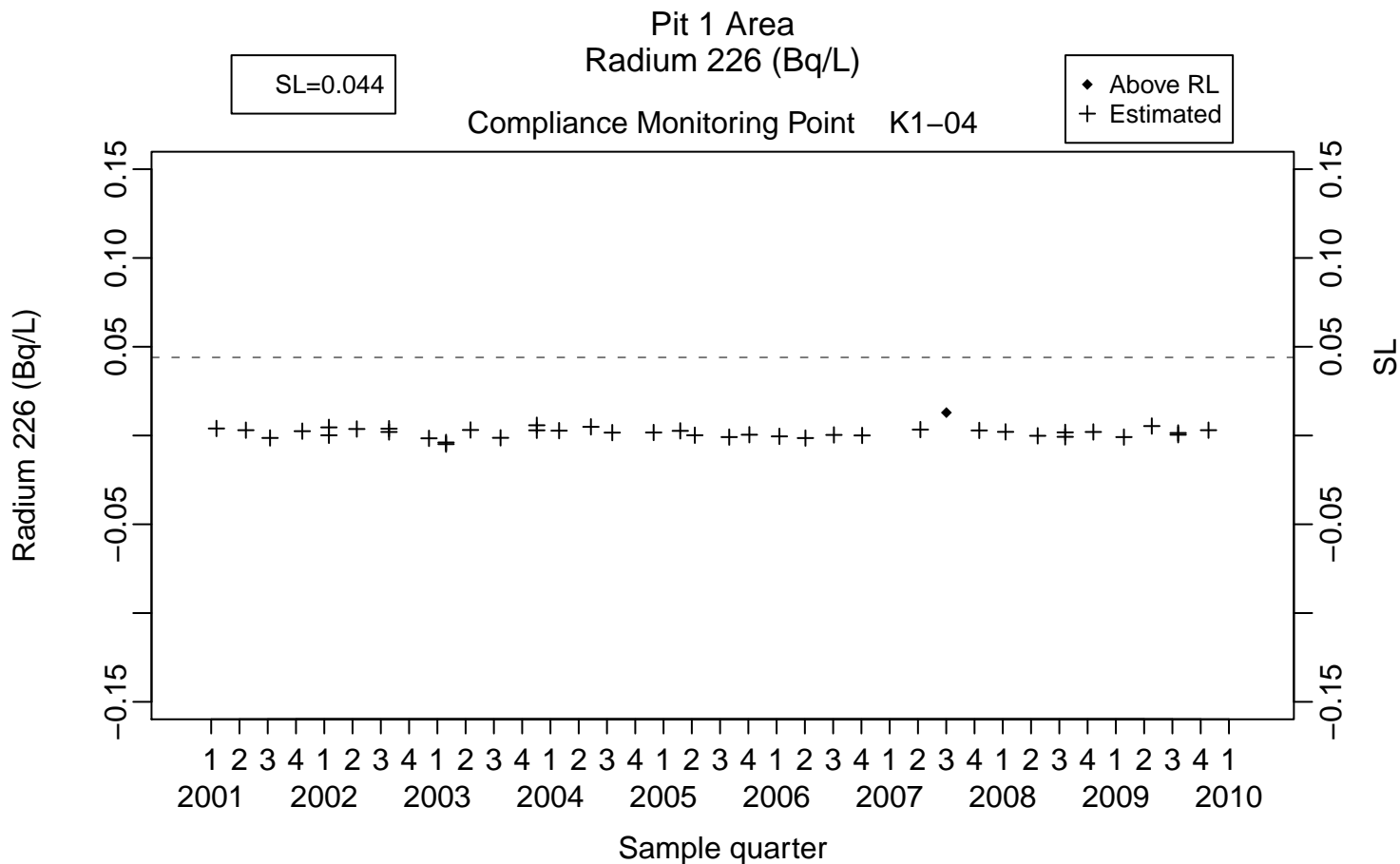
◆ Above RL
+ Estimated

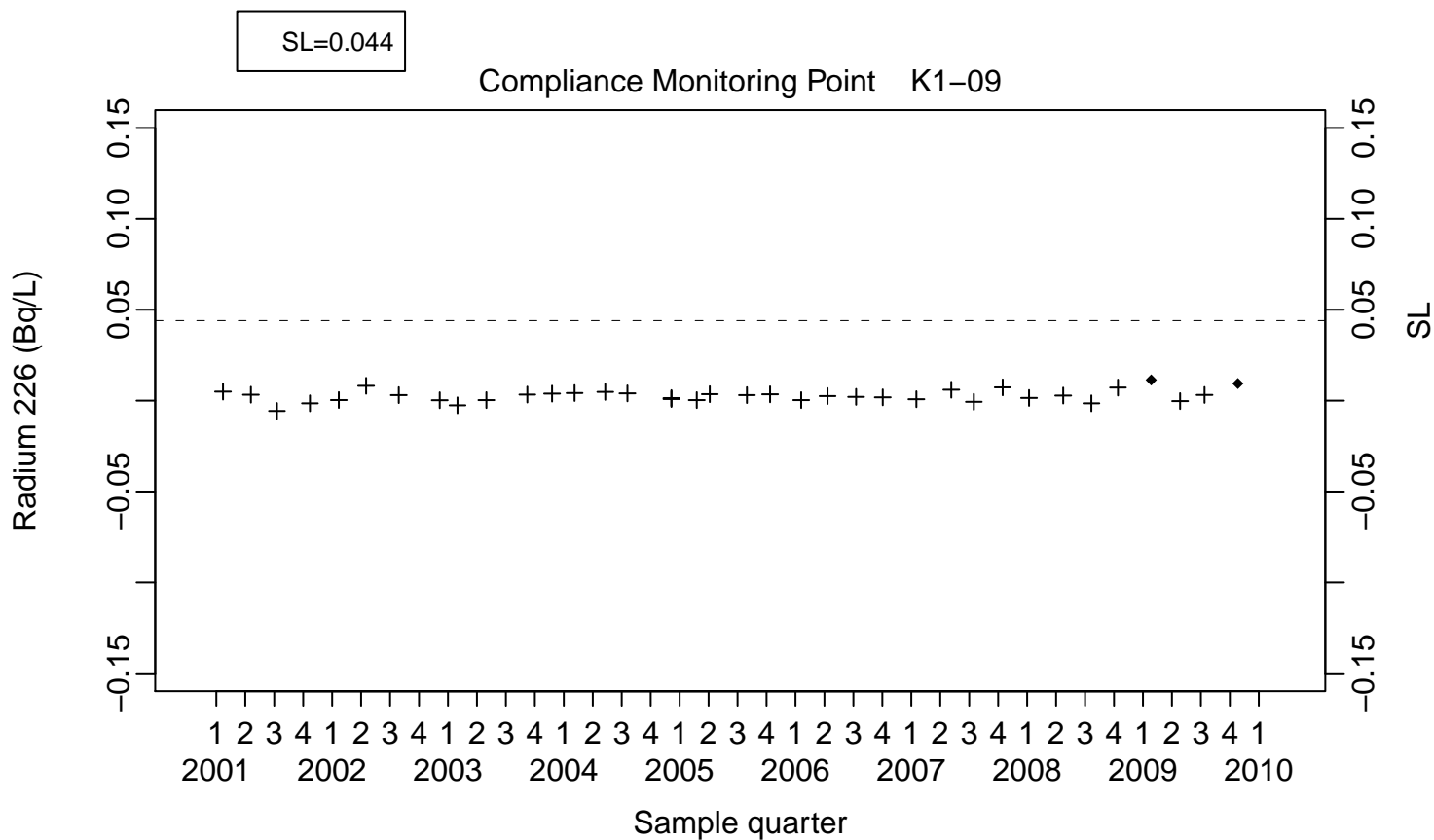
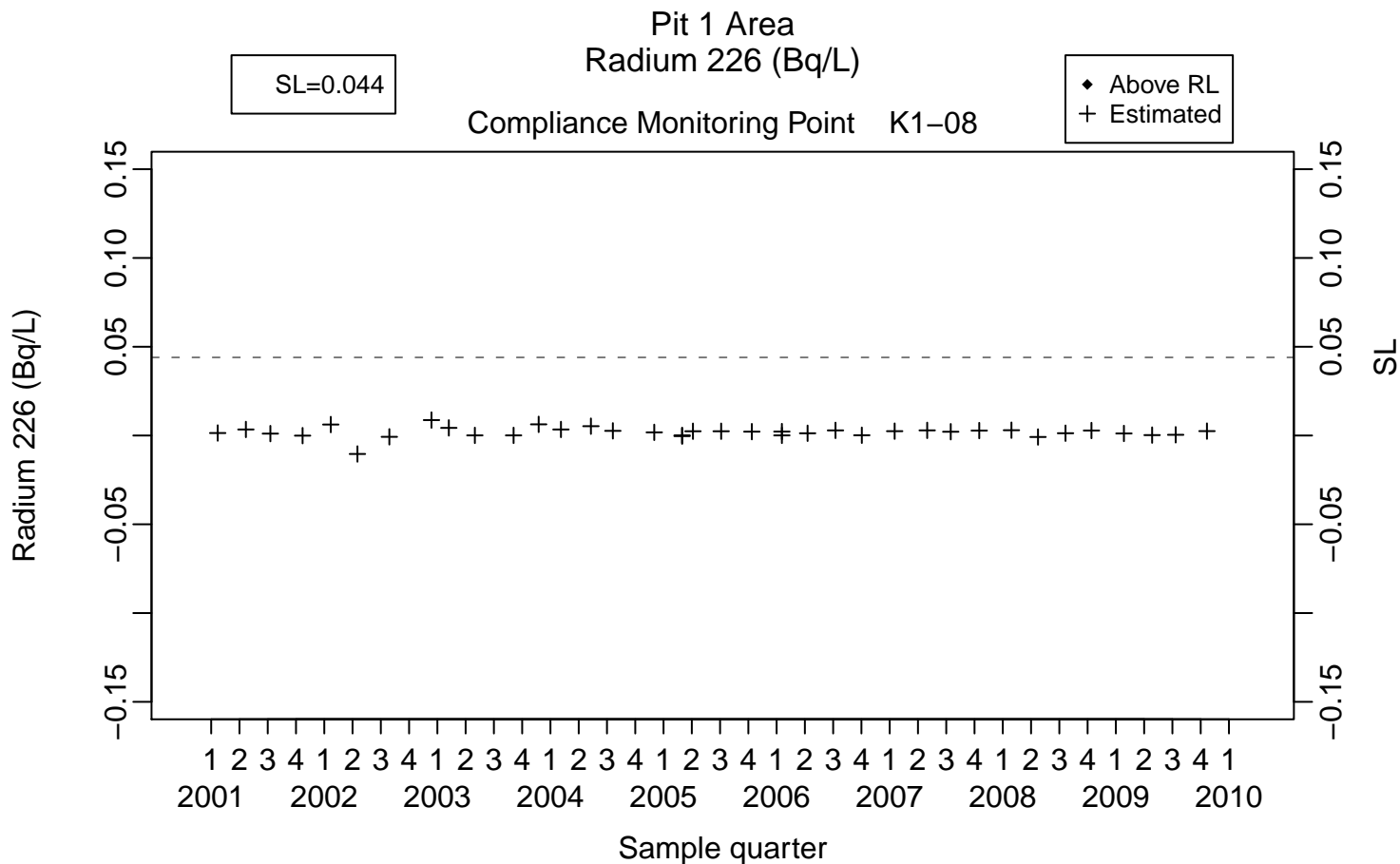


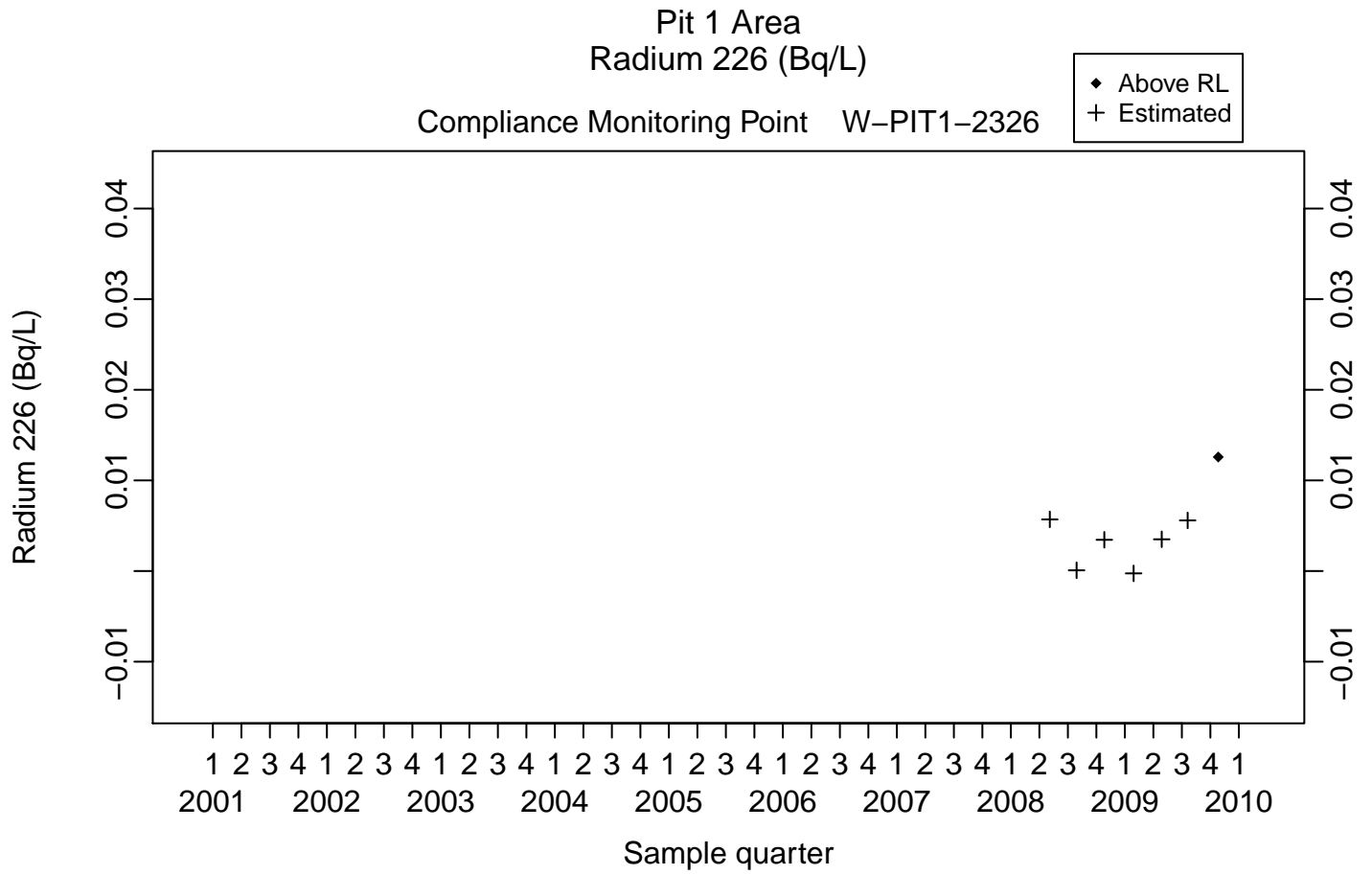
Compliance Monitoring Point K1-03

SL=0.044





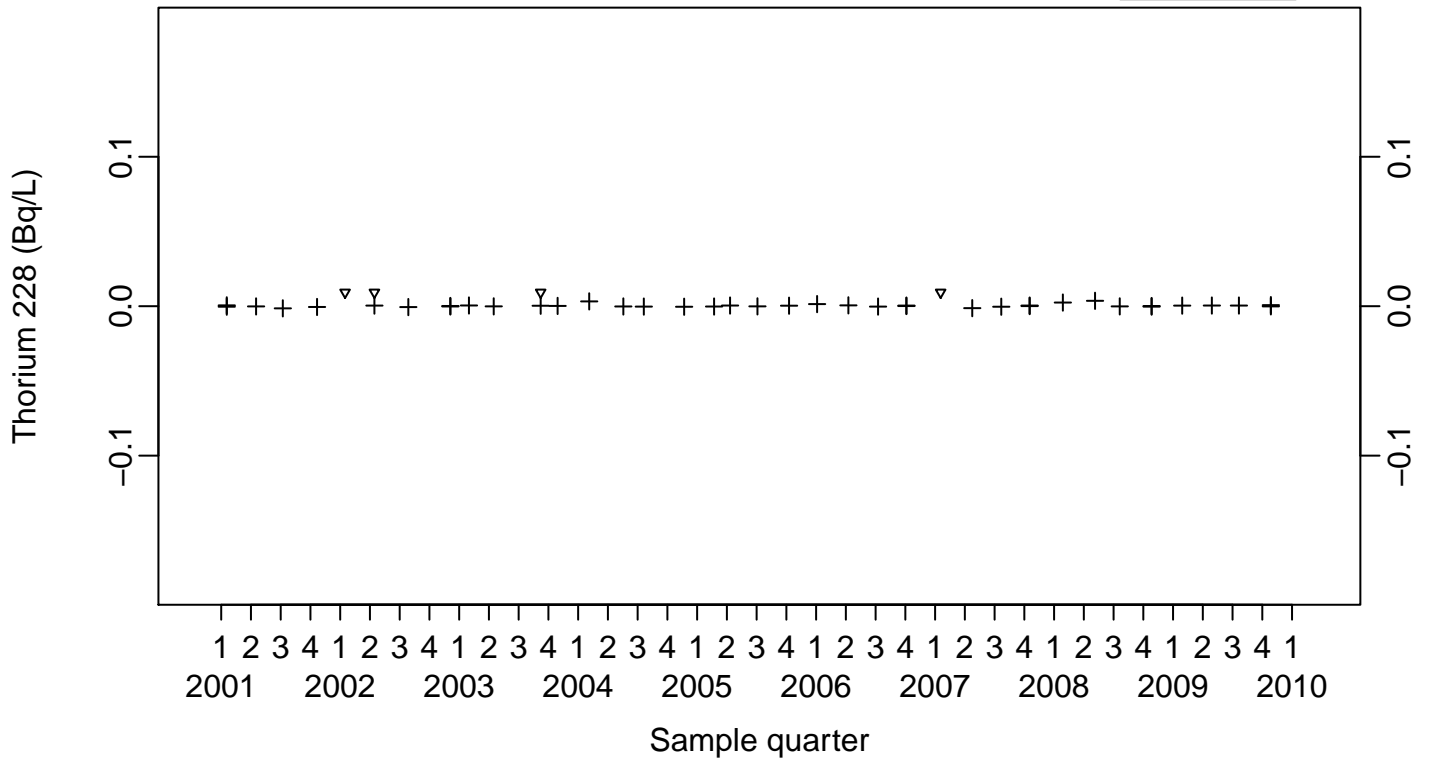




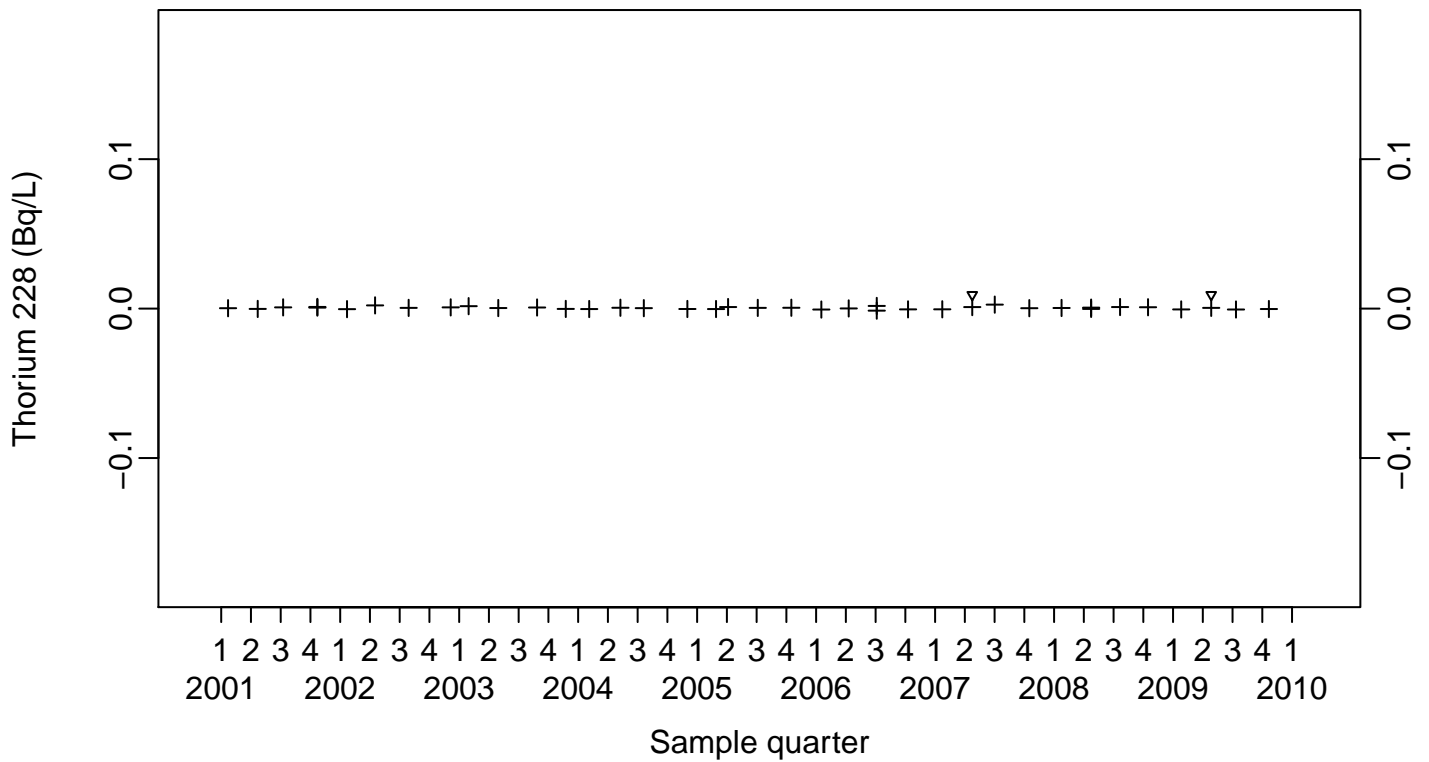
Pit 1 Area
Thorium 228 (Bq/L)

Background Monitoring Point K1-01C

- ◆ Above RL
- ▽ Below RL
- + Estimated



Background Monitoring Point K1-07

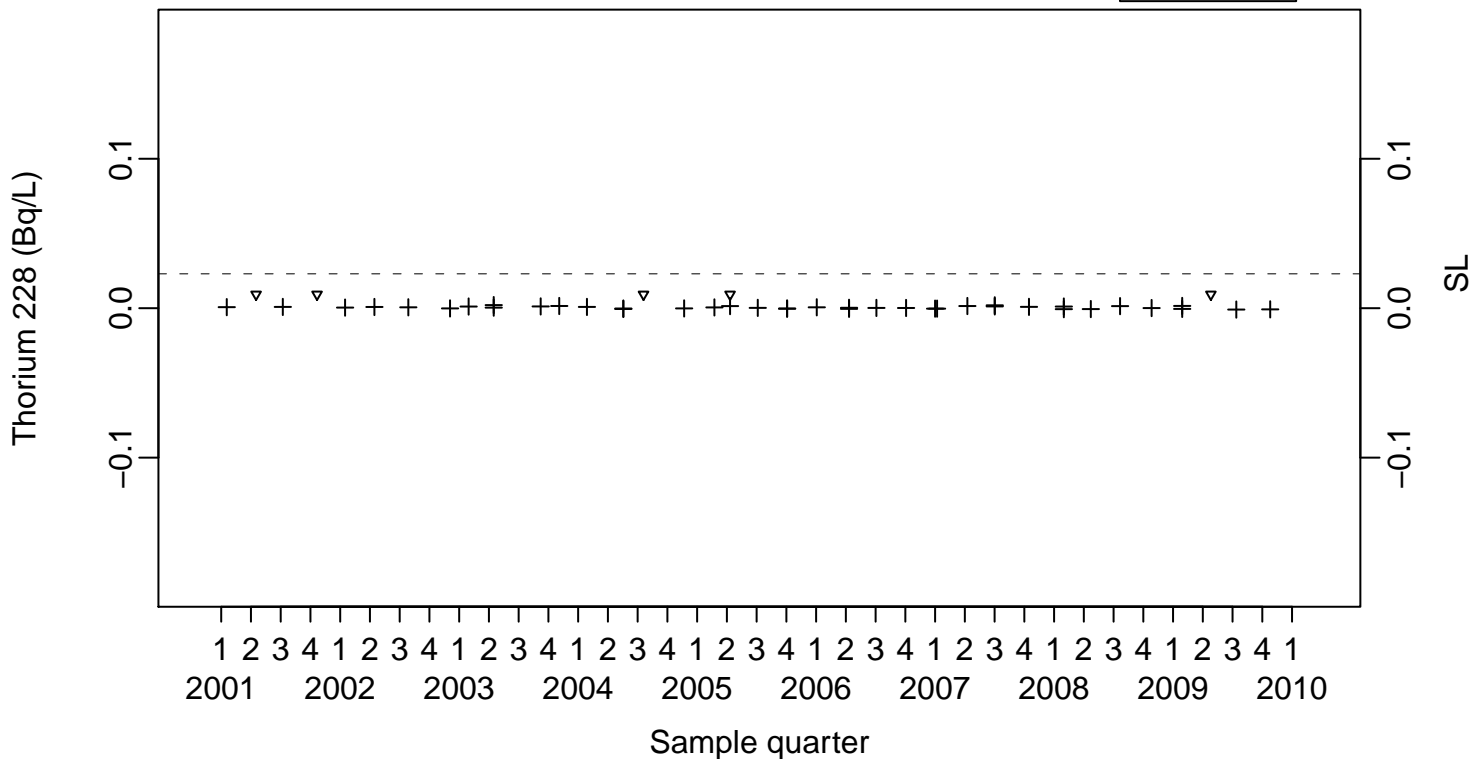


Pit 1 Area
Thorium 228 (Bq/L)

Compliance Monitoring Point K1-02B

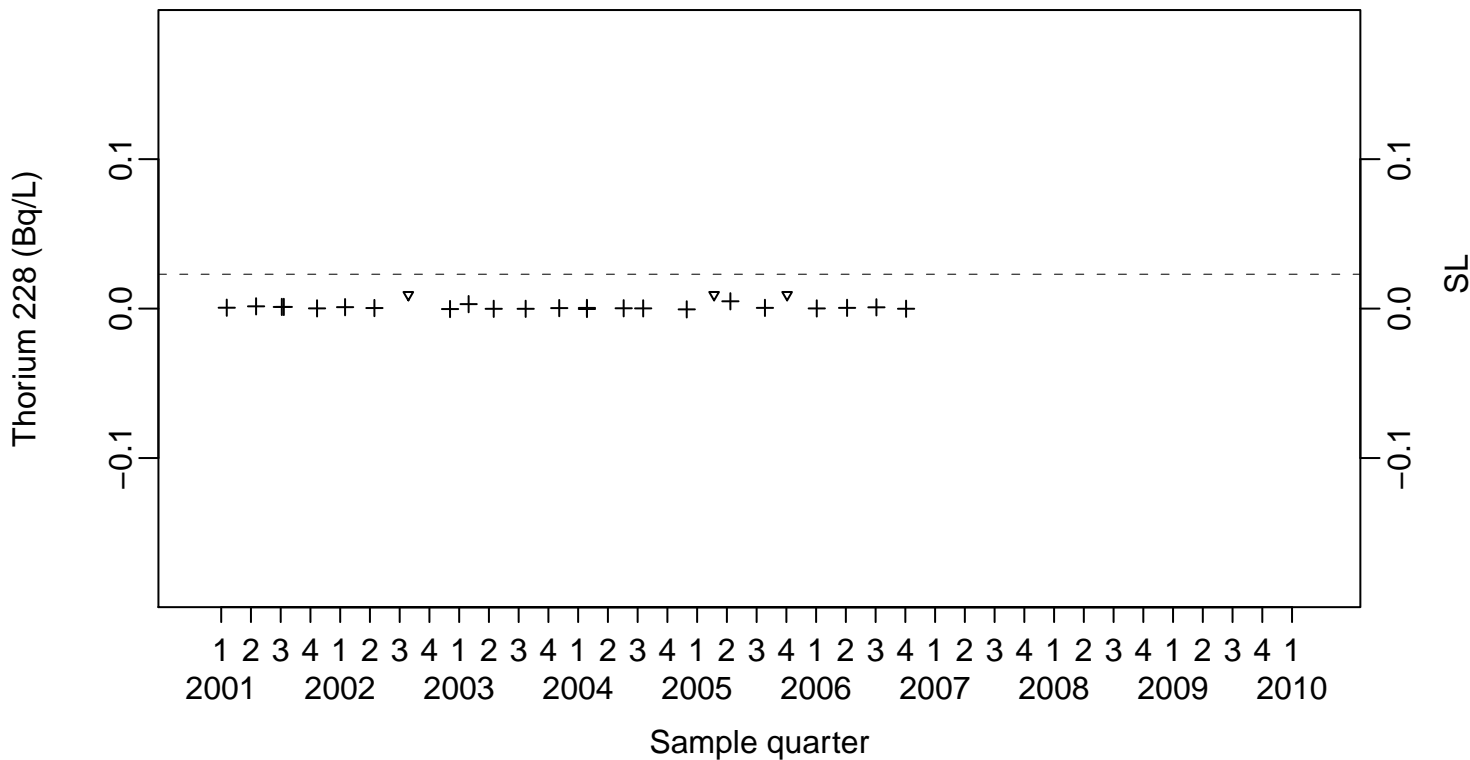
SL=0.023

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.023

Compliance Monitoring Point K1-03

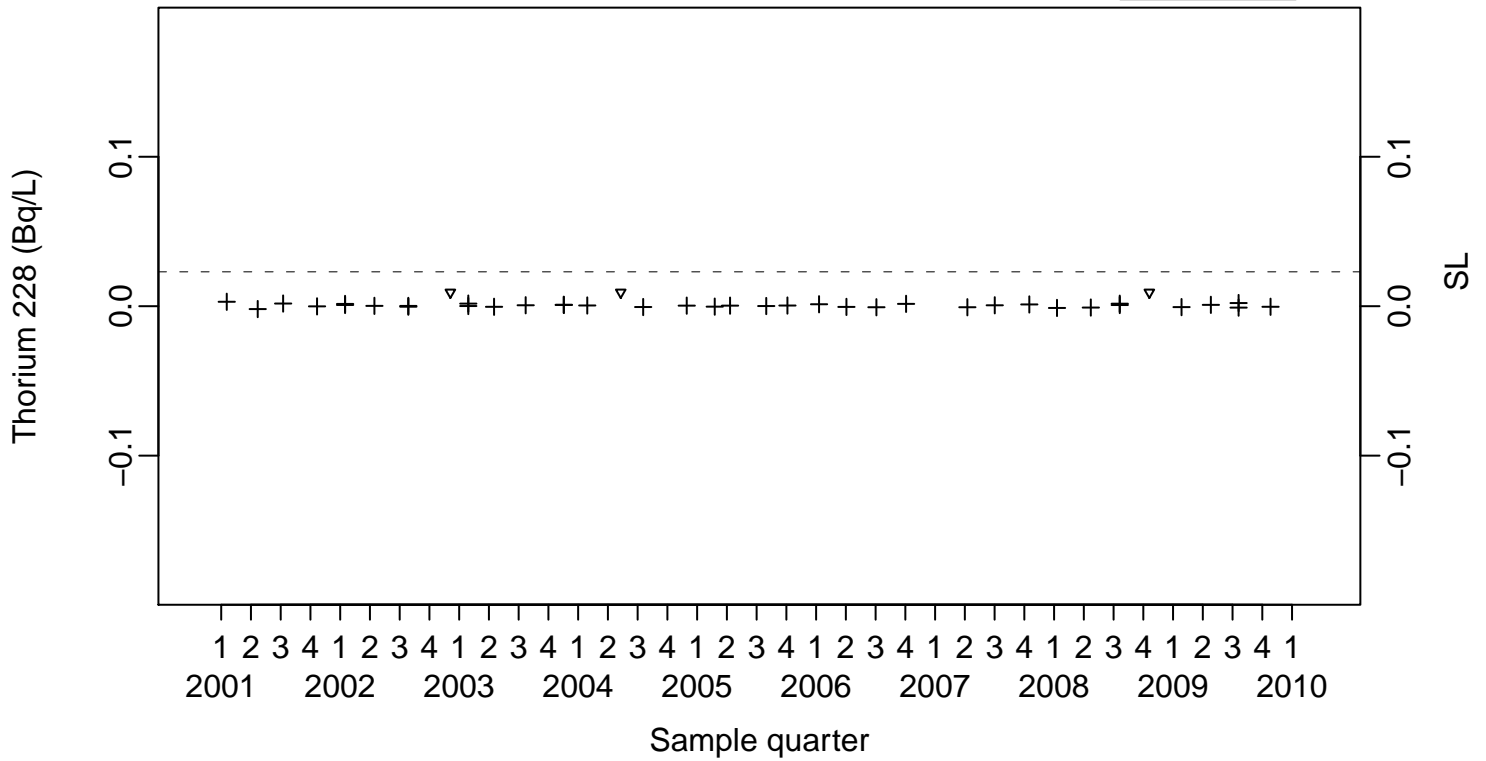


Pit 1 Area
Thorium 228 (Bq/L)

Compliance Monitoring Point K1-04

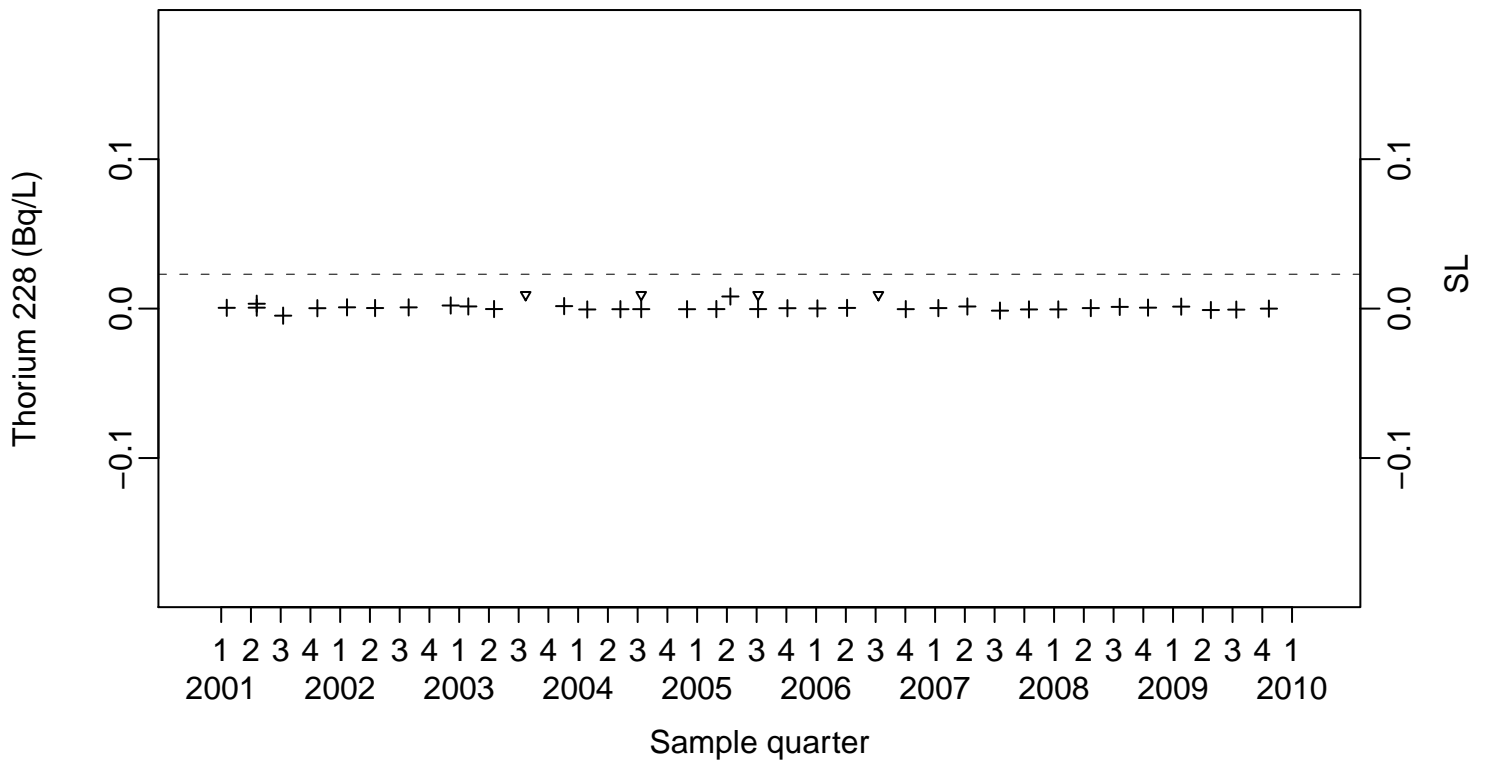
SL=0.023

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.023

Compliance Monitoring Point K1-05

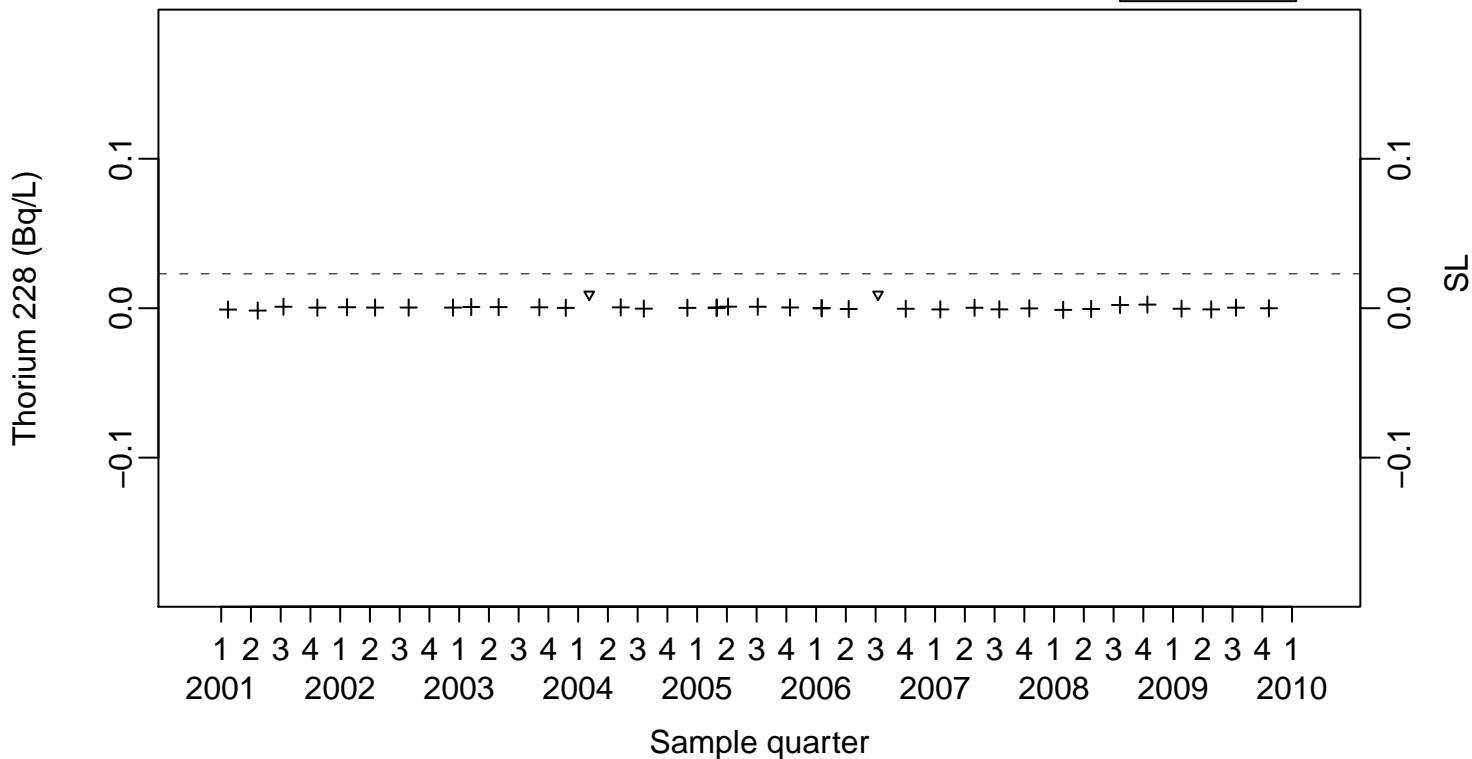


Pit 1 Area Thorium 228 (Bq/L)

SL=0.023

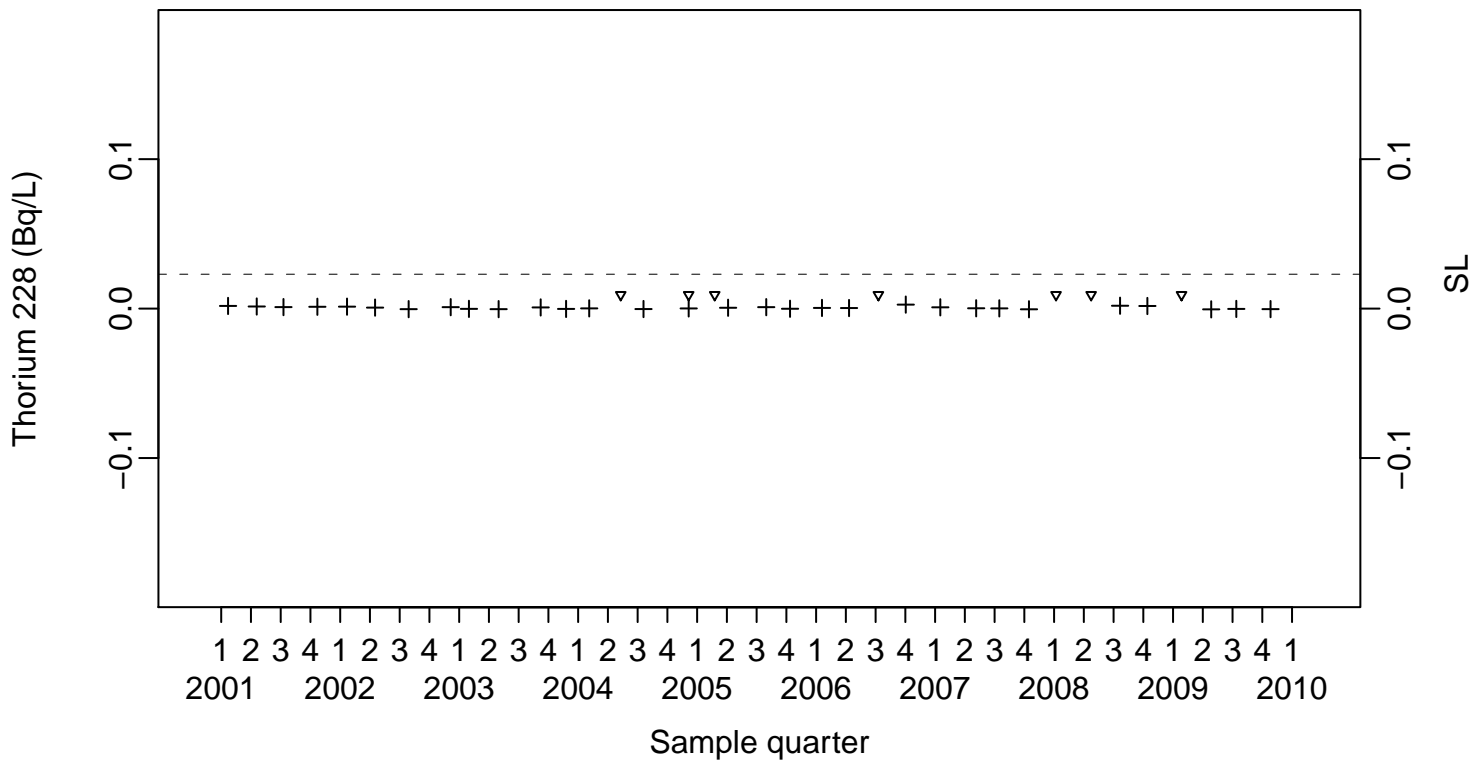
Compliance Monitoring Point K1-08

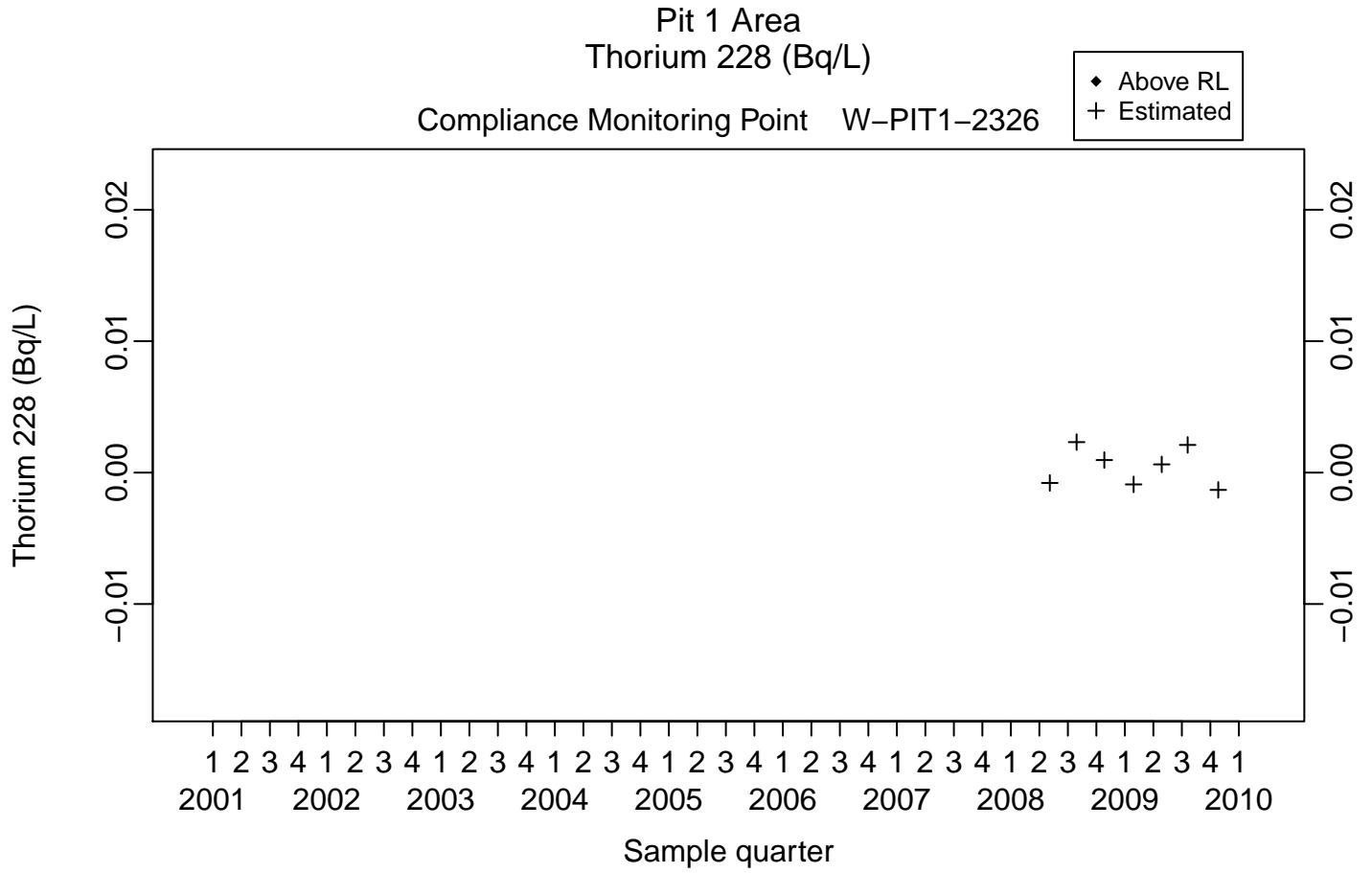
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.023

Compliance Monitoring Point K1-09

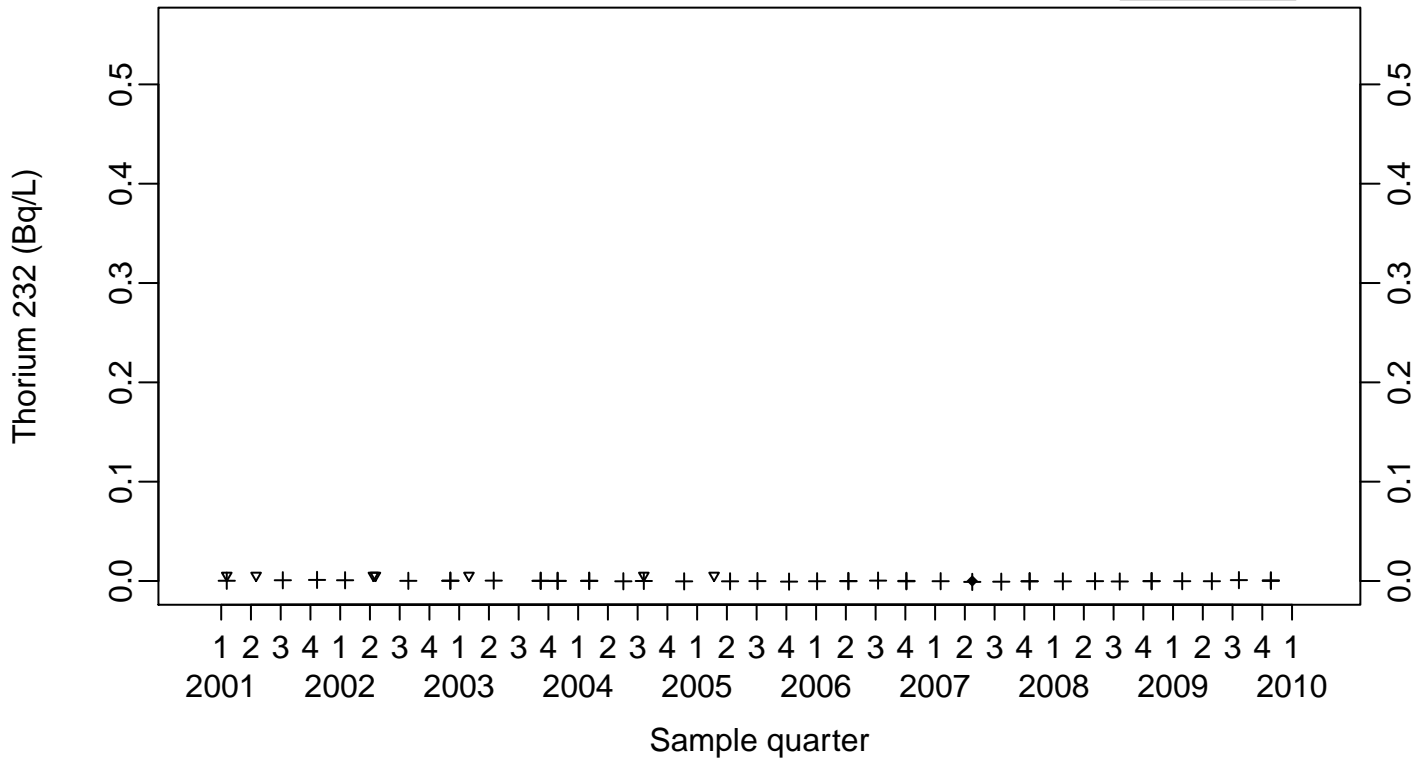




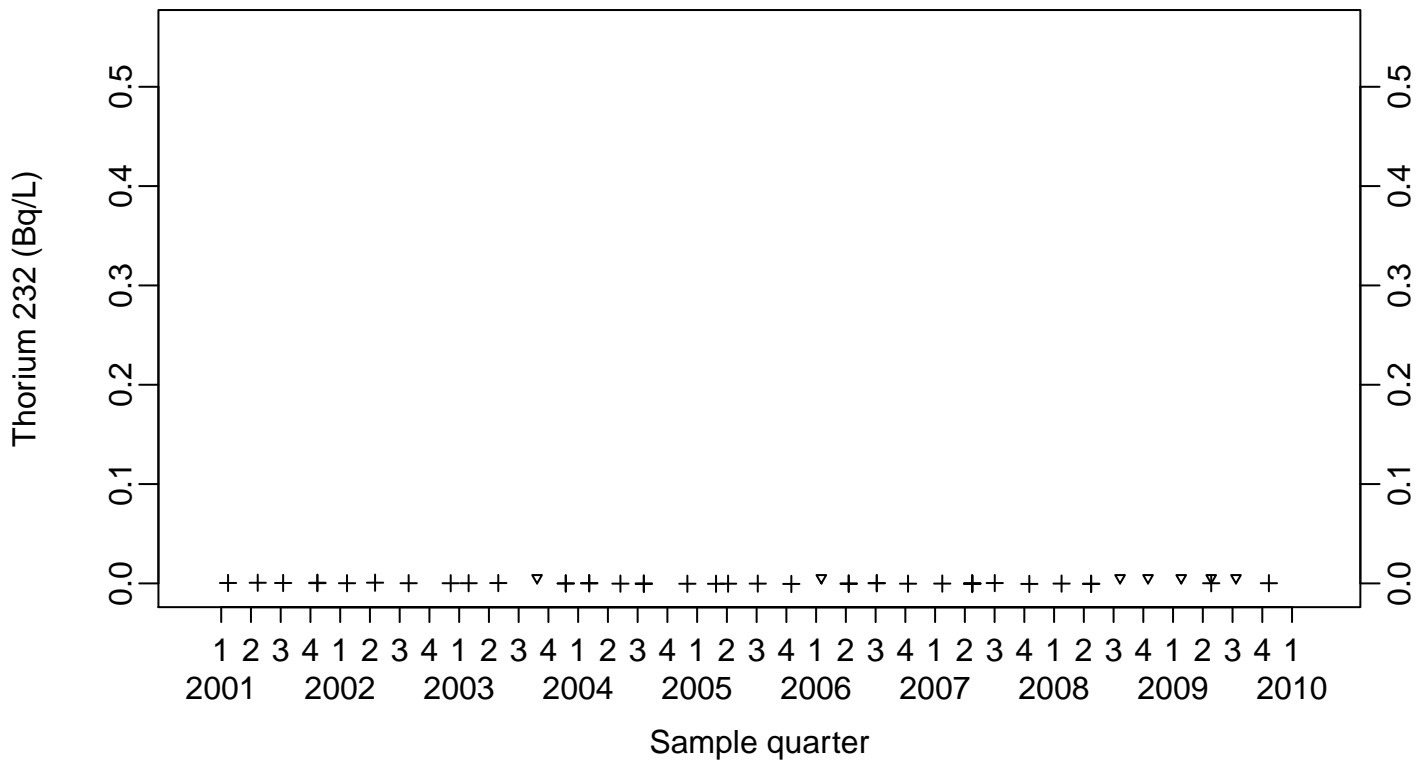
Pit 1 Area
Thorium 232 (Bq/L)

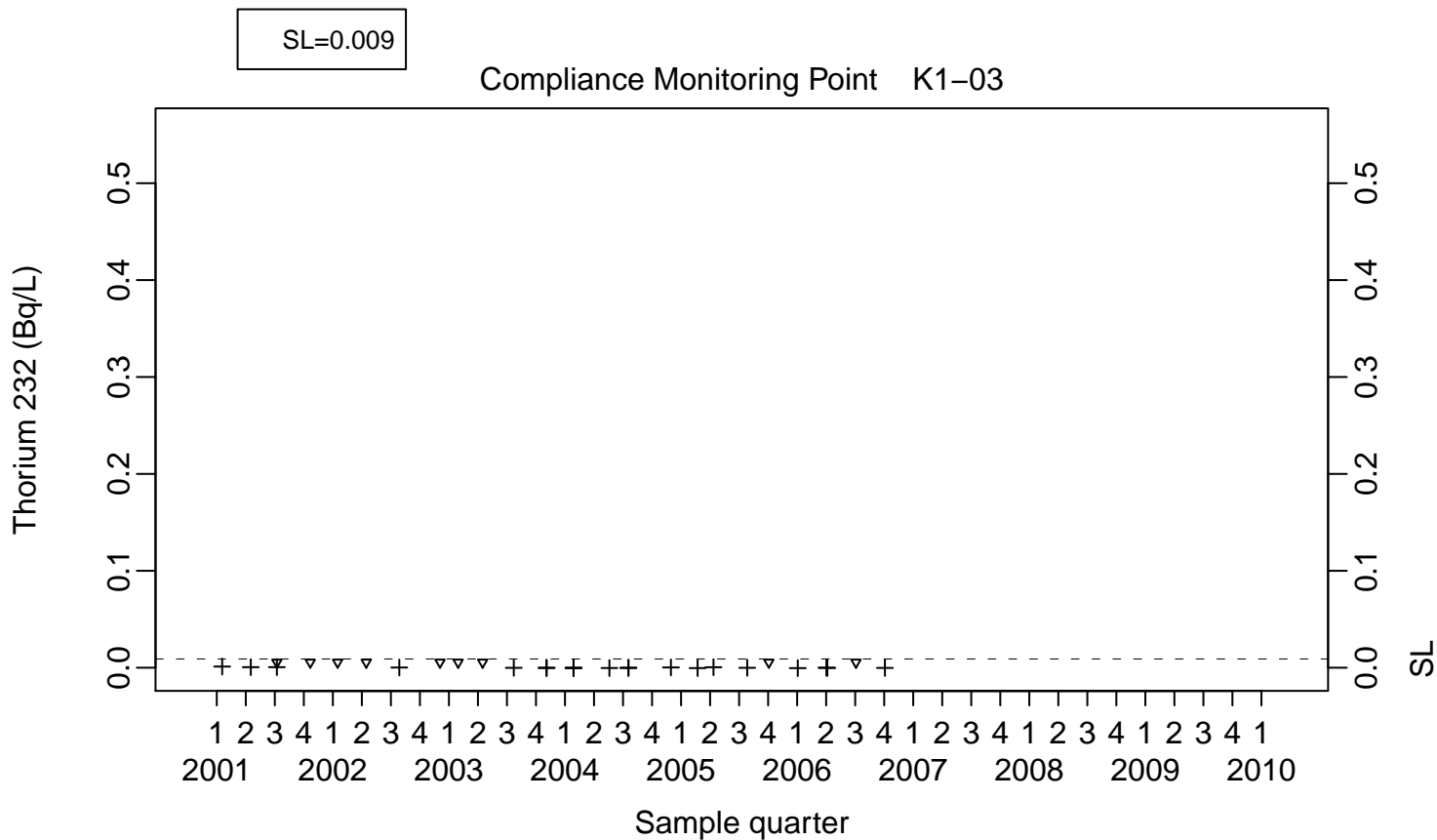
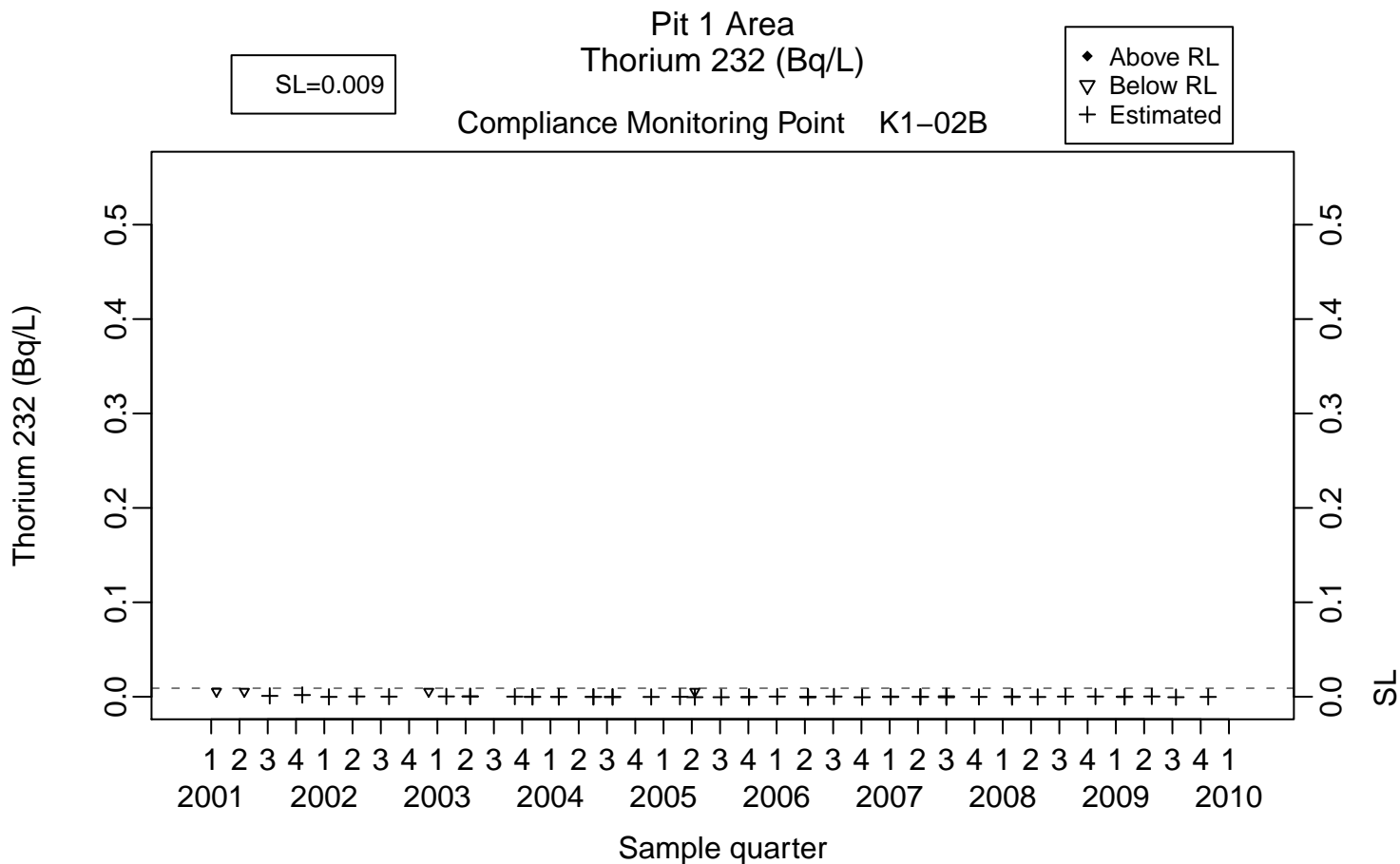
Background Monitoring Point K1-01C

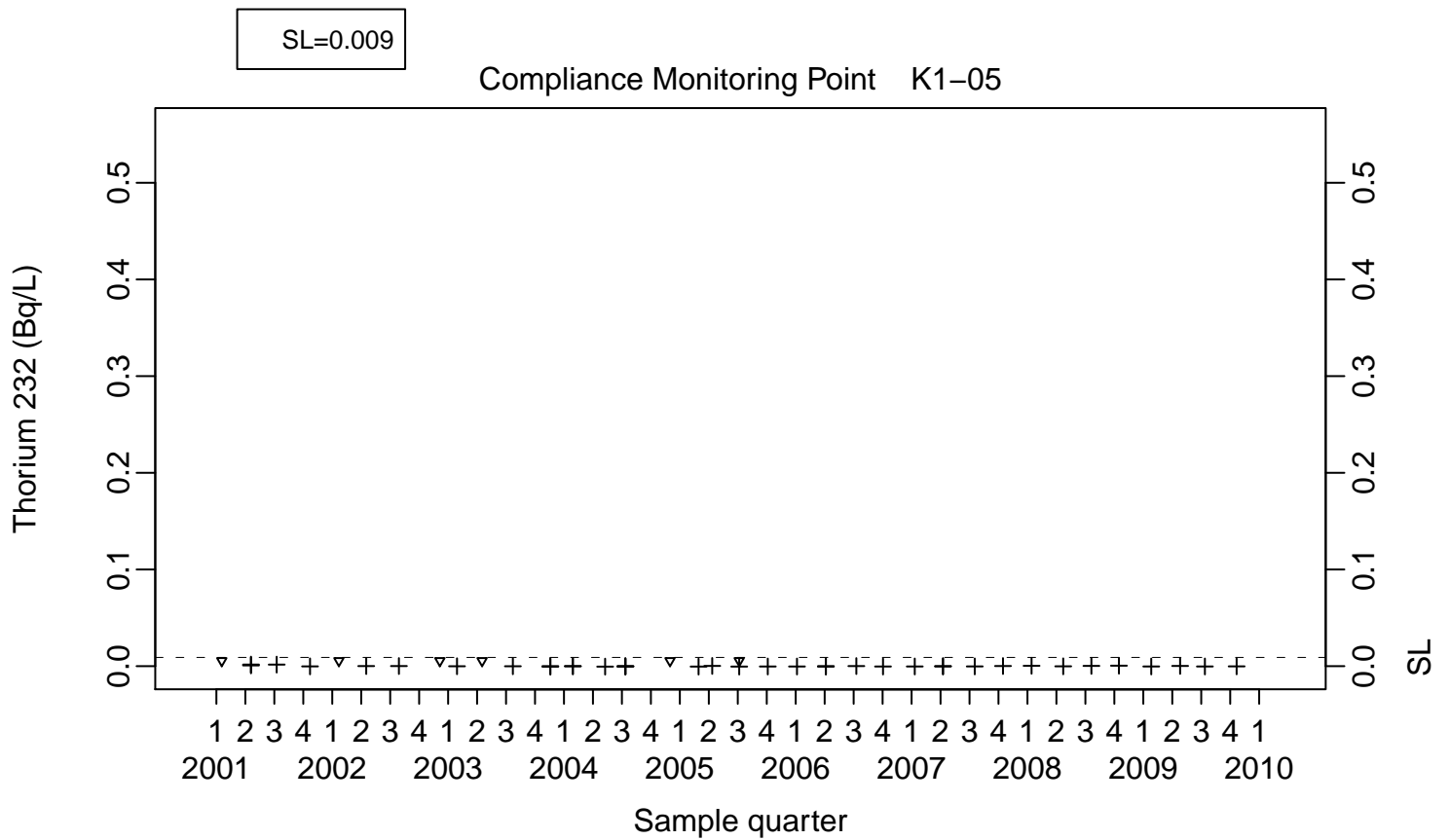
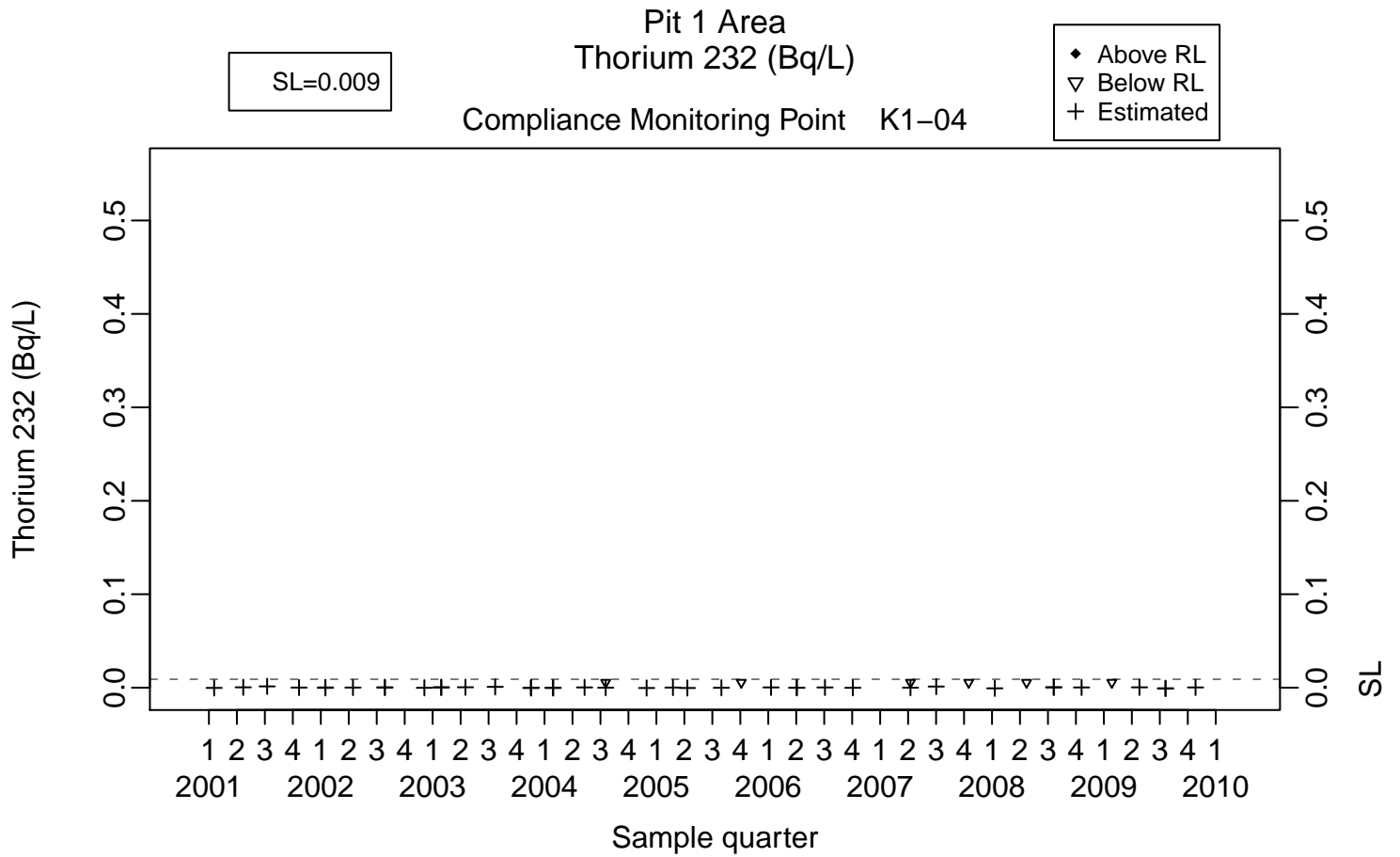
- ◆ Above RL
- ▽ Below RL
- + Estimated

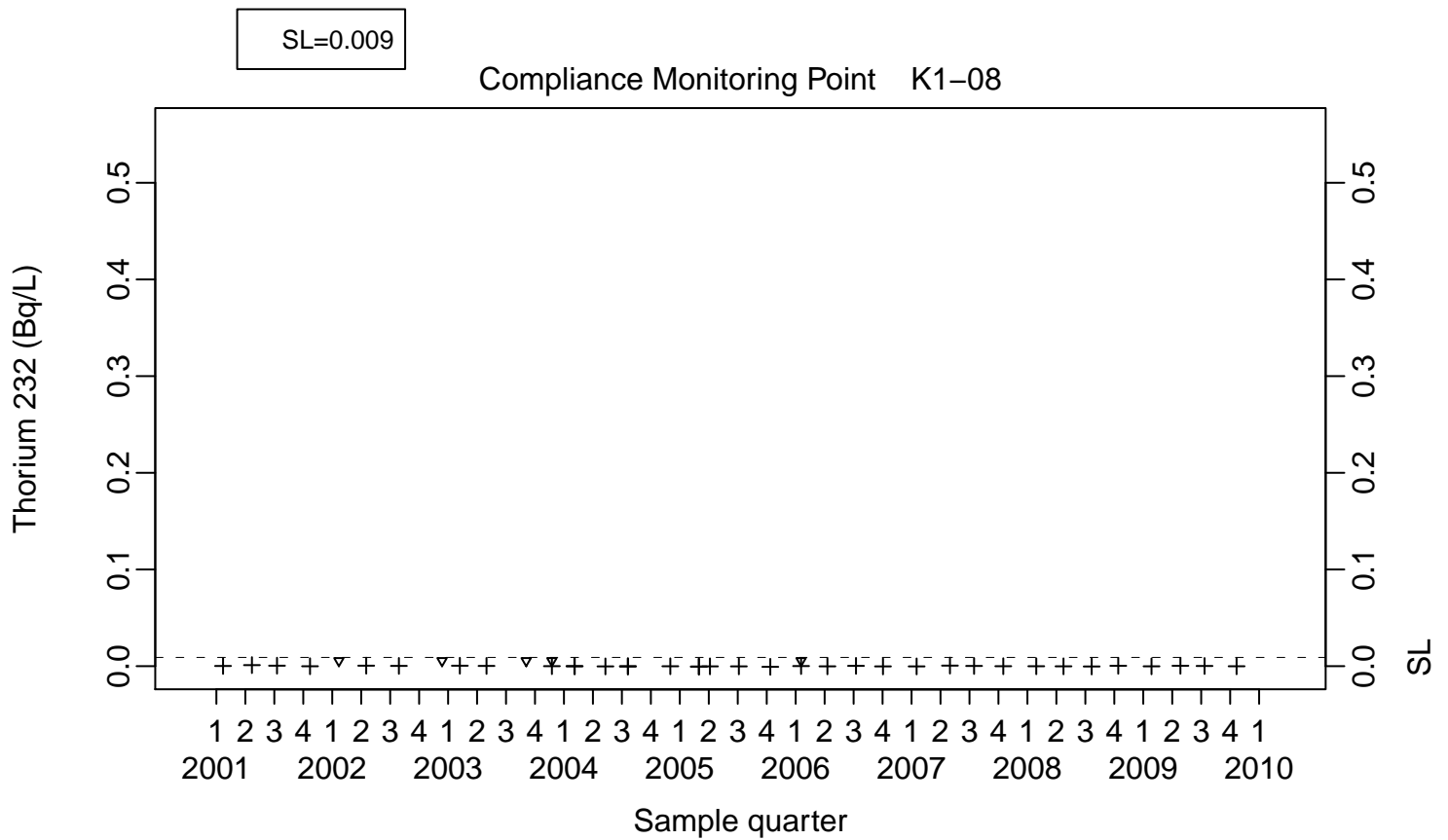
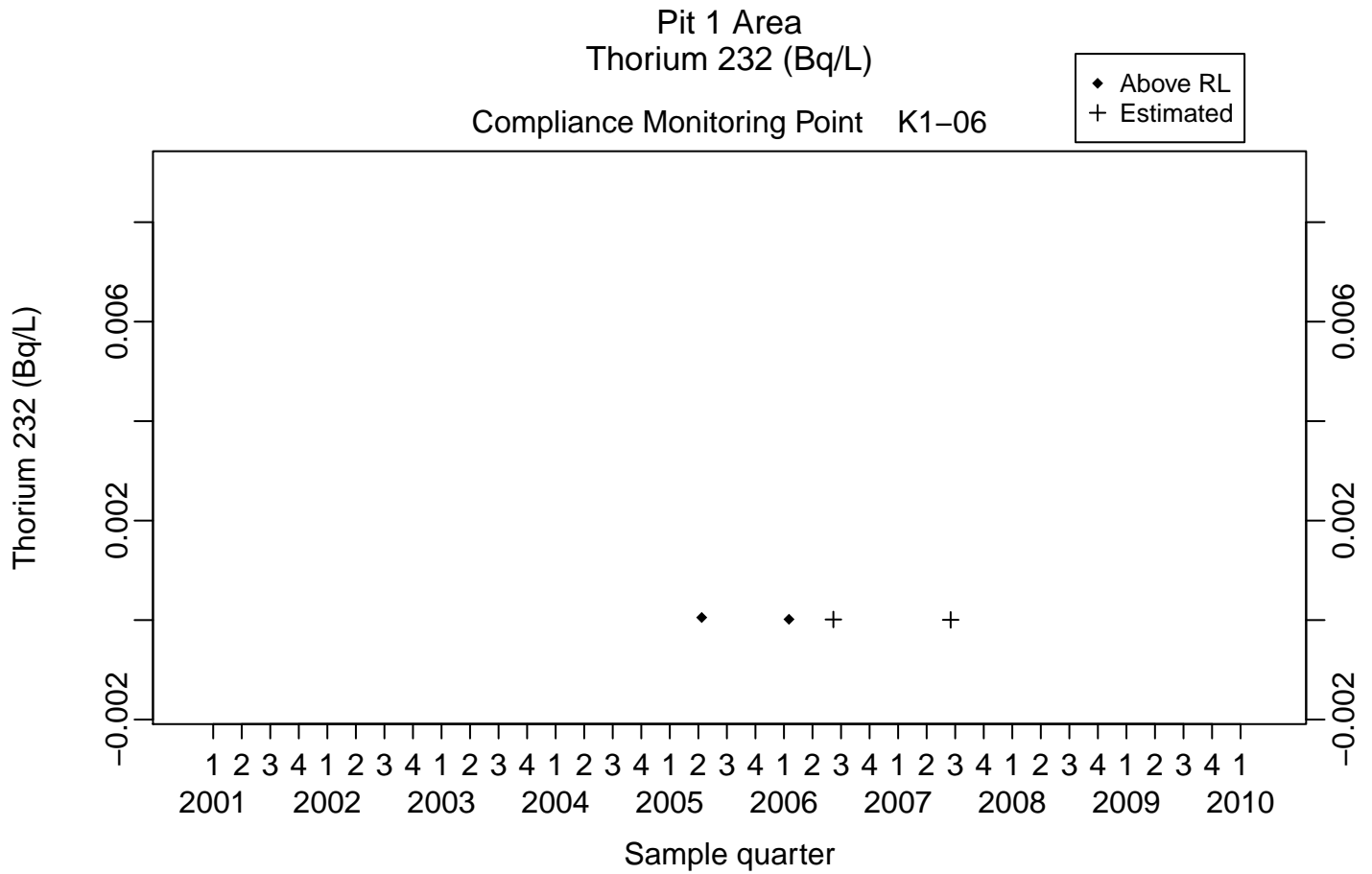


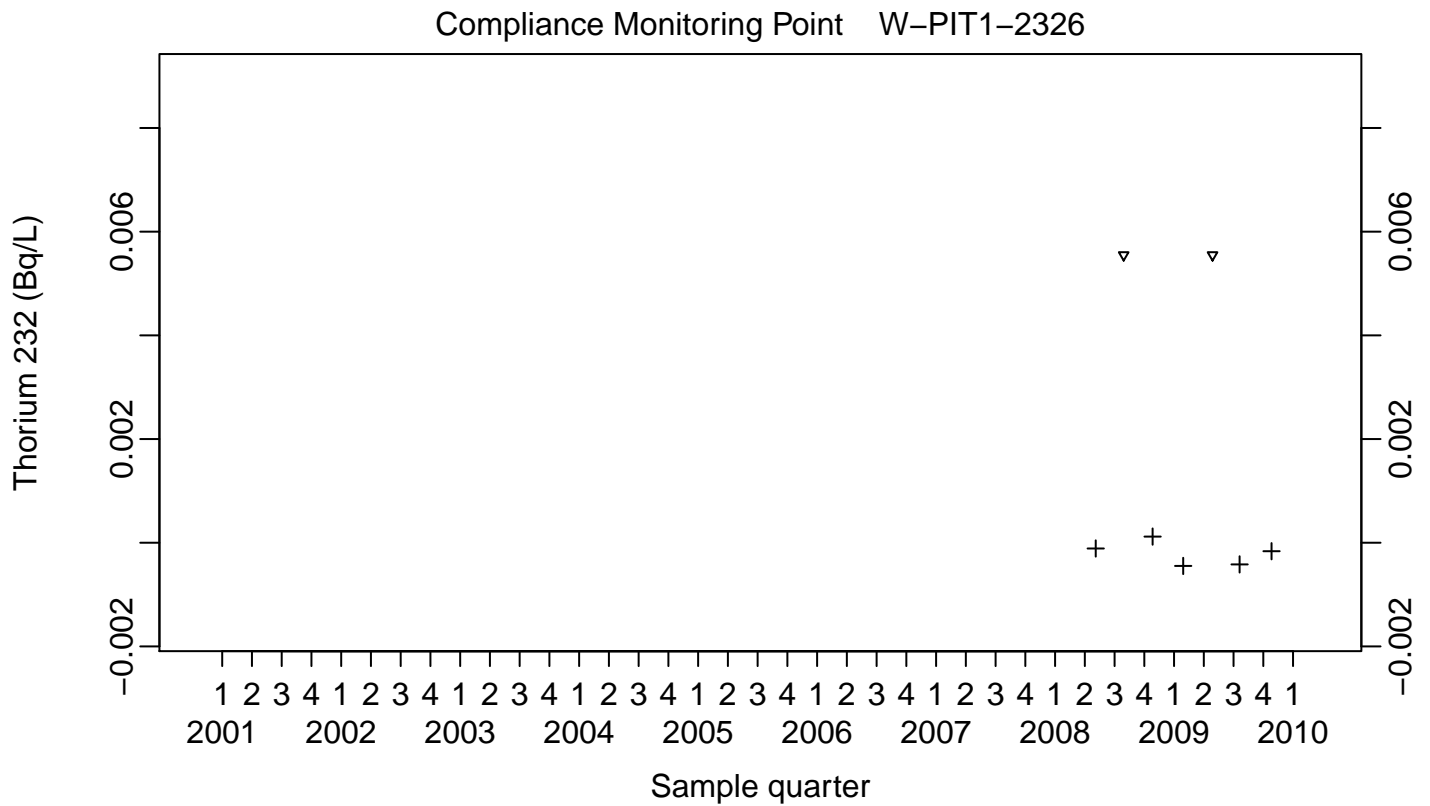
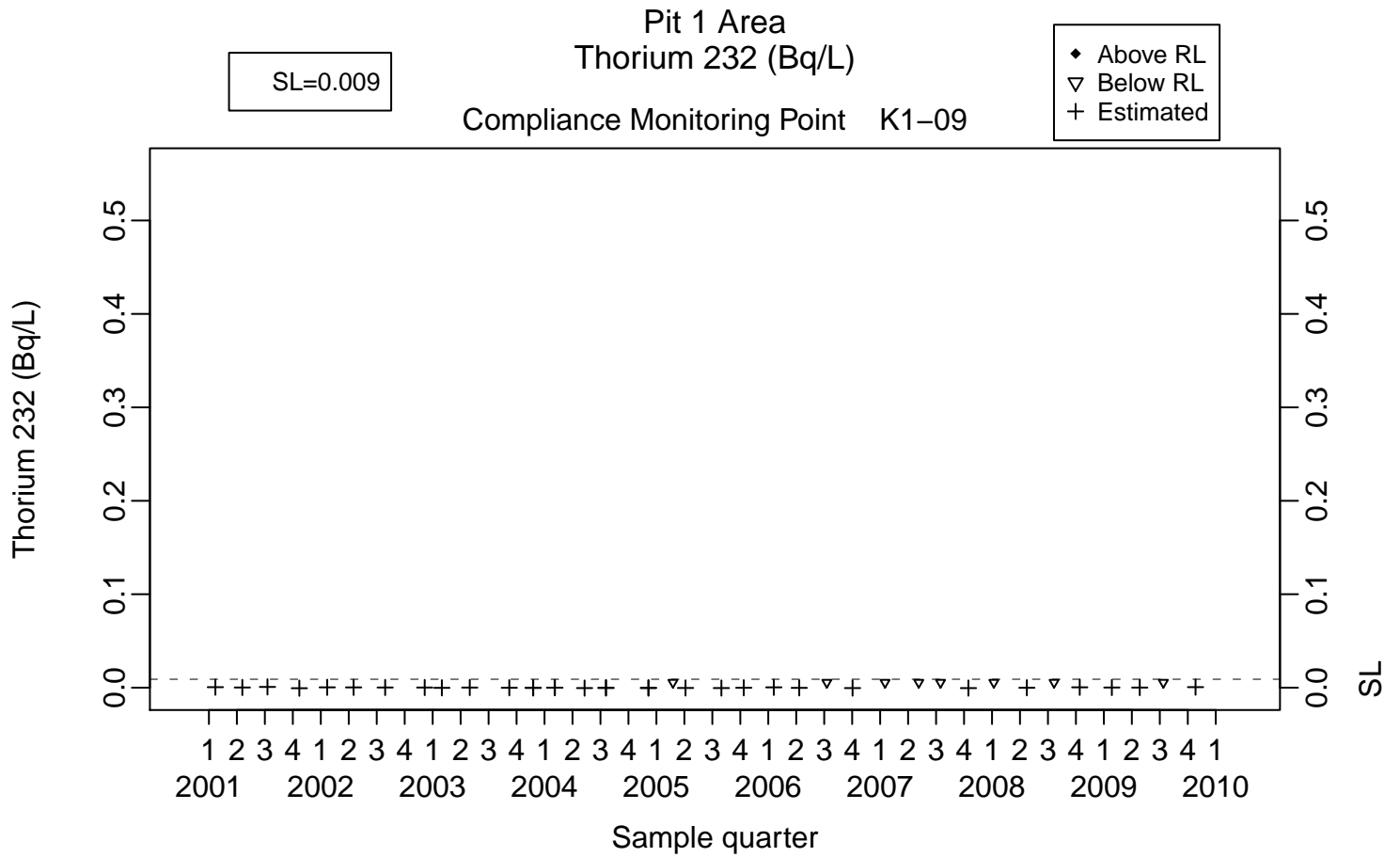
Background Monitoring Point K1-07







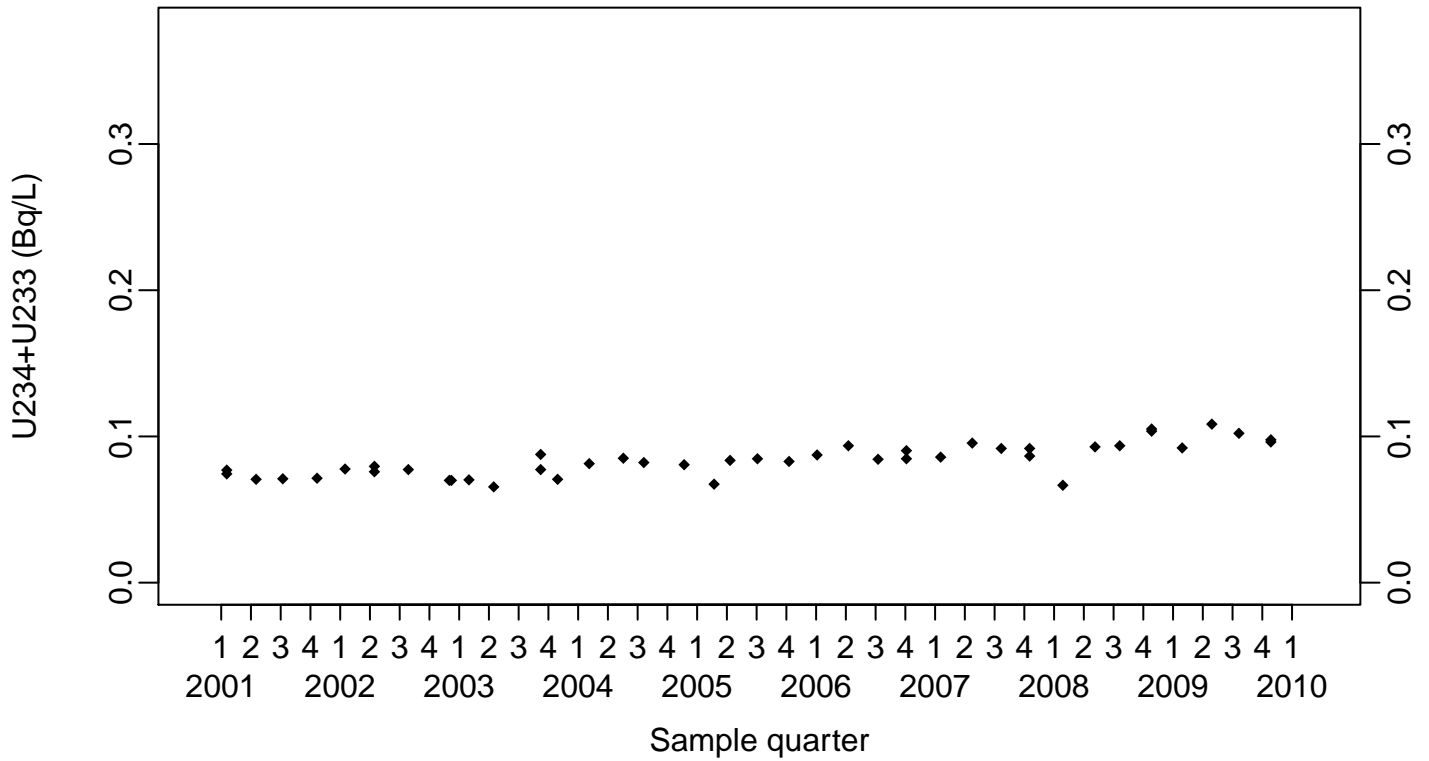




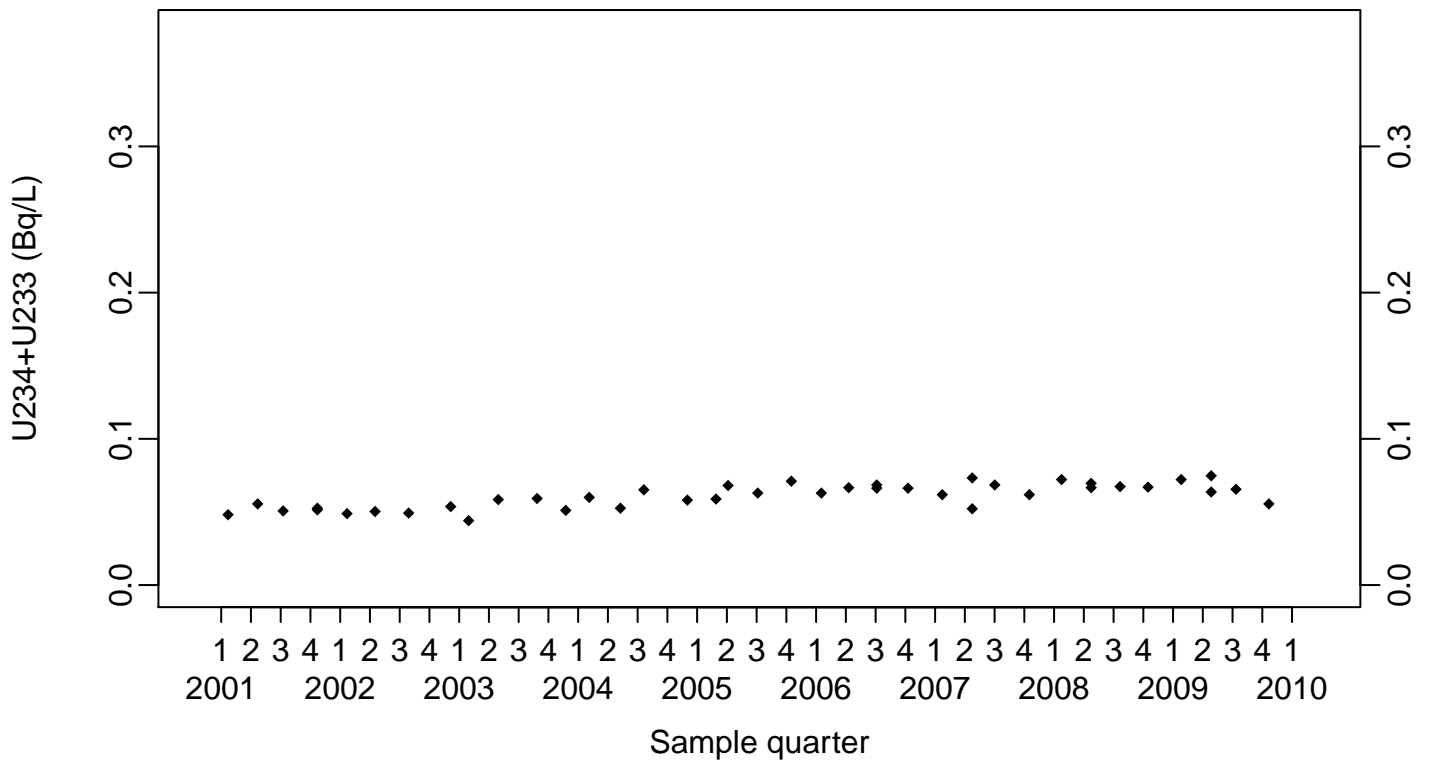
Pit 1 Area
U234+U233 (Bq/L)

Background Monitoring Point K1-01C

◆ Above RL
▽ Below RL



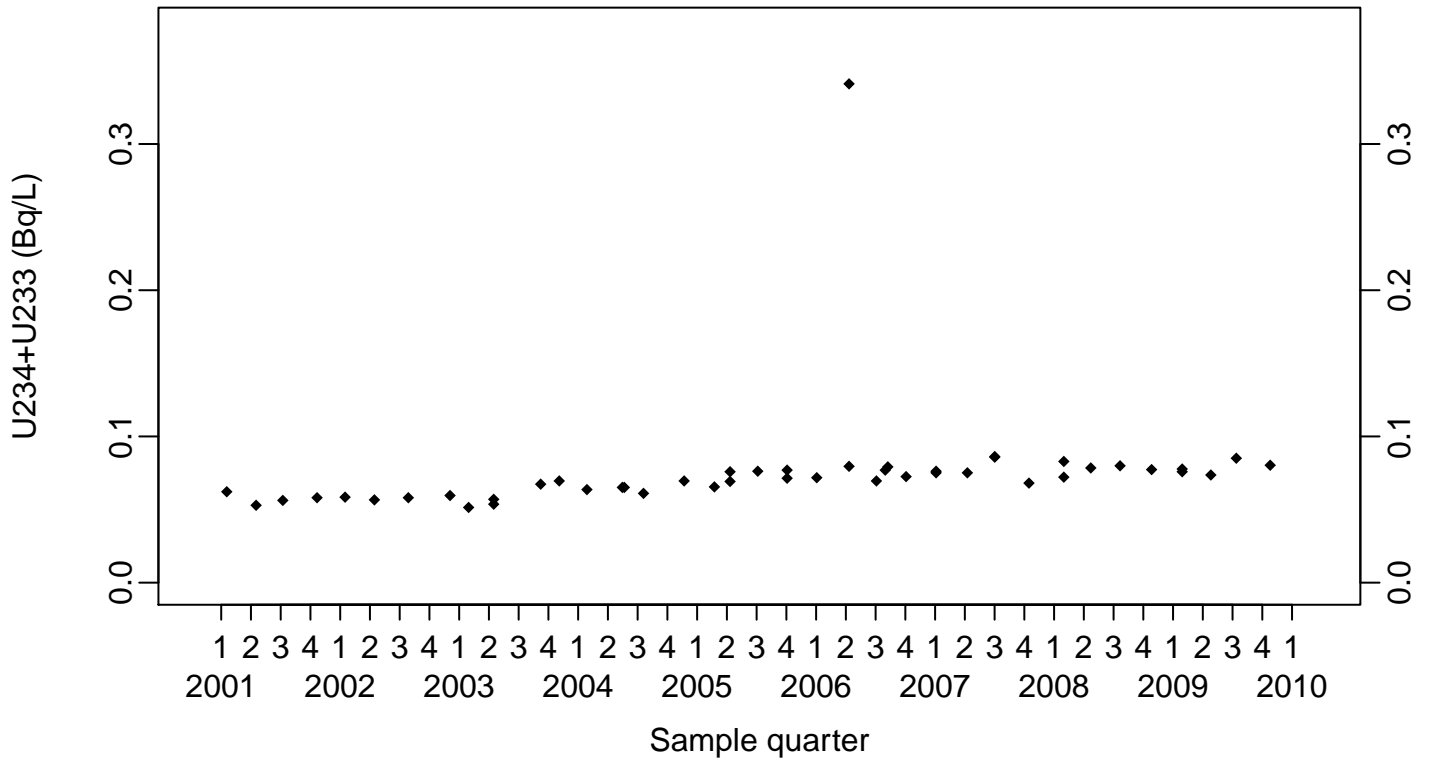
Background Monitoring Point K1-07



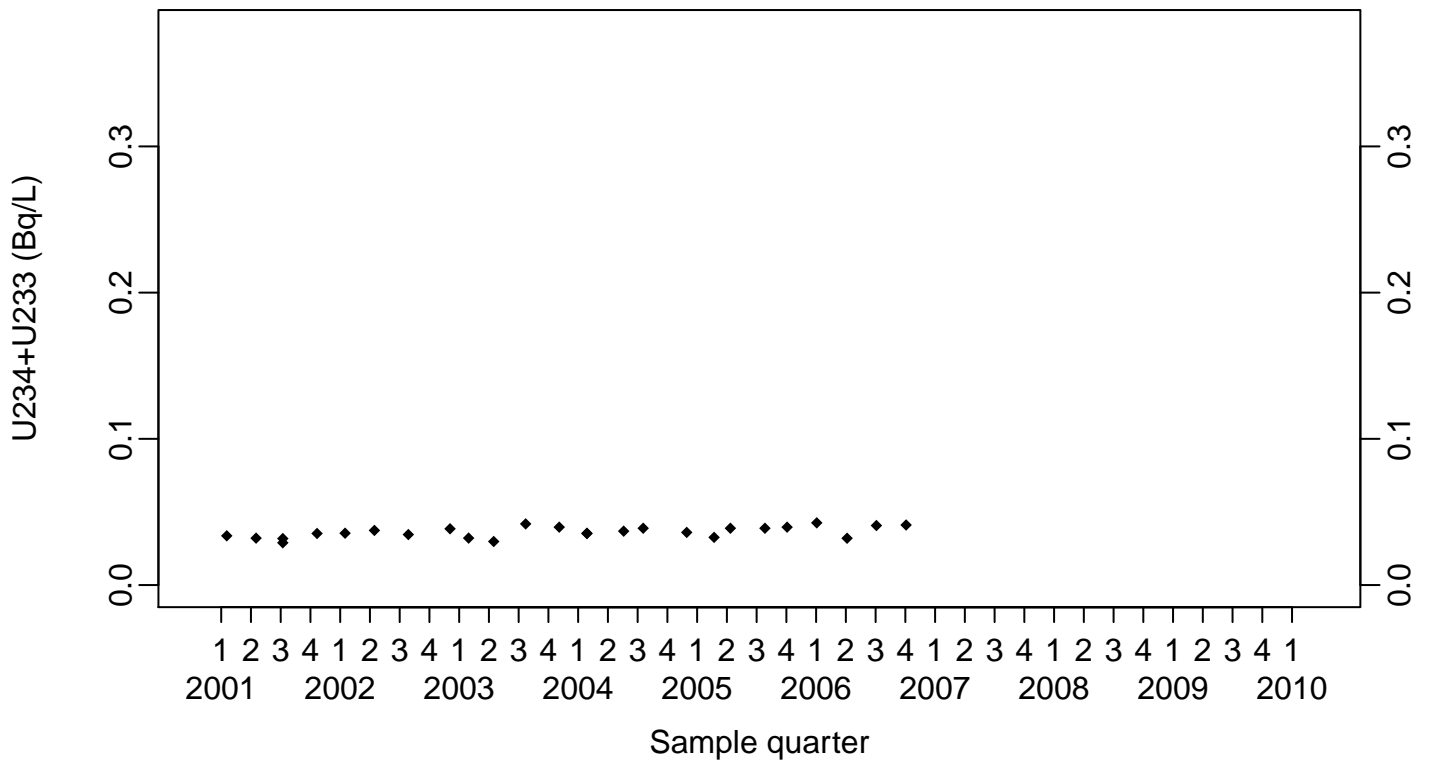
Pit 1 Area
U234+U233 (Bq/L)

Compliance Monitoring Point K1-02B

◆ Above RL
▽ Below RL



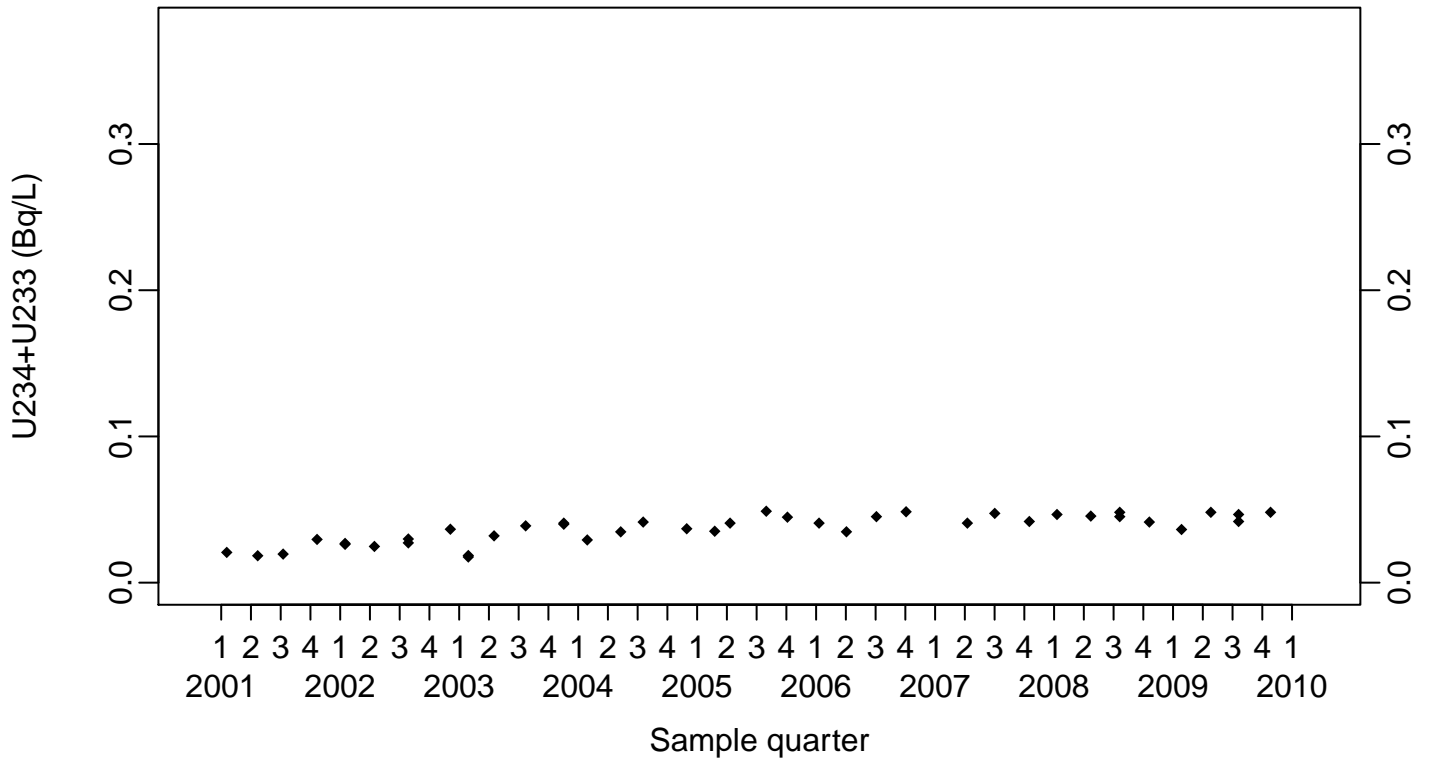
Compliance Monitoring Point K1-03



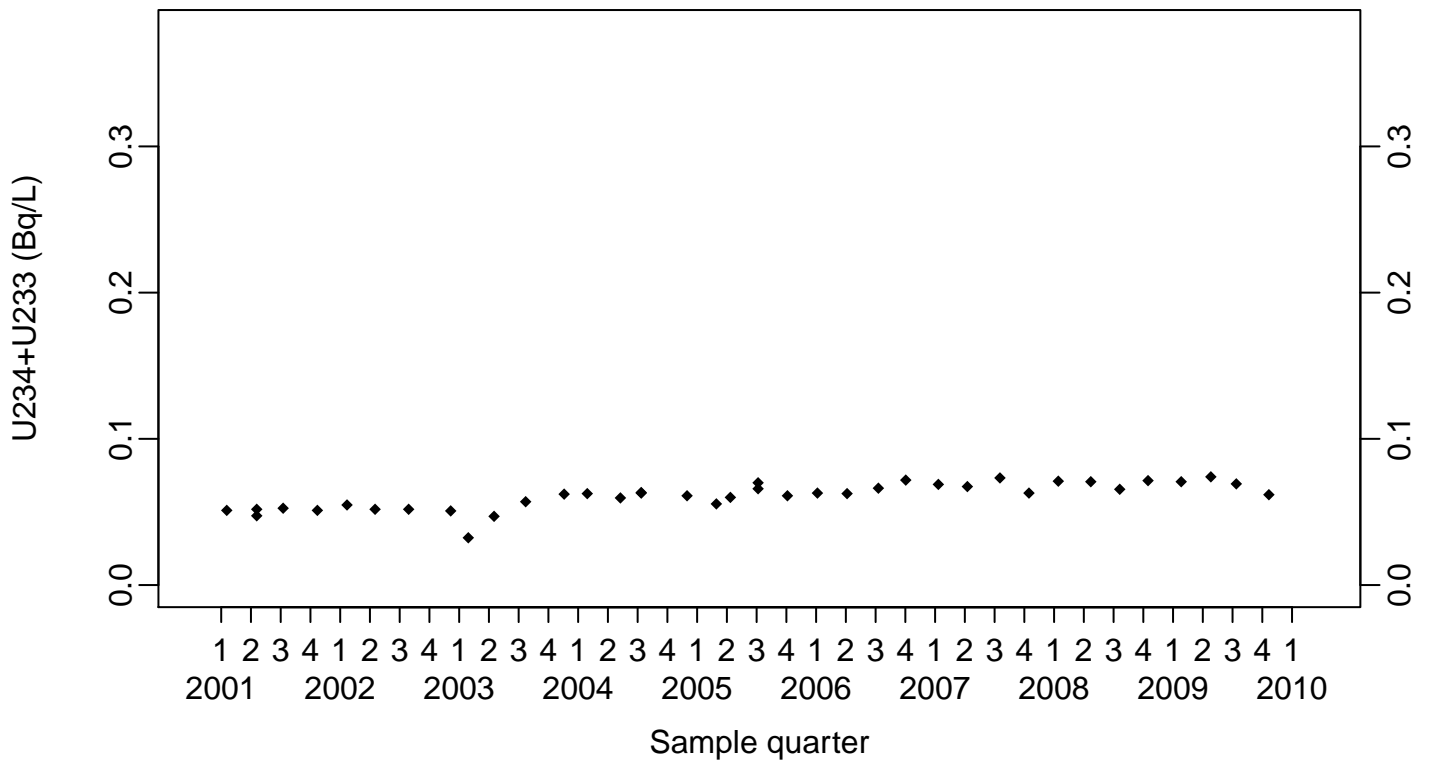
Pit 1 Area
U234+U233 (Bq/L)

Compliance Monitoring Point K1-04

◆ Above RL
▽ Below RL



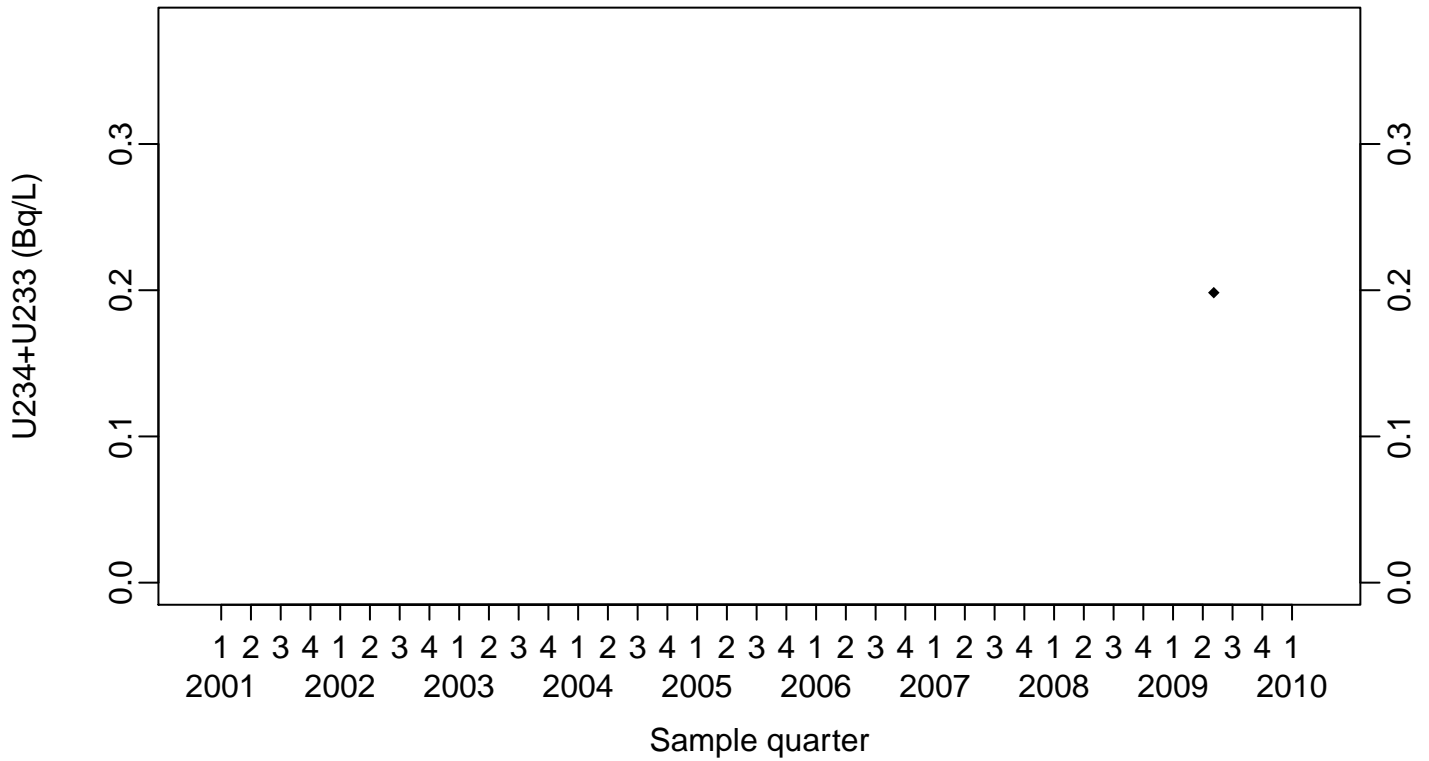
Compliance Monitoring Point K1-05



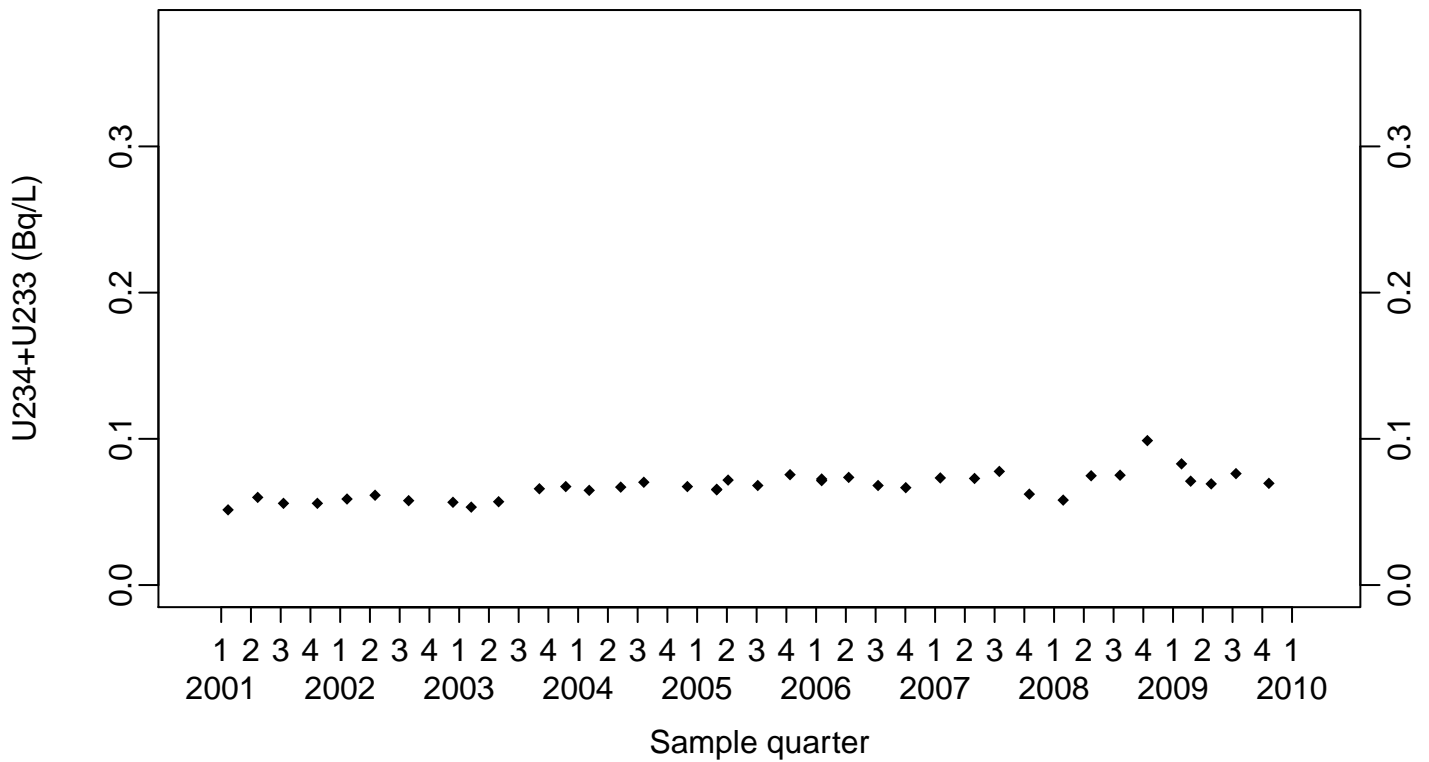
Pit 1 Area
U234+U233 (Bq/L)

Compliance Monitoring Point K1-06

◆ Above RL
▽ Below RL



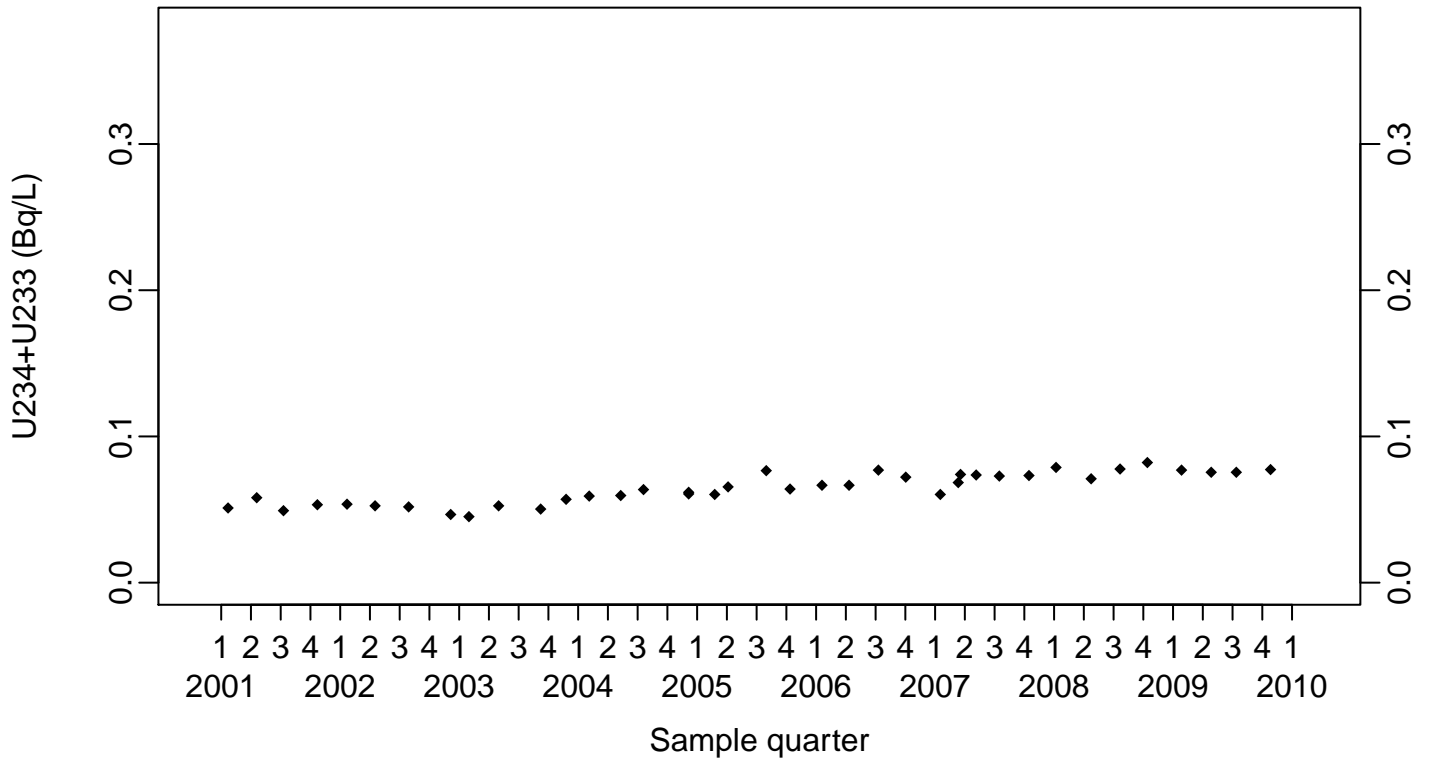
Compliance Monitoring Point K1-08



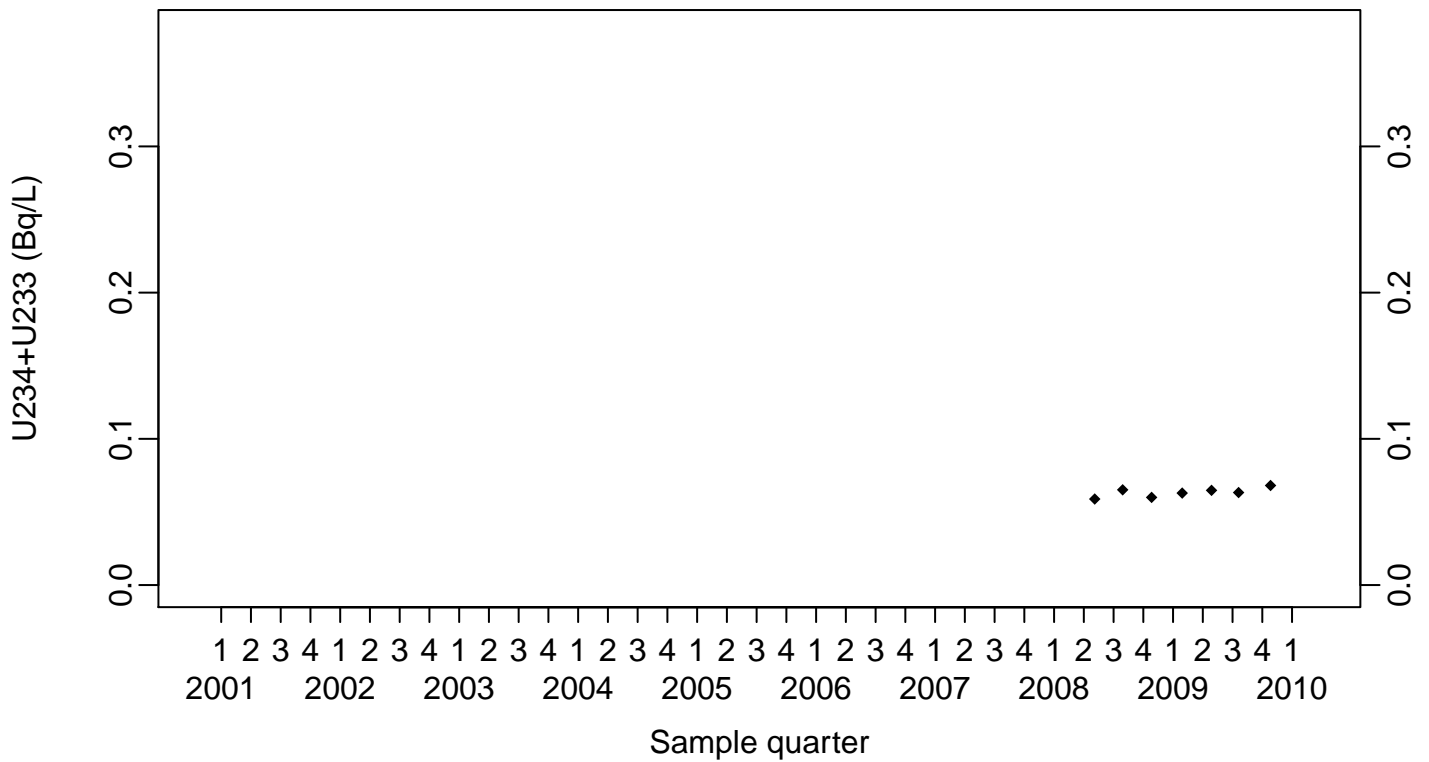
Pit 1 Area
U234+U233 (Bq/L)

Compliance Monitoring Point K1-09

◆ Above RL
▽ Below RL



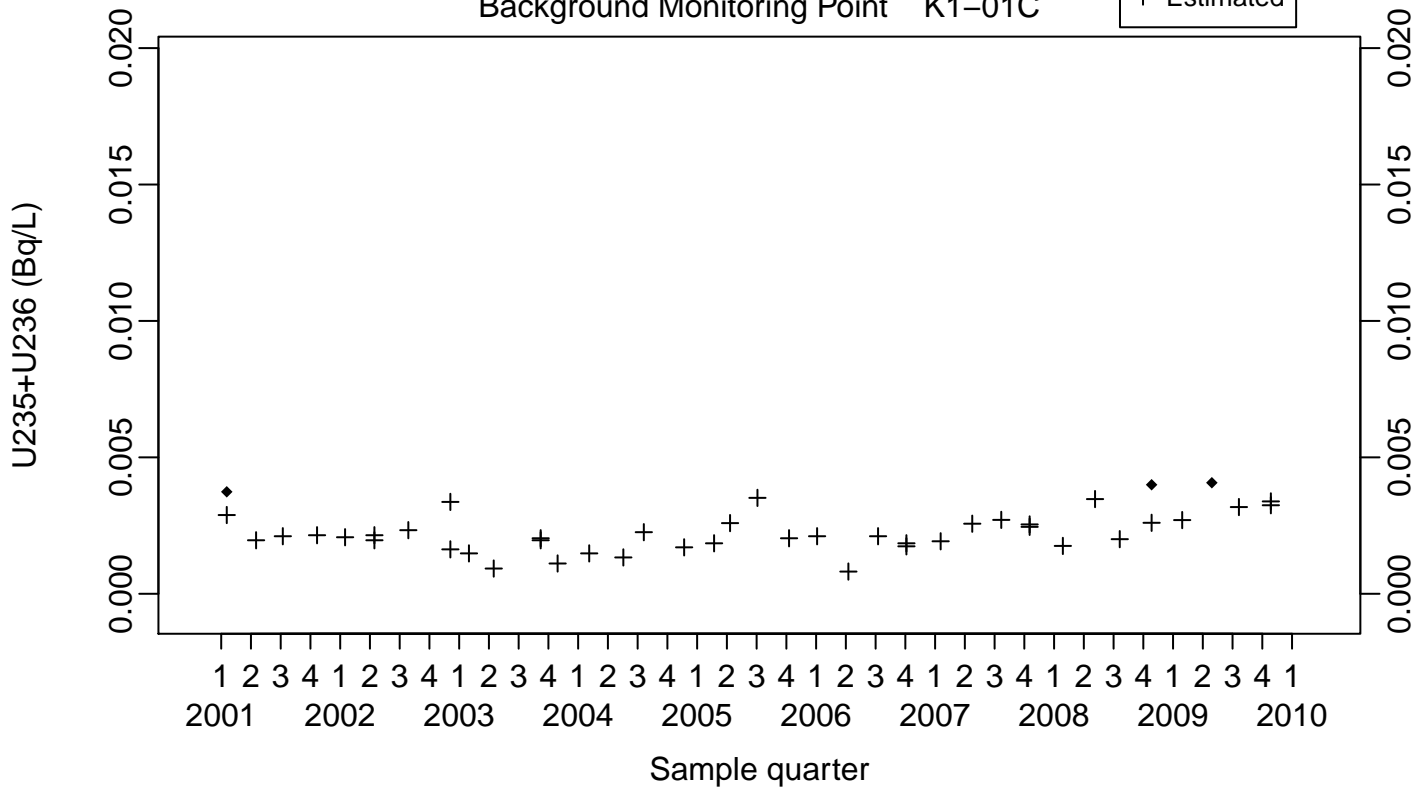
Compliance Monitoring Point W-PIT1-2326



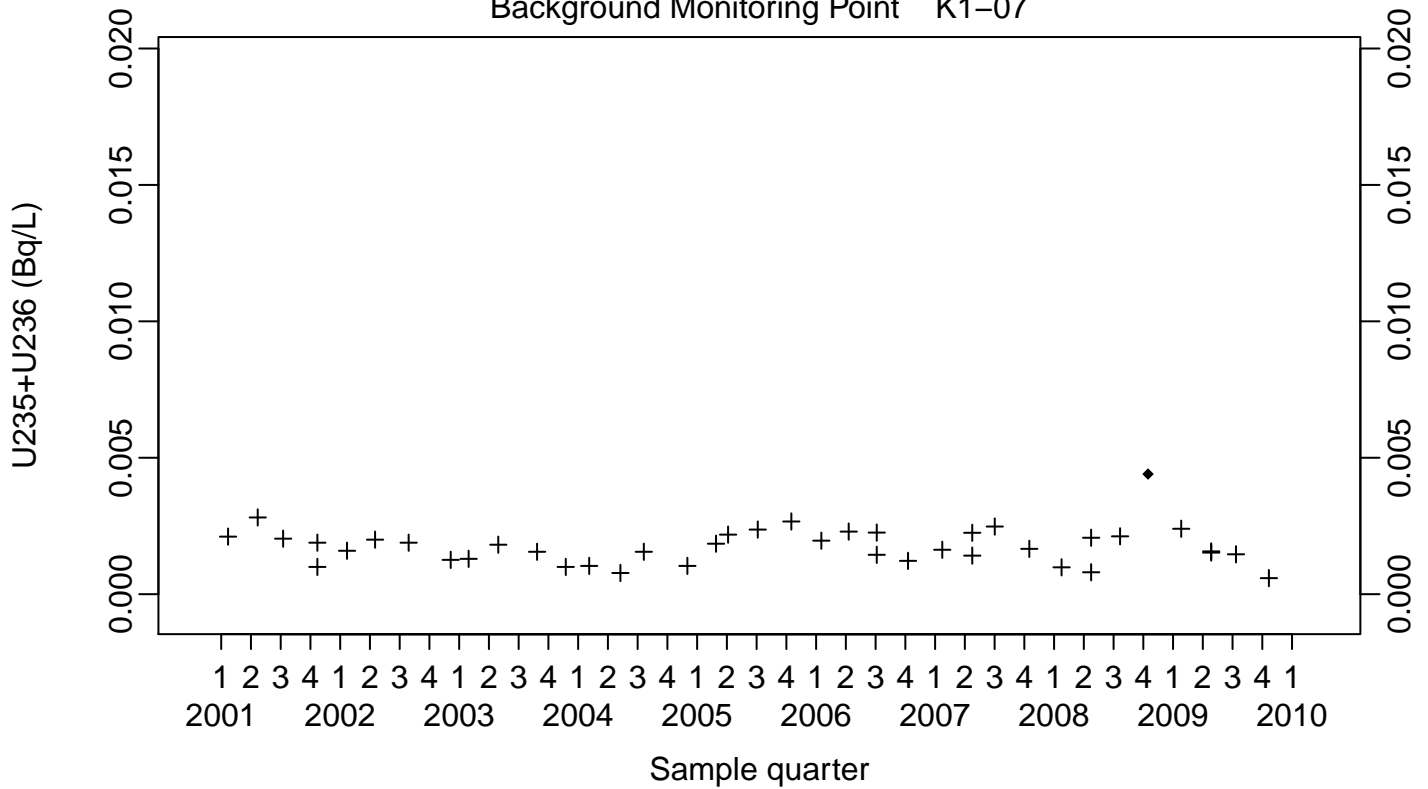
Pit 1 Area
U235+U236 (Bq/L)

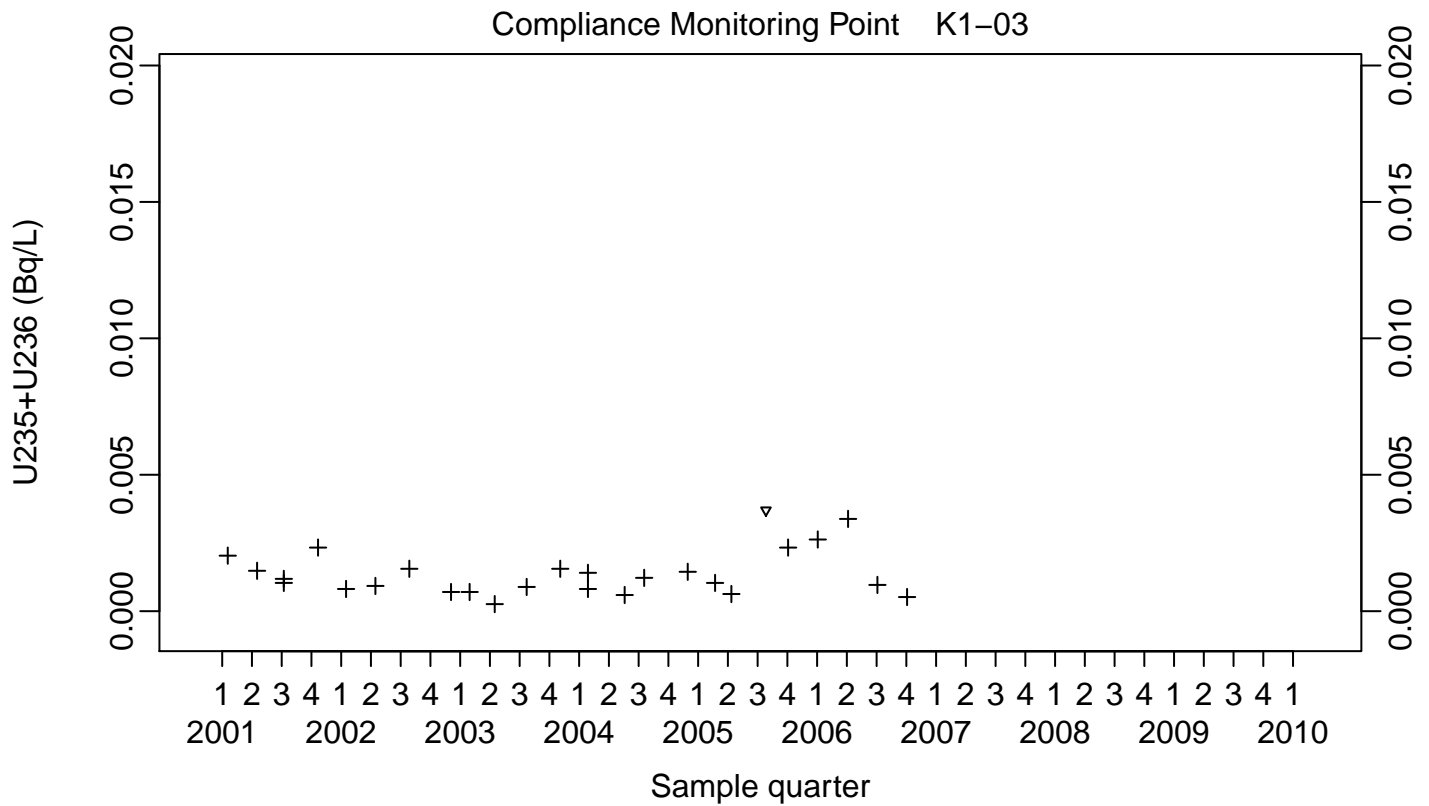
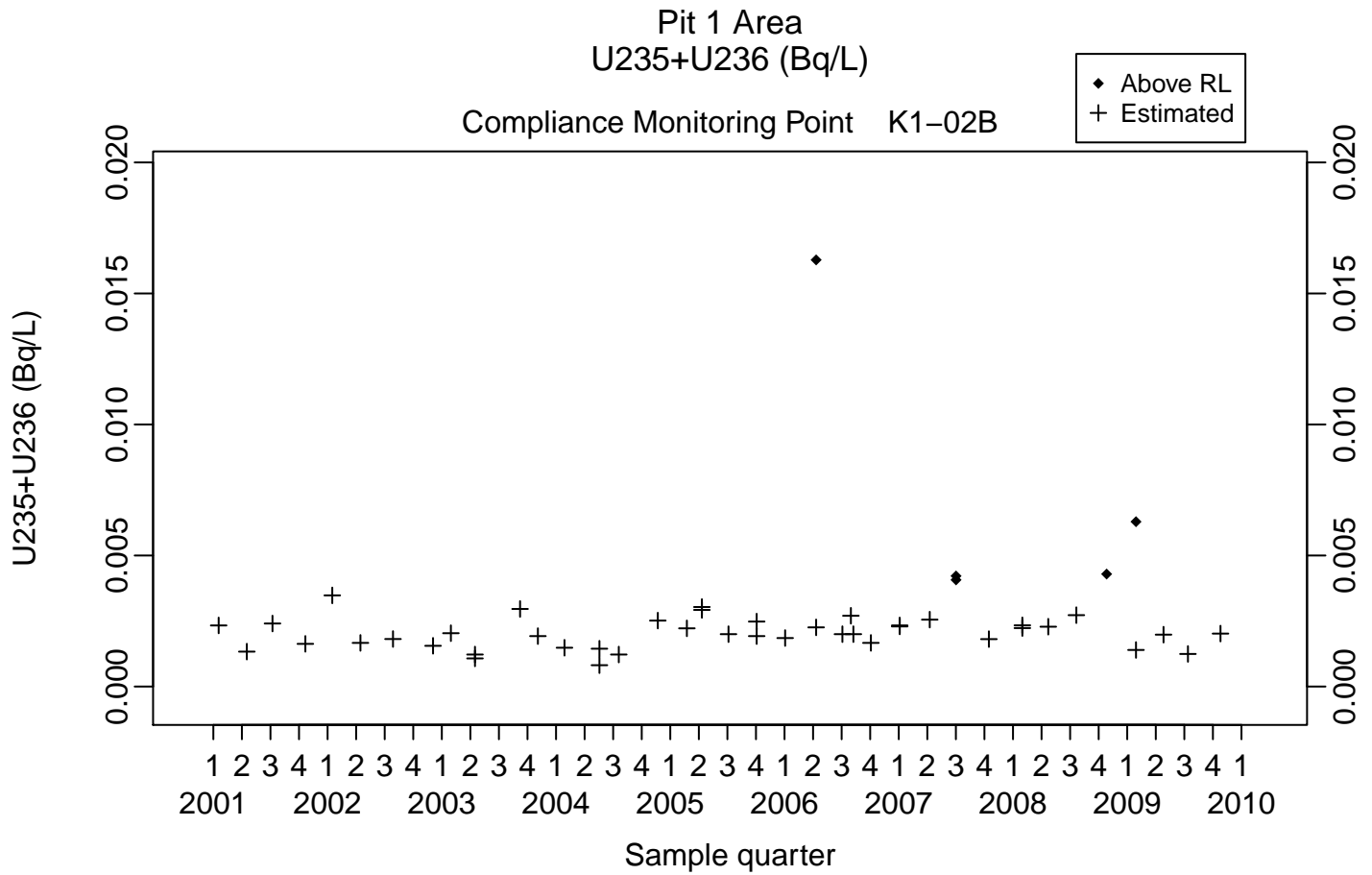
Background Monitoring Point K1-01C

◆ Above RL
+ Estimated



Background Monitoring Point K1-07

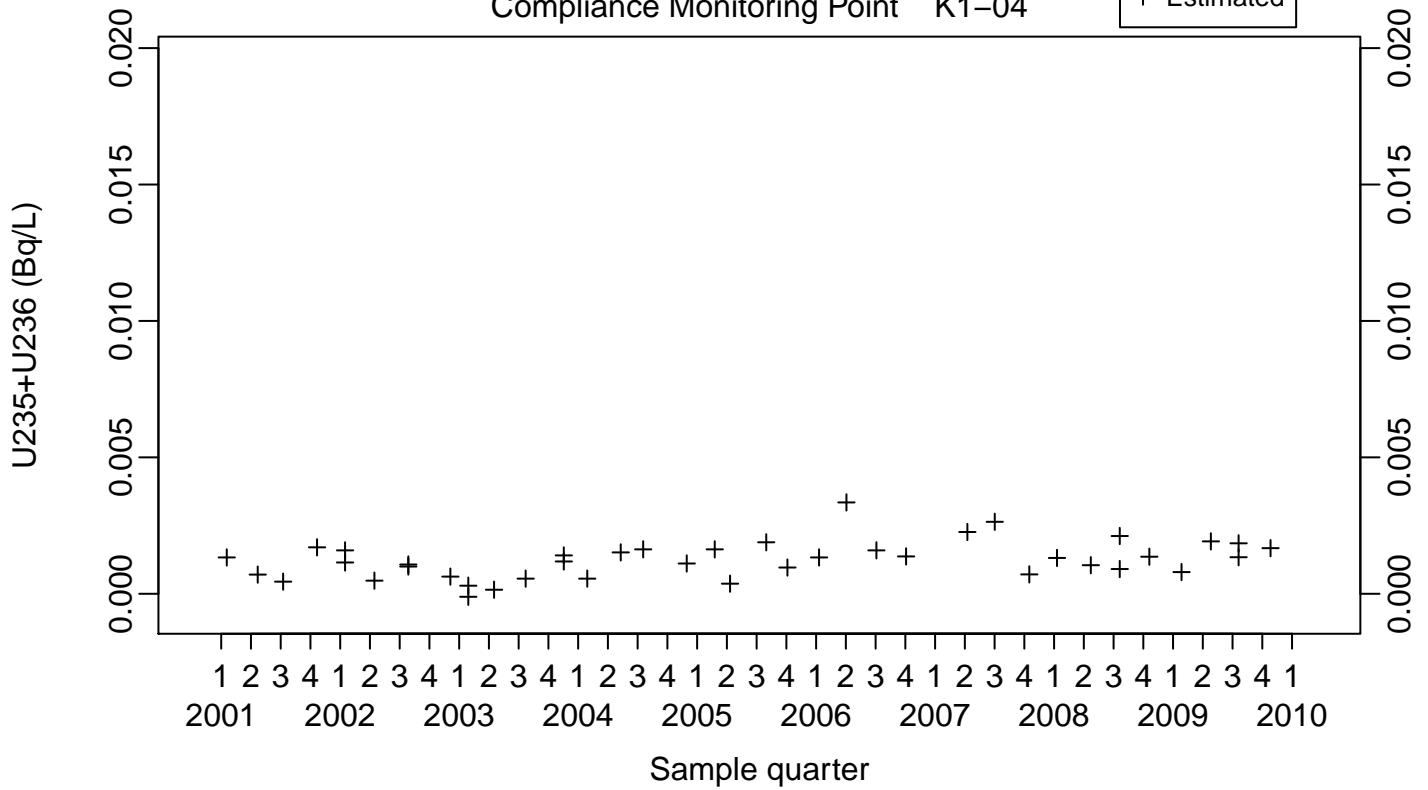




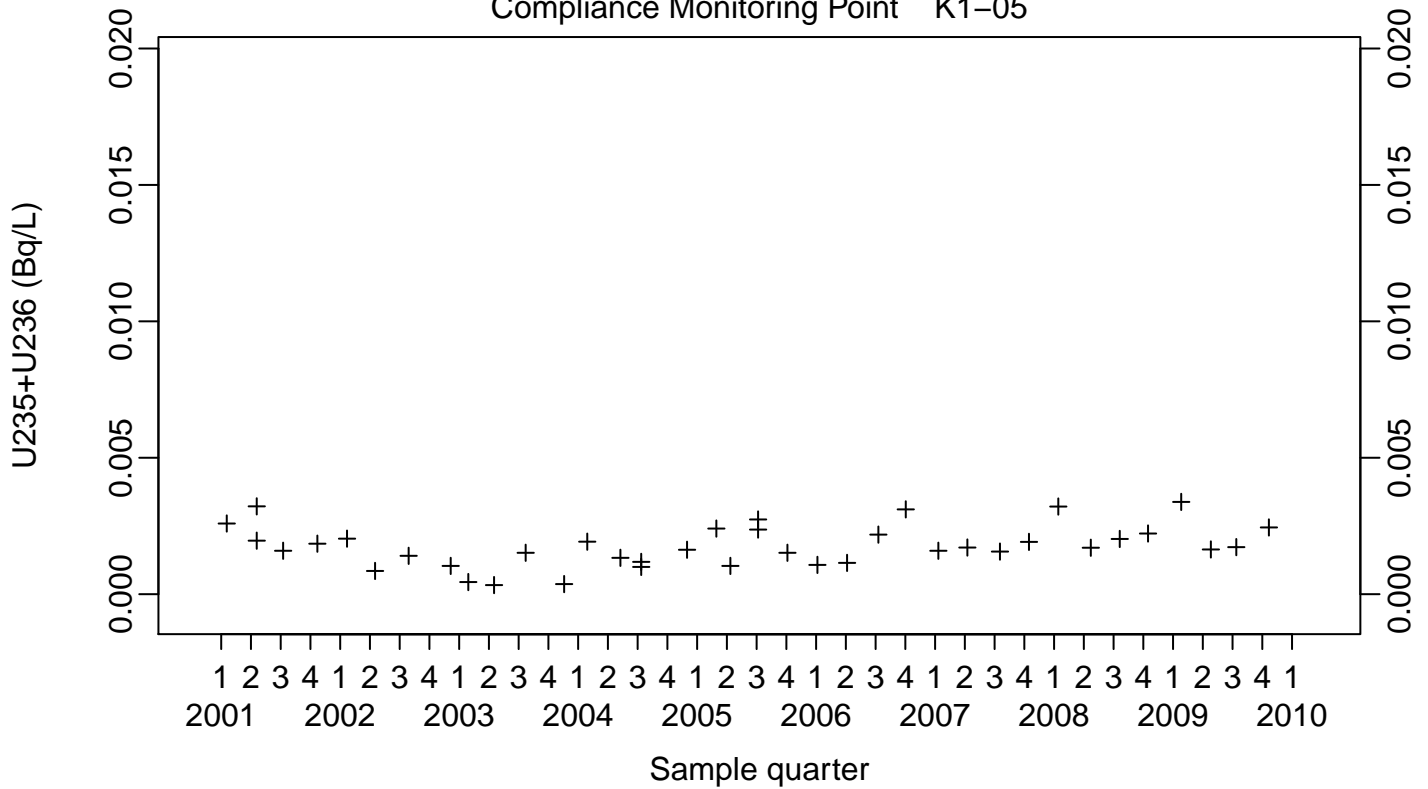
Pit 1 Area
U235+U236 (Bq/L)

Compliance Monitoring Point K1-04

◆ Above RL
+ Estimated



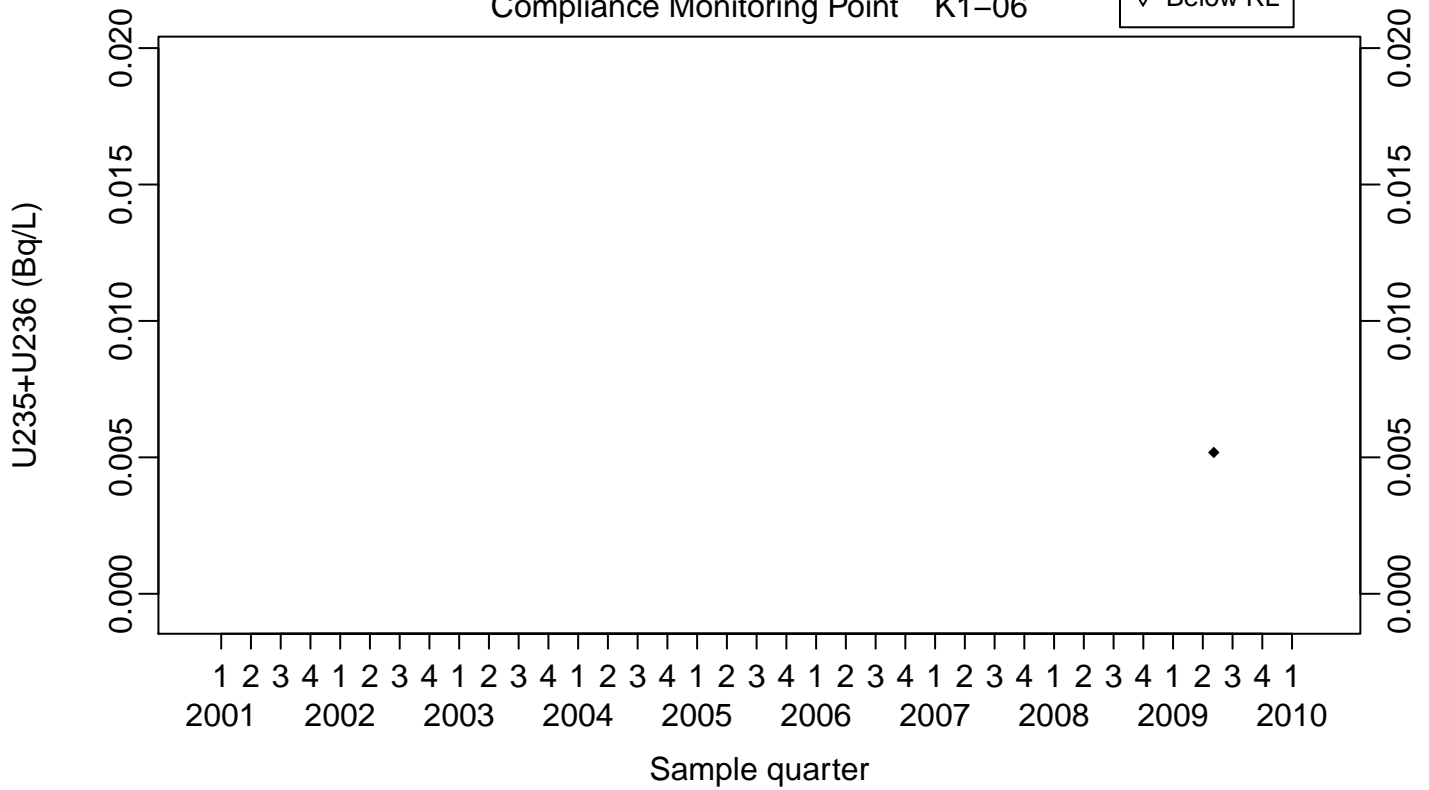
Compliance Monitoring Point K1-05



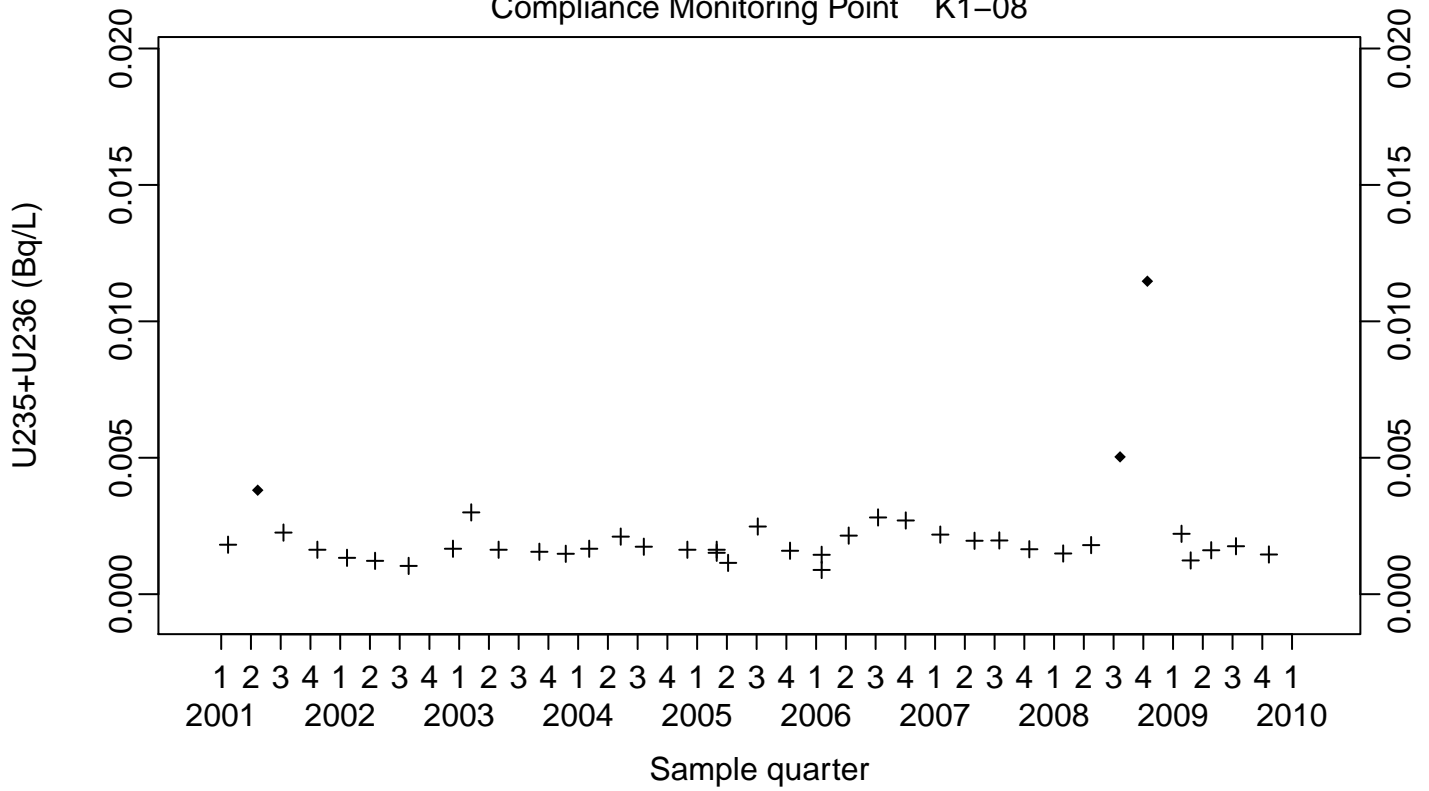
Pit 1 Area
U235+U236 (Bq/L)

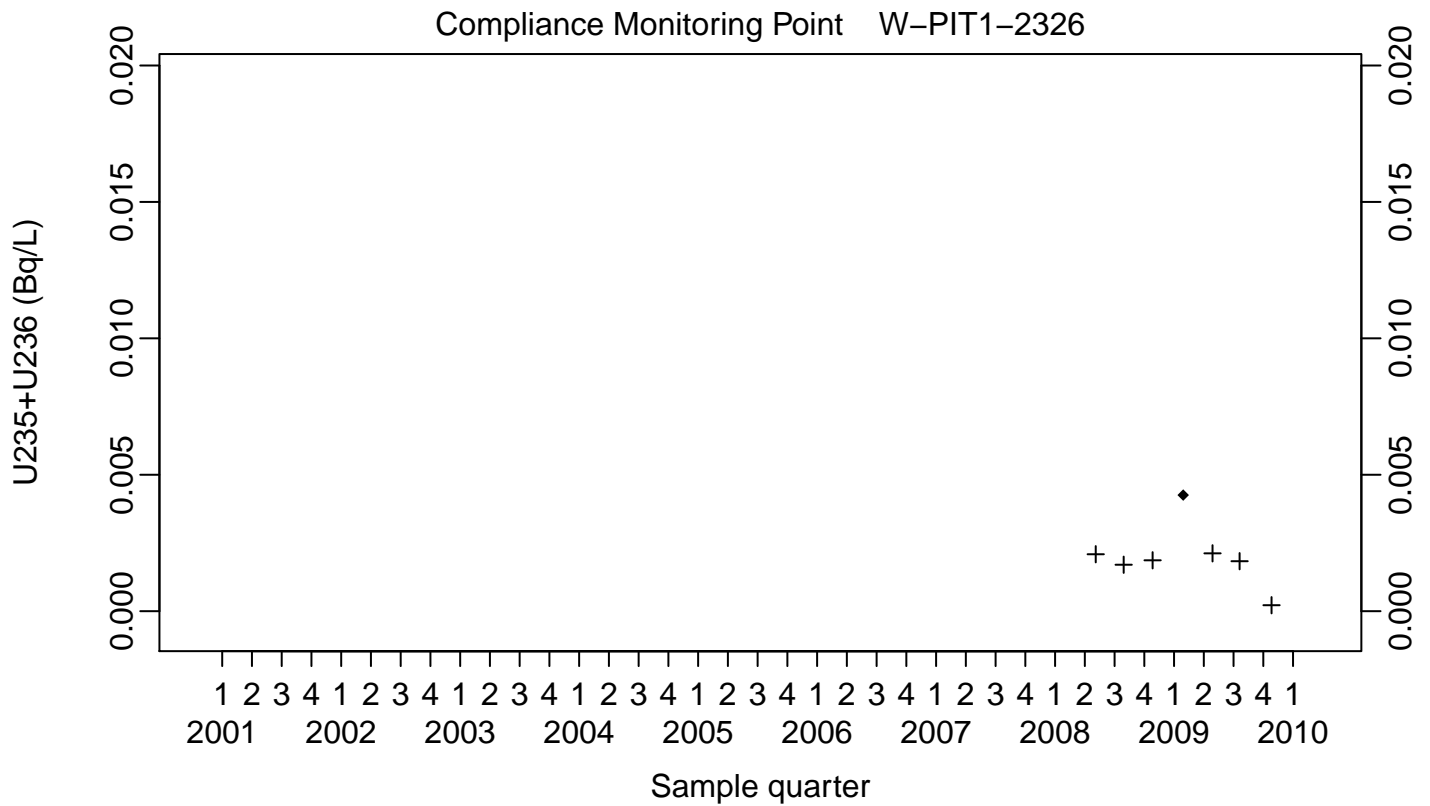
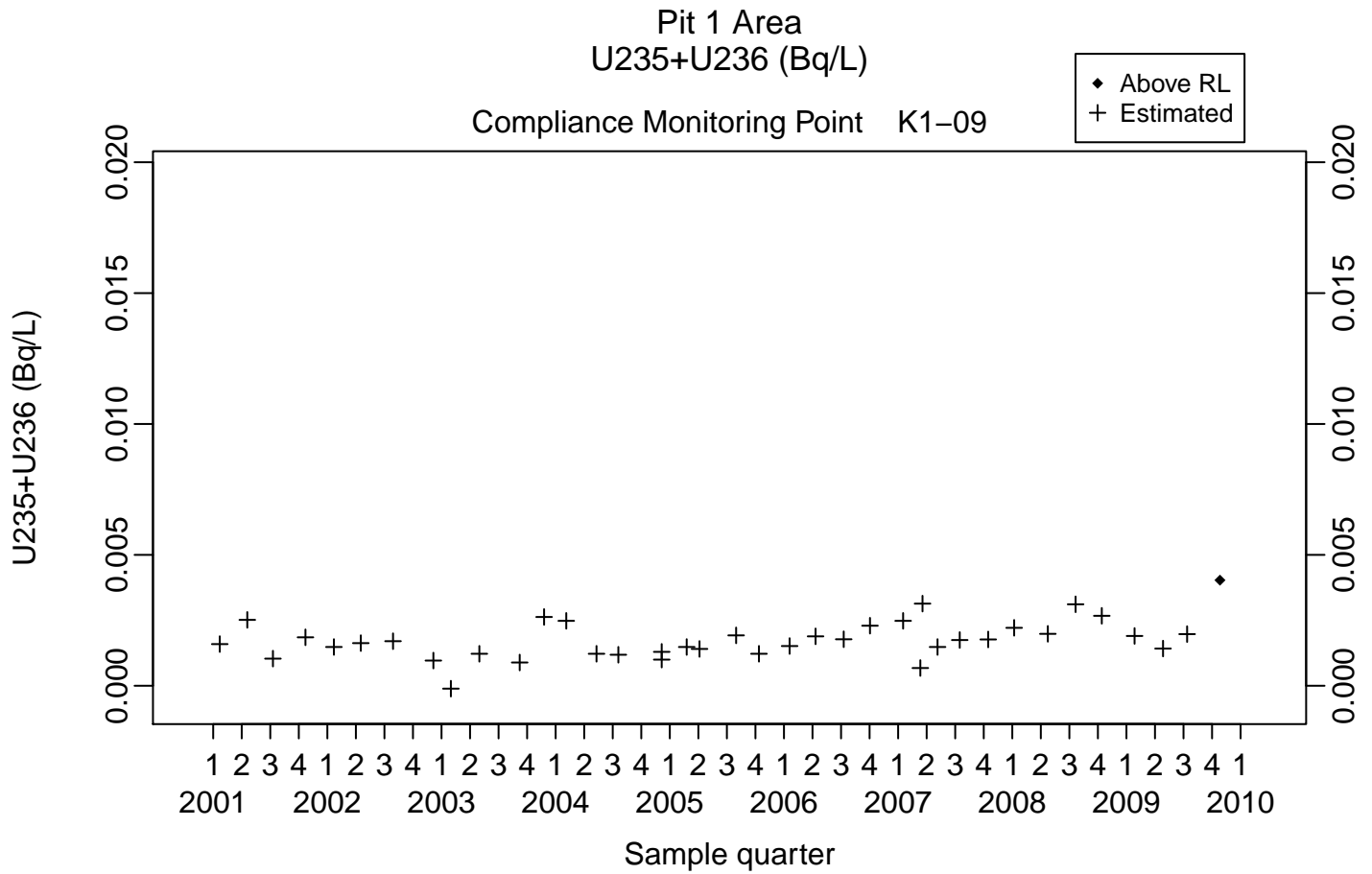
Compliance Monitoring Point K1-06

◆ Above RL
▽ Below RL



Compliance Monitoring Point K1-08

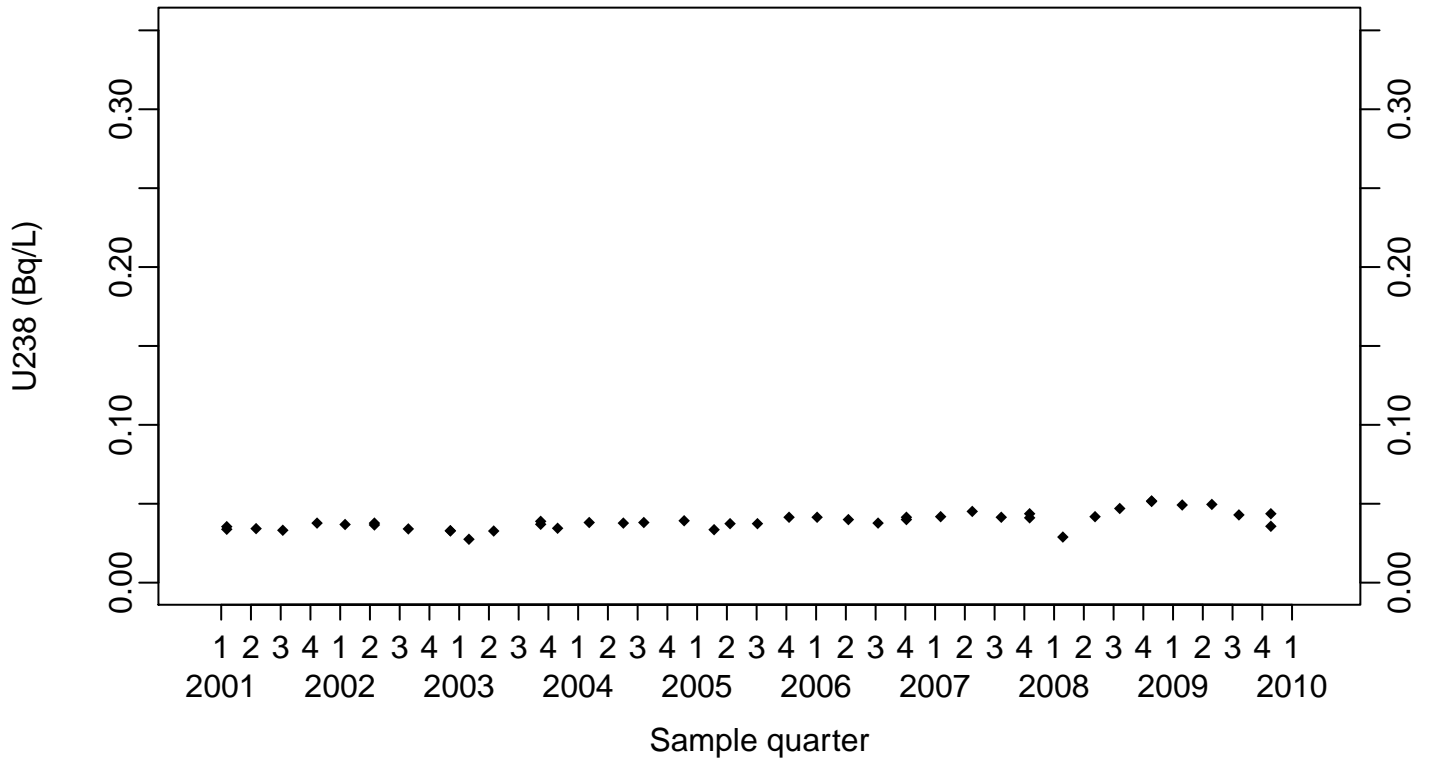




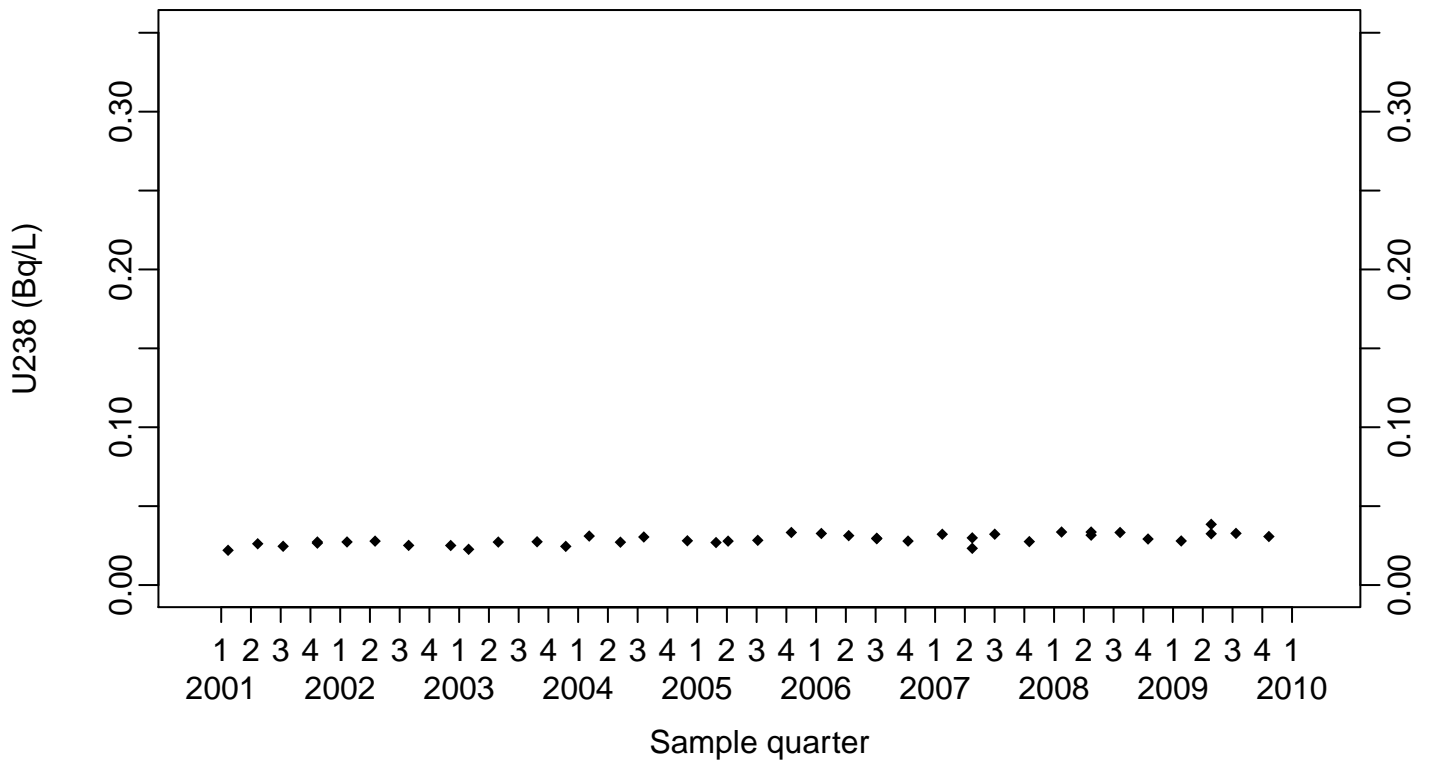
Pit 1 Area
U238 (Bq/L)

Background Monitoring Point K1-01C

◆ Above RL
▽ Below RL



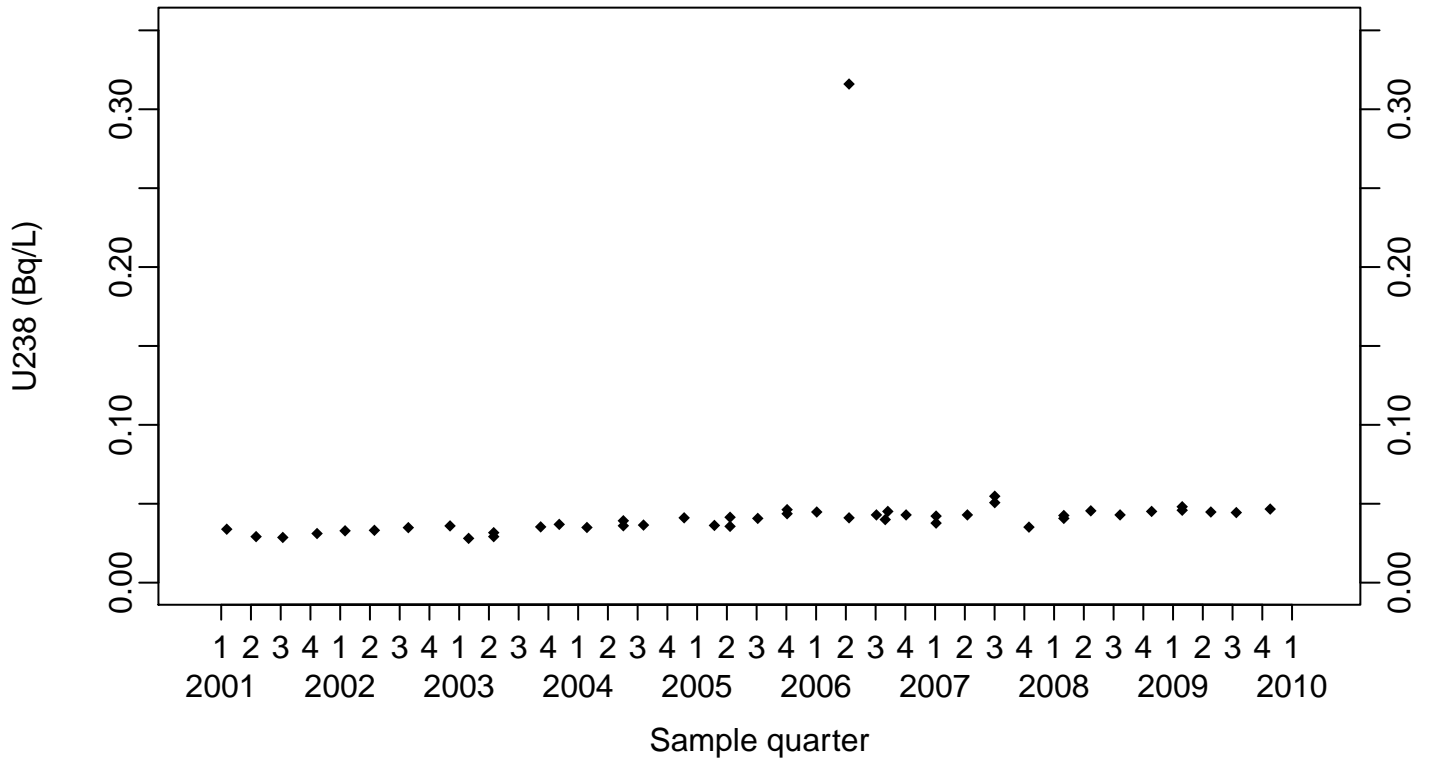
Background Monitoring Point K1-07



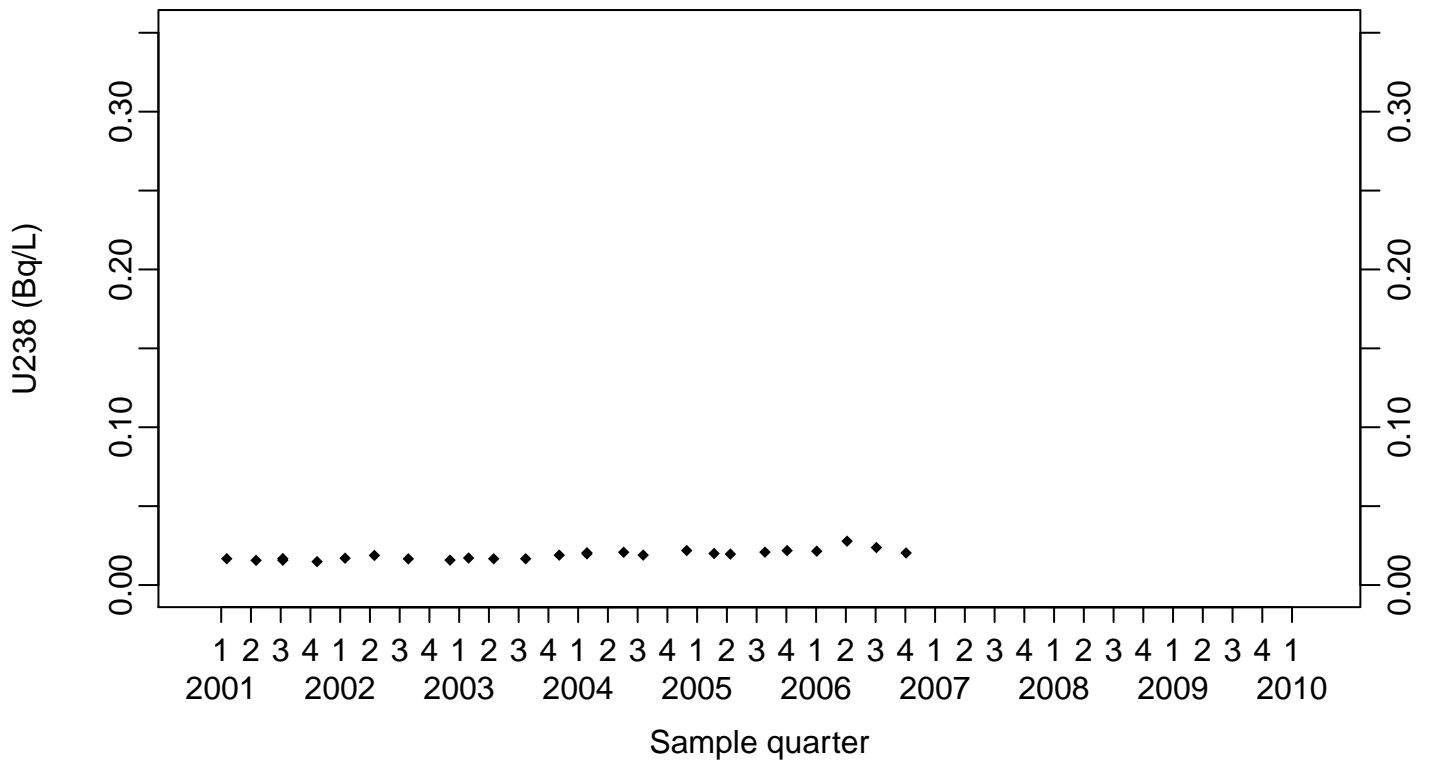
Pit 1 Area
U238 (Bq/L)

Compliance Monitoring Point K1-02B

◆ Above RL
▽ Below RL



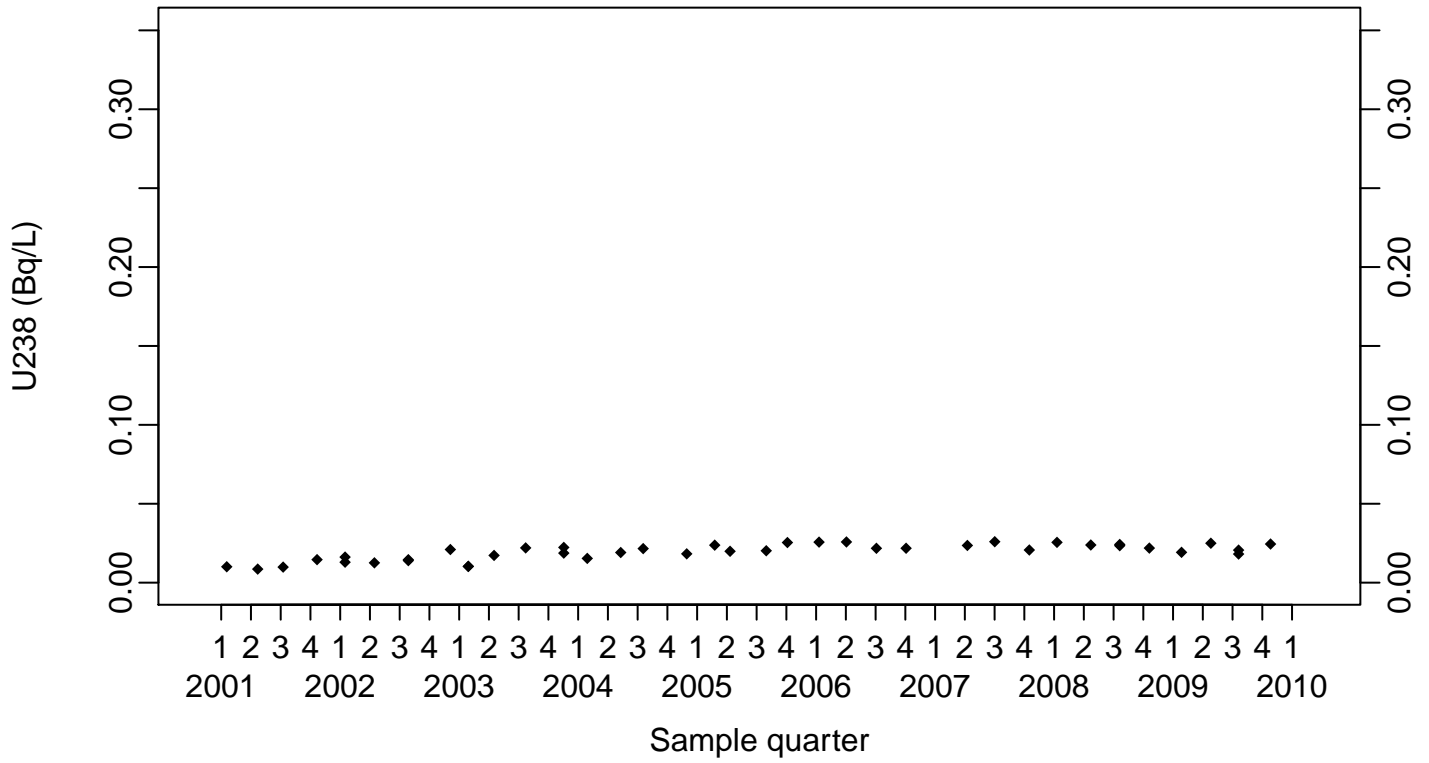
Compliance Monitoring Point K1-03



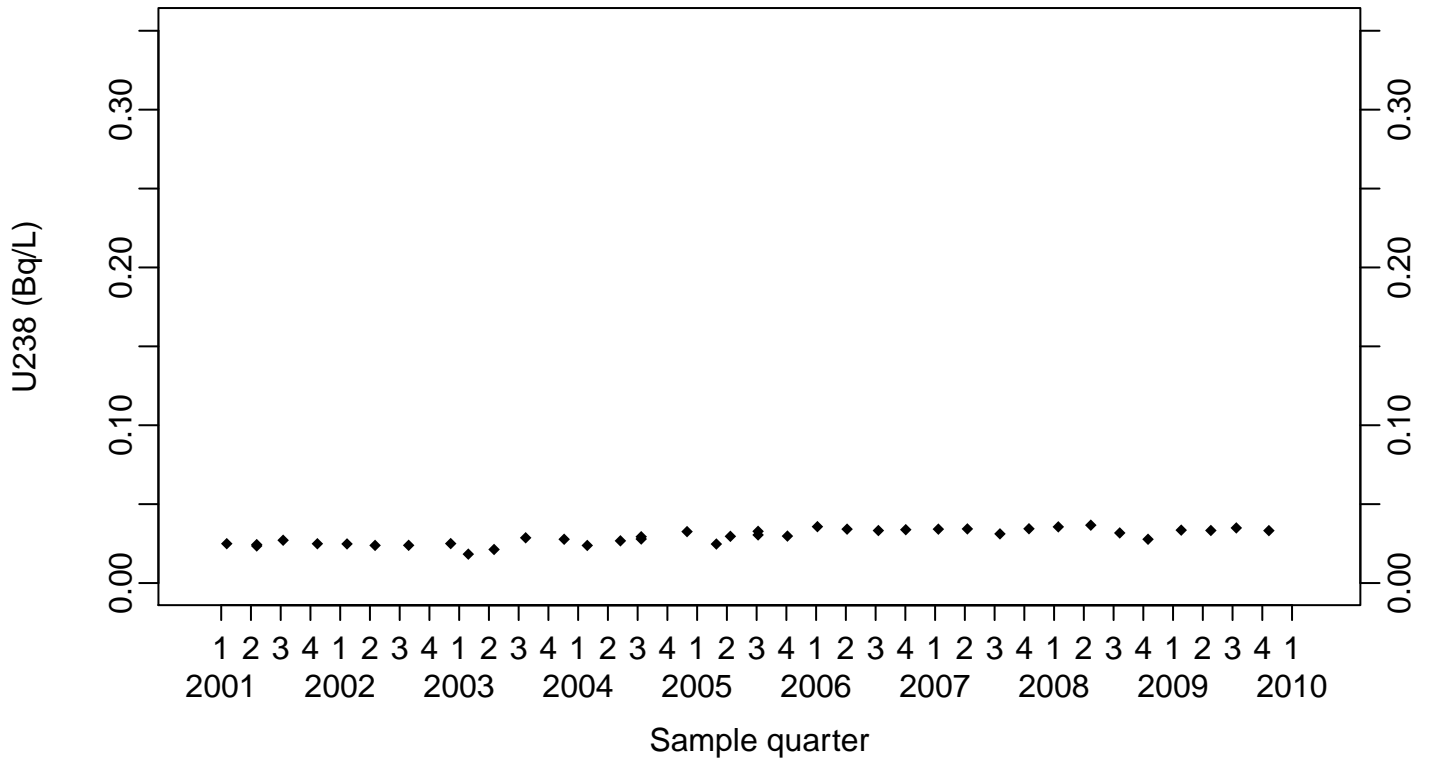
Pit 1 Area U238 (Bq/L)

Compliance Monitoring Point K1-04

◆ Above RL
▽ Below RL



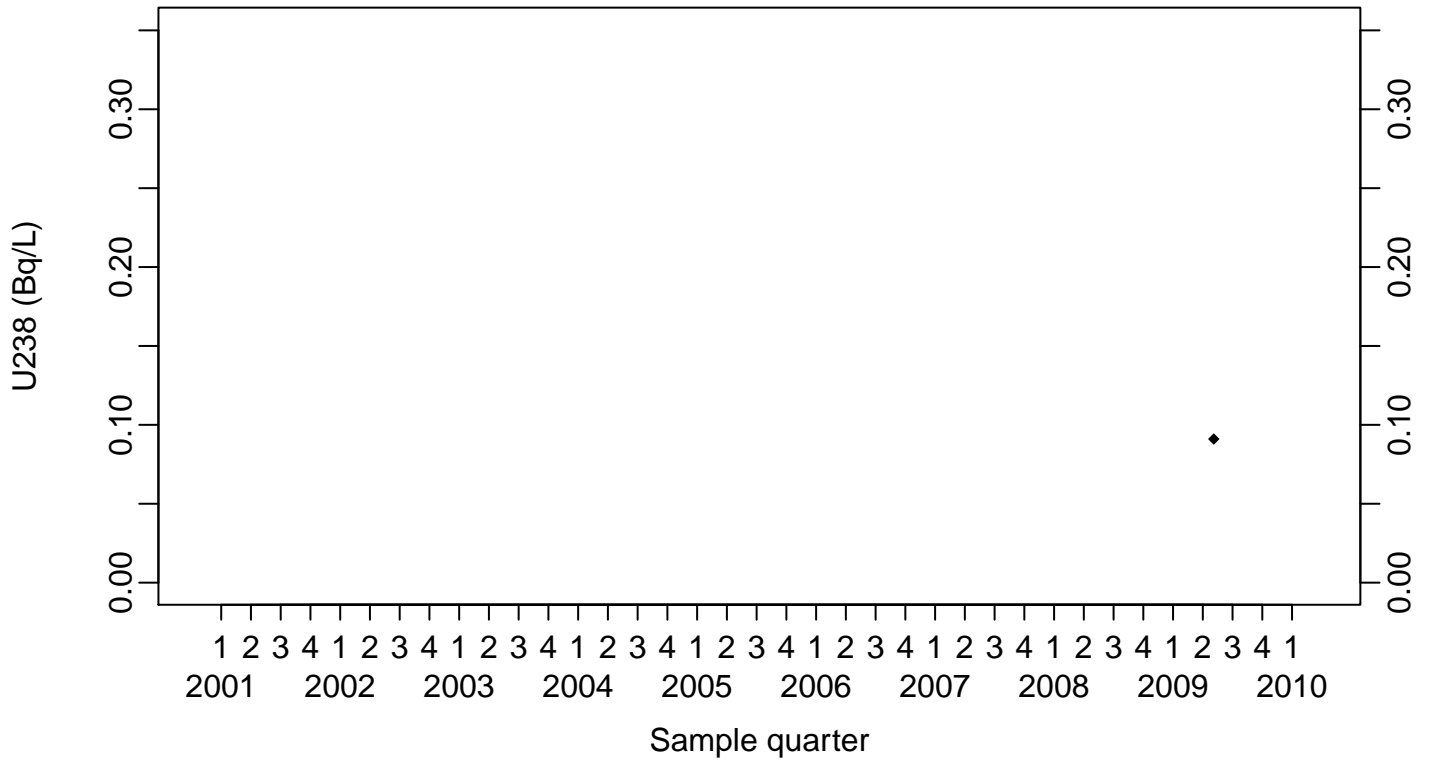
Compliance Monitoring Point K1-05



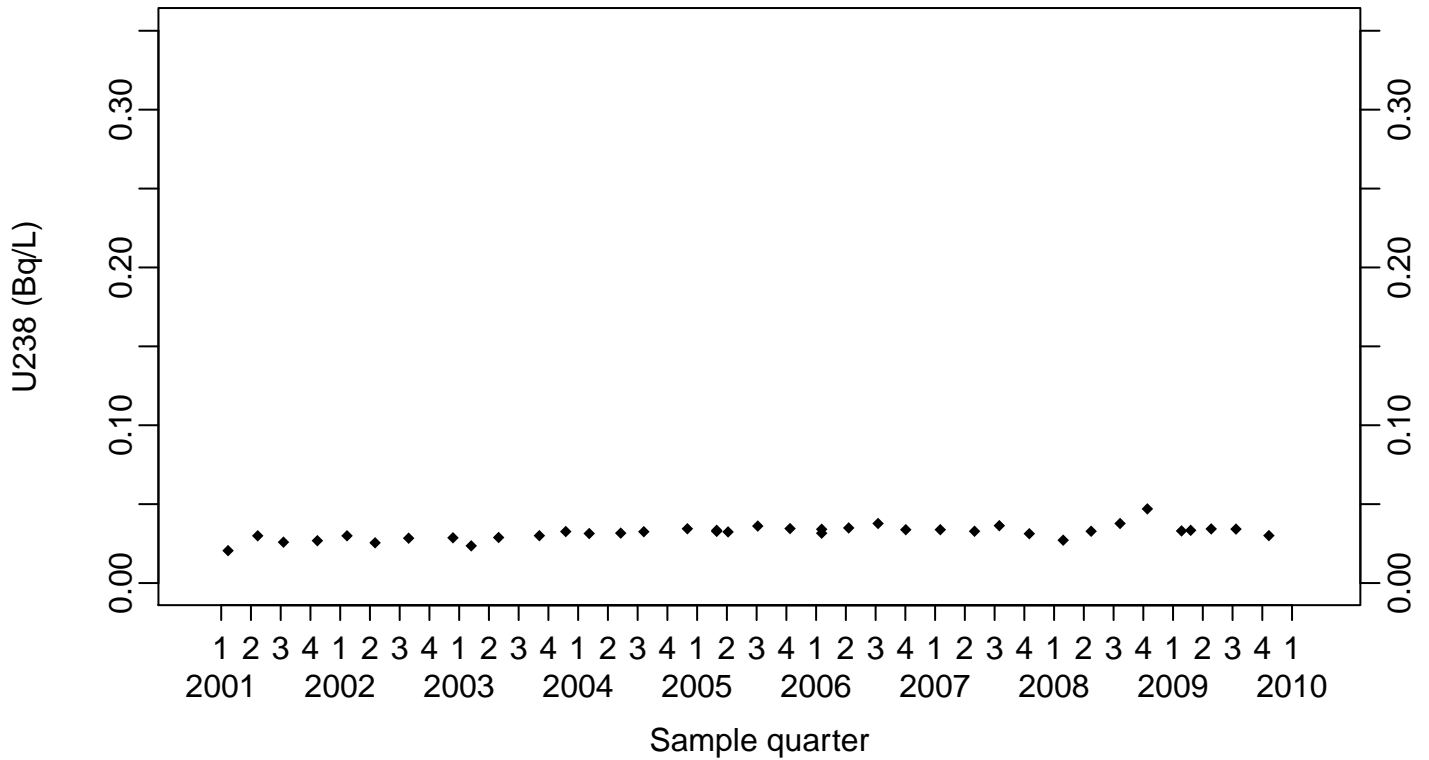
Pit 1 Area U238 (Bq/L)

Compliance Monitoring Point K1-06

◆ Above RL
▽ Below RL



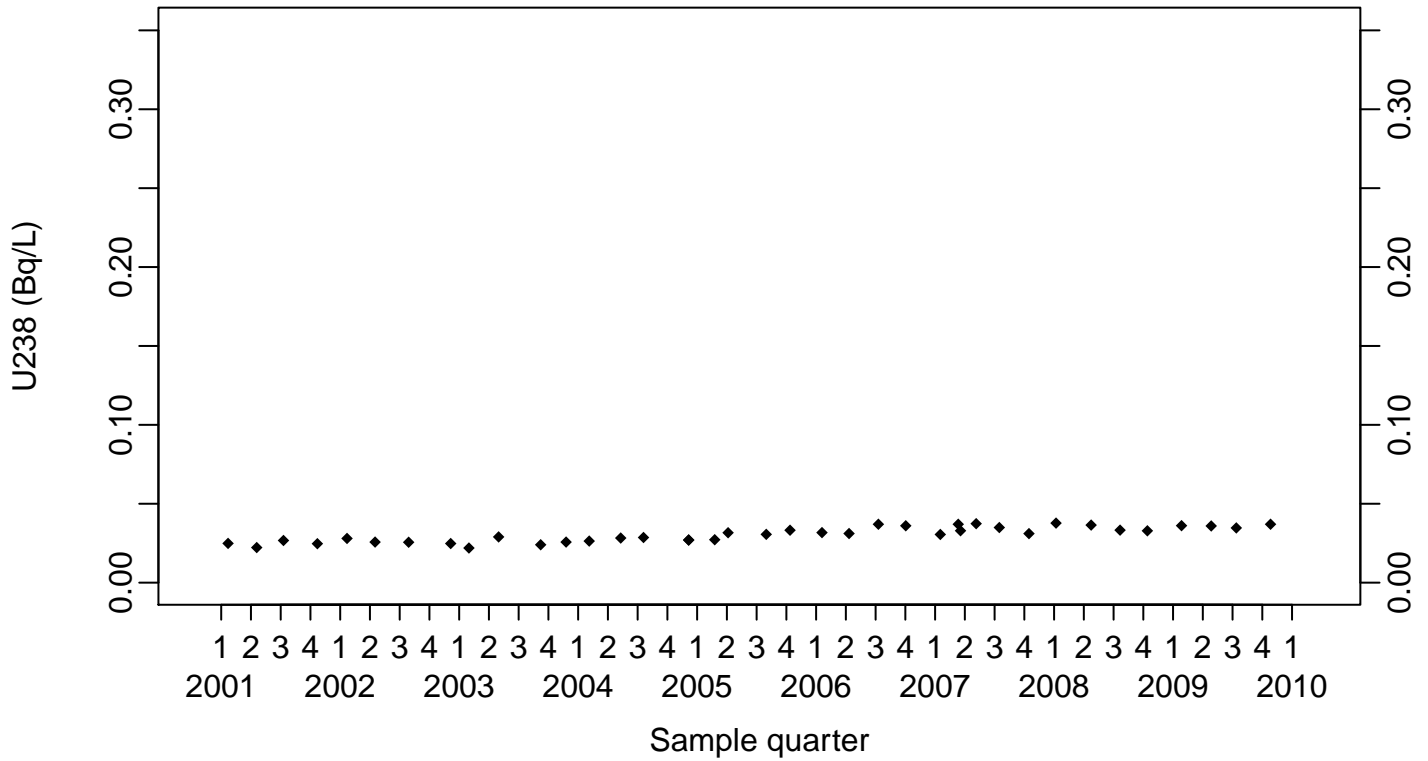
Compliance Monitoring Point K1-08



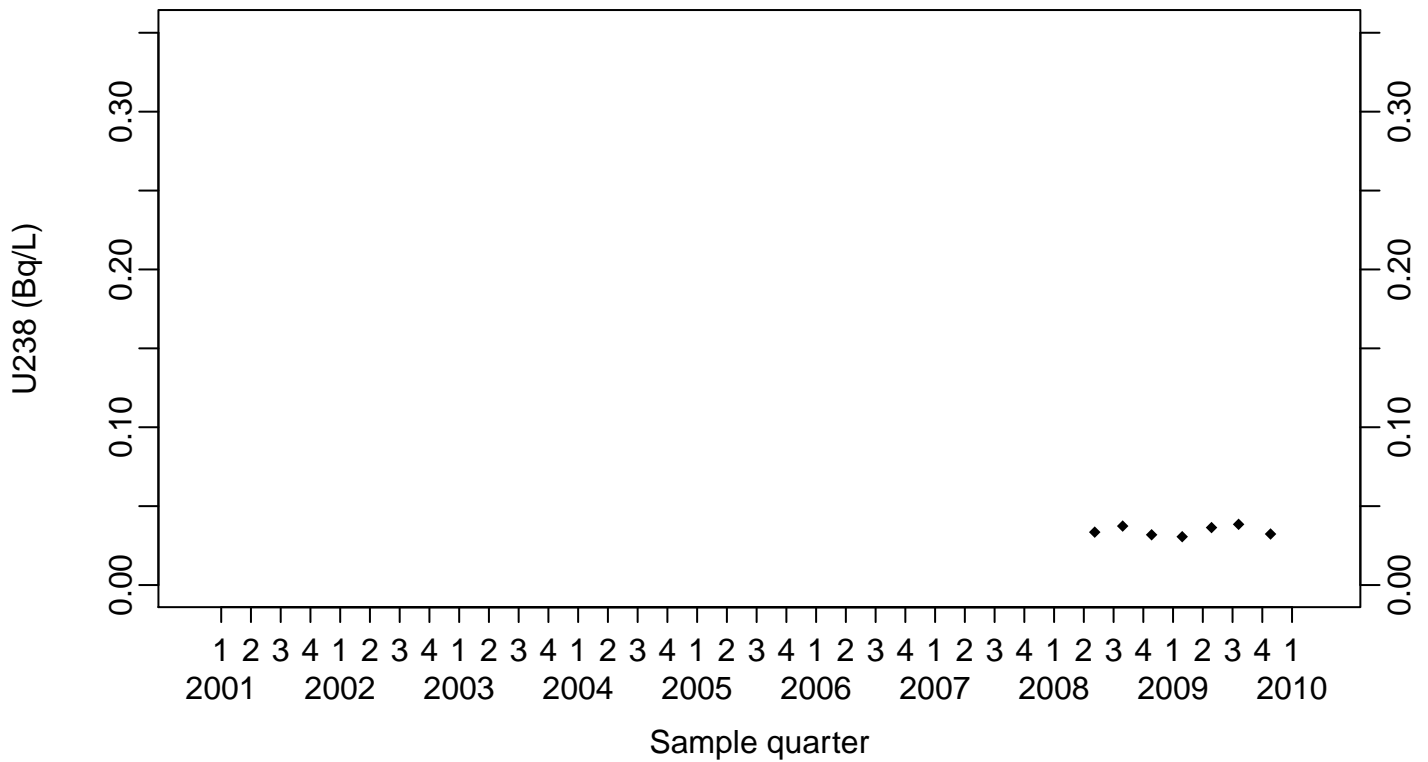
Pit 1 Area
U238 (Bq/L)

Compliance Monitoring Point K1-09

◆ Above RL
▽ Below RL



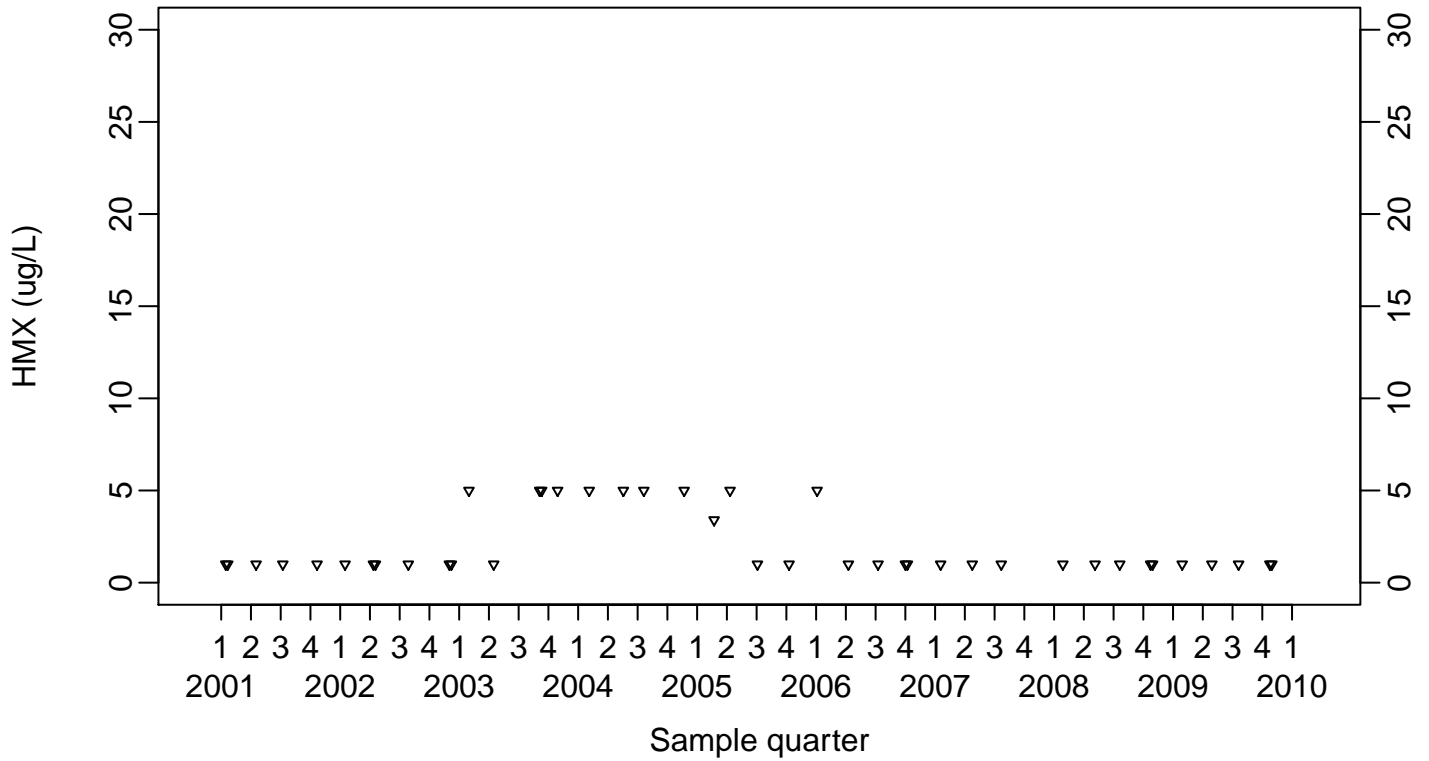
Compliance Monitoring Point W-PIT1-2326



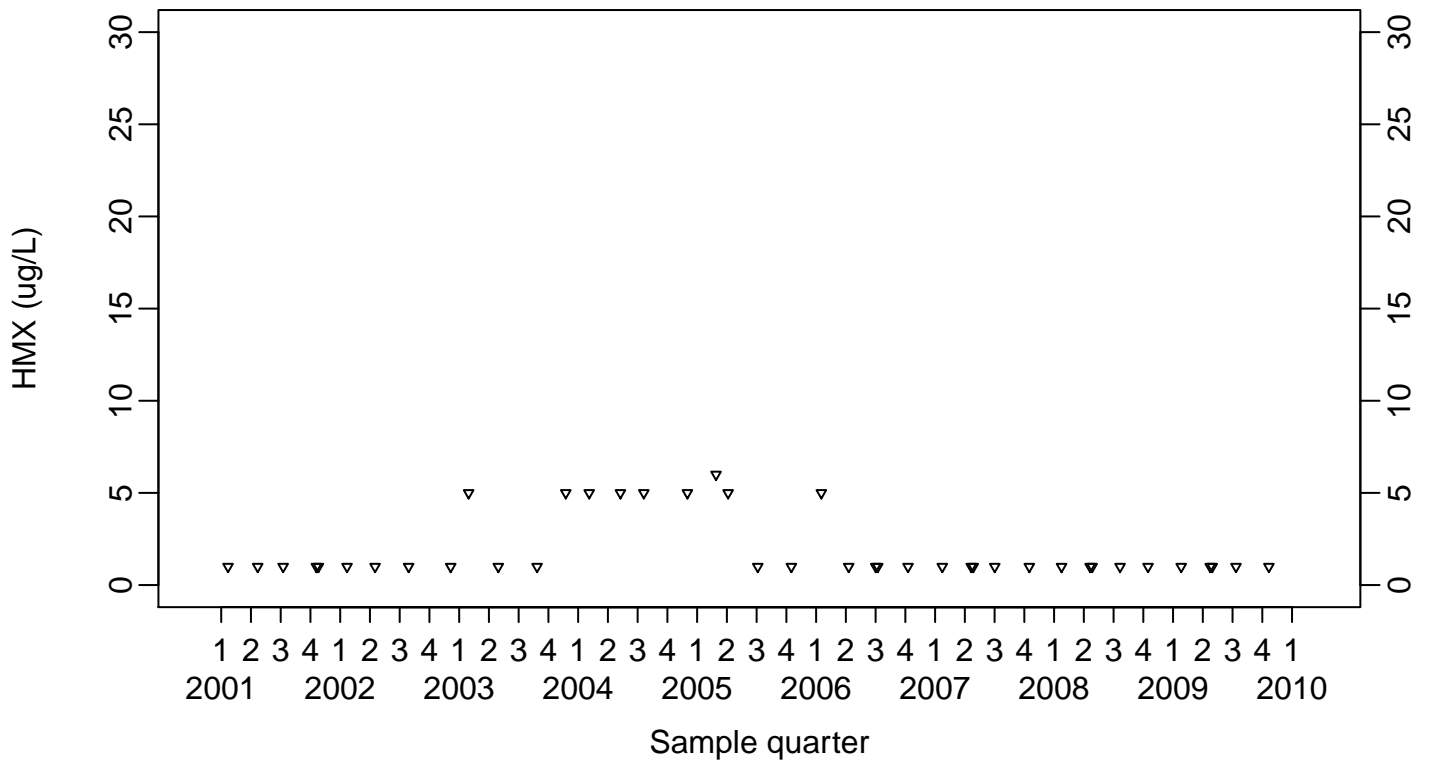
Pit 1 Area
HMX (ug/L)

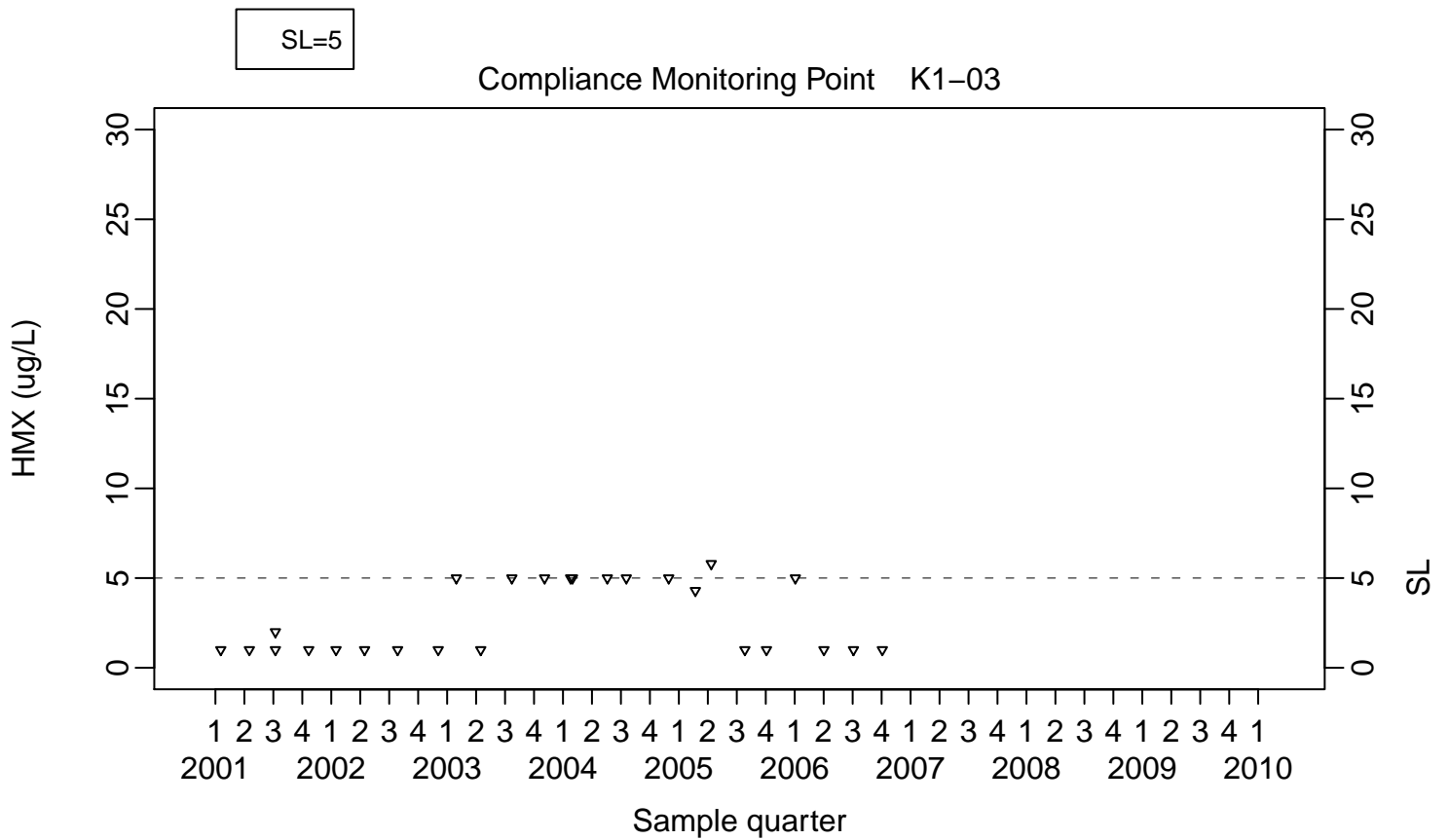
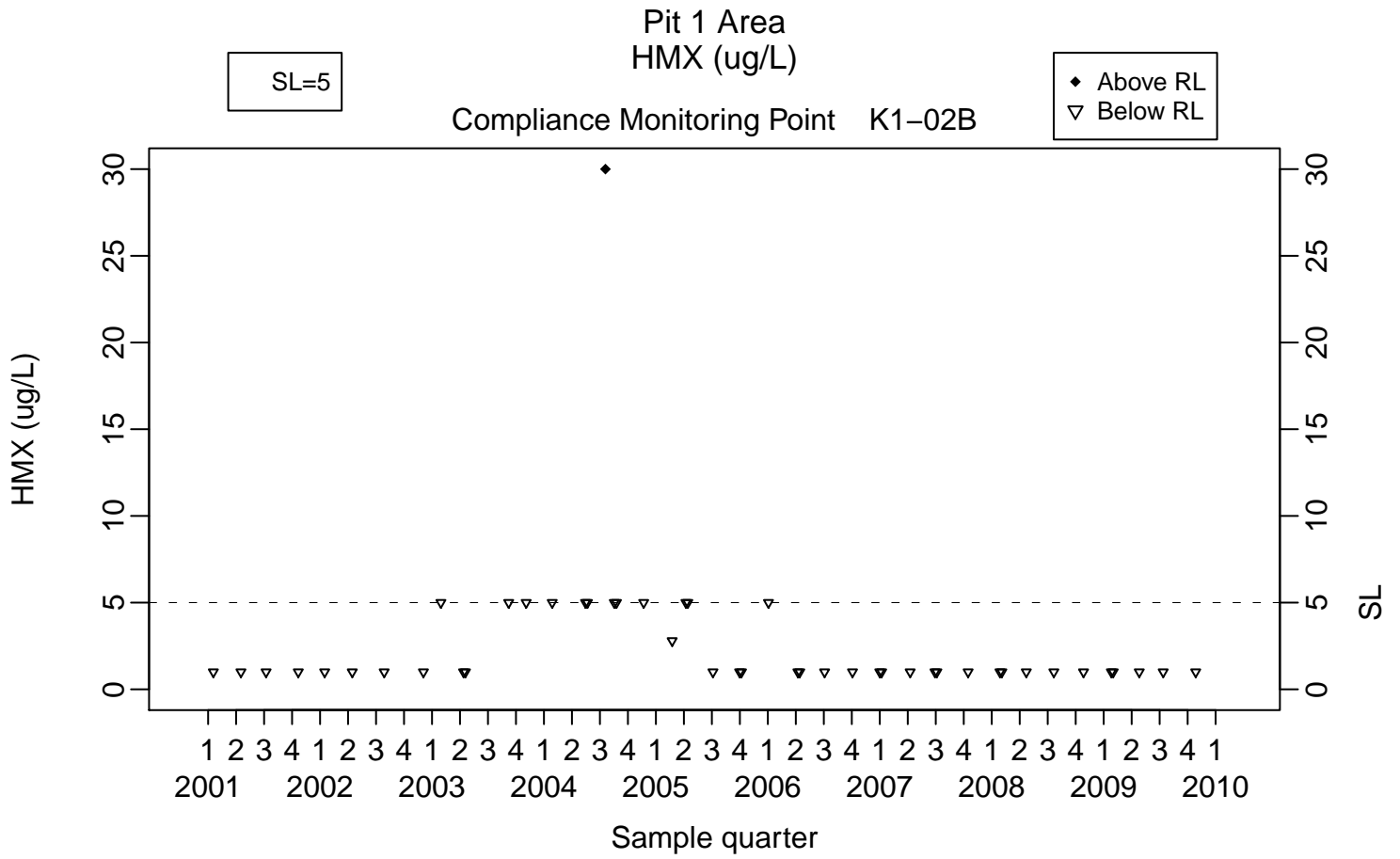
Background Monitoring Point K1-01C

◆ Above RL
▽ Below RL



Background Monitoring Point K1-07



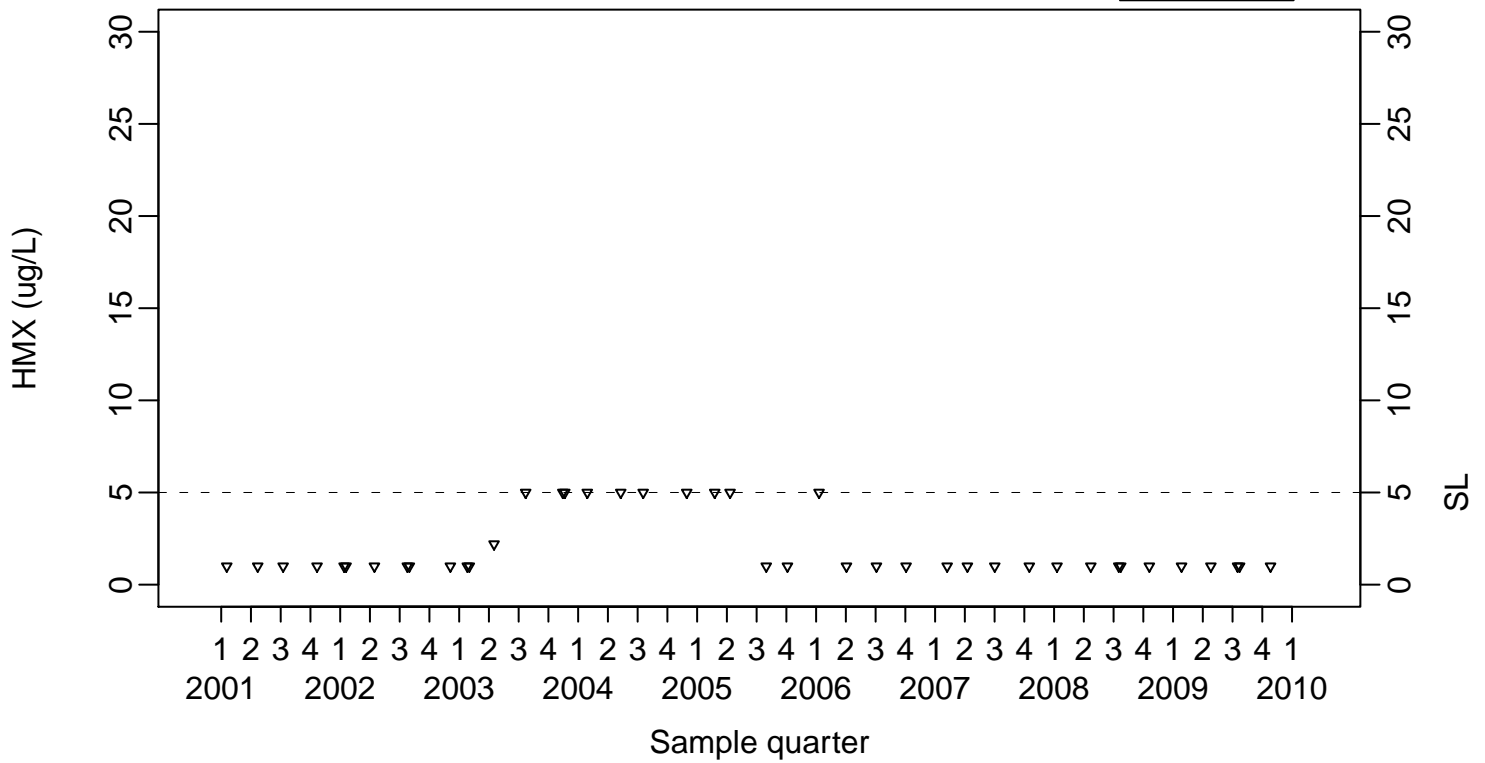


Pit 1 Area HMX (ug/L)

Compliance Monitoring Point K1-04

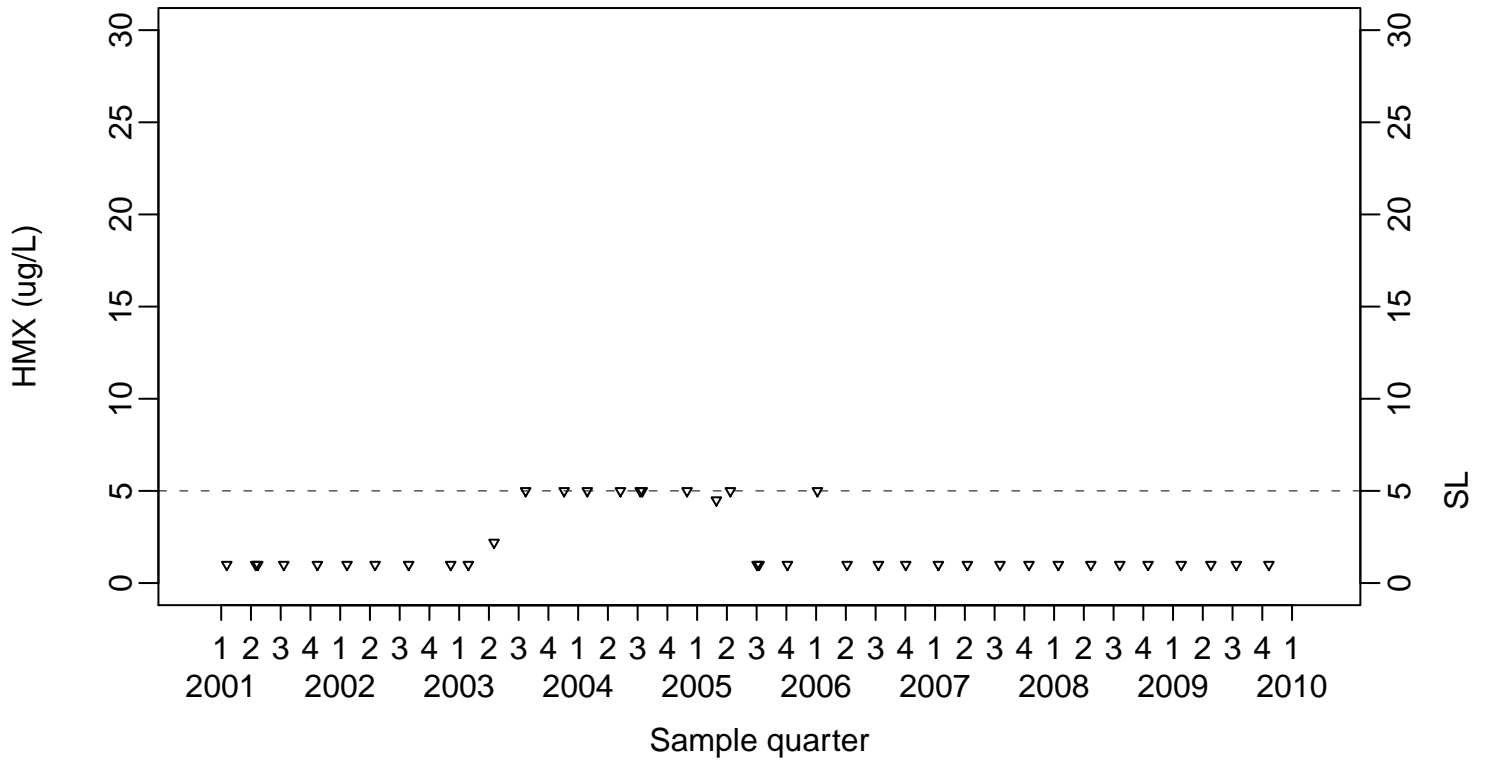
SL=5

◆ Above RL
▽ Below RL



Compliance Monitoring Point K1-05

SL=5

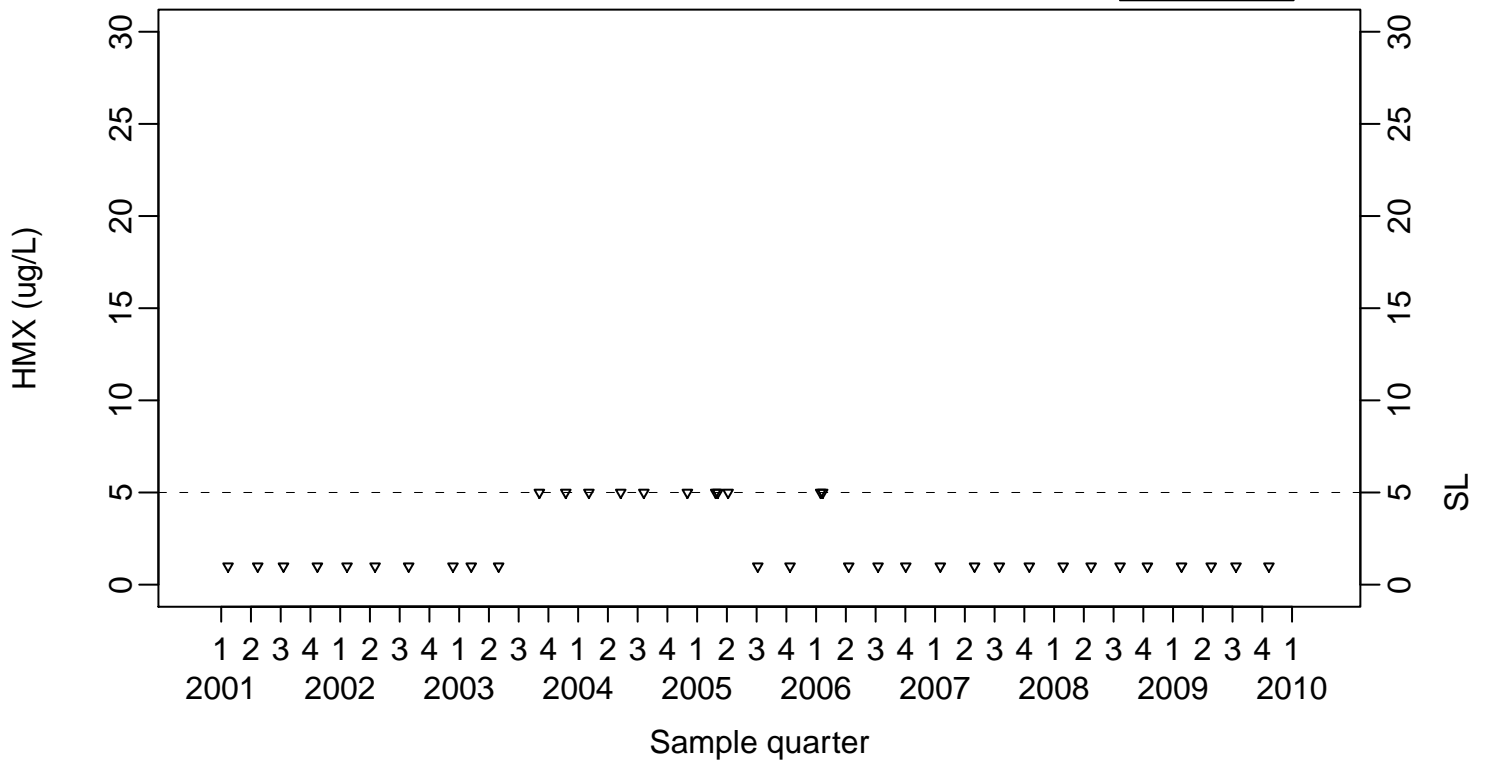


Pit 1 Area HMX (ug/L)

Compliance Monitoring Point K1-08

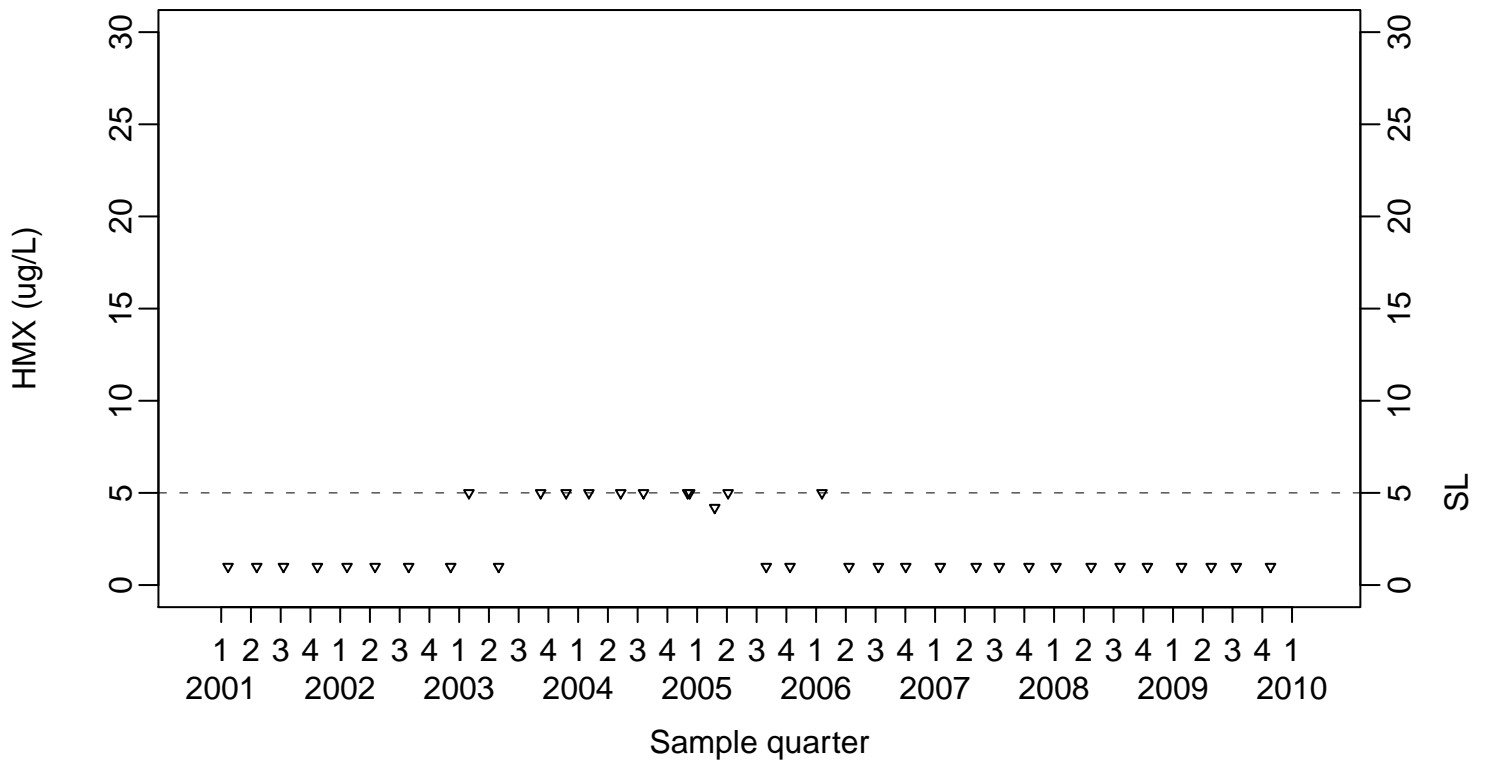
SL=5

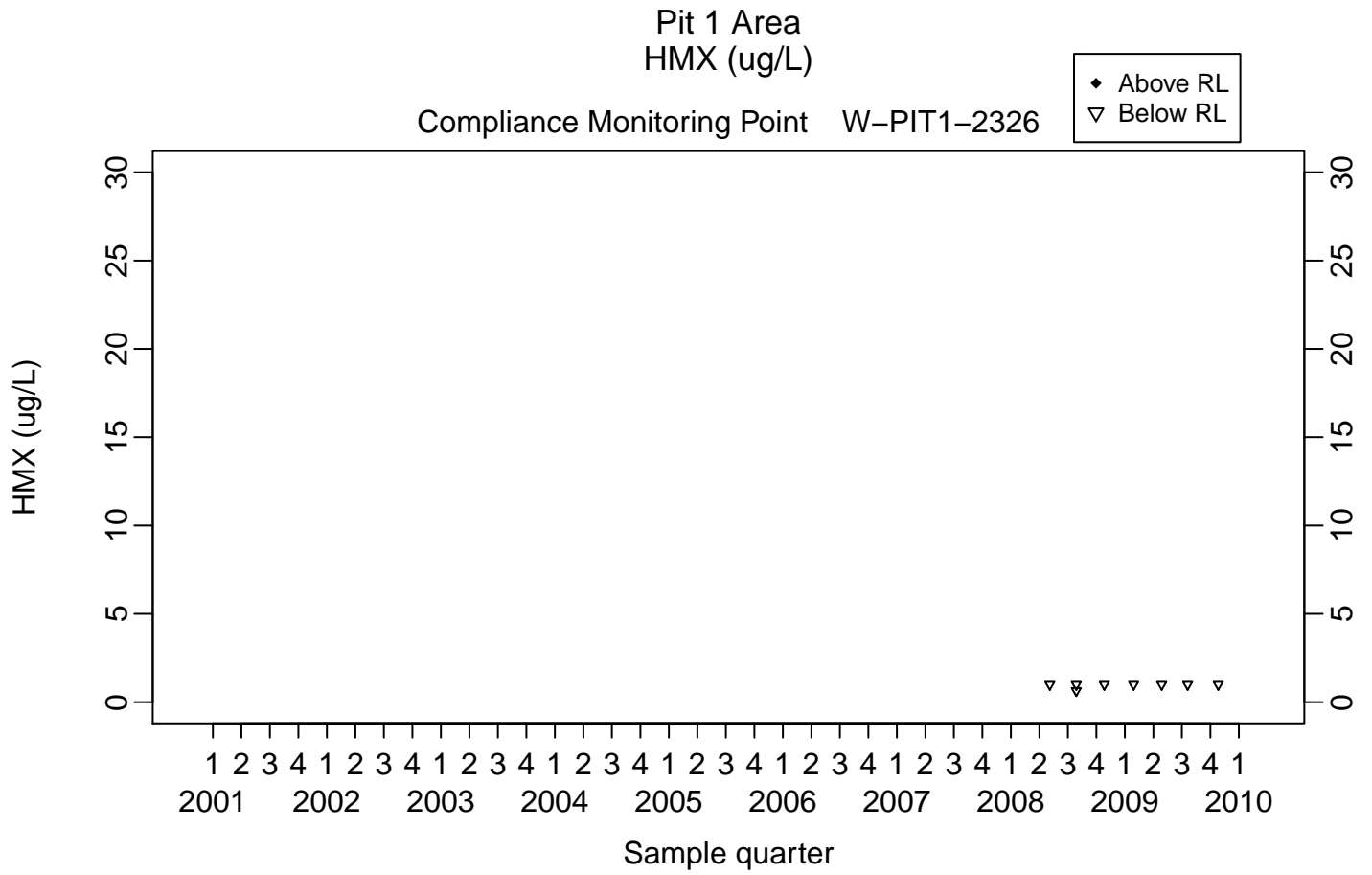
◆ Above RL
▽ Below RL



SL=5

Compliance Monitoring Point K1-09

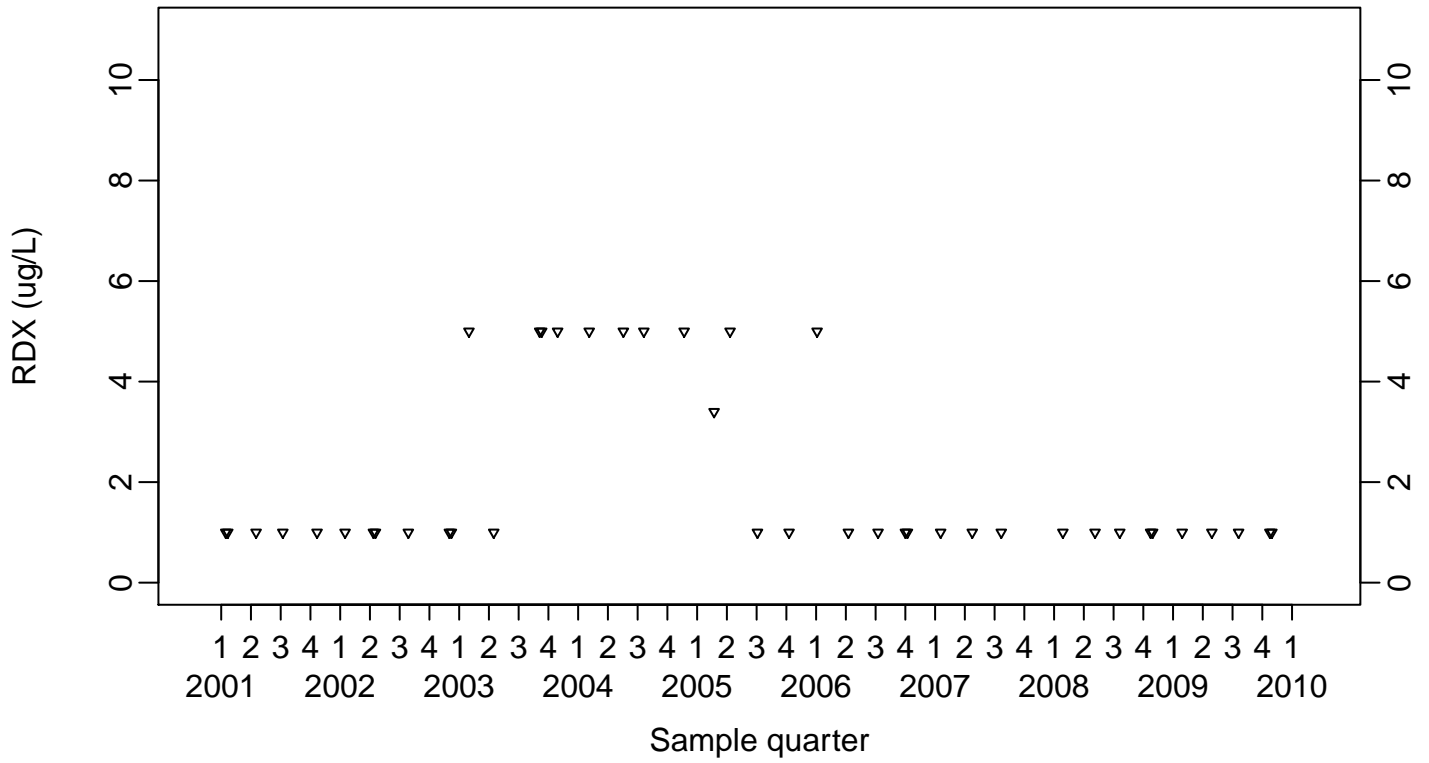




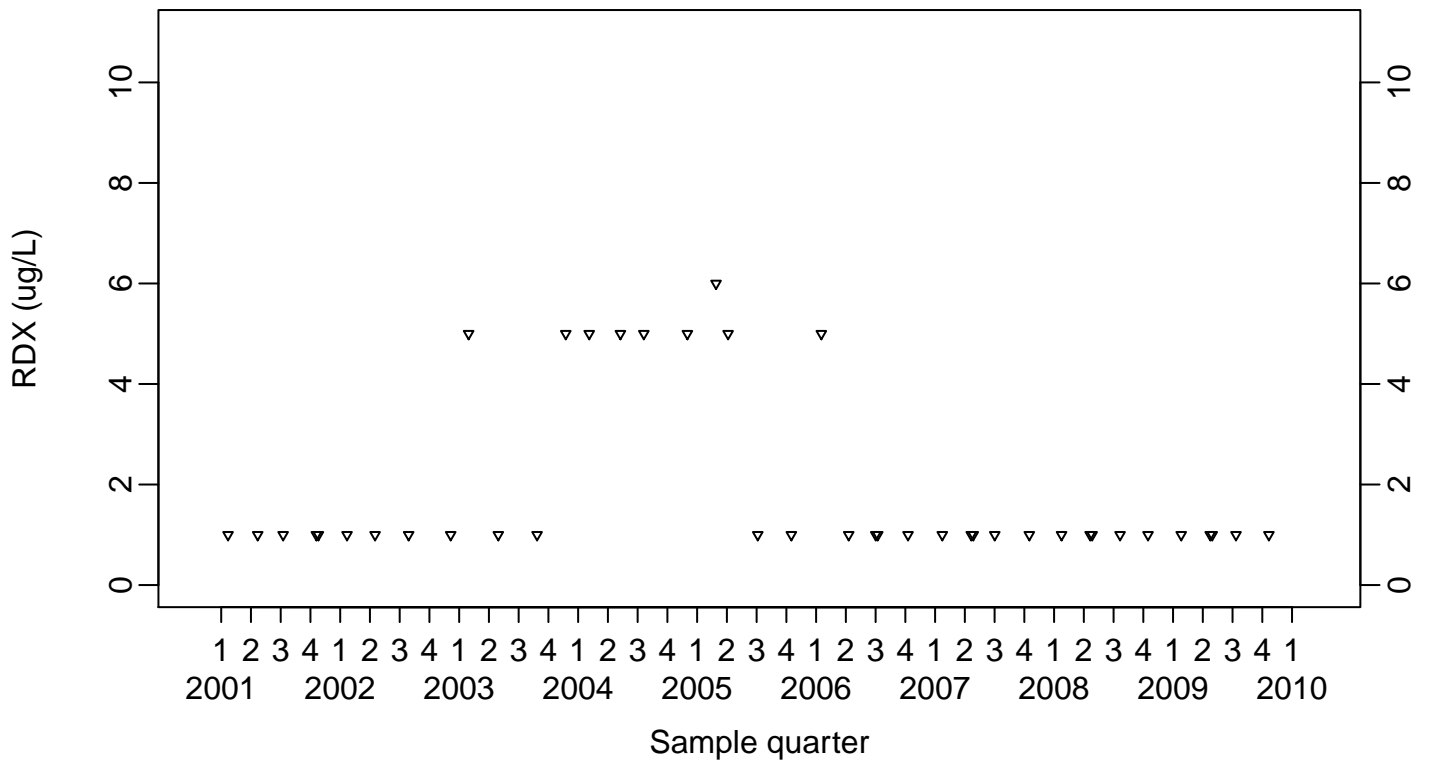
Pit 1 Area RDX (ug/L)

Background Monitoring Point K1-01C

◆ Above RL
▽ Below RL



Background Monitoring Point K1-07

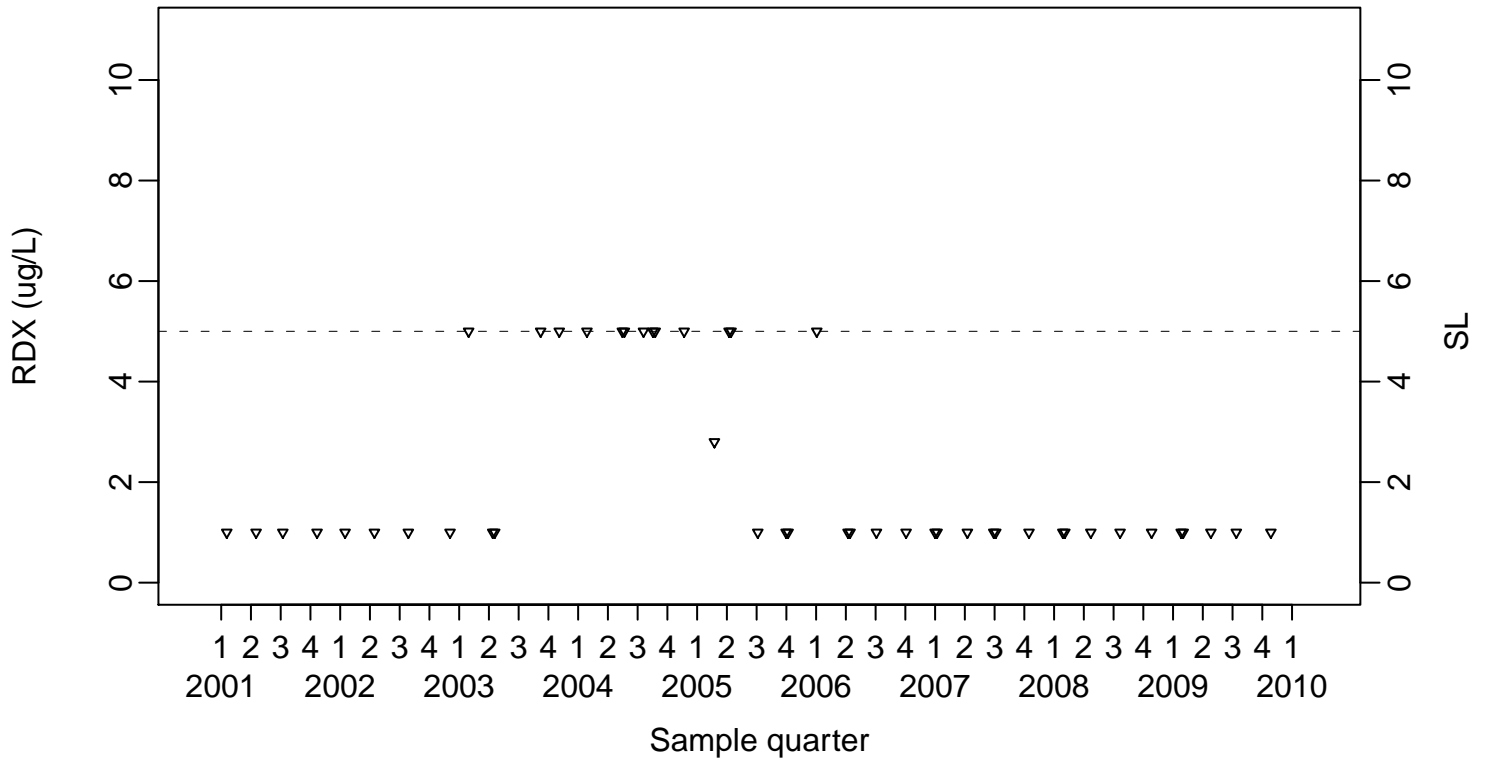


Pit 1 Area RDX (ug/L)

Compliance Monitoring Point K1-02B

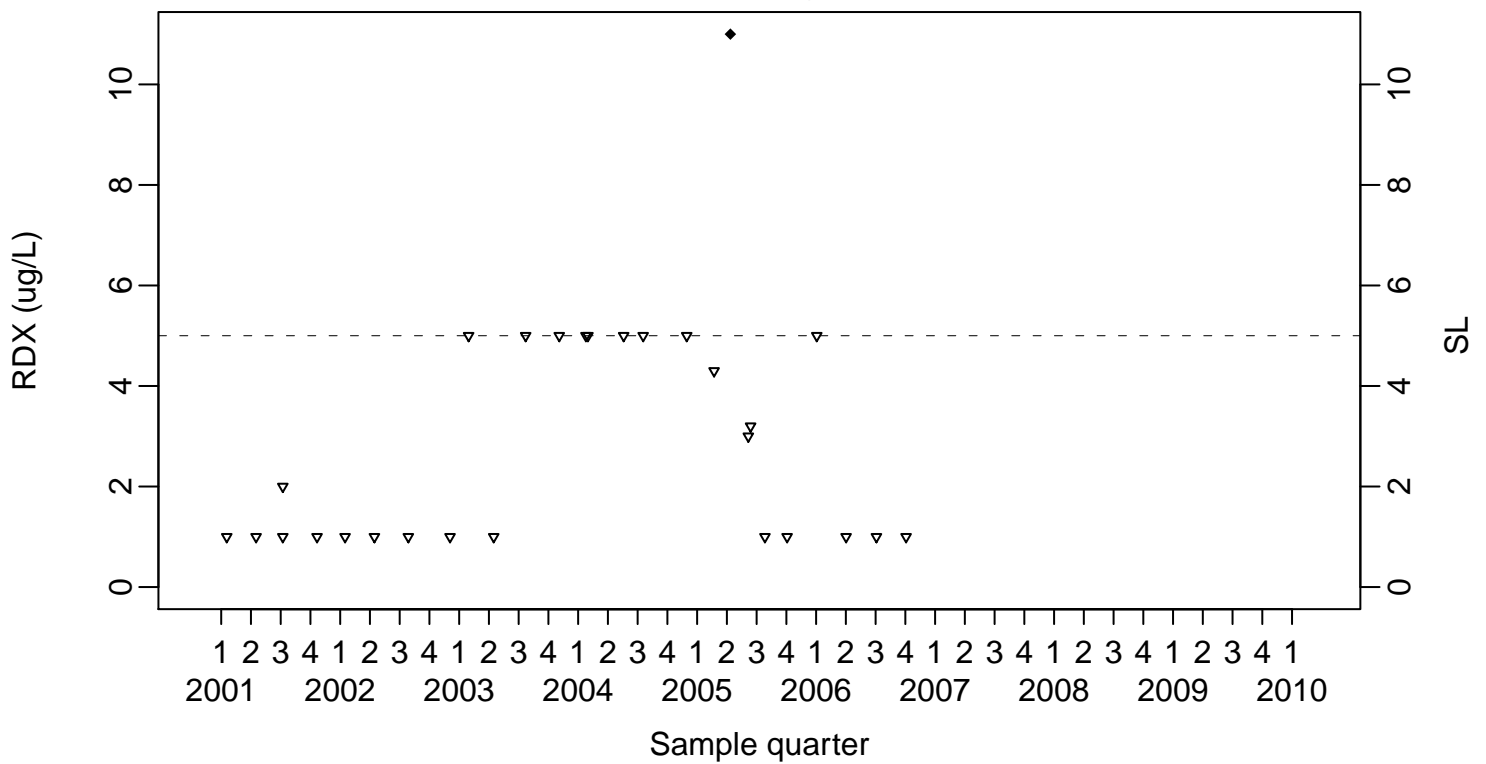
SL=5

◆ Above RL
▽ Below RL



Compliance Monitoring Point K1-03

SL=5

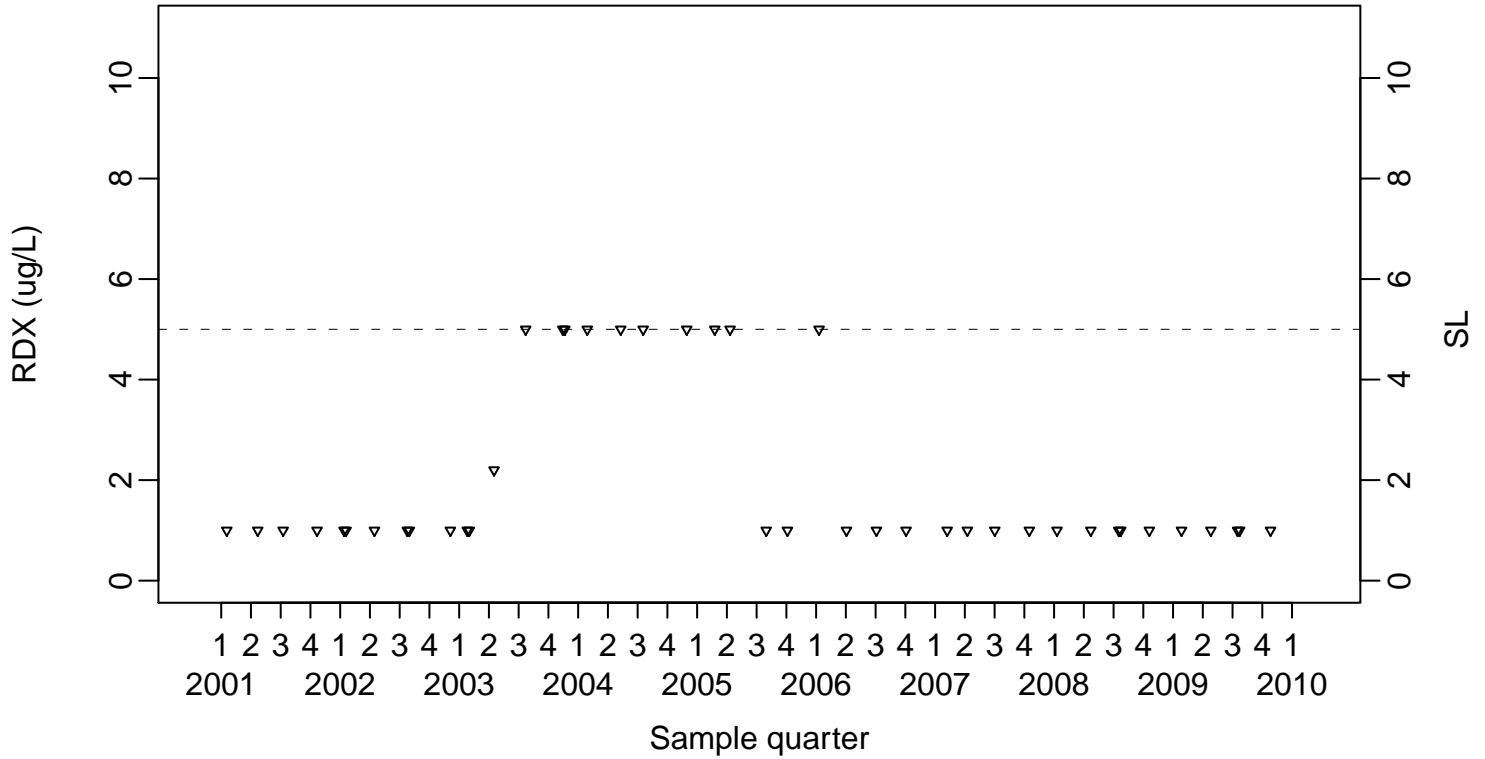


Pit 1 Area RDX (ug/L)

Compliance Monitoring Point K1-04

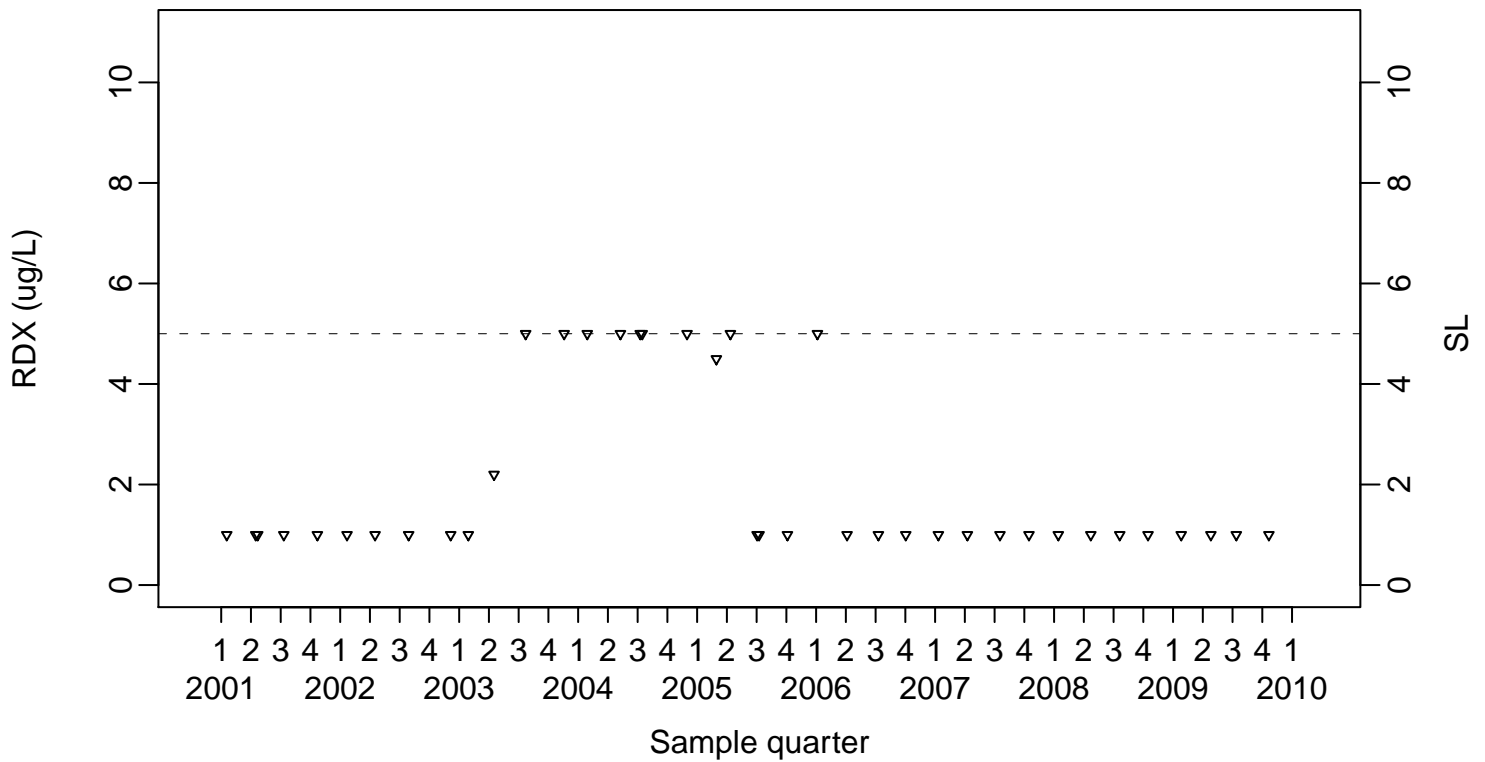
SL=5

◆ Above RL
▽ Below RL



Compliance Monitoring Point K1-05

SL=5

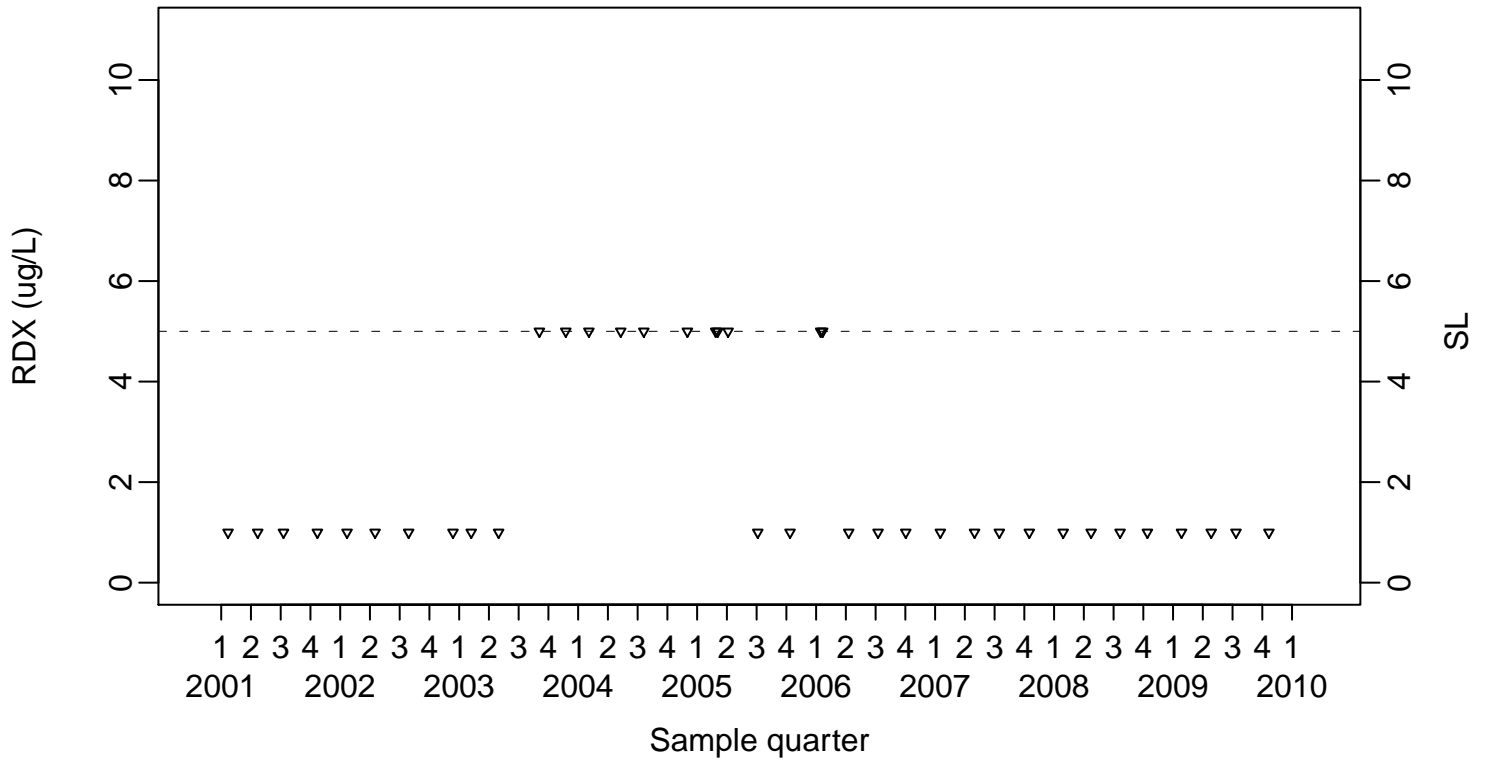


Pit 1 Area RDX (ug/L)

Compliance Monitoring Point K1-08

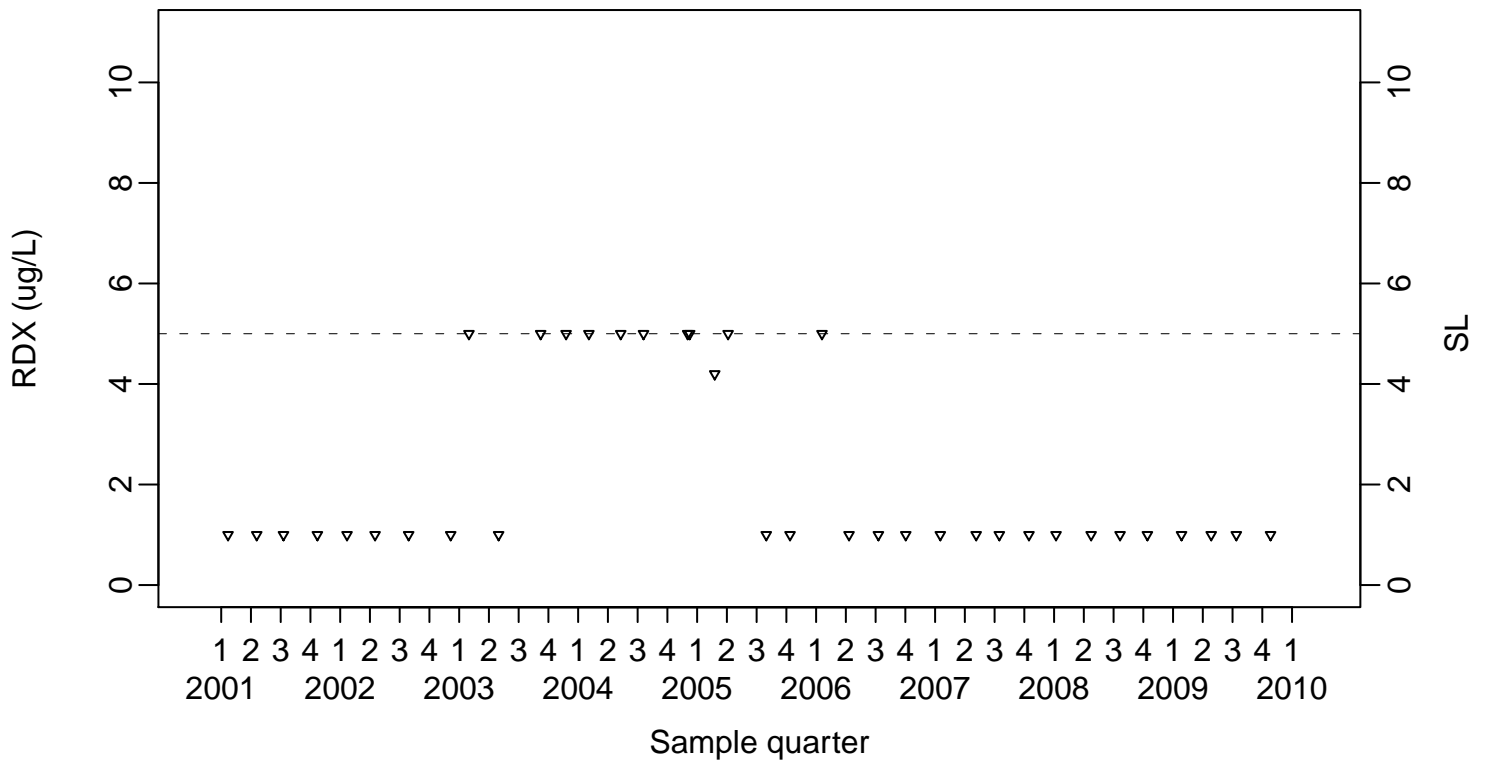
SL=5

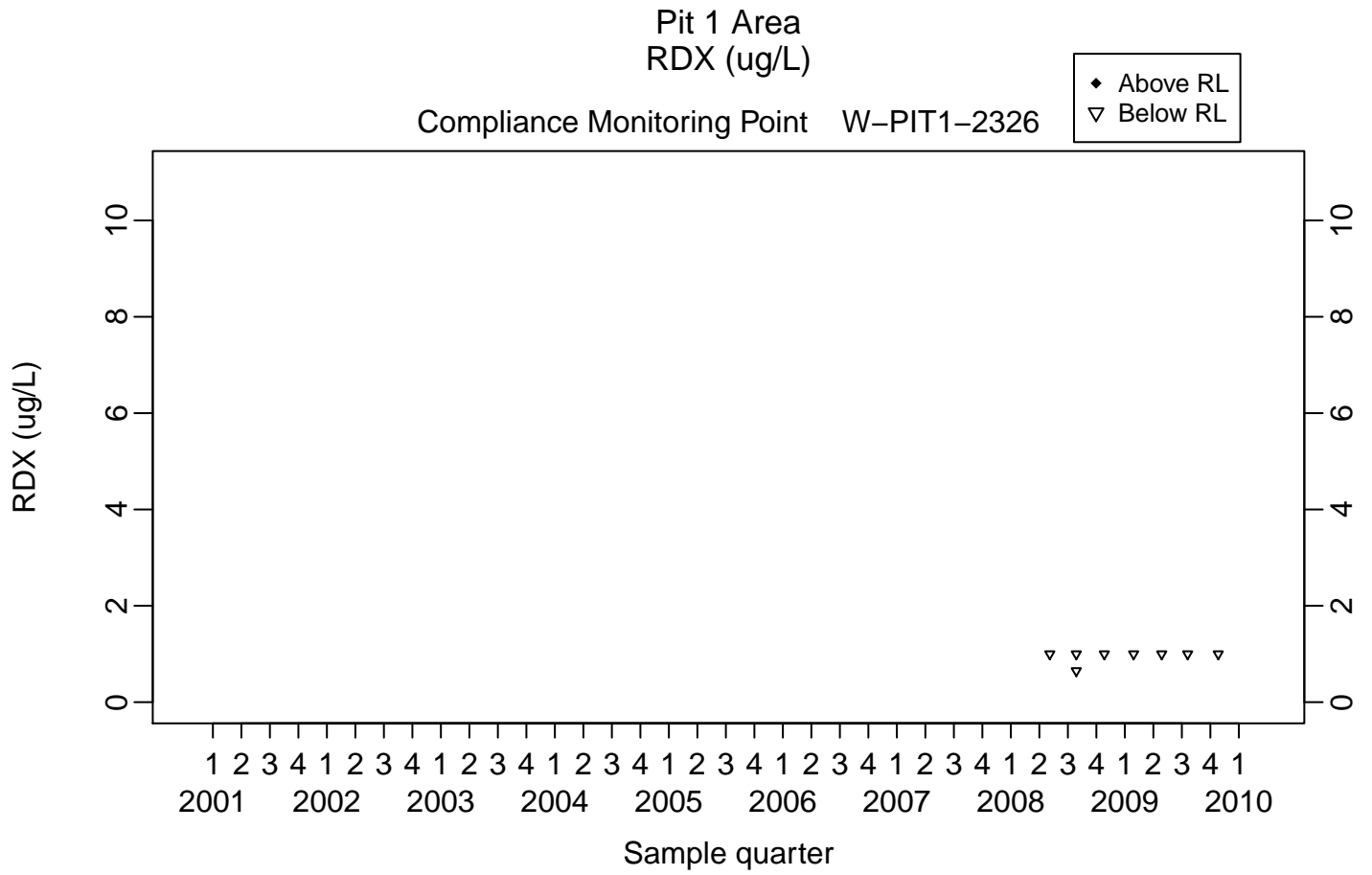
◆ Above RL
▽ Below RL



Compliance Monitoring Point K1-09

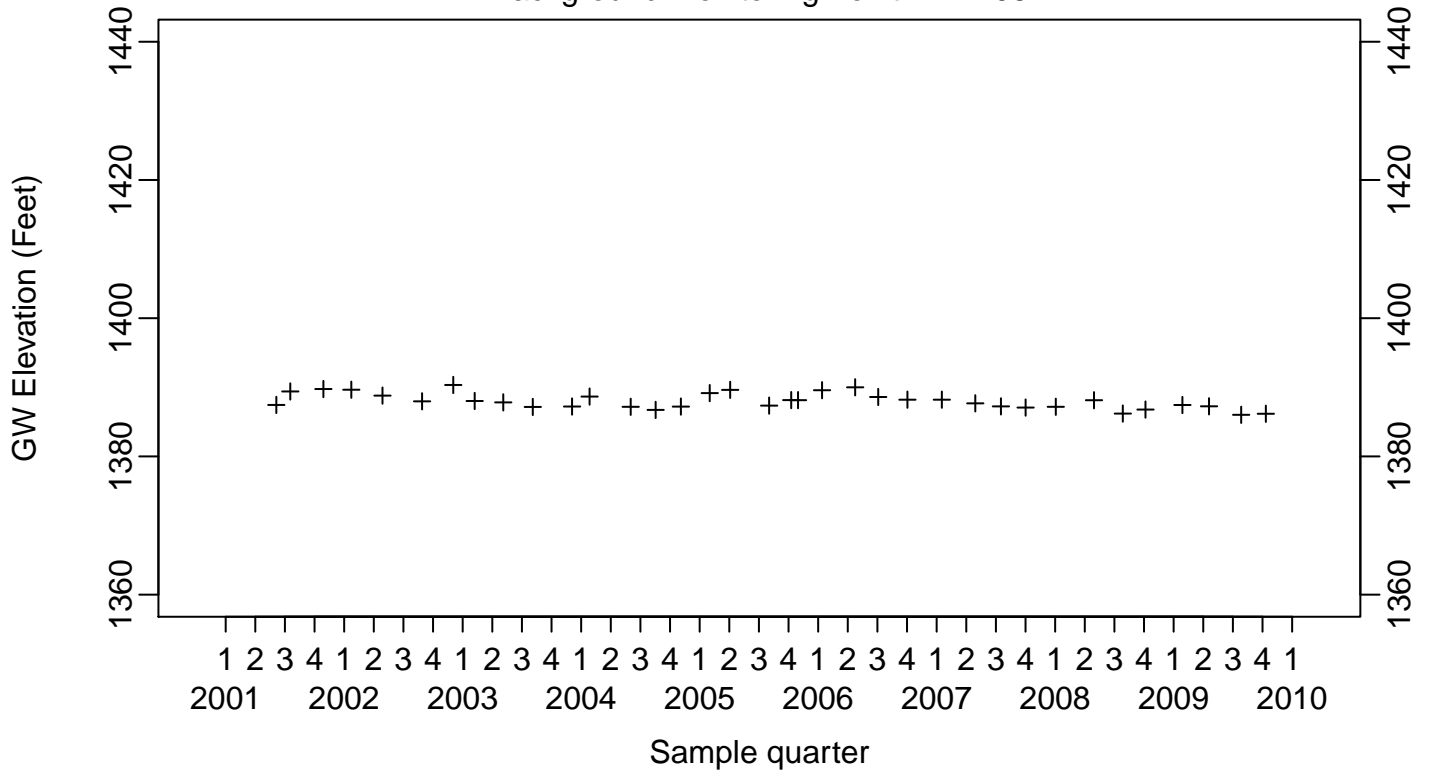
SL=5



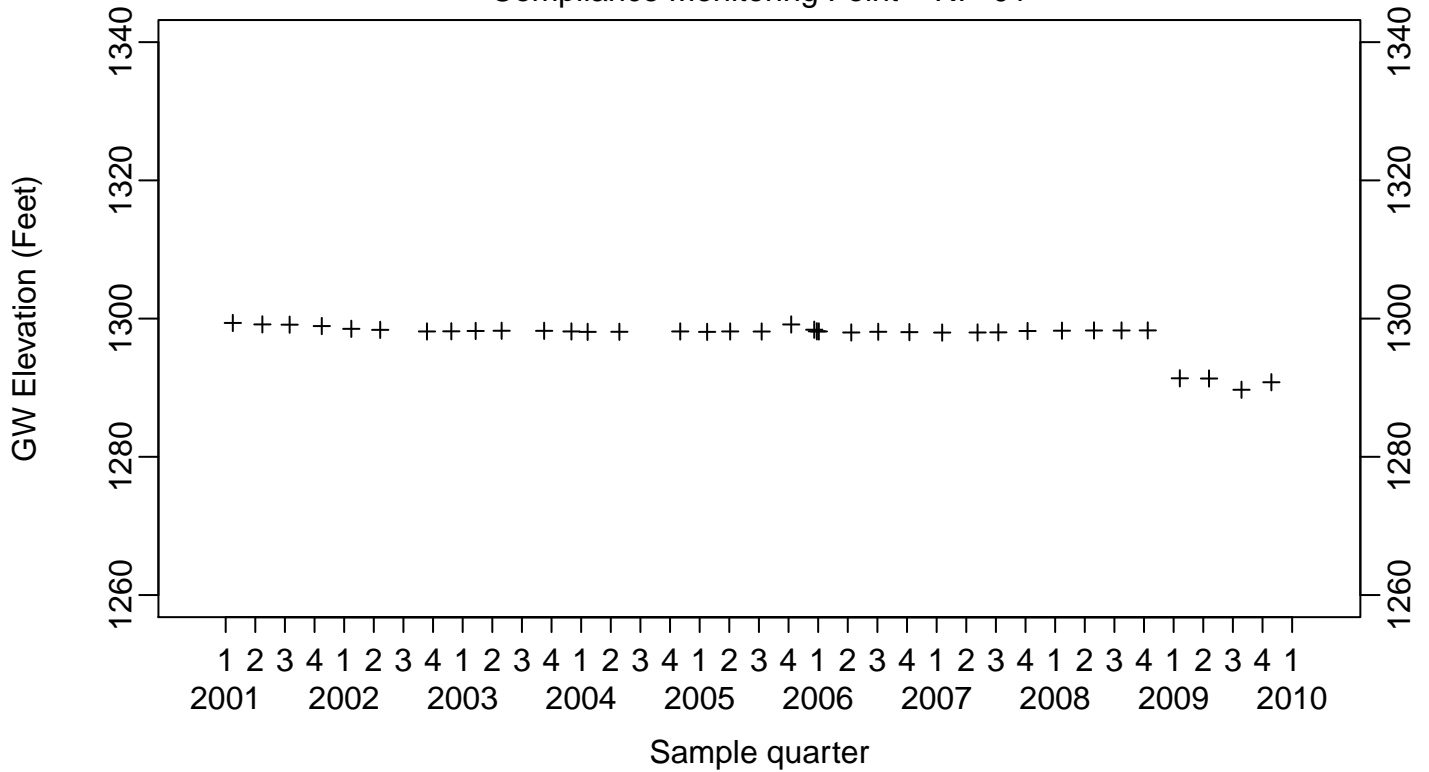


Pit 7 Complex GW Elevation (Feet)

Background Monitoring Point K7-06

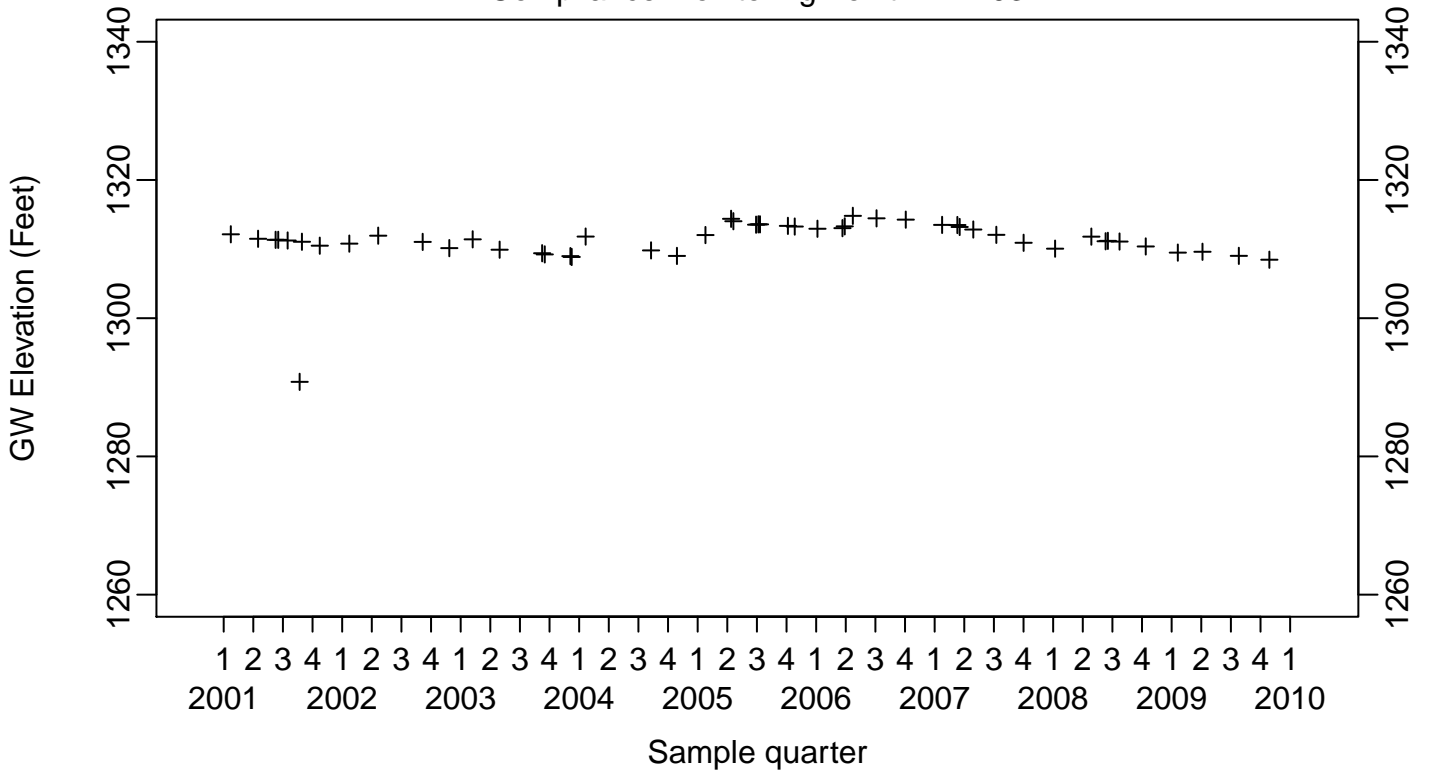


Compliance Monitoring Point K7-01

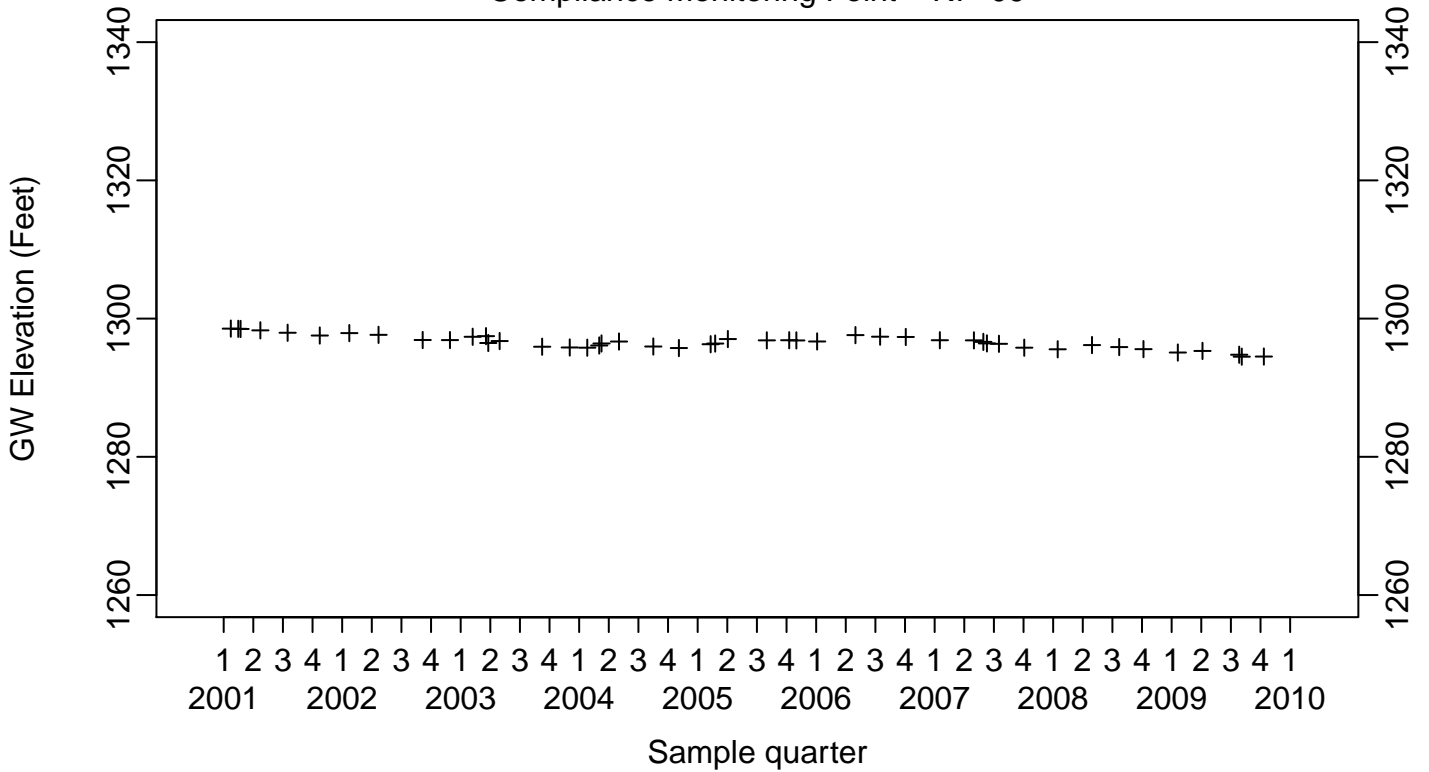


Pit 7 Complex GW Elevation (Feet)

Compliance Monitoring Point K7-03

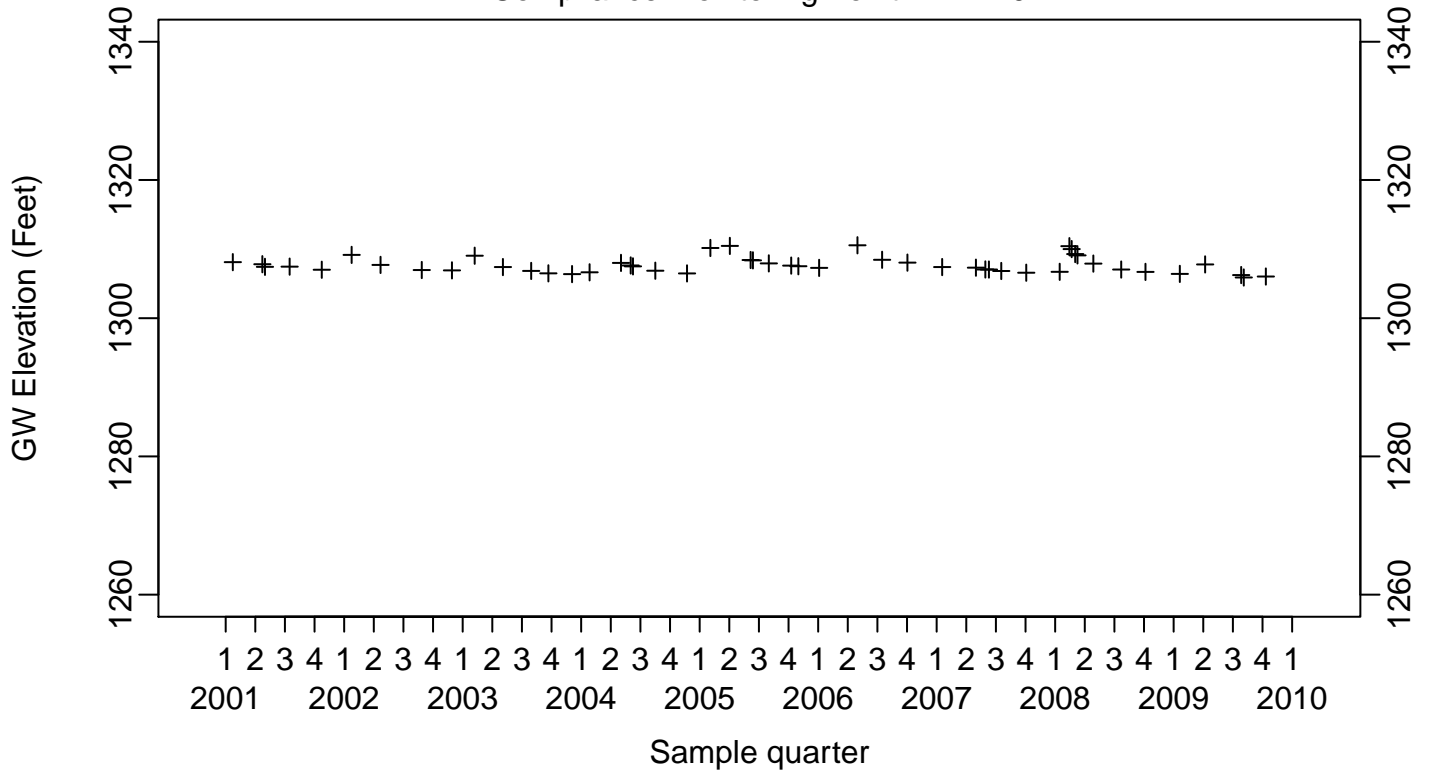


Compliance Monitoring Point K7-09

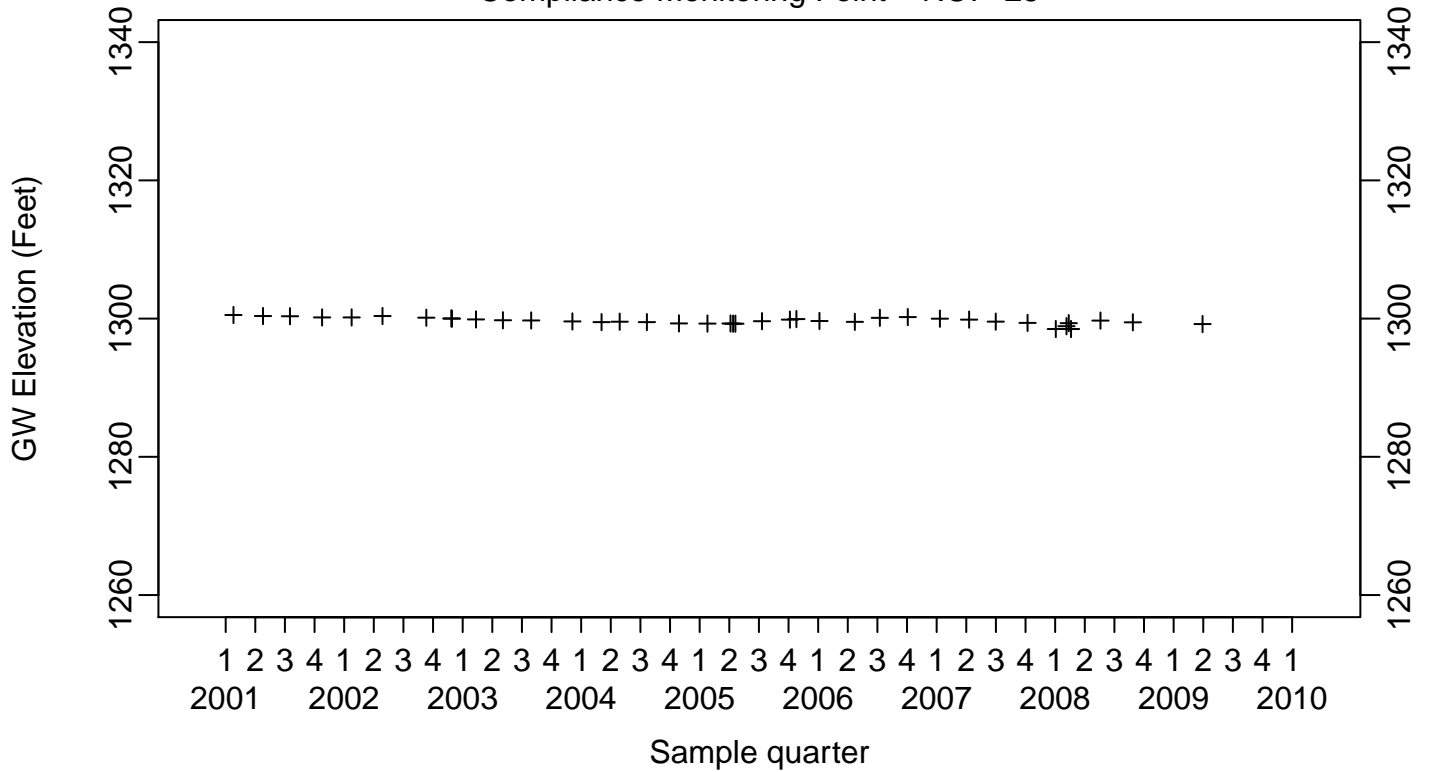


Pit 7 Complex
GW Elevation (Feet)

Compliance Monitoring Point K7-10

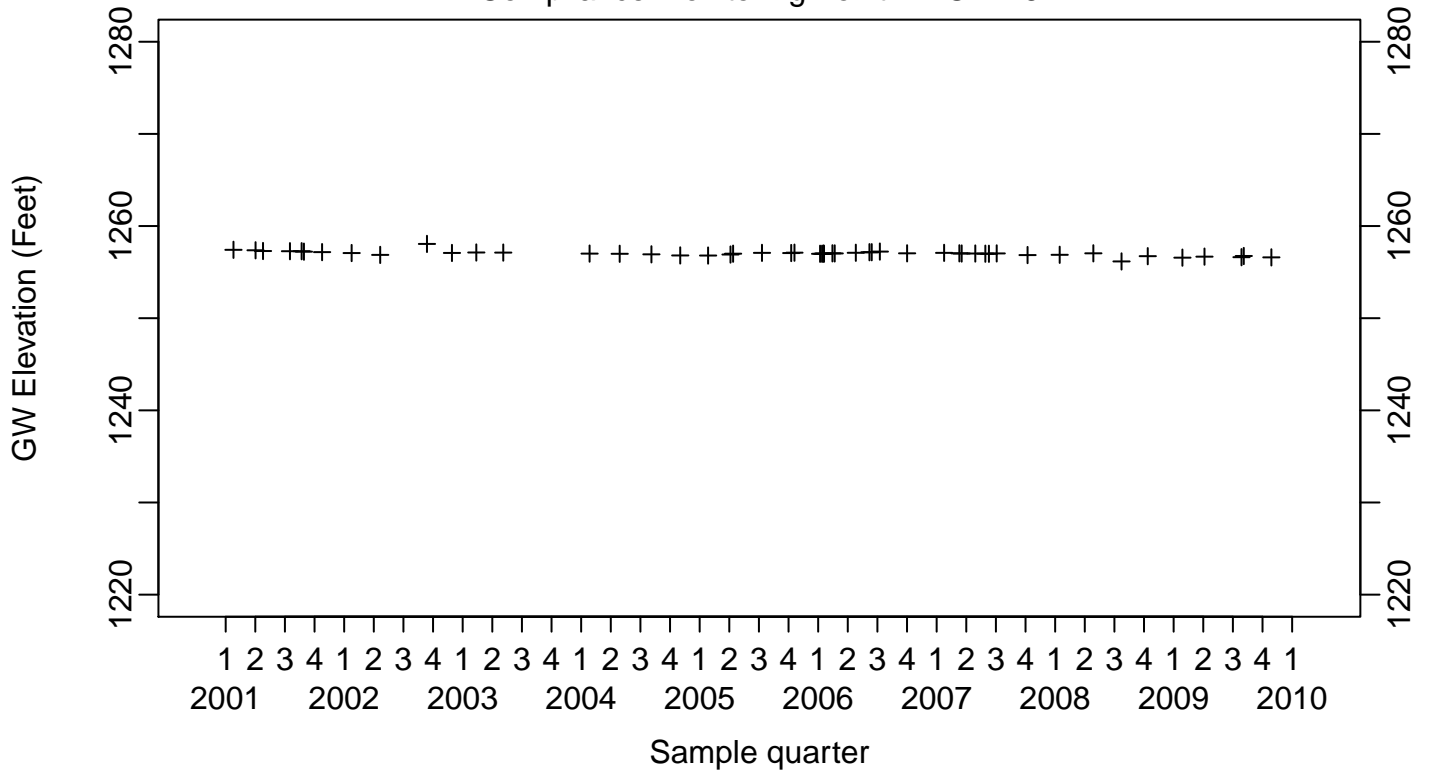


Compliance Monitoring Point NC7-25

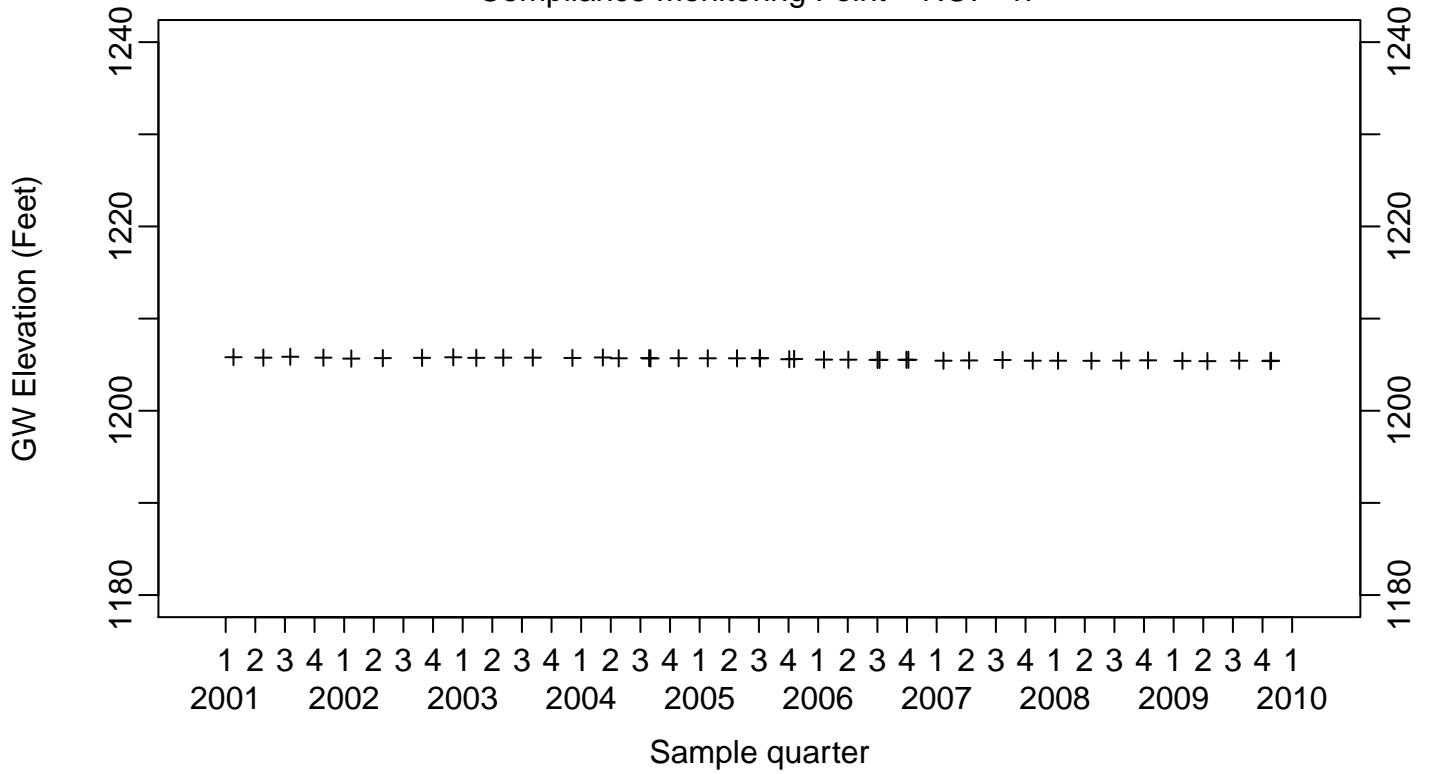


Pit 7 Complex GW Elevation (Feet)

Compliance Monitoring Point NC7-26

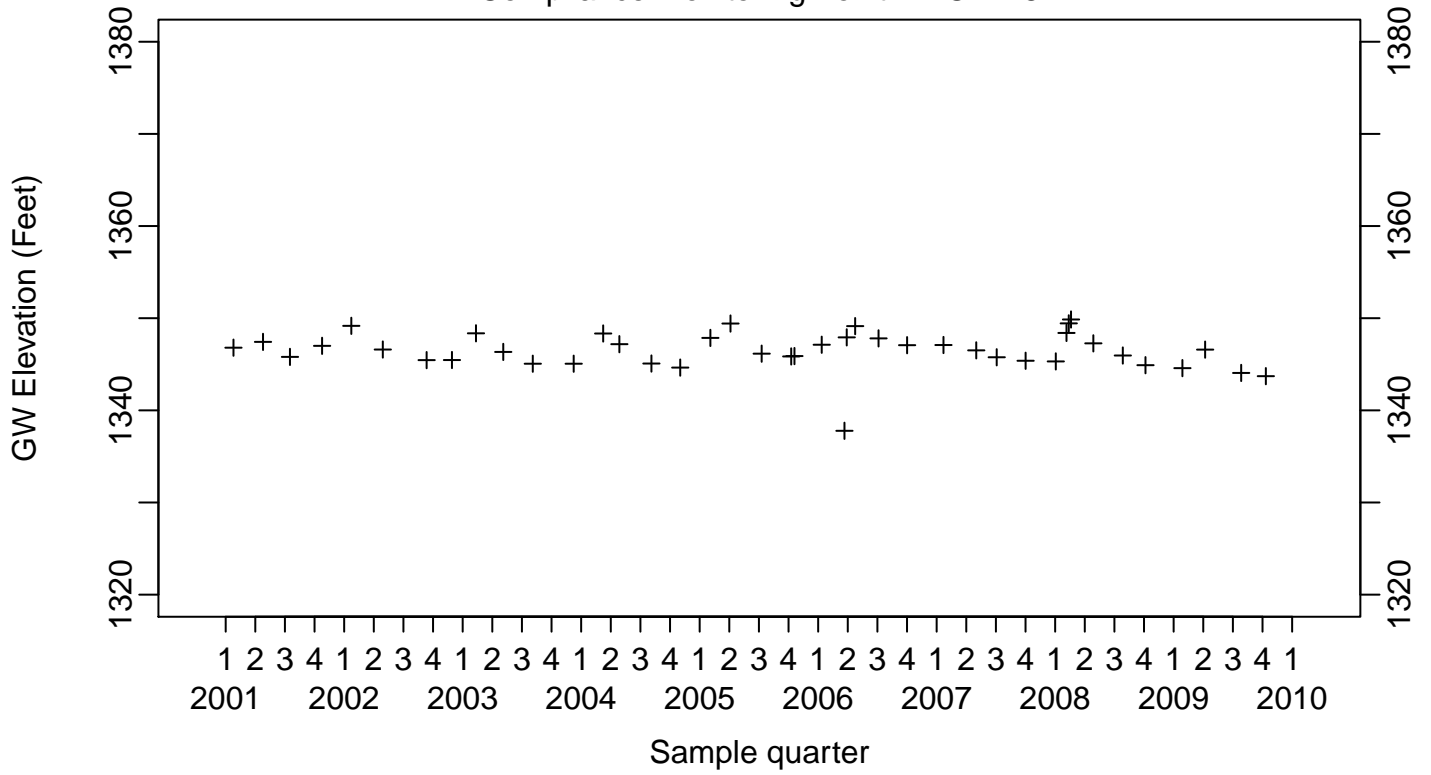


Compliance Monitoring Point NC7-47



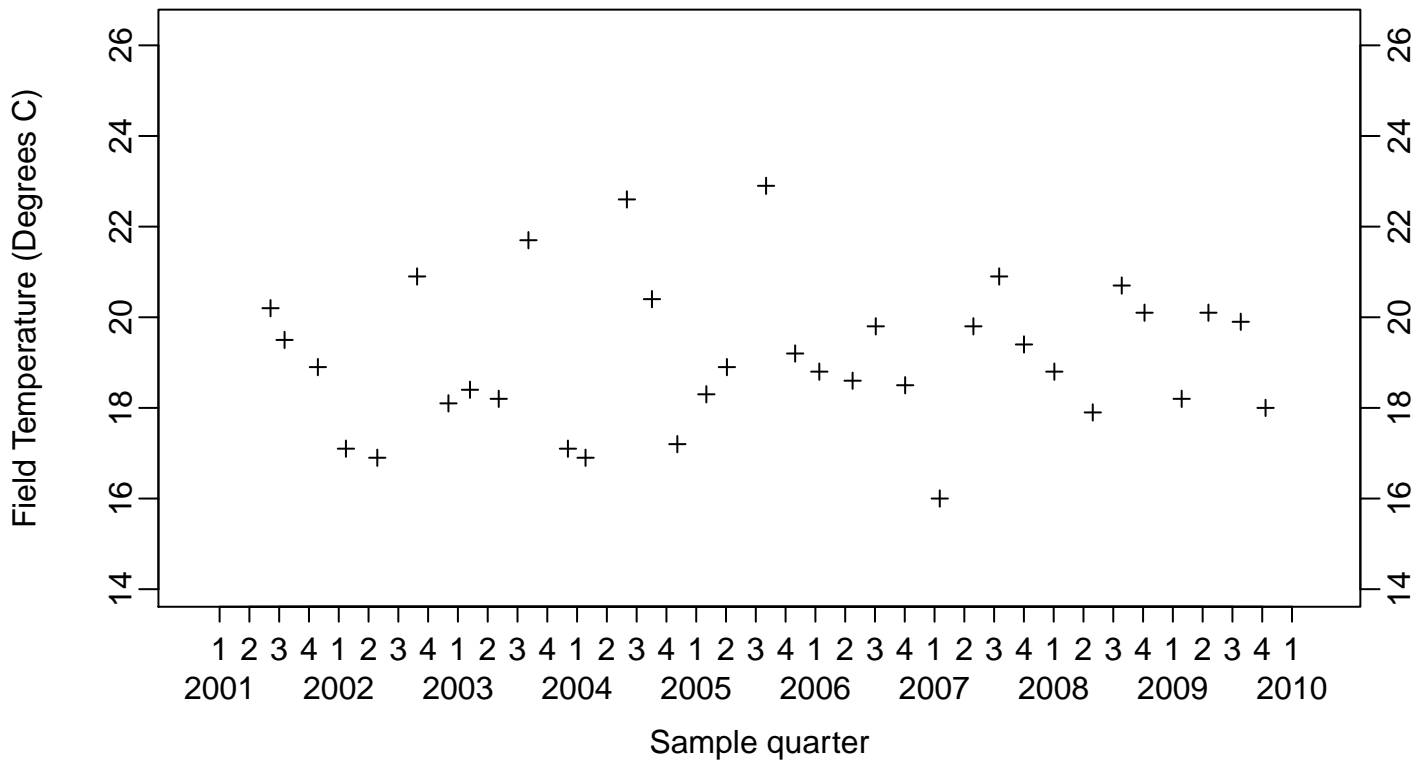
Pit 7 Complex GW Elevation (Feet)

Compliance Monitoring Point NC7-48

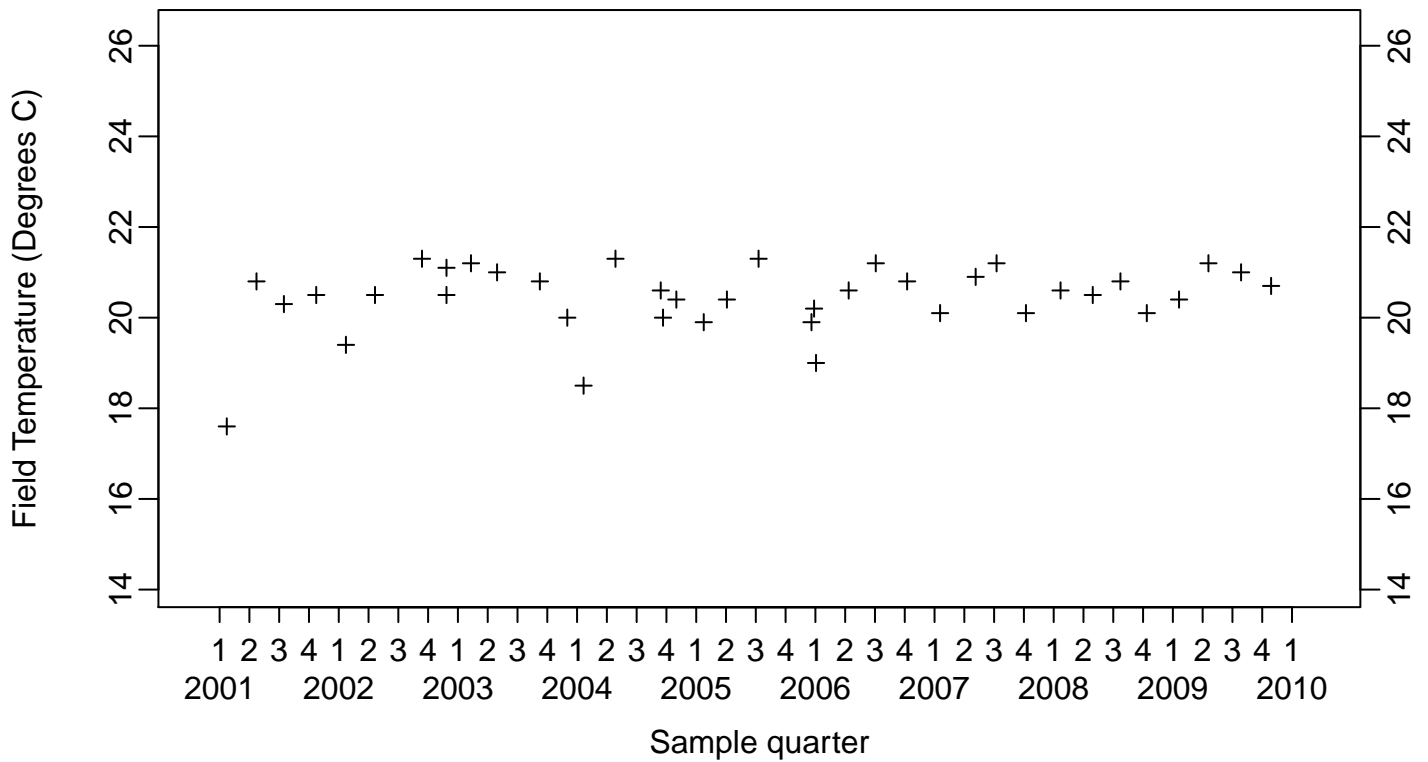


Pit 7 Complex Field Temperature (Degrees C)

Background Monitoring Point K7-06

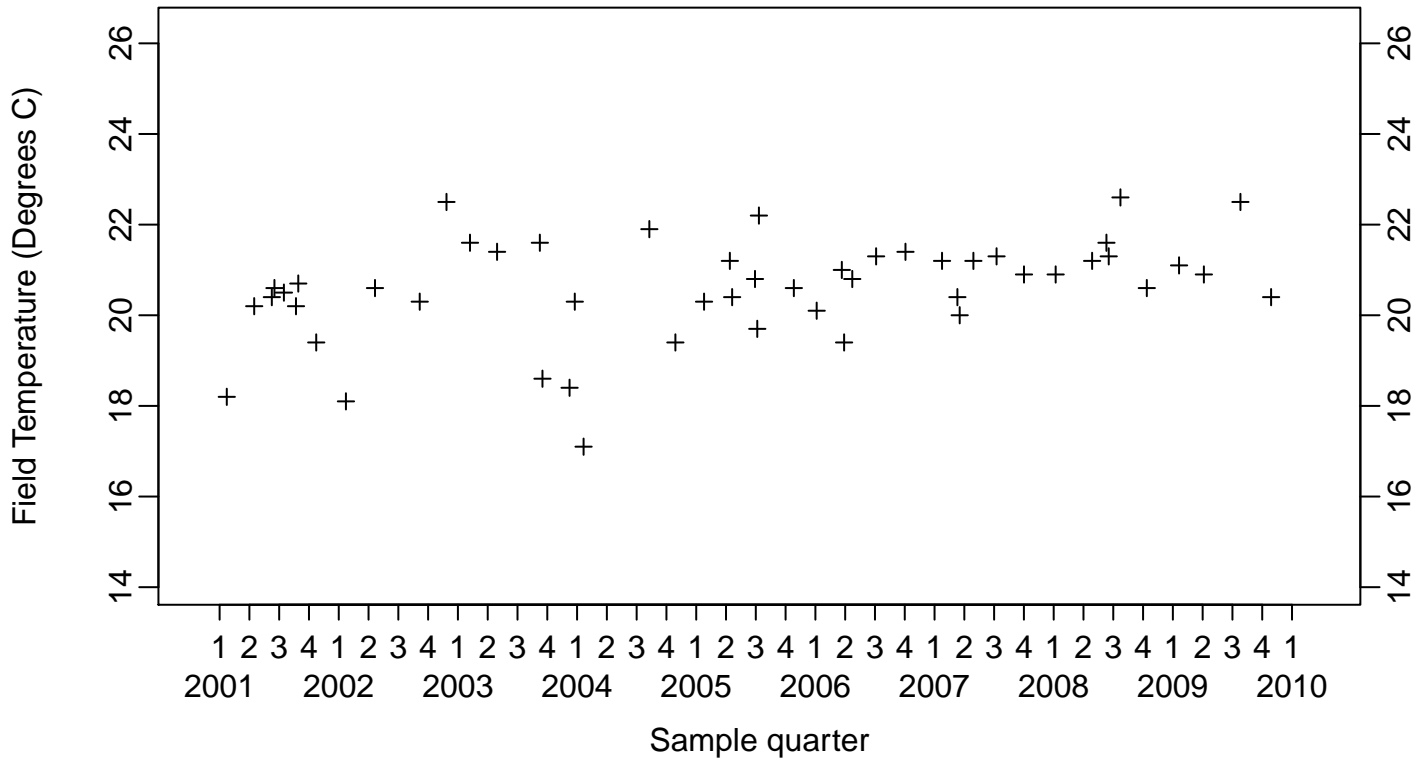


Compliance Monitoring Point K7-01

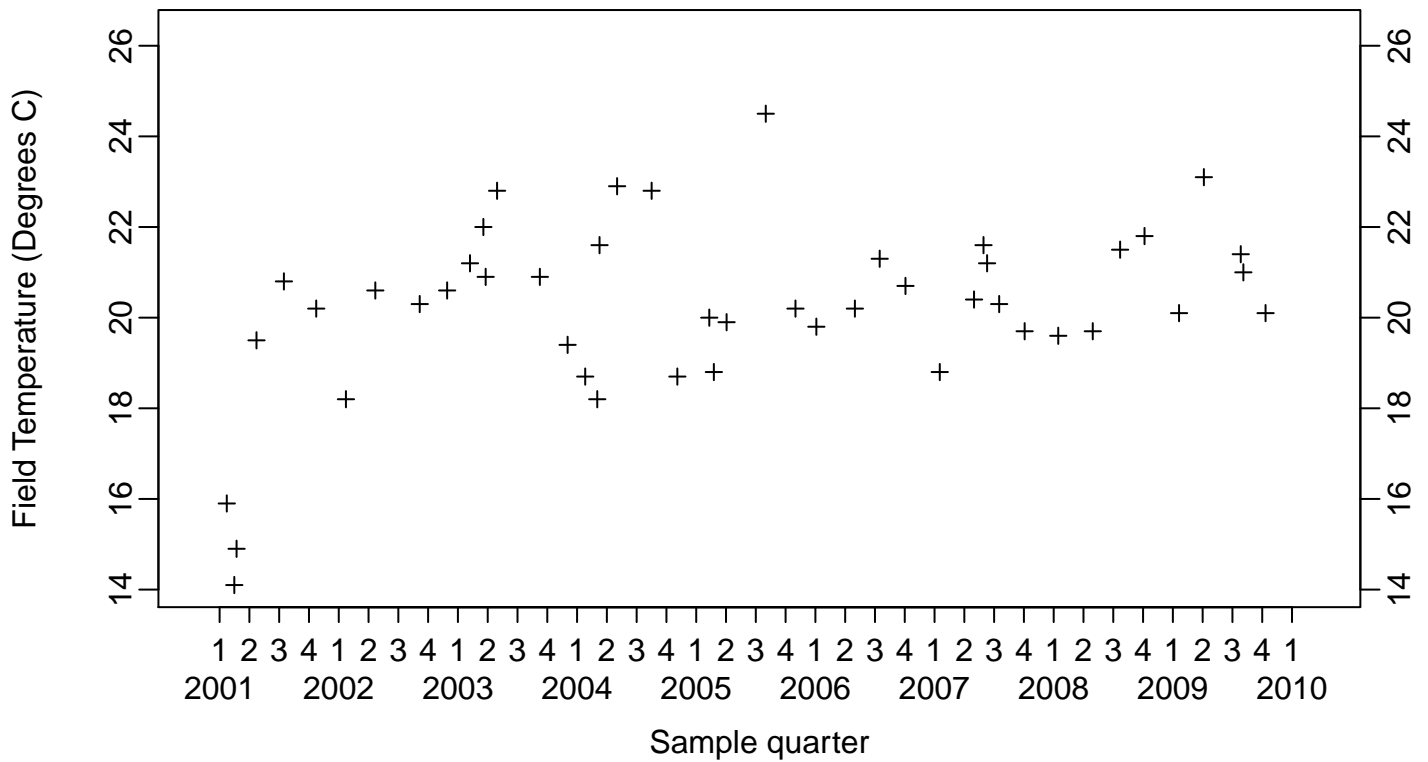


Pit 7 Complex Field Temperature (Degrees C)

Compliance Monitoring Point K7-03

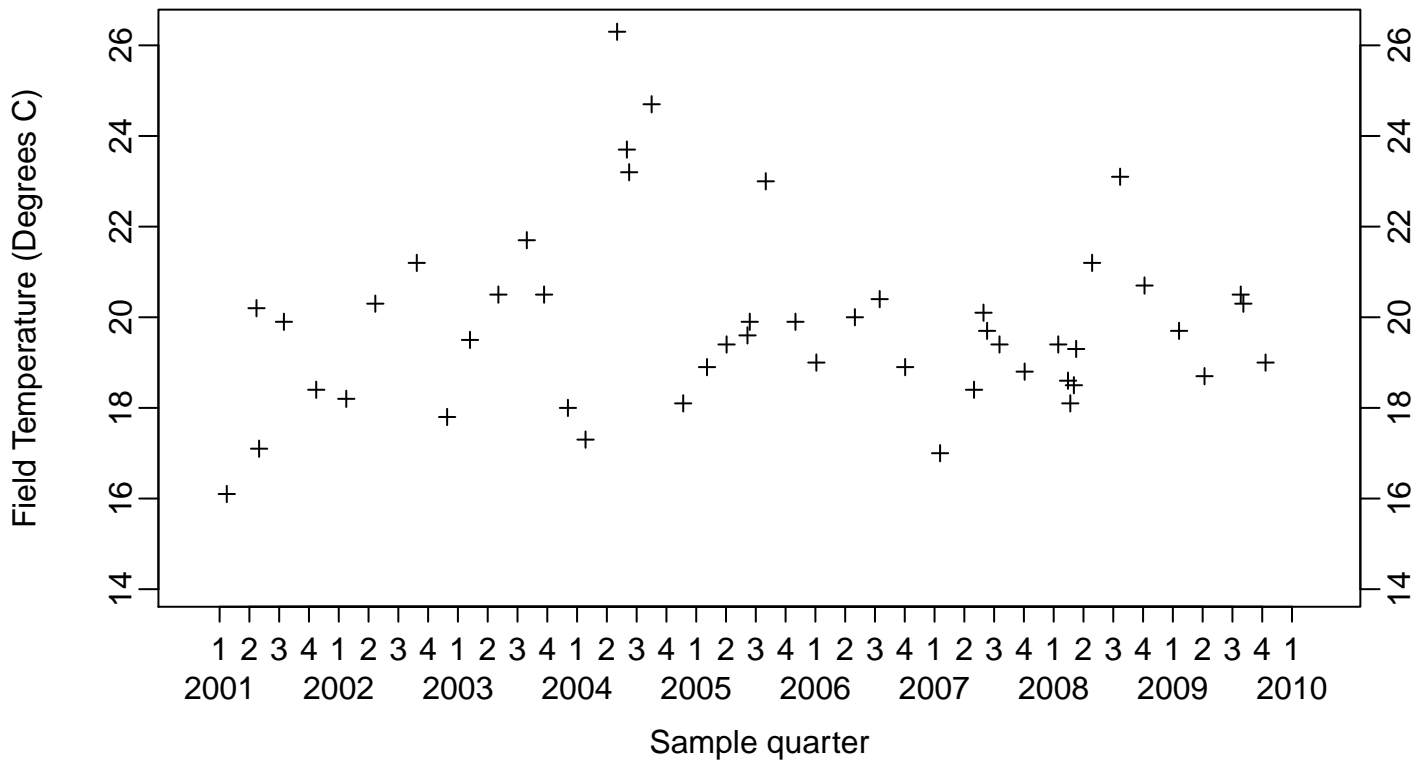


Compliance Monitoring Point K7-09

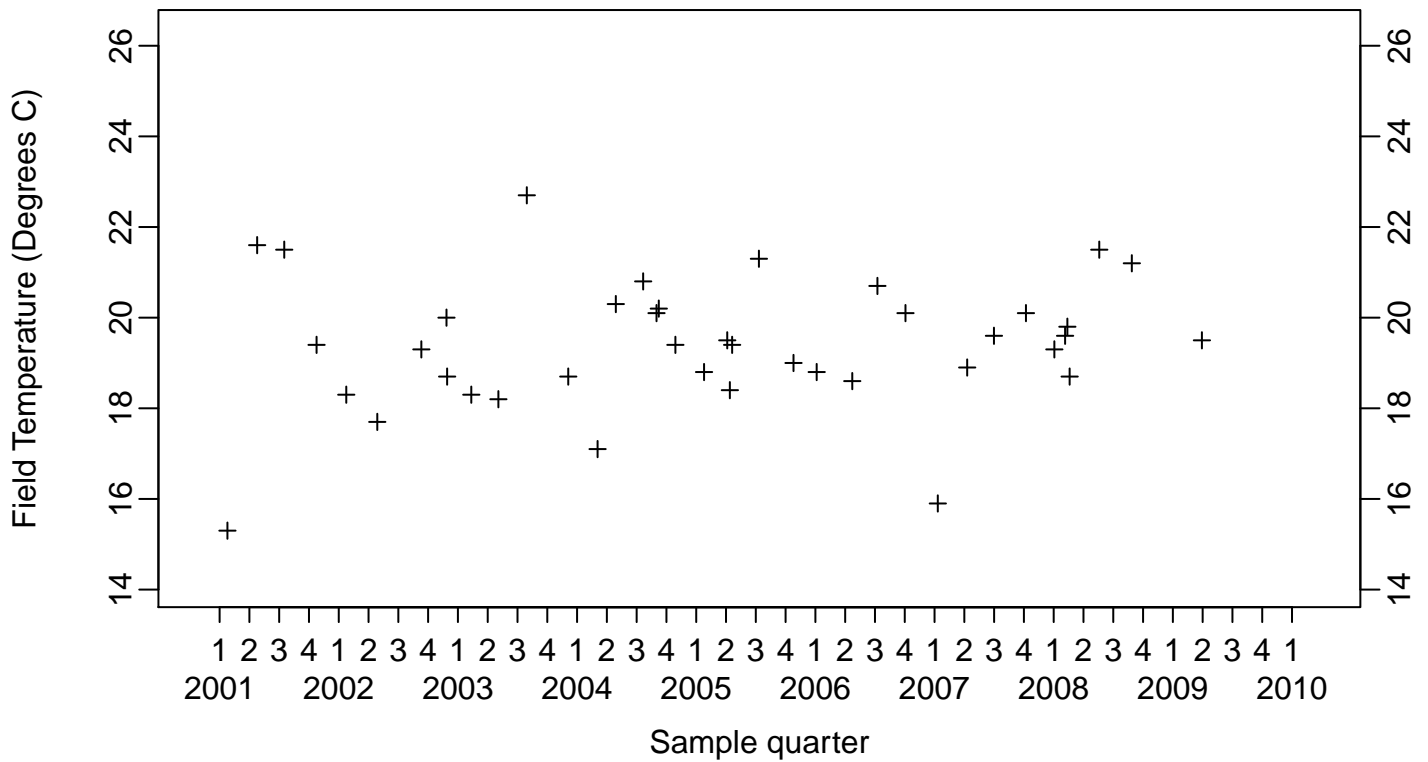


Pit 7 Complex Field Temperature (Degrees C)

Compliance Monitoring Point K7-10

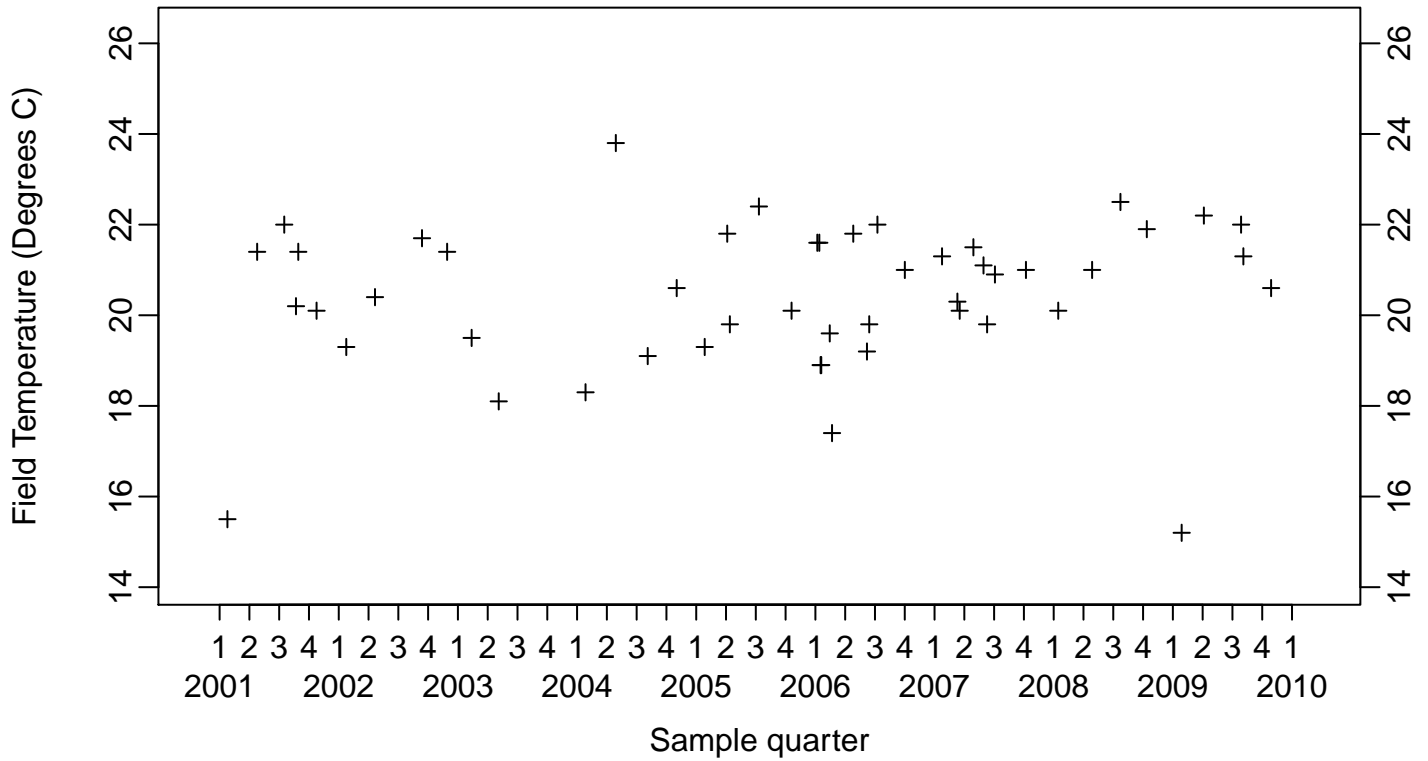


Compliance Monitoring Point NC7-25

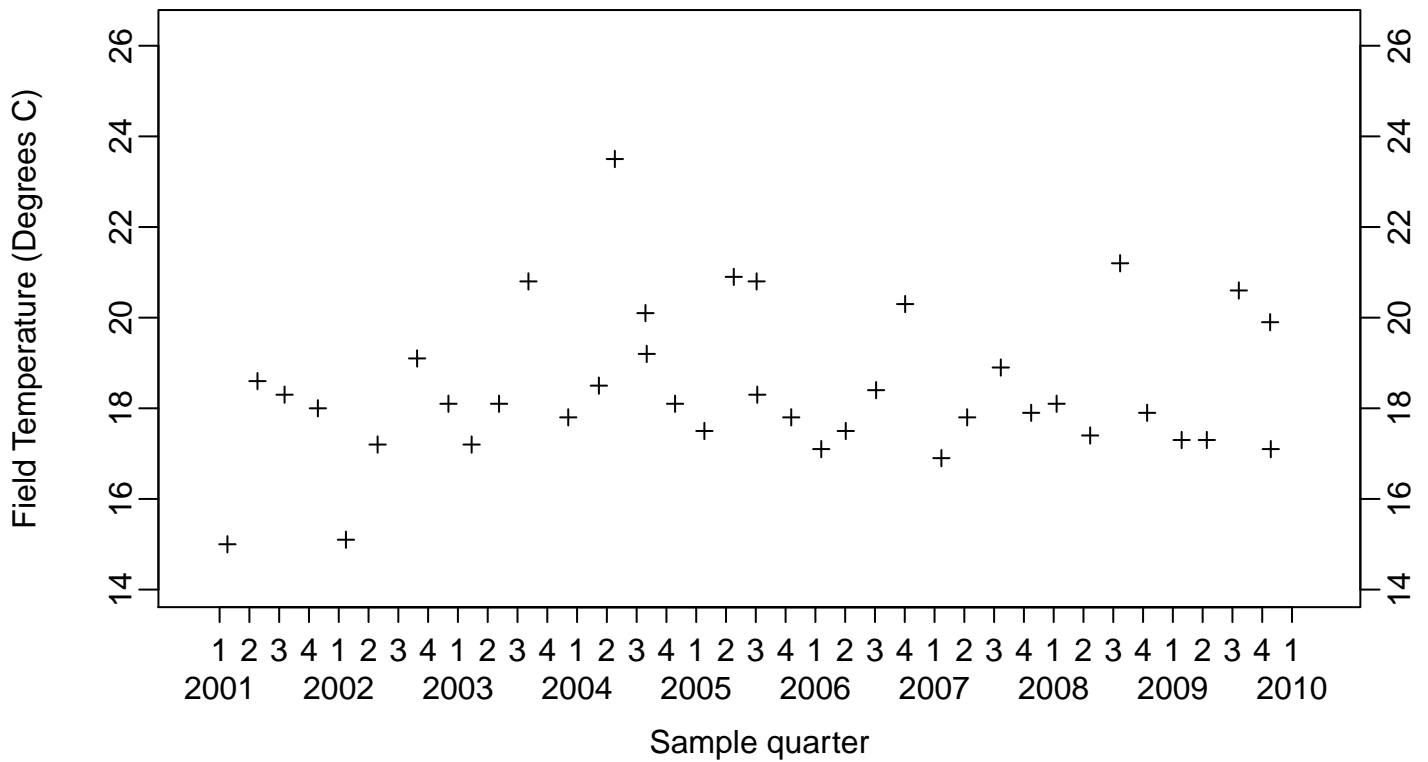


Pit 7 Complex
Field Temperature (Degrees C)

Compliance Monitoring Point NC7-26

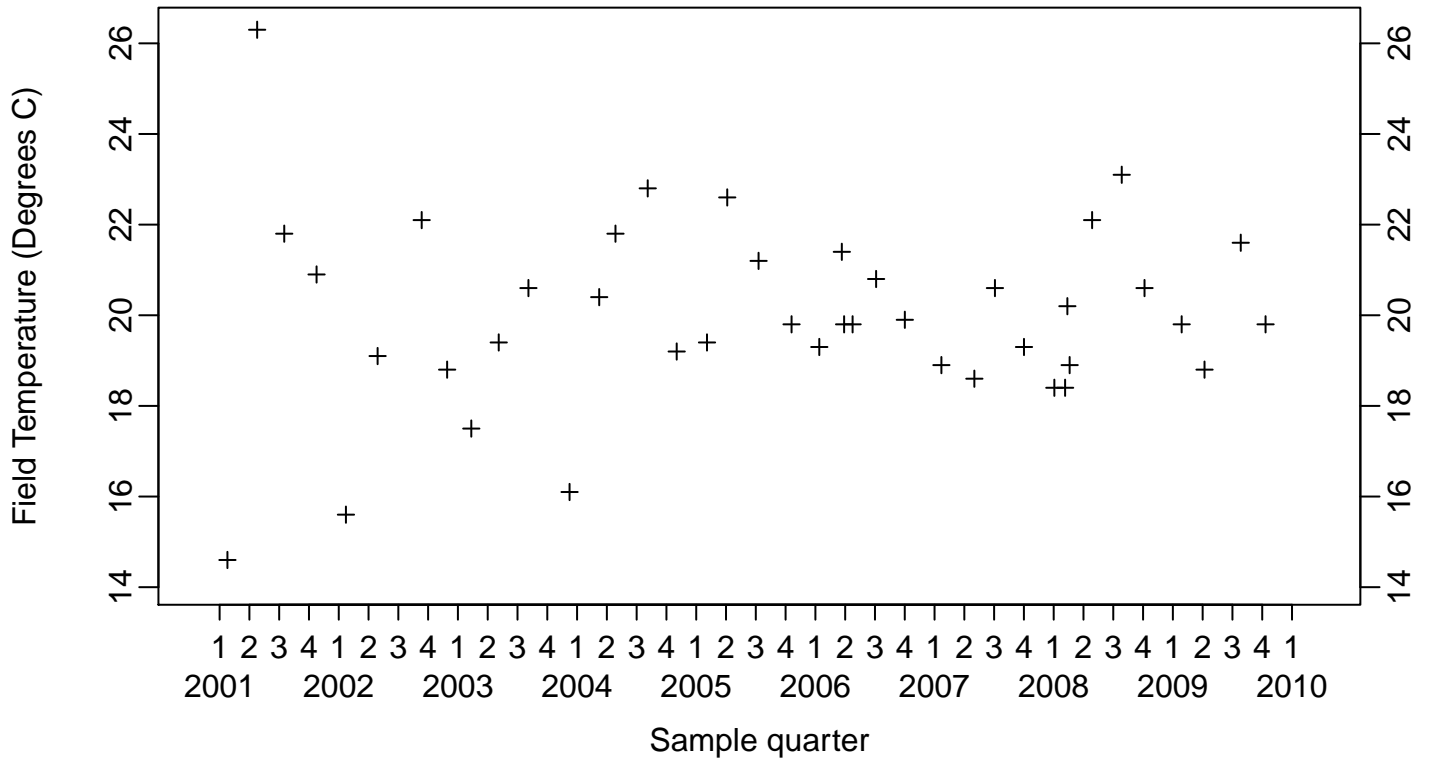


Compliance Monitoring Point NC7-47



Pit 7 Complex Field Temperature (Degrees C)

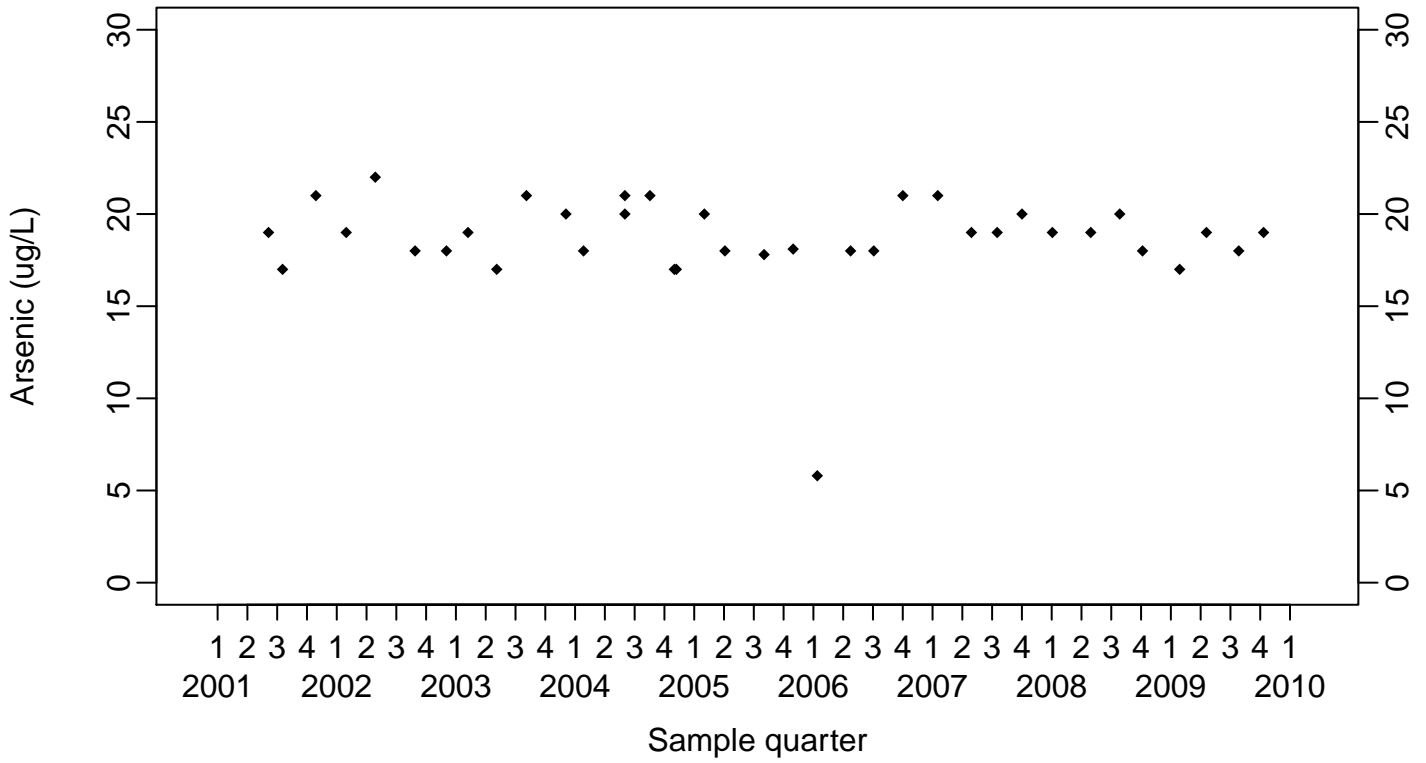
Compliance Monitoring Point NC7-48



Pit 7 Complex Arsenic (ug/L)

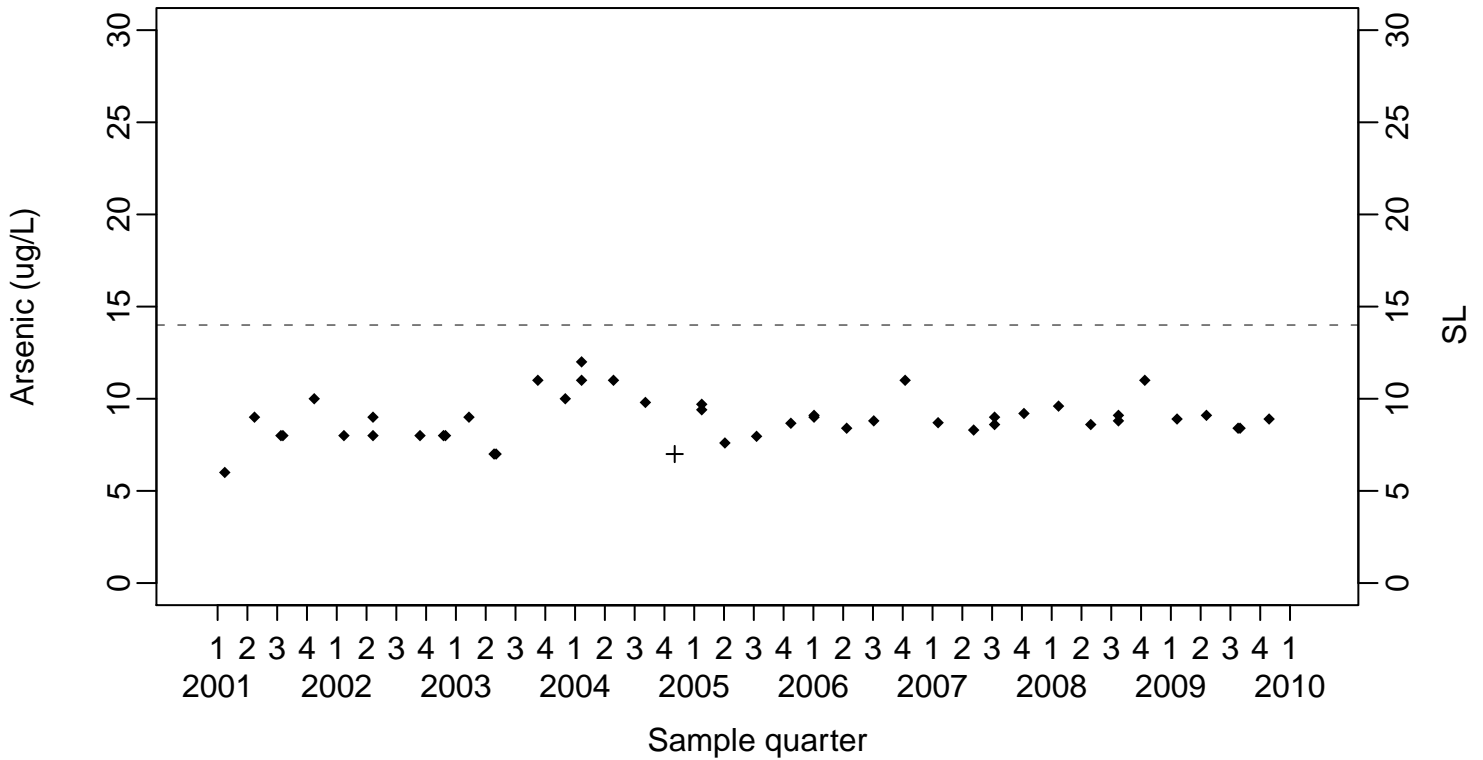
Background Monitoring Point K7-06

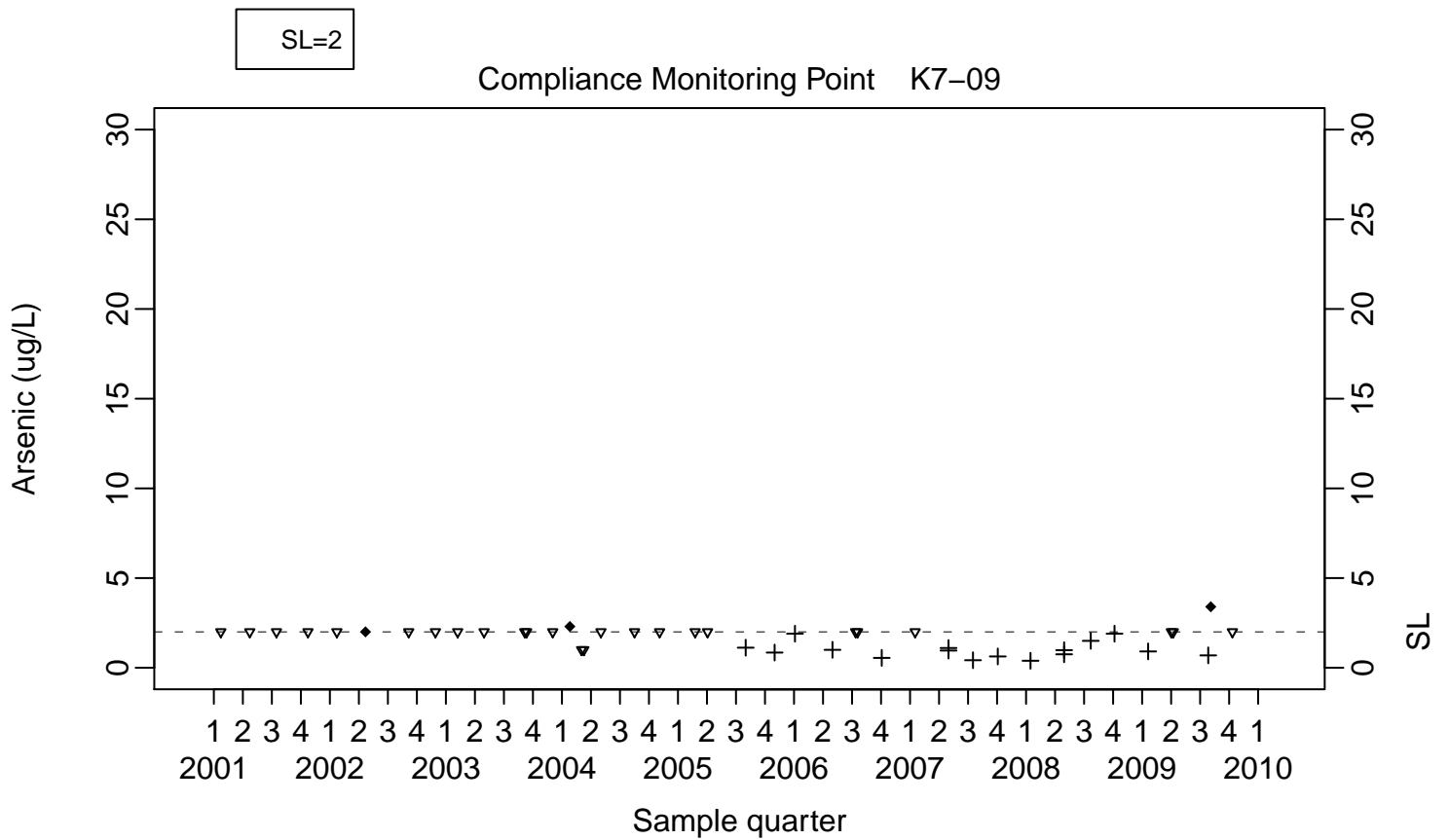
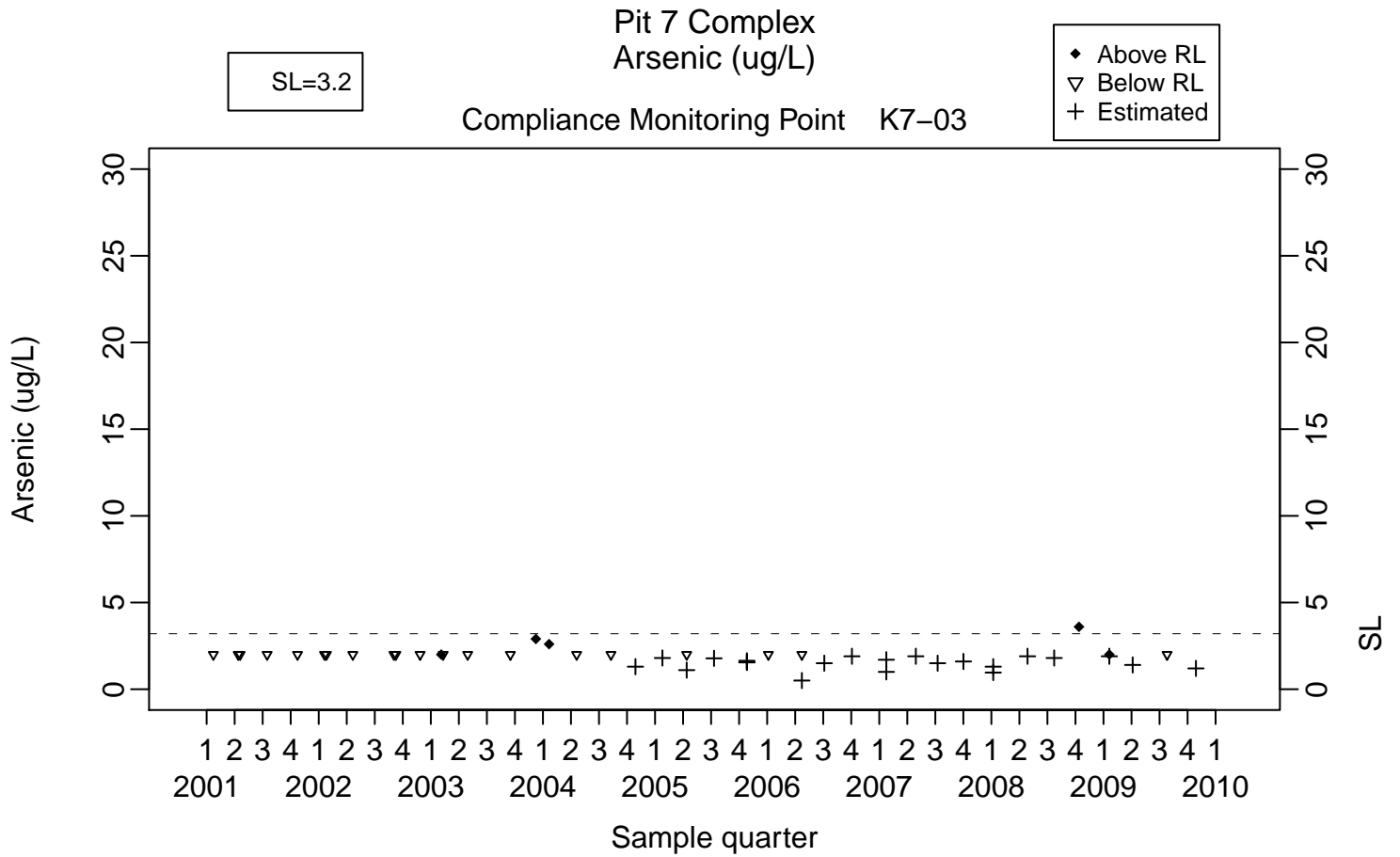
◆ Above RL
▽ Below RL



SL=14

Compliance Monitoring Point K7-01



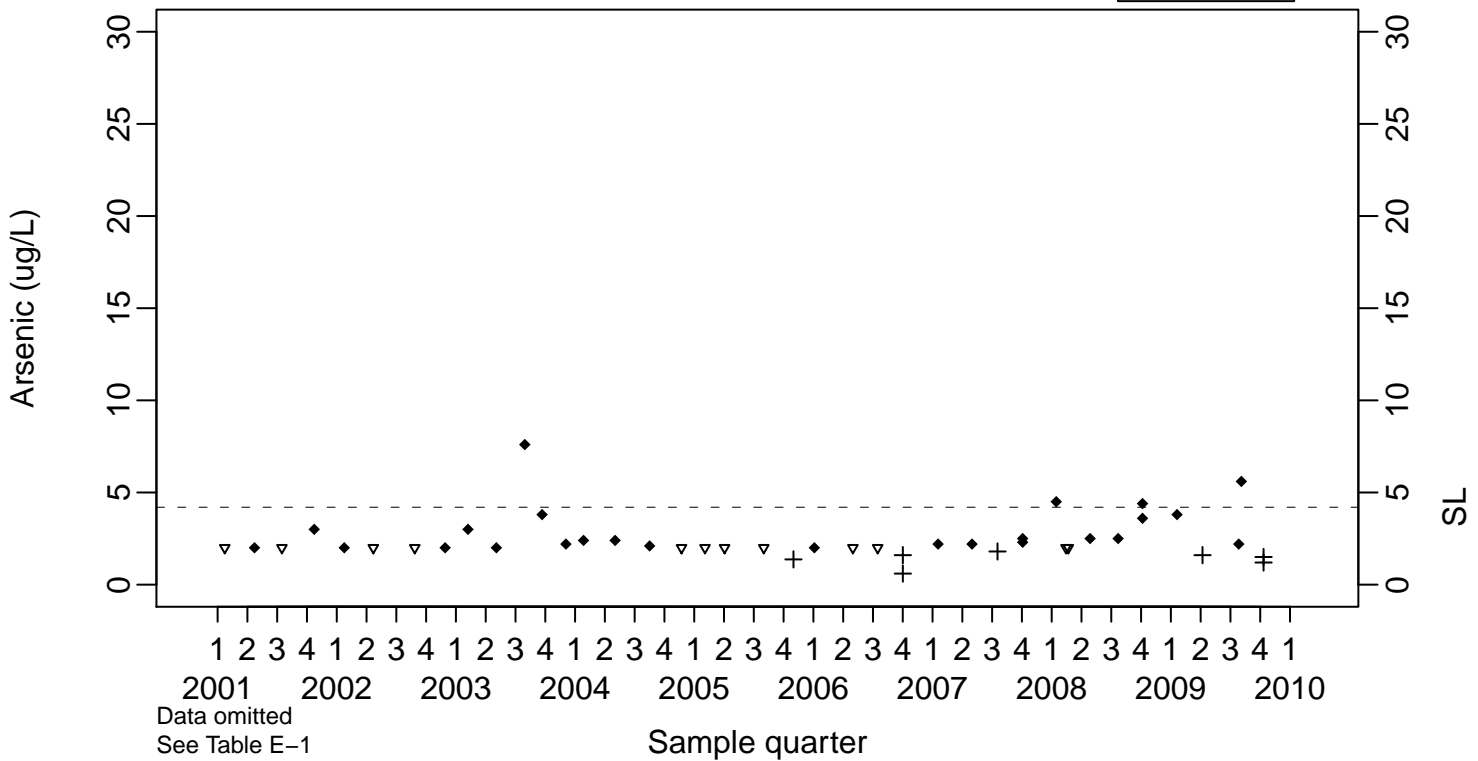


Pit 7 Complex
Arsenic (ug/L)

Compliance Monitoring Point K7-10

SL=4.2

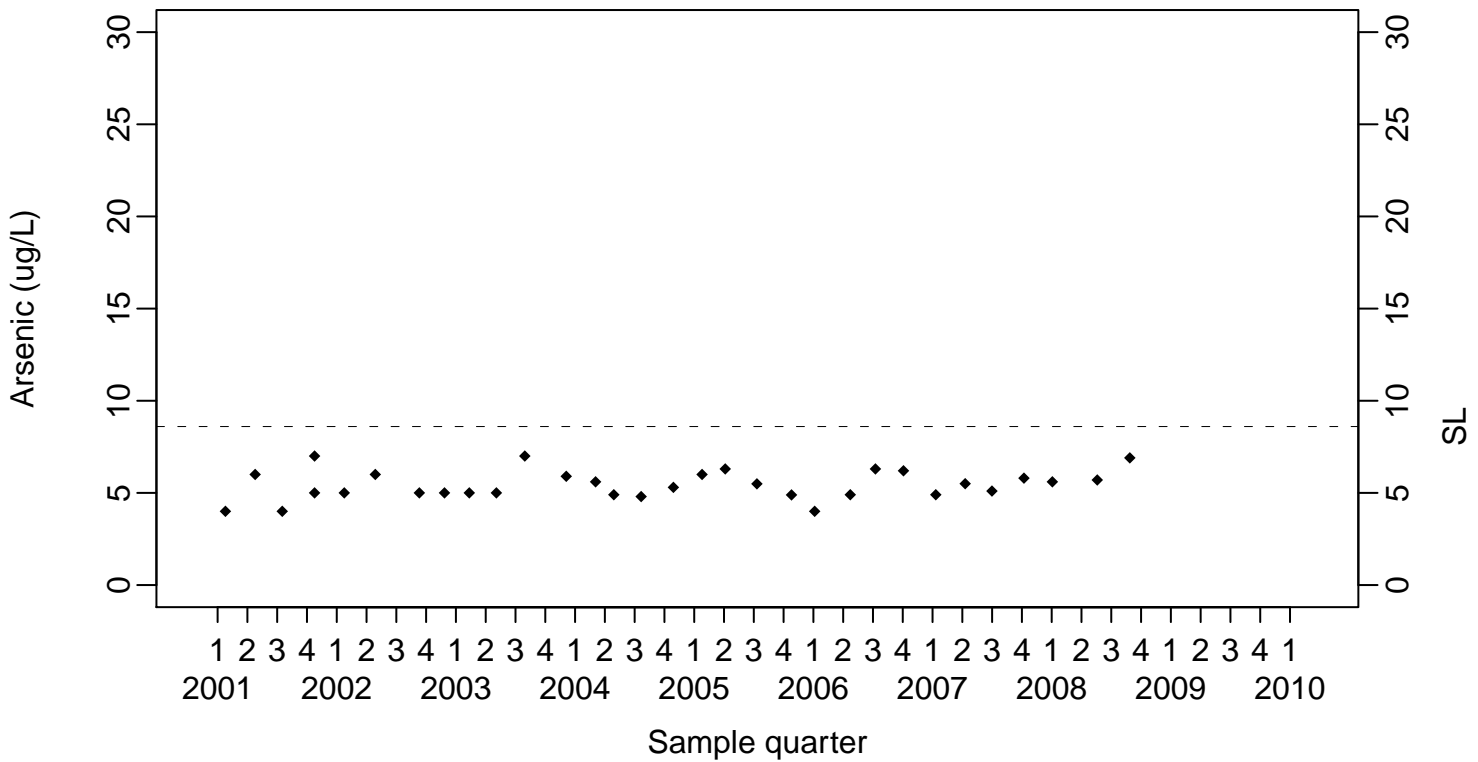
- ◆ Above RL
- ▽ Below RL
- + Estimated



Data omitted
See Table E-1

SL=8.6

Compliance Monitoring Point NC7-25

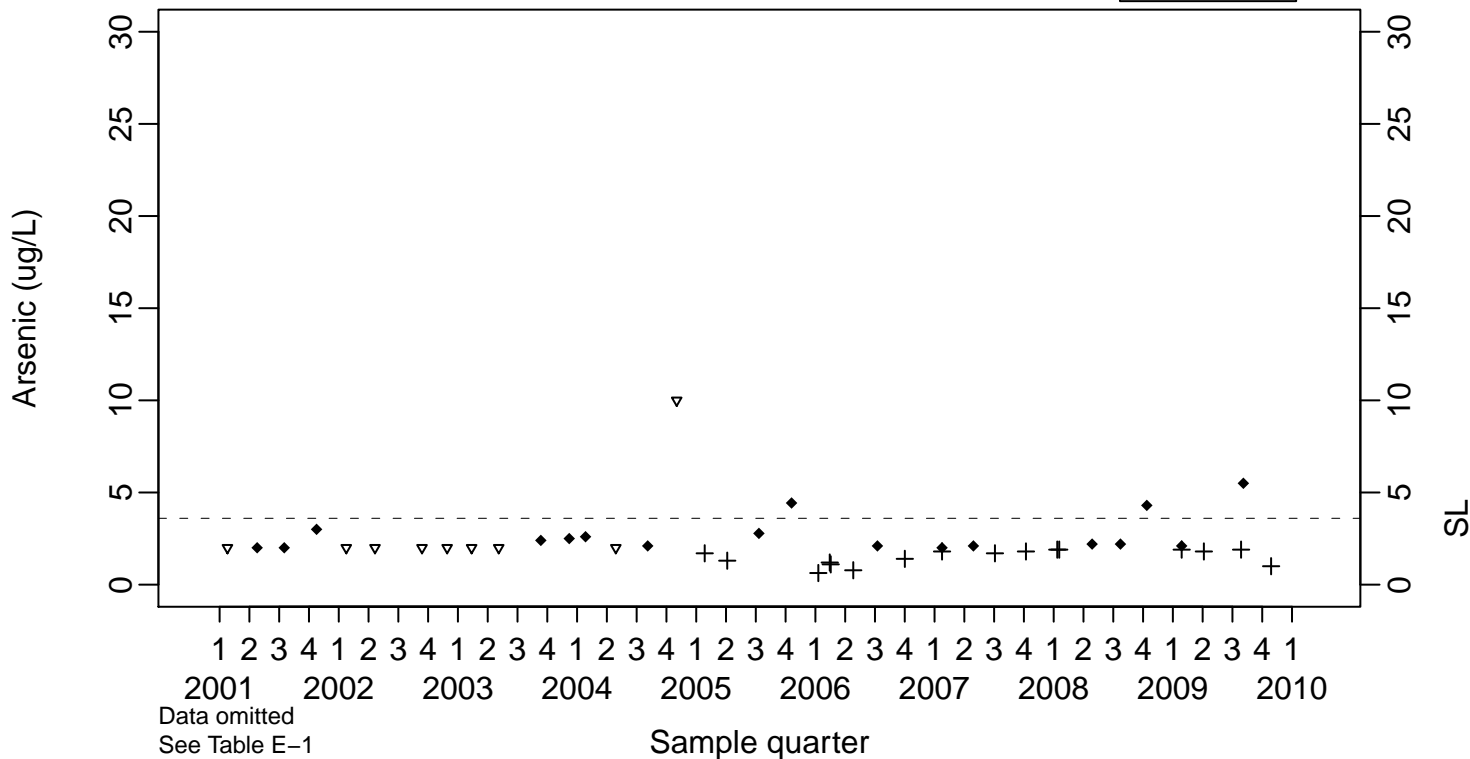


Pit 7 Complex
Arsenic (ug/L)

Compliance Monitoring Point NC7-26

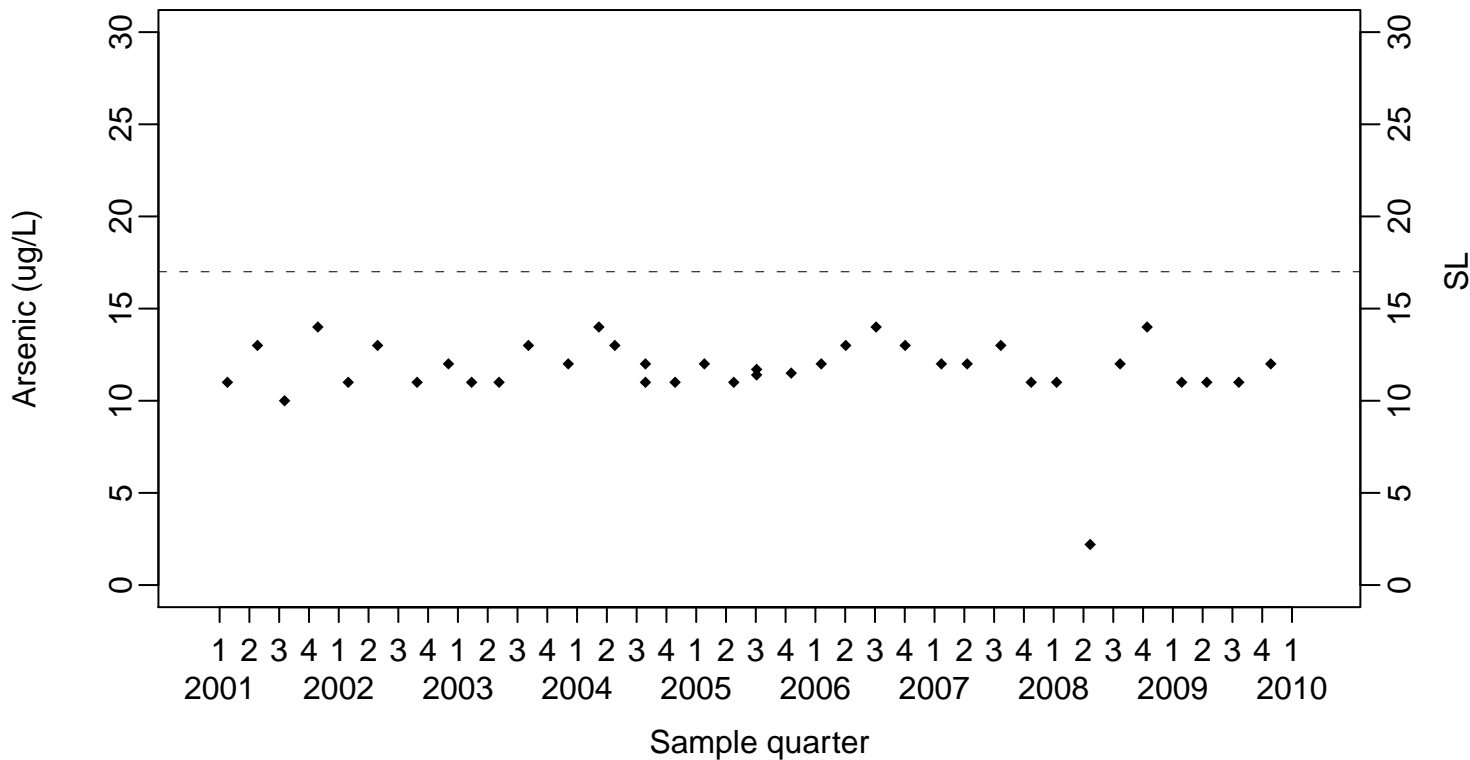
SL=3.6

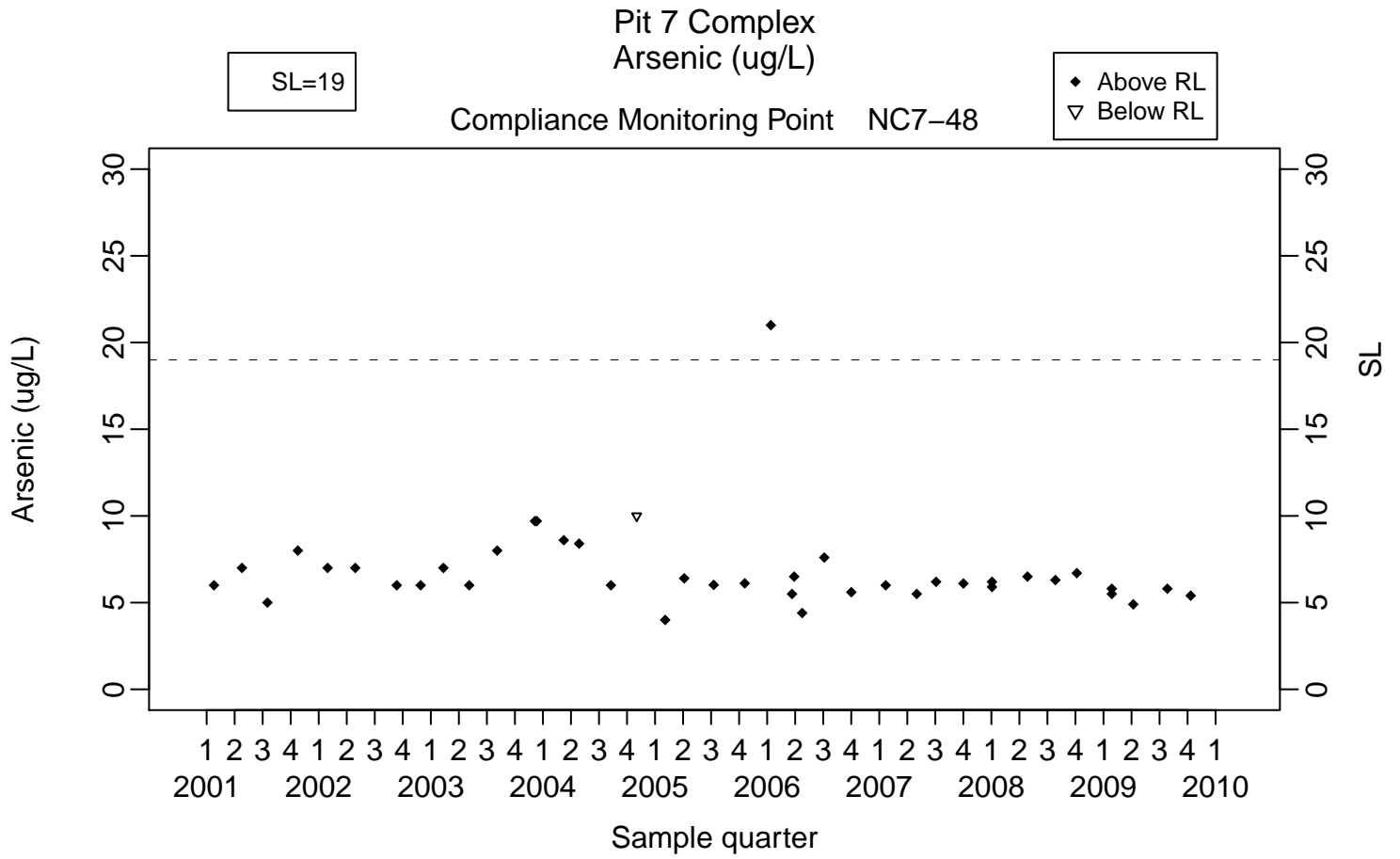
- ◆ Above RL
- ▽ Below RL
- + Estimated



Compliance Monitoring Point NC7-47

SL=17

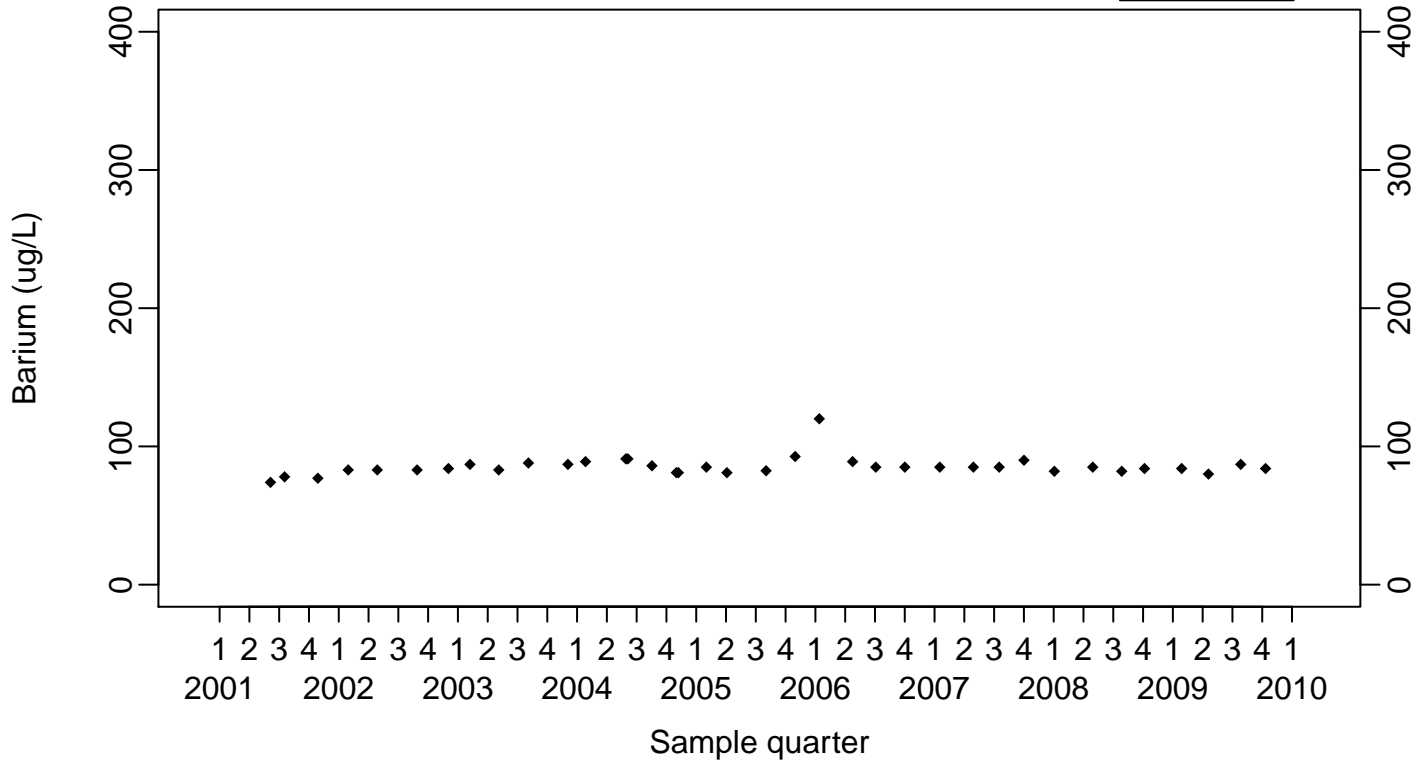




Pit 7 Complex Barium (ug/L)

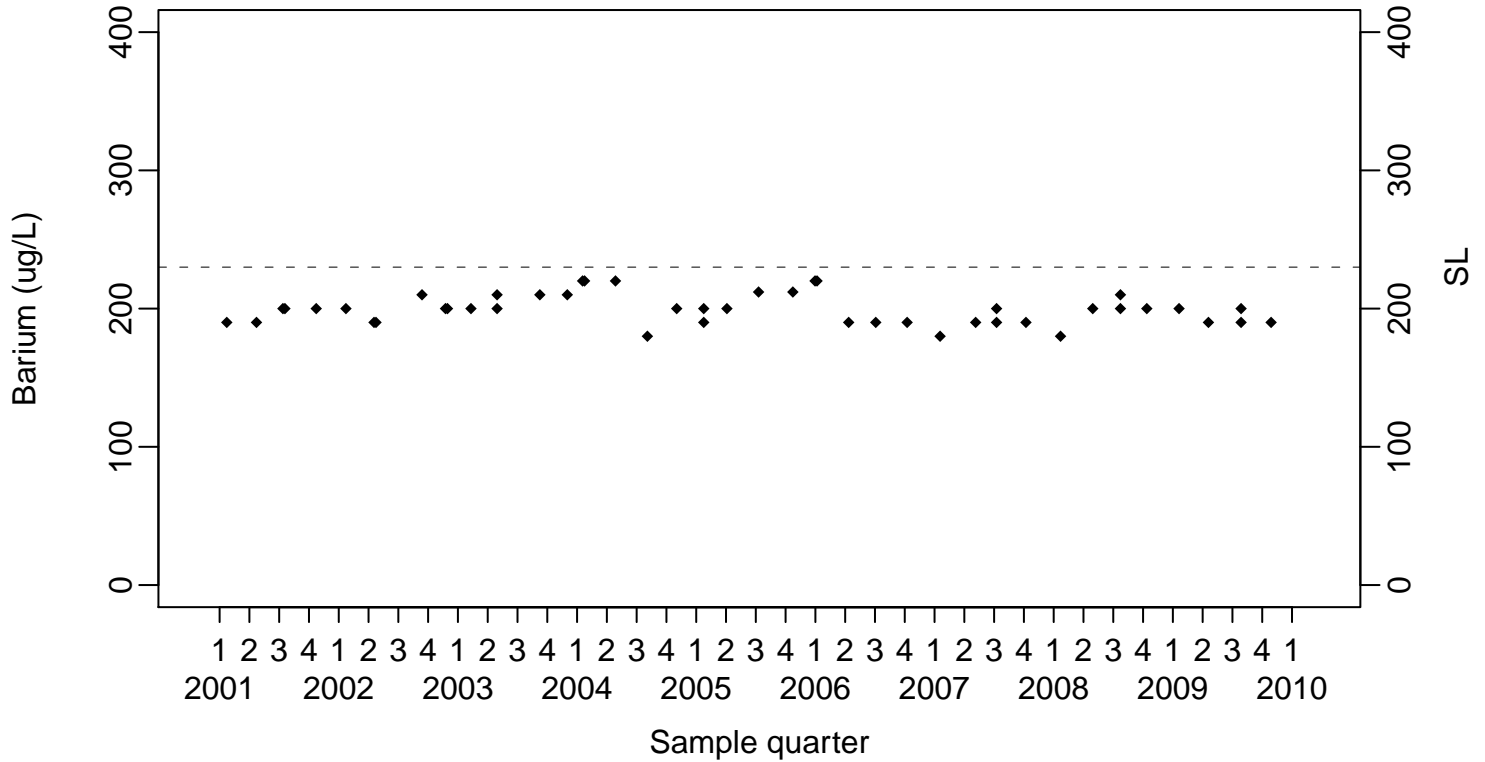
Background Monitoring Point K7-06

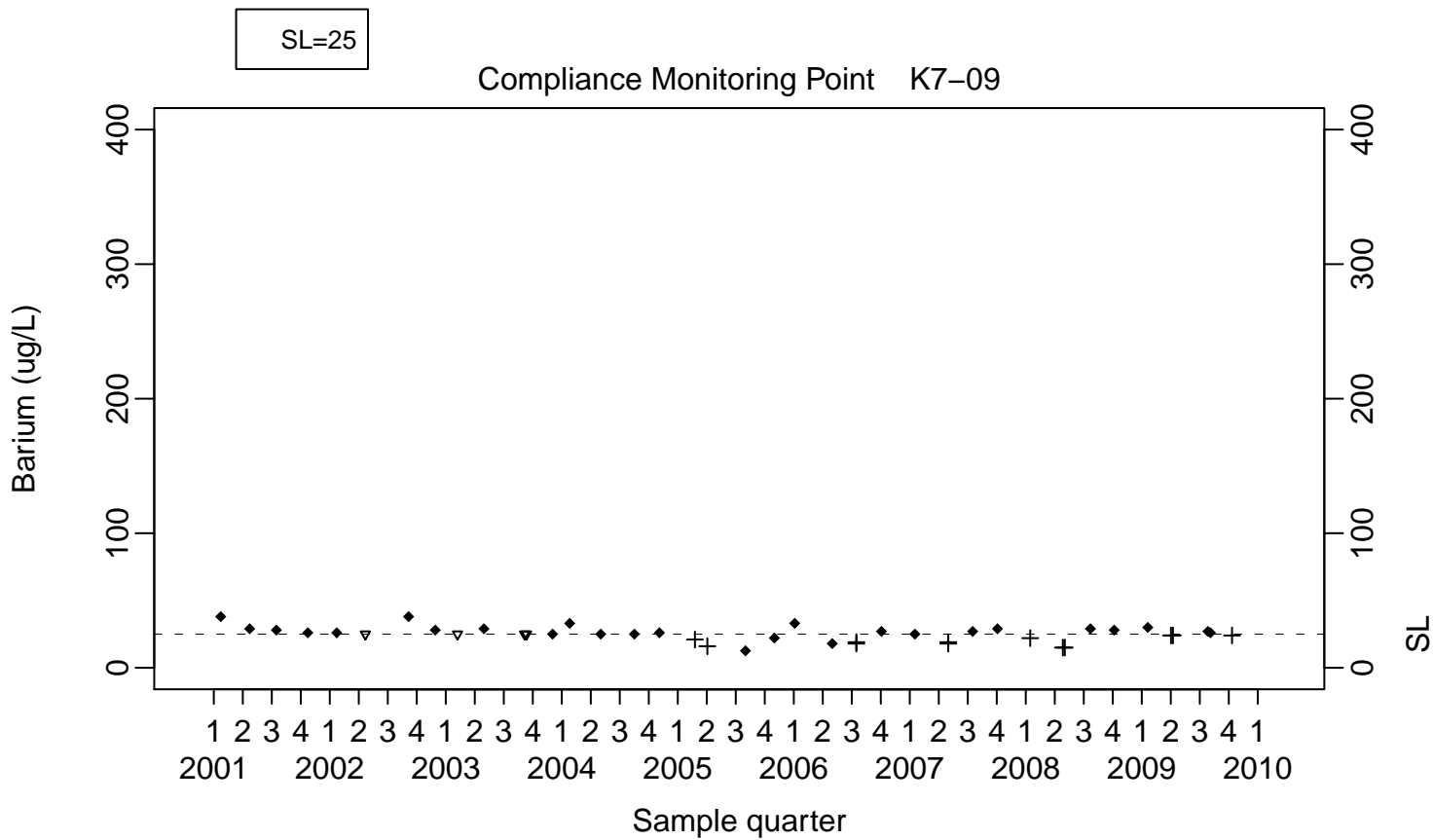
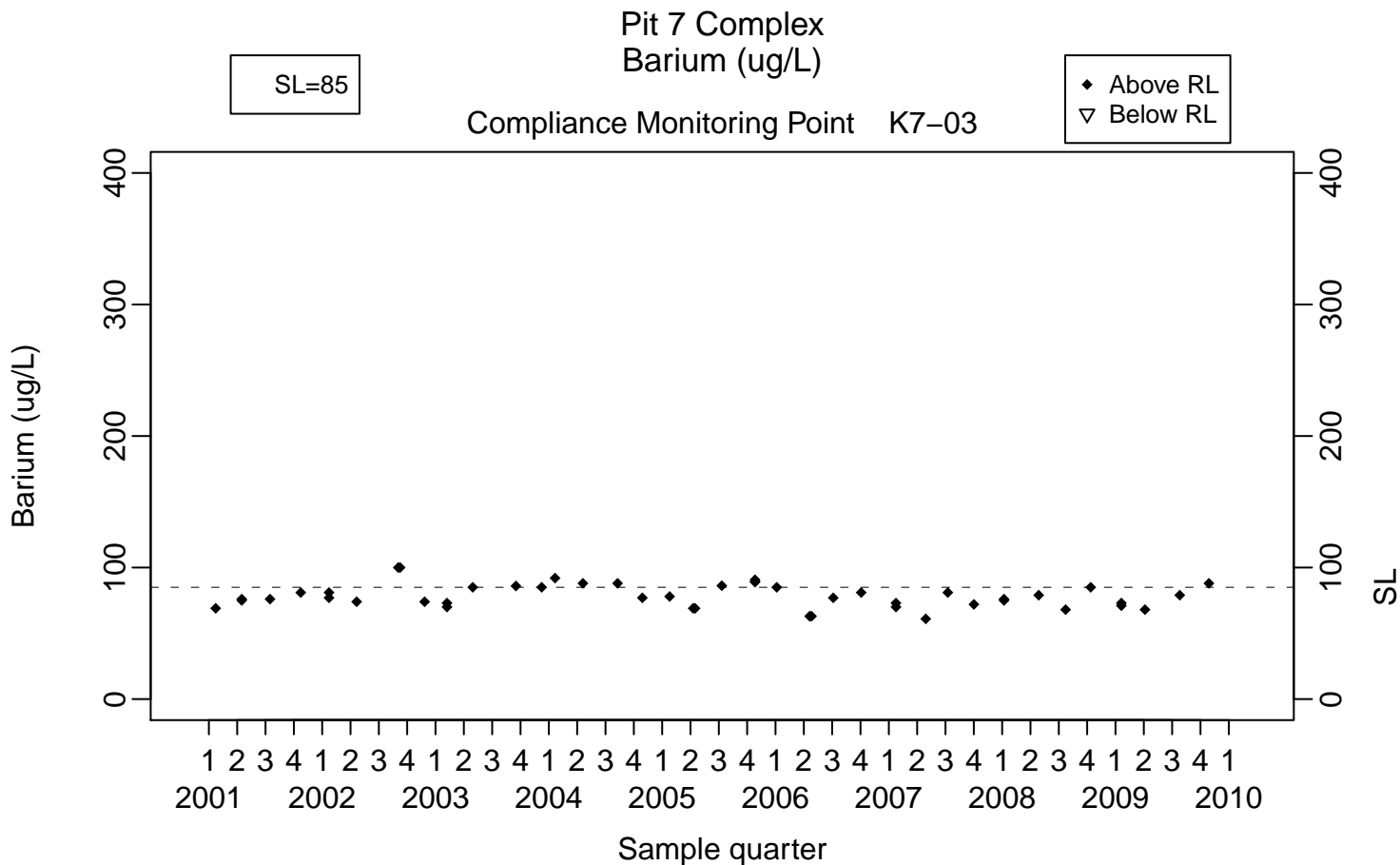
◆ Above RL
▽ Below RL

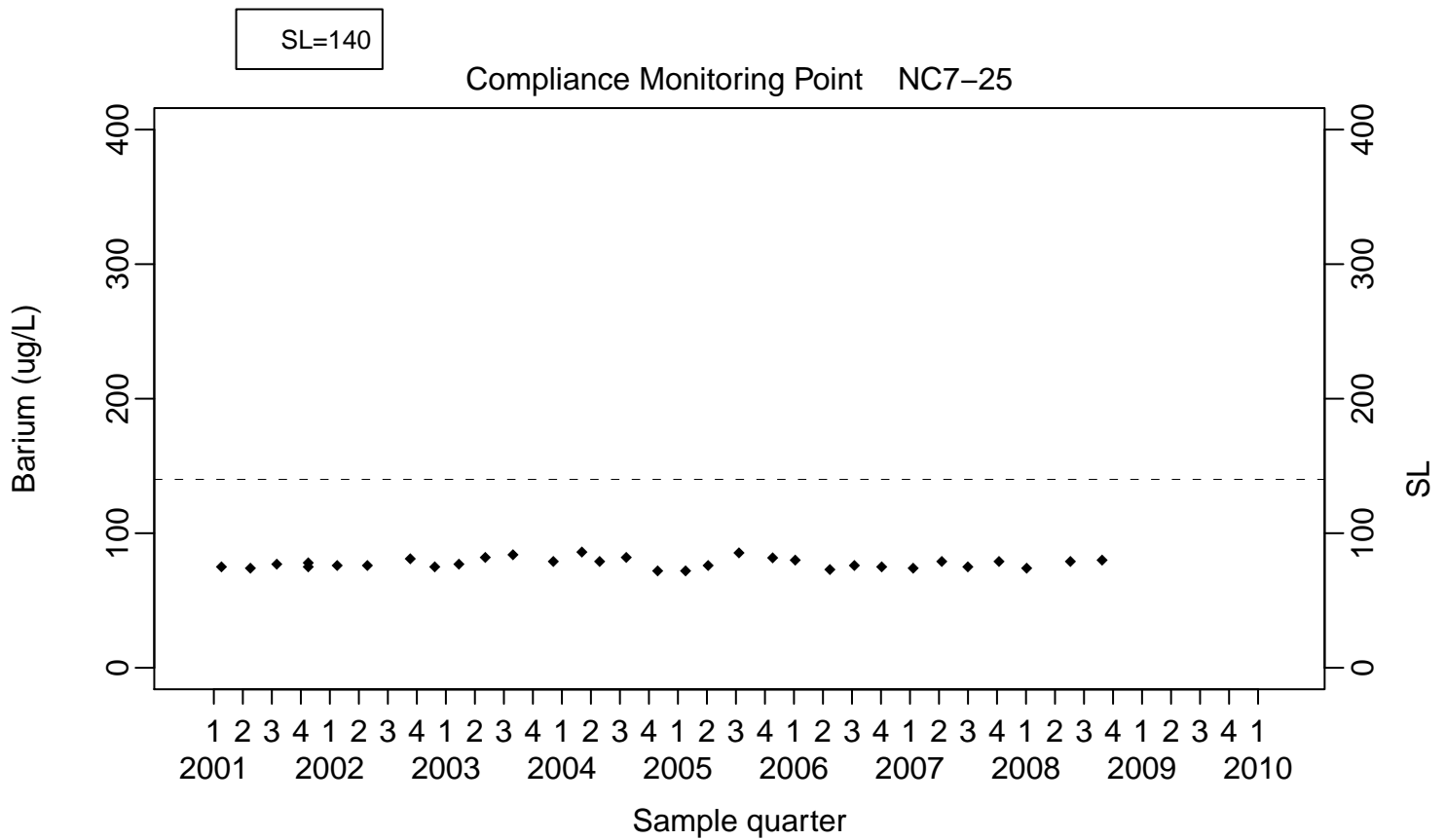
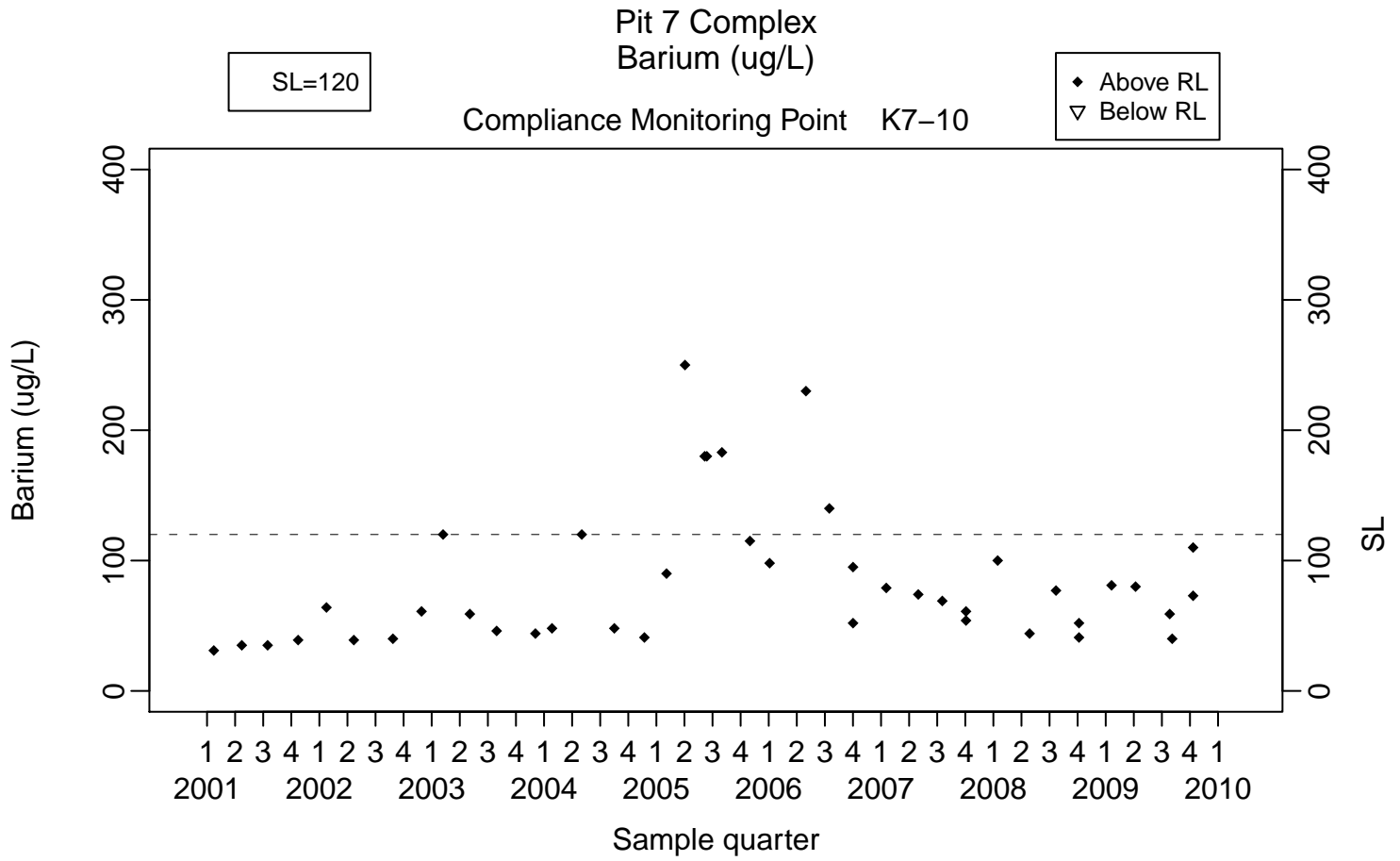


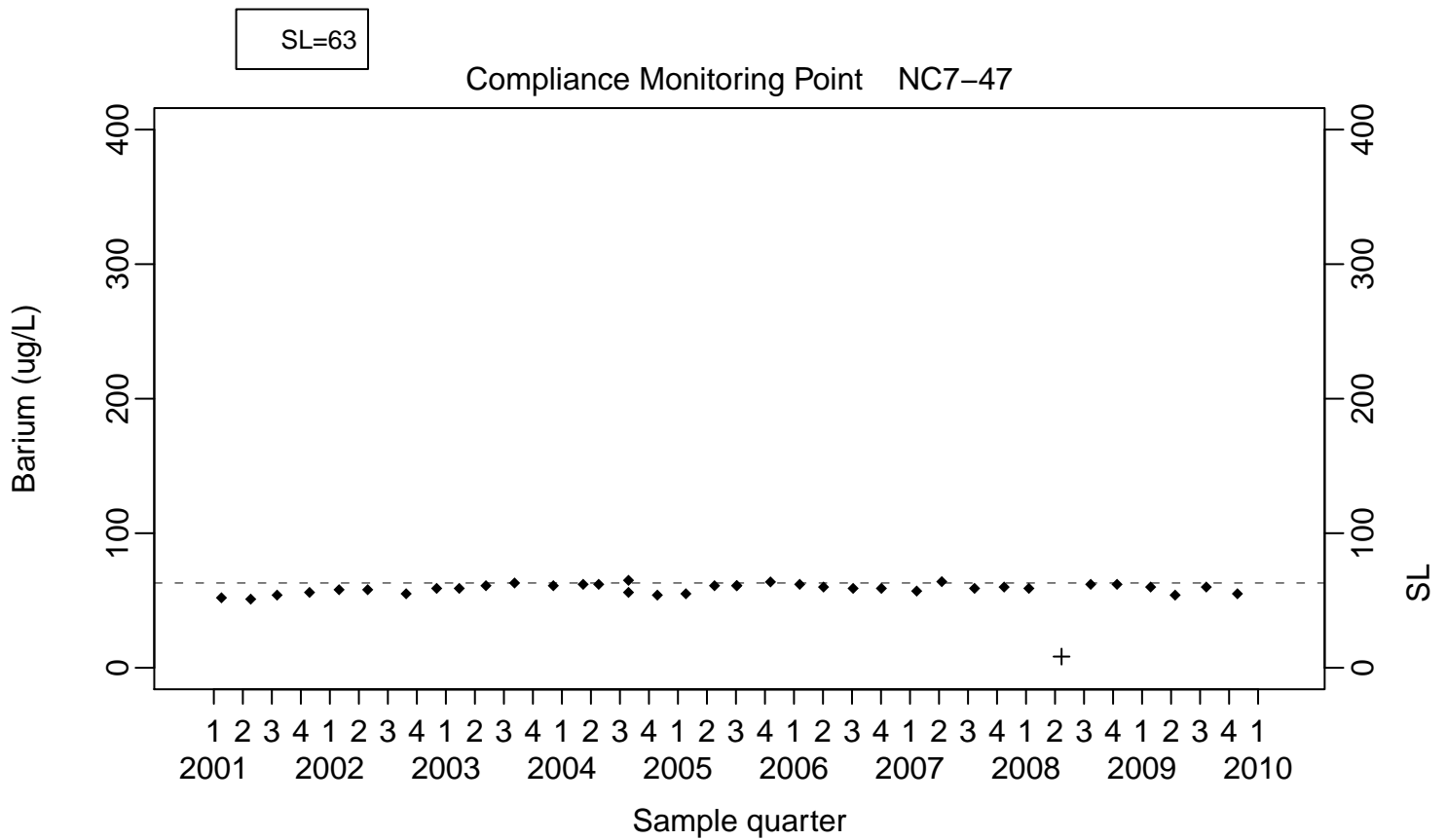
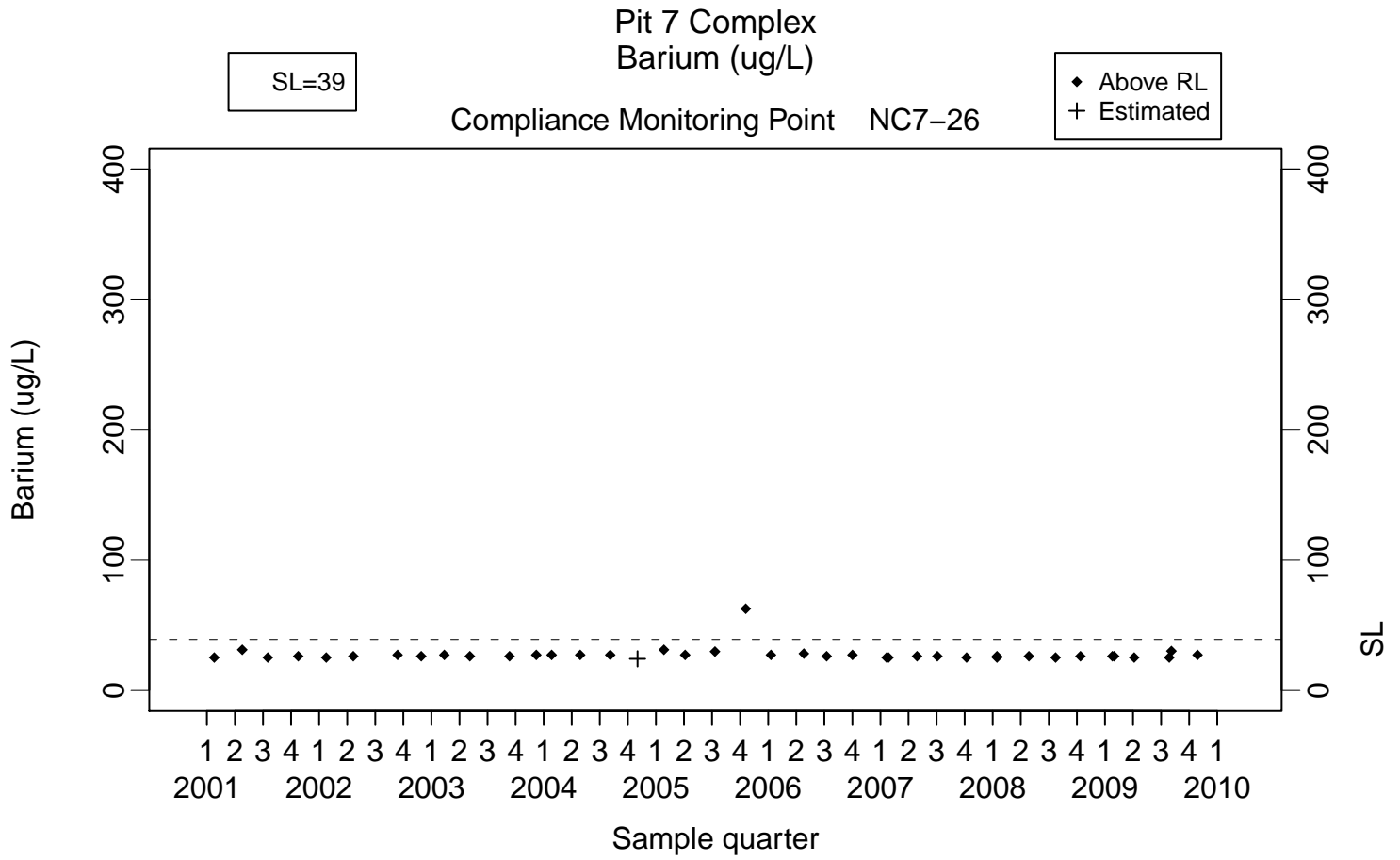
SL=230

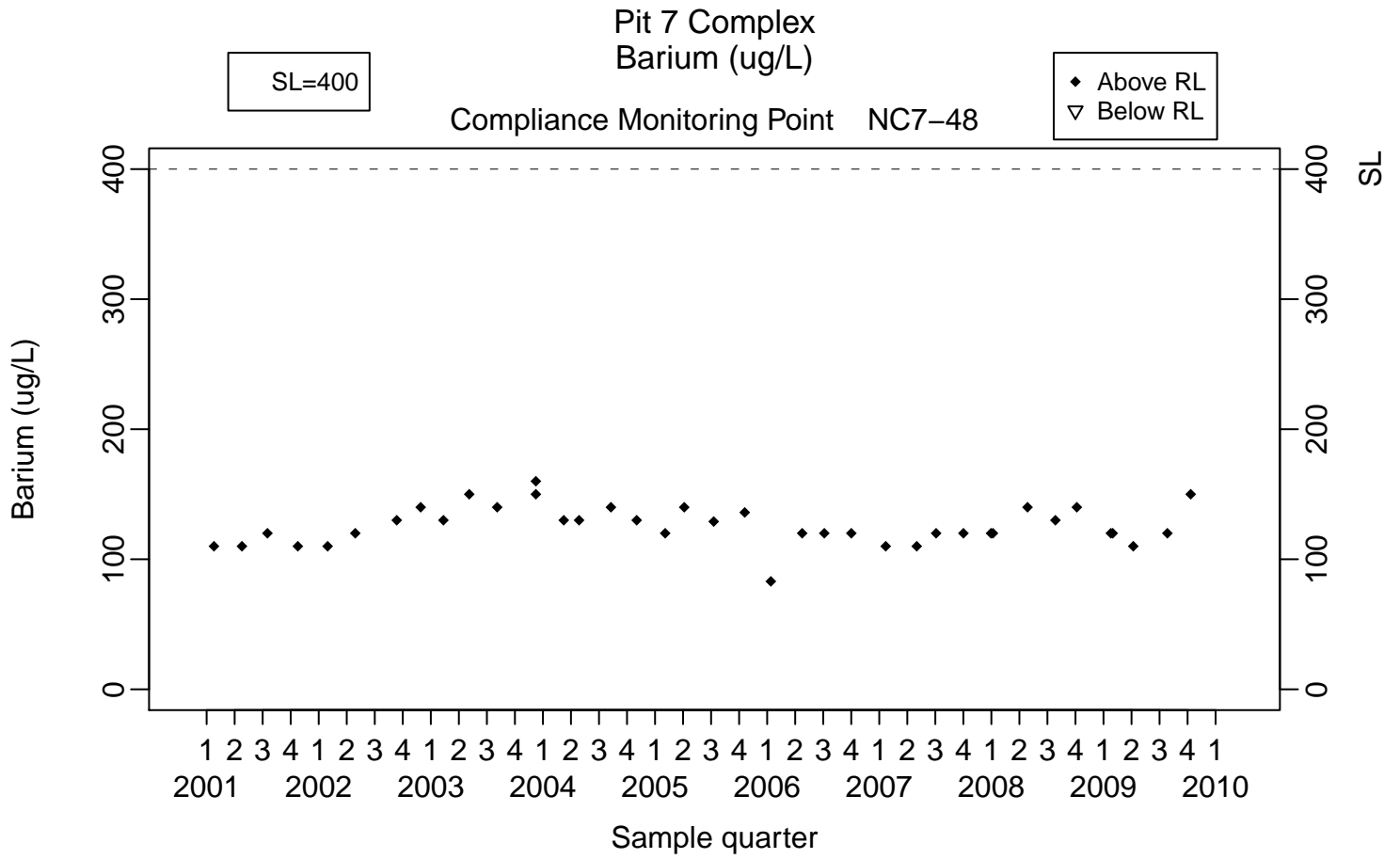
Compliance Monitoring Point K7-01







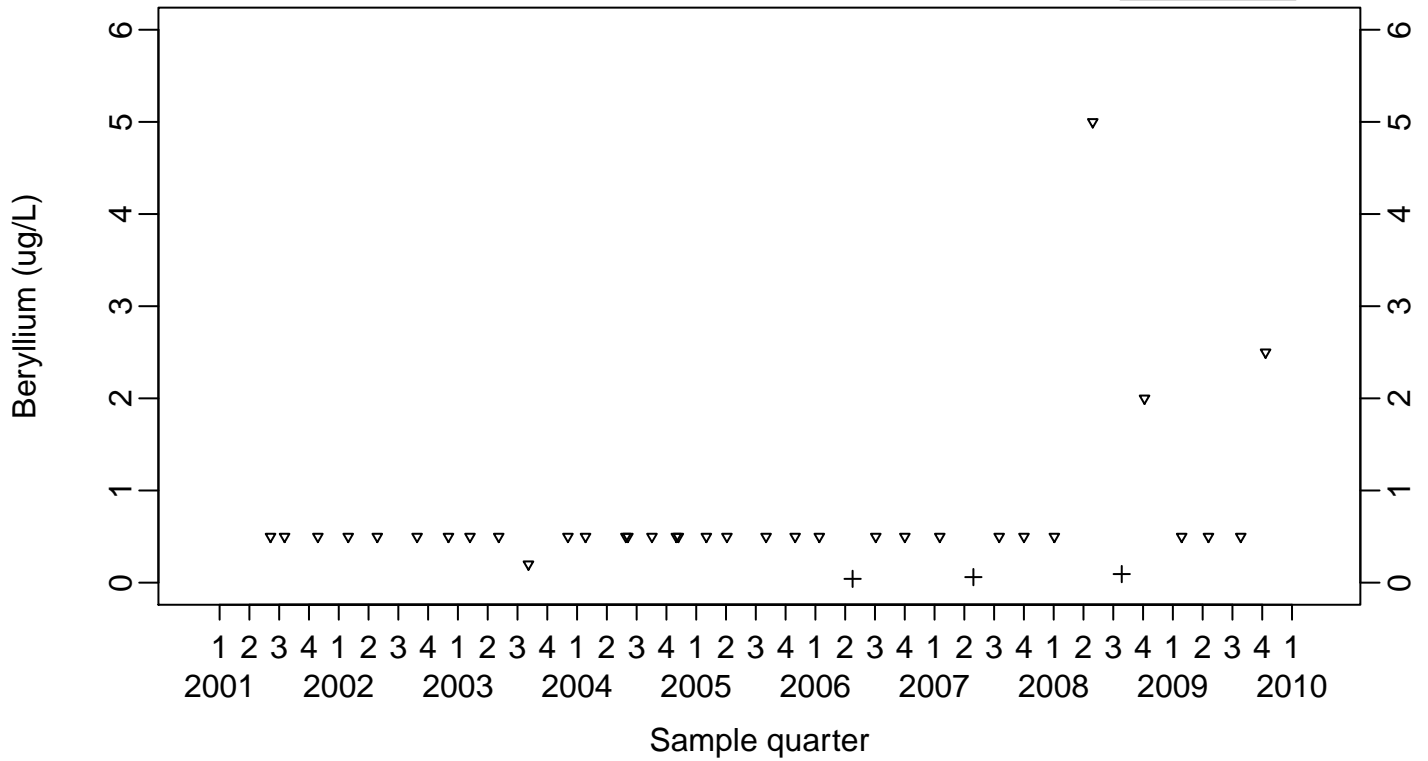




Pit 7 Complex Beryllium (ug/L)

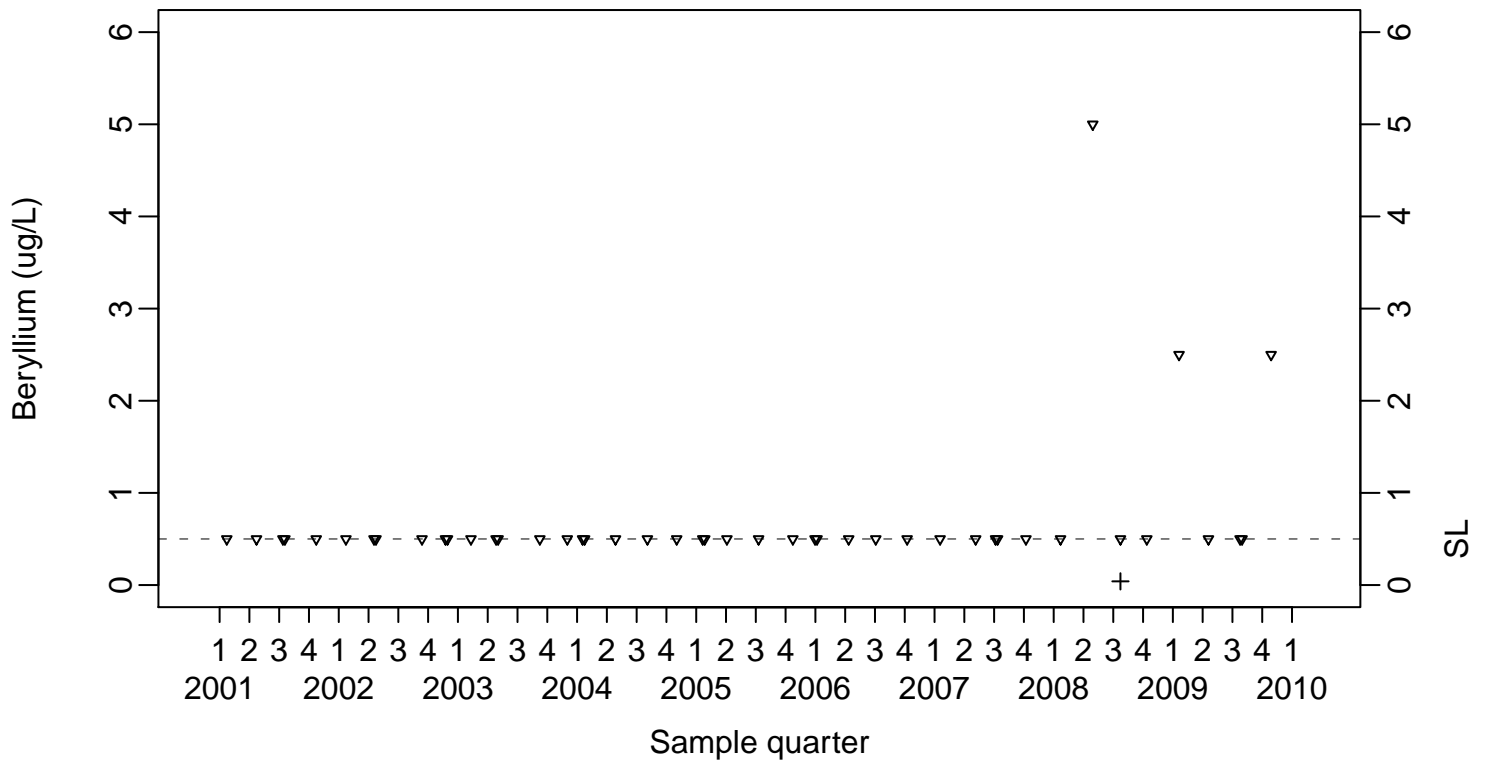
Background Monitoring Point K7-06

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K7-01

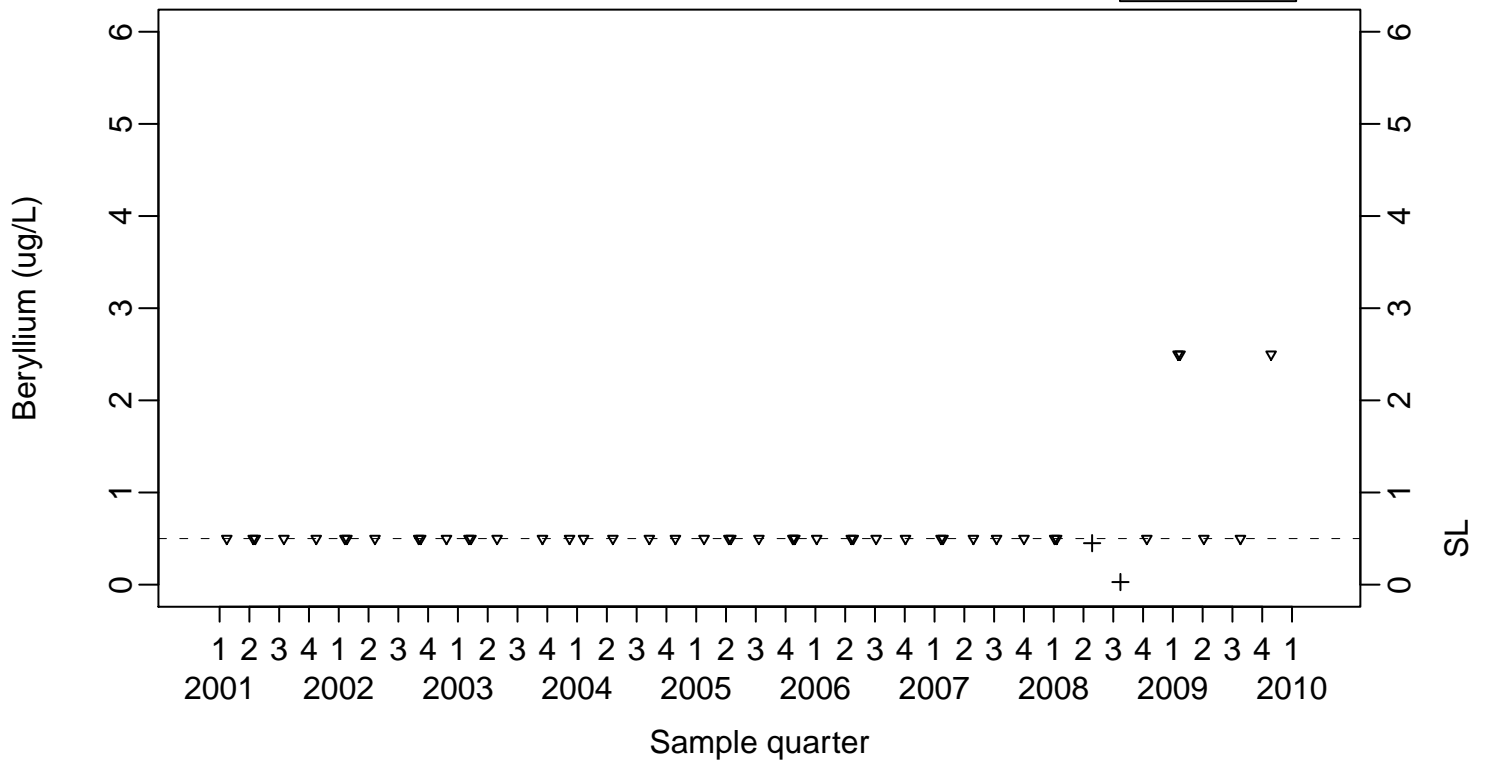


Pit 7 Complex
Beryllium (ug/L)

Compliance Monitoring Point K7-03

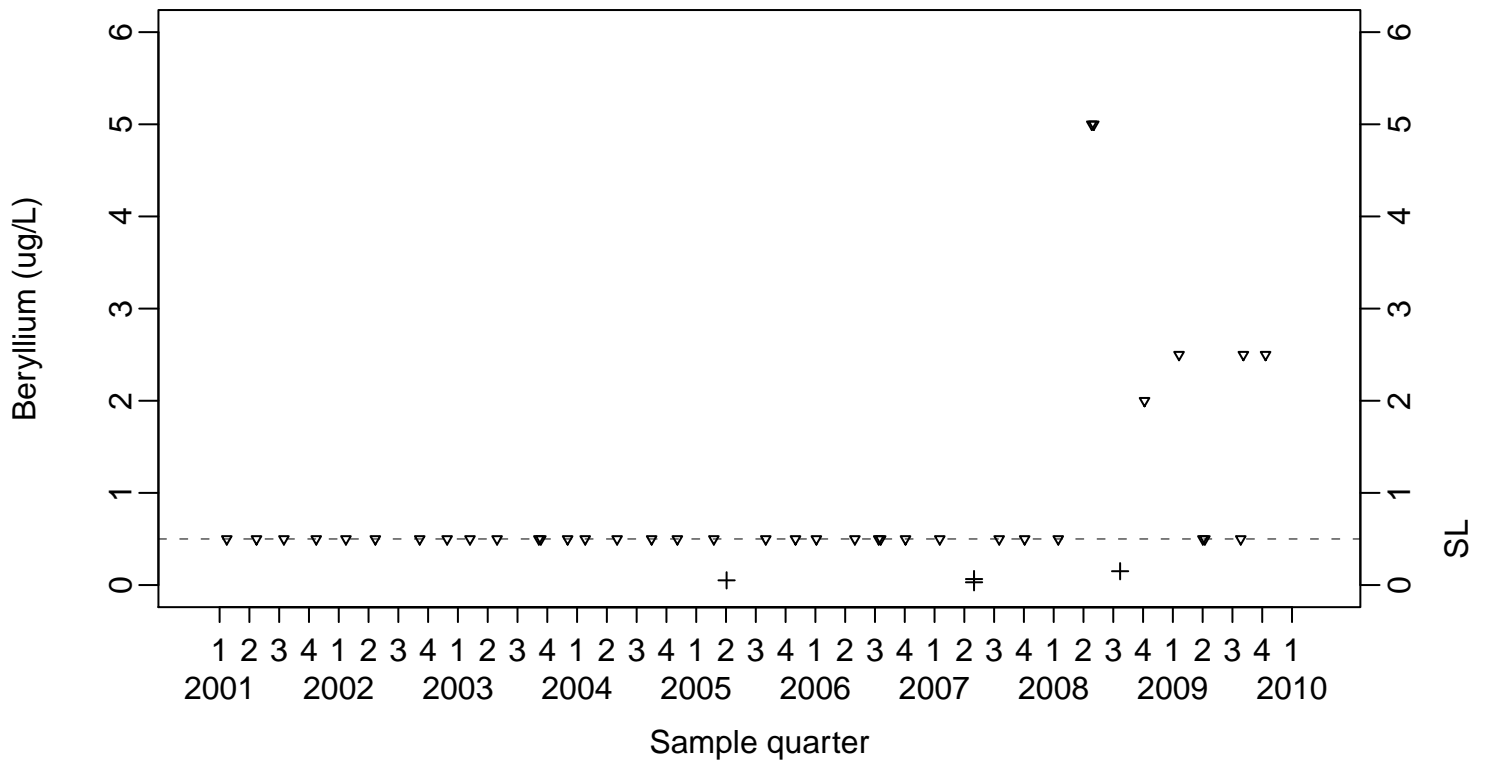
SL=0.5

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K7-09

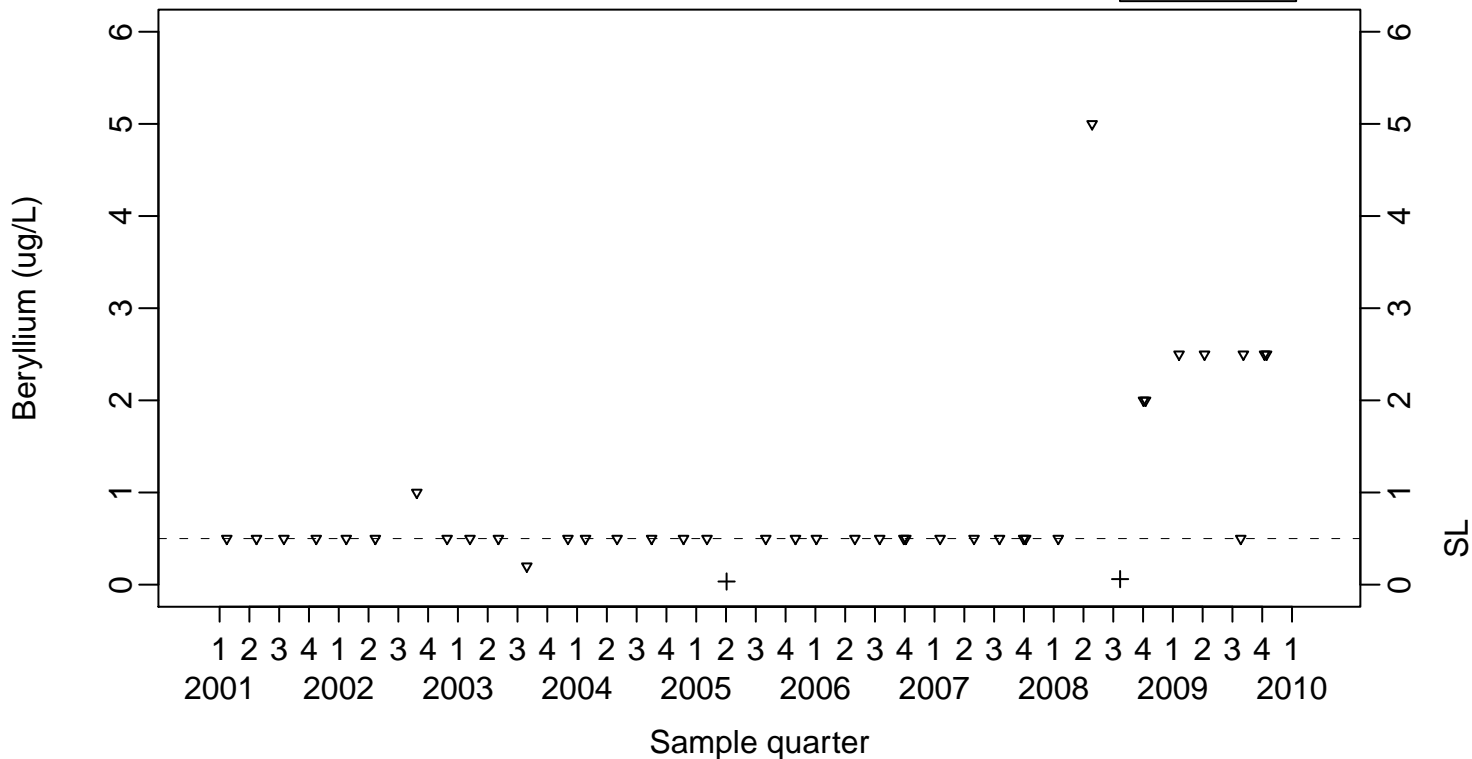


Pit 7 Complex Beryllium (ug/L)

Compliance Monitoring Point K7-10

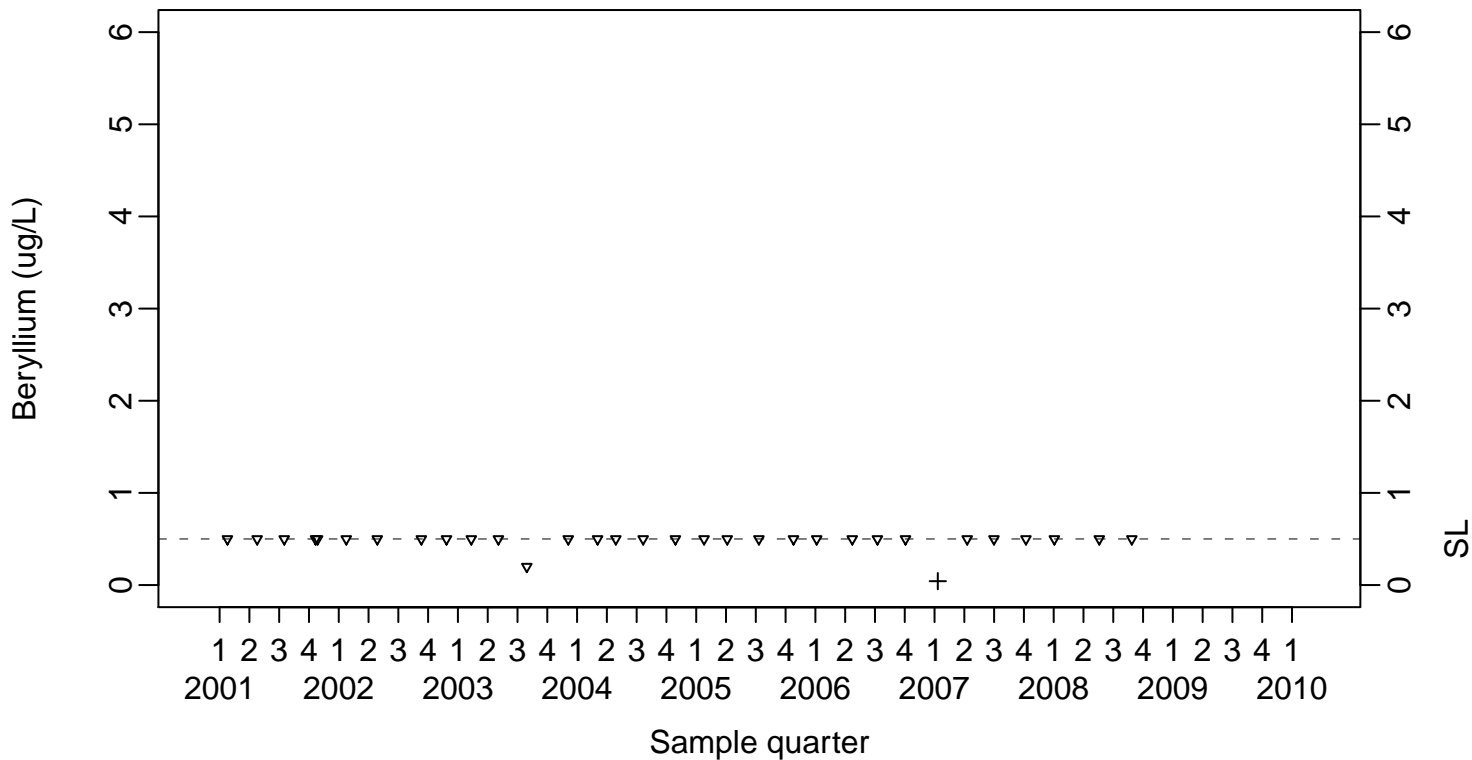
SL=0.5

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point NC7-25

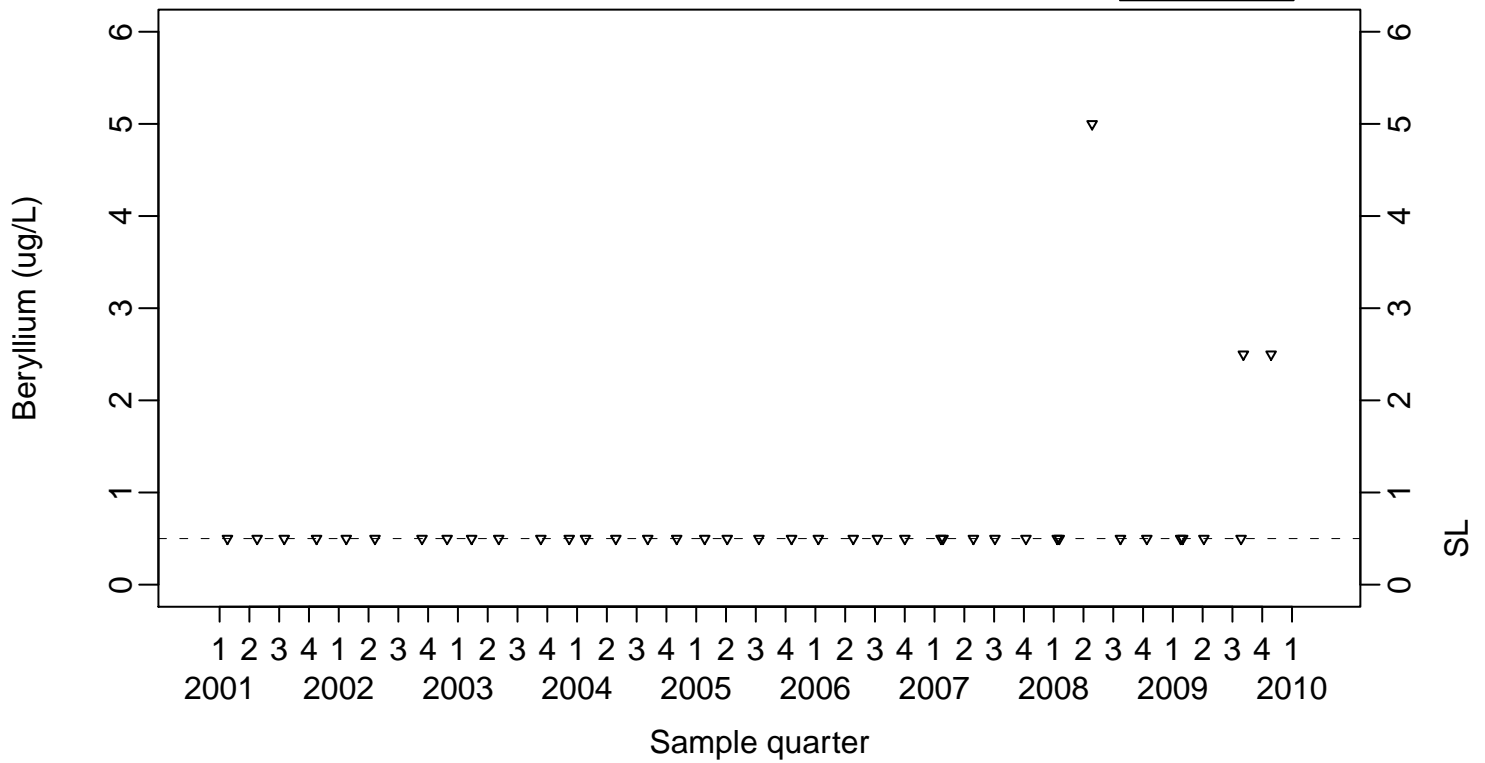


Pit 7 Complex Beryllium (ug/L)

Compliance Monitoring Point NC7-26

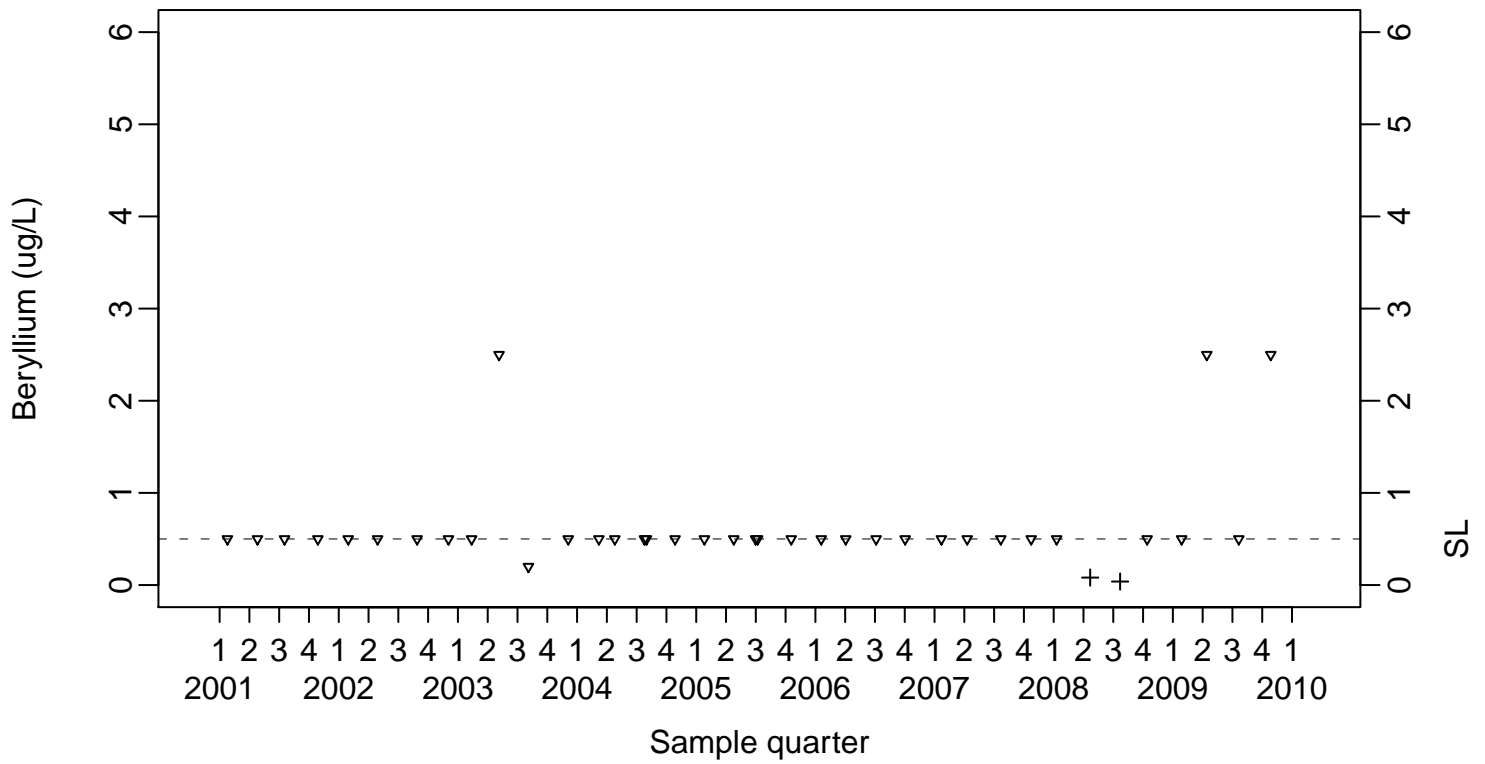
SL=0.5

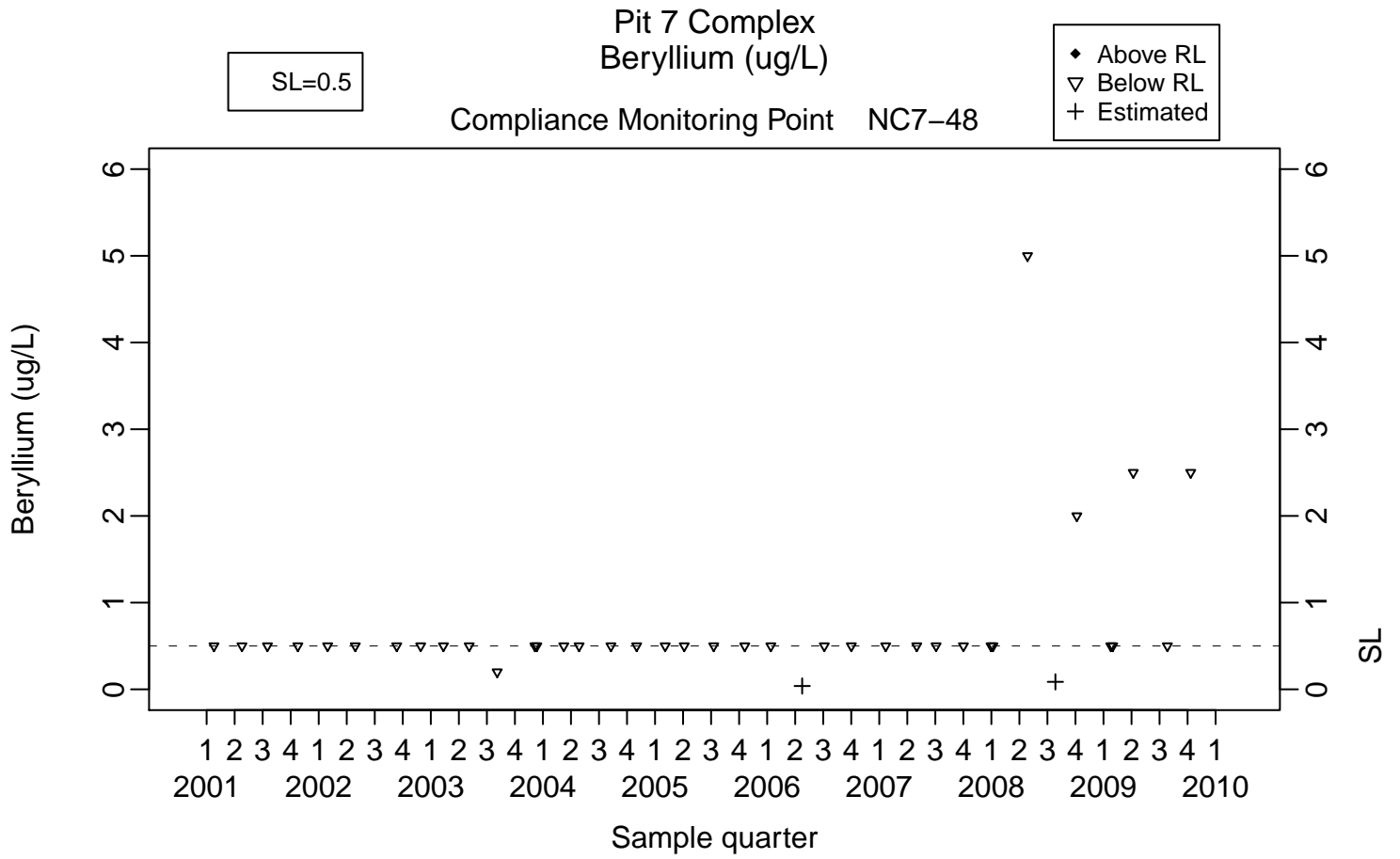
◆ Above RL
▽ Below RL

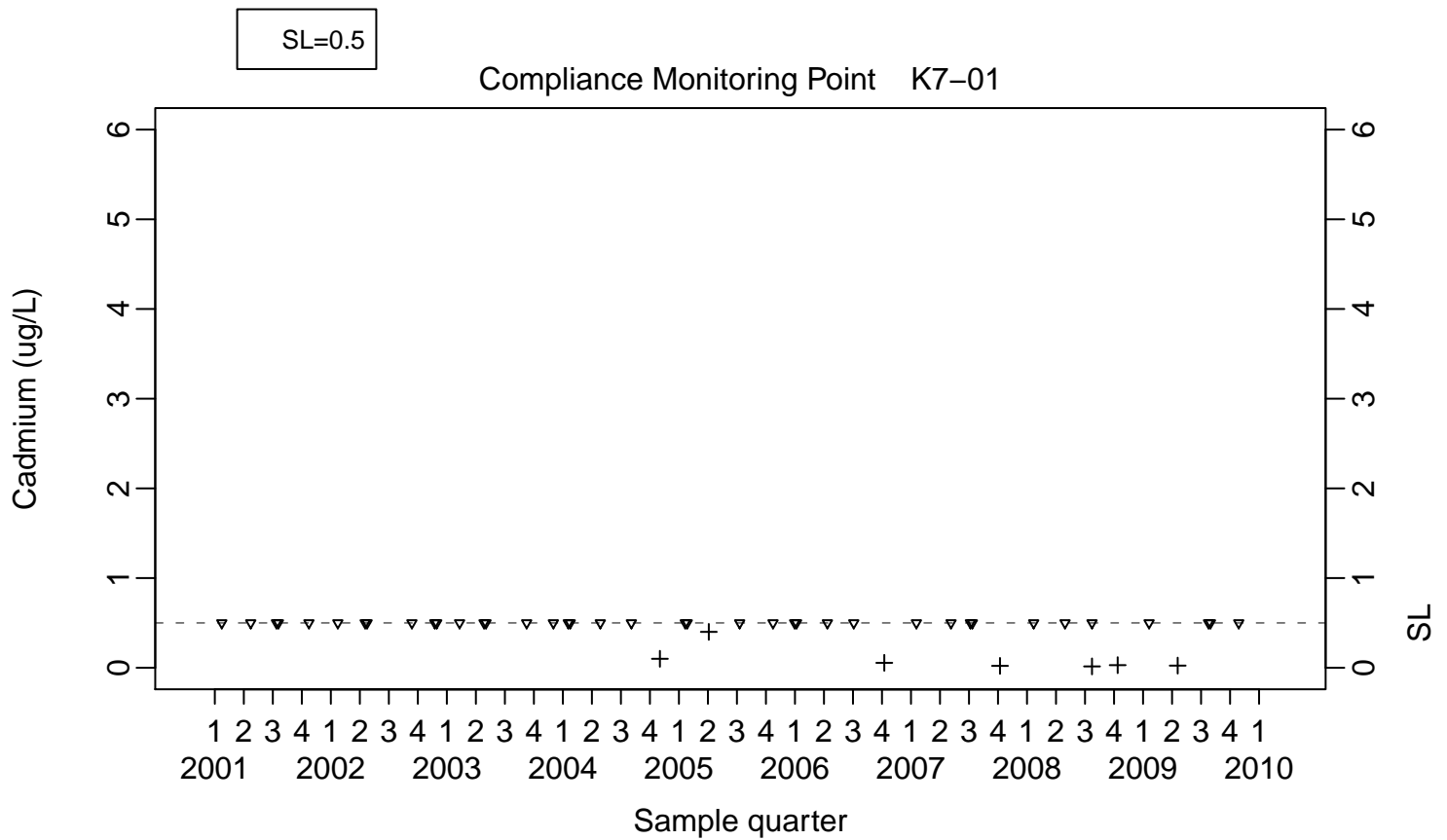
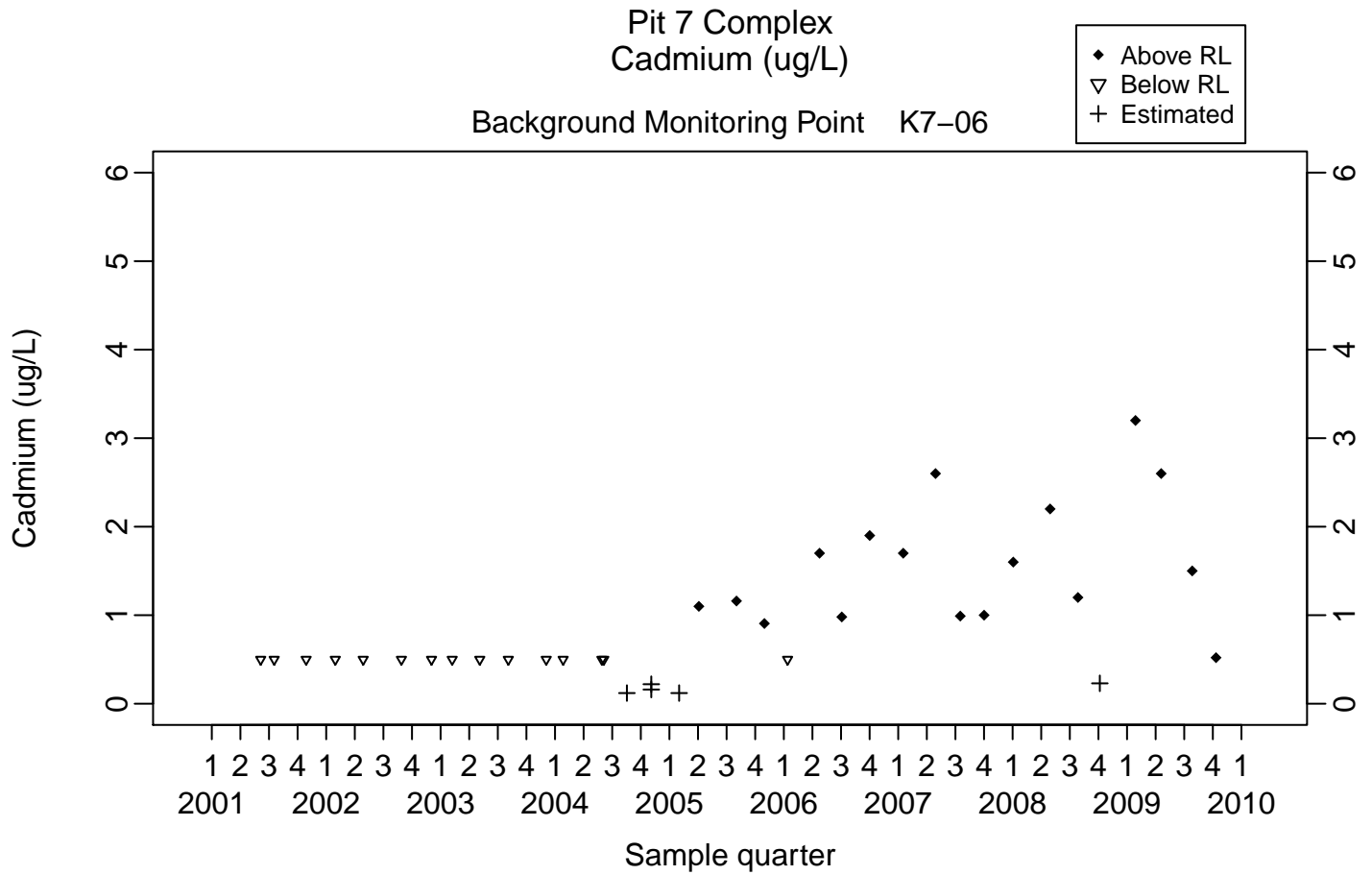


Compliance Monitoring Point NC7-47

SL=0.5





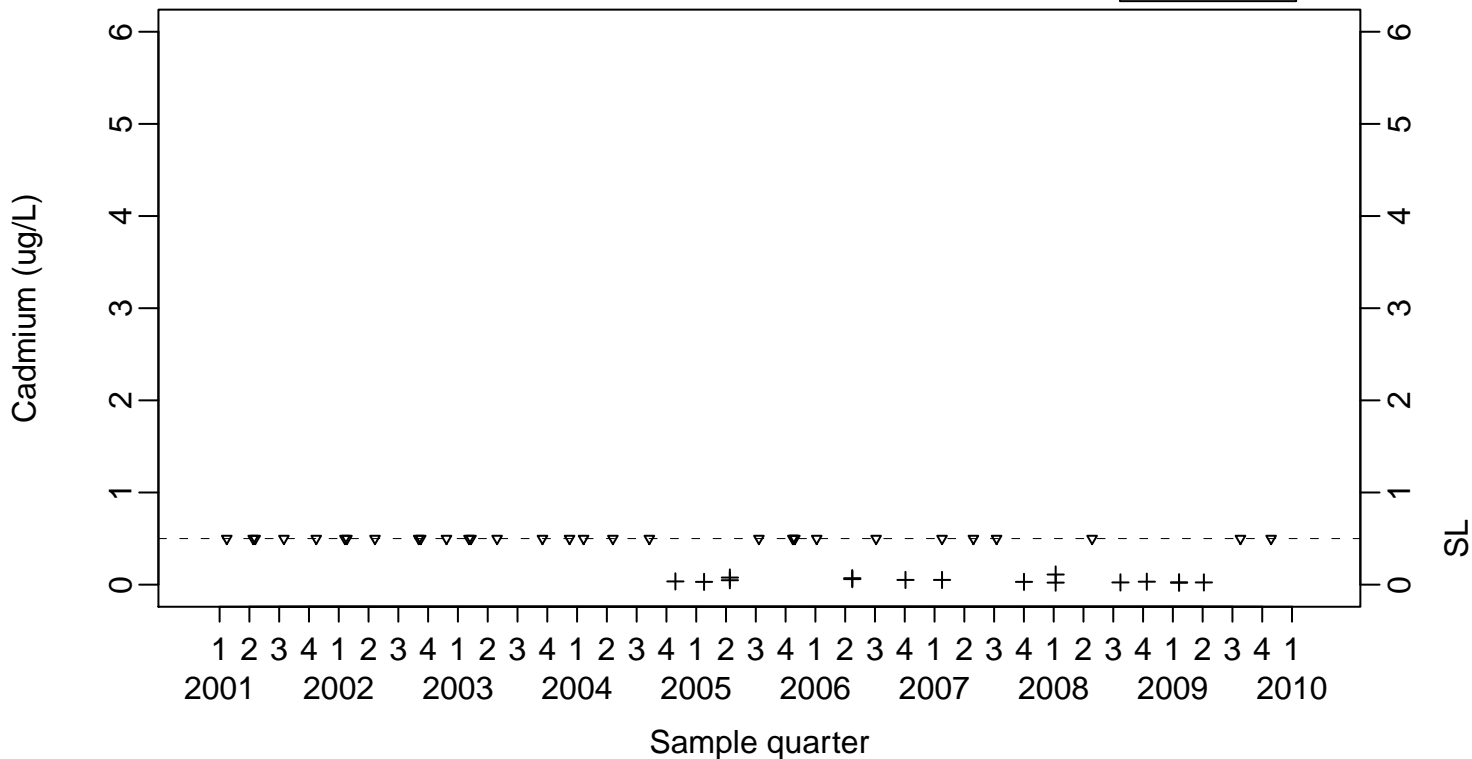


Pit 7 Complex Cadmium (ug/L)

Compliance Monitoring Point K7-03

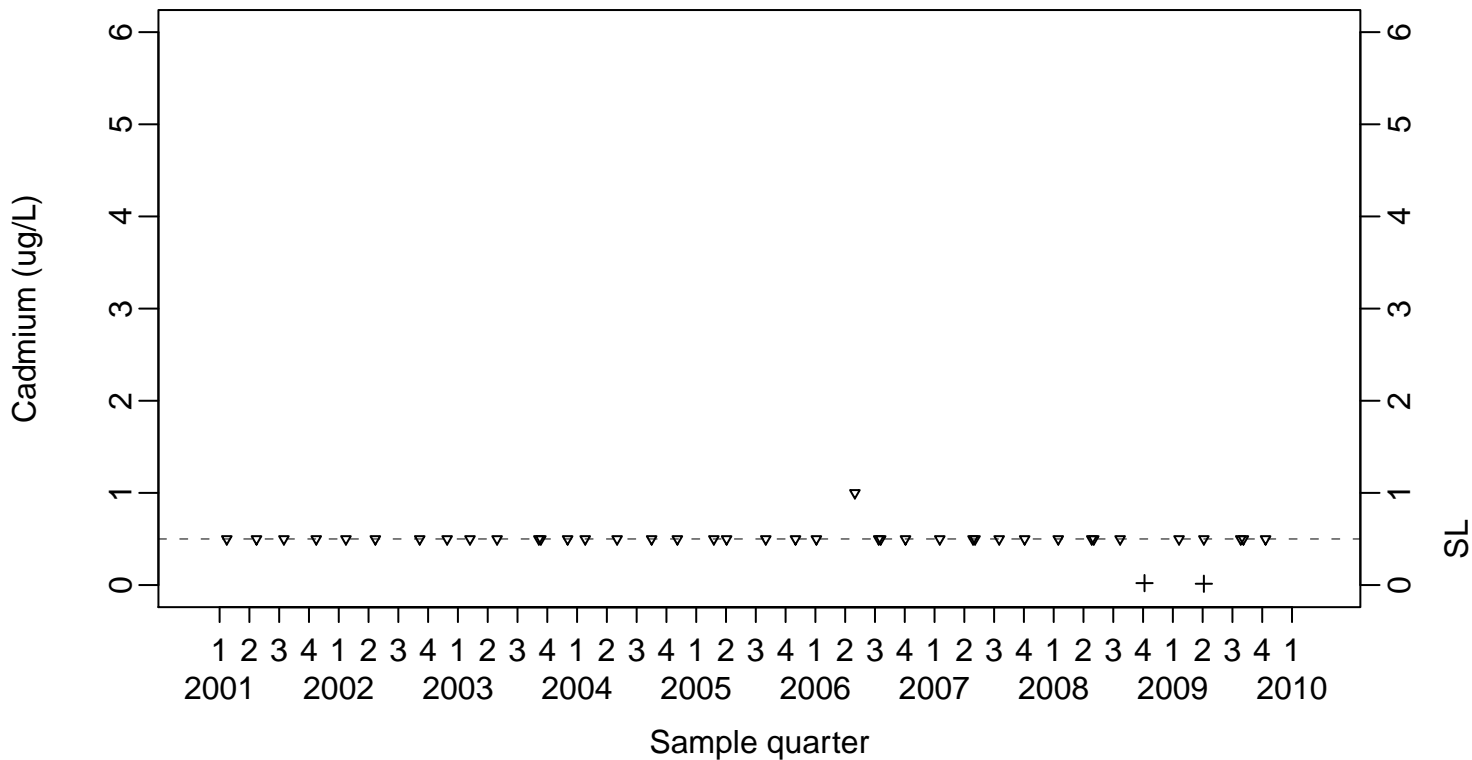
SL=0.5

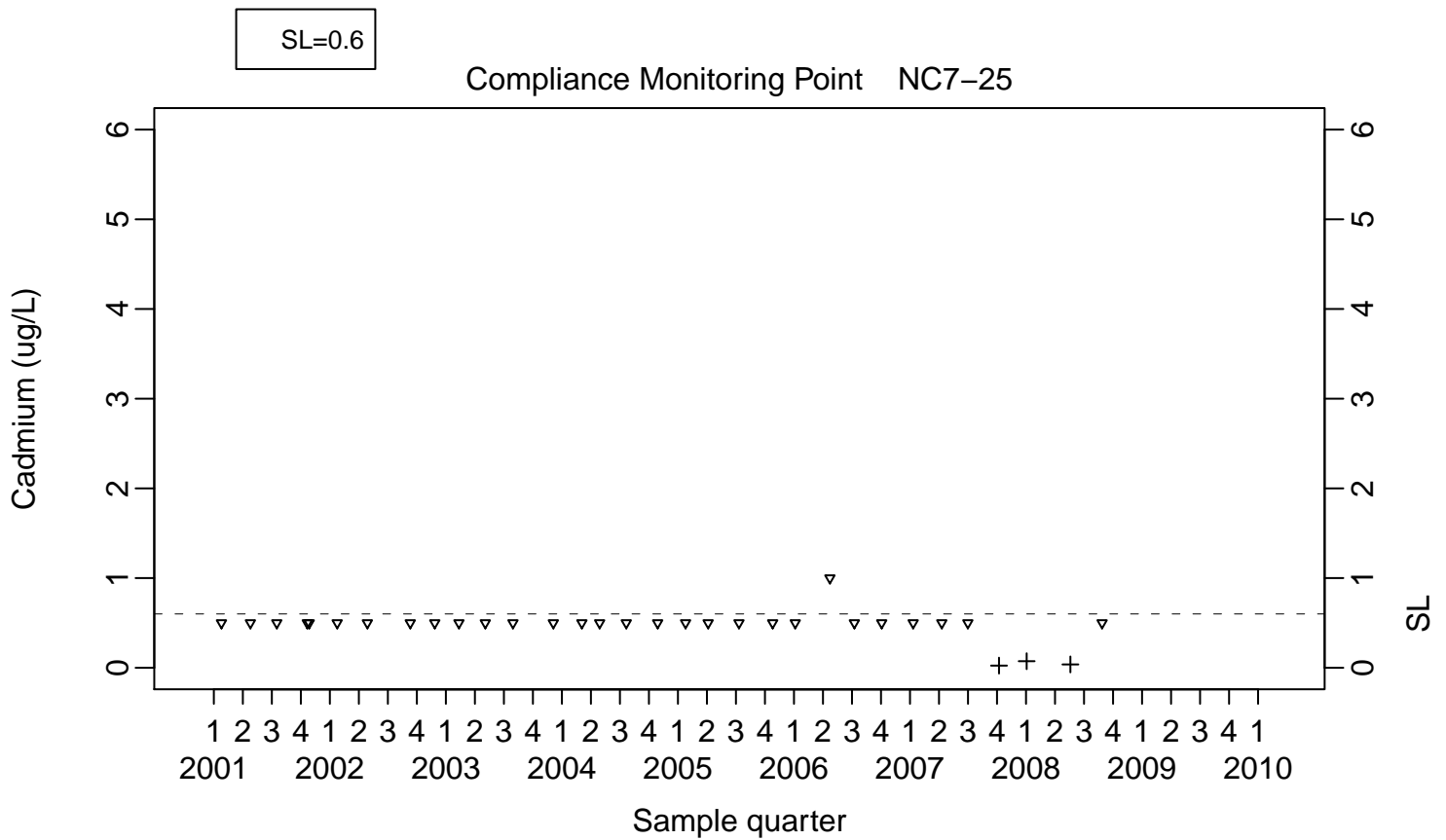
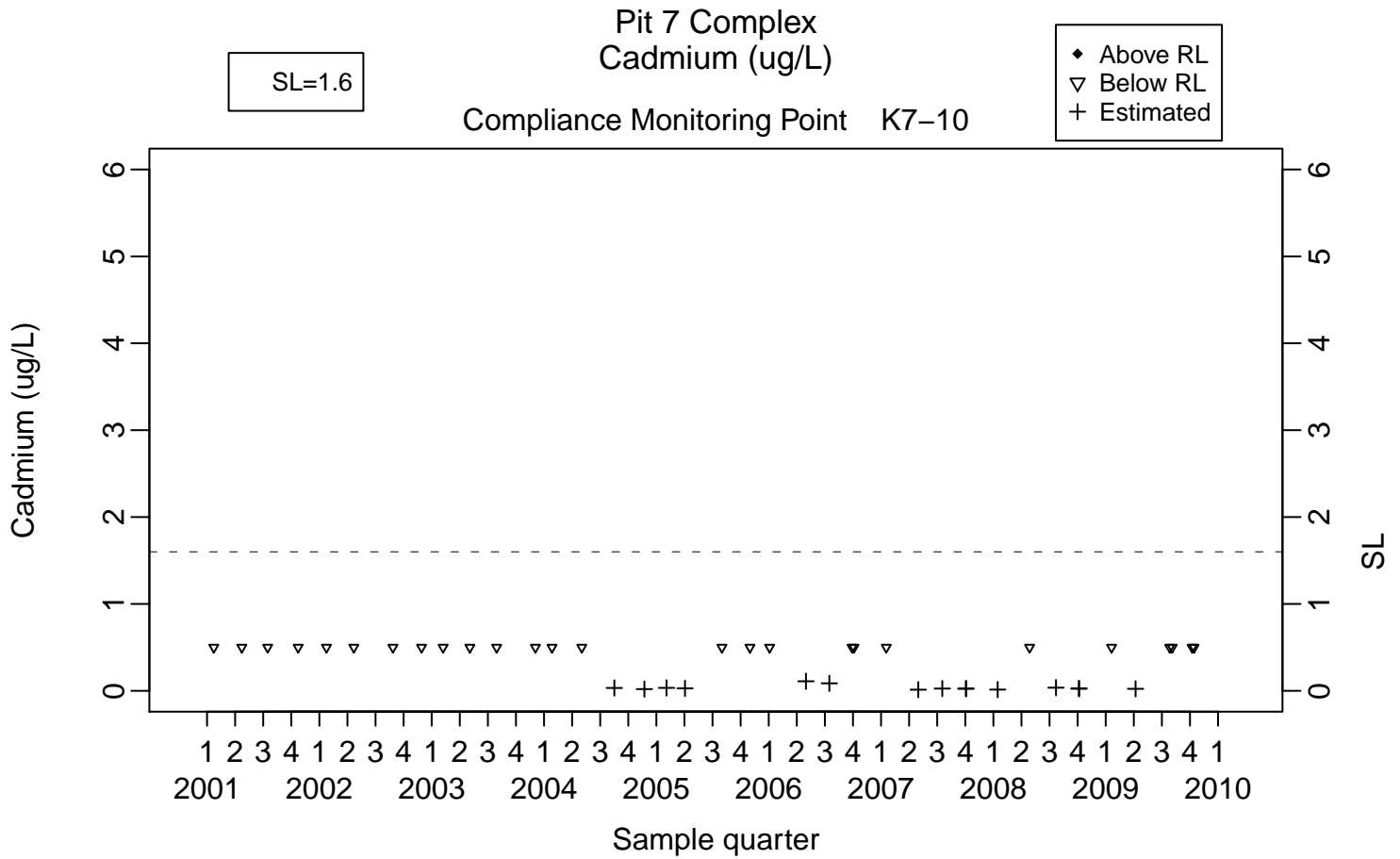
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point K7-09



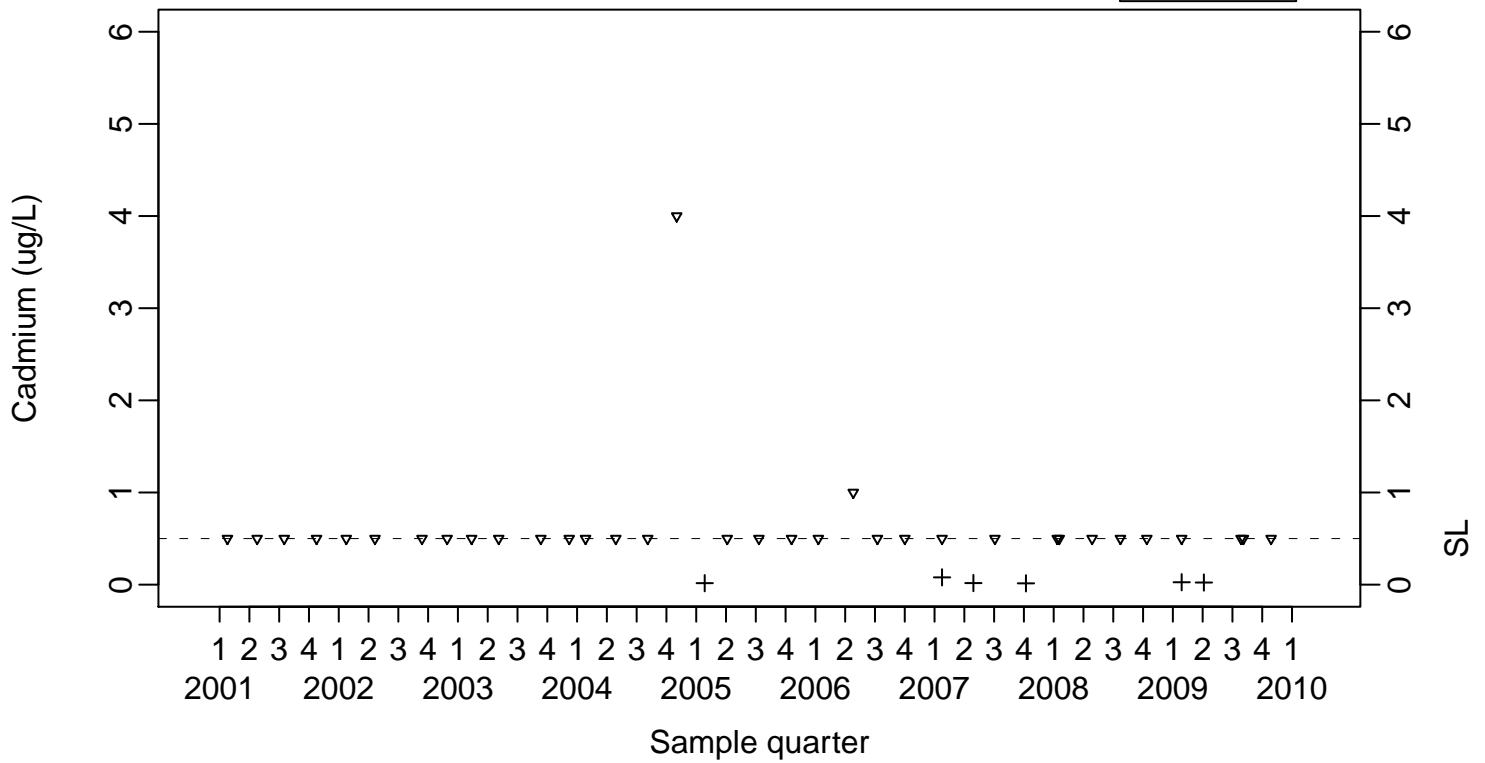


Pit 7 Complex Cadmium (ug/L)

Compliance Monitoring Point NC7-26

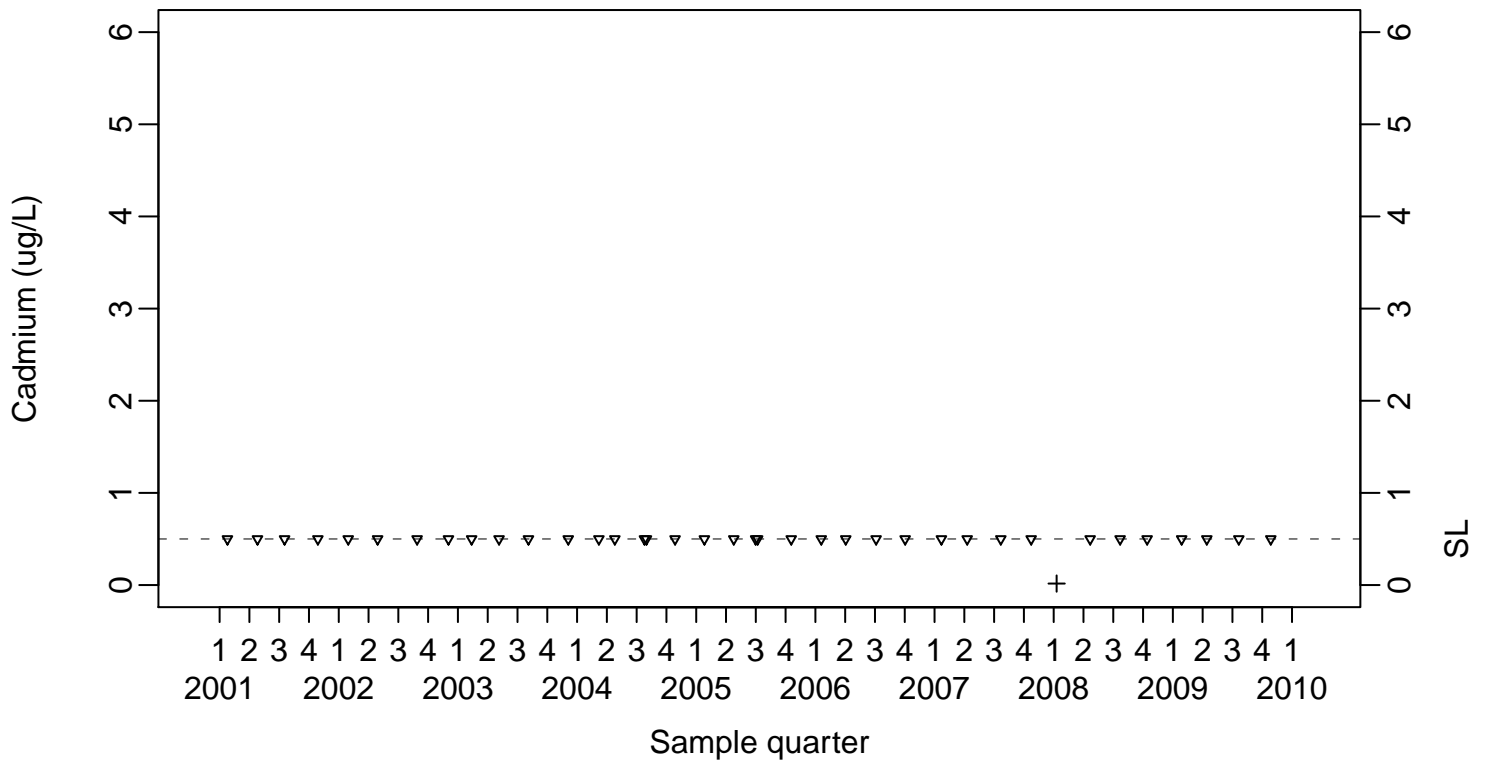
SL=0.5

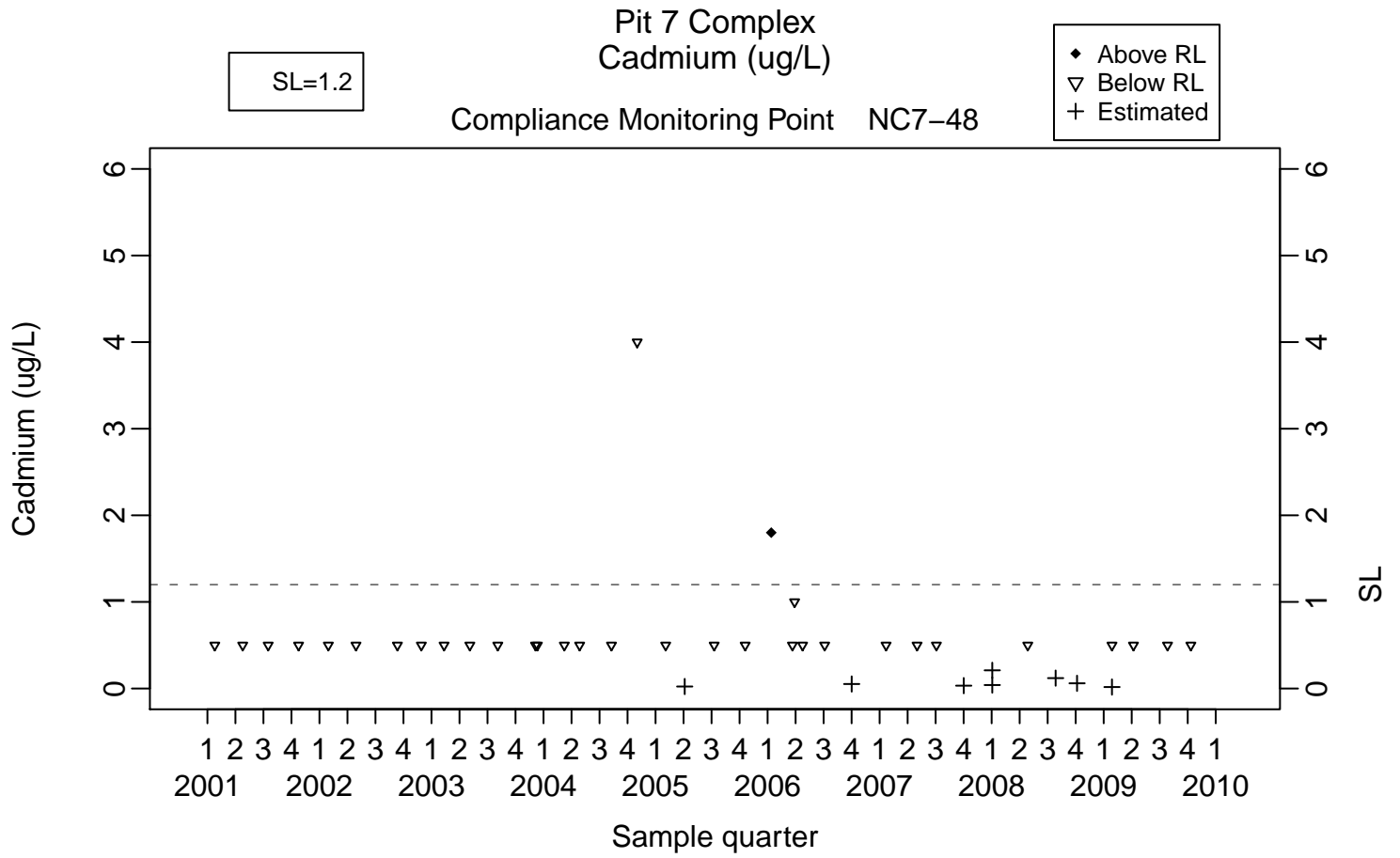
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.5

Compliance Monitoring Point NC7-47

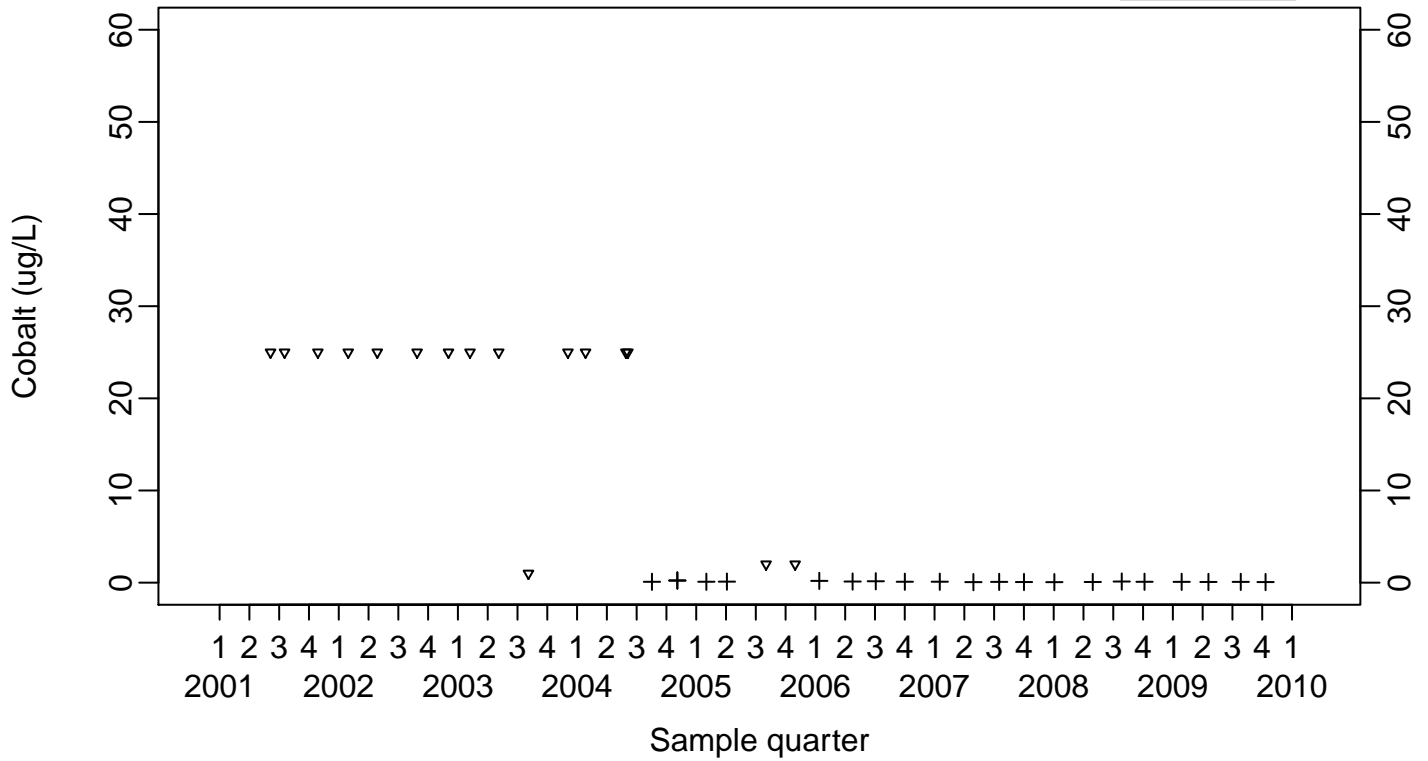




Pit 7 Complex
Cobalt (ug/L)

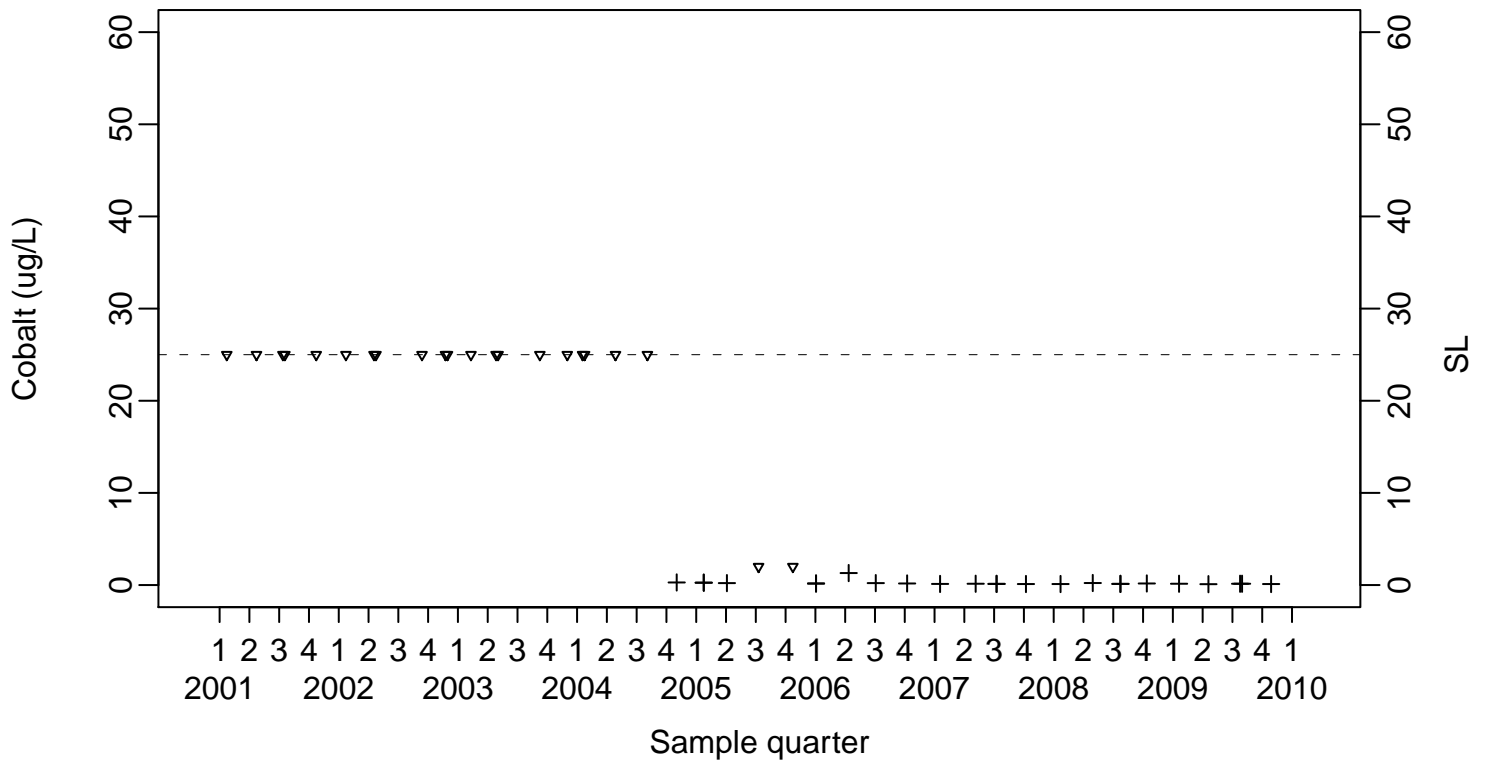
Background Monitoring Point K7-06

◆ Above RL
▽ Below RL
+ Estimated



SL=25

Compliance Monitoring Point K7-01

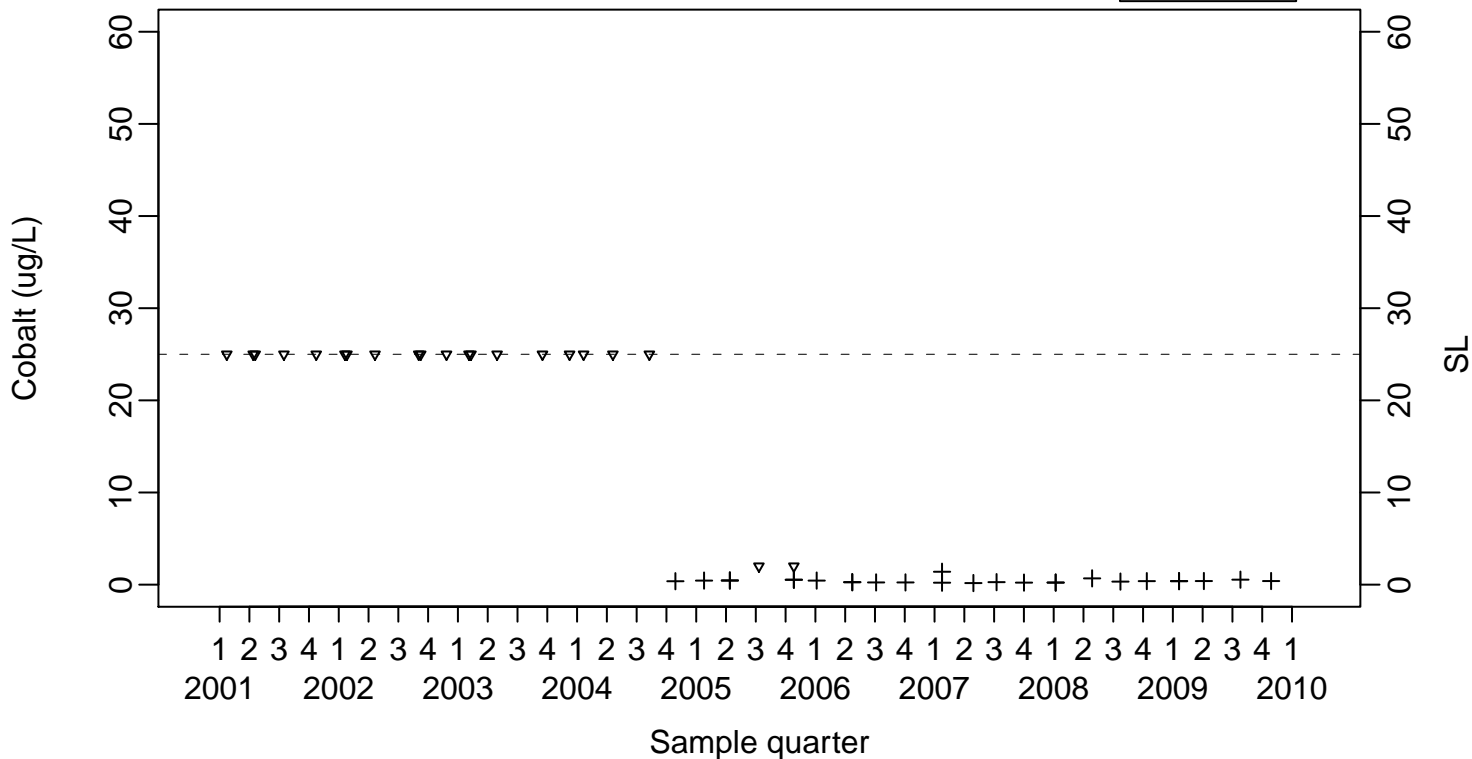


Pit 7 Complex Cobalt (ug/L)

Compliance Monitoring Point K7-03

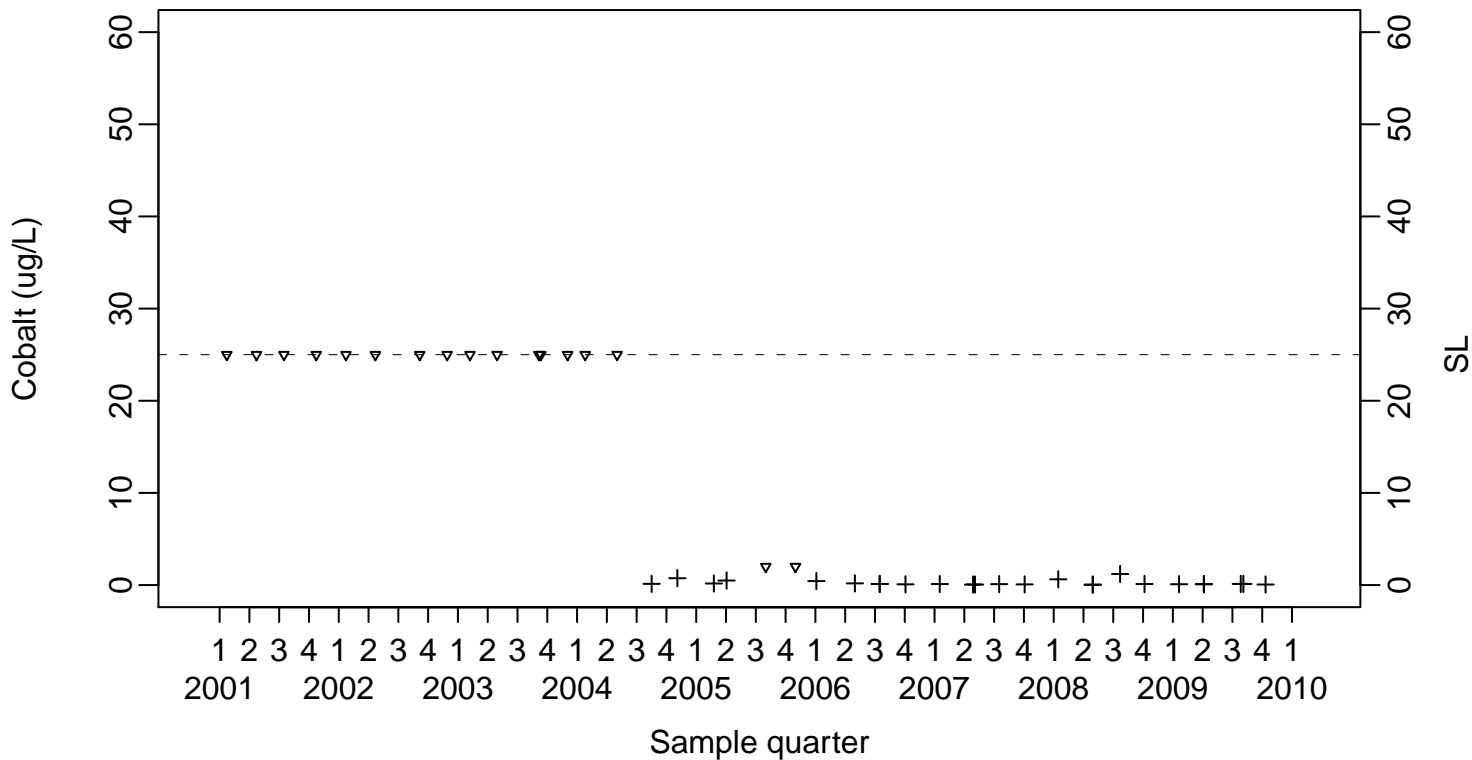
SL=25

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=25

Compliance Monitoring Point K7-09

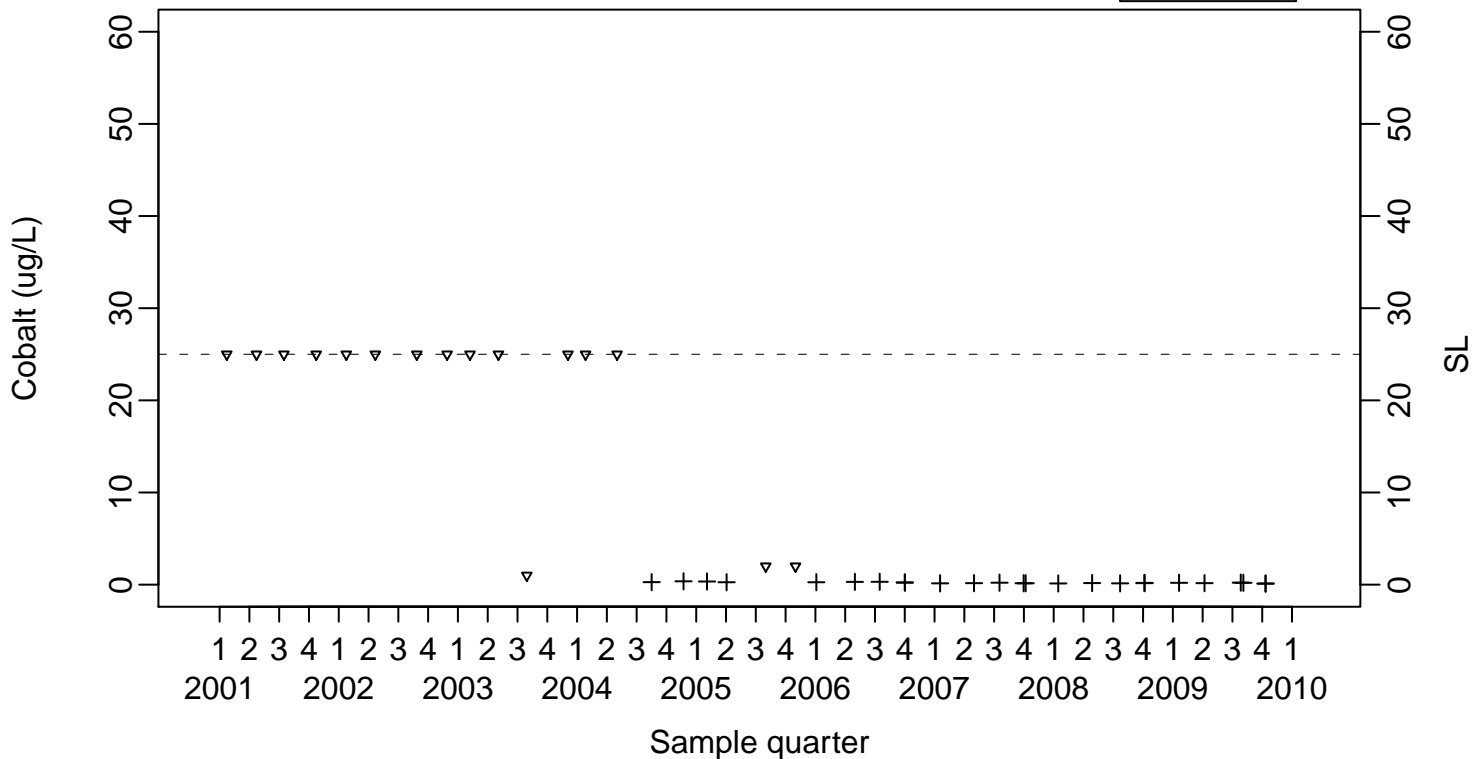


Pit 7 Complex Cobalt (ug/L)

Compliance Monitoring Point K7-10

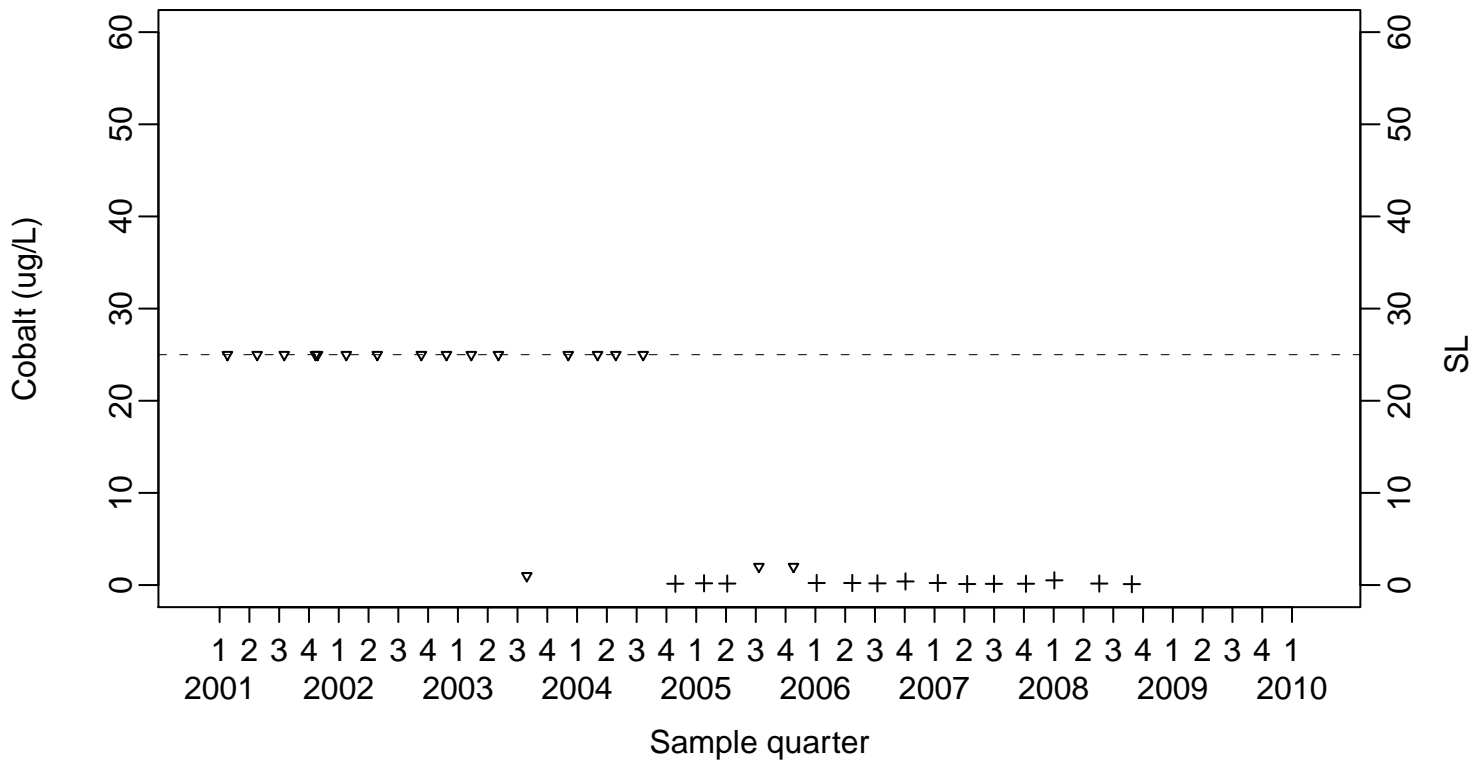
SL=25

- ◆ Above RL
- ▽ Below RL
- + Estimated



Compliance Monitoring Point NC7-25

SL=25

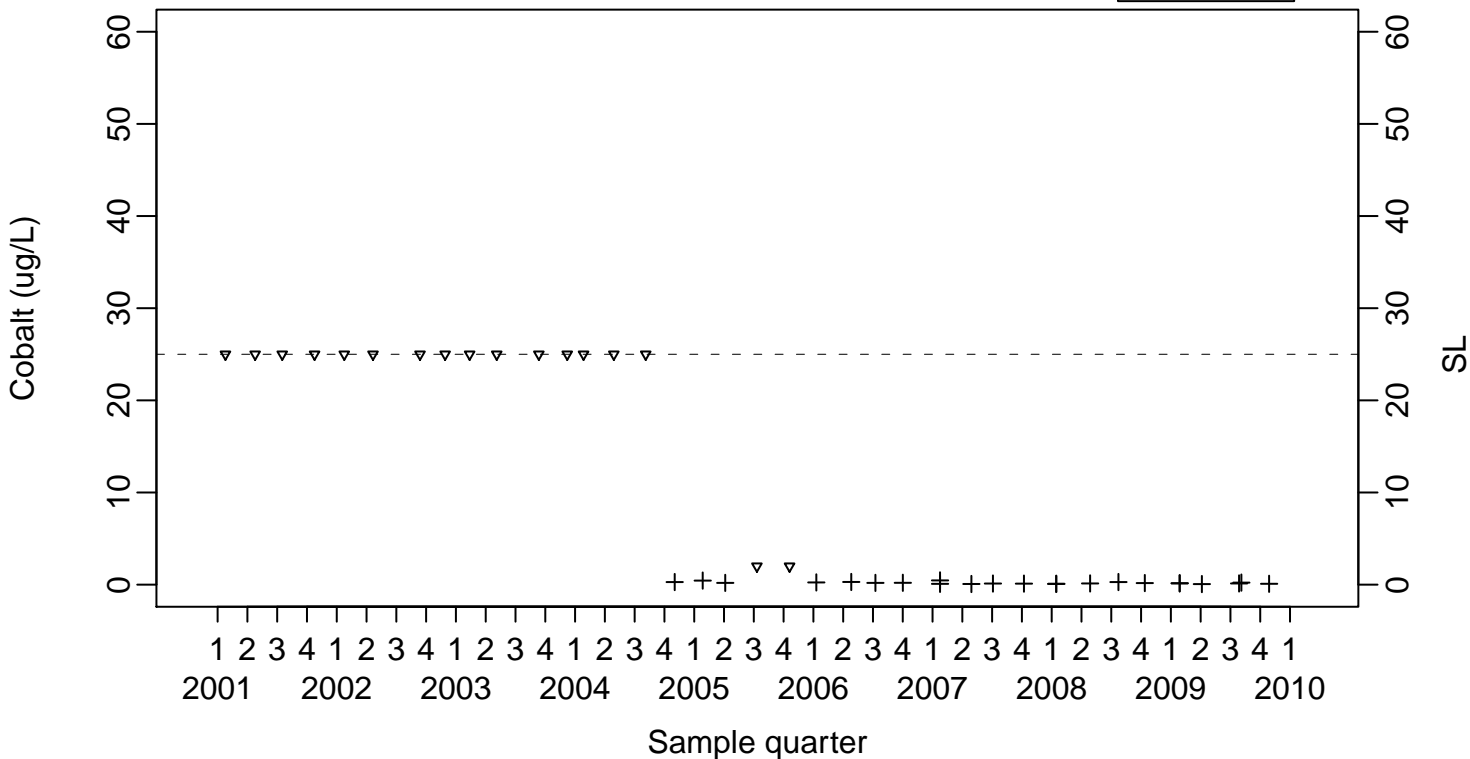


Pit 7 Complex
Cobalt (ug/L)

Compliance Monitoring Point NC7-26

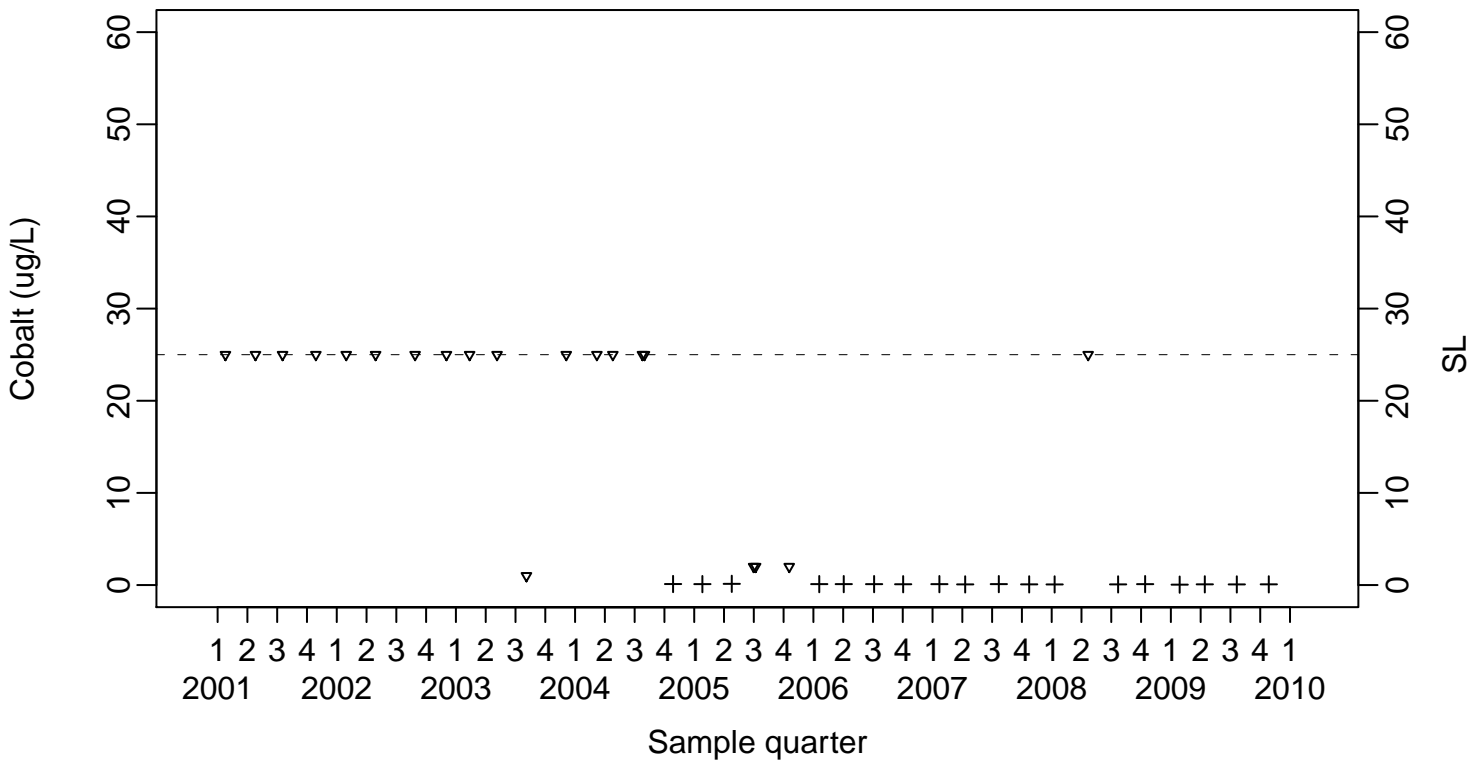
SL=25

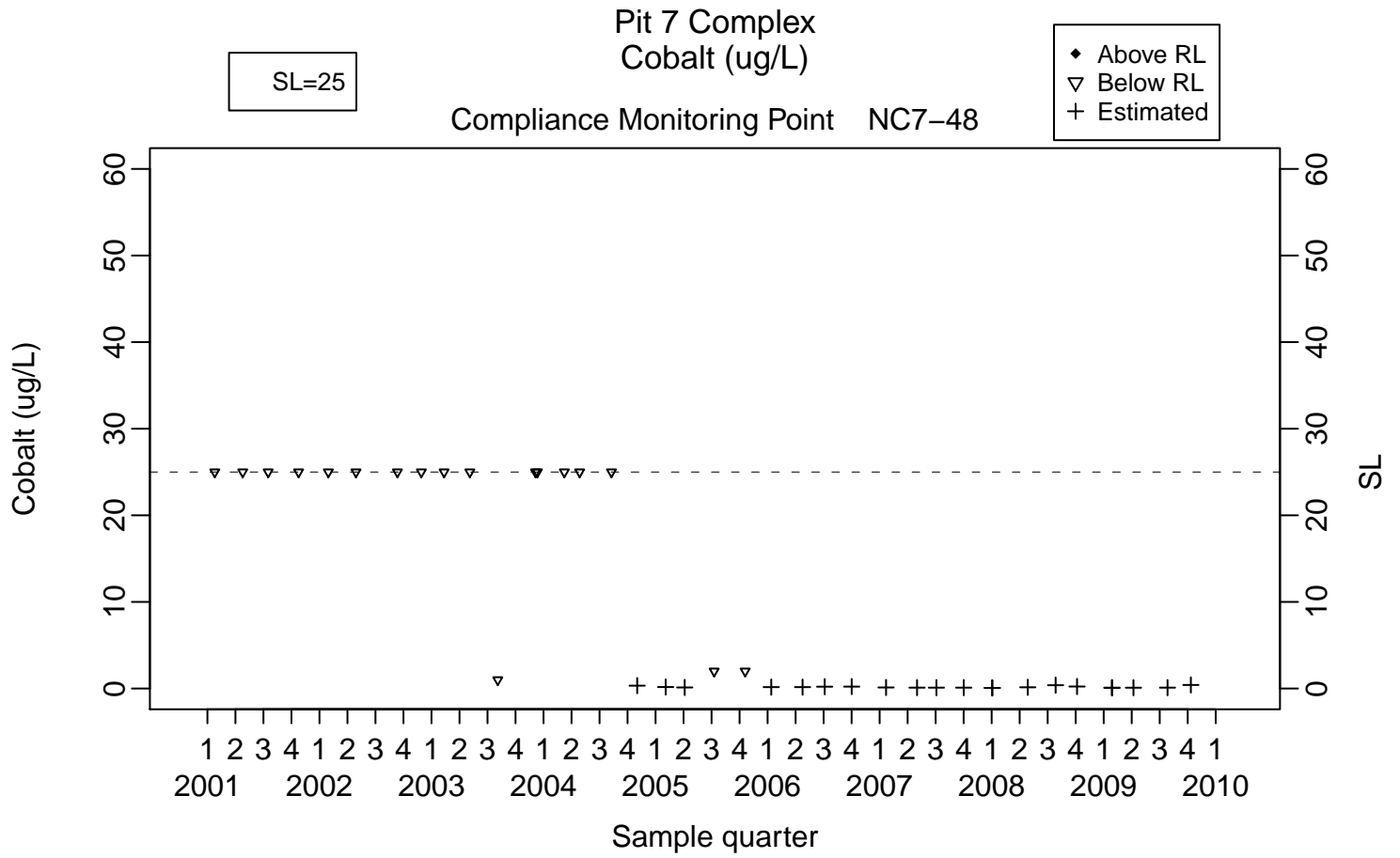
- ◆ Above RL
- ▽ Below RL
- + Estimated

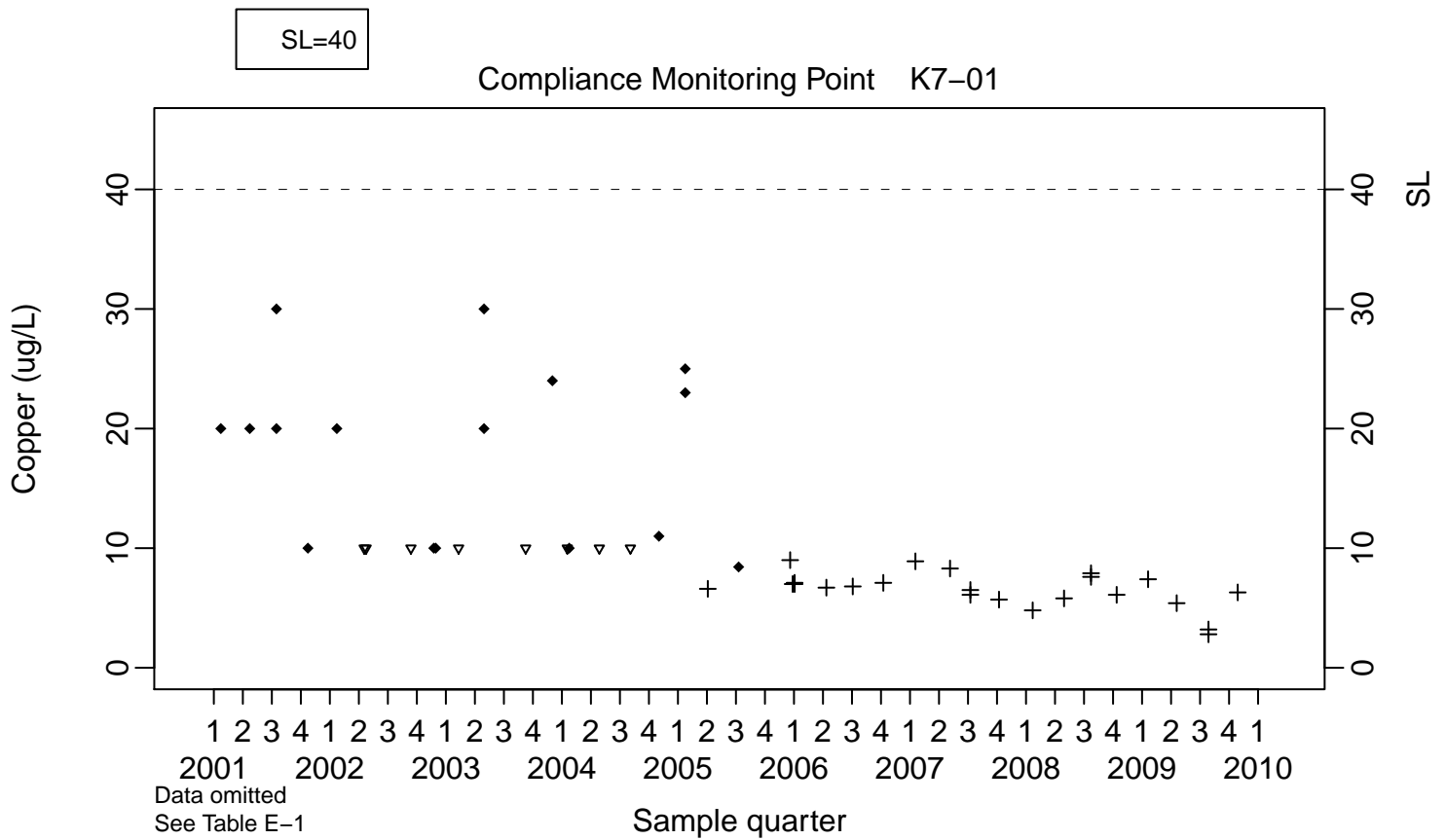
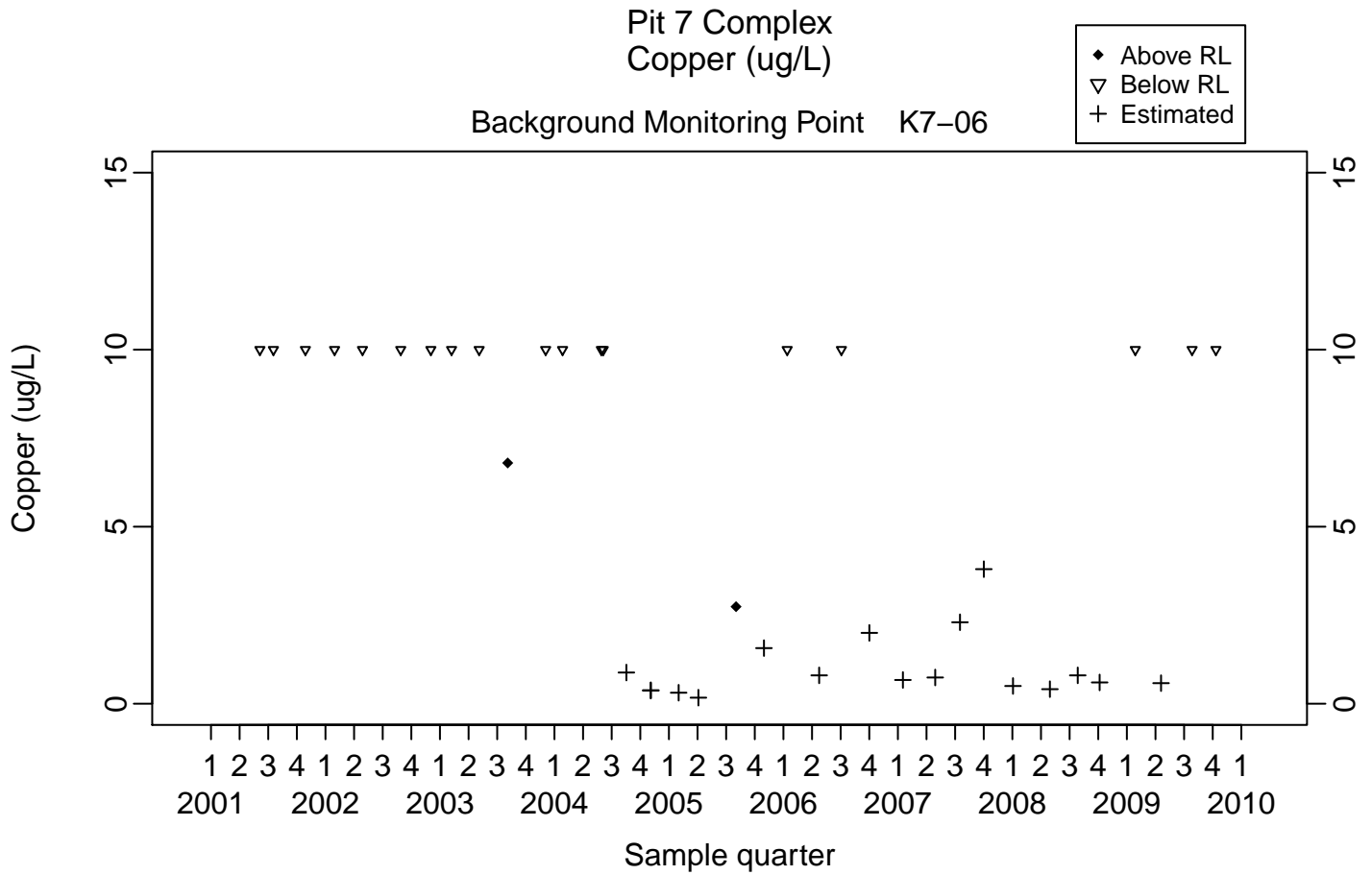


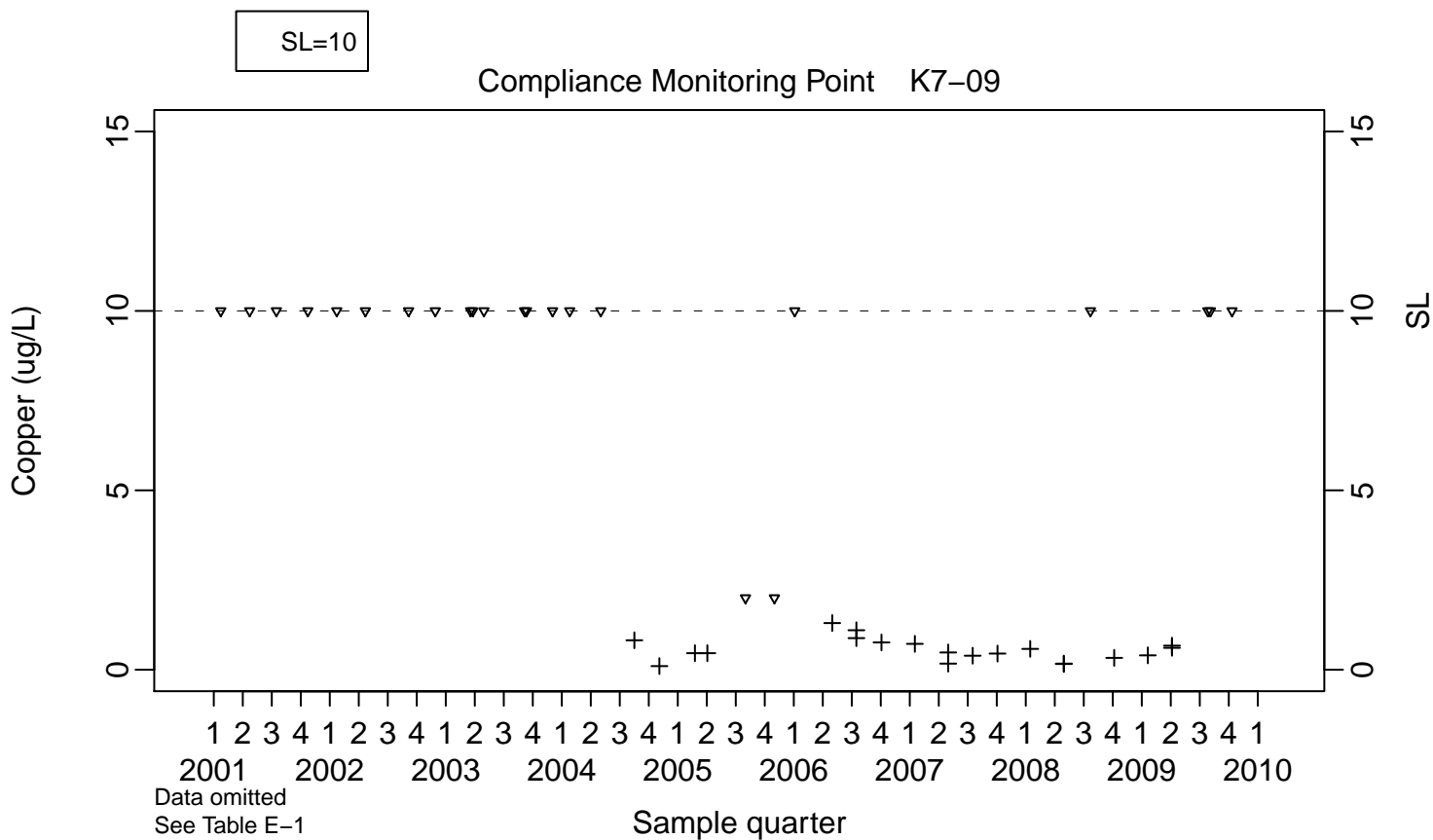
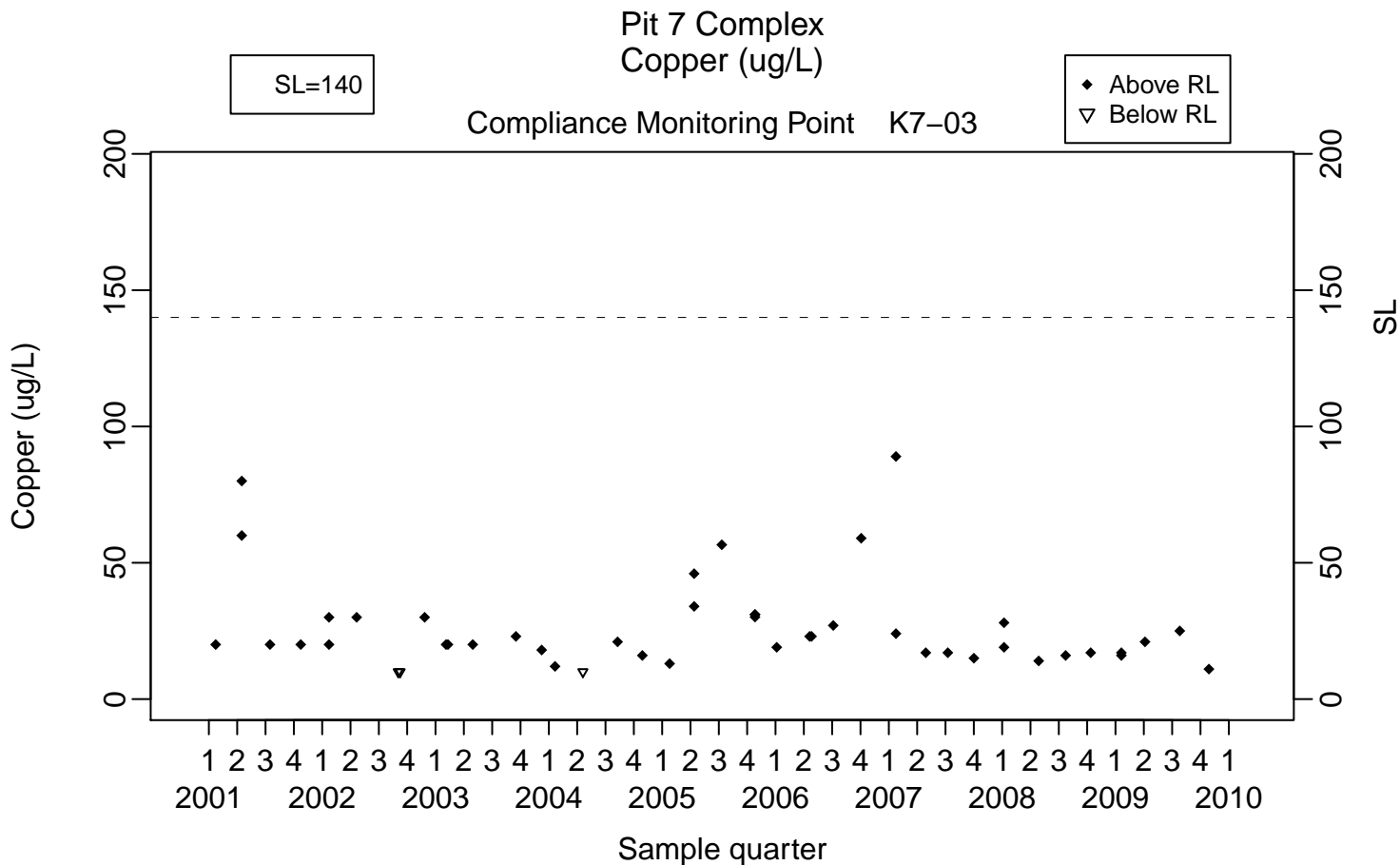
SL=25

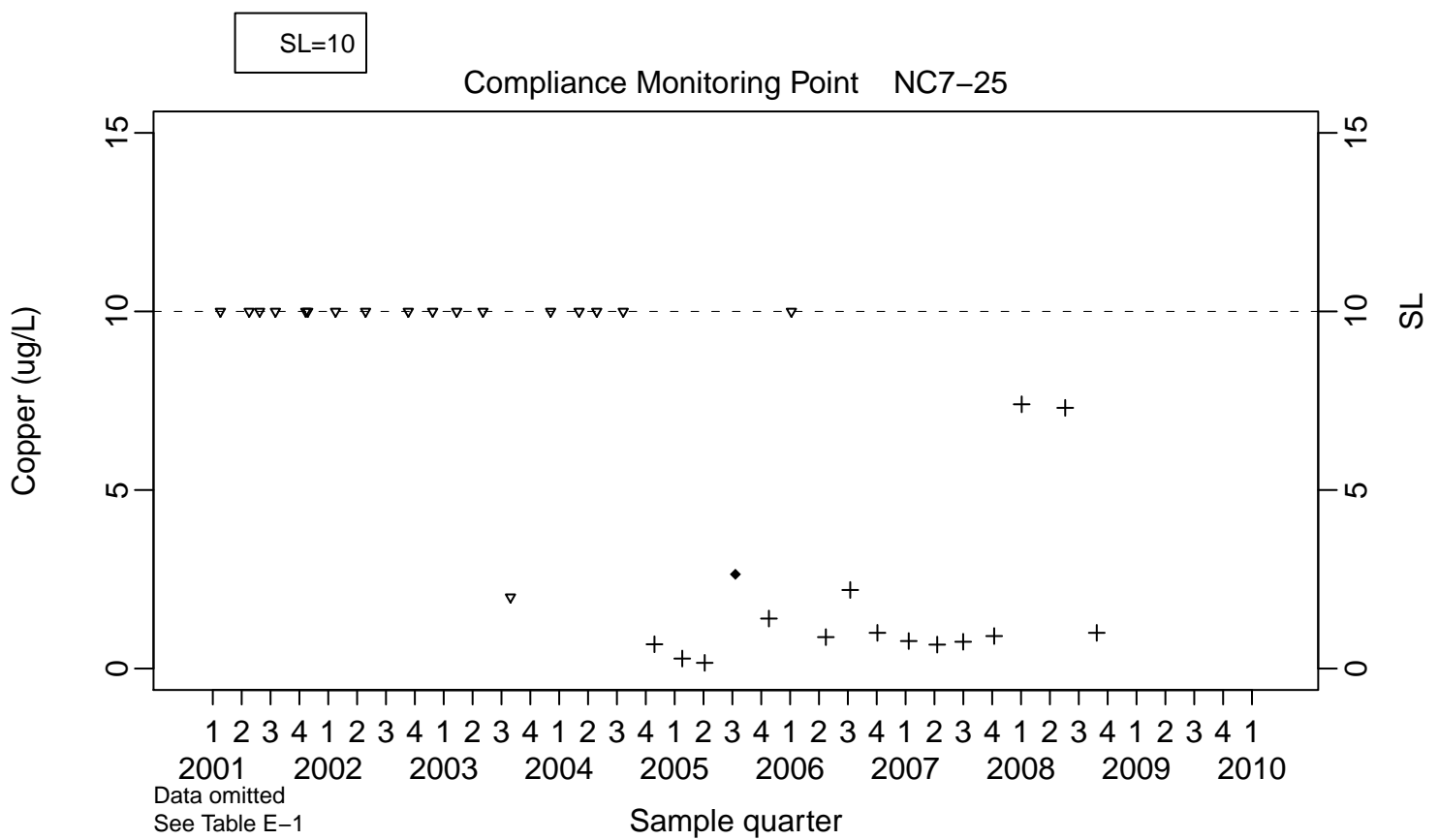
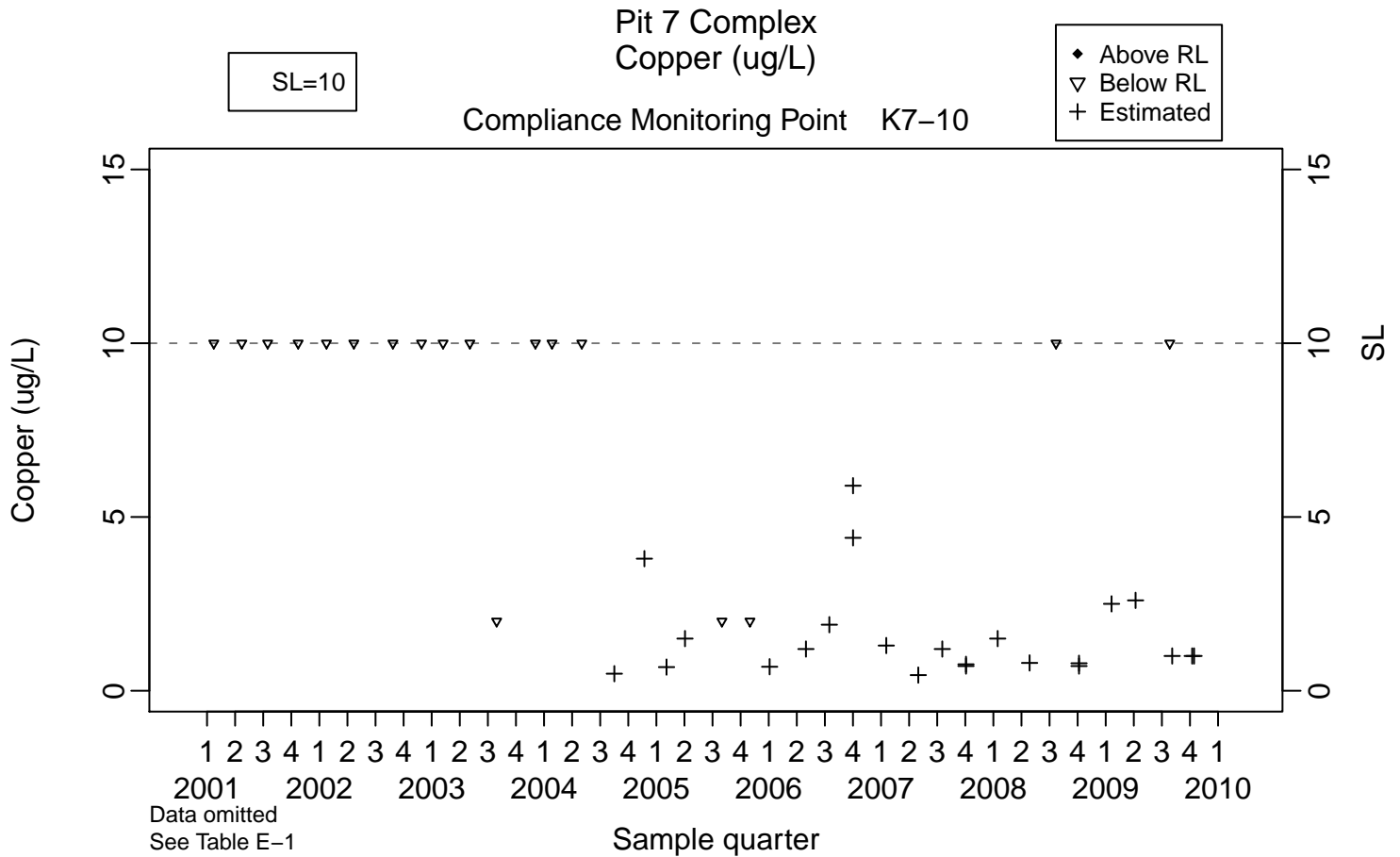
Compliance Monitoring Point NC7-47

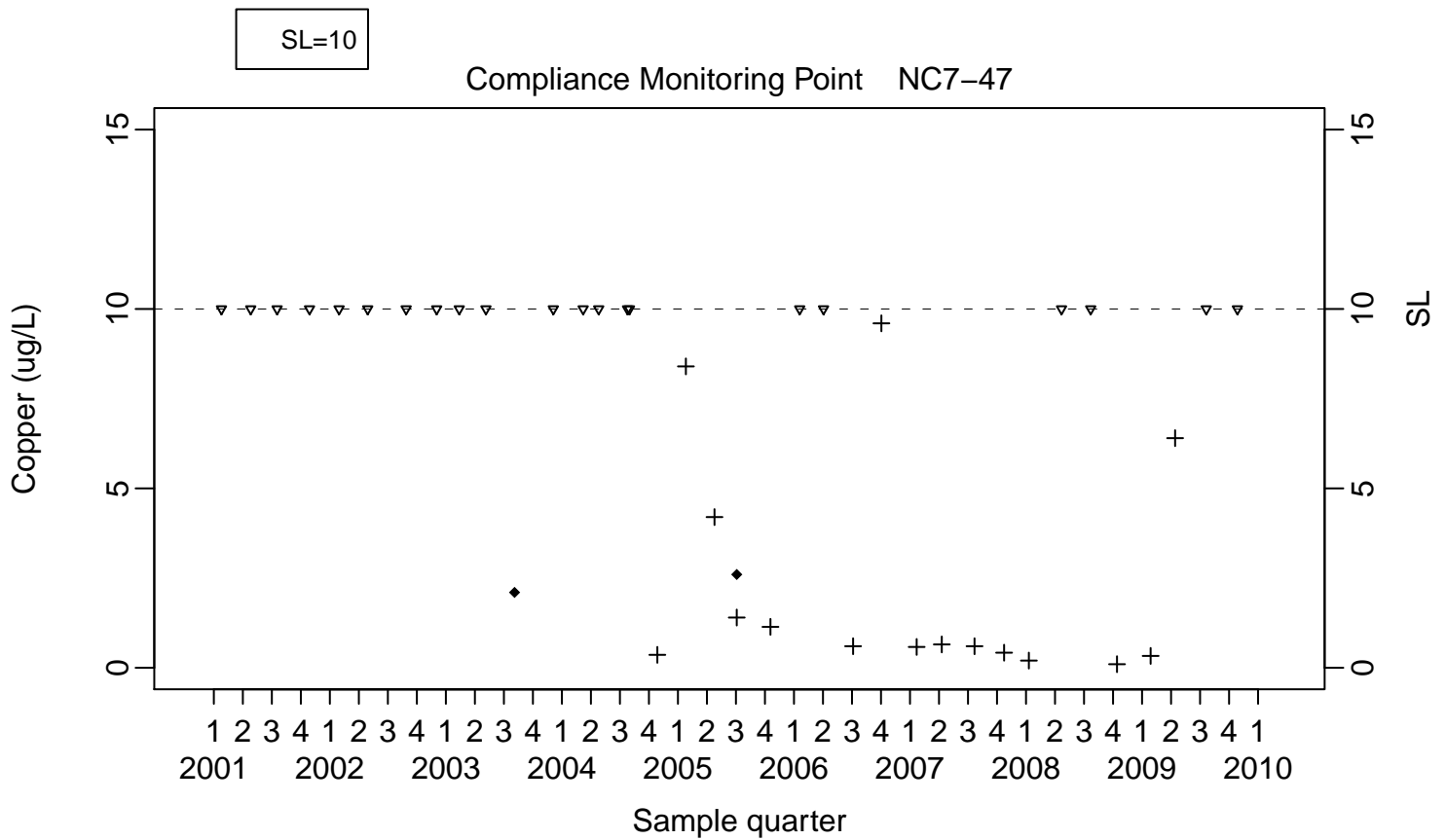
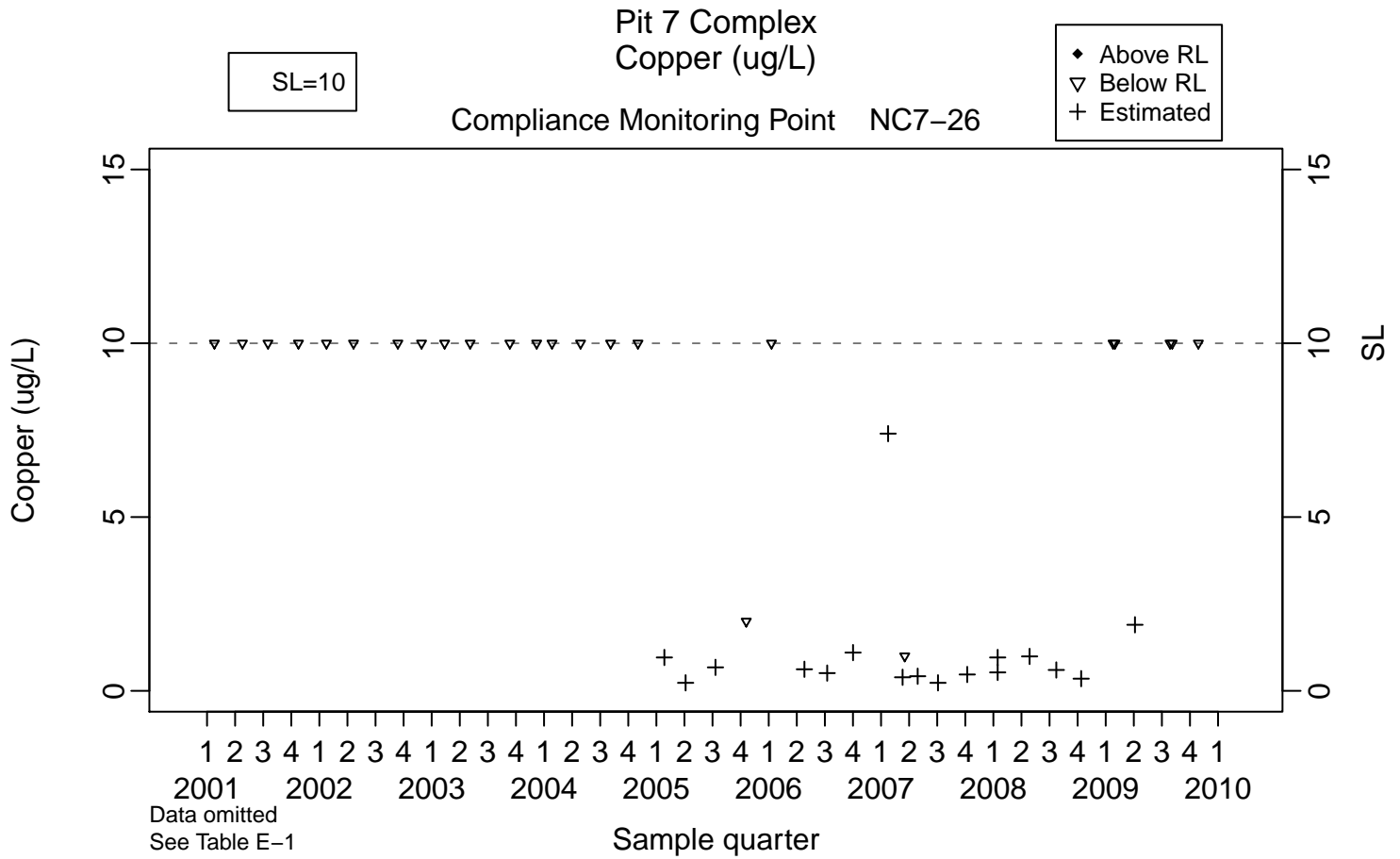


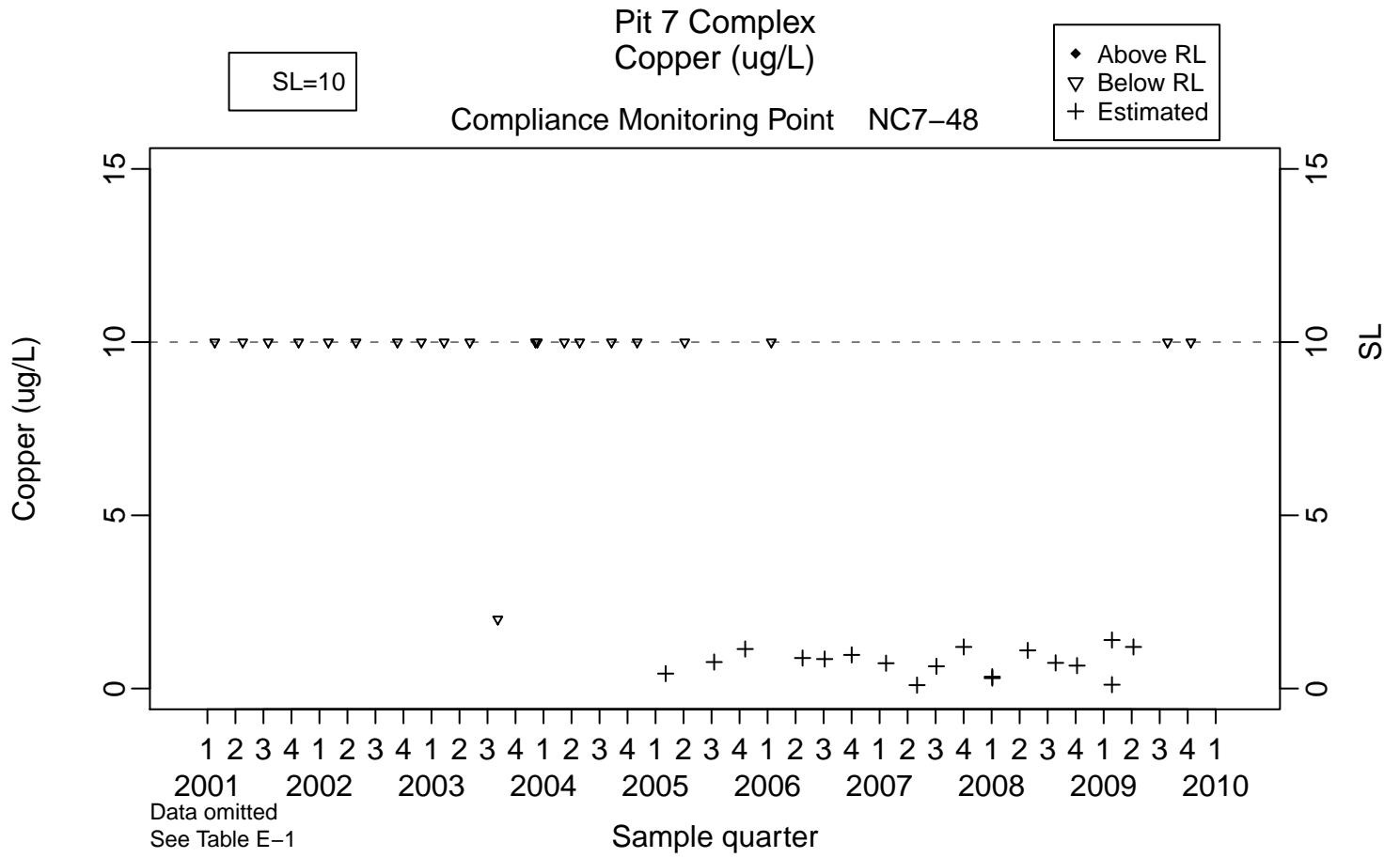








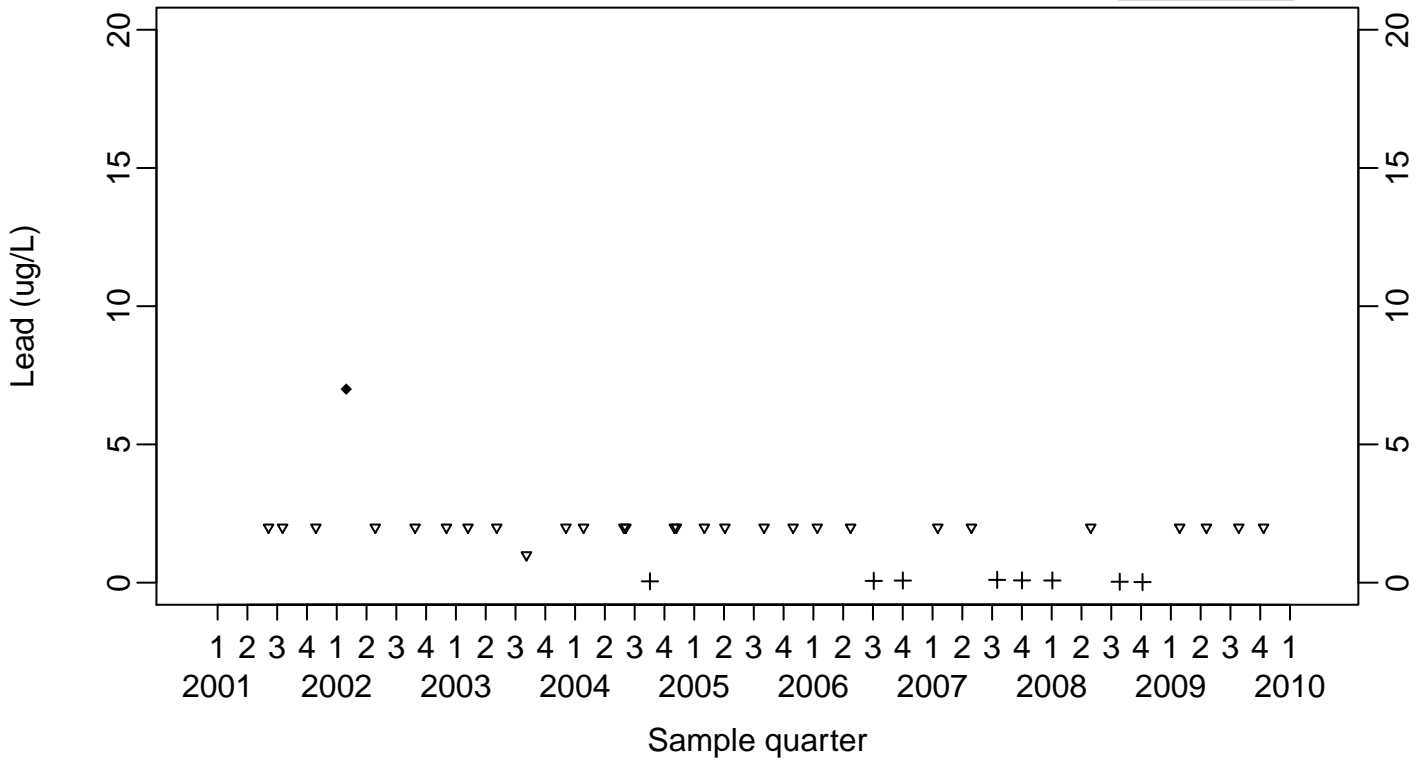




Pit 7 Complex
Lead (ug/L)

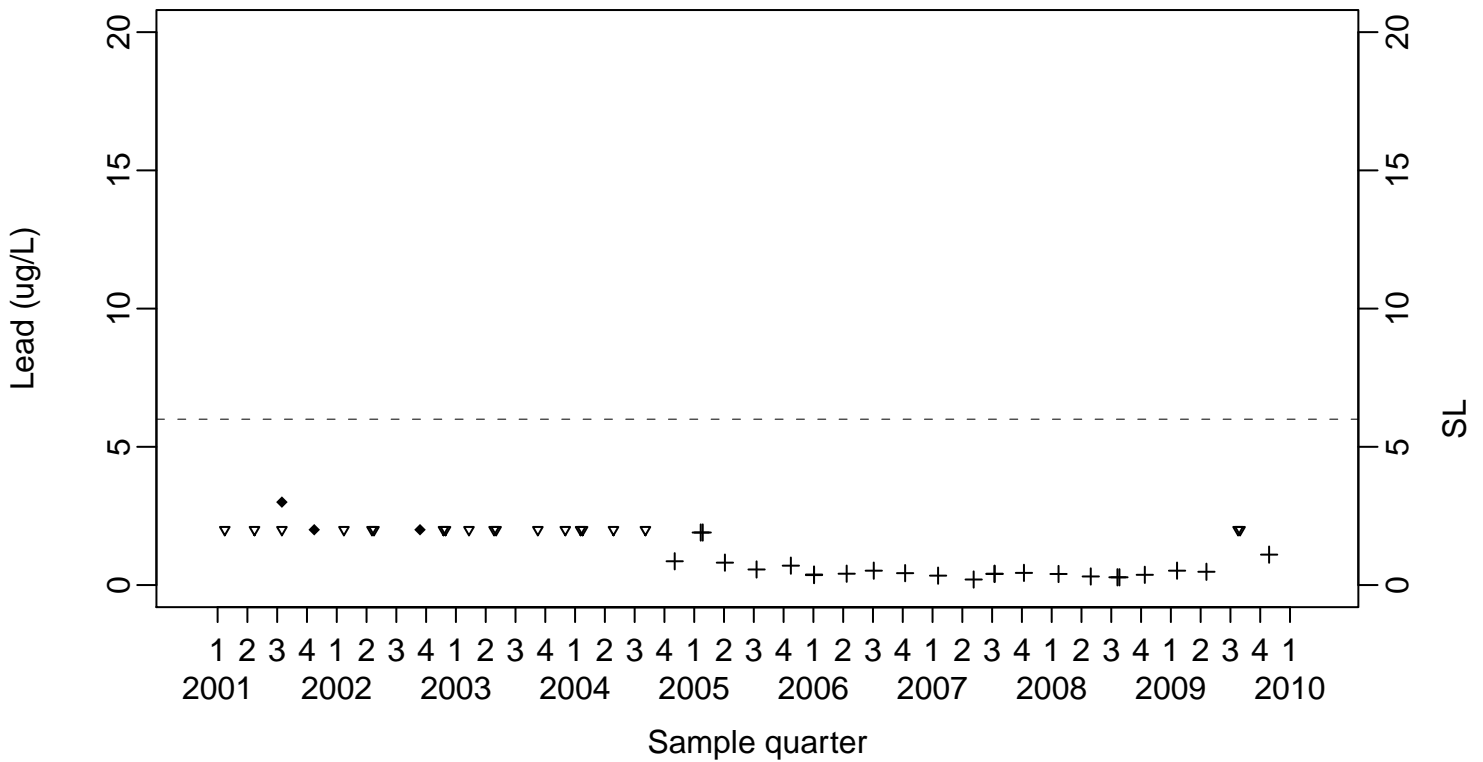
Background Monitoring Point K7-06

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=6

Compliance Monitoring Point K7-01

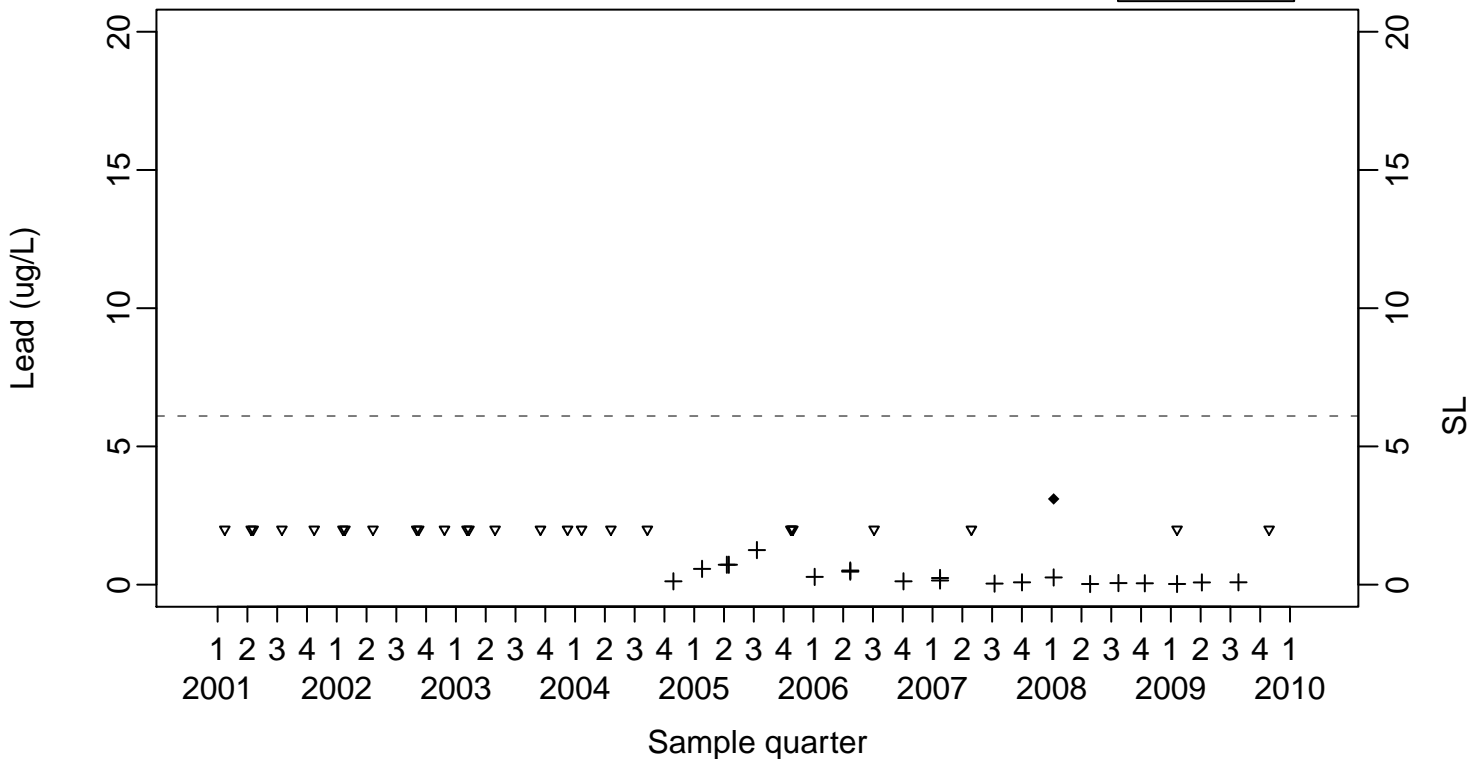


Pit 7 Complex
Lead (ug/L)

SL=6.1

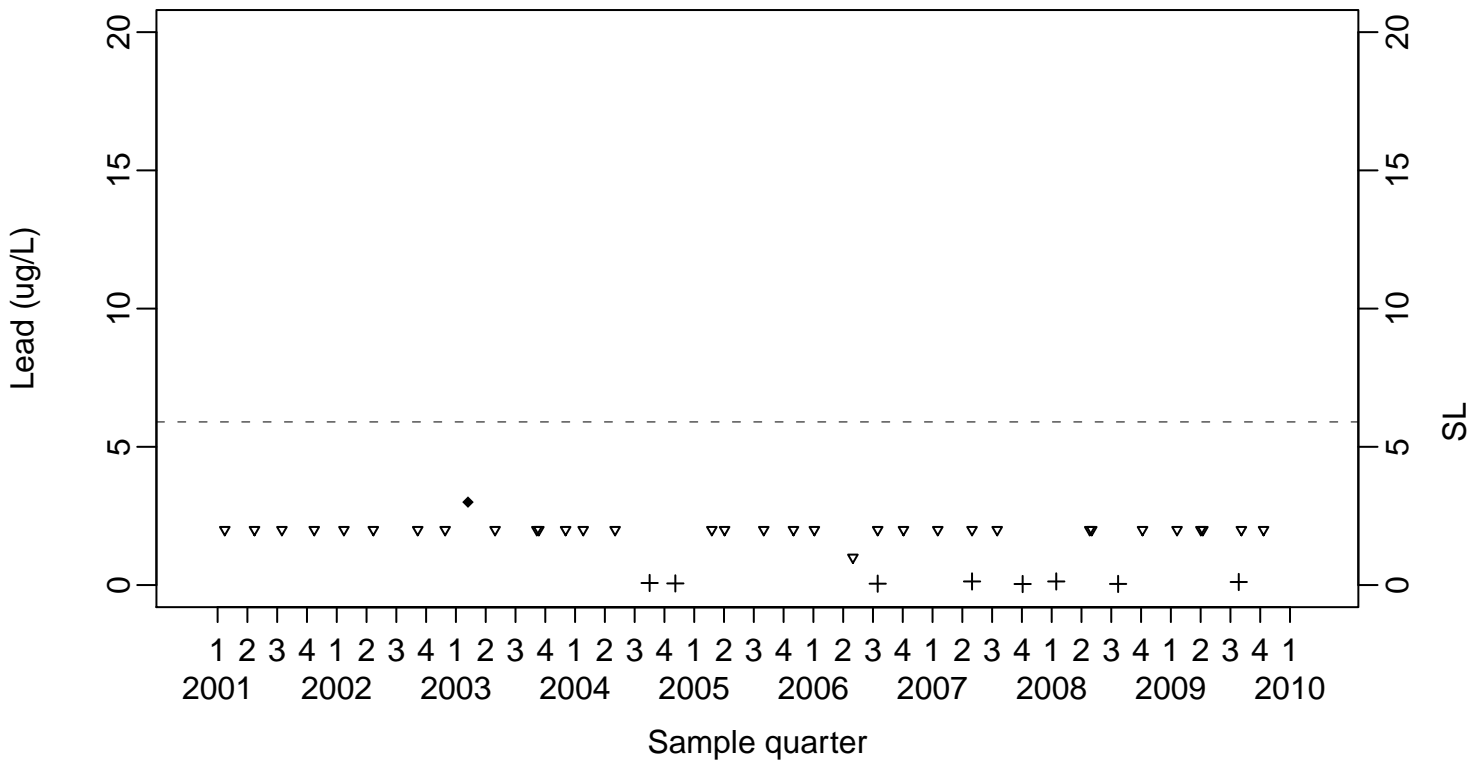
Compliance Monitoring Point K7-03

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=5.9

Compliance Monitoring Point K7-09

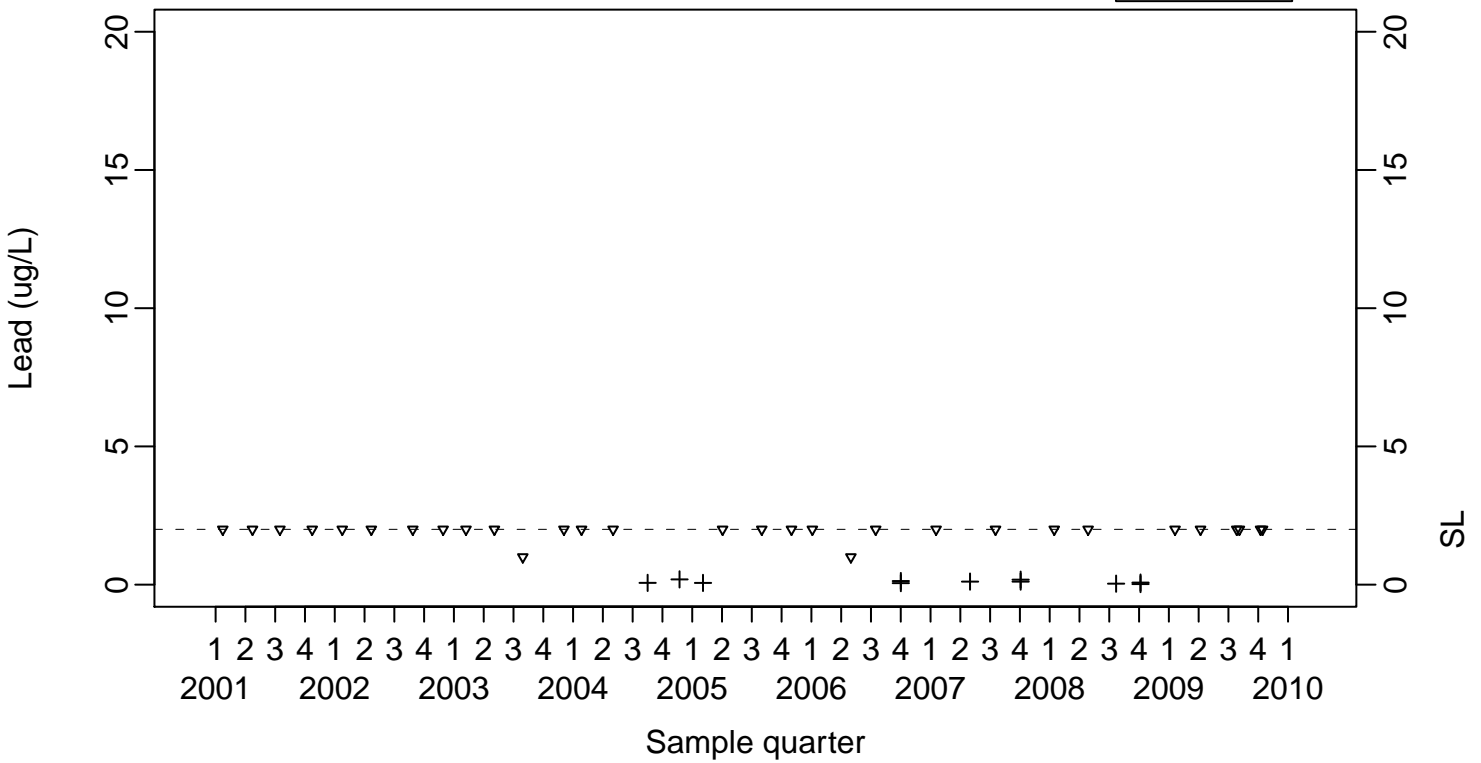


Pit 7 Complex
Lead (ug/L)

Compliance Monitoring Point K7-10

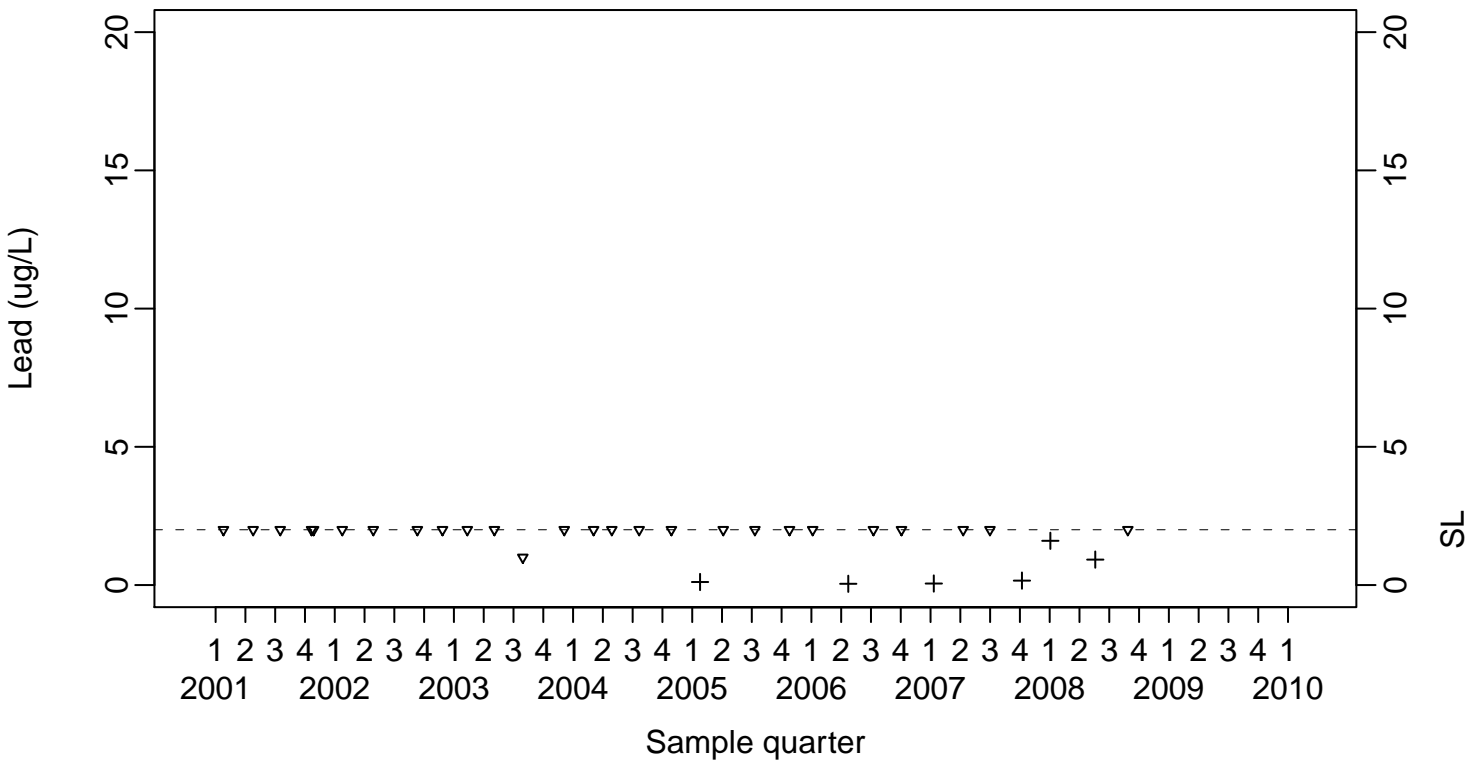
SL=2

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=2

Compliance Monitoring Point NC7-25

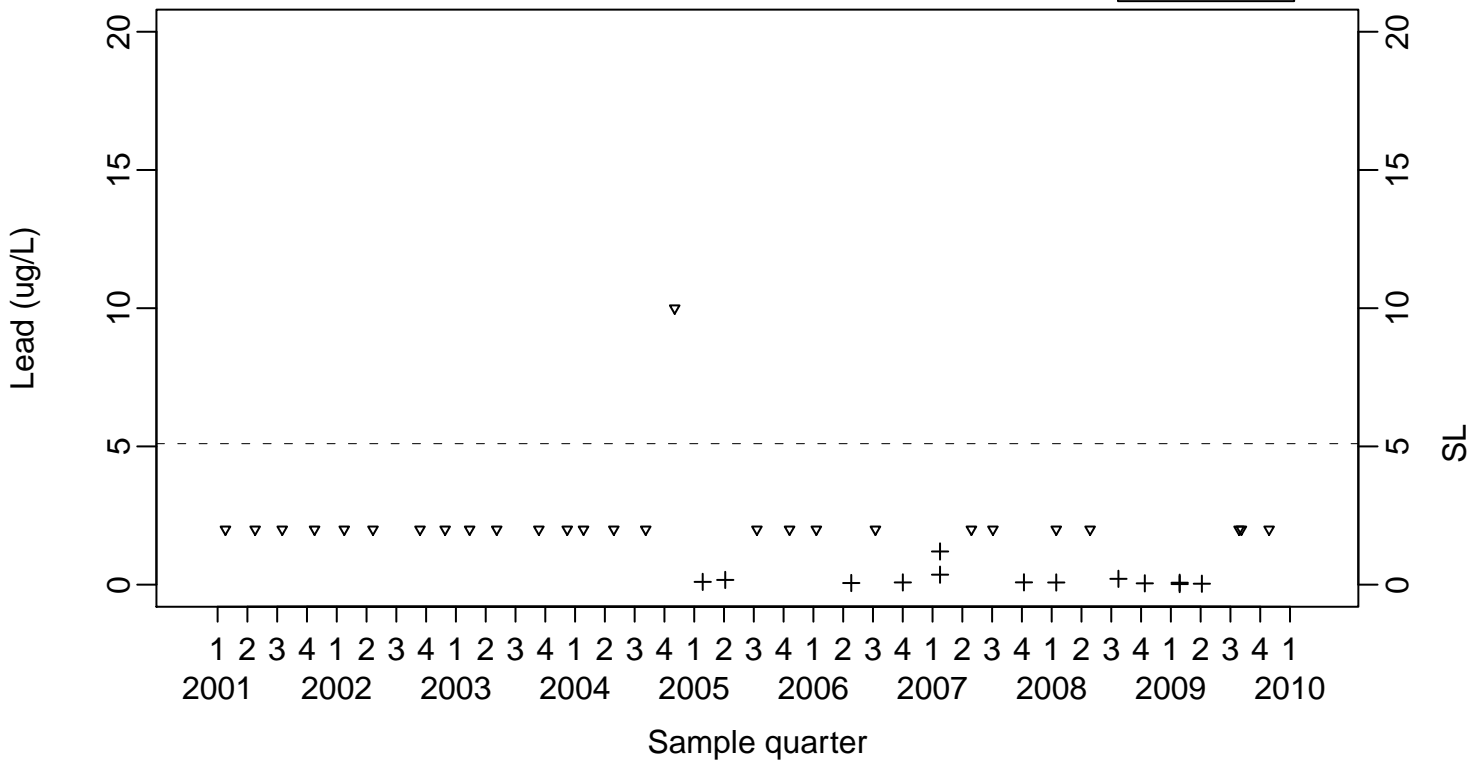


Pit 7 Complex
Lead (ug/L)

Compliance Monitoring Point NC7-26

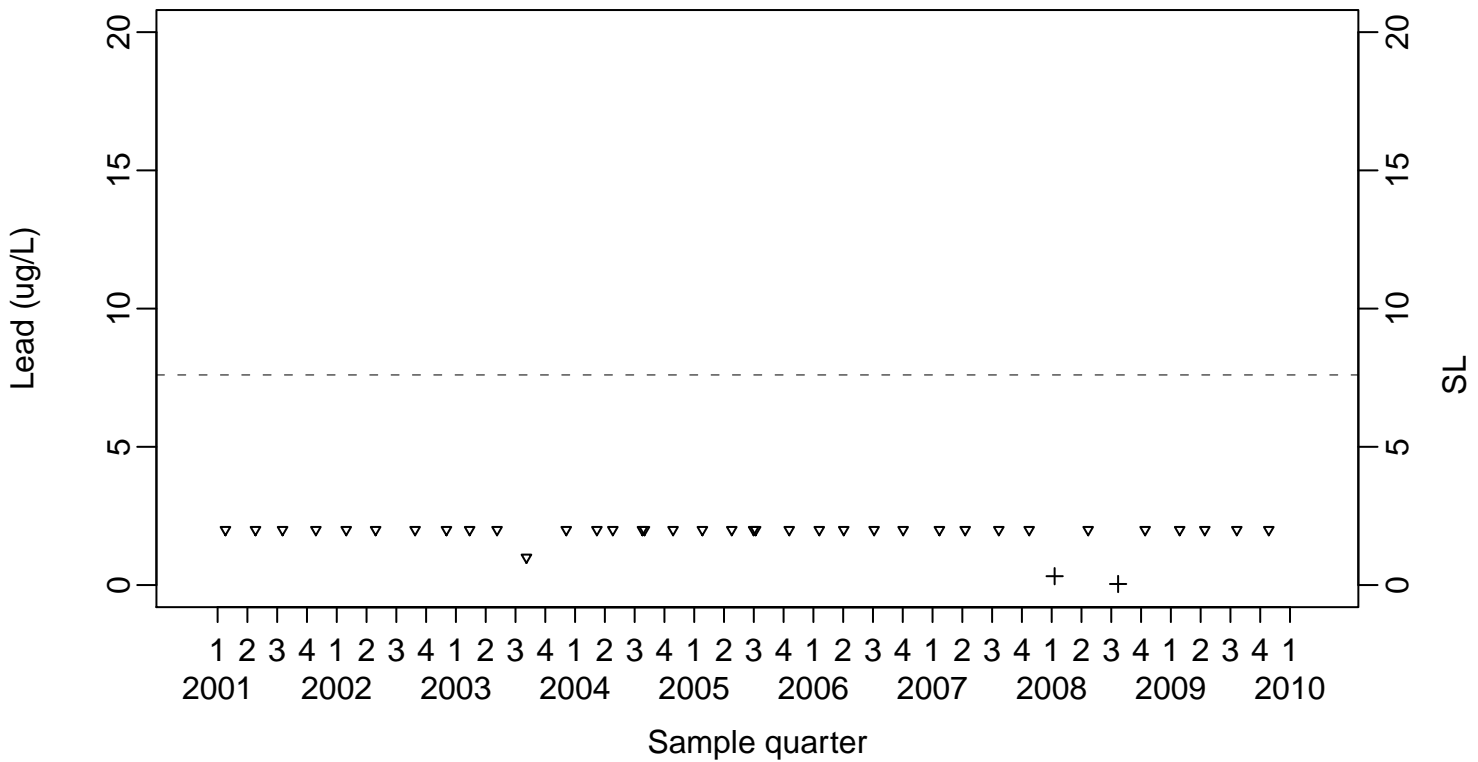
SL=5.1

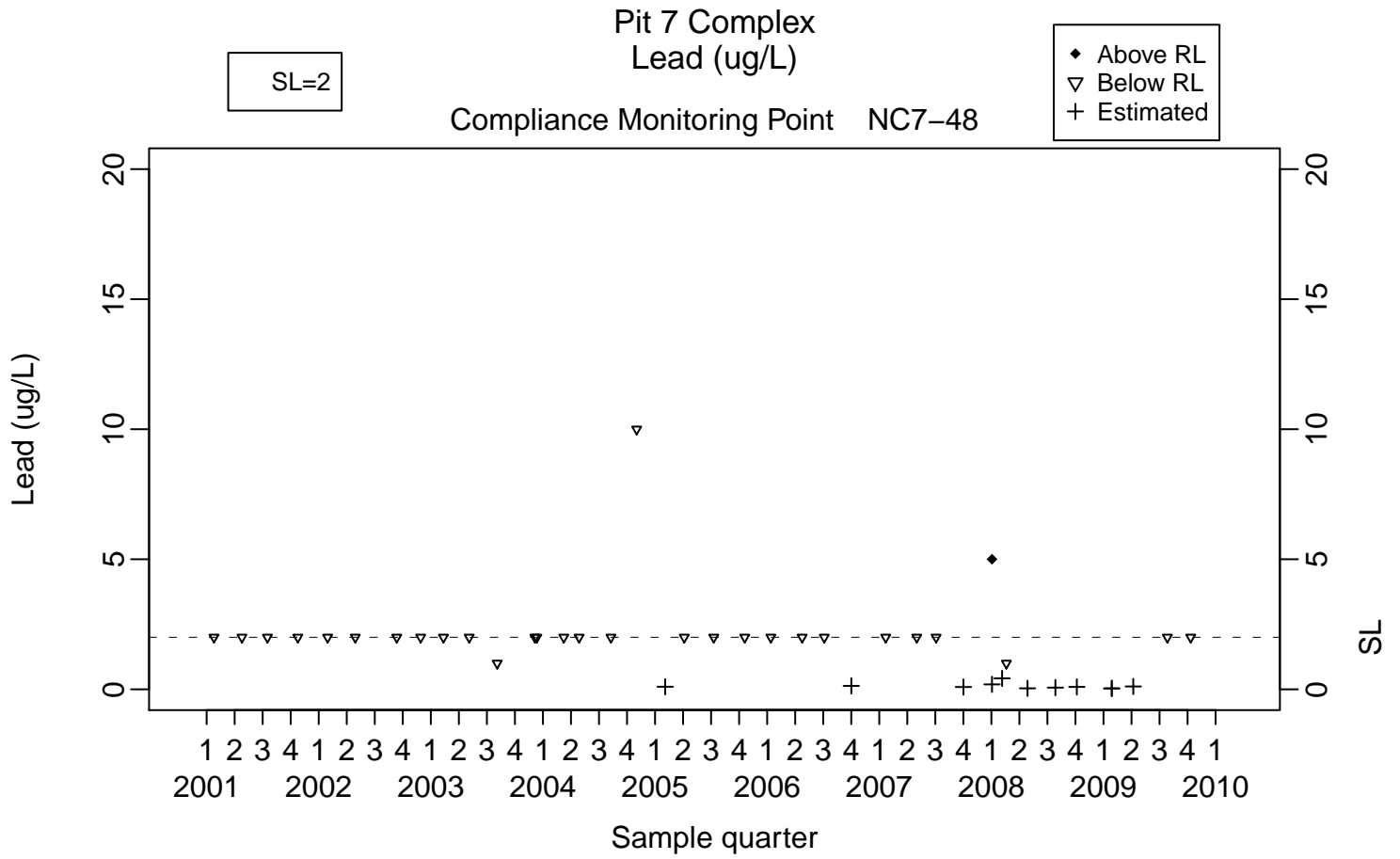
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=7.6

Compliance Monitoring Point NC7-47

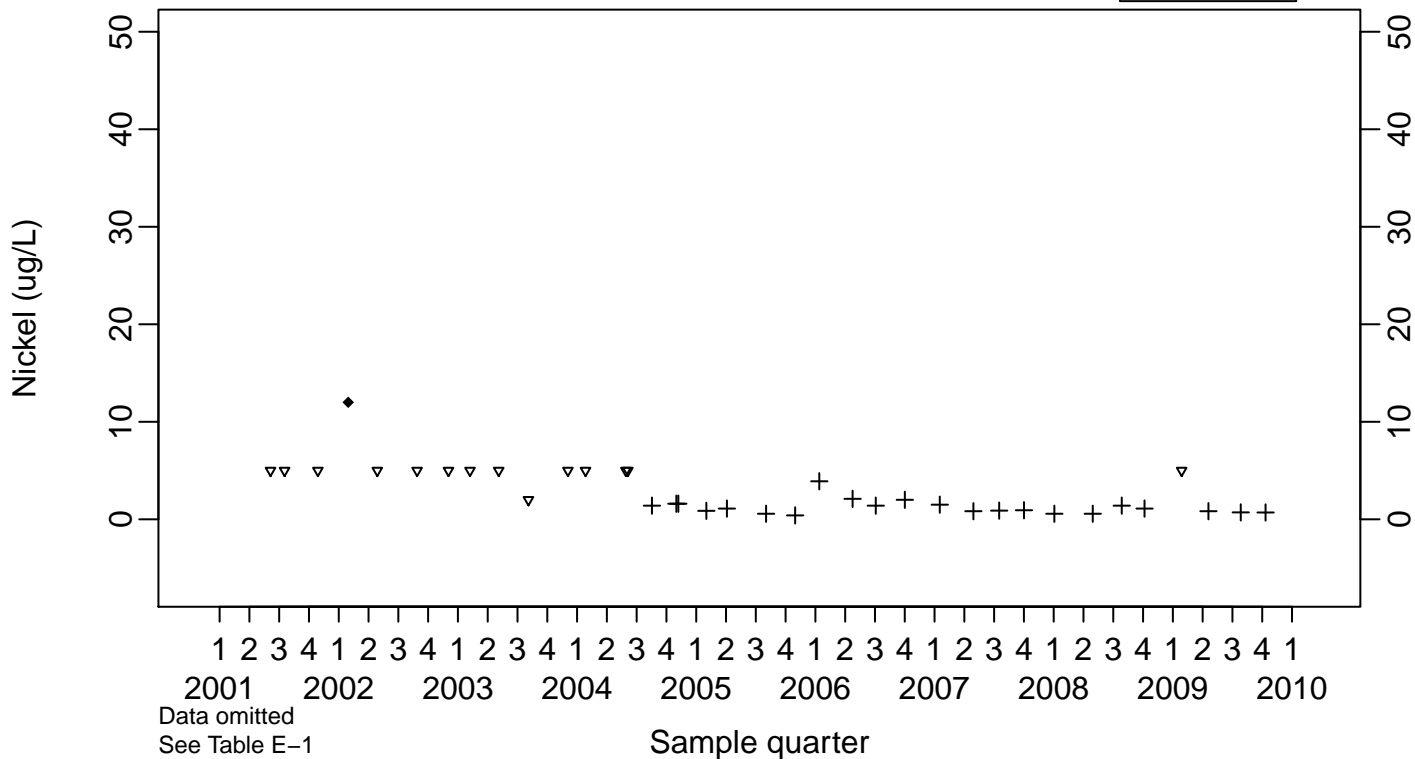




Pit 7 Complex
Nickel (ug/L)

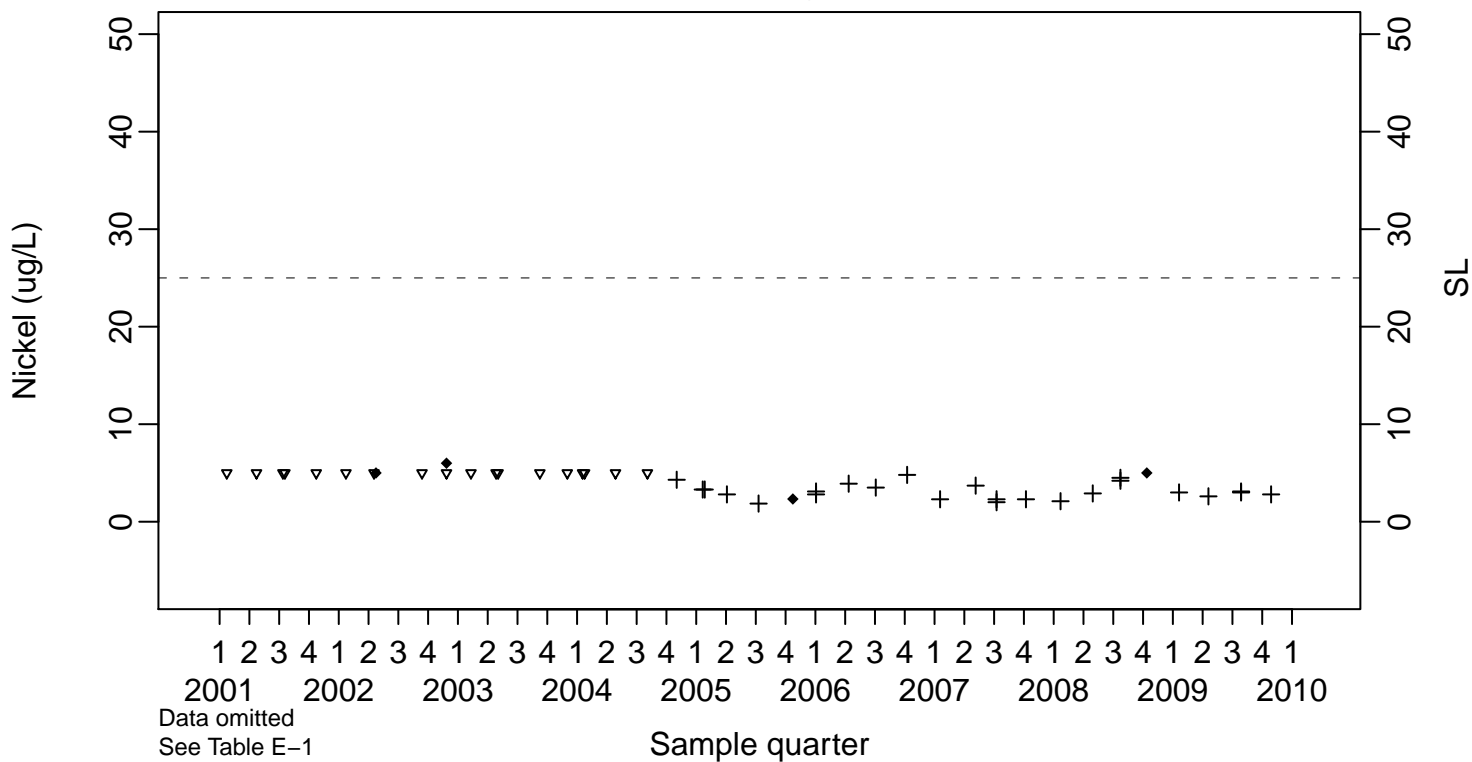
Background Monitoring Point K7-06

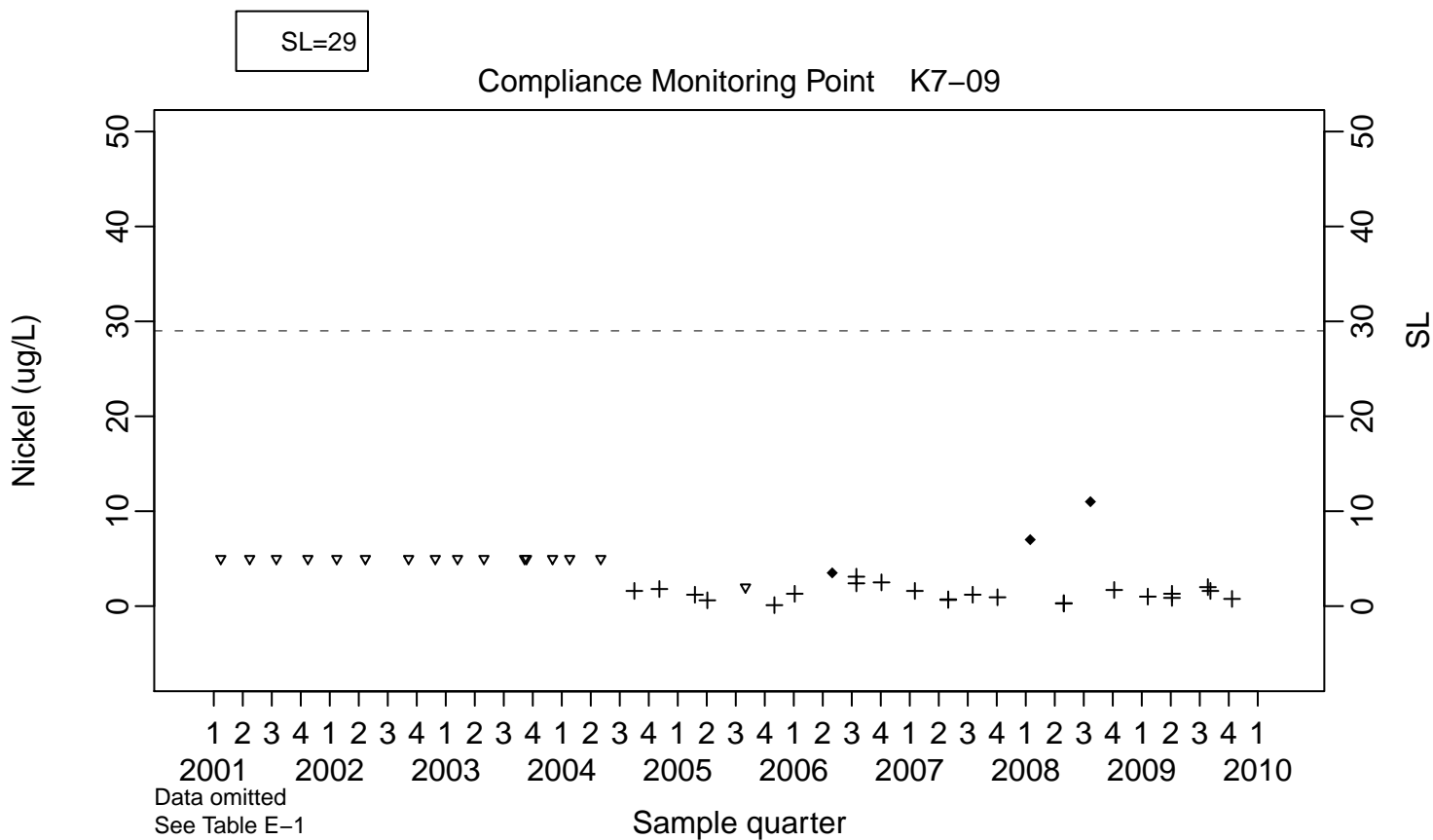
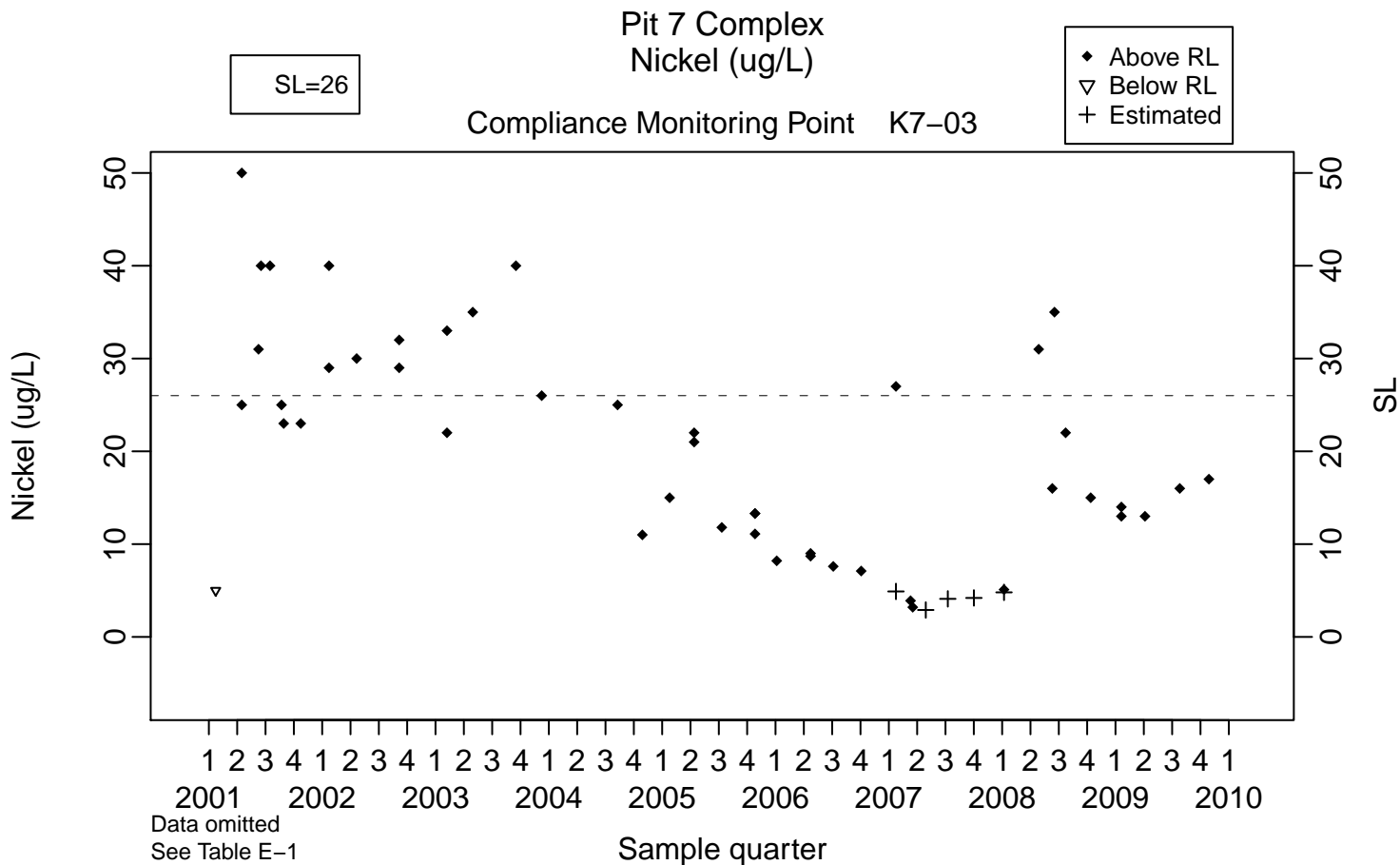
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=25

Compliance Monitoring Point K7-01



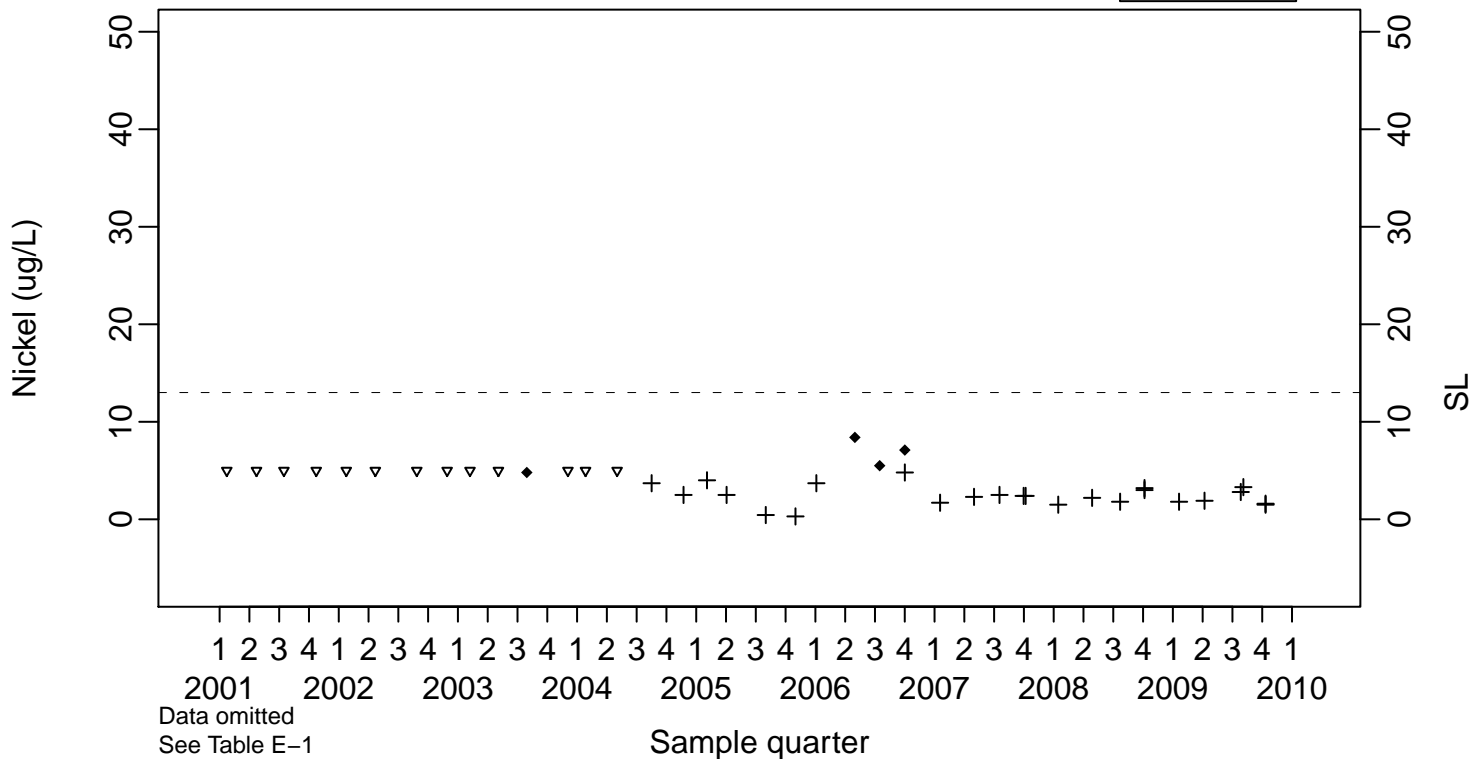


Pit 7 Complex
Nickel (ug/L)

SL=13

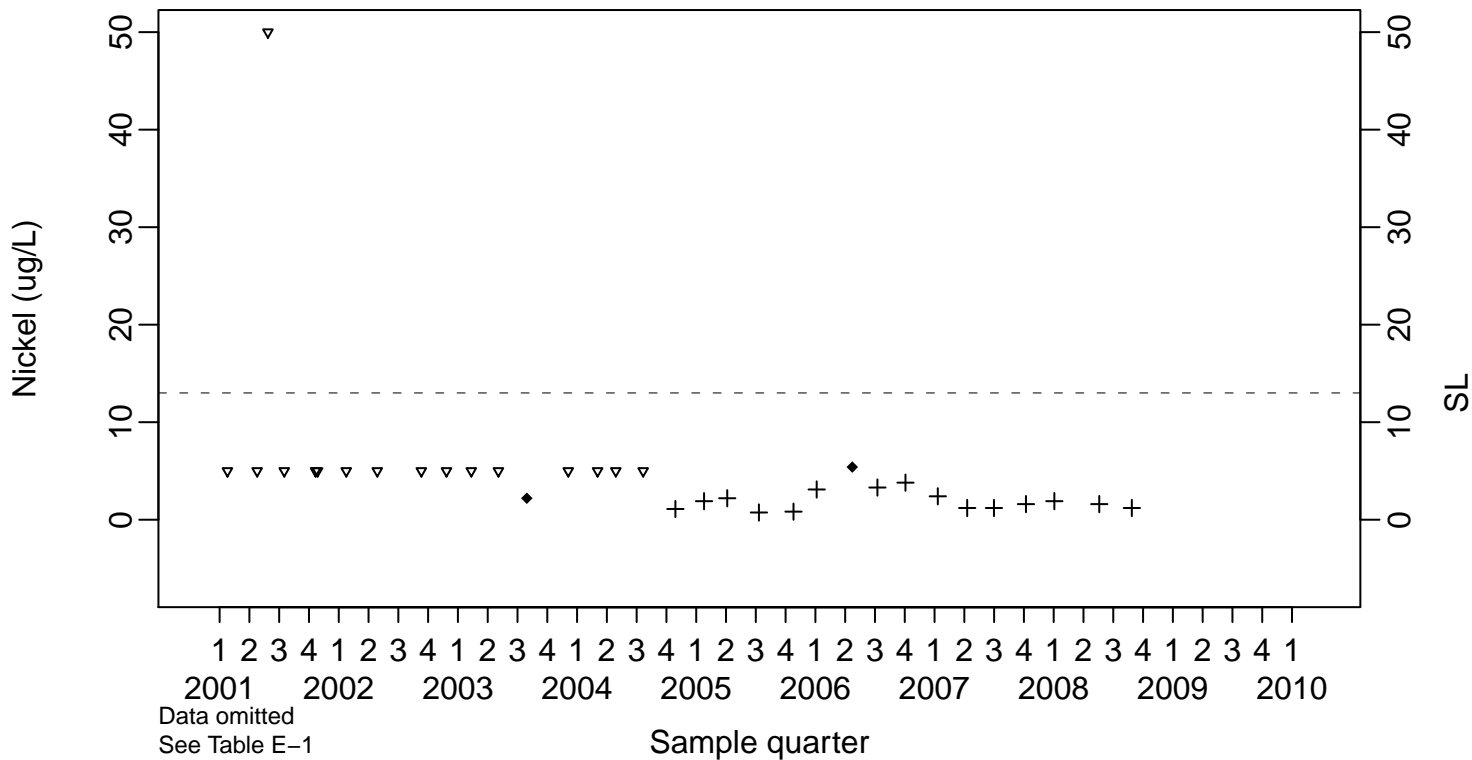
Compliance Monitoring Point K7-10

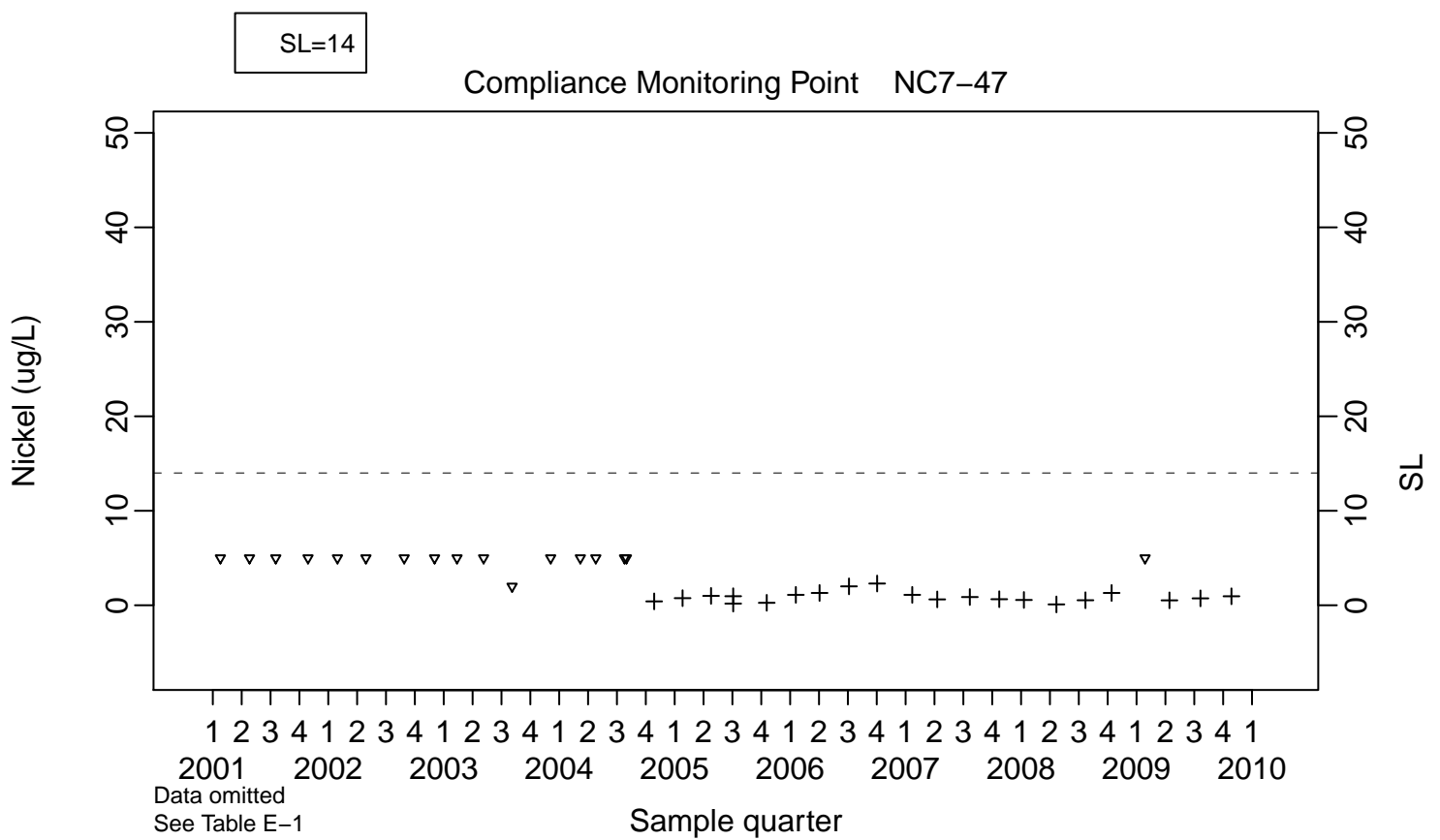
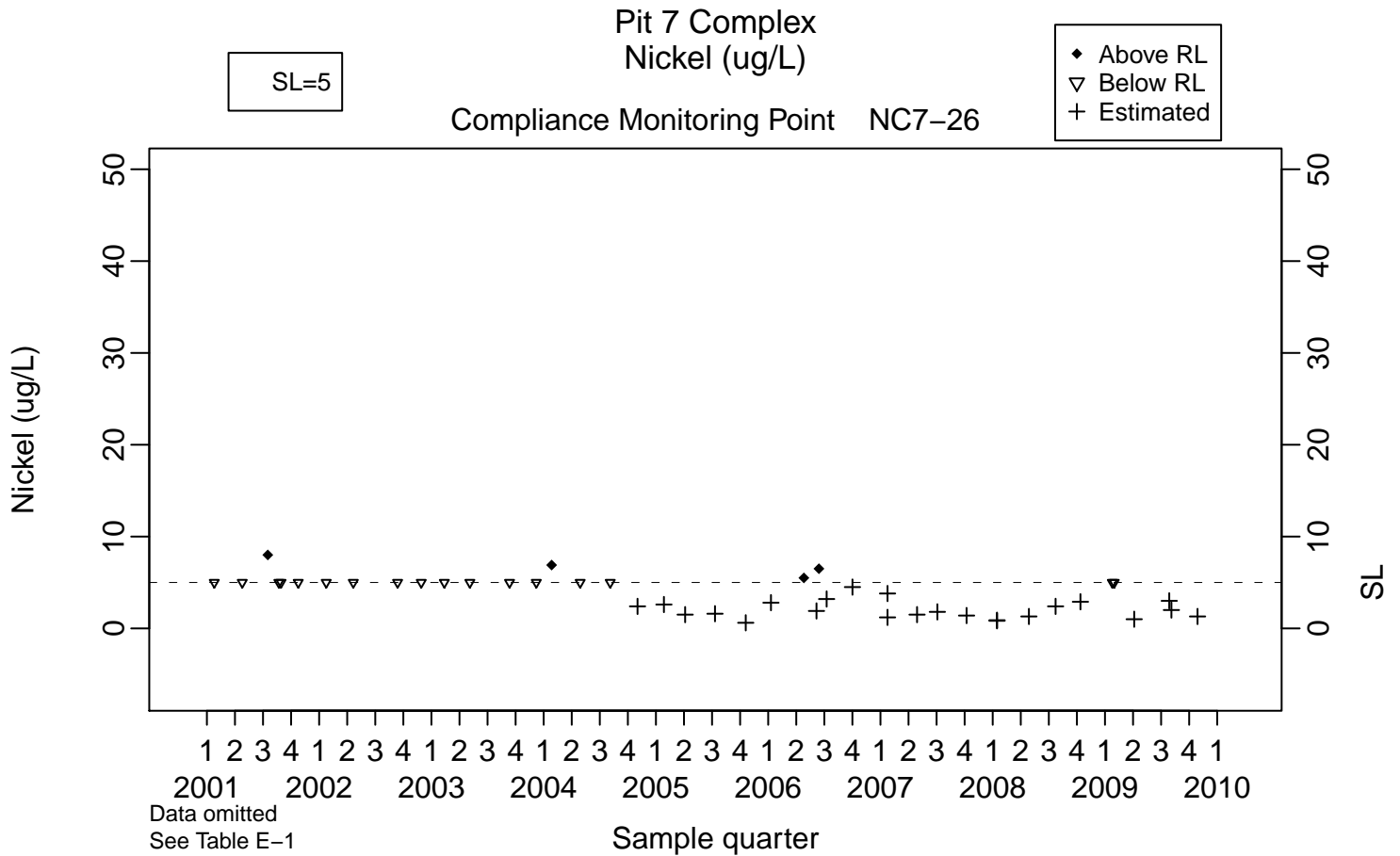
◆ Above RL
▽ Below RL
+ Estimated

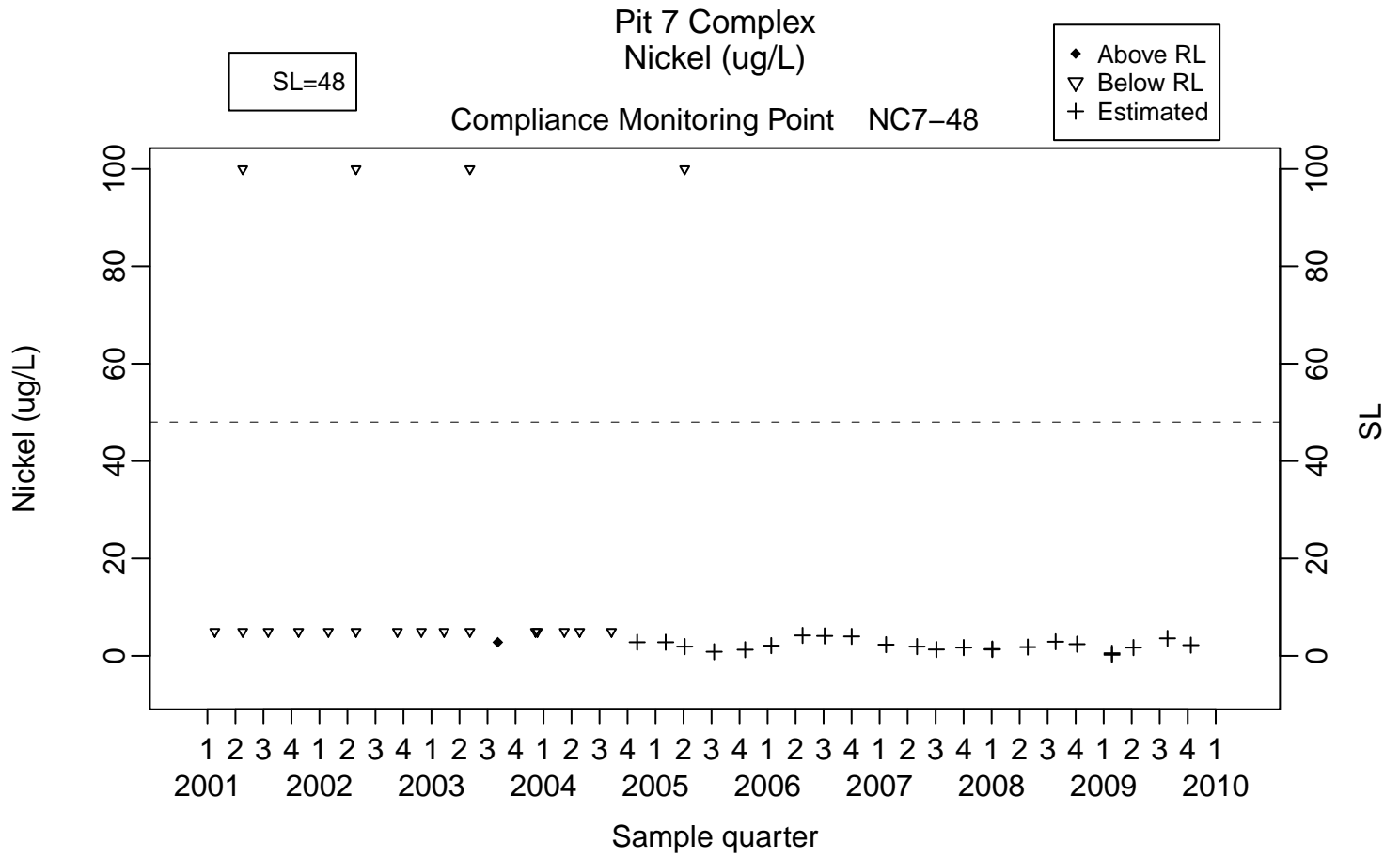


SL=13

Compliance Monitoring Point NC7-25



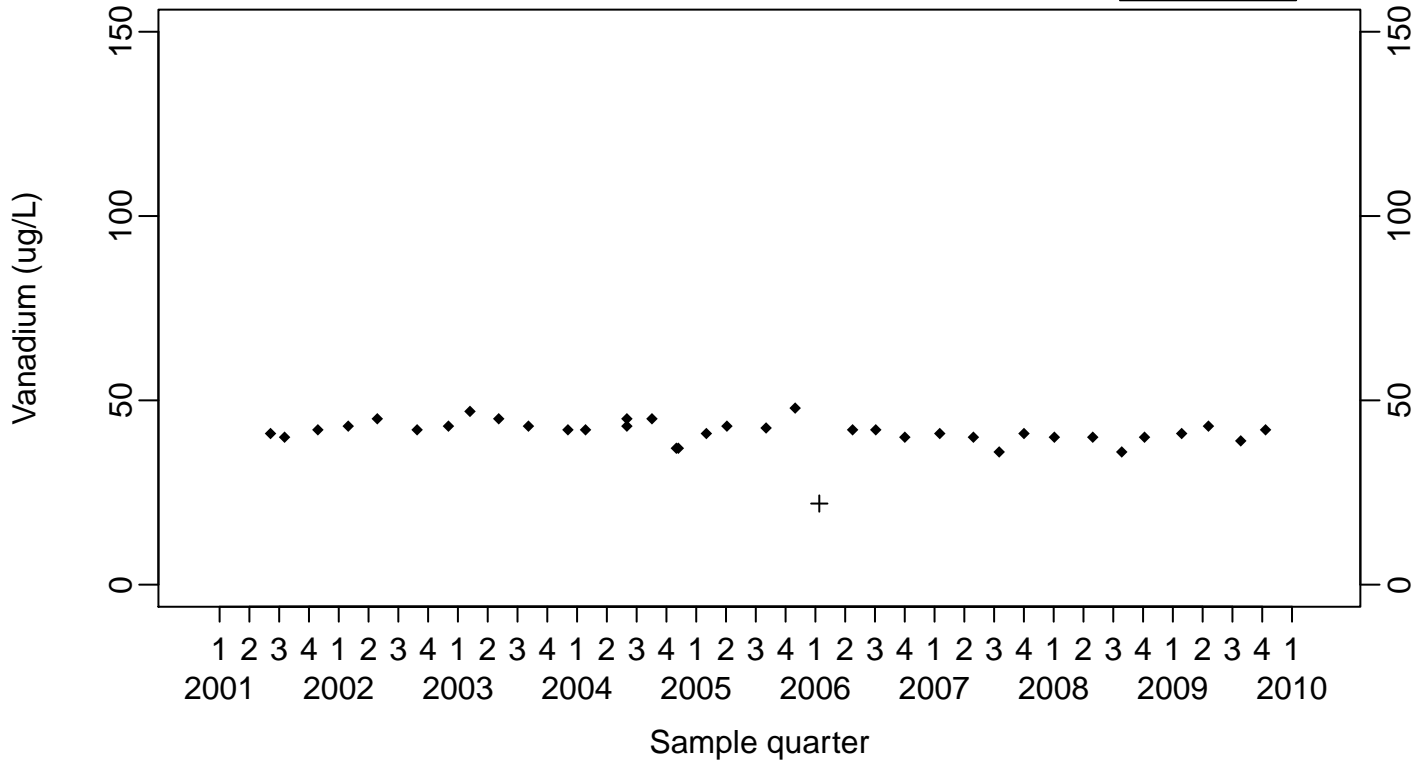




Pit 7 Complex
Vanadium (ug/L)

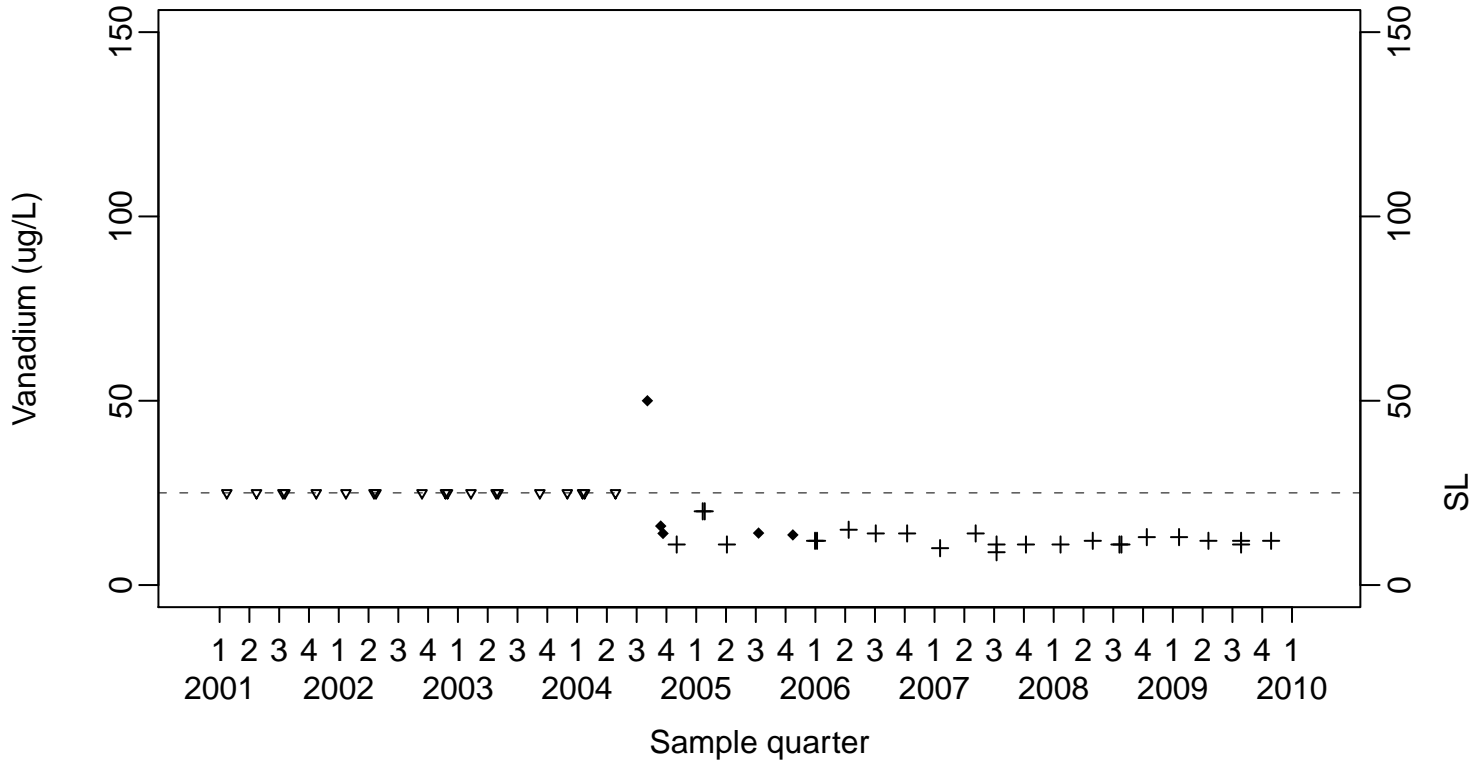
Background Monitoring Point K7-06

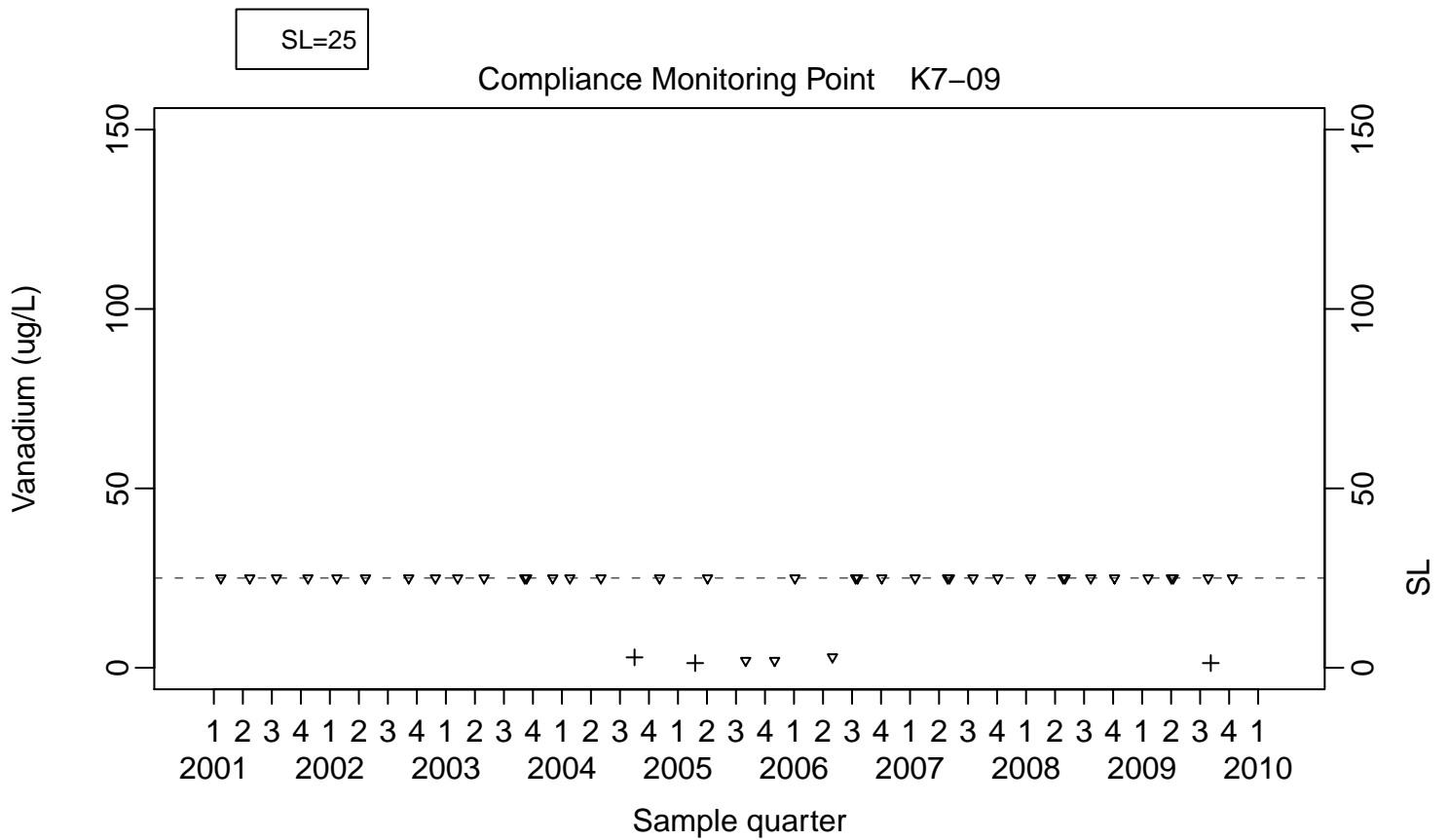
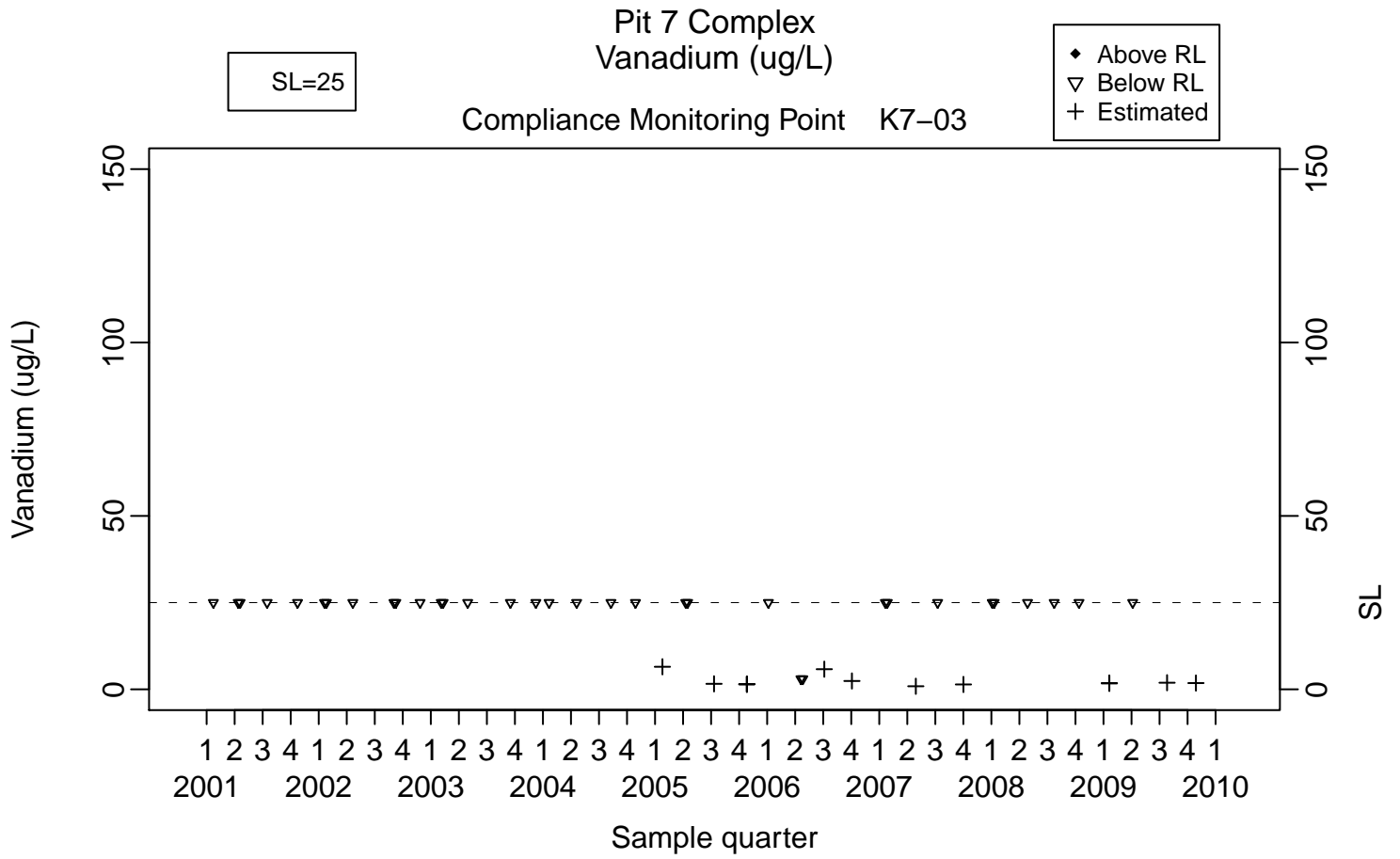
◆ Above RL
+ Estimated

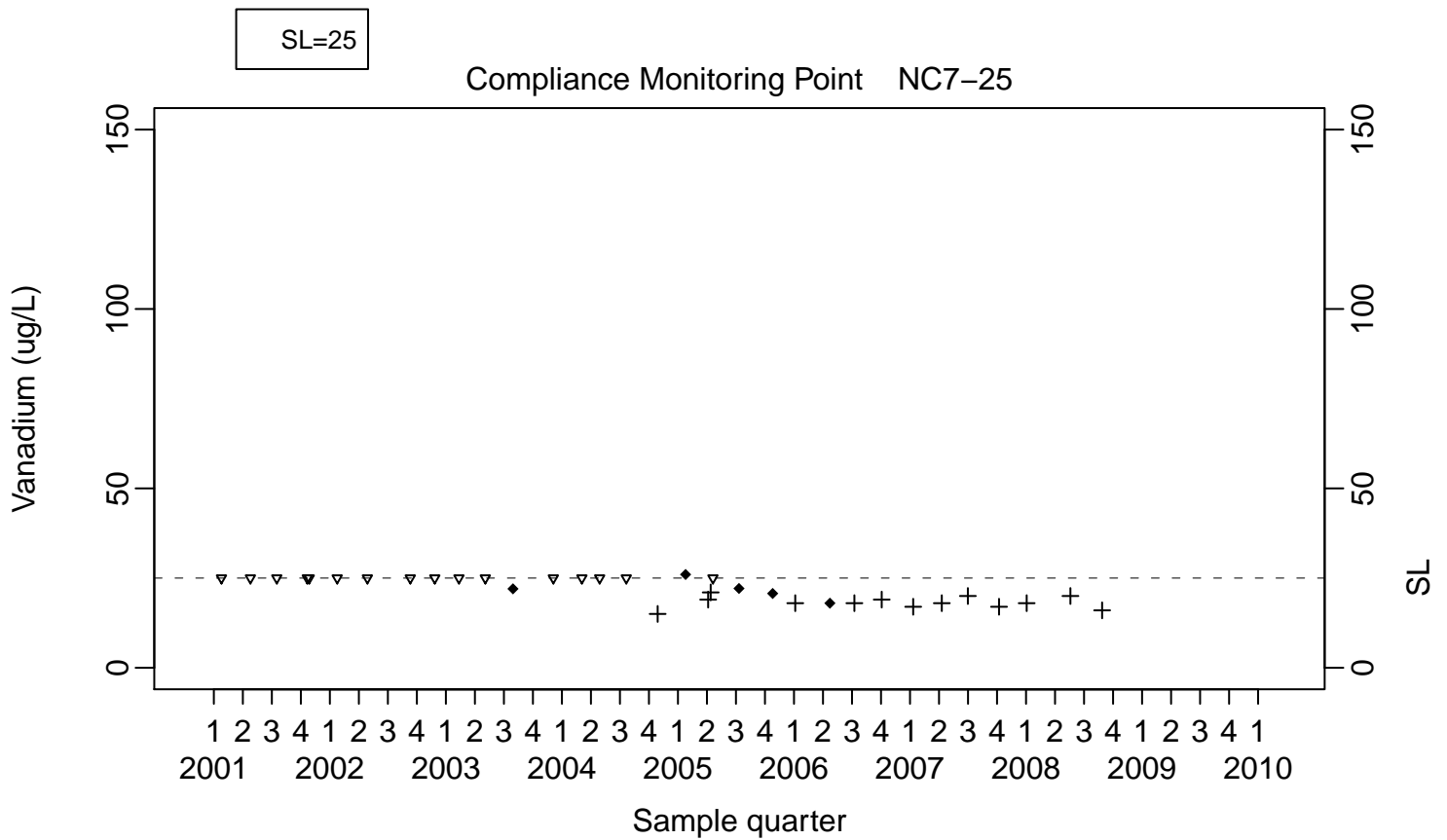
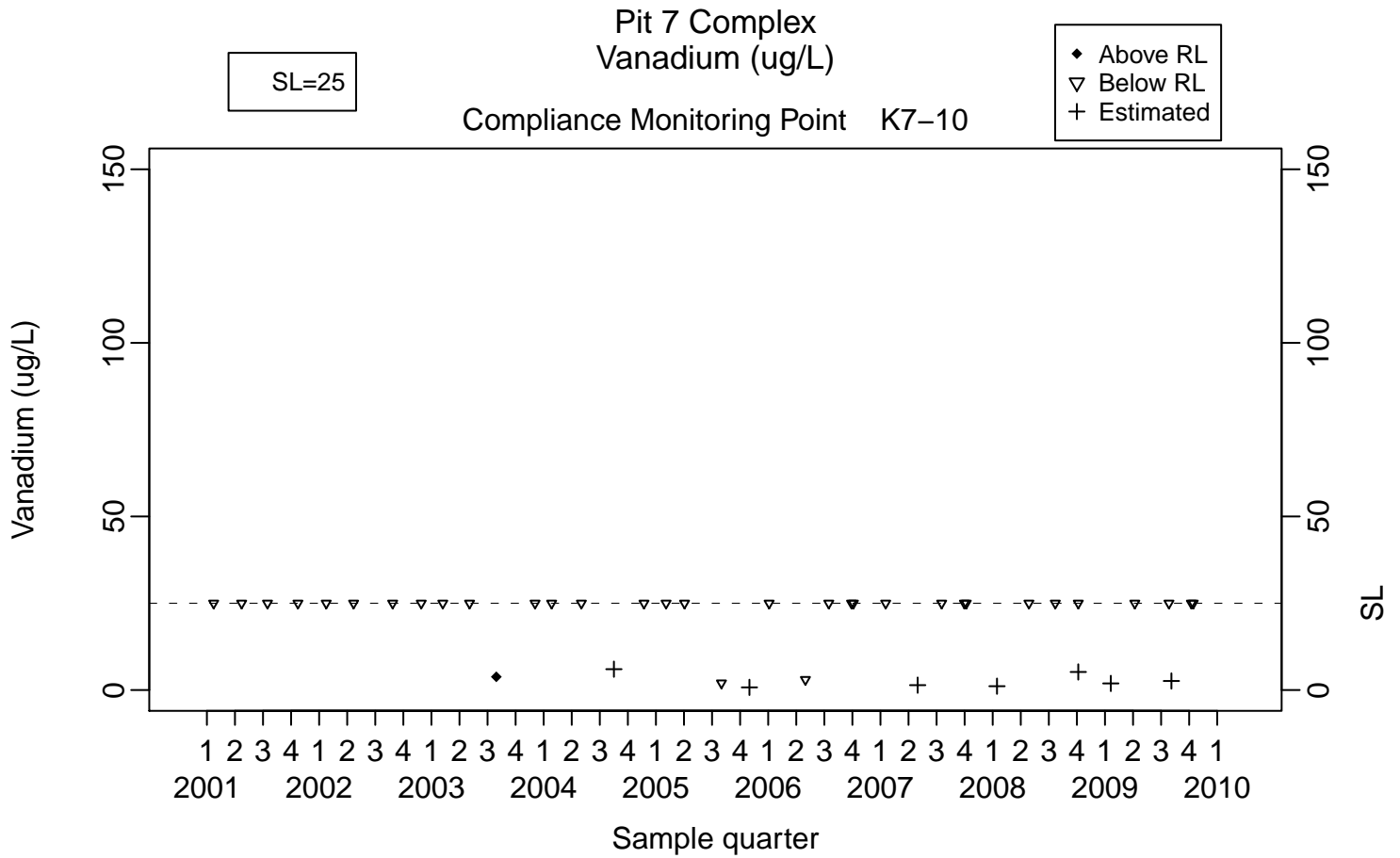


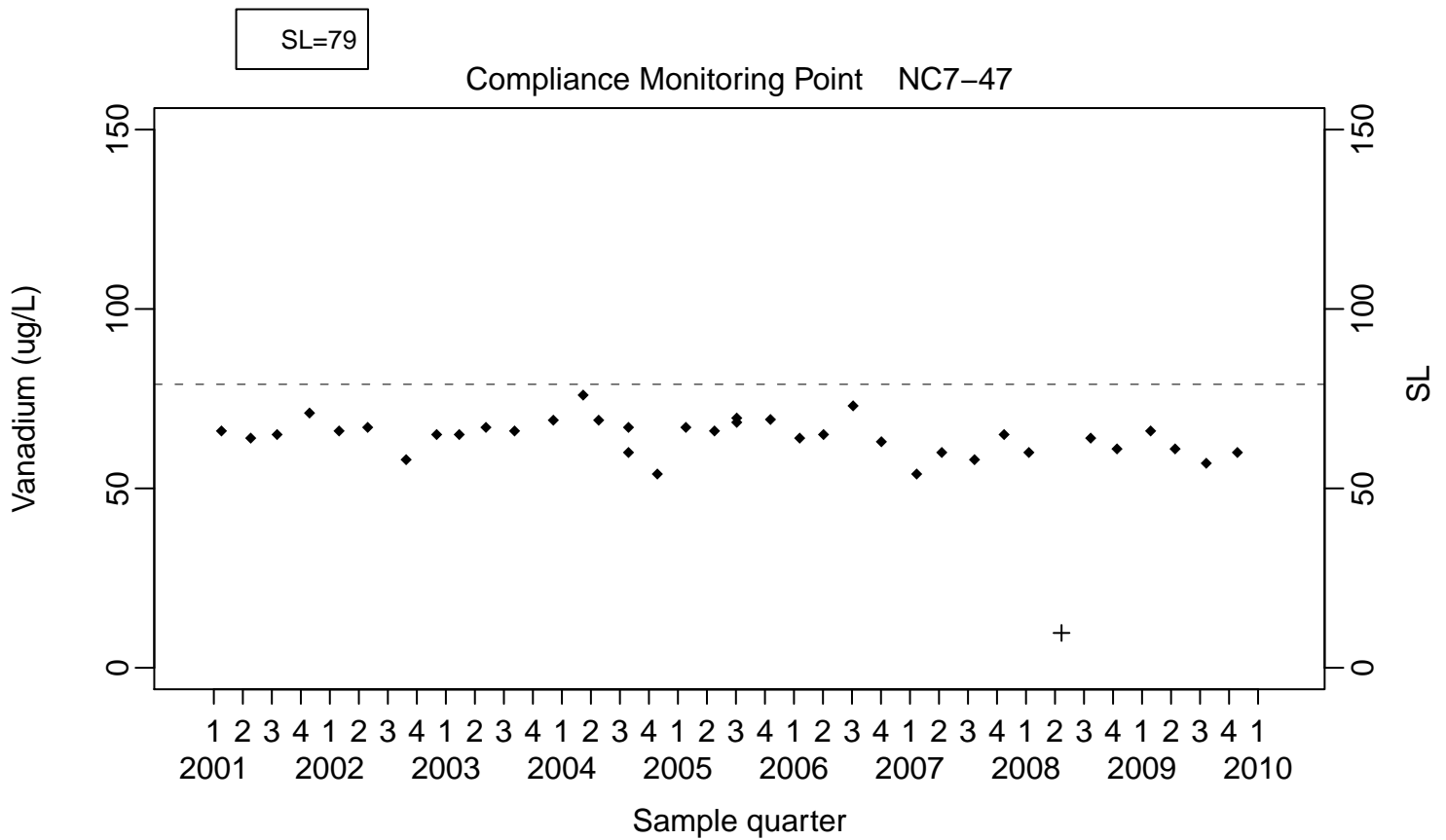
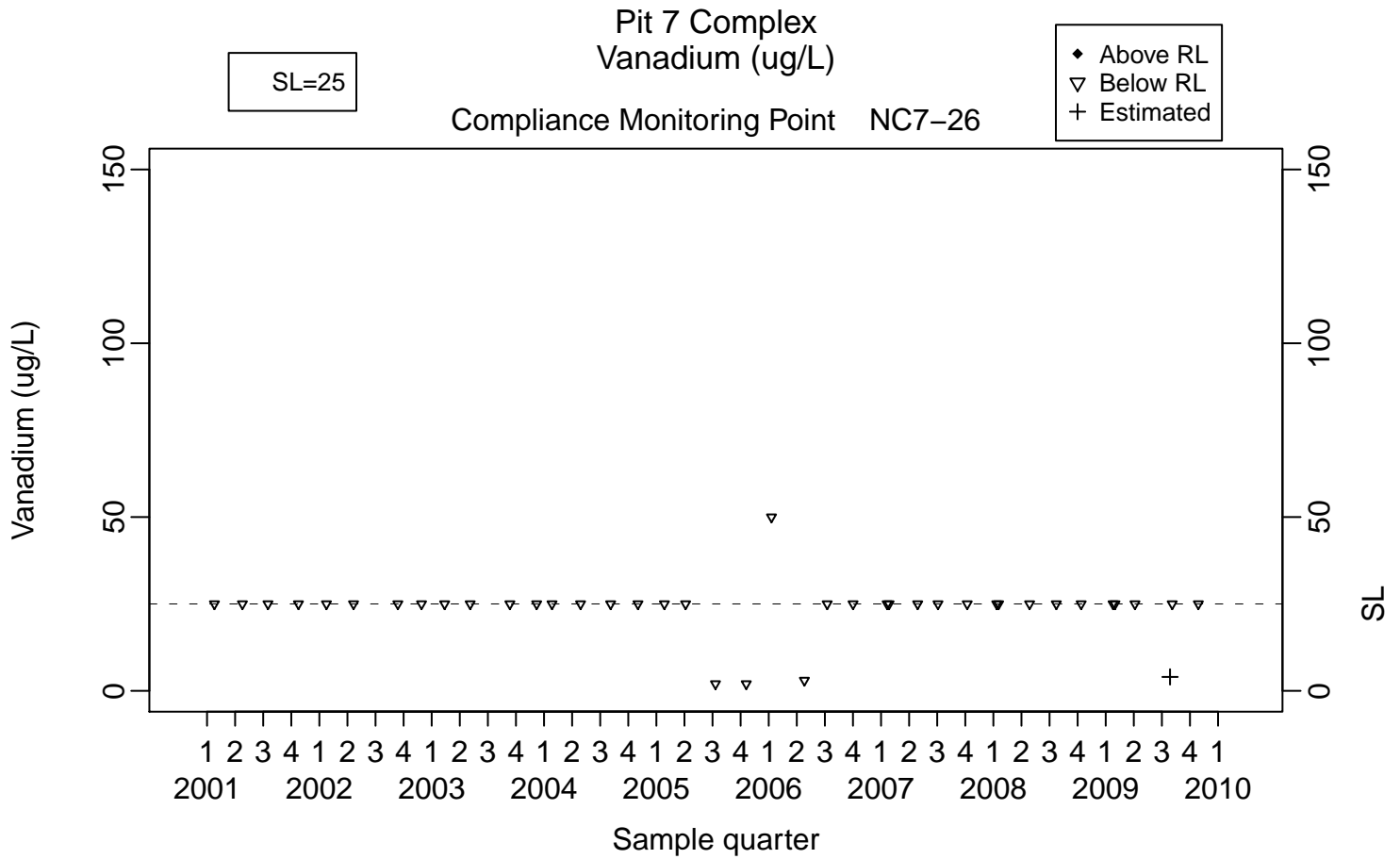
SL=25

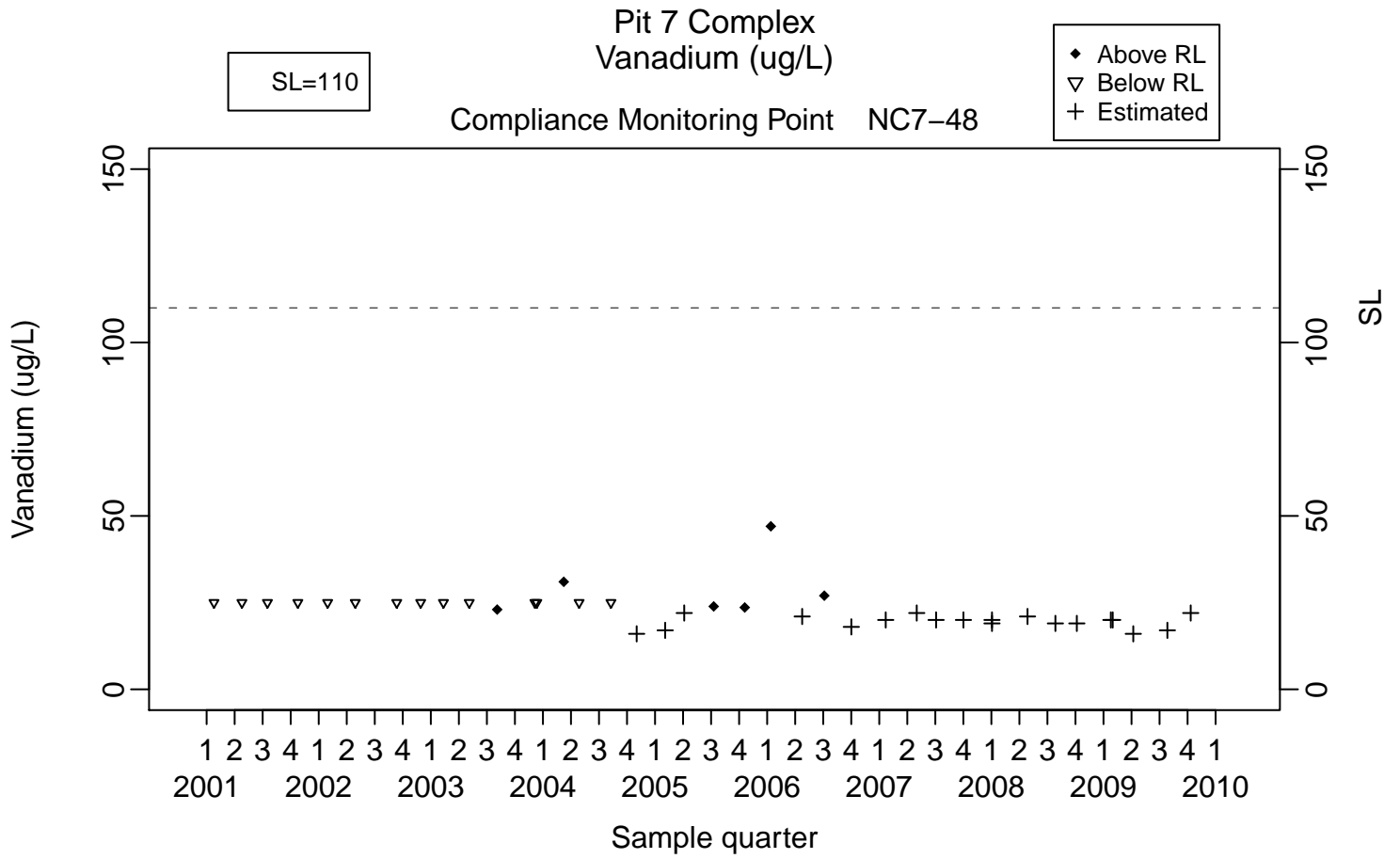
Compliance Monitoring Point K7-01

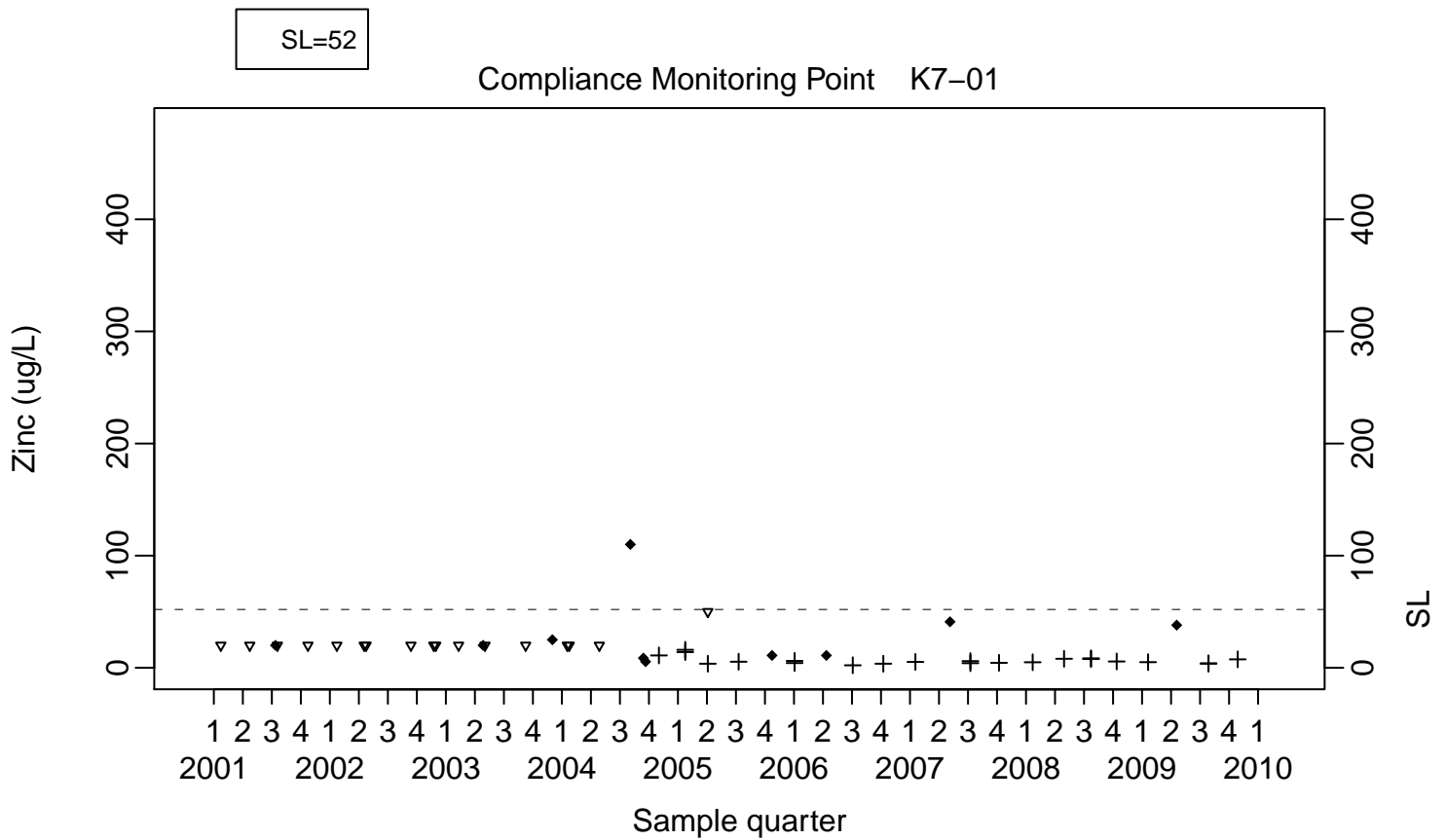
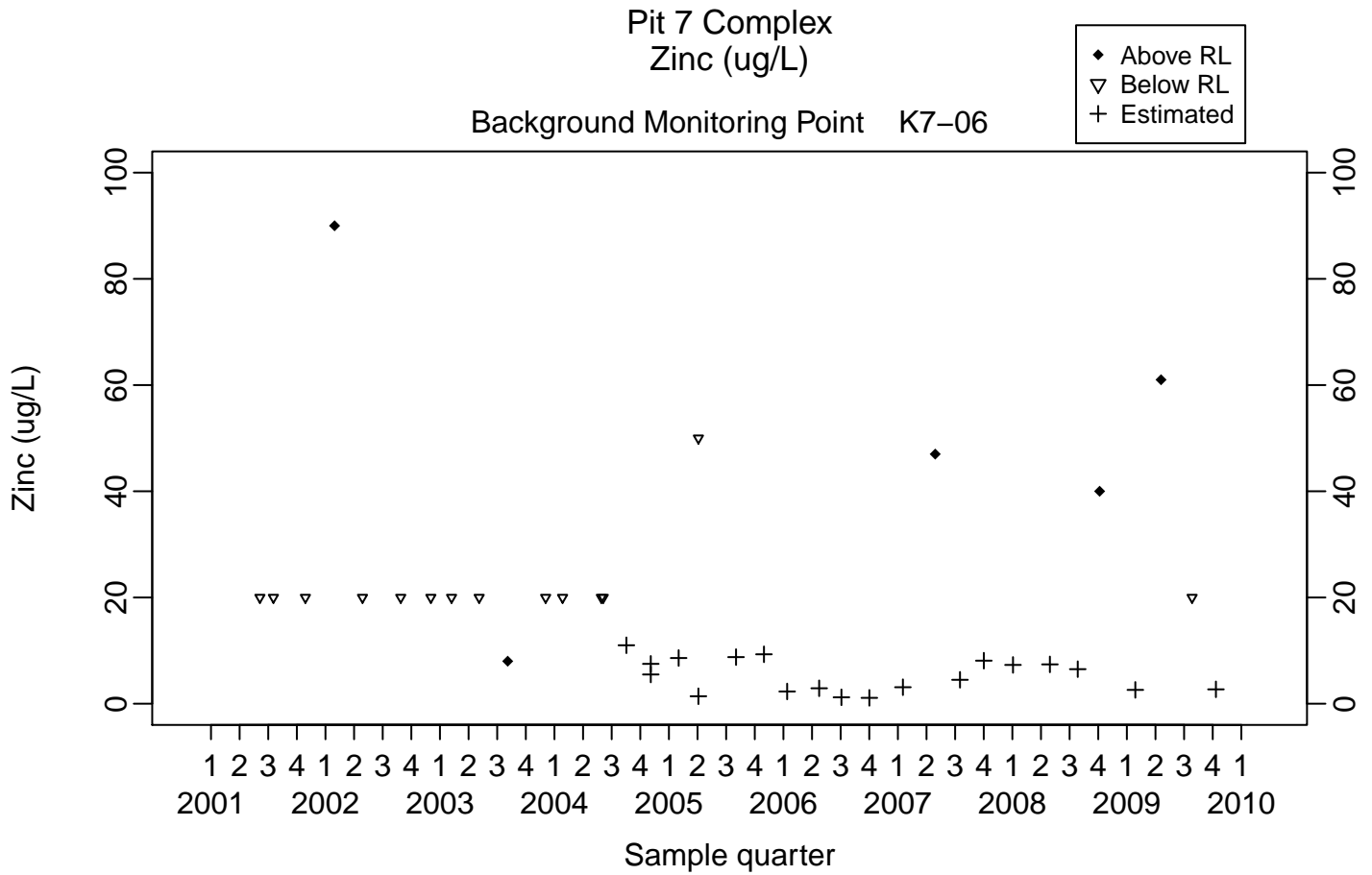


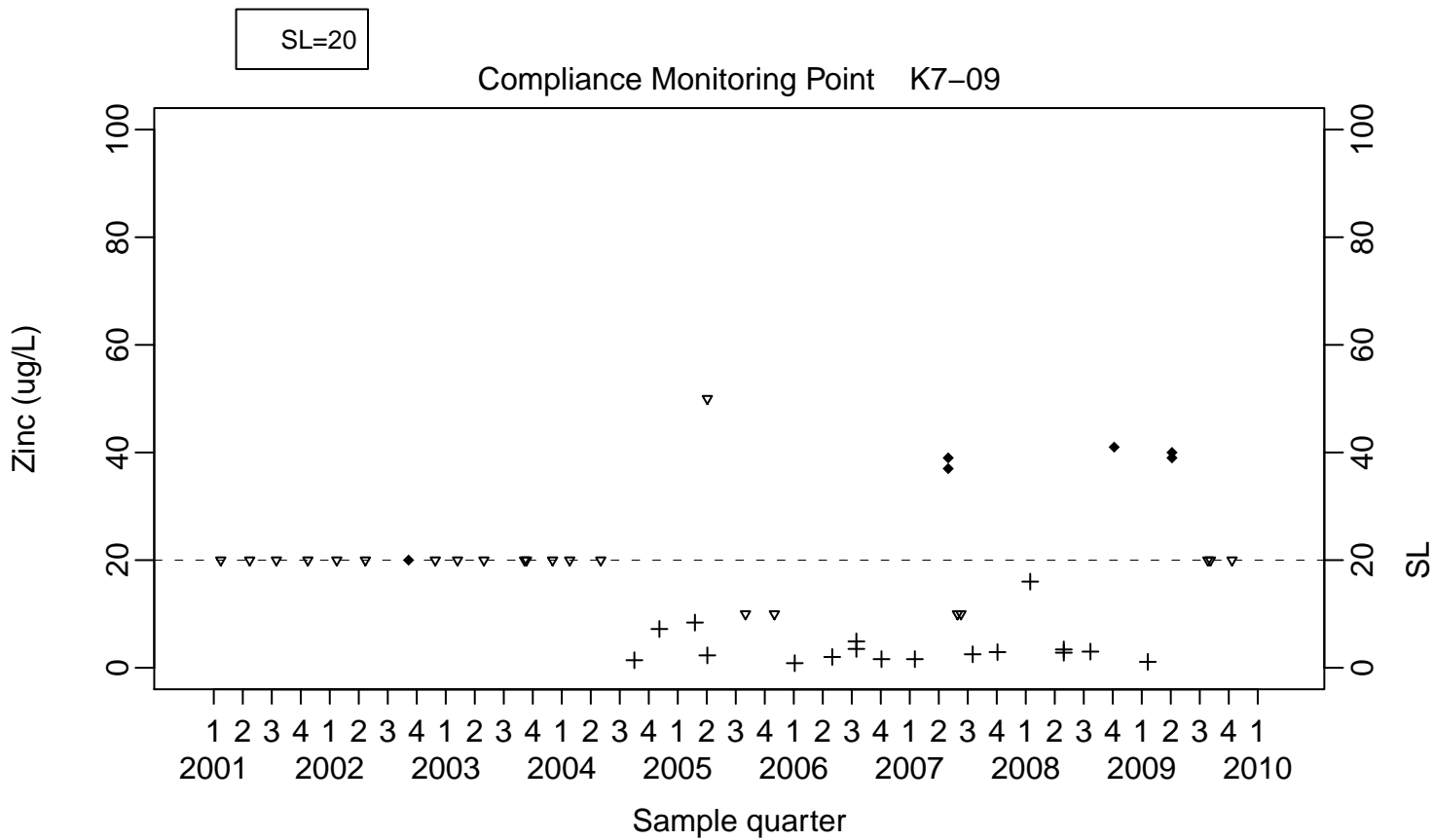
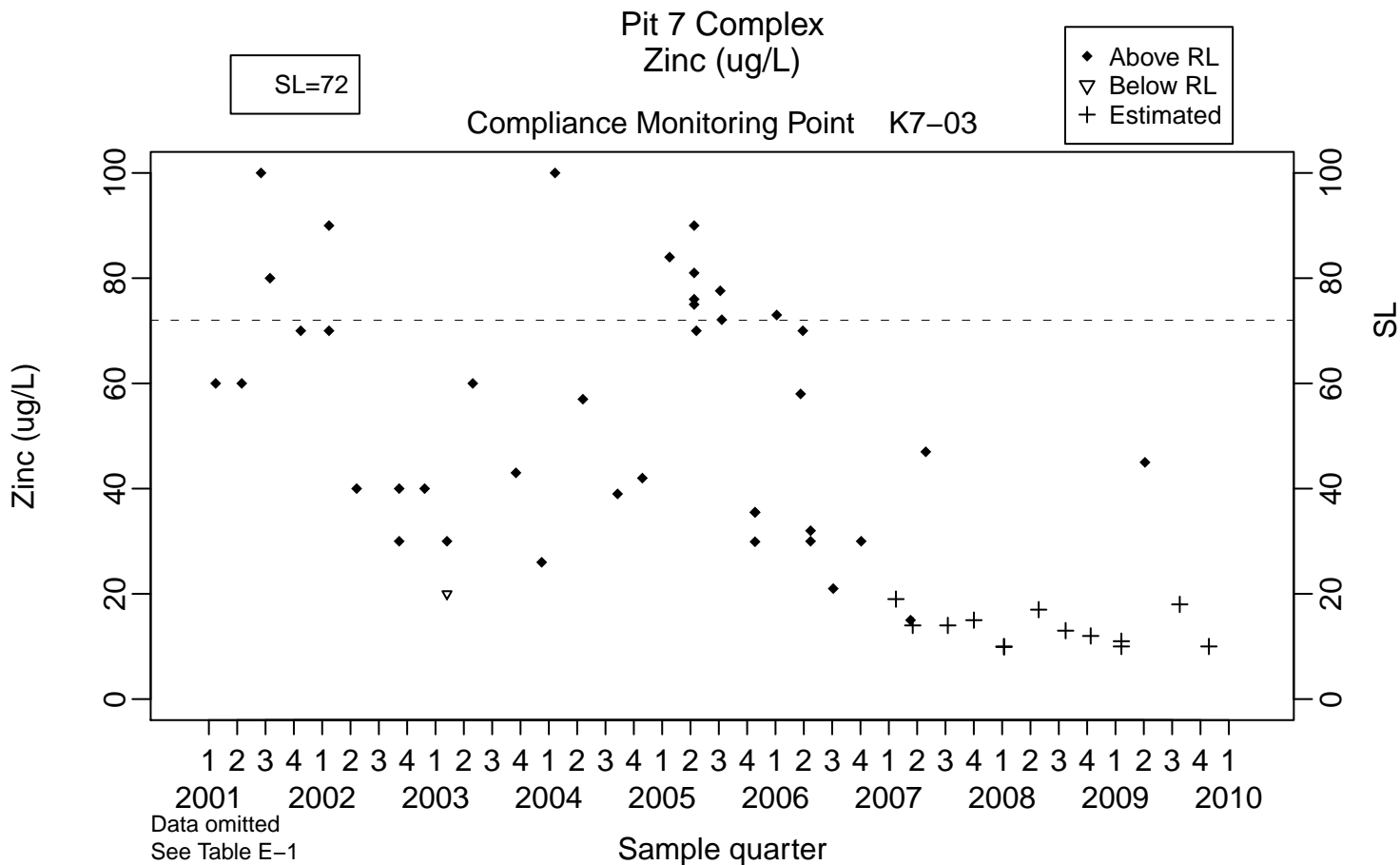


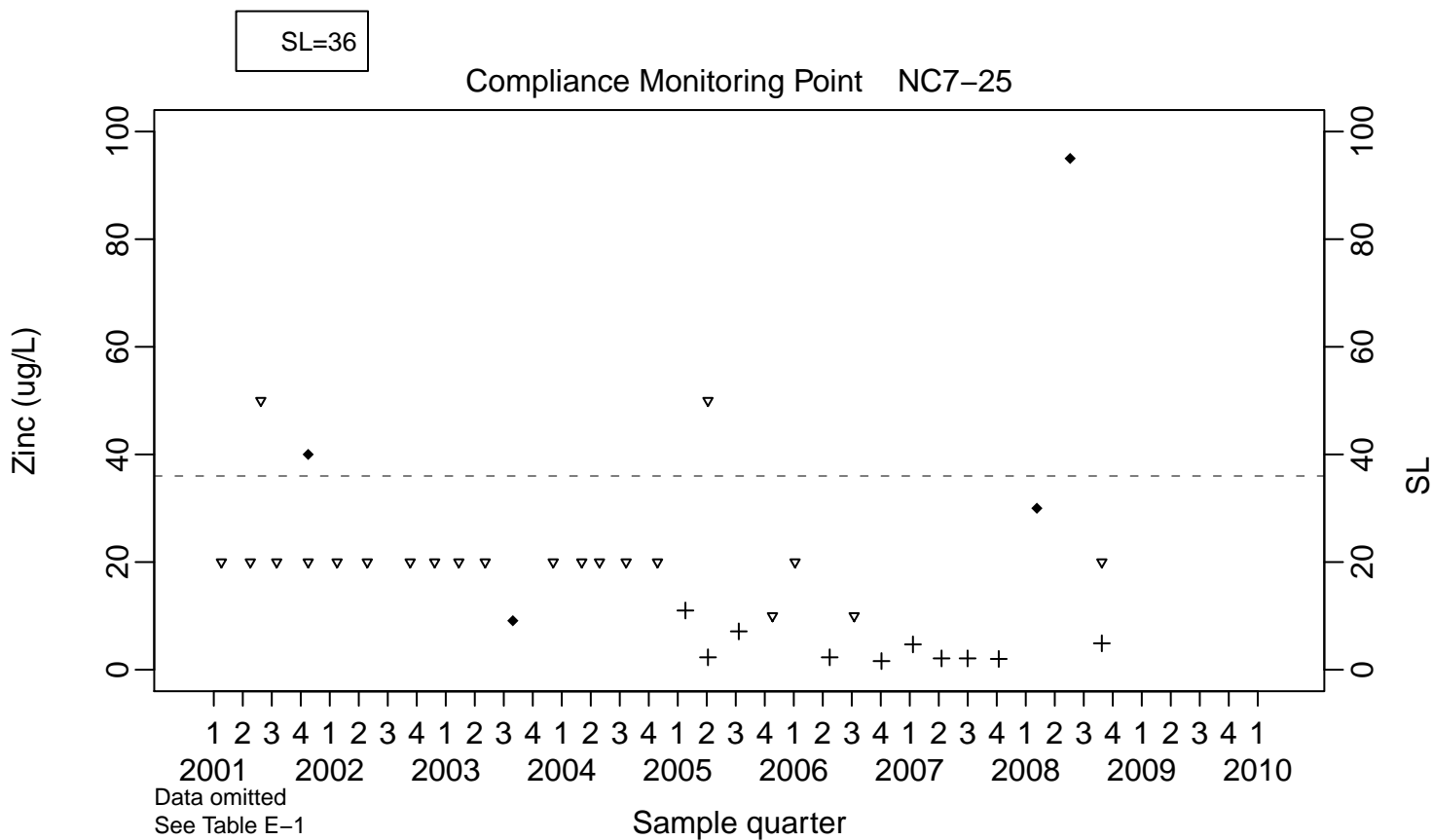
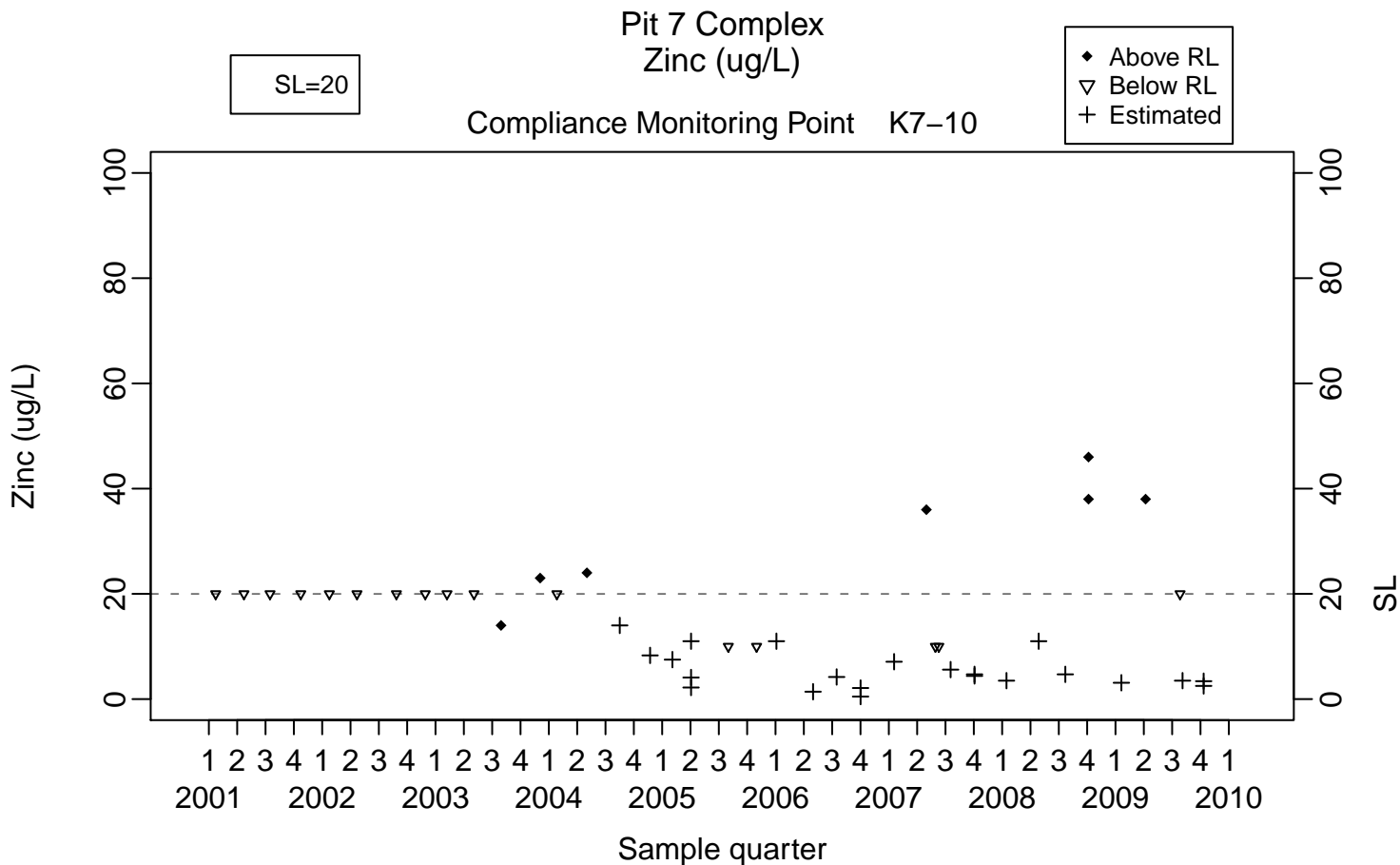


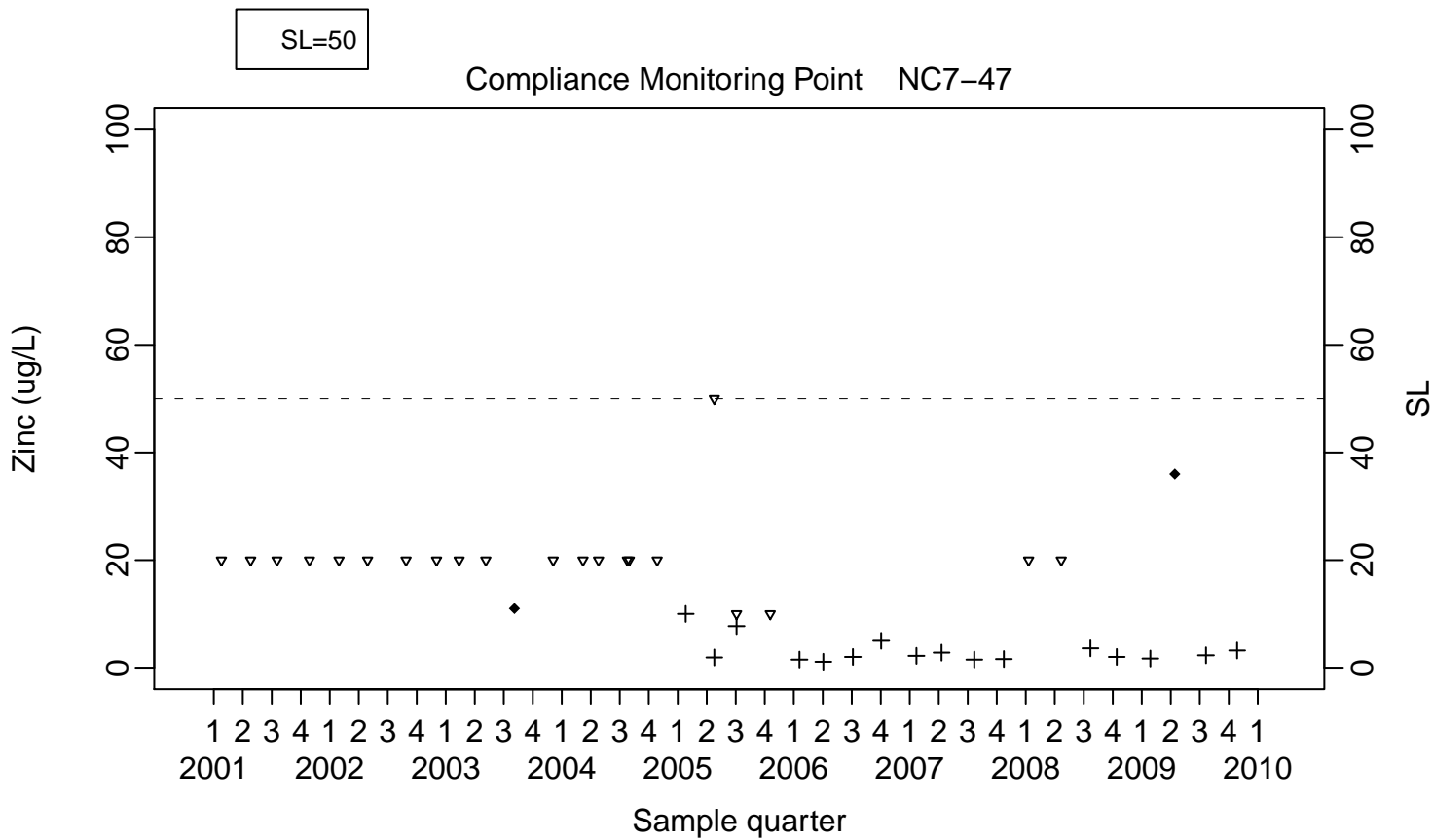
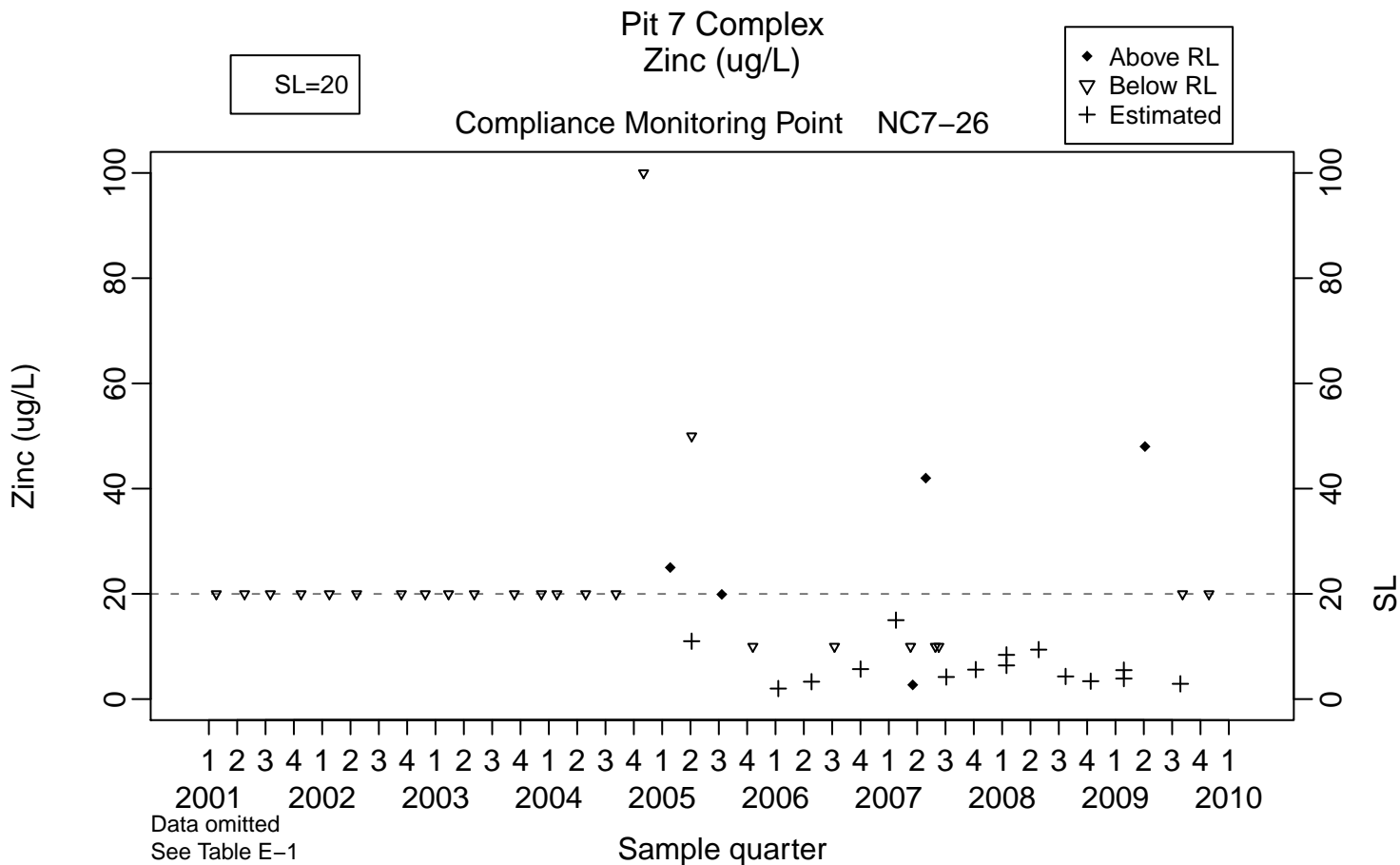


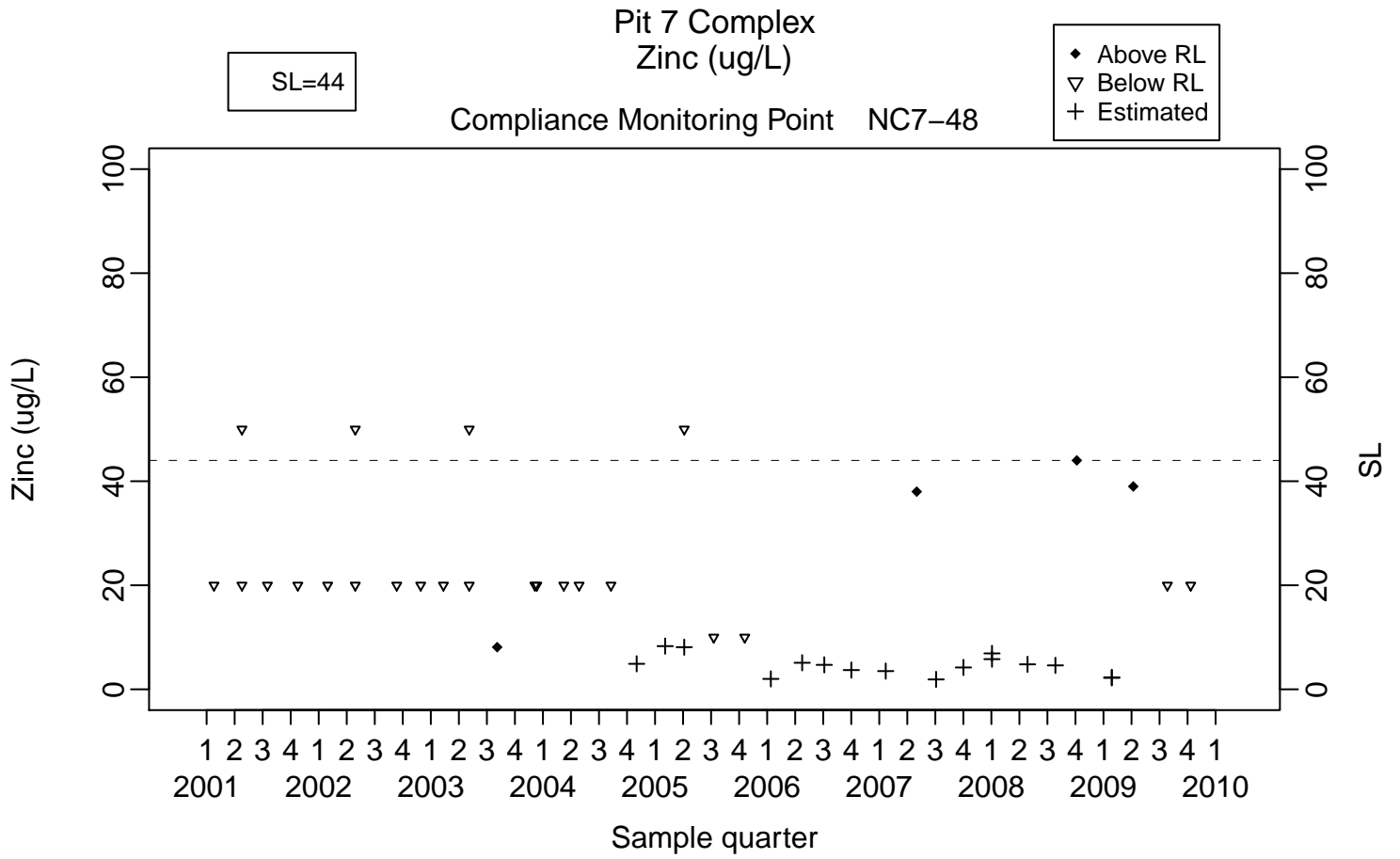








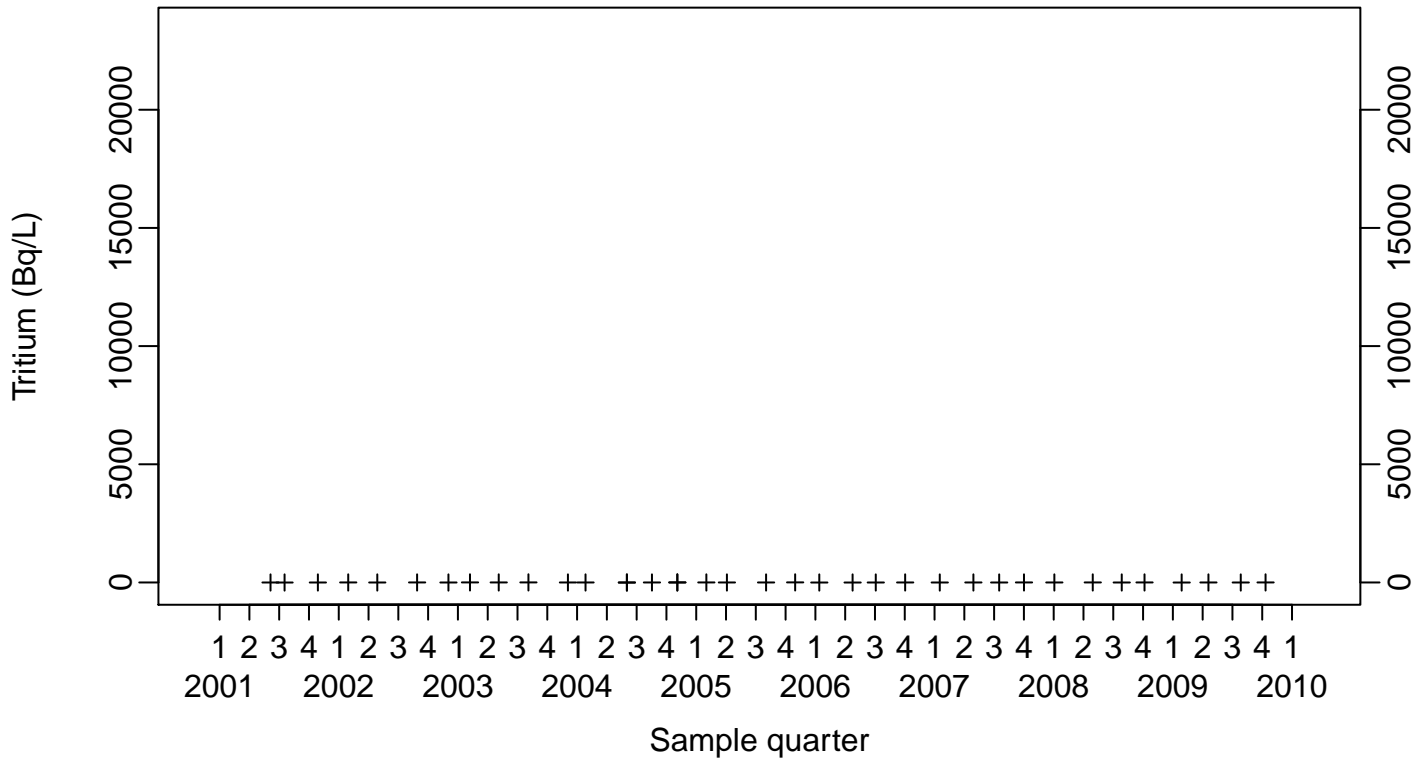




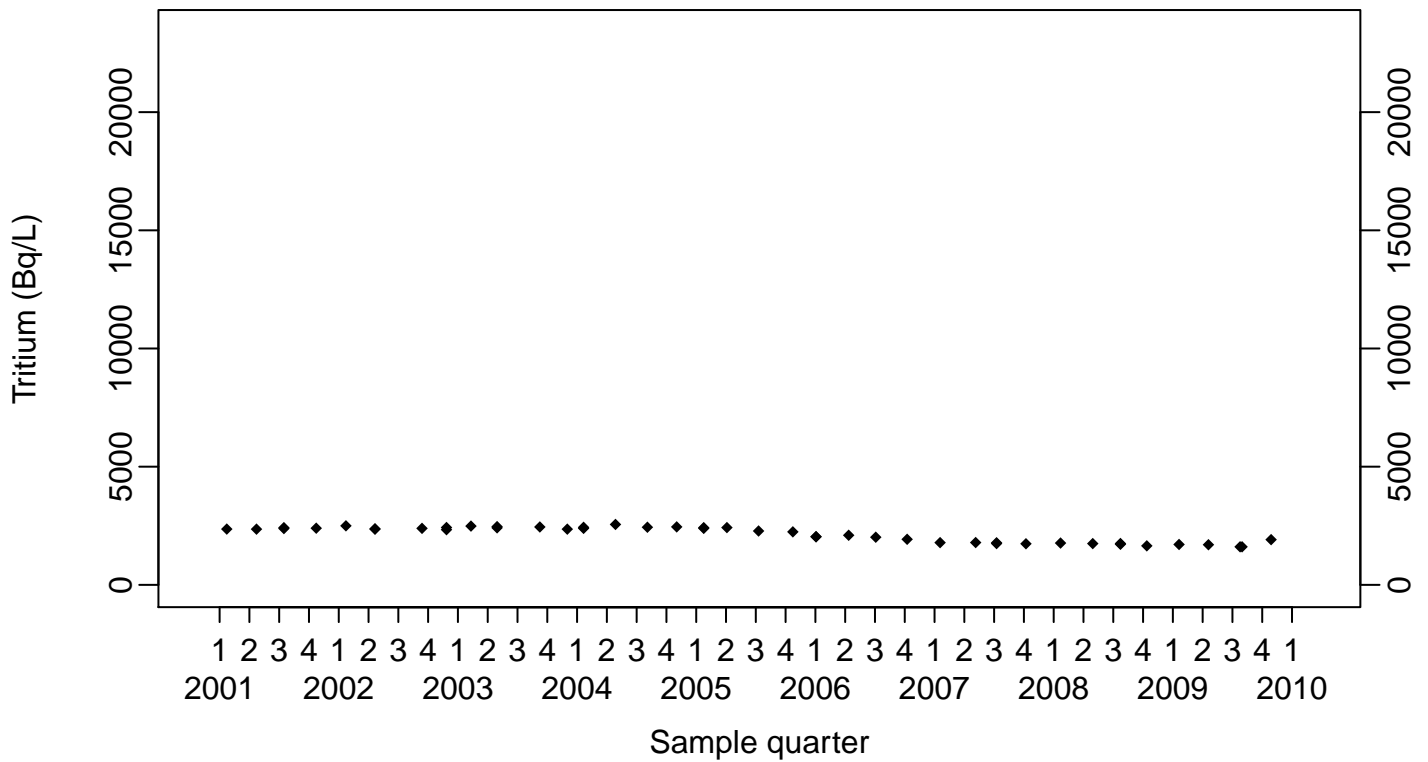
Pit 7 Complex Tritium (Bq/L)

Background Monitoring Point K7-06

◆ Above RL
+ Estimated



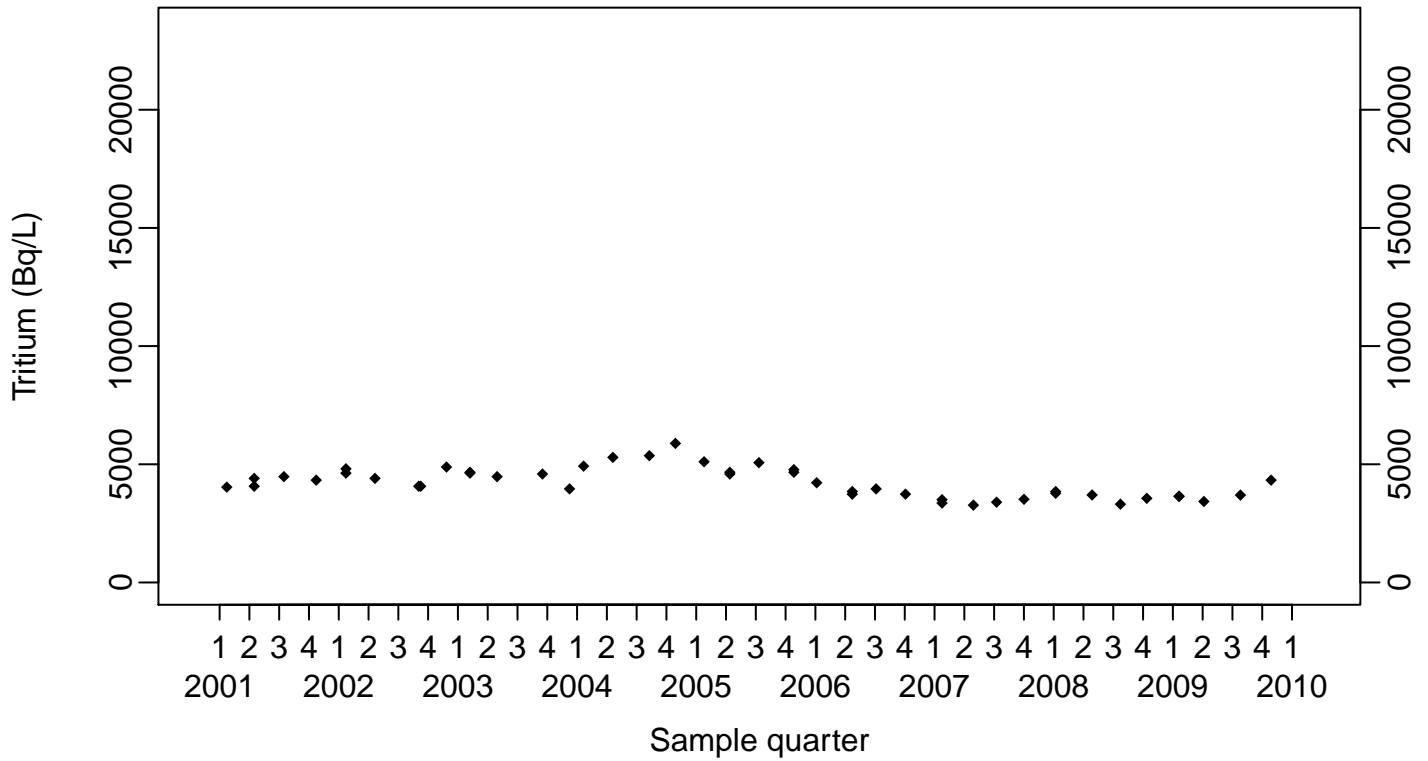
Compliance Monitoring Point K7-01



Pit 7 Complex
Tritium (Bq/L)

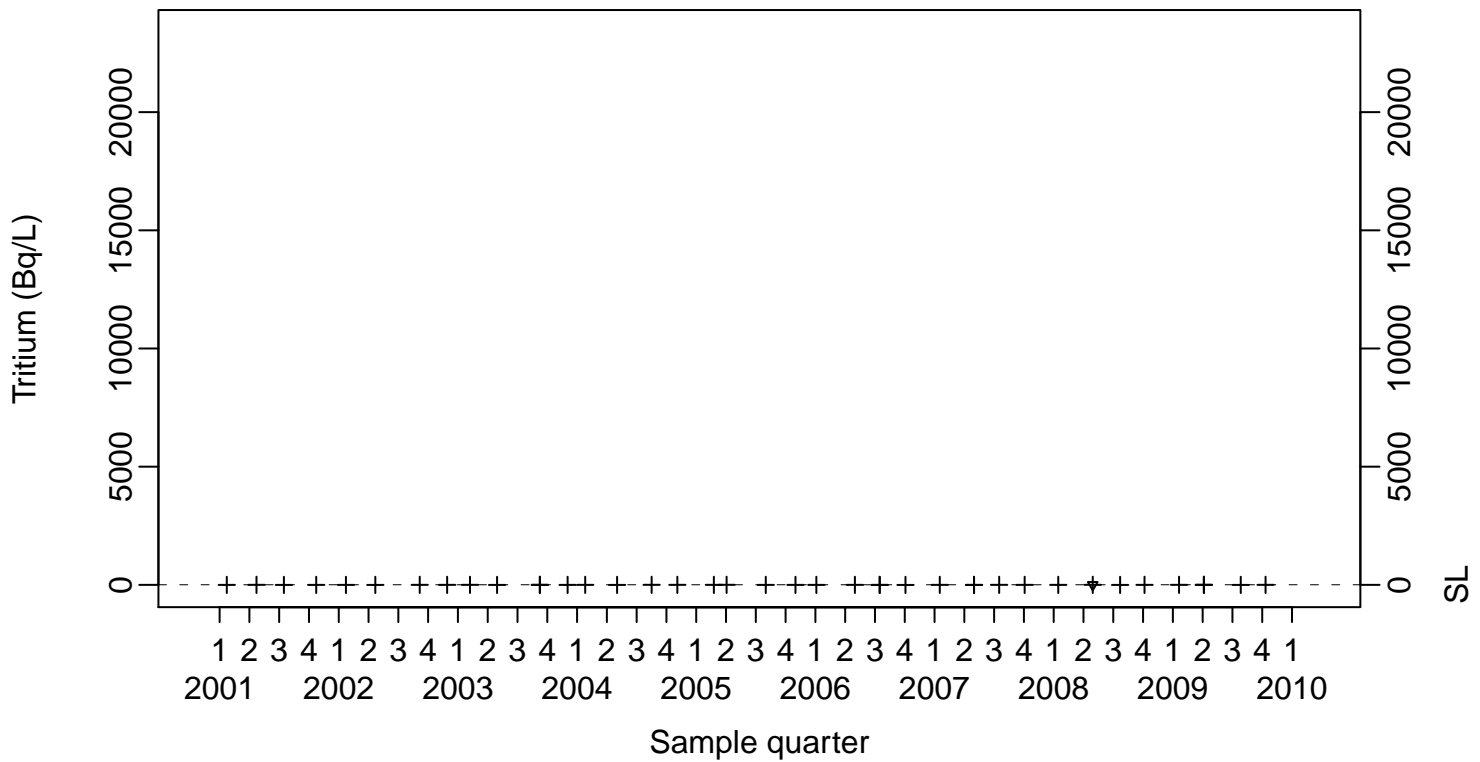
Compliance Monitoring Point K7-03

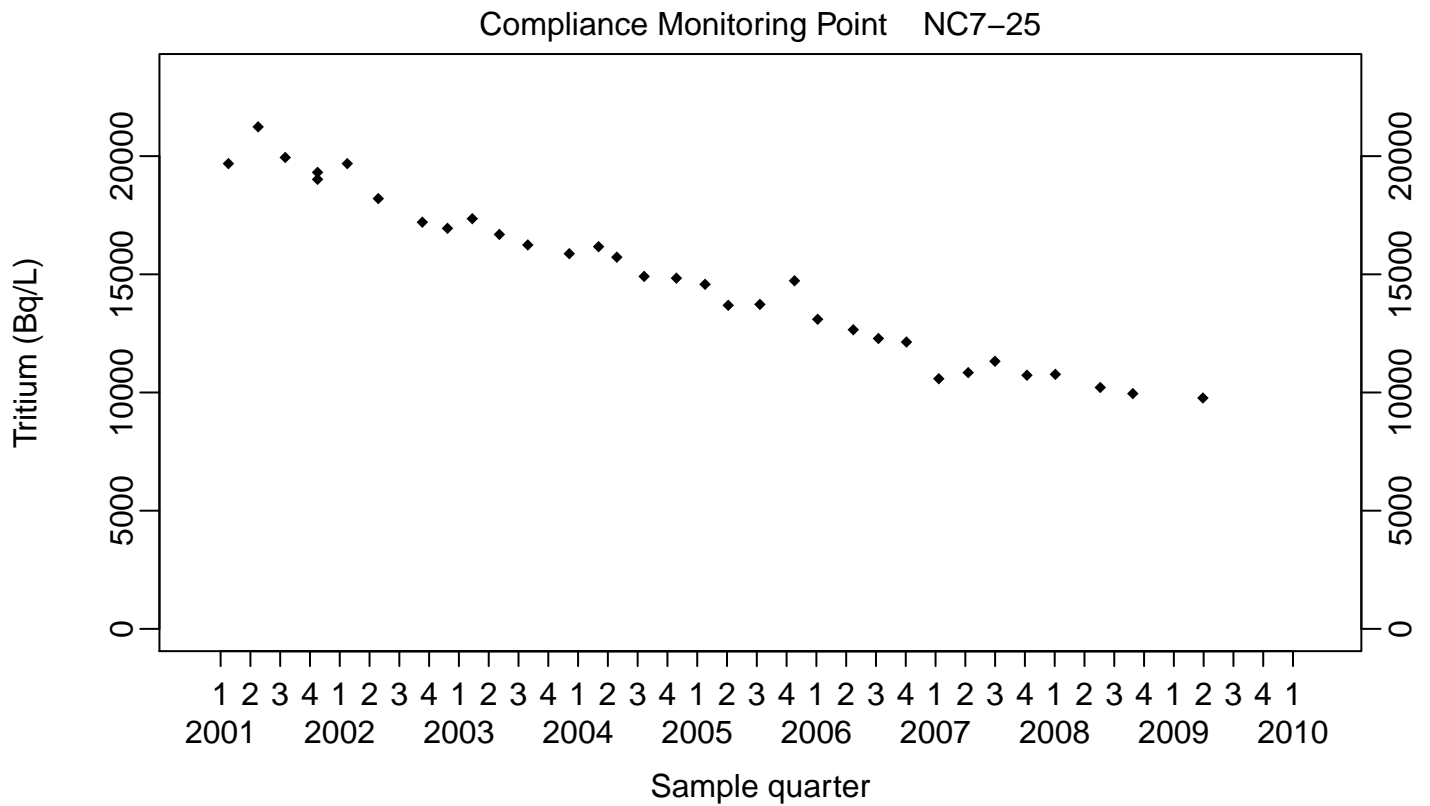
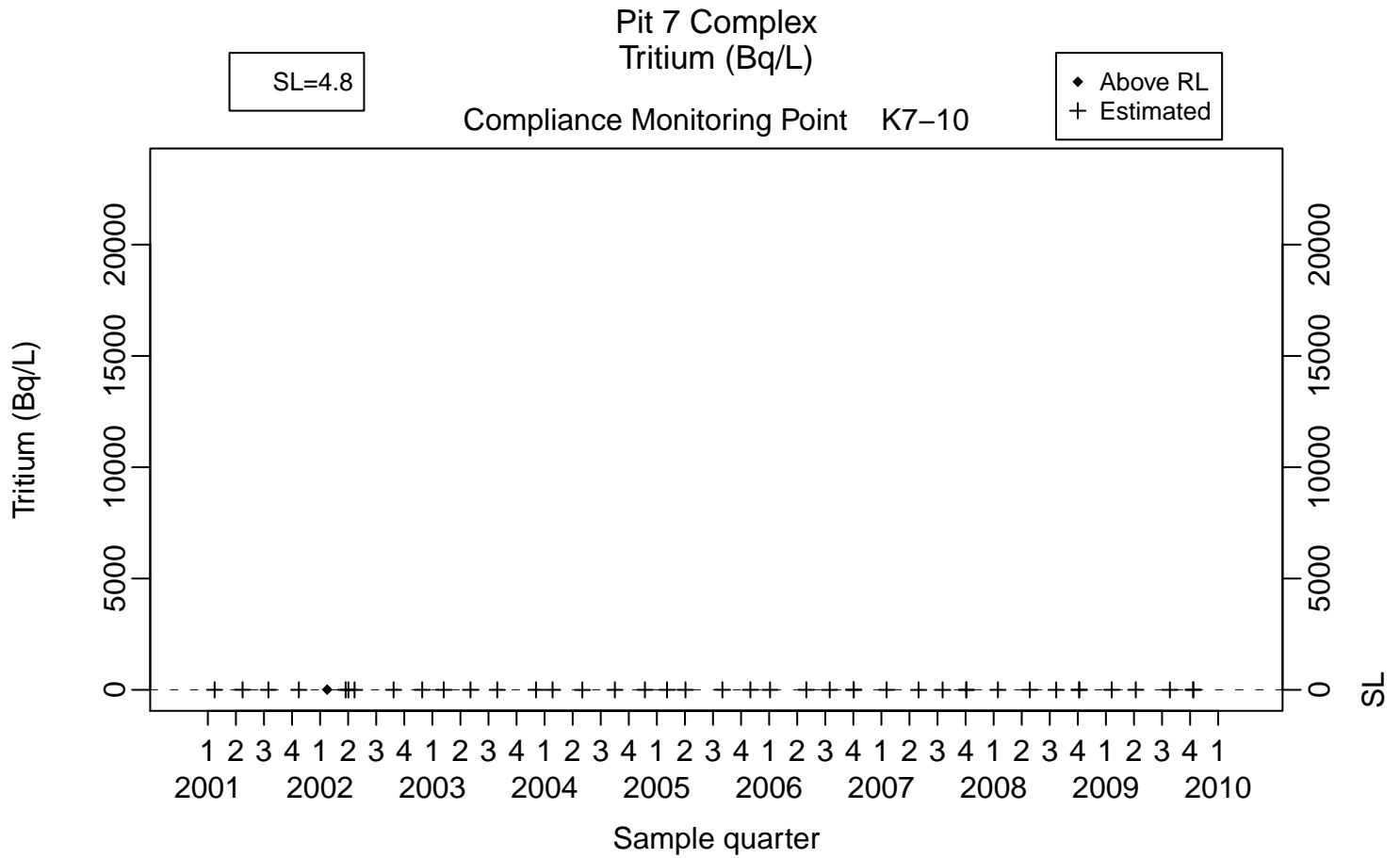
◆ Above RL
▽ Below RL



SL=4.8

Compliance Monitoring Point K7-09

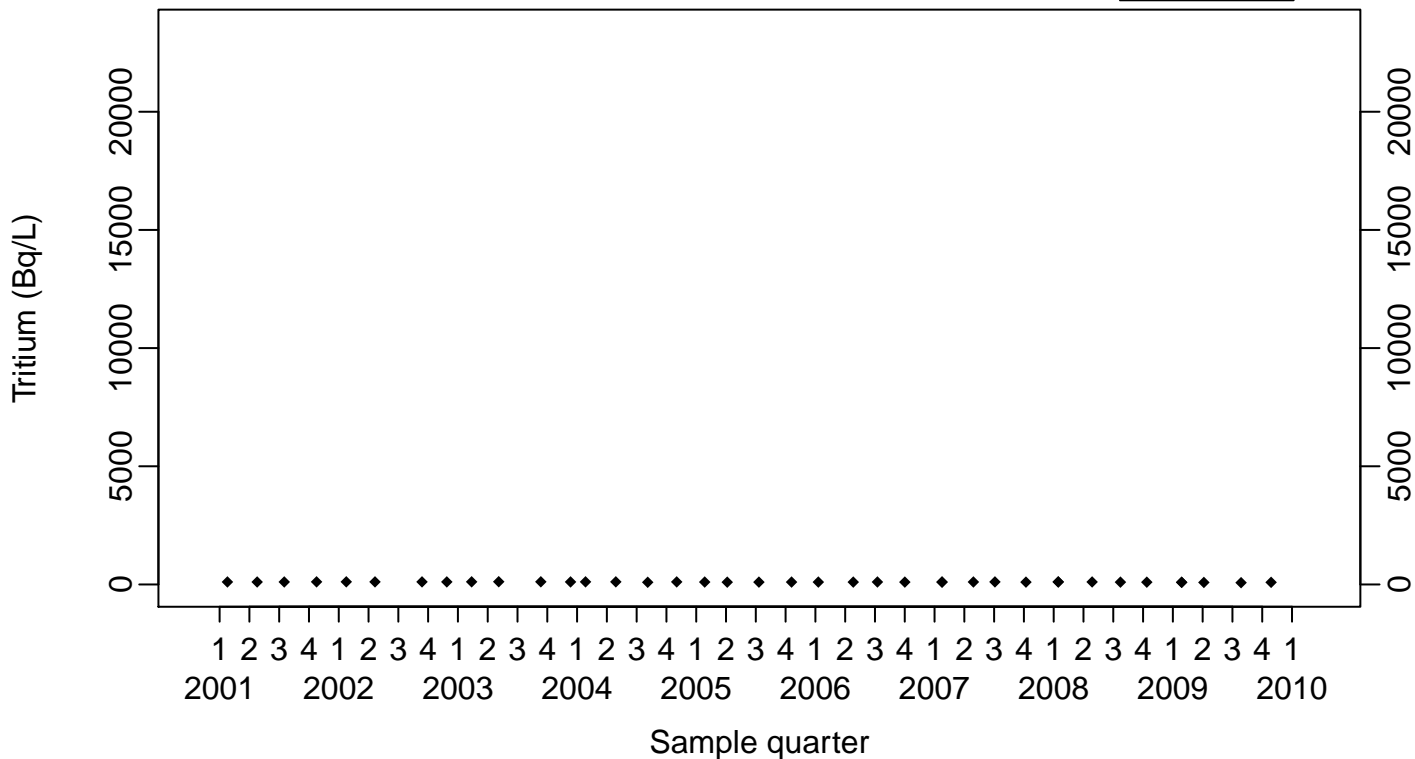




Pit 7 Complex
Tritium (Bq/L)

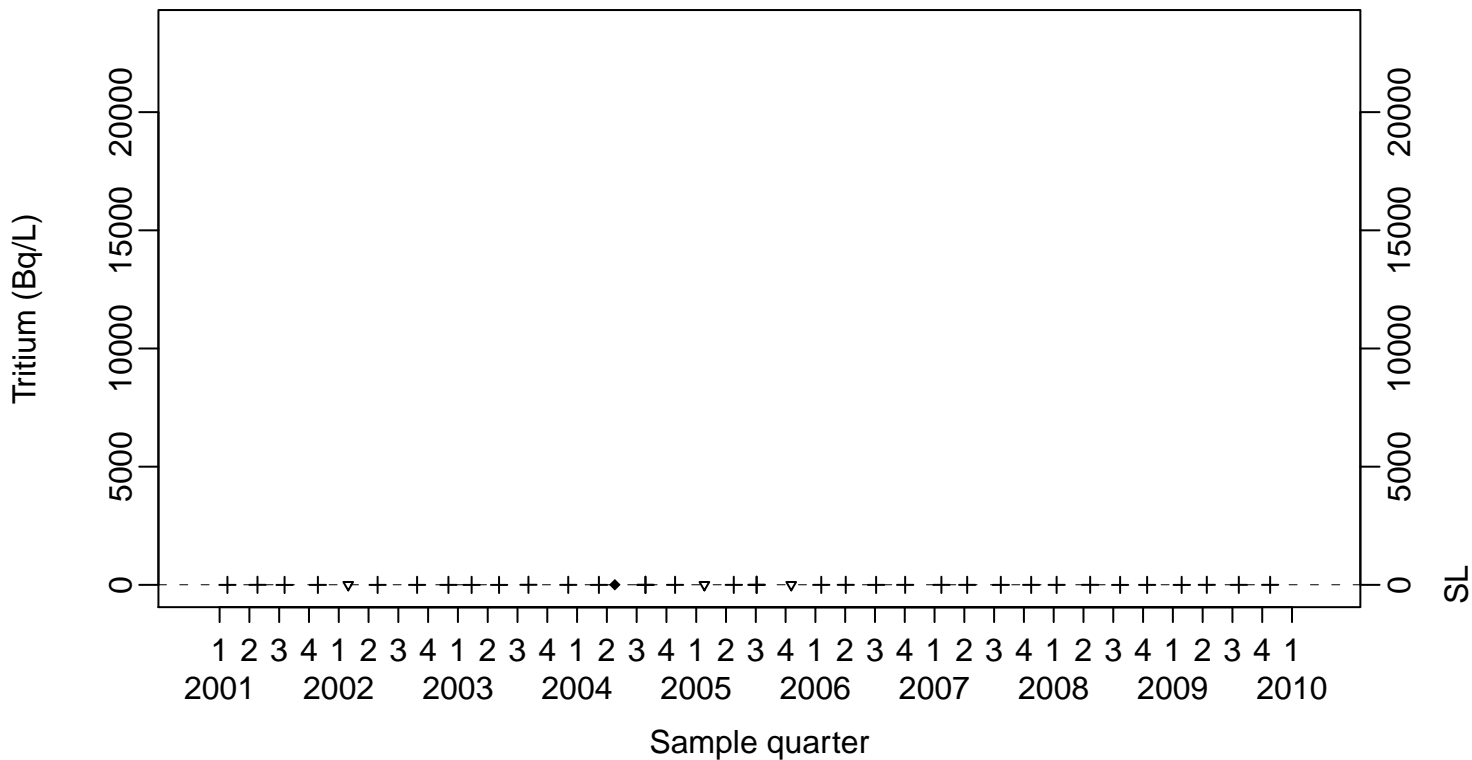
Compliance Monitoring Point NC7-26

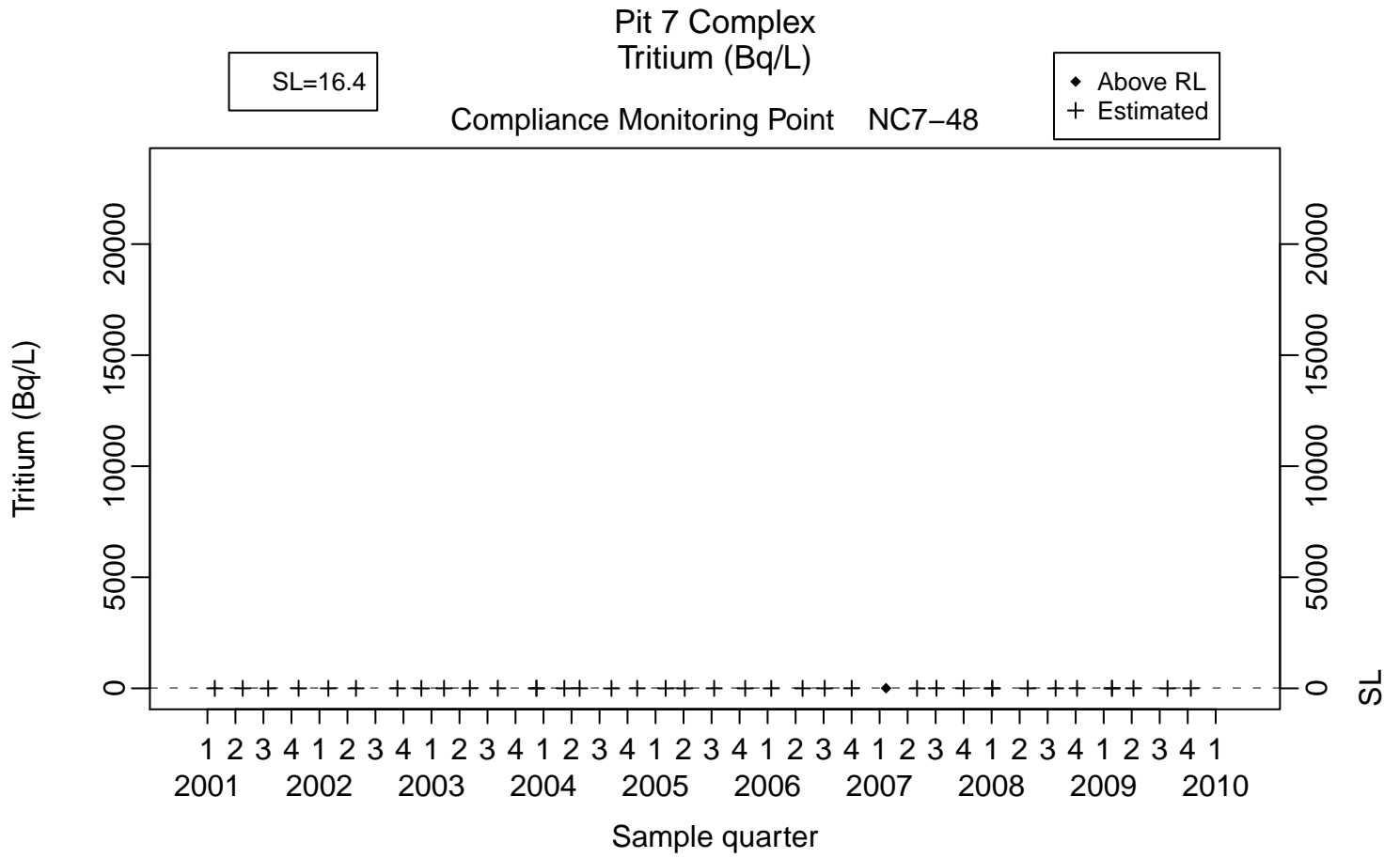
◆ Above RL
▽ Below RL



SL=4.8

Compliance Monitoring Point NC7-47

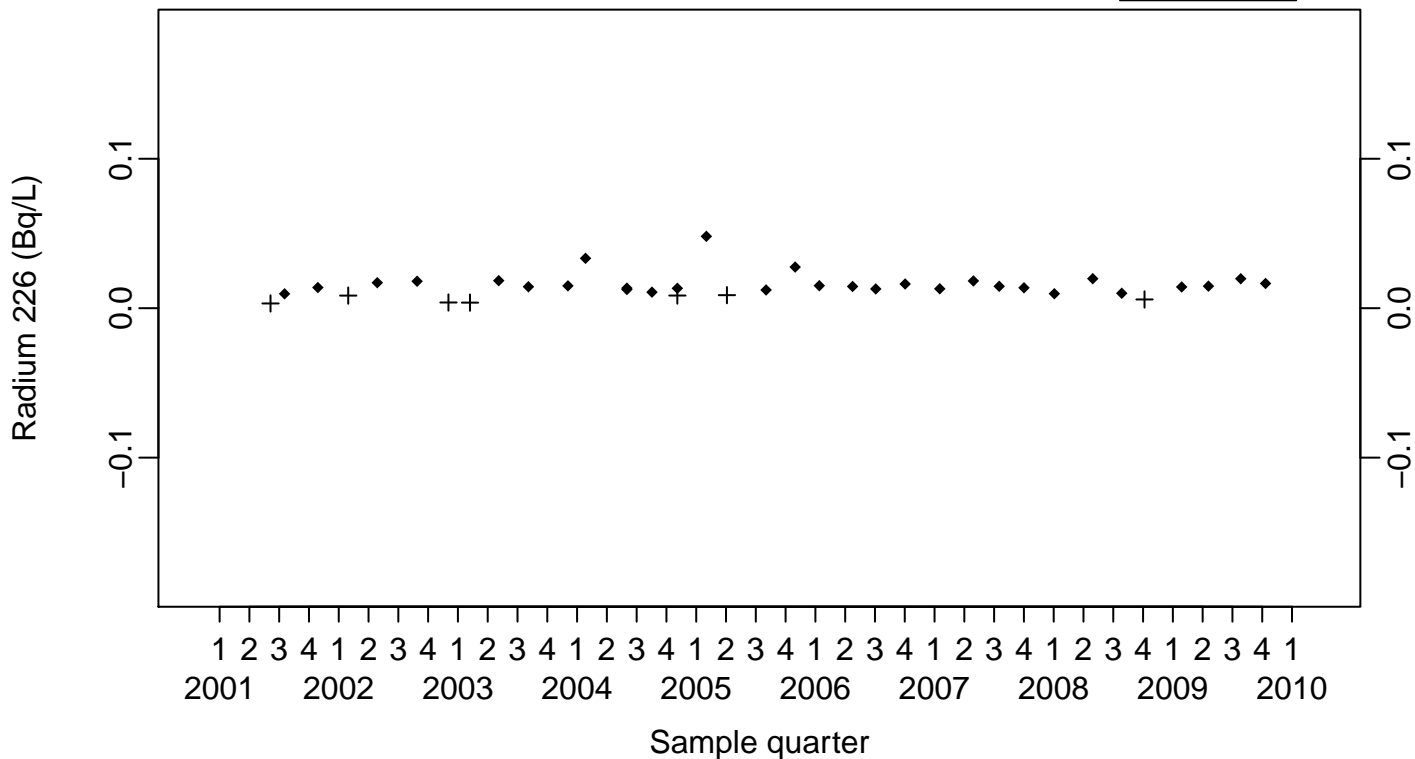




Pit 7 Complex Radium 226 (Bq/L)

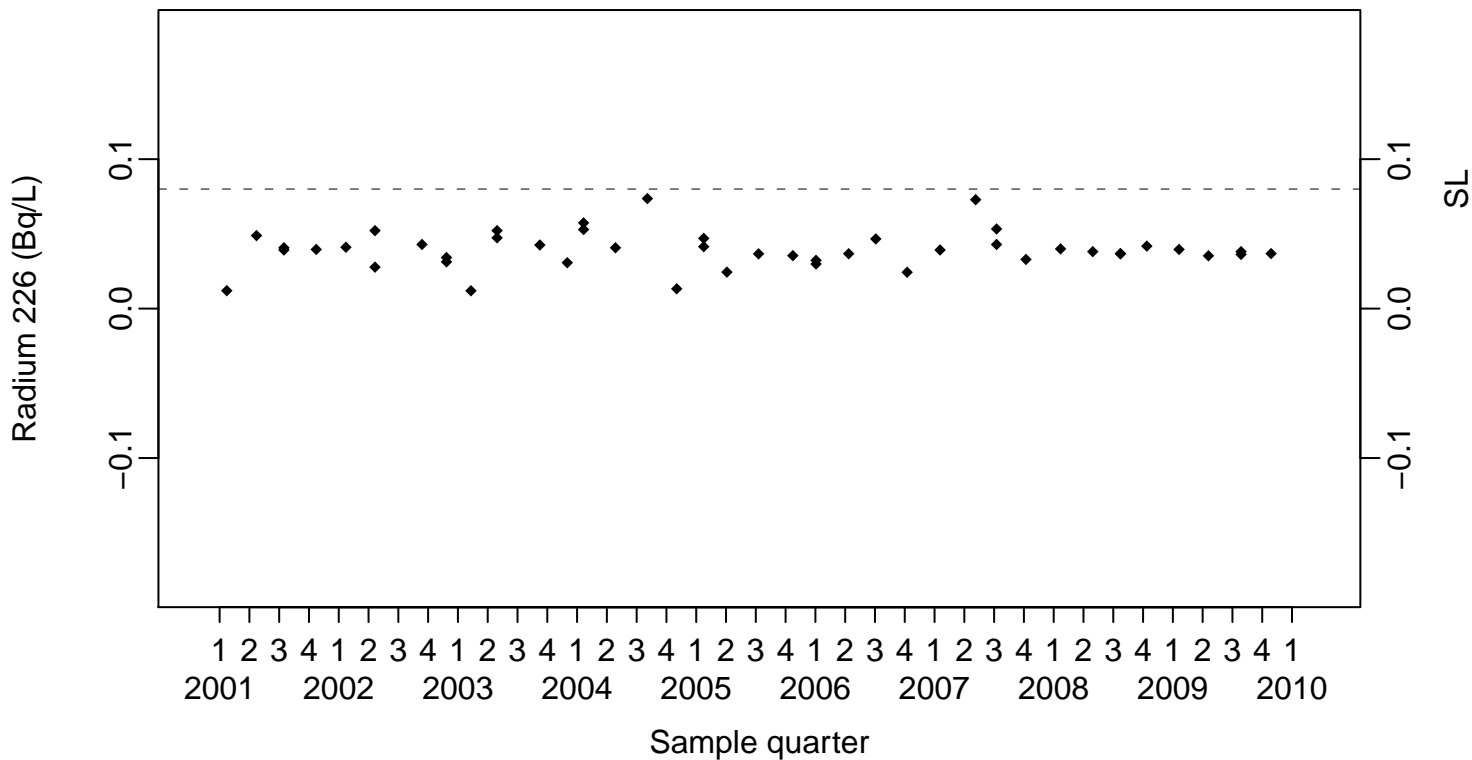
Background Monitoring Point K7-06

◆ Above RL
+ Estimated



SL=0.08

Compliance Monitoring Point K7-01

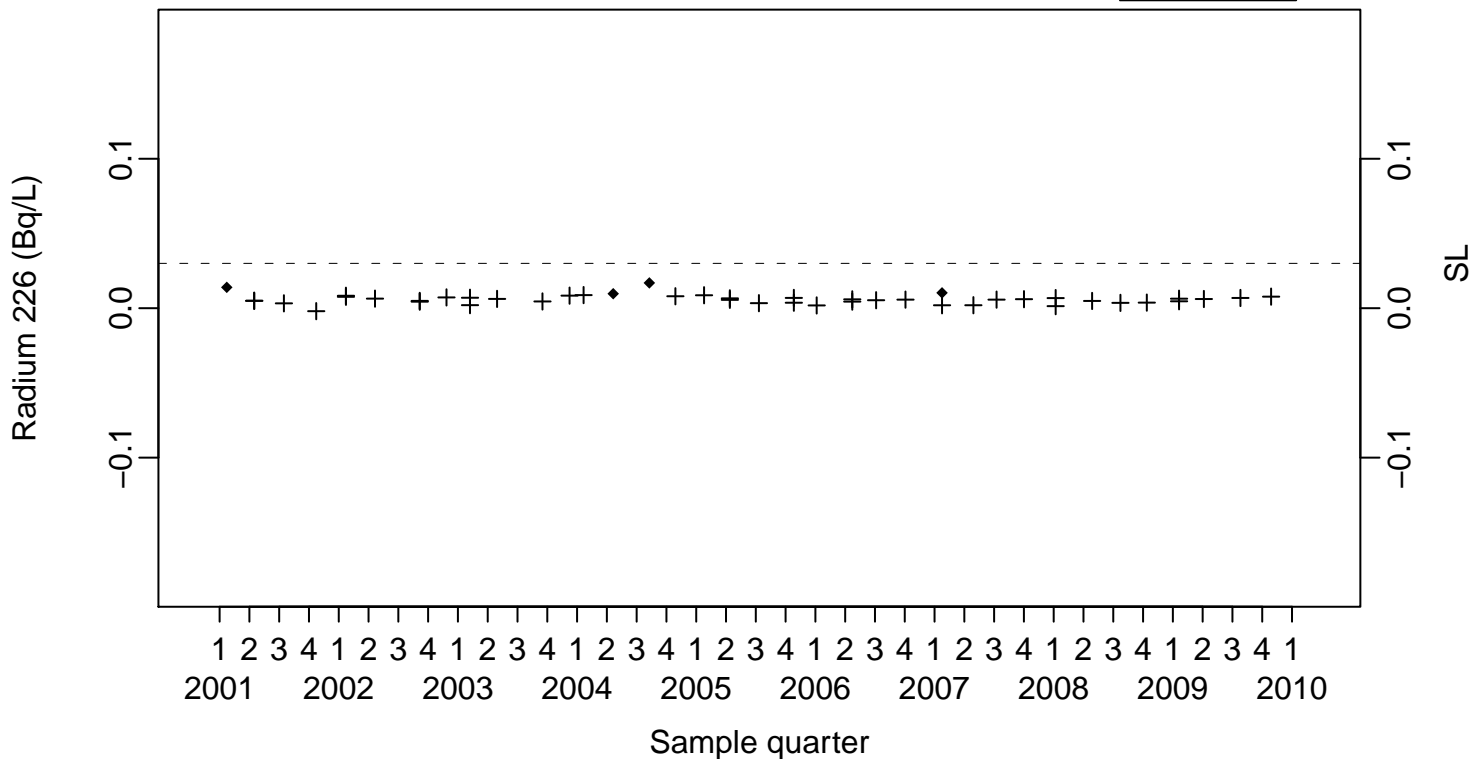


Pit 7 Complex Radium 226 (Bq/L)

SL=0.03

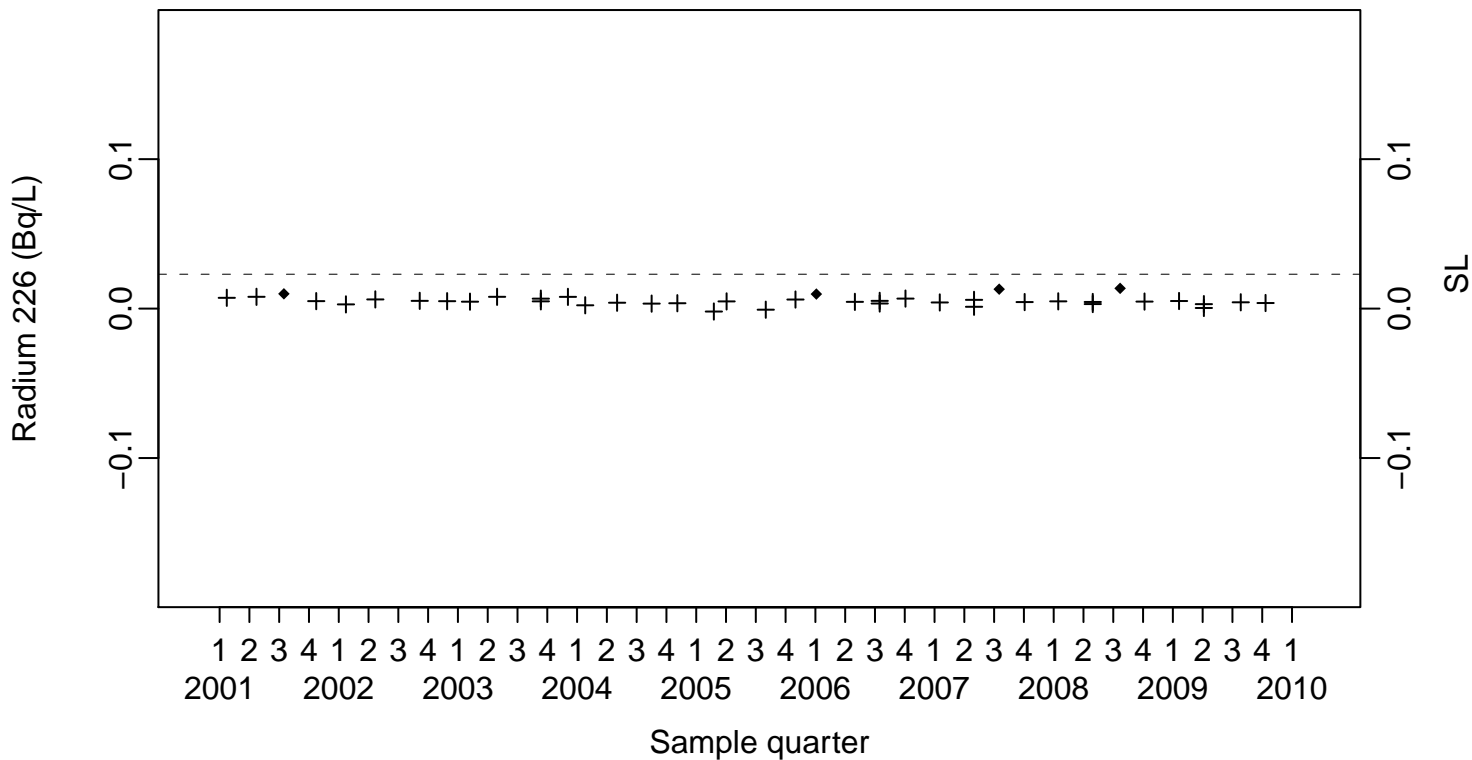
Compliance Monitoring Point K7-03

◆ Above RL
+ Estimated



SL=0.023

Compliance Monitoring Point K7-09

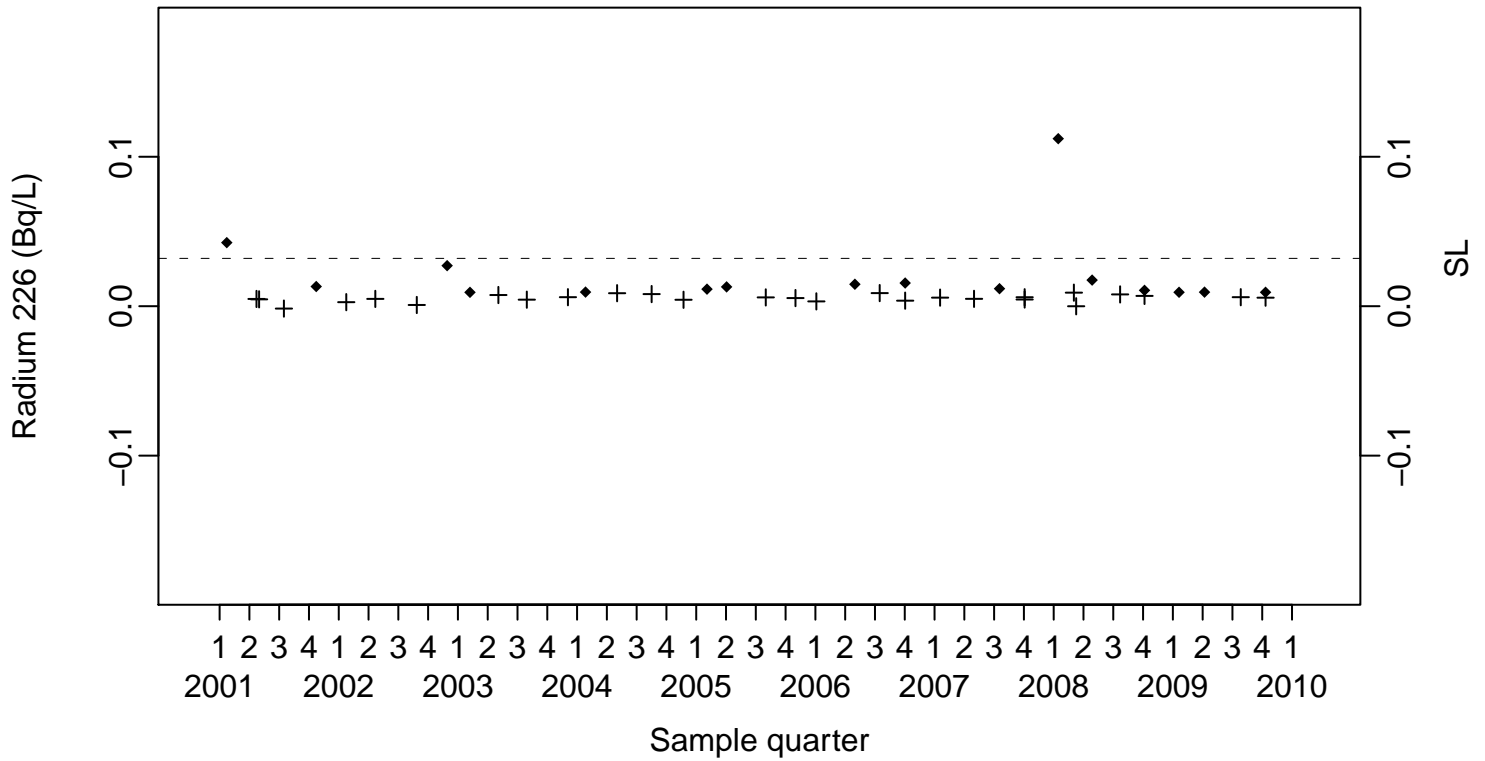


Pit 7 Complex Radium 226 (Bq/L)

SL=0.032

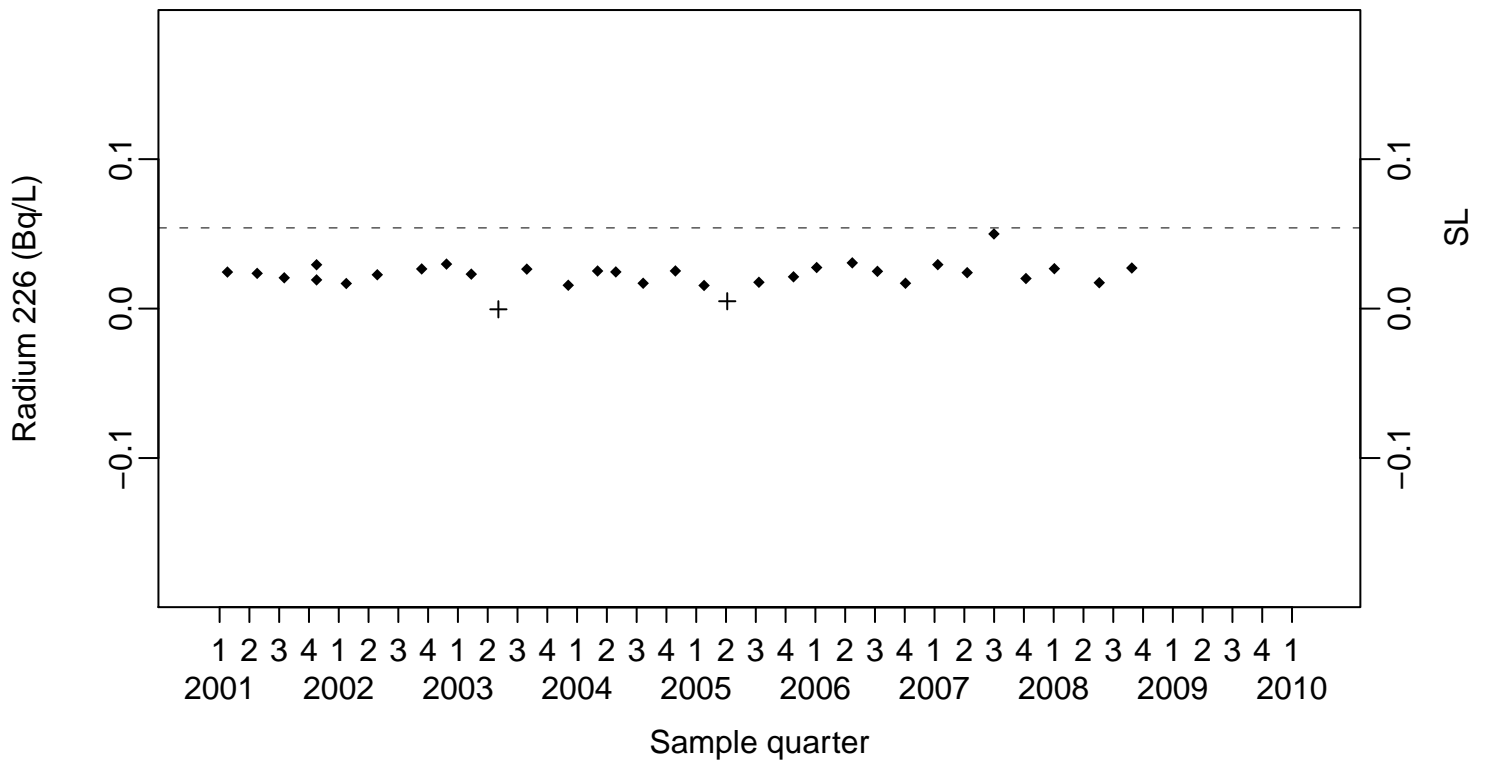
Compliance Monitoring Point K7-10

◆ Above RL
+ Estimated



SL=0.054

Compliance Monitoring Point NC7-25

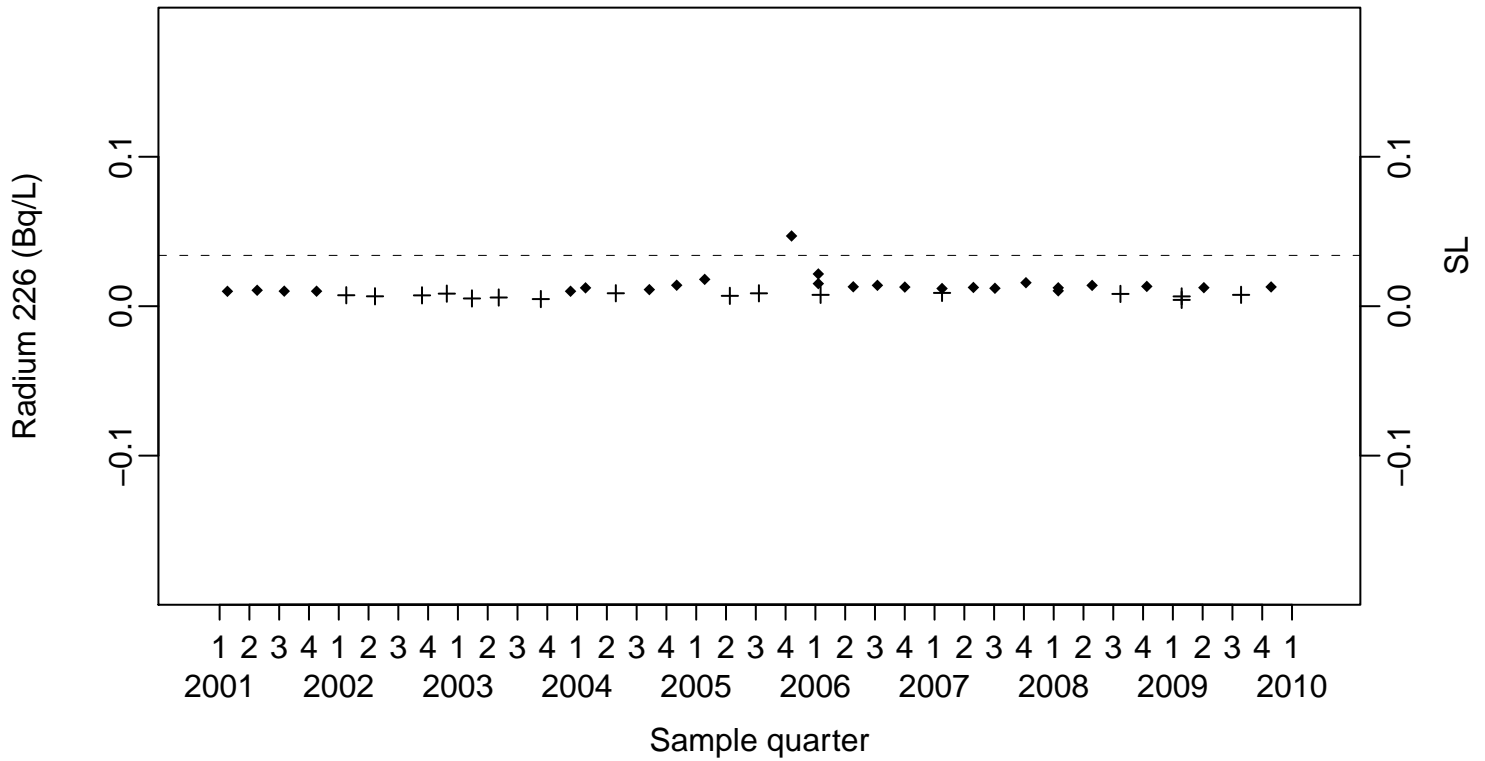


Pit 7 Complex Radium 226 (Bq/L)

SL=0.034

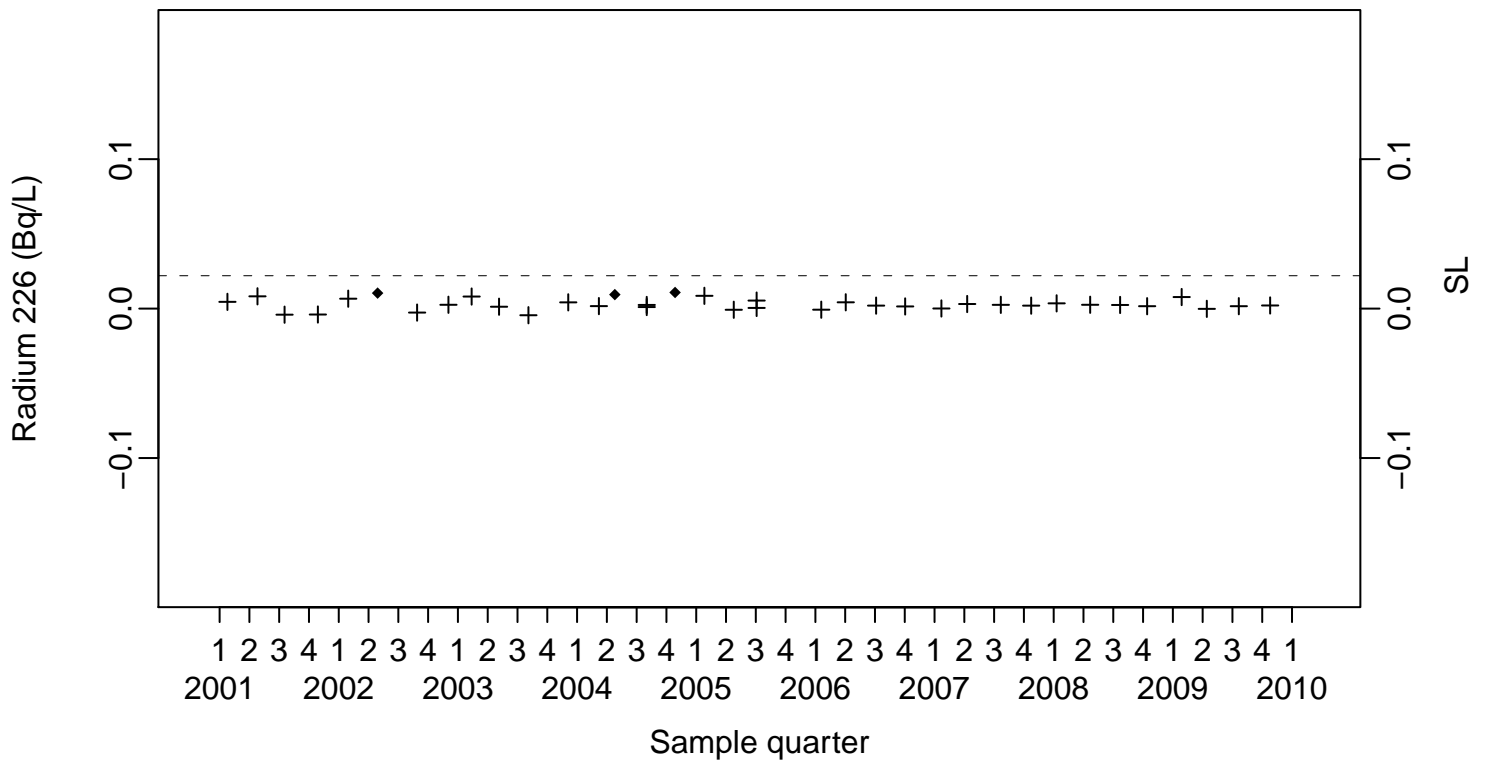
Compliance Monitoring Point NC7-26

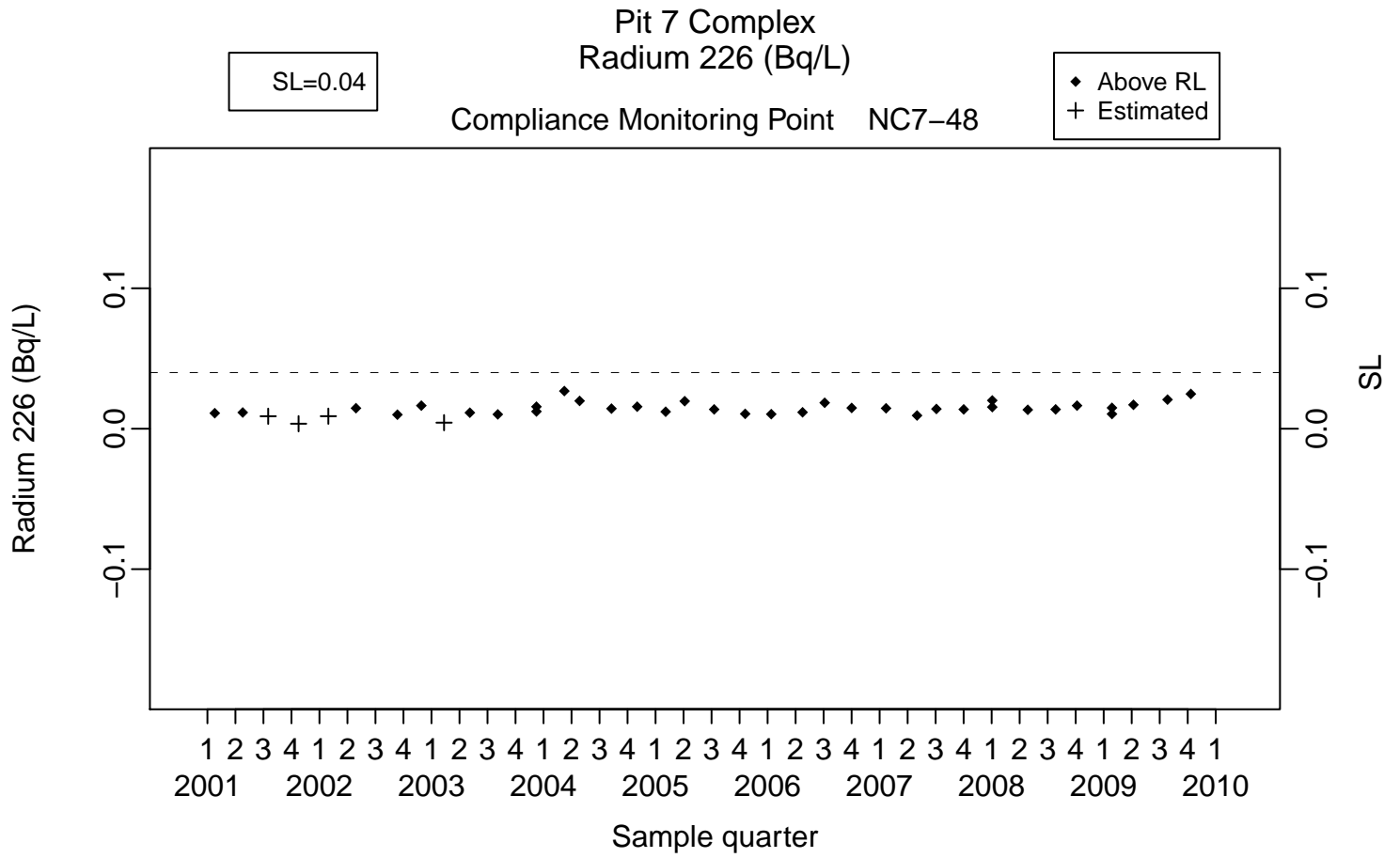
◆ Above RL
+ Estimated



SL=0.022

Compliance Monitoring Point NC7-47

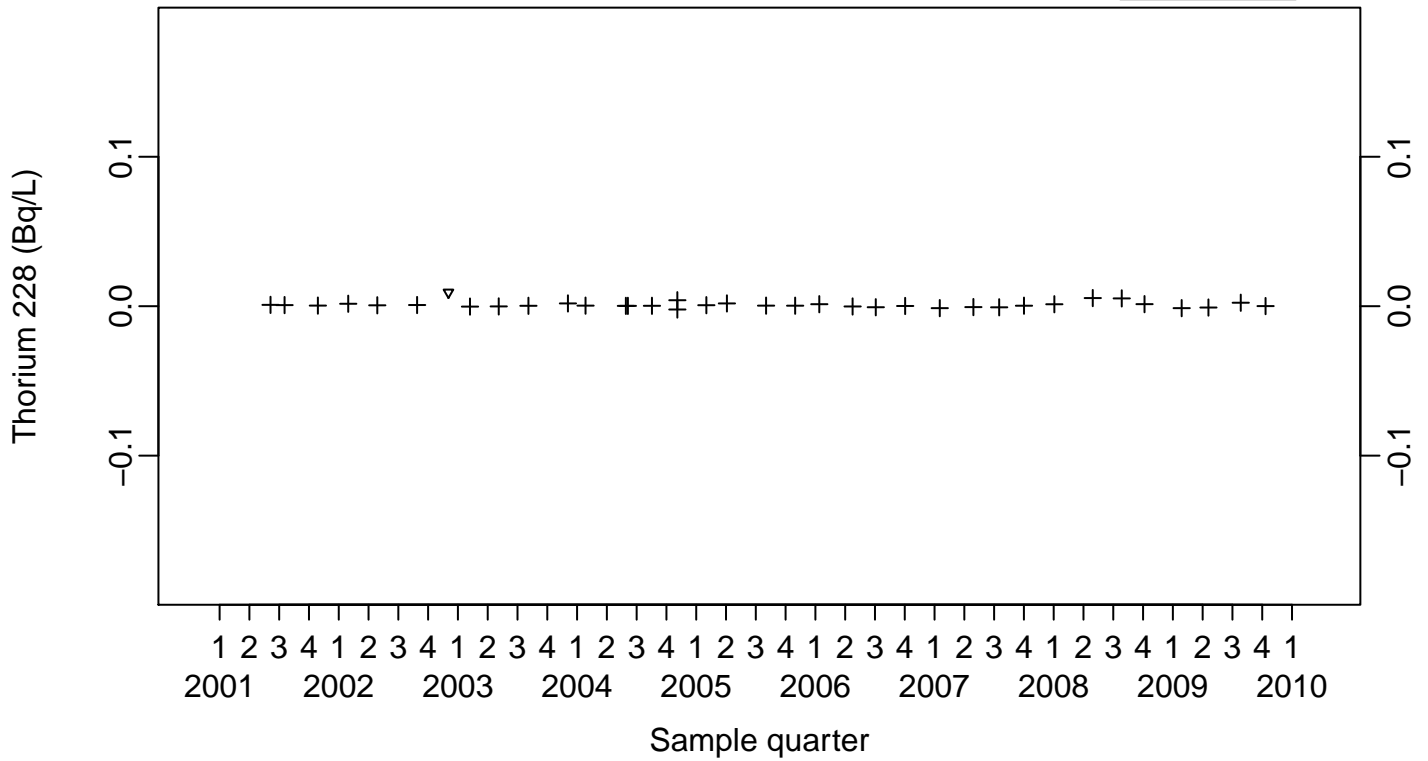




Pit 7 Complex Thorium 228 (Bq/L)

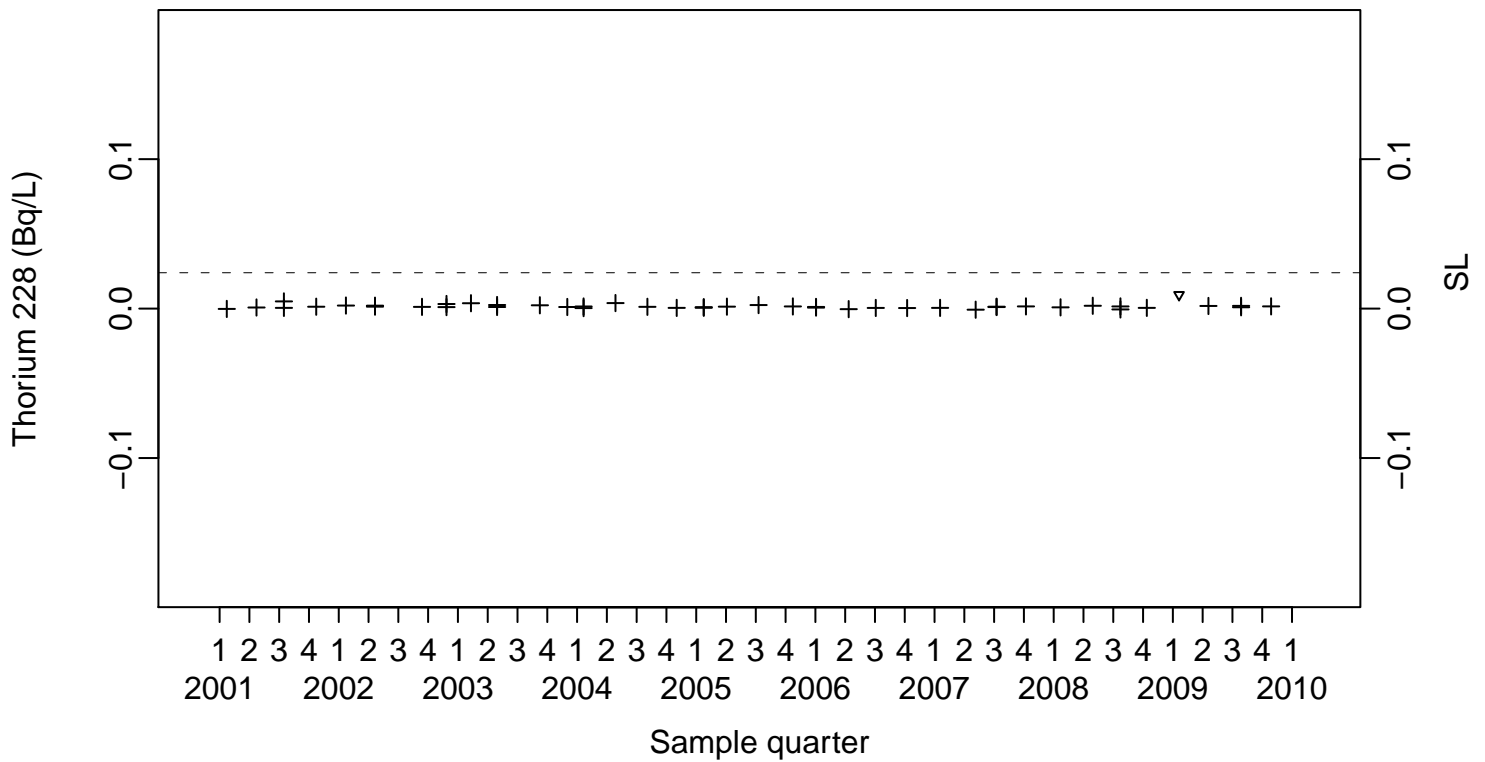
Background Monitoring Point K7-06

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.024

Compliance Monitoring Point K7-01

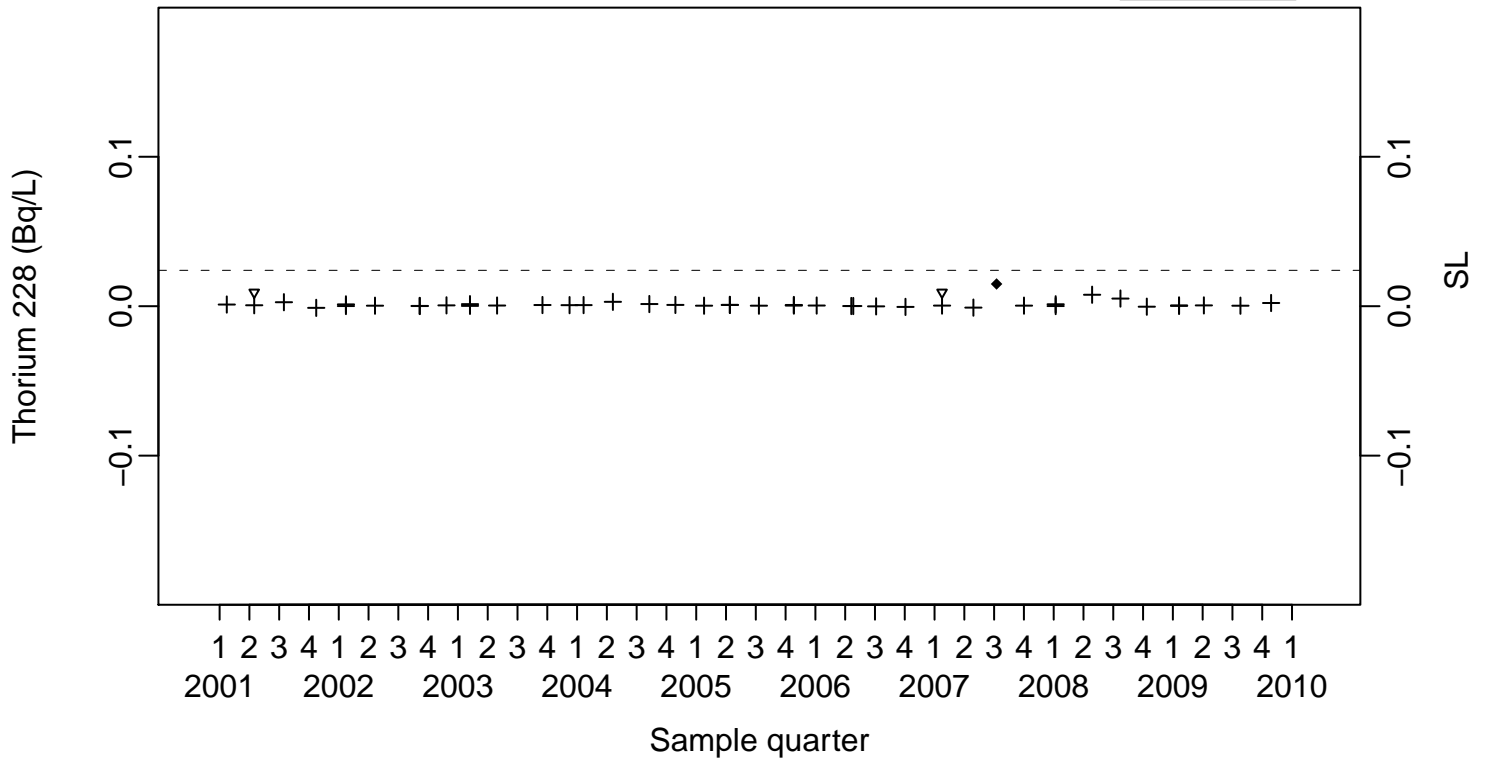


Pit 7 Complex
Thorium 228 (Bq/L)

SL=0.024

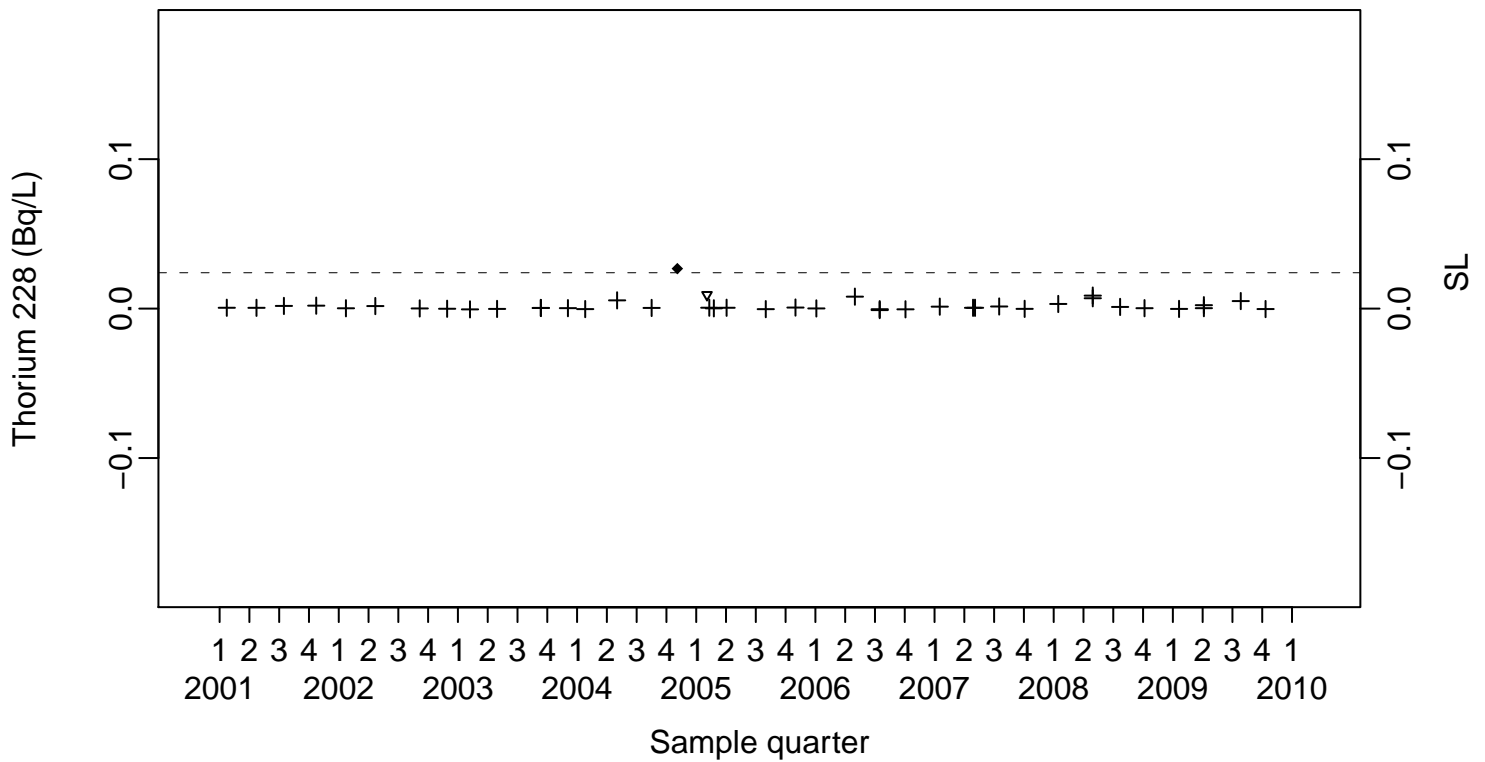
Compliance Monitoring Point K7-03

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.024

Compliance Monitoring Point K7-09

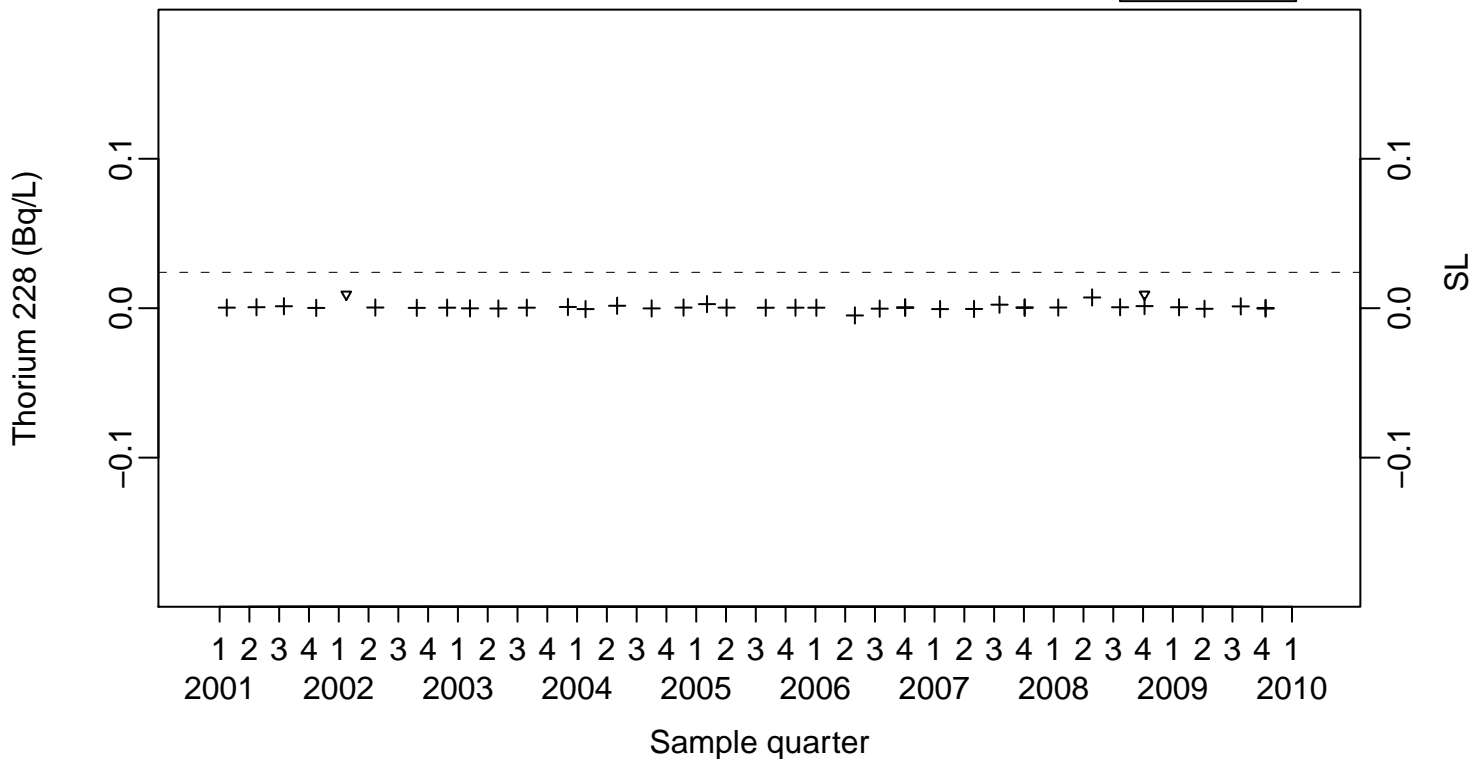


Pit 7 Complex
Thorium 228 (Bq/L)

SL=0.024

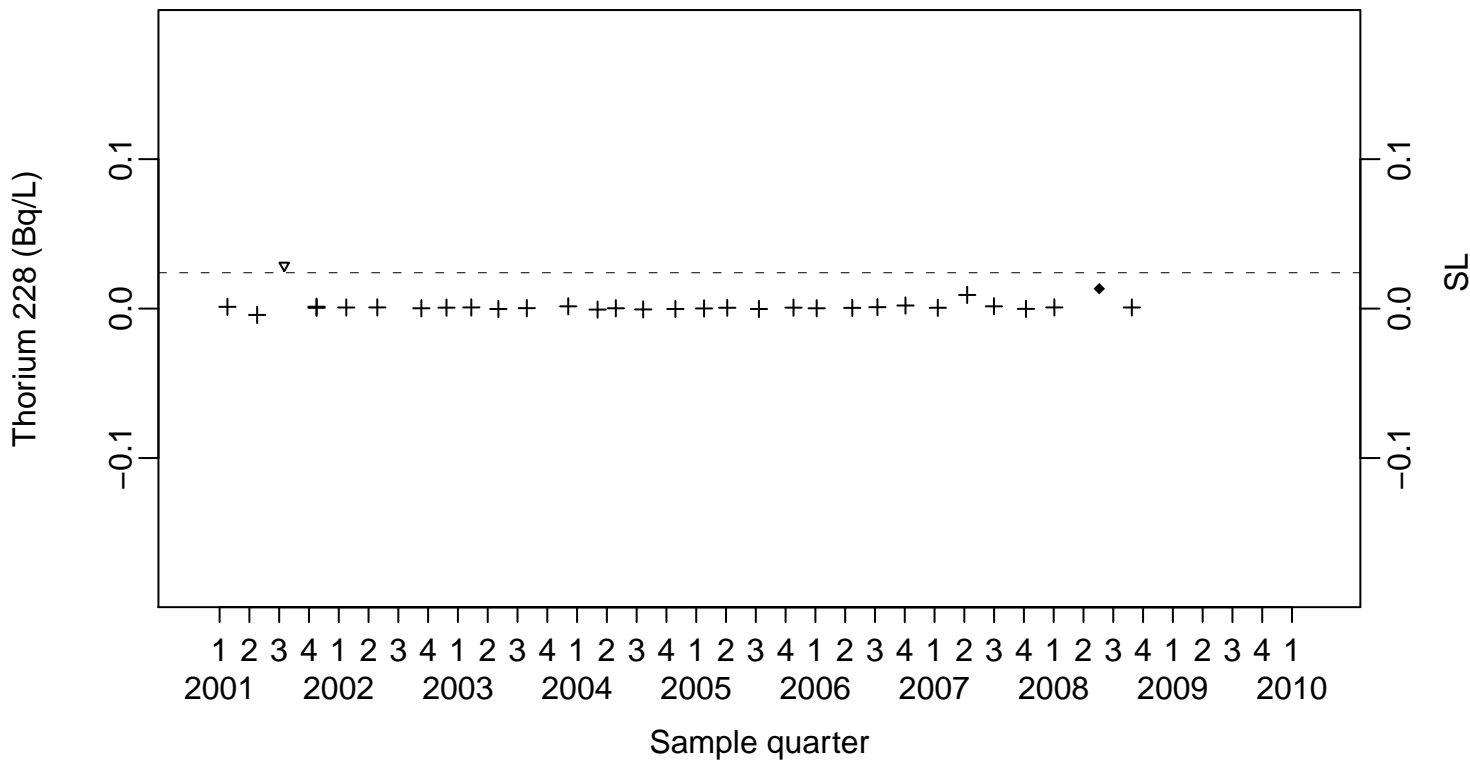
Compliance Monitoring Point K7-10

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.024

Compliance Monitoring Point NC7-25

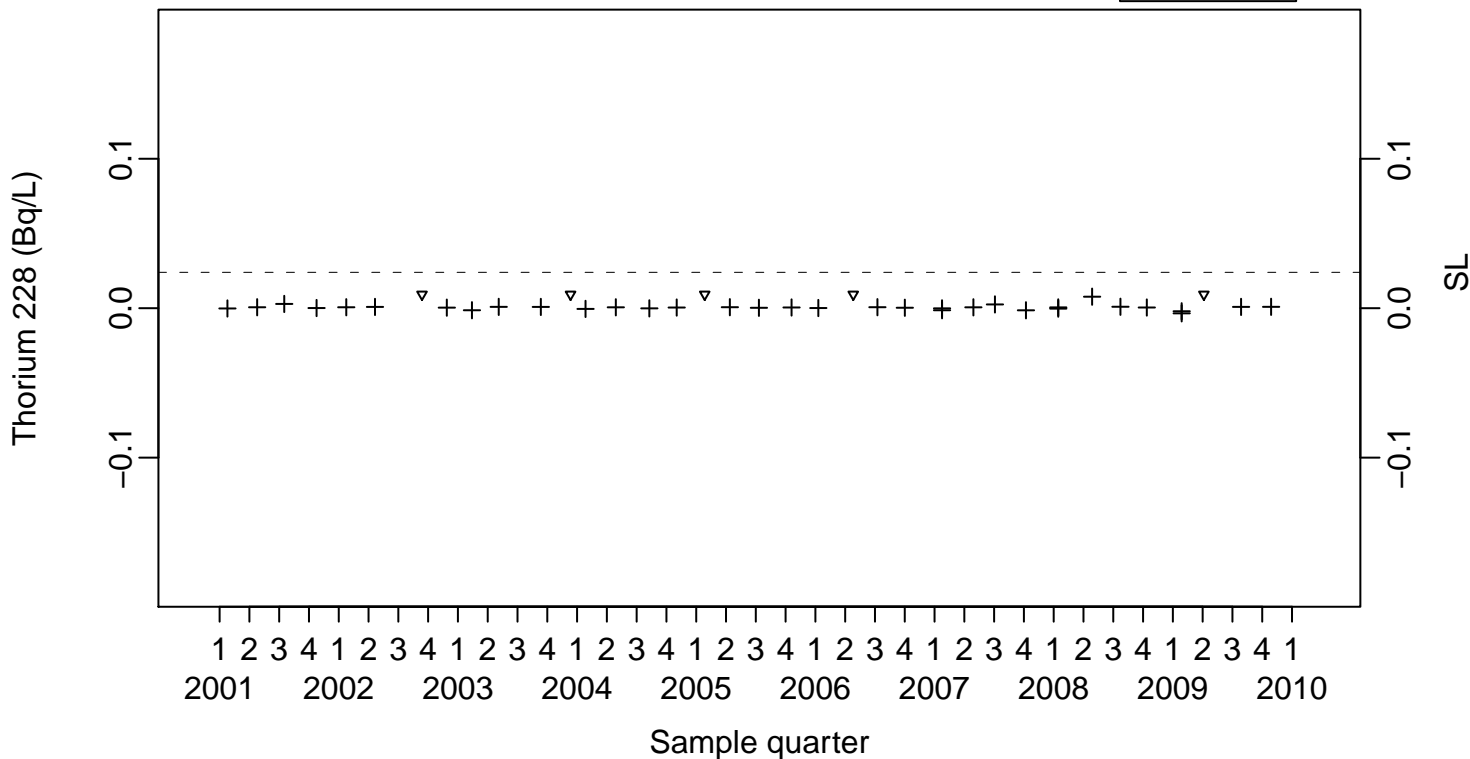


Pit 7 Complex Thorium 228 (Bq/L)

Compliance Monitoring Point NC7-26

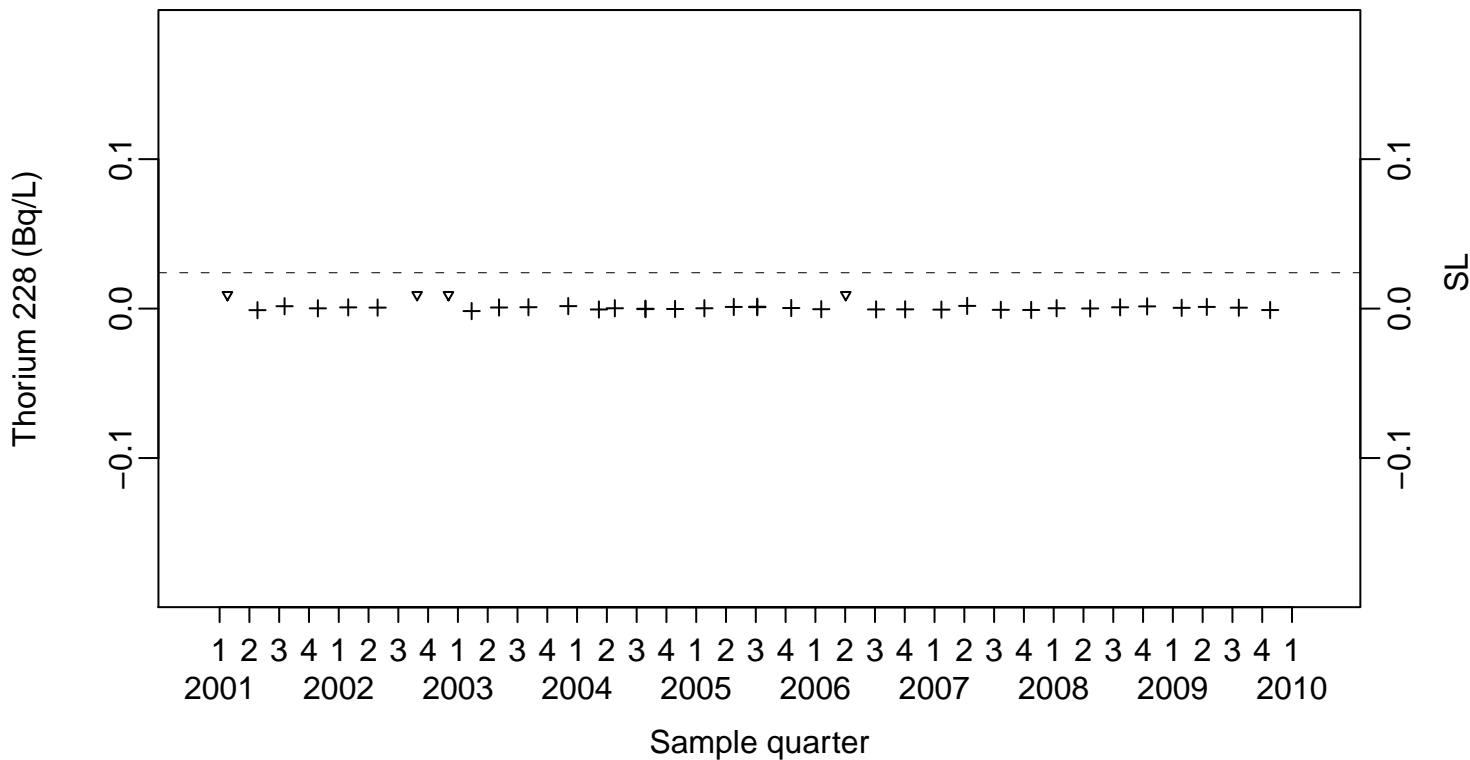
SL=0.024

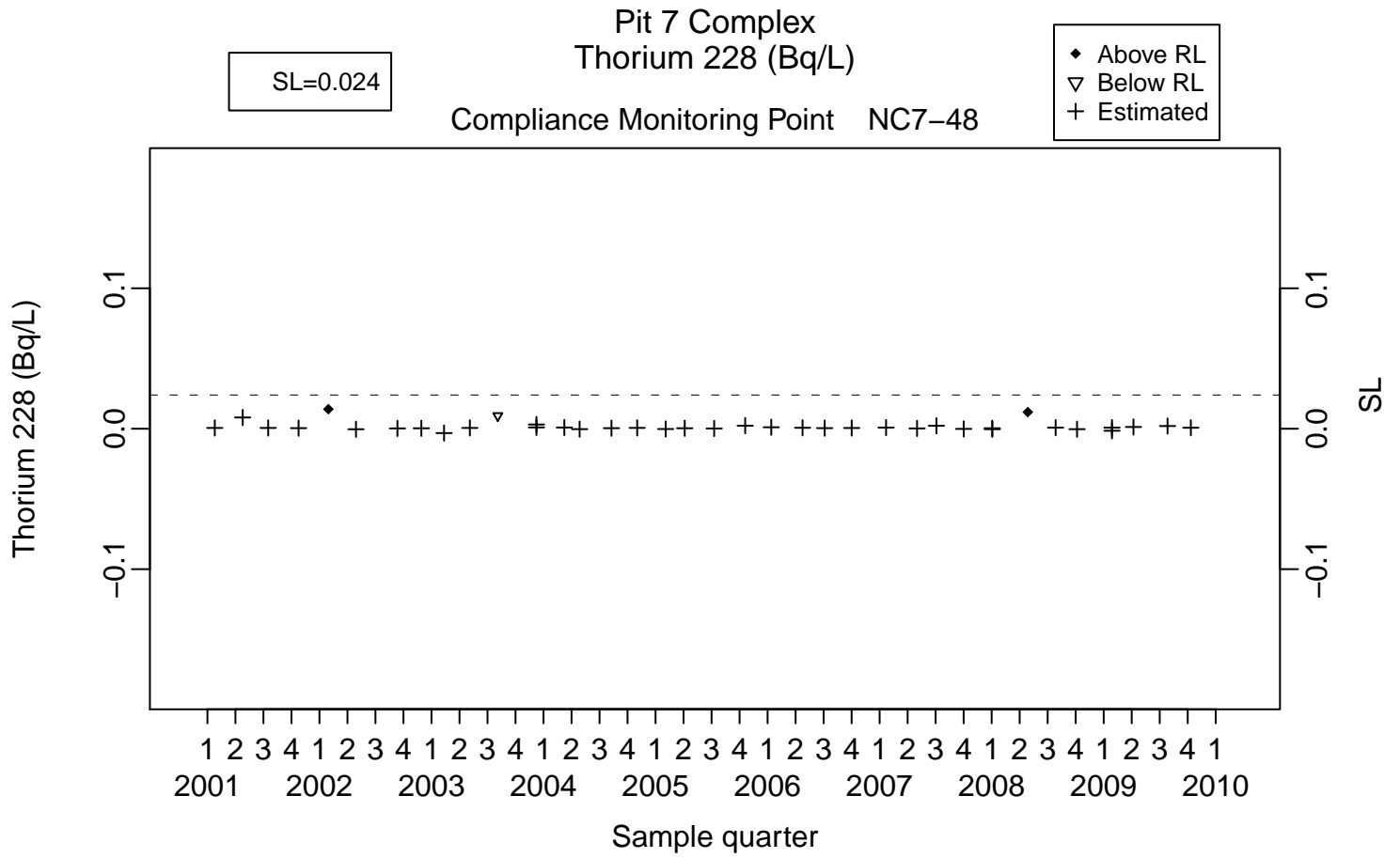
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.024

Compliance Monitoring Point NC7-47

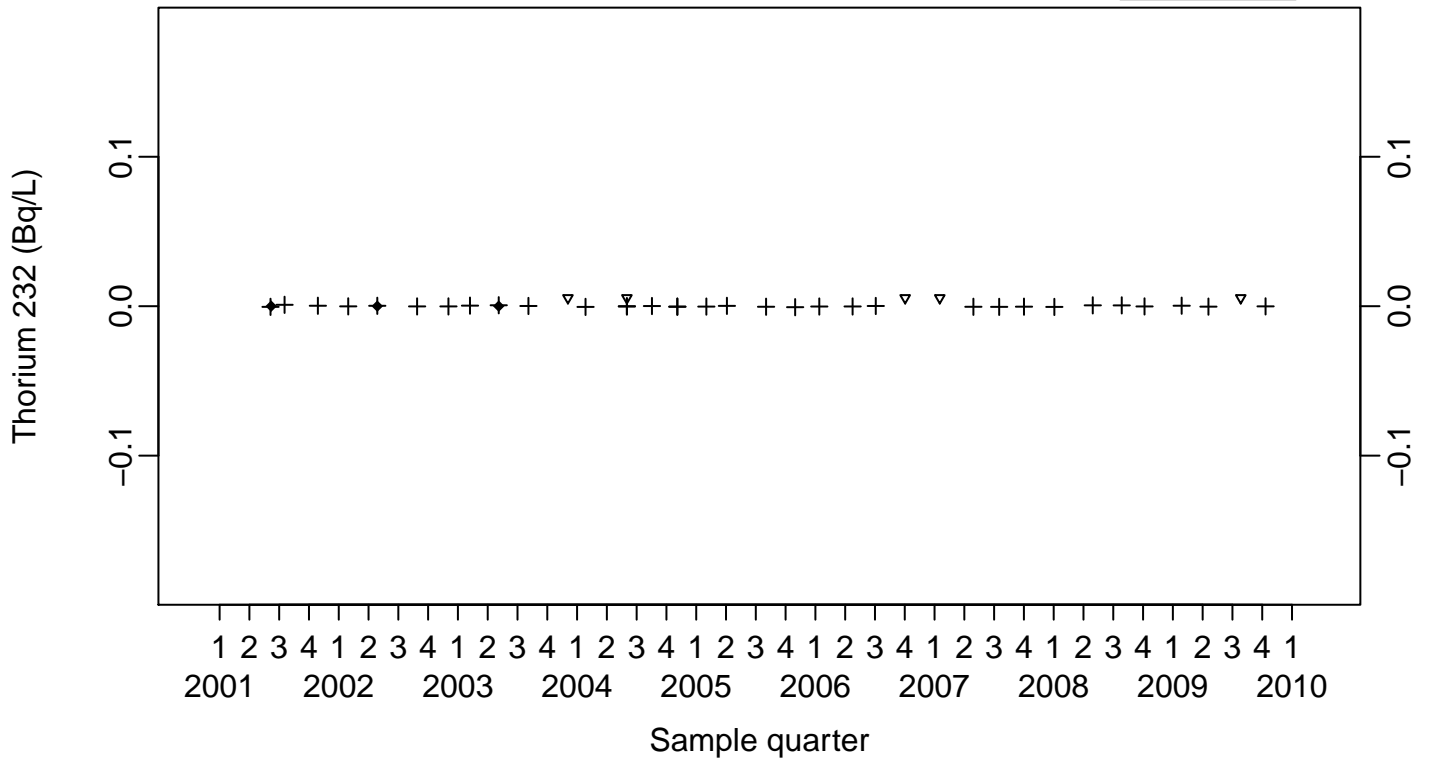




Pit 7 Complex
Thorium 232 (Bq/L)

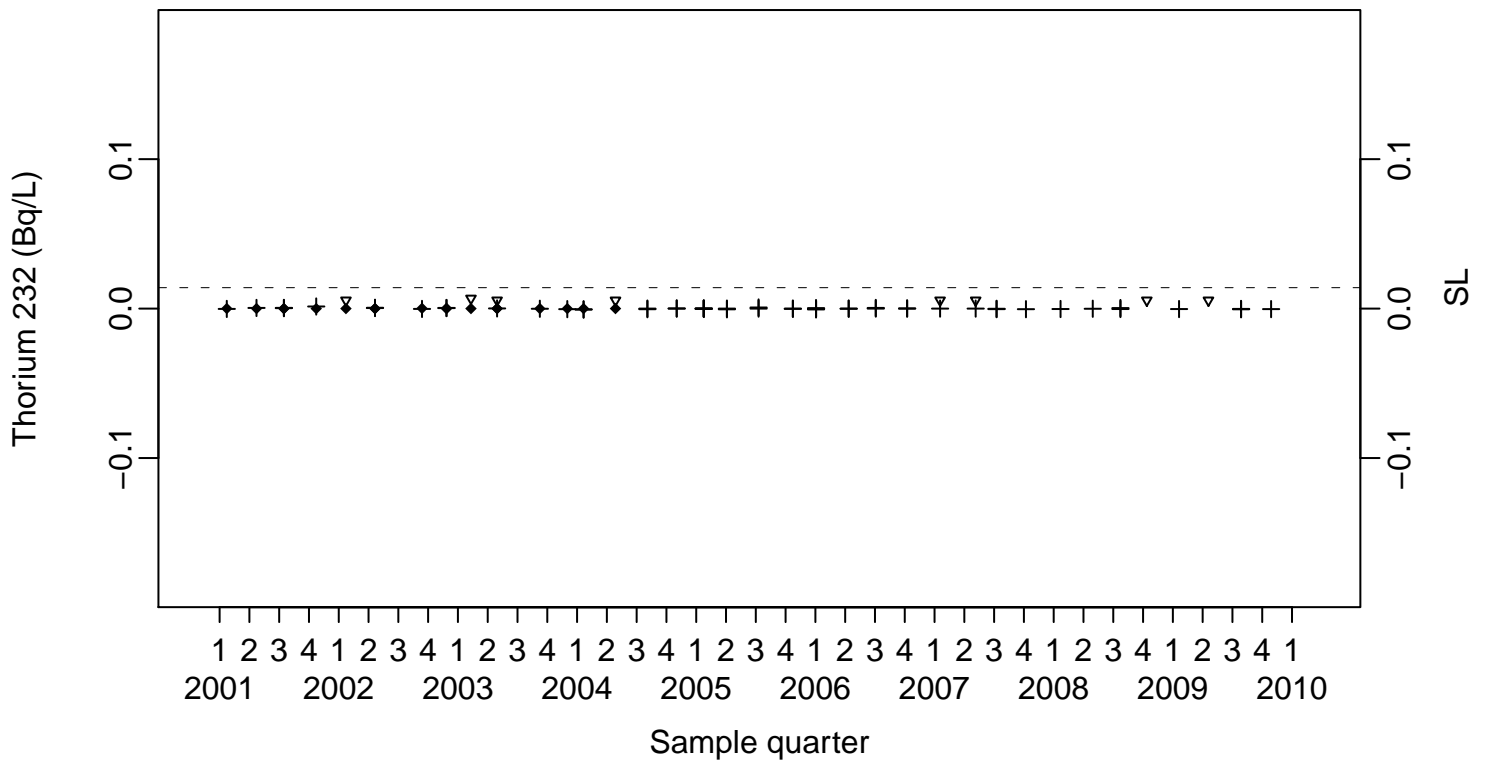
Background Monitoring Point K7-06

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.014

Compliance Monitoring Point K7-01

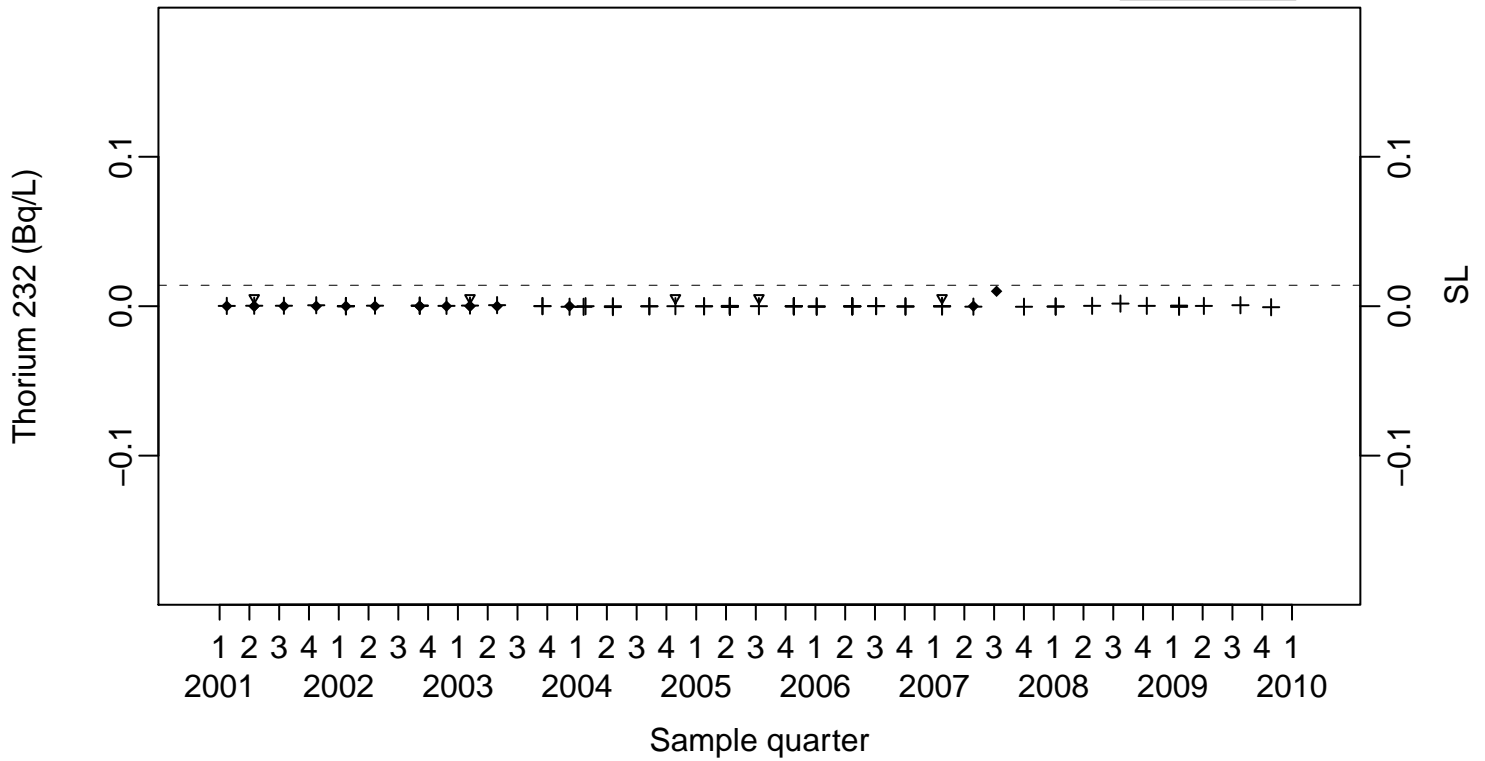


Pit 7 Complex Thorium 232 (Bq/L)

SL=0.014

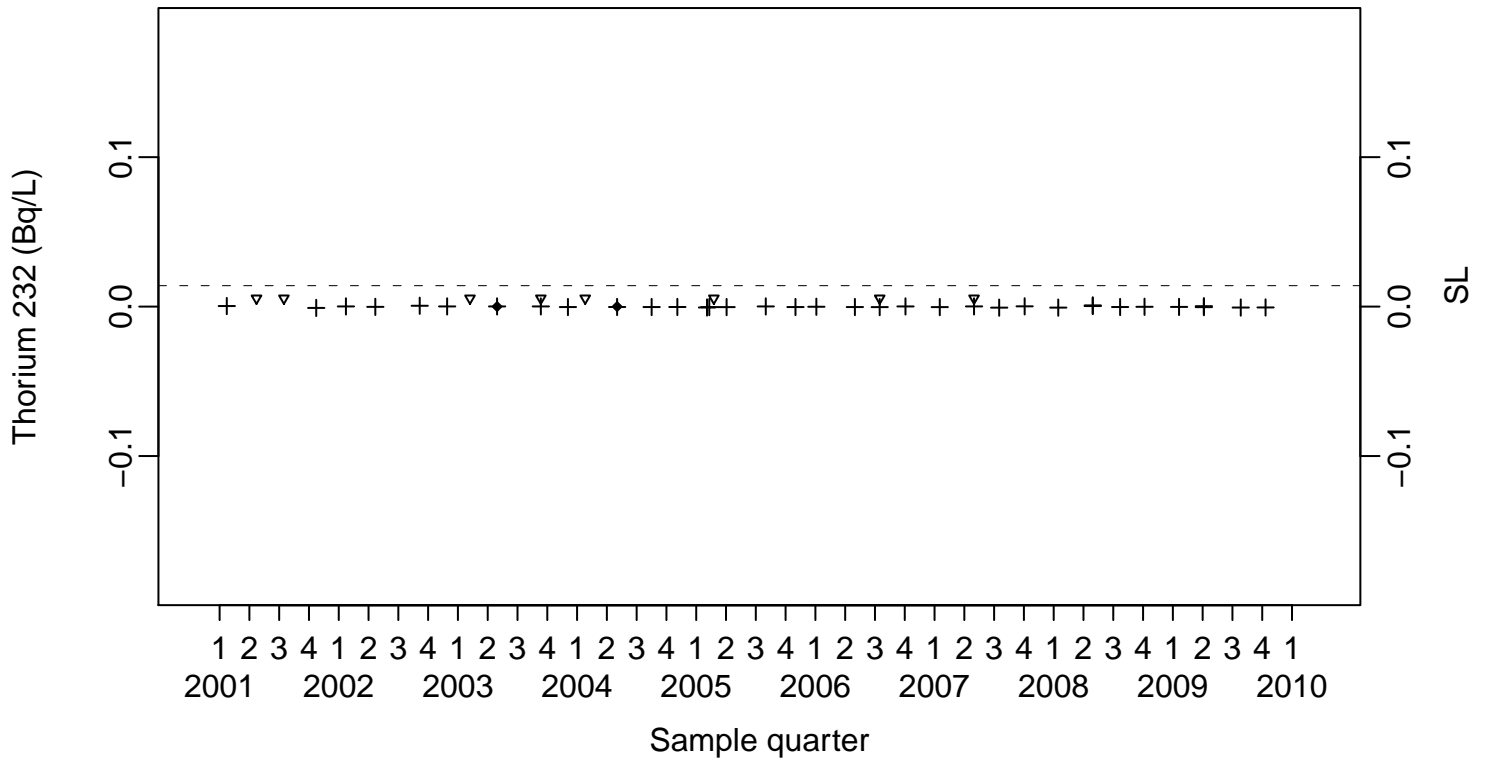
Compliance Monitoring Point K7-03

- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.014

Compliance Monitoring Point K7-09

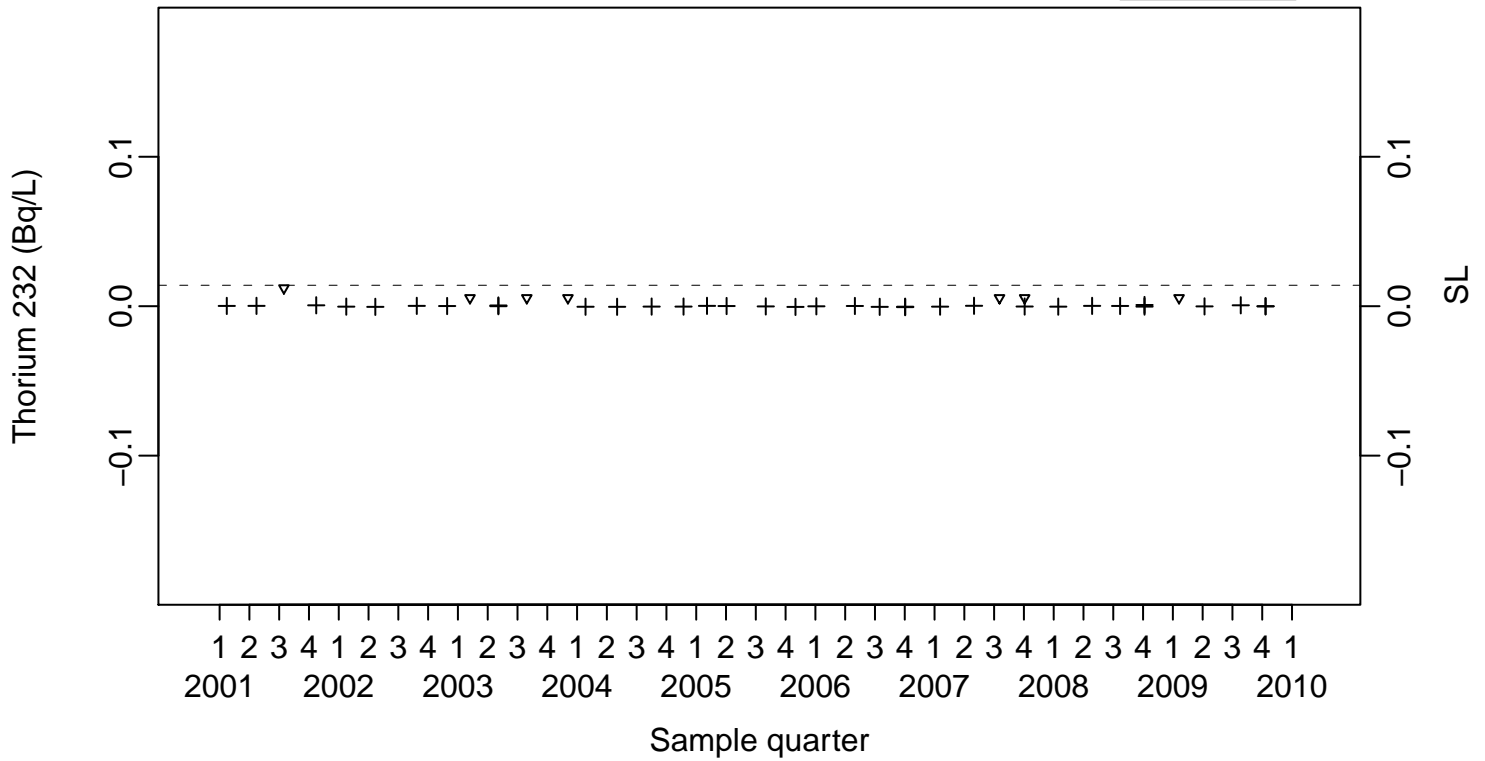


Pit 7 Complex Thorium 232 (Bq/L)

SL=0.014

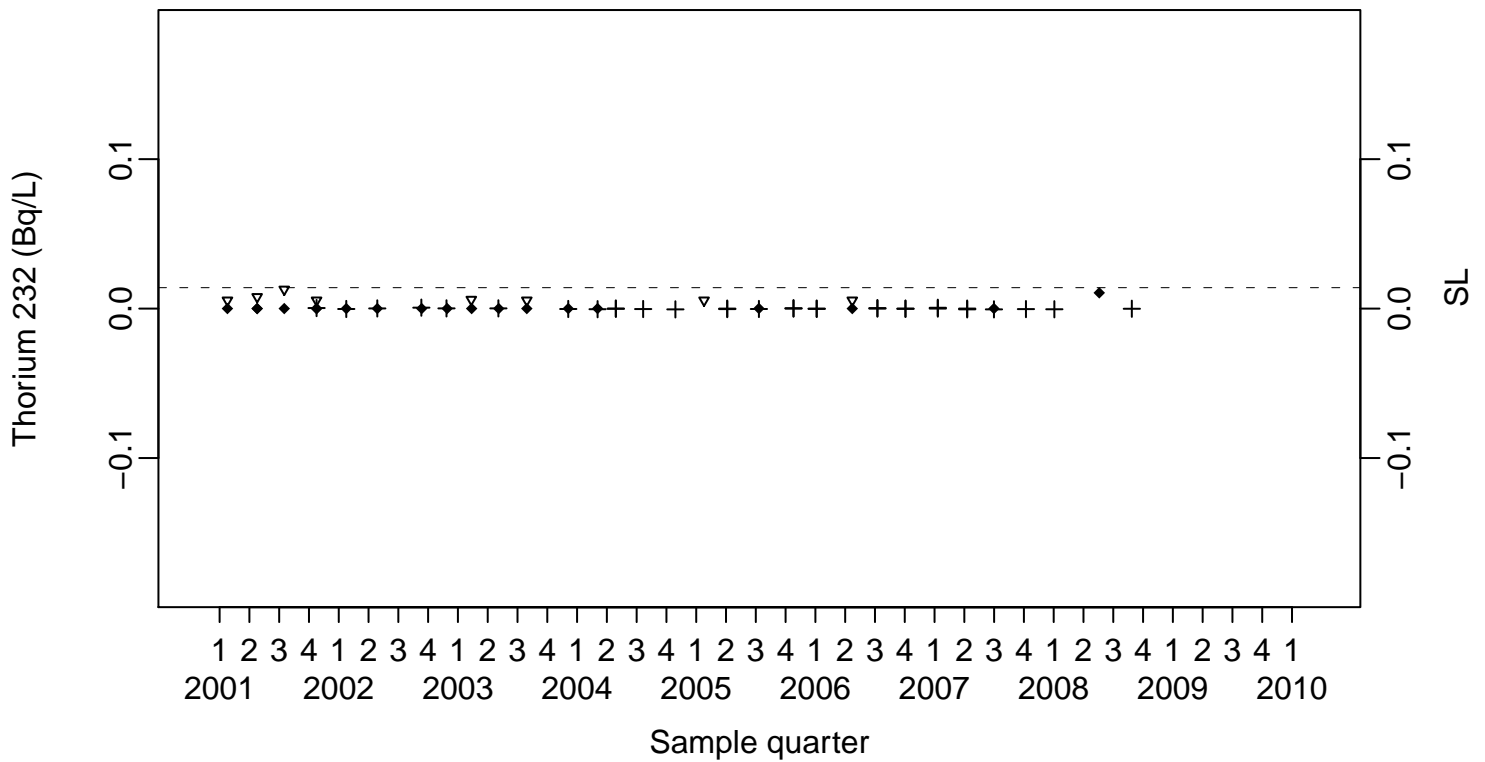
- ◆ Above RL
- ▽ Below RL
- + Estimated

Compliance Monitoring Point K7-10



SL=0.014

Compliance Monitoring Point NC7-25

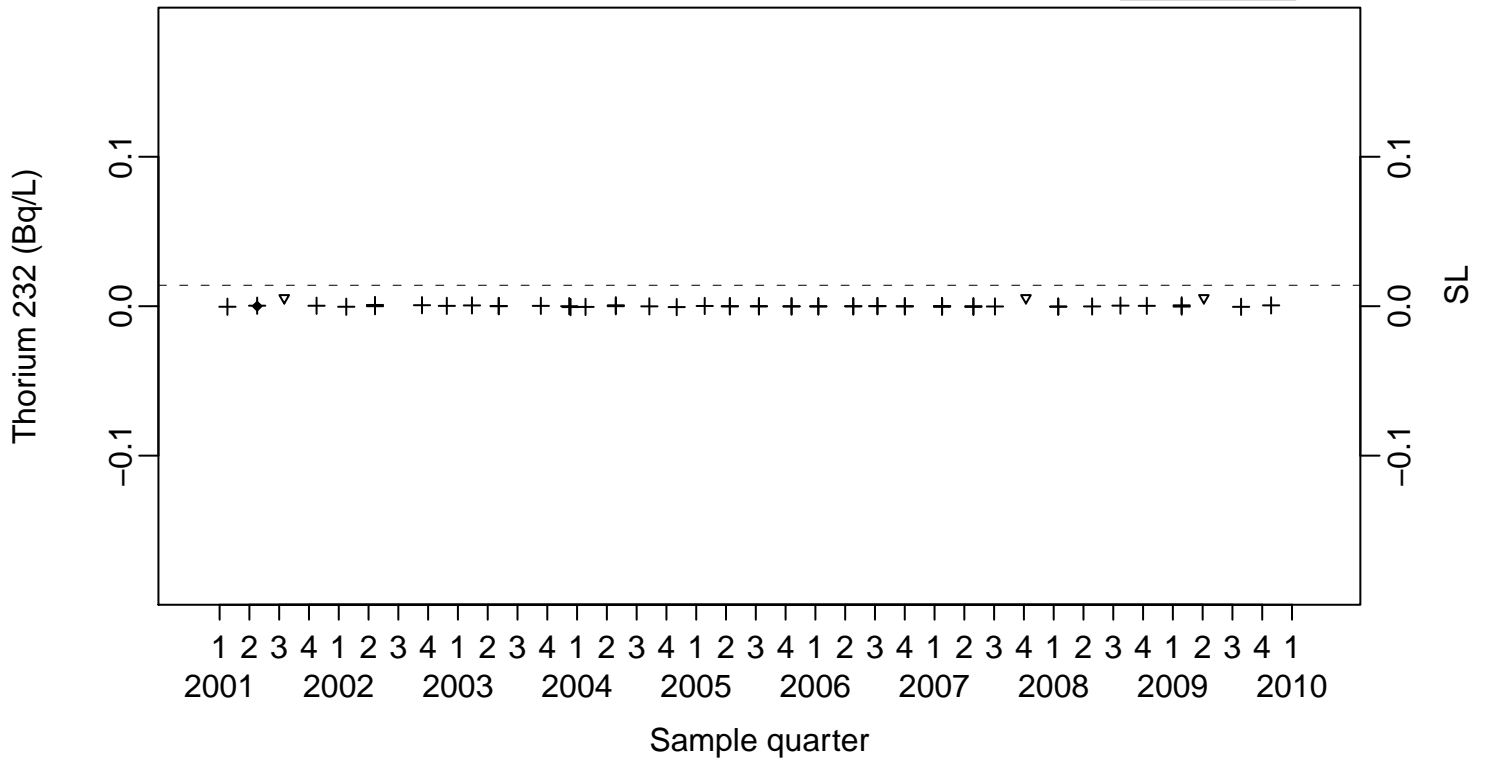


Pit 7 Complex Thorium 232 (Bq/L)

Compliance Monitoring Point NC7-26

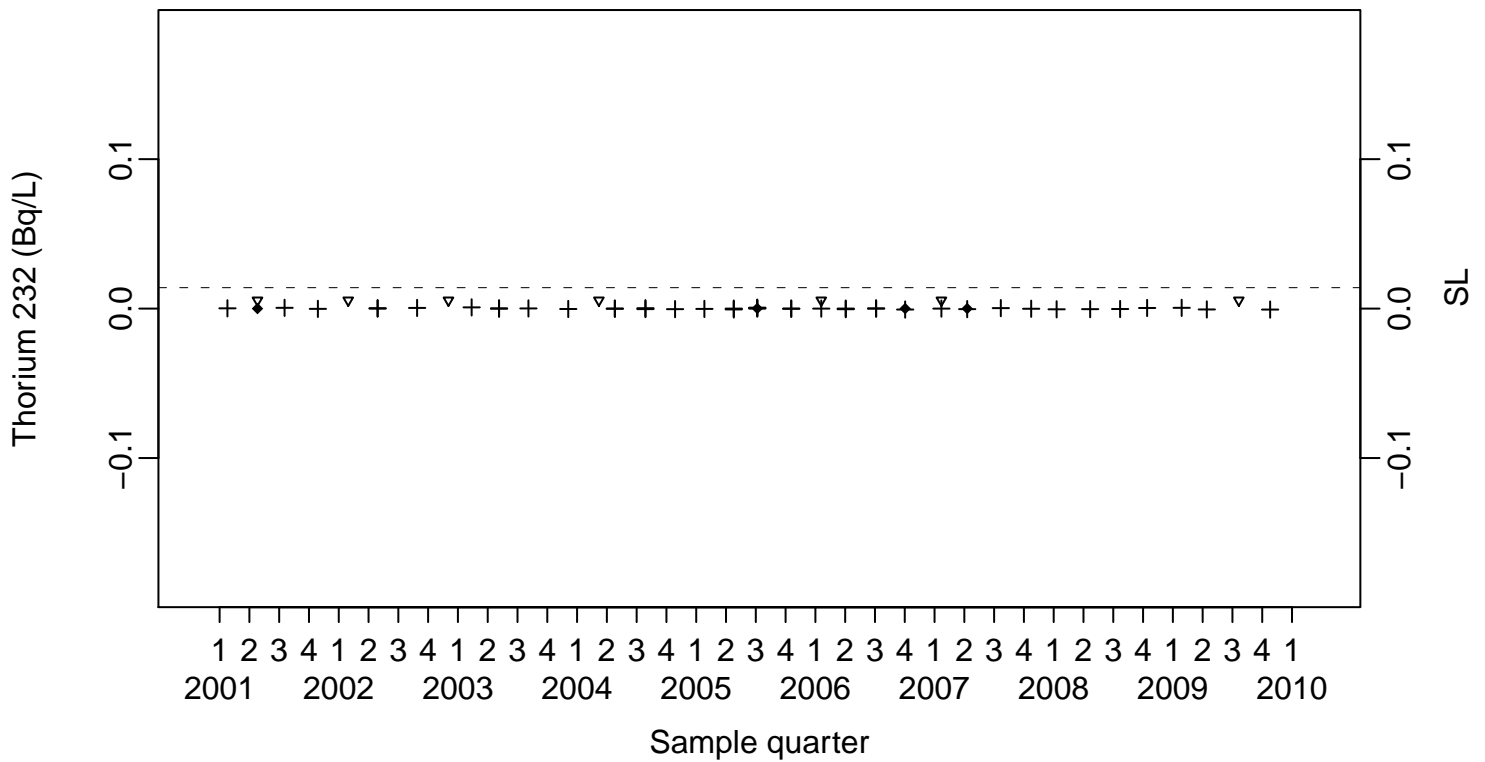
SL=0.014

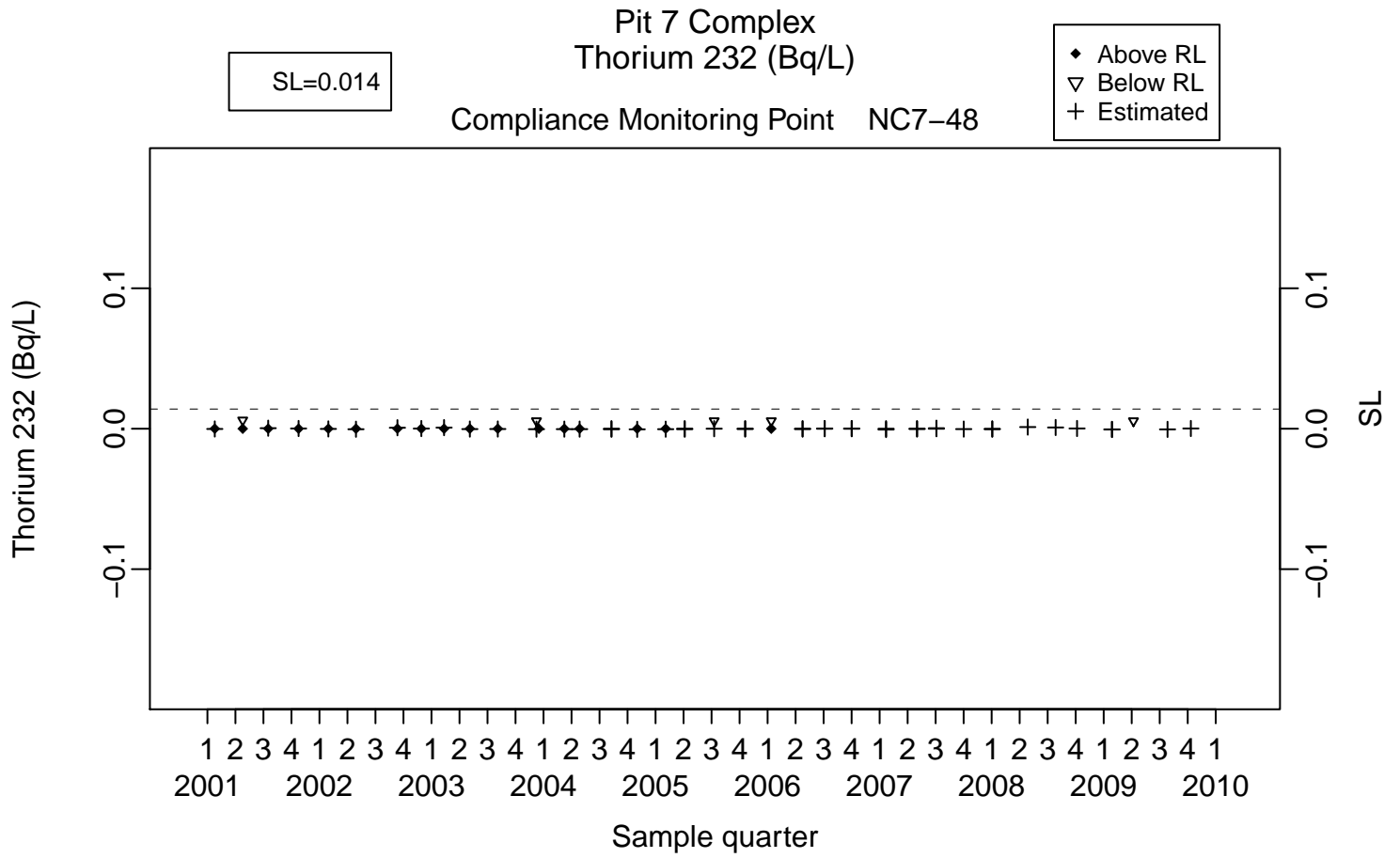
- ◆ Above RL
- ▽ Below RL
- + Estimated



SL=0.014

Compliance Monitoring Point NC7-47

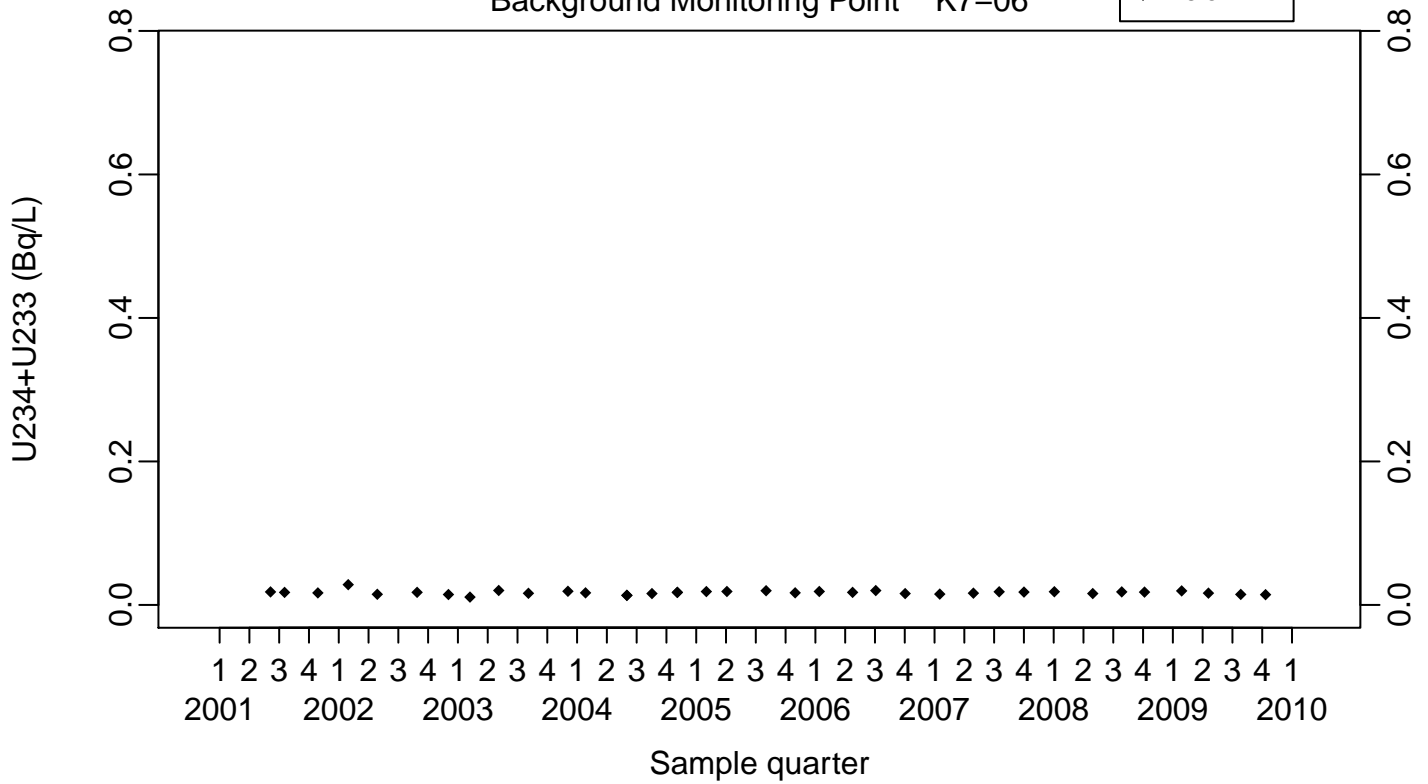




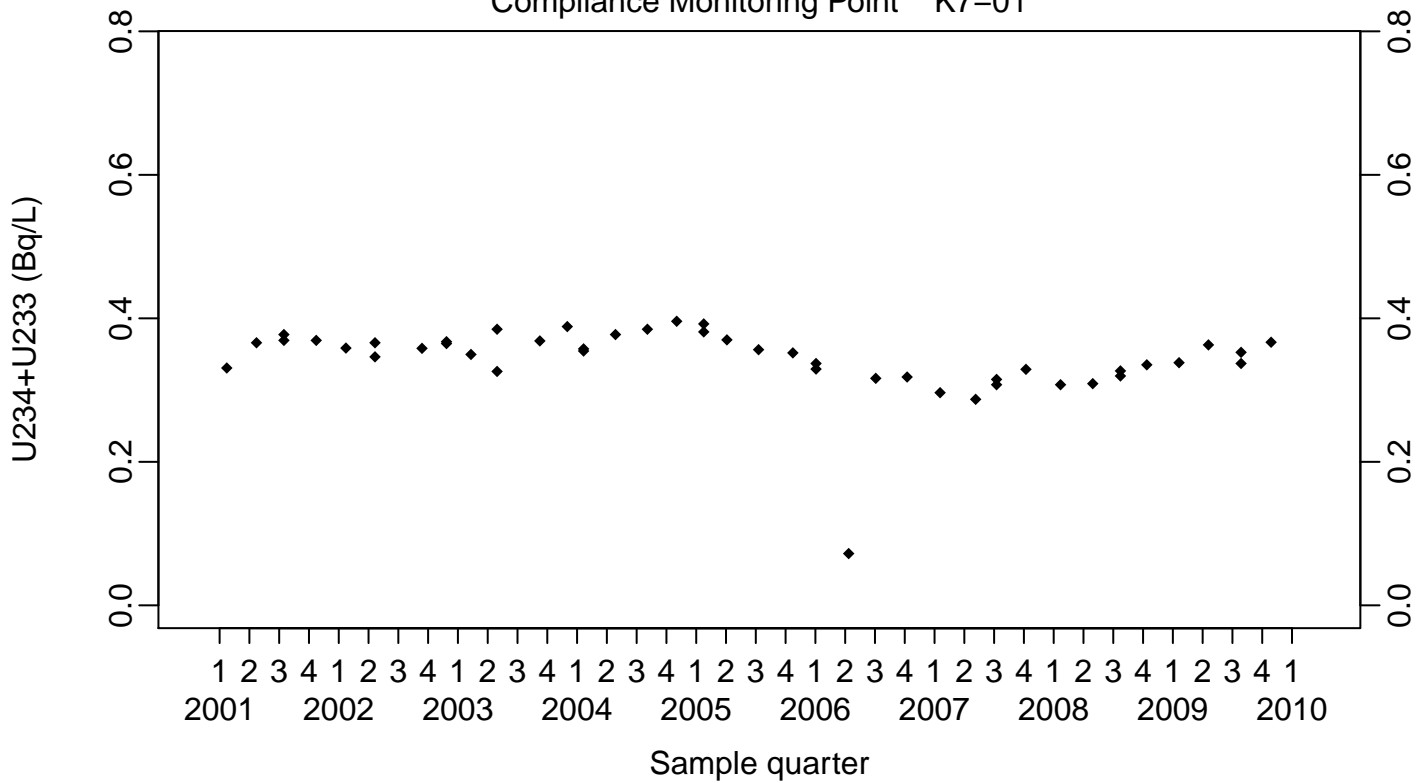
Pit 7 Complex U234+U233 (Bq/L)

Background Monitoring Point K7-06

◆ Above RL
▽ Below RL



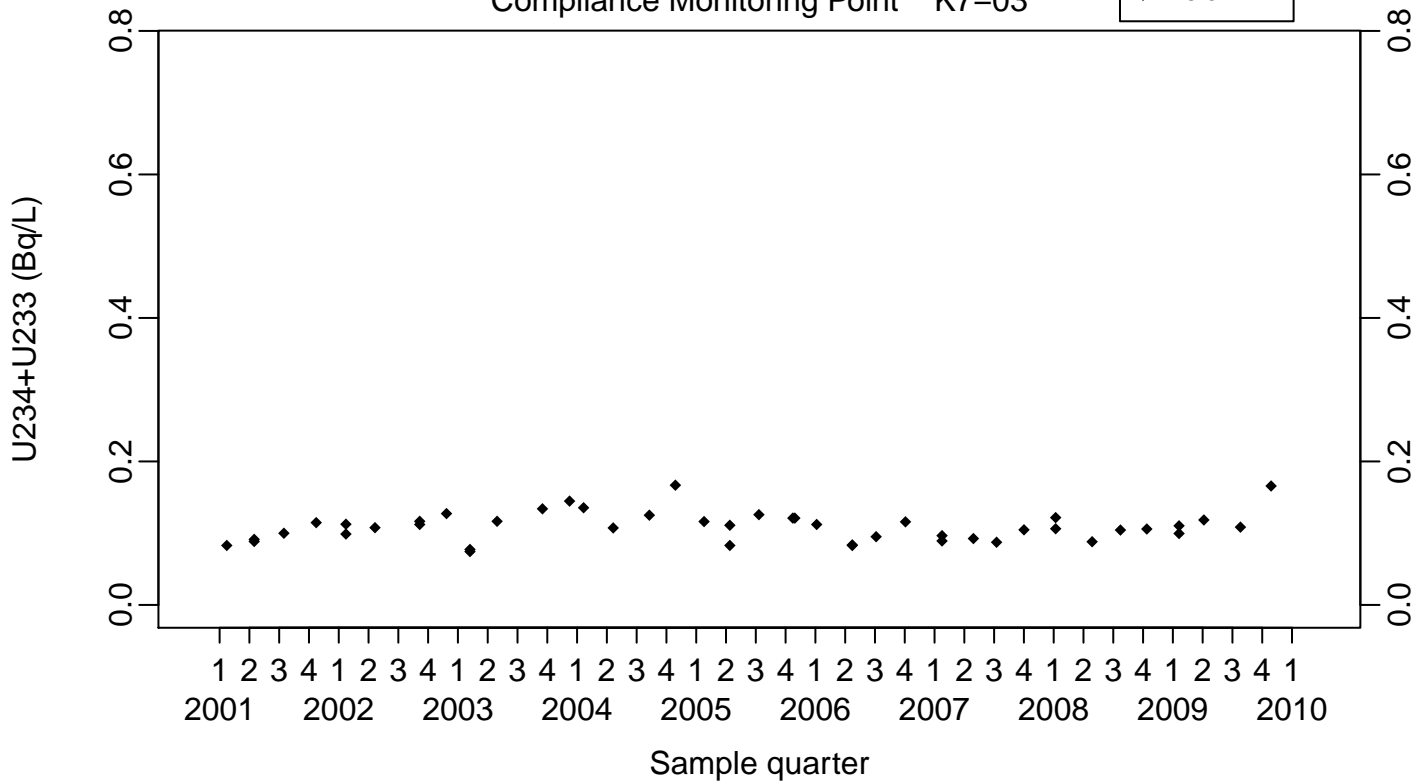
Compliance Monitoring Point K7-01



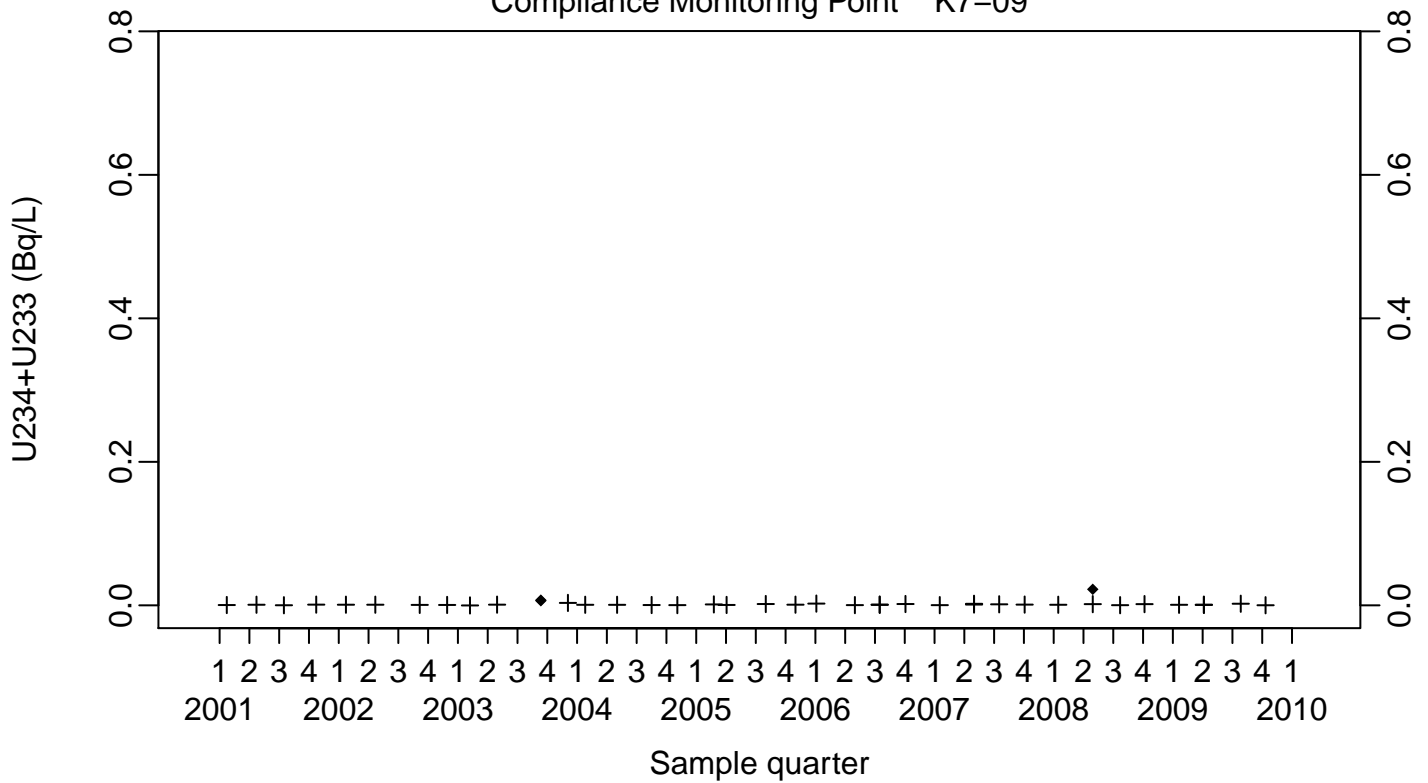
Pit 7 Complex
U234+U233 (Bq/L)

Compliance Monitoring Point K7-03

◆ Above RL
▽ Below RL



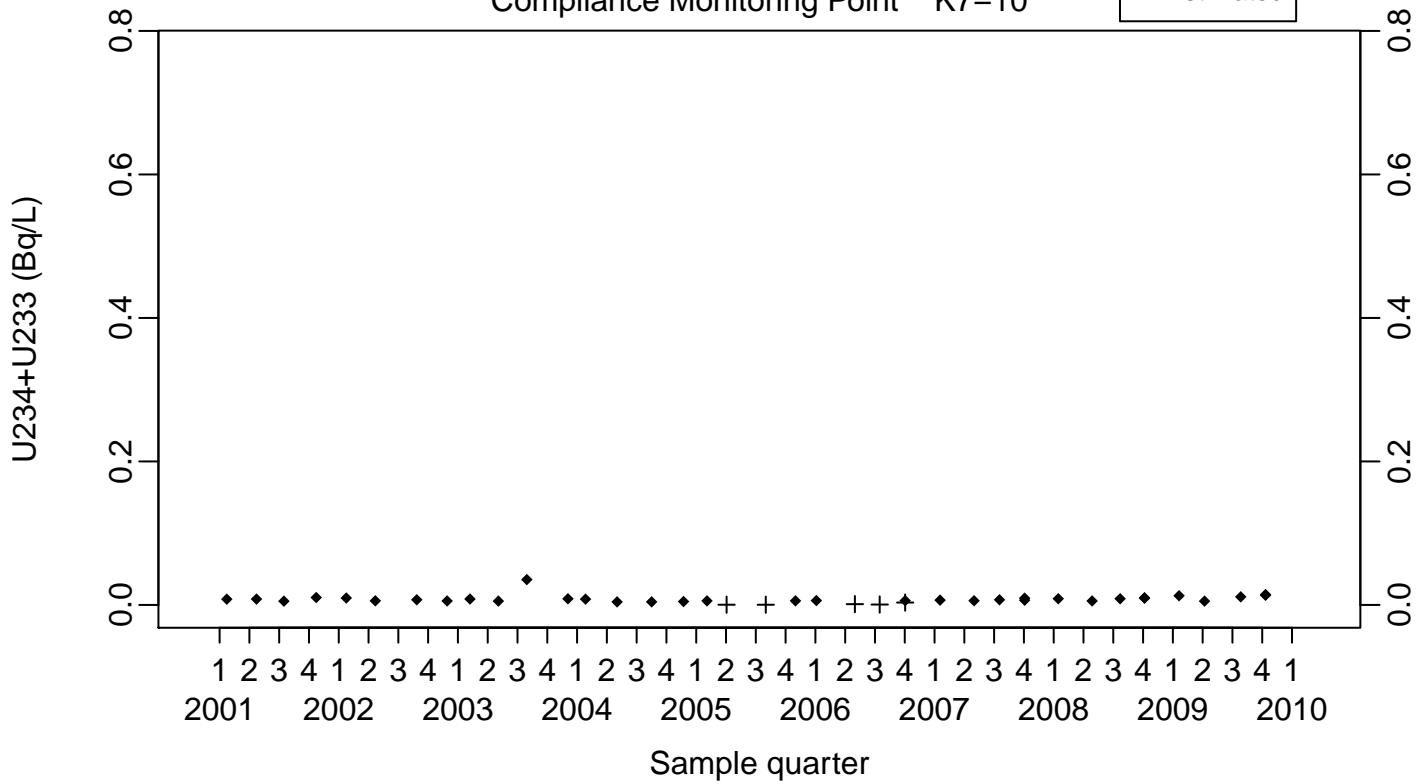
Compliance Monitoring Point K7-09



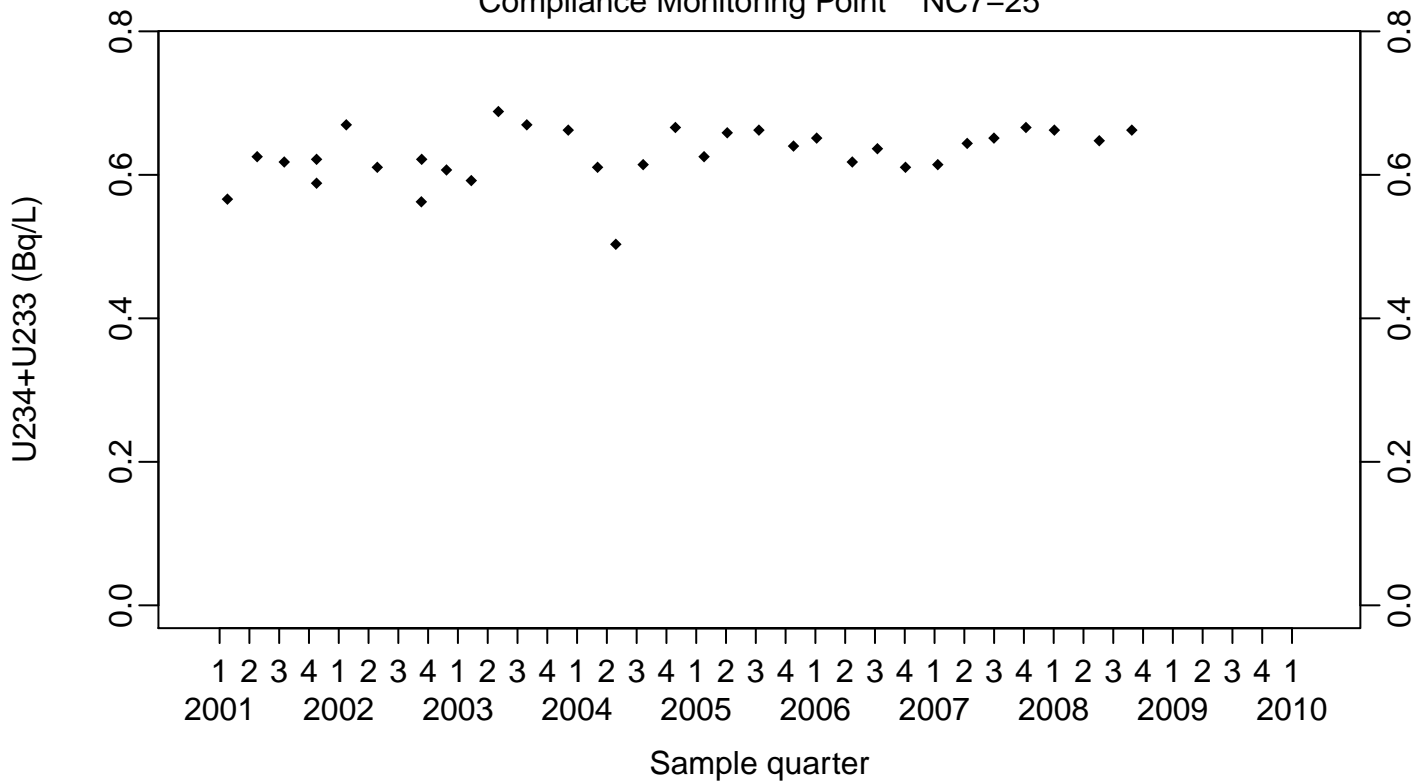
Pit 7 Complex U234+U233 (Bq/L)

Compliance Monitoring Point K7-10

◆ Above RL
+ Estimated



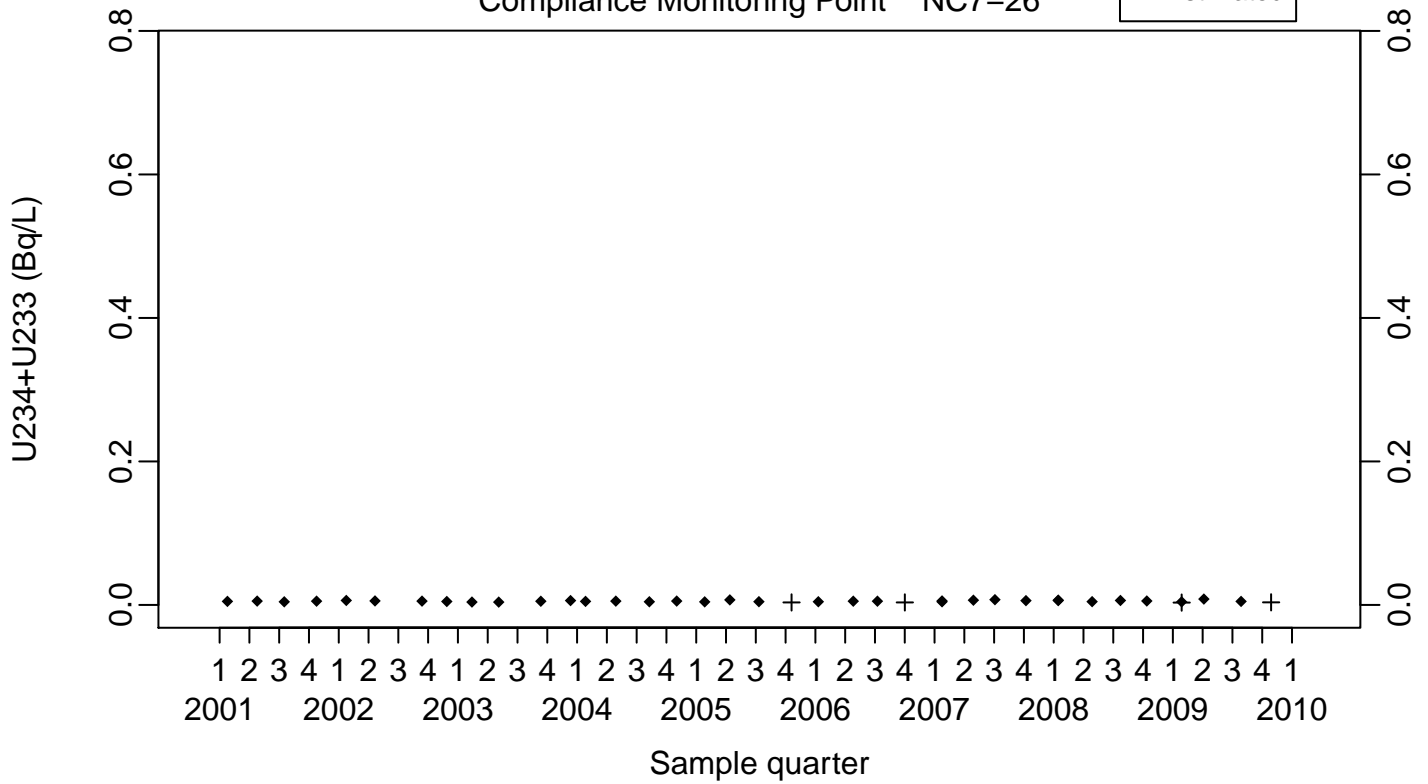
Compliance Monitoring Point NC7-25



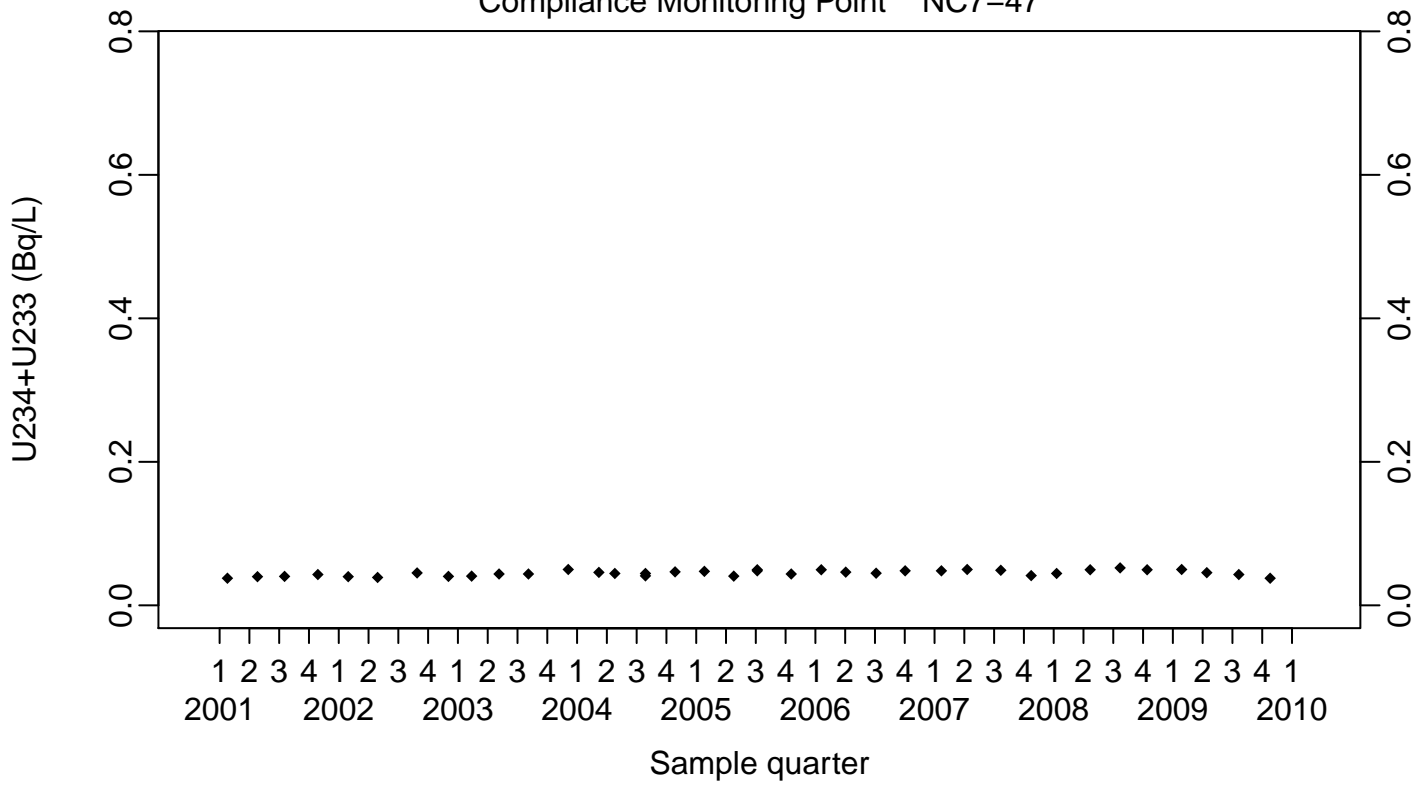
Pit 7 Complex
U234+U233 (Bq/L)

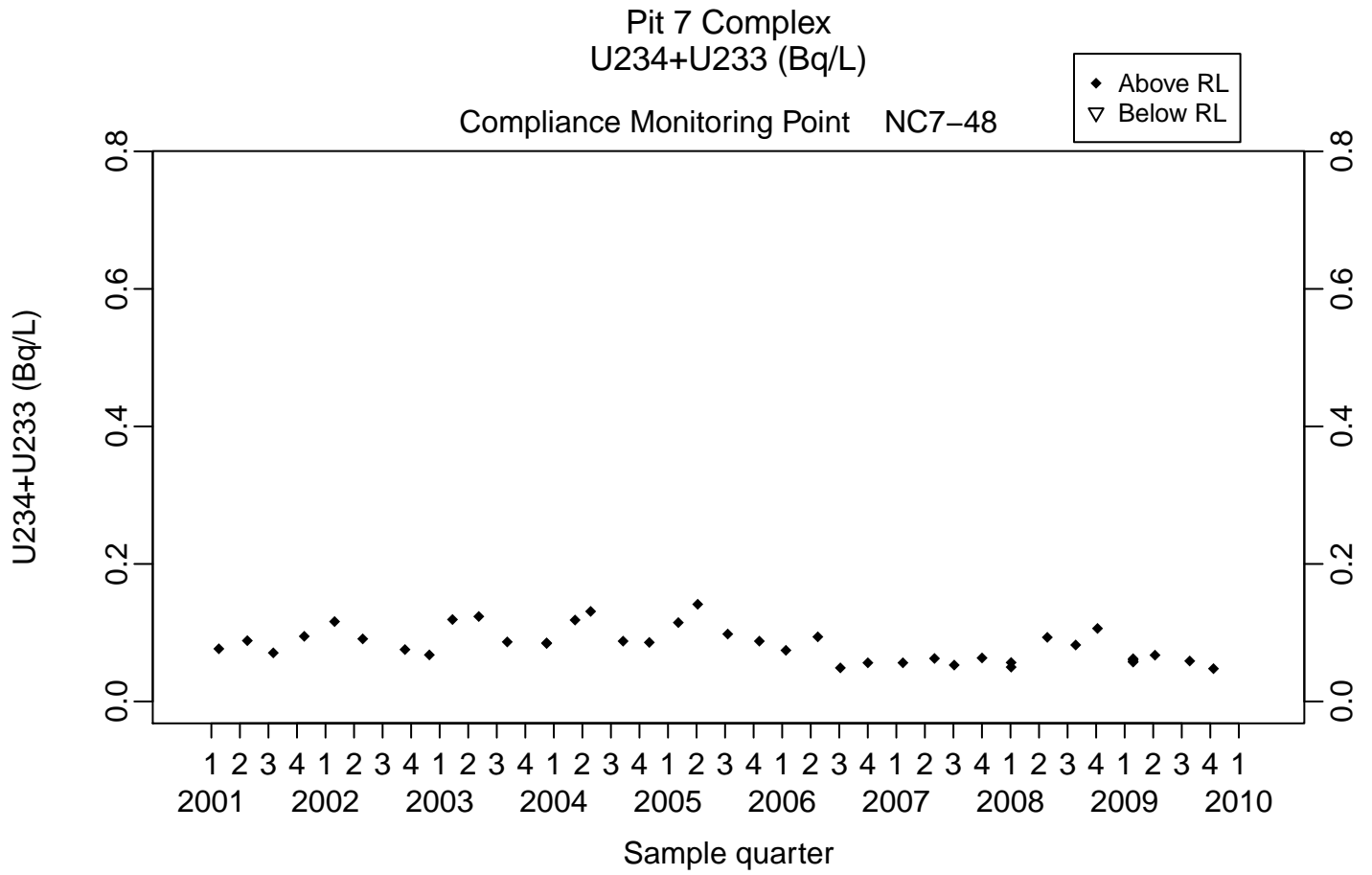
Compliance Monitoring Point NC7-26

◆ Above RL
+ Estimated



Compliance Monitoring Point NC7-47

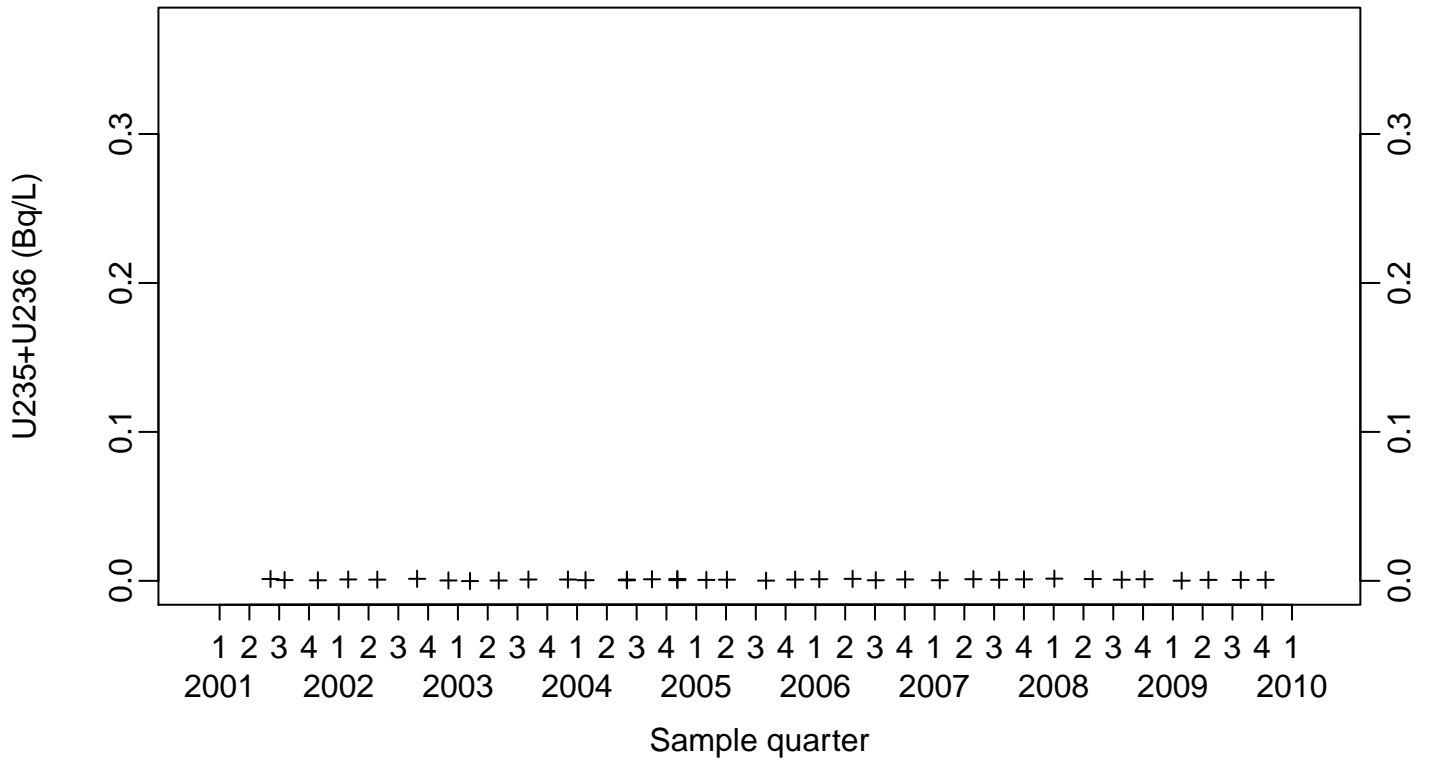




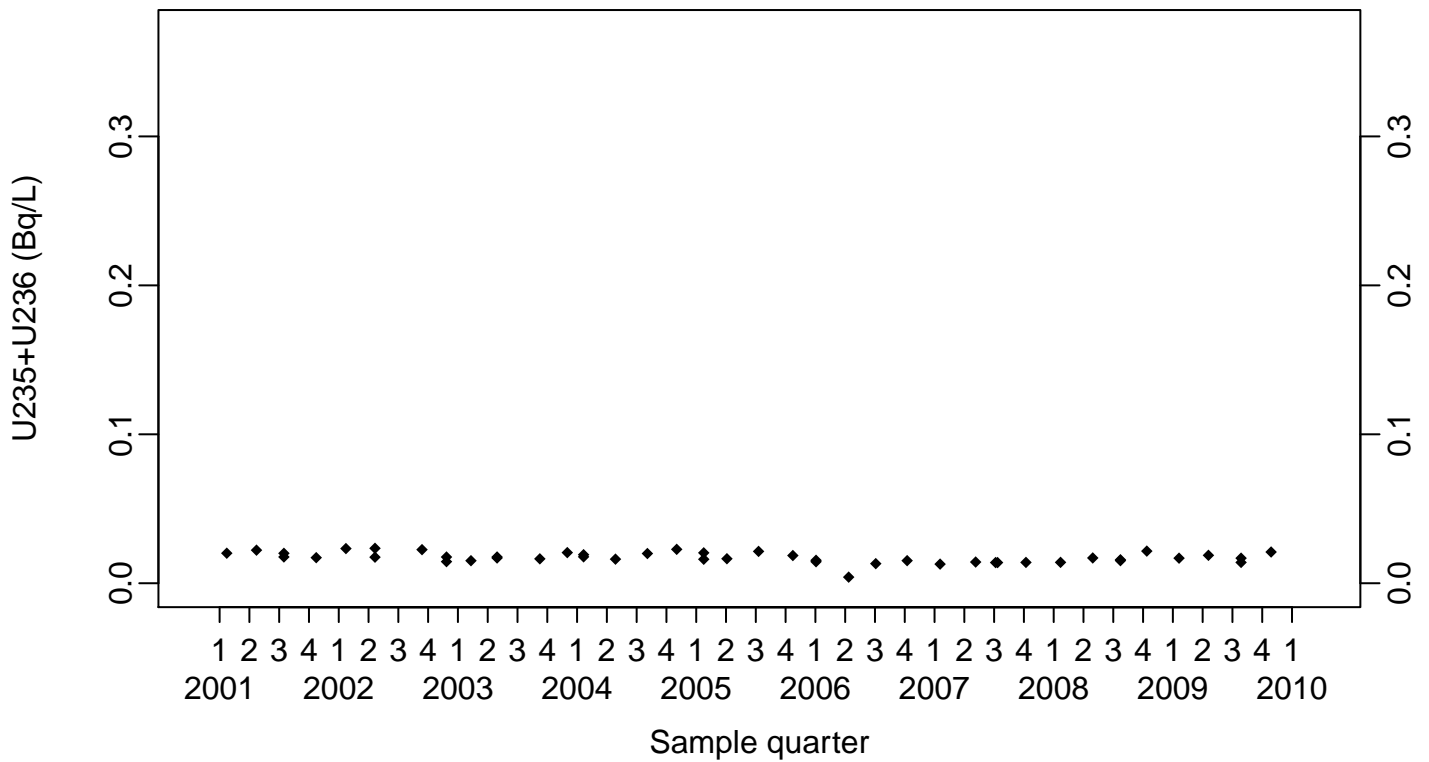
Pit 7 Complex U235+U236 (Bq/L)

Background Monitoring Point K7-06

◆ Above RL
+ Estimated



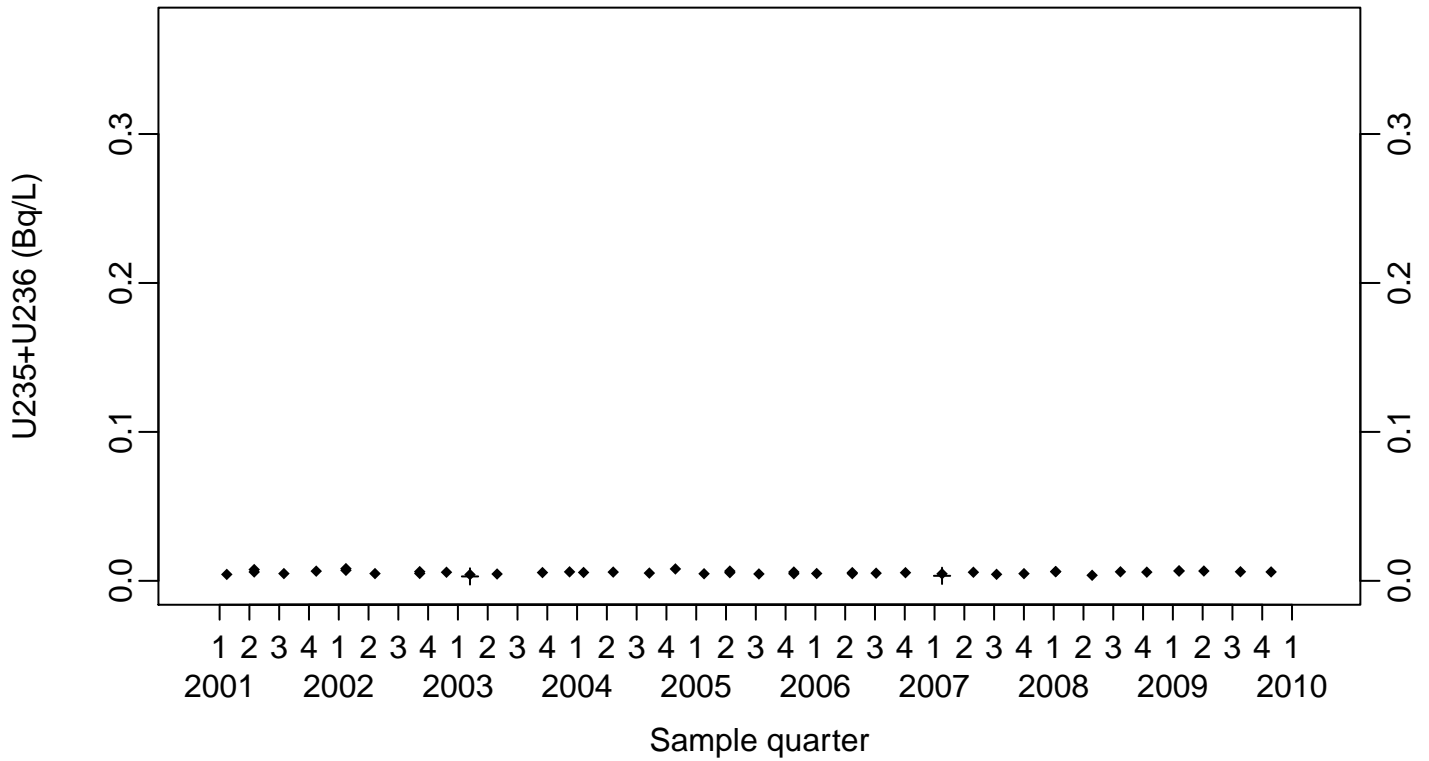
Compliance Monitoring Point K7-01



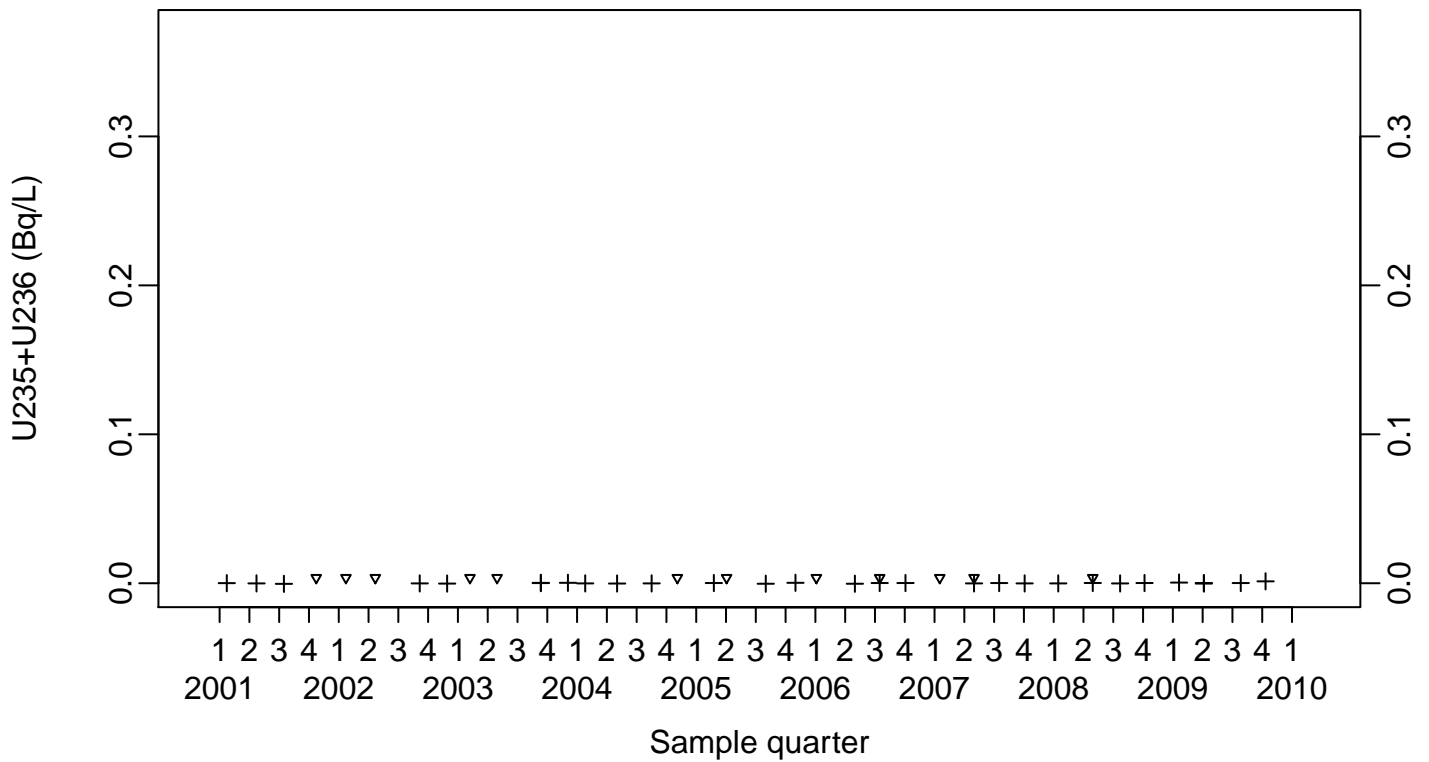
Pit 7 Complex U235+U236 (Bq/L)

Compliance Monitoring Point K7-03

◆ Above RL
+ Estimated



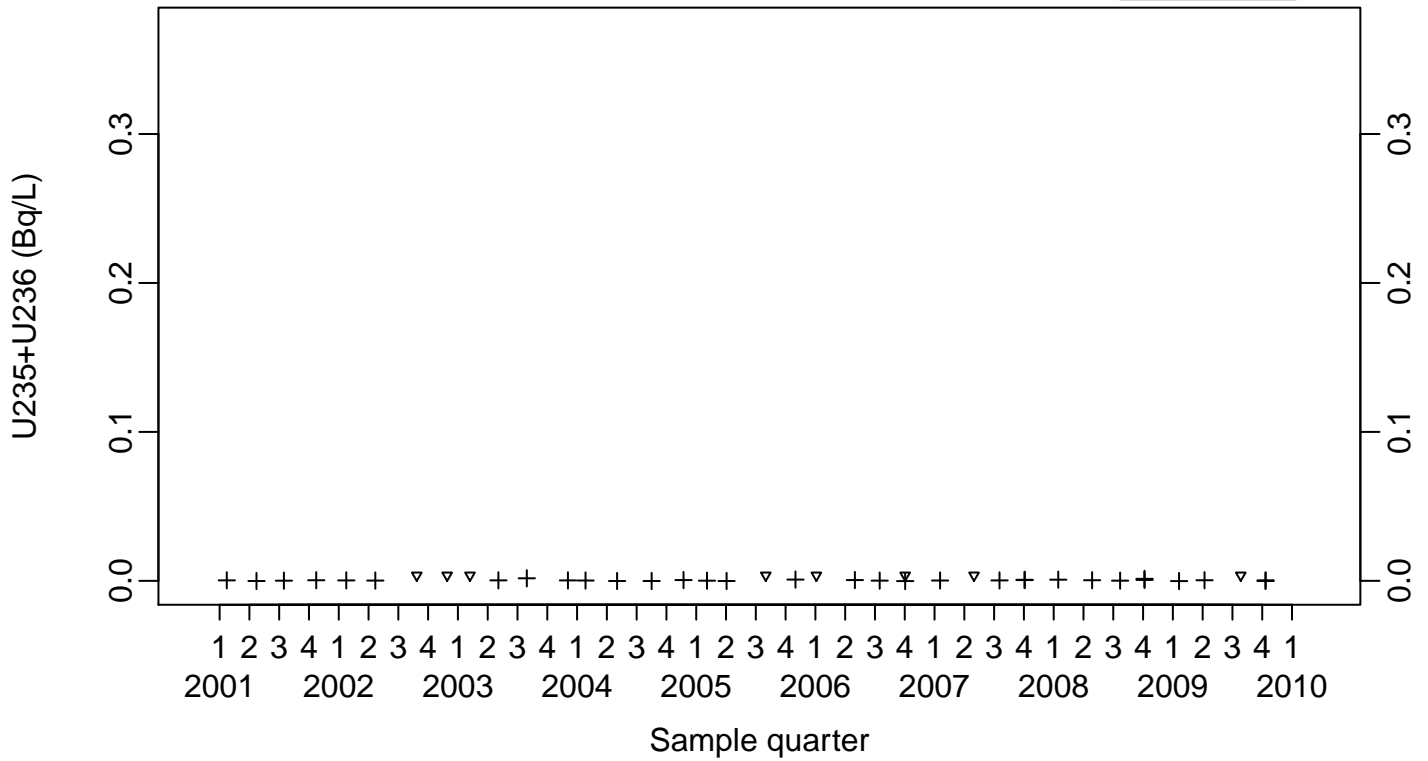
Compliance Monitoring Point K7-09



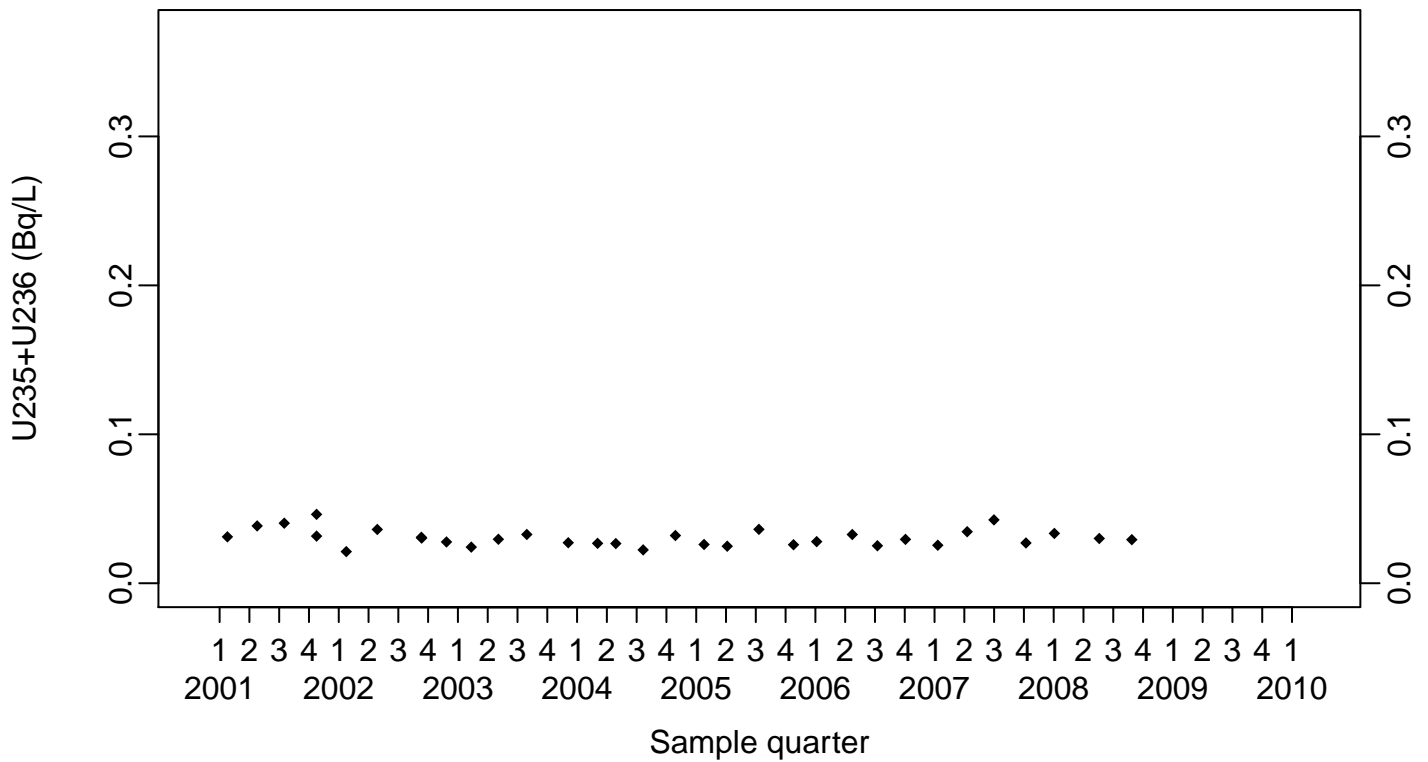
Pit 7 Complex
U235+U236 (Bq/L)

Compliance Monitoring Point K7-10

- ◆ Above RL
- ▽ Below RL
- + Estimated



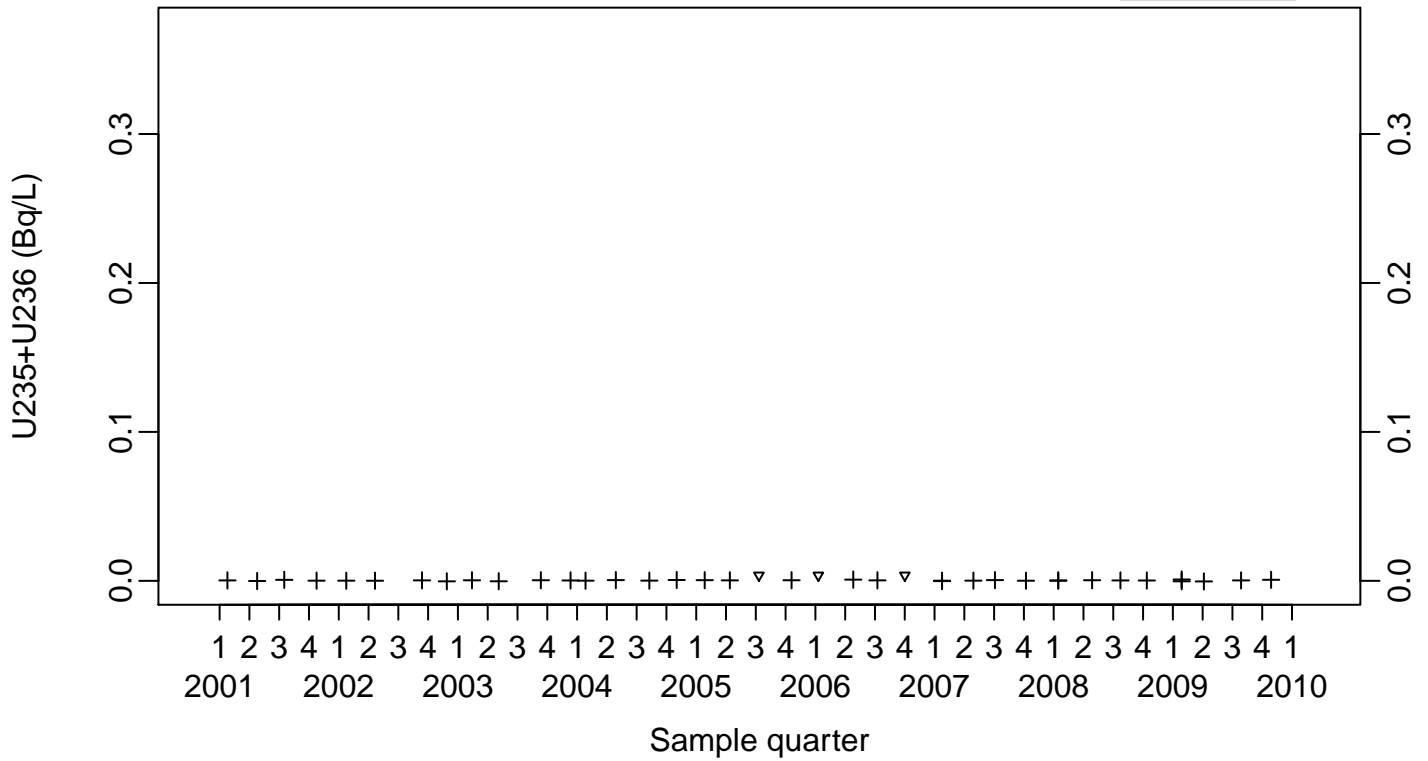
Compliance Monitoring Point NC7-25



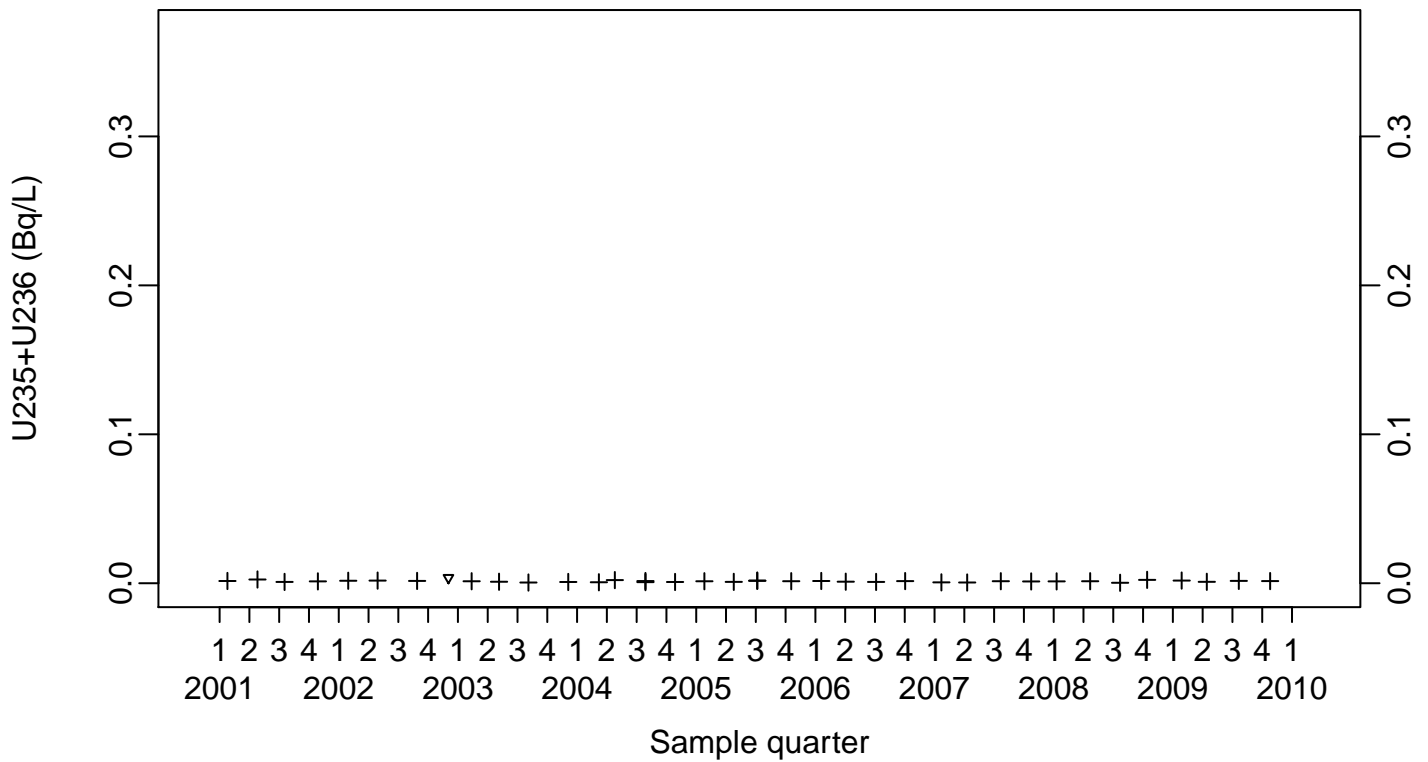
Pit 7 Complex U235+U236 (Bq/L)

Compliance Monitoring Point NC7-26

- ◆ Above RL
- ▽ Below RL
- + Estimated



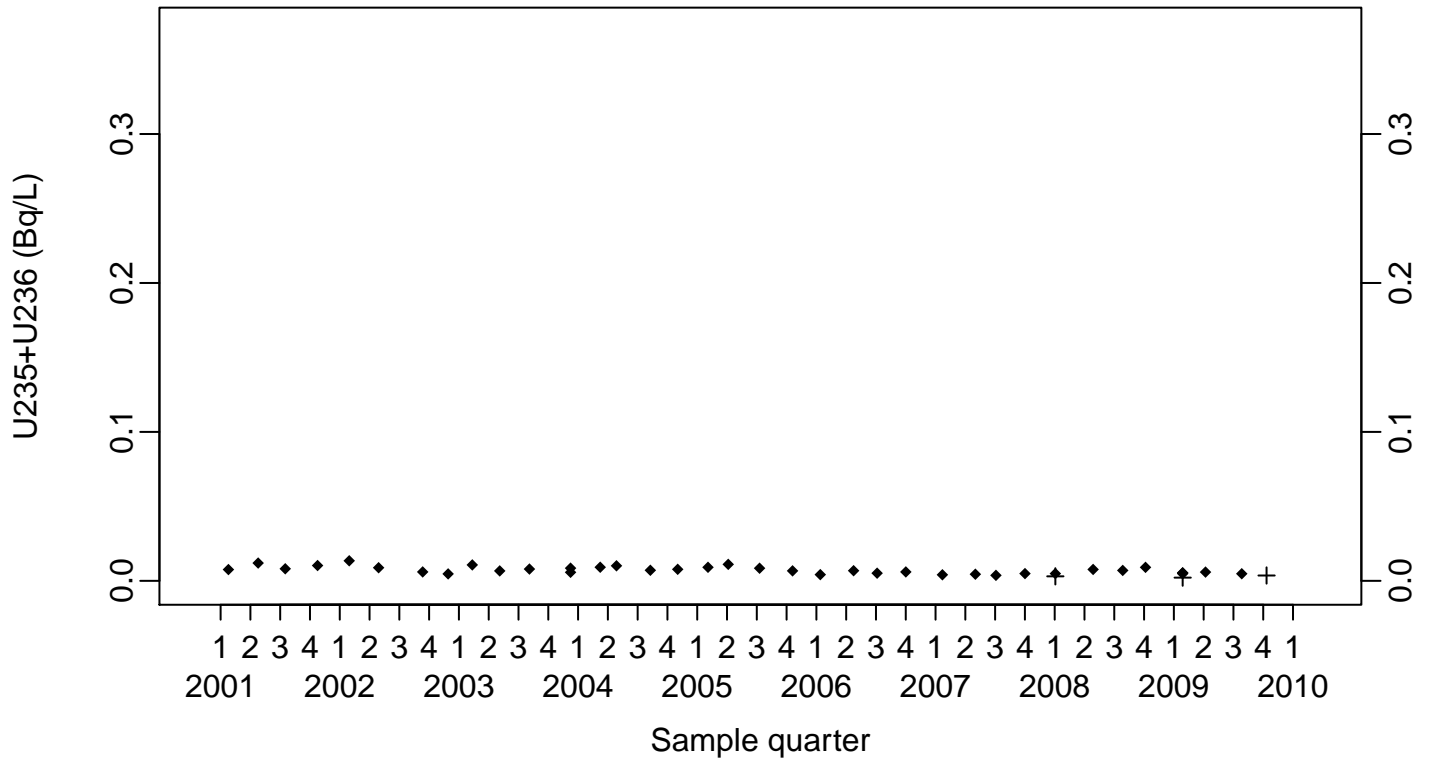
Compliance Monitoring Point NC7-47



Pit 7 Complex
U235+U236 (Bq/L)

Compliance Monitoring Point NC7-48

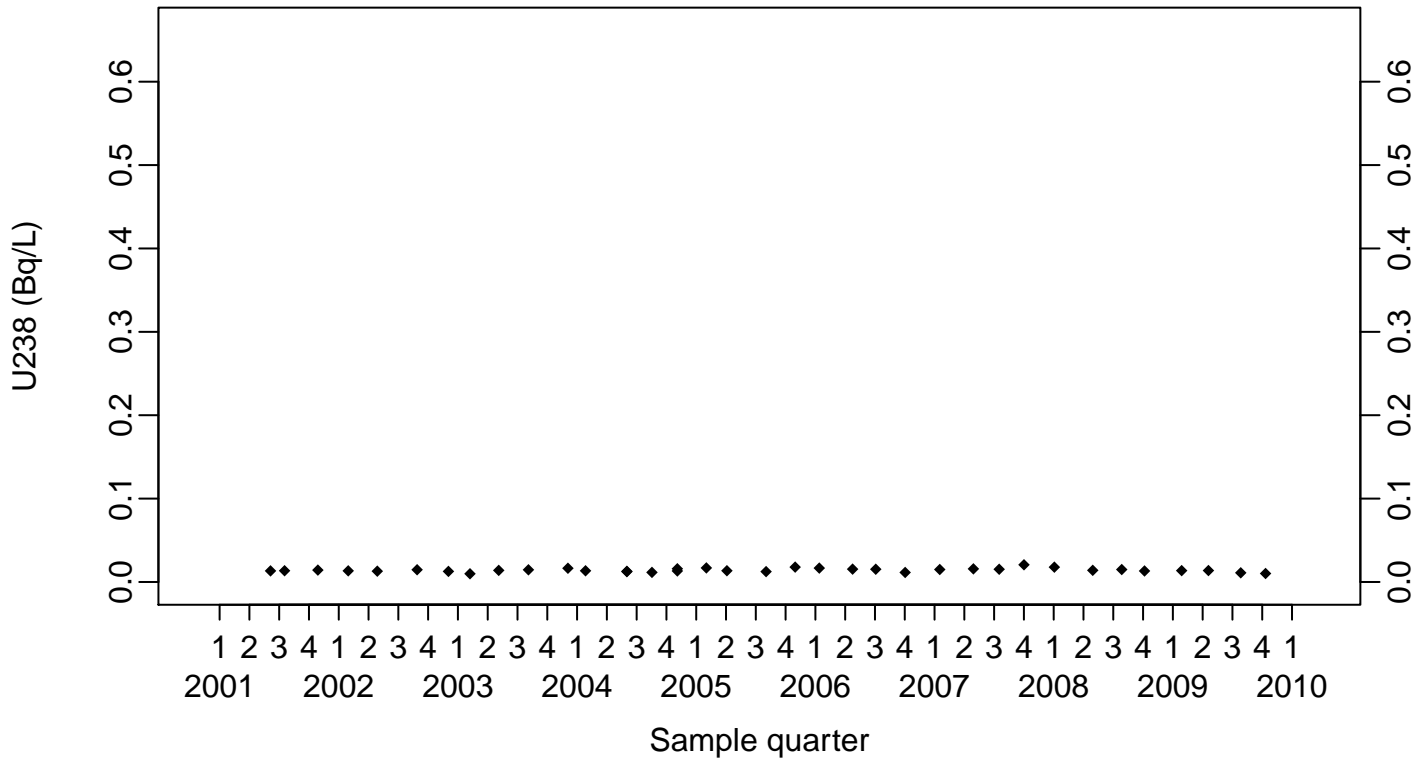
◆ Above RL
+ Estimated



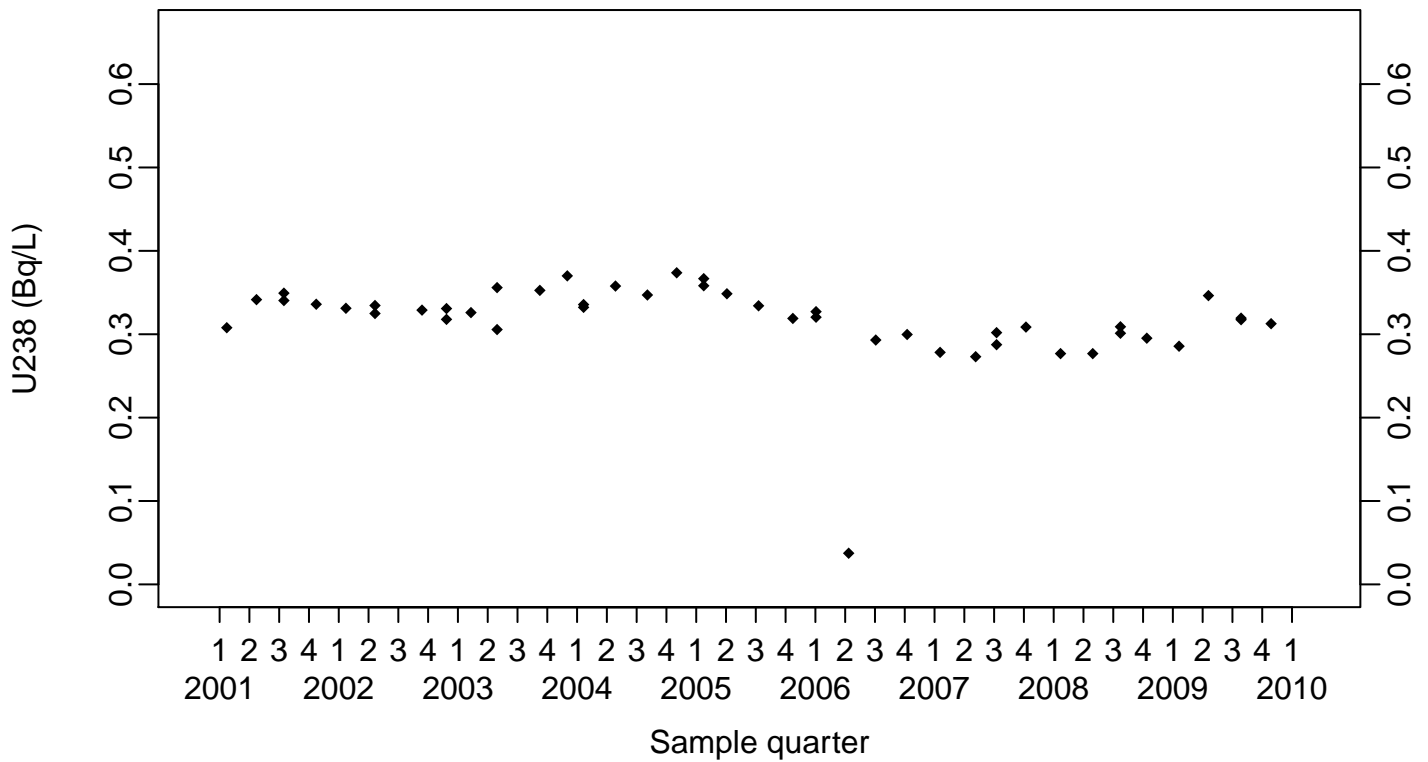
Pit 7 Complex
U238 (Bq/L)

Background Monitoring Point K7-06

◆ Above RL
▽ Below RL



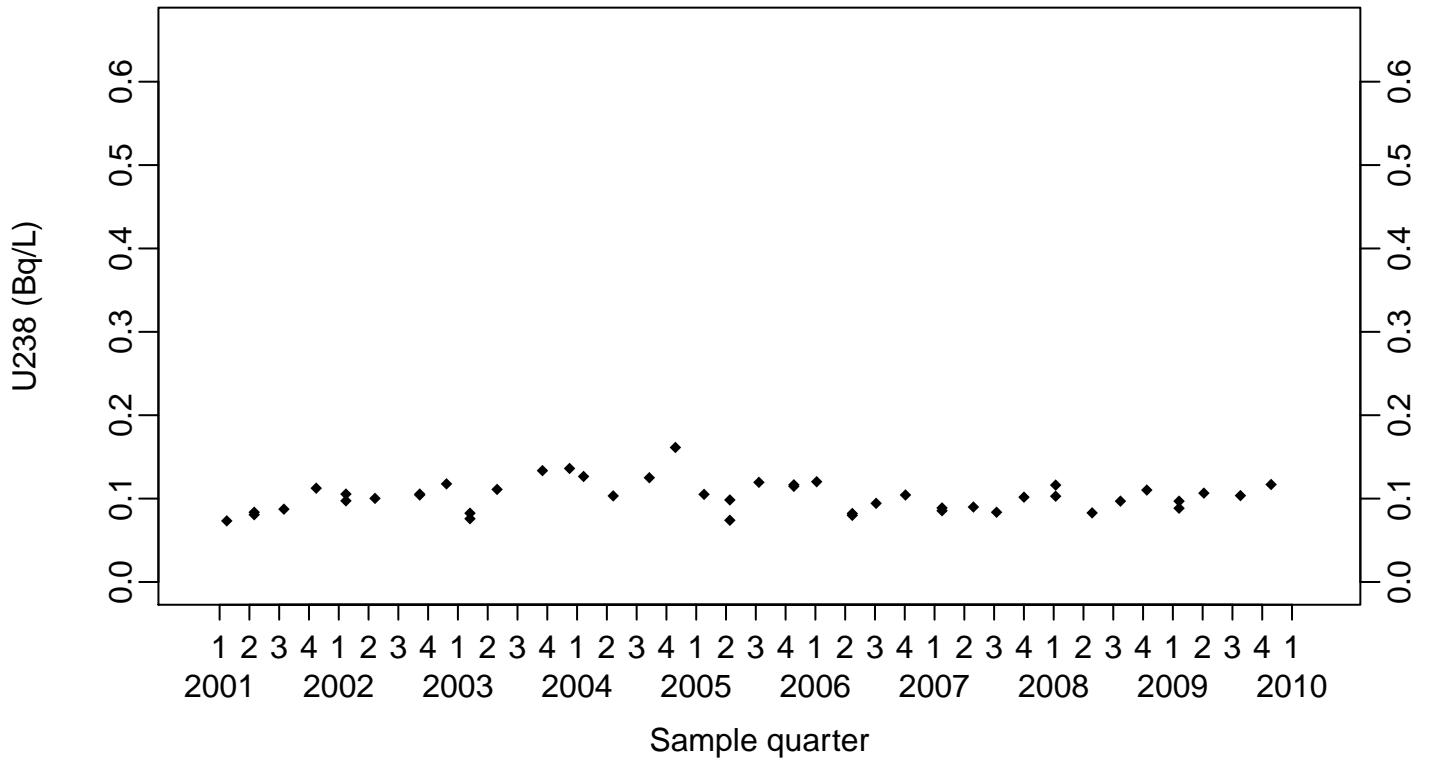
Compliance Monitoring Point K7-01



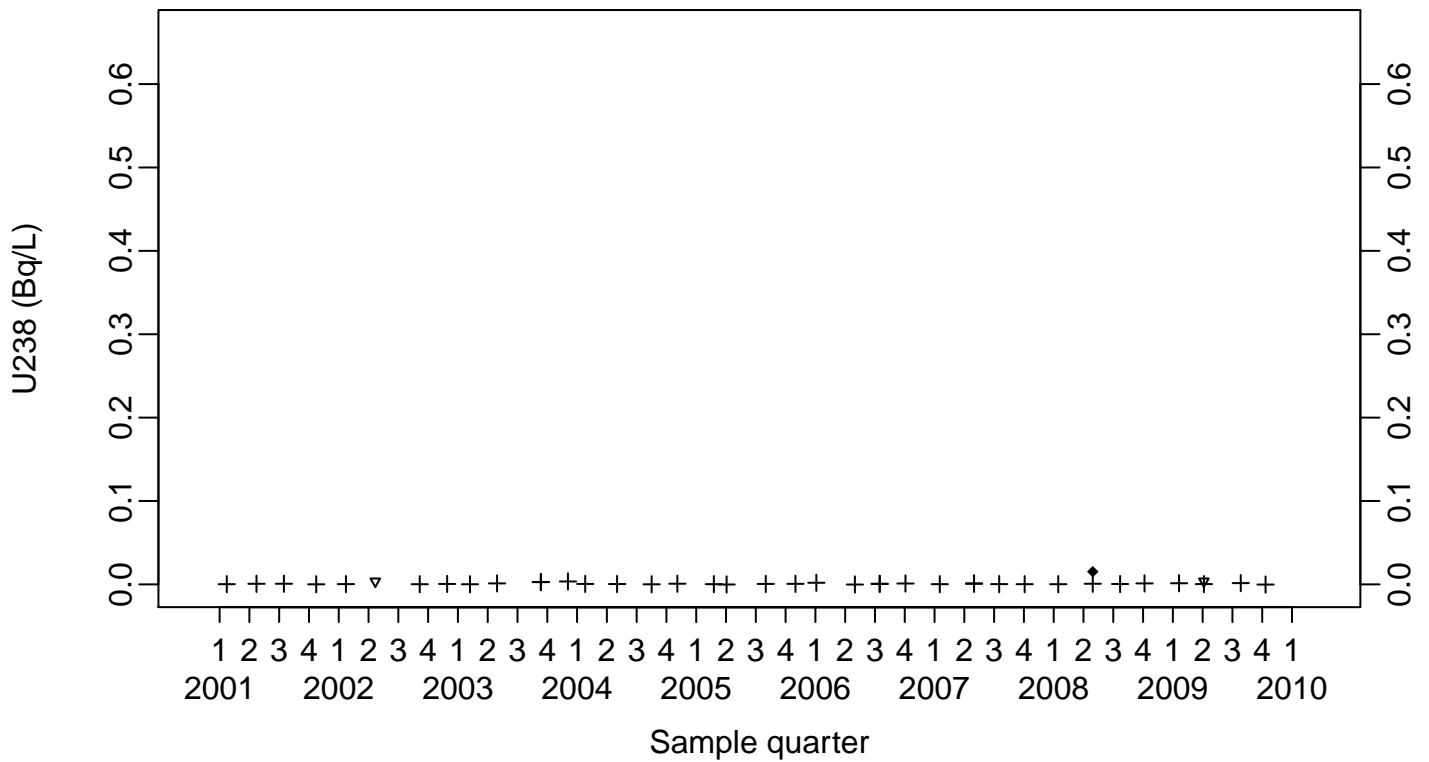
Pit 7 Complex
U238 (Bq/L)

Compliance Monitoring Point K7-03

◆ Above RL
▽ Below RL



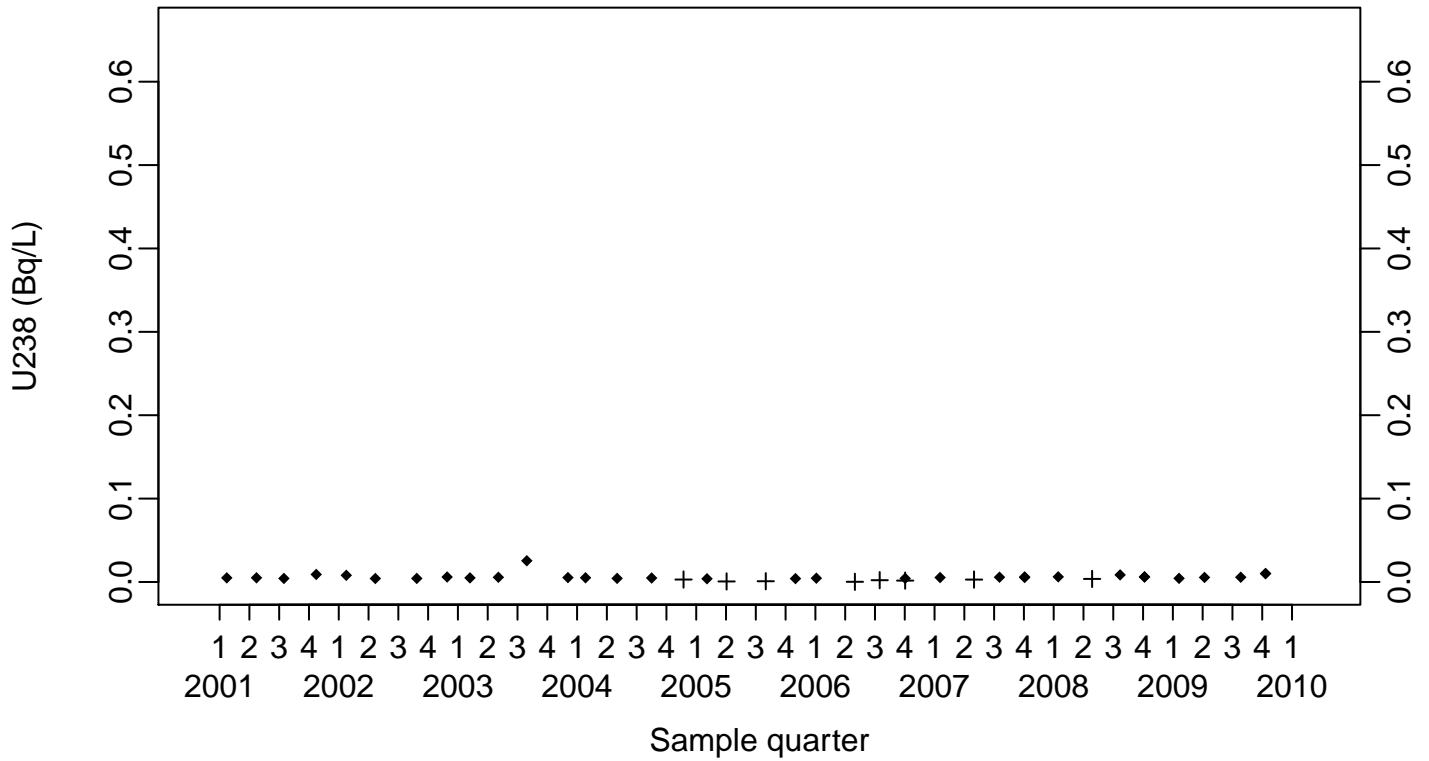
Compliance Monitoring Point K7-09



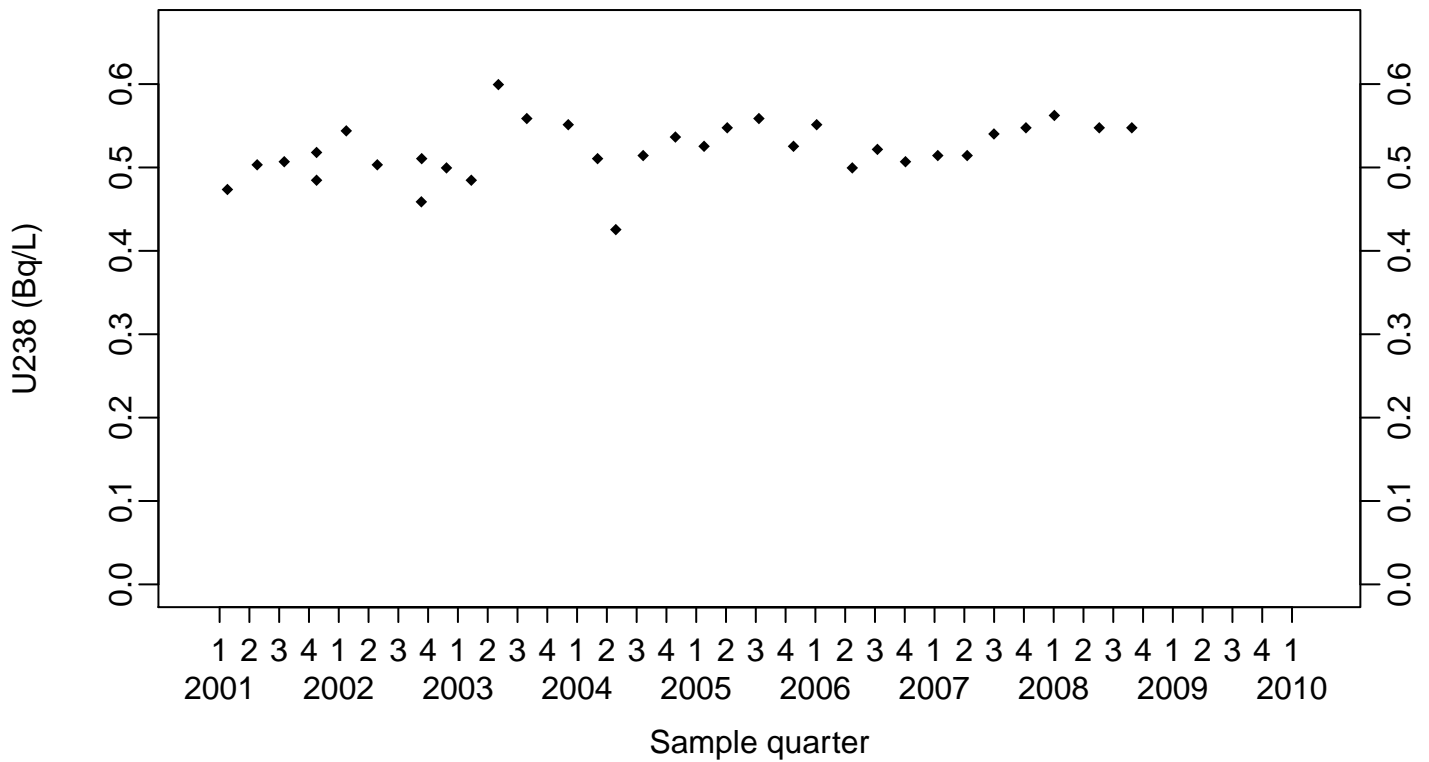
Pit 7 Complex U238 (Bq/L)

Compliance Monitoring Point K7-10

◆ Above RL
+ Estimated



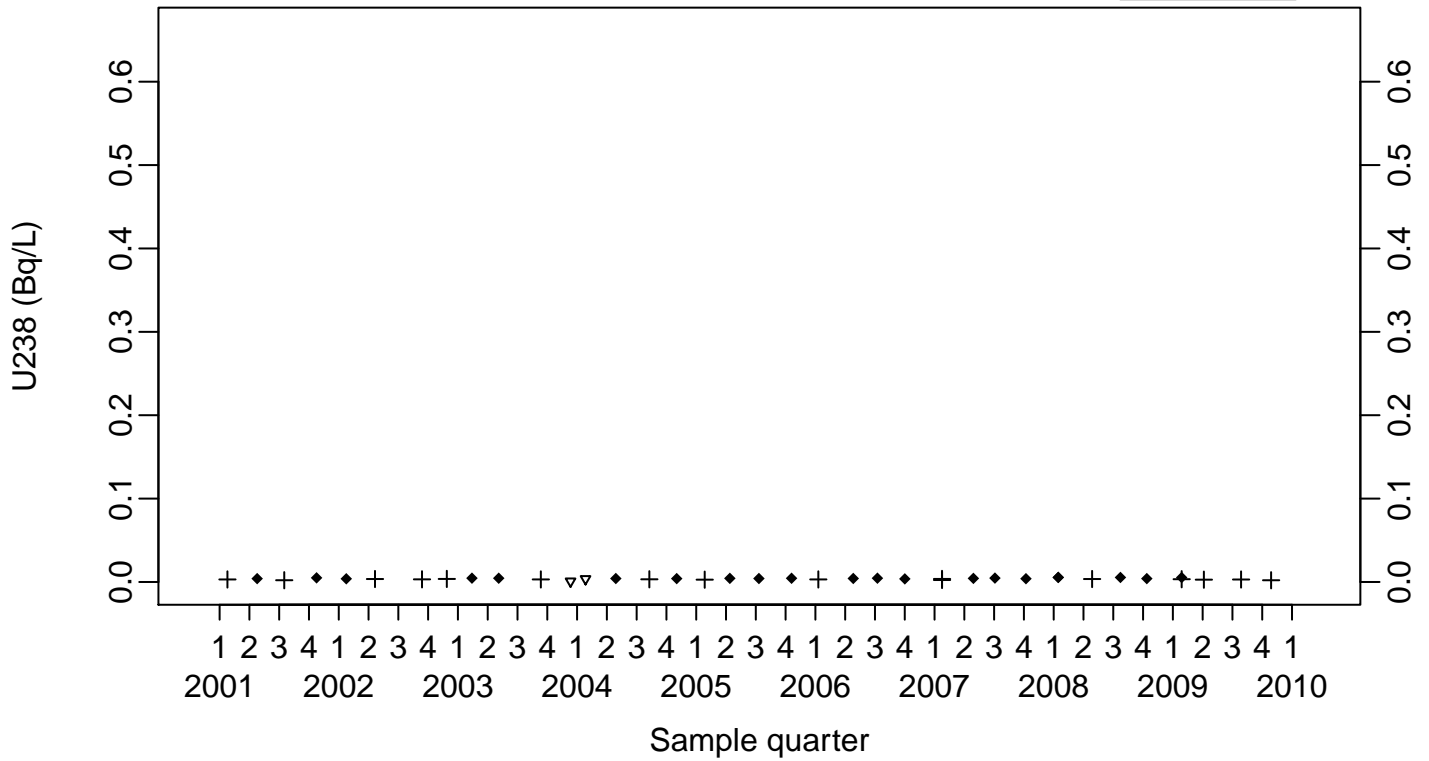
Compliance Monitoring Point NC7-25



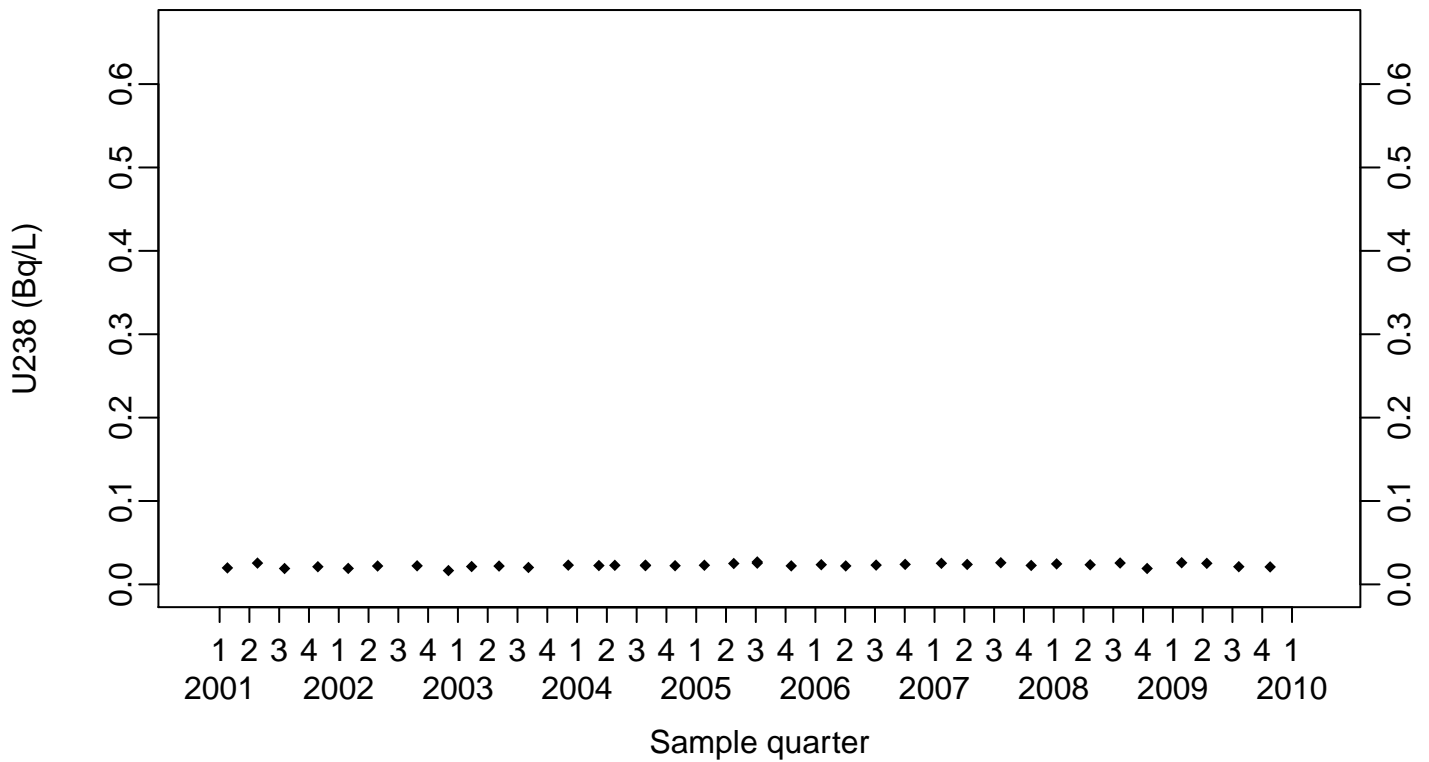
Pit 7 Complex
U238 (Bq/L)

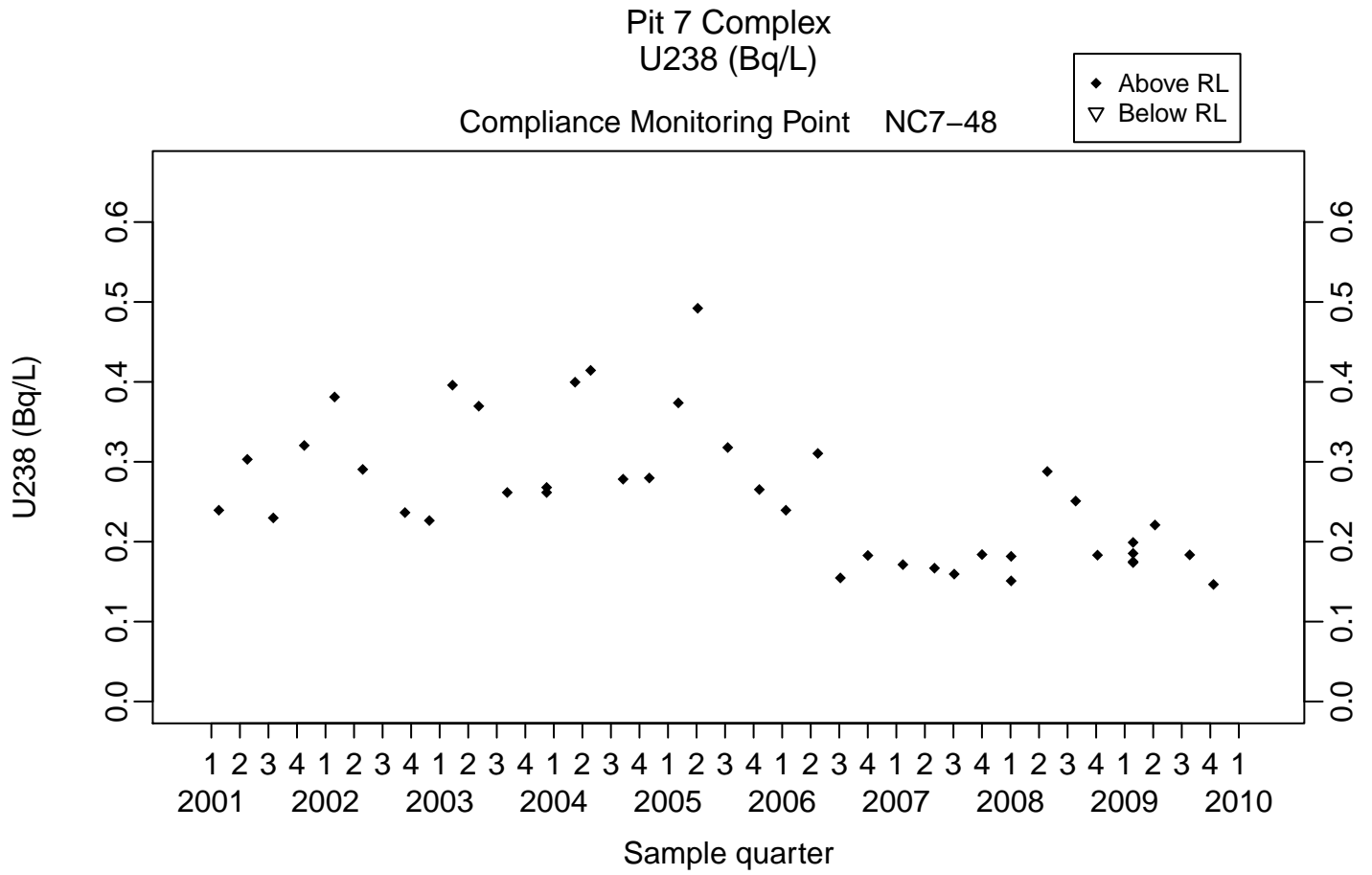
Compliance Monitoring Point NC7-26

- ◆ Above RL
- ▽ Below RL
- + Estimated



Compliance Monitoring Point NC7-47

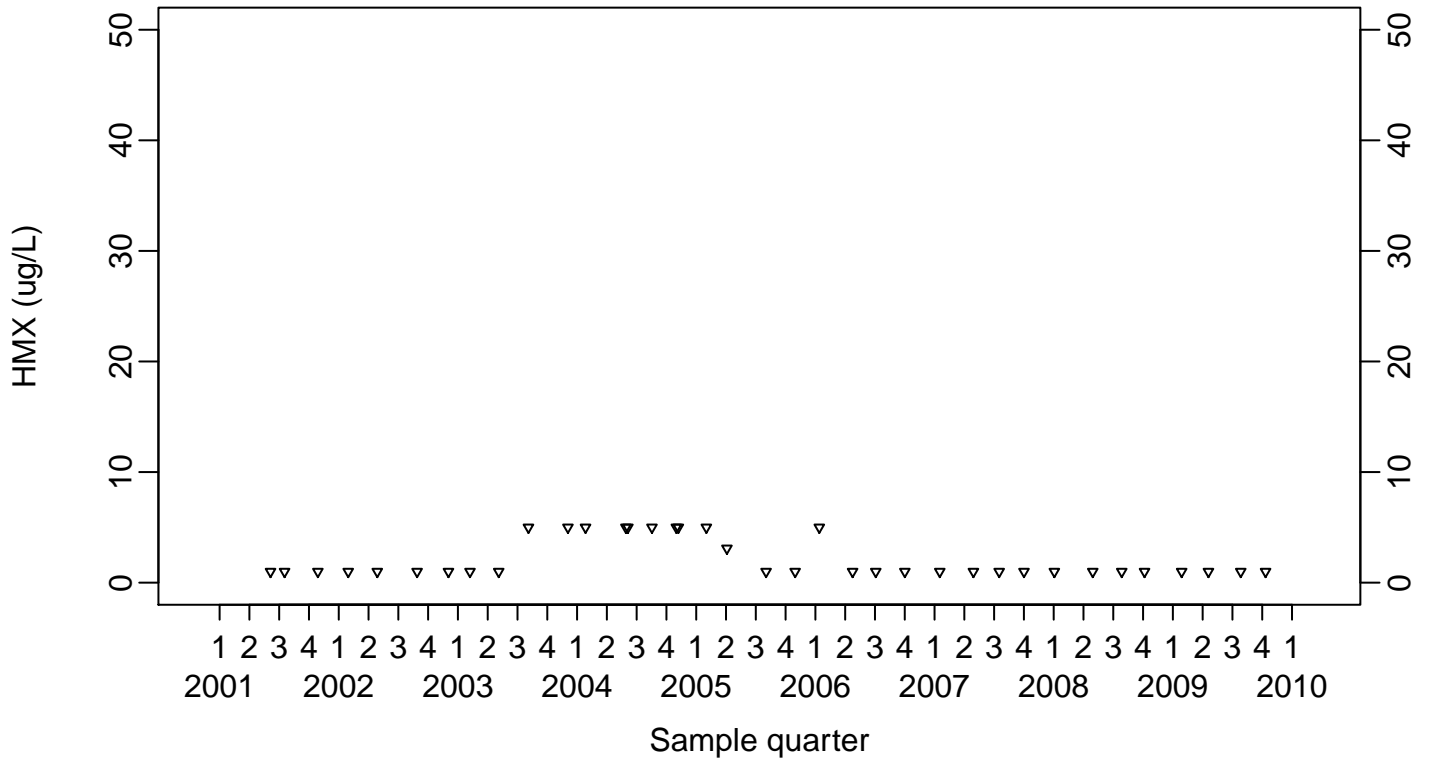




Pit 7 Complex HMX (ug/L)

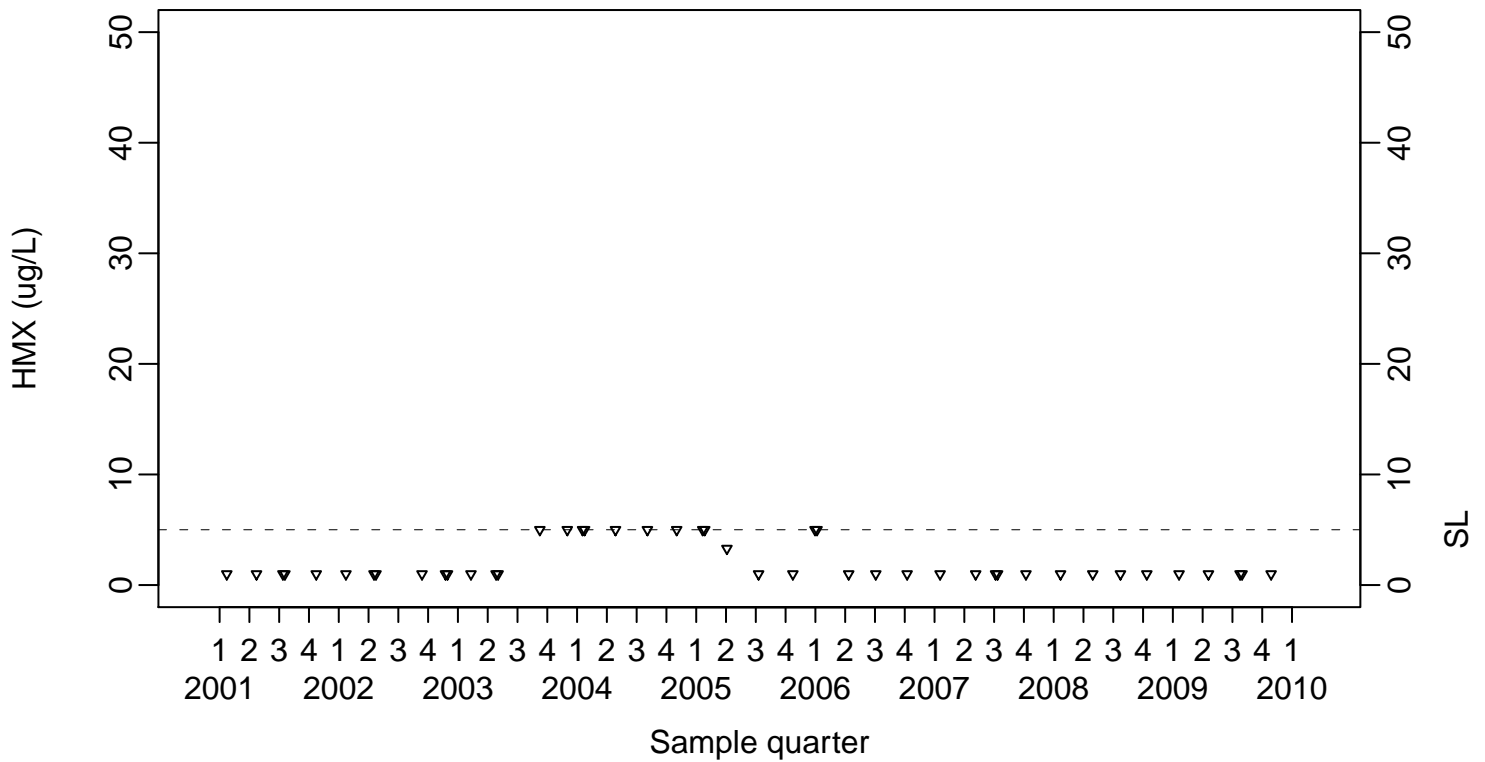
Background Monitoring Point K7-06

◆ Above RL
▽ Below RL



SL=5

Compliance Monitoring Point K7-01

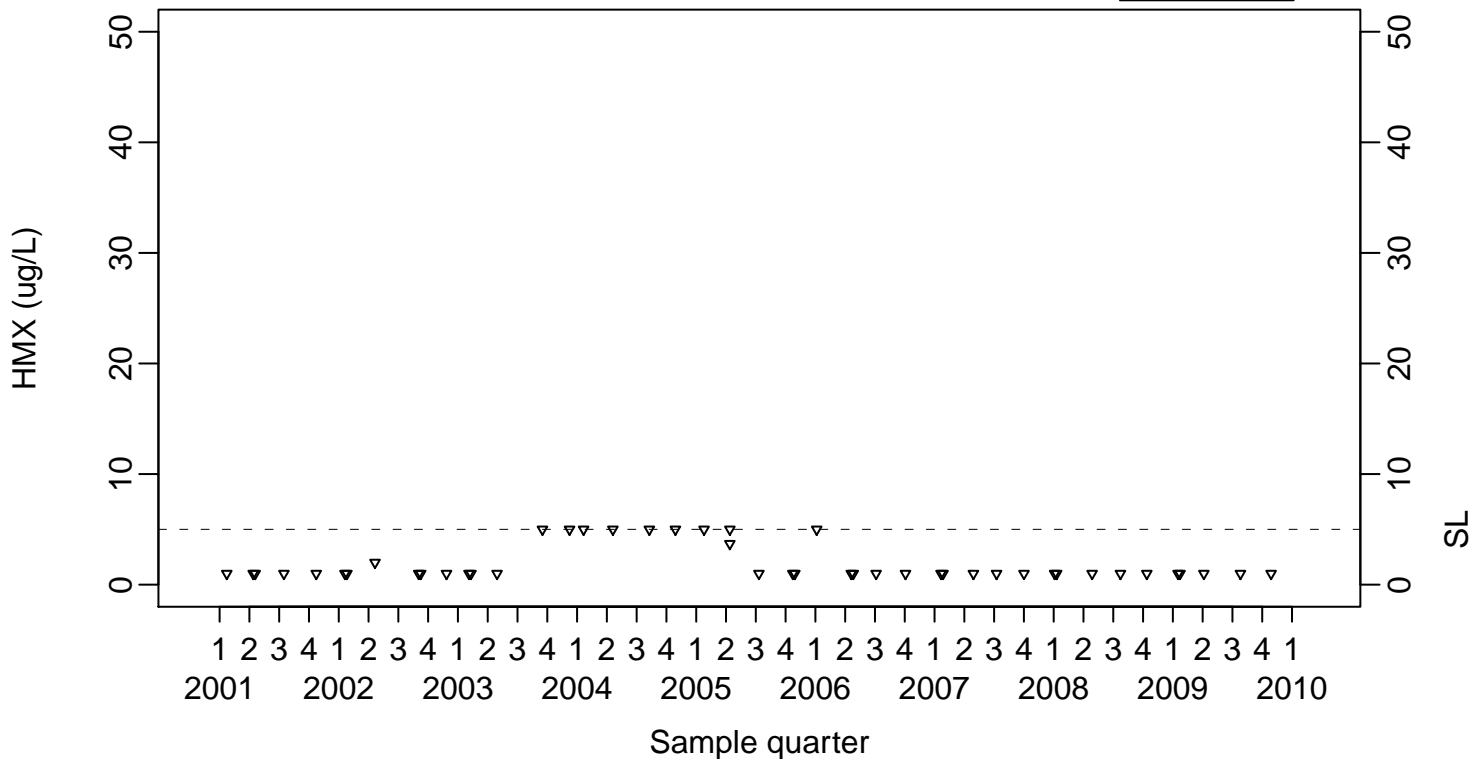


Pit 7 Complex HMX (ug/L)

Compliance Monitoring Point K7-03

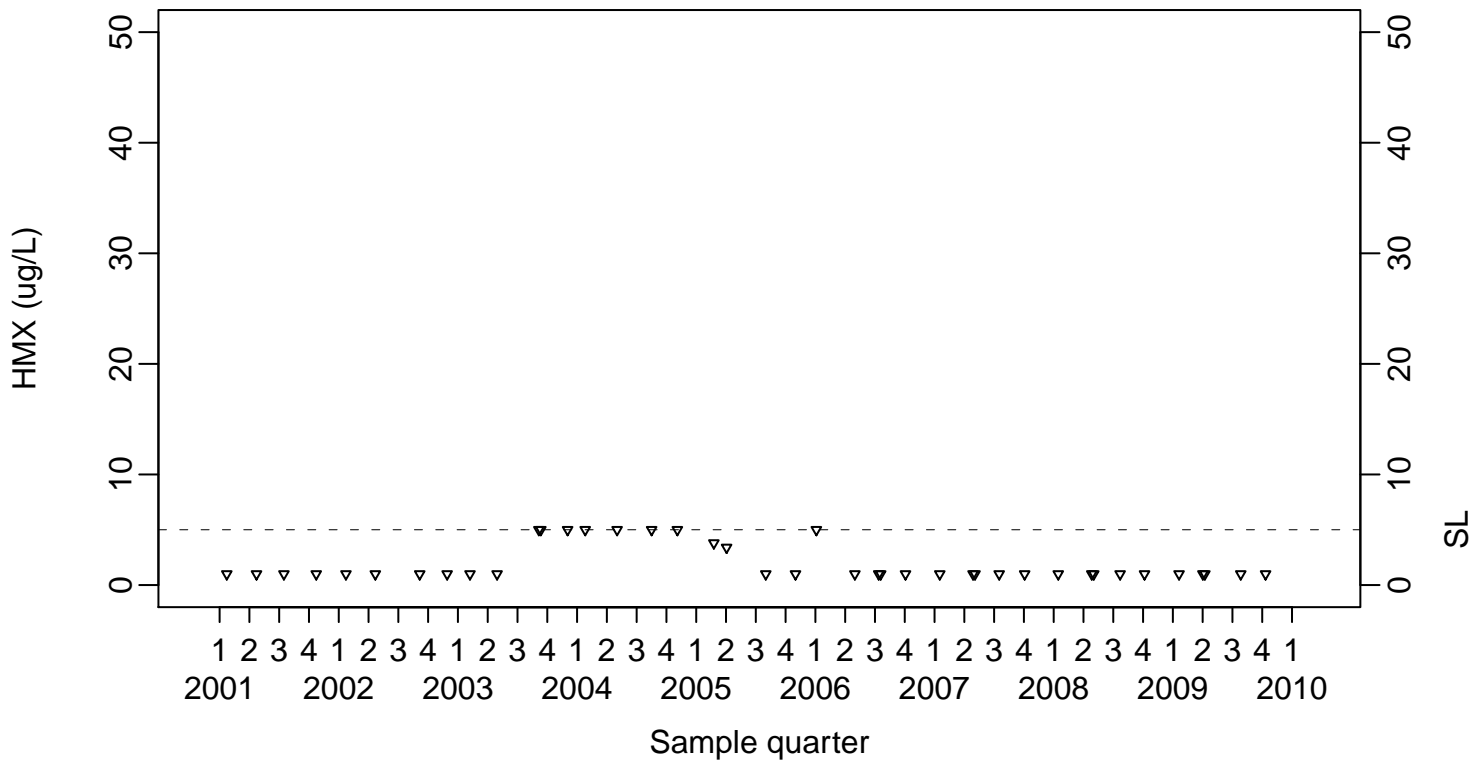
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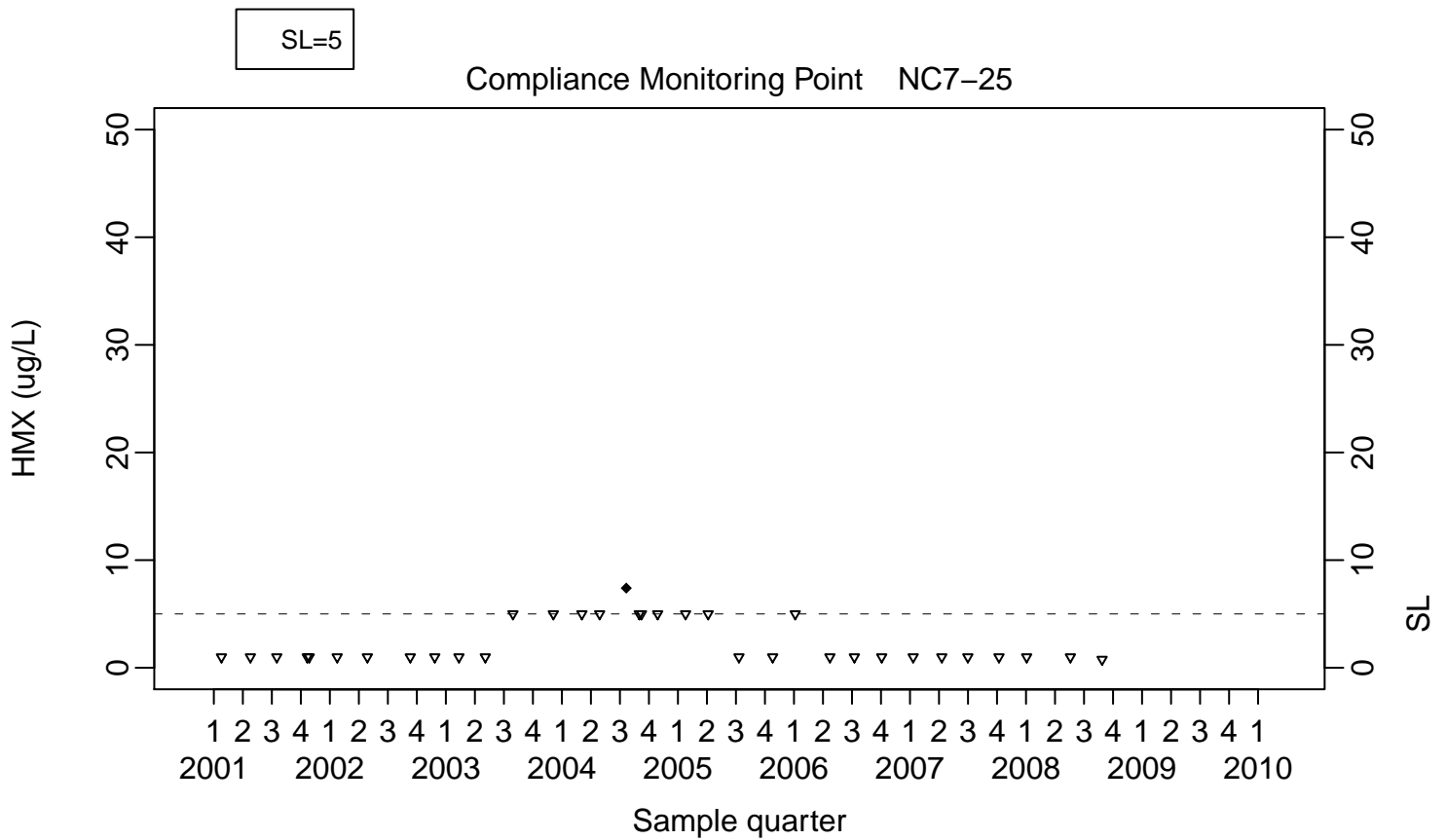
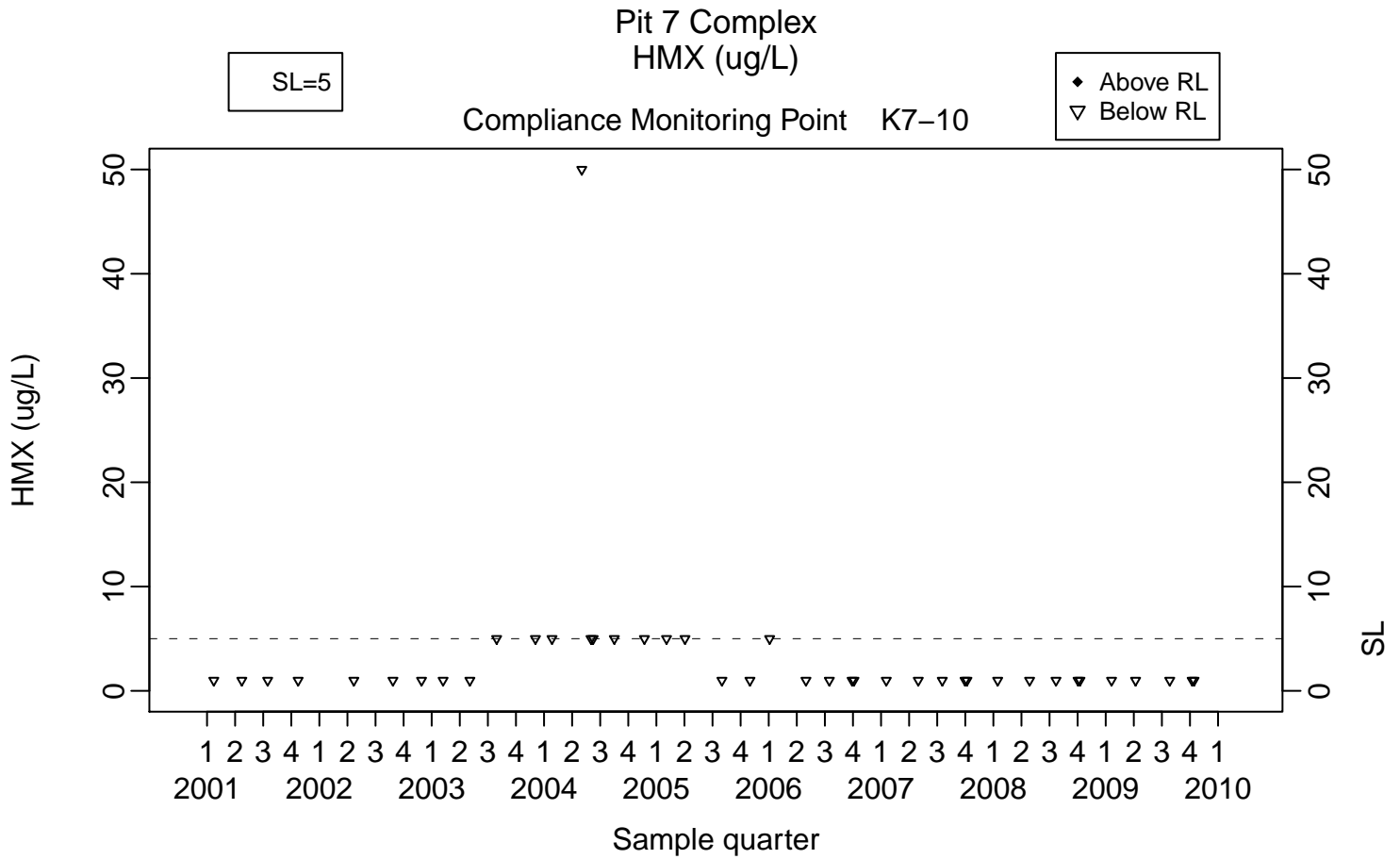
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Compliance Monitoring Point K7-09

SL=5



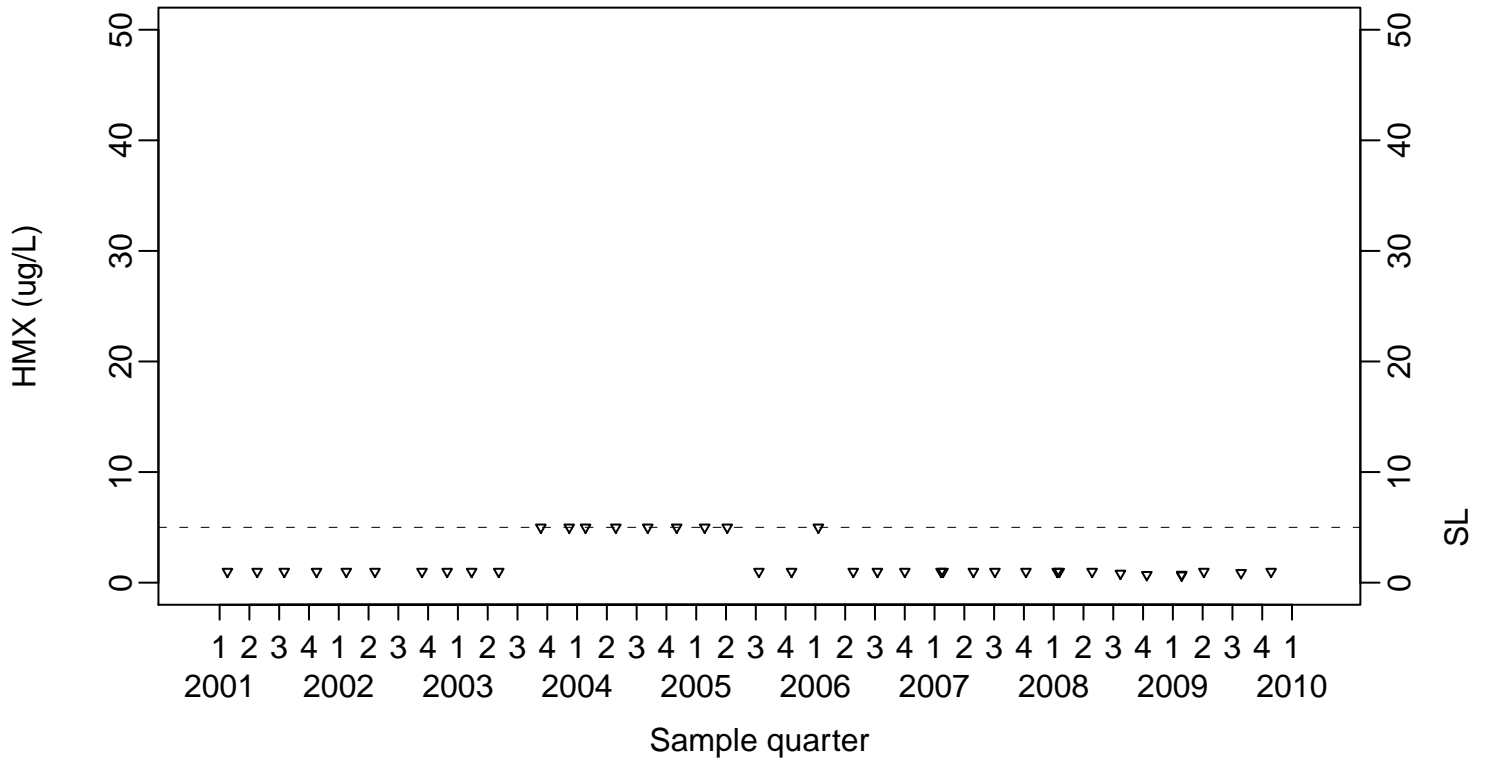


Pit 7 Complex HMX (ug/L)

Compliance Monitoring Point NC7-26

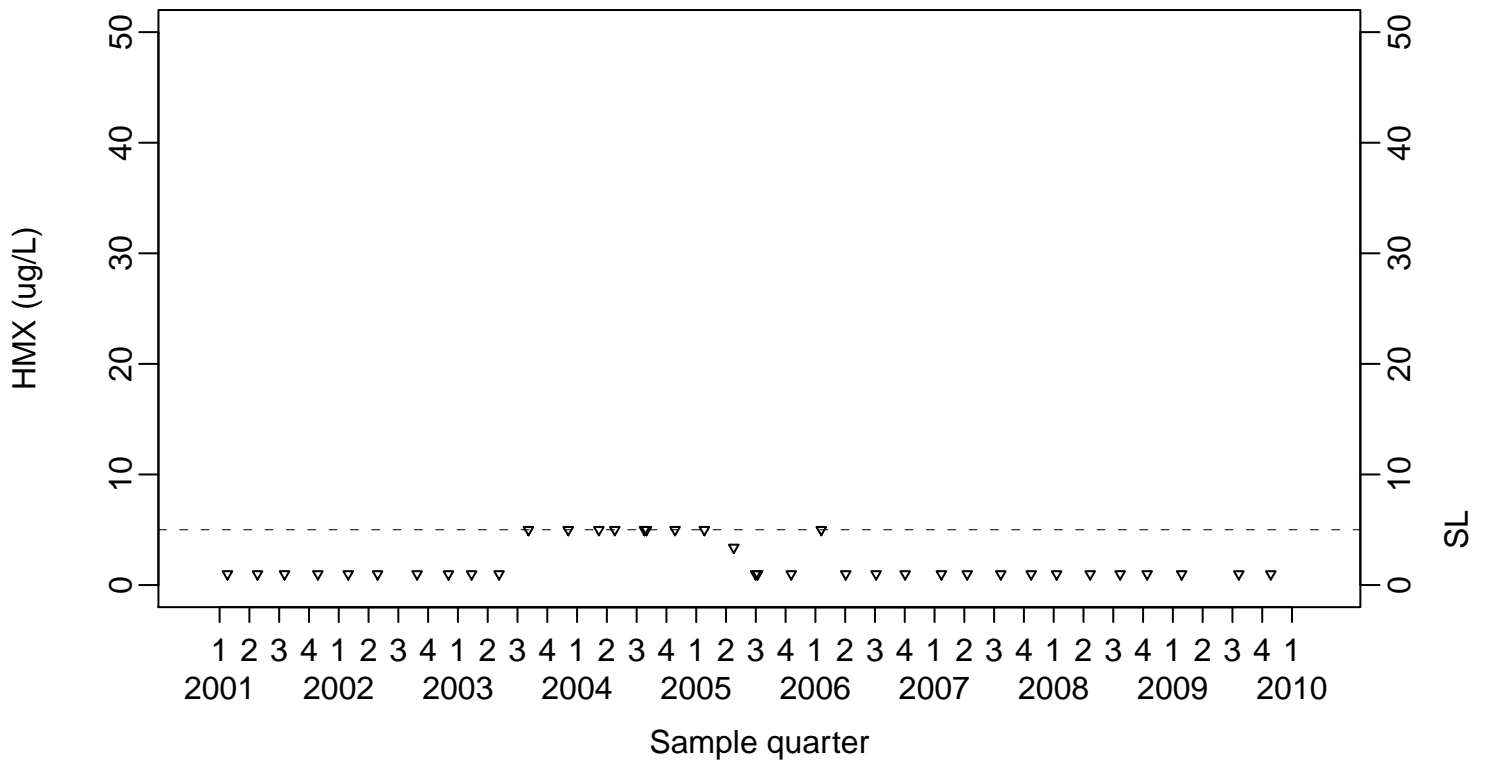
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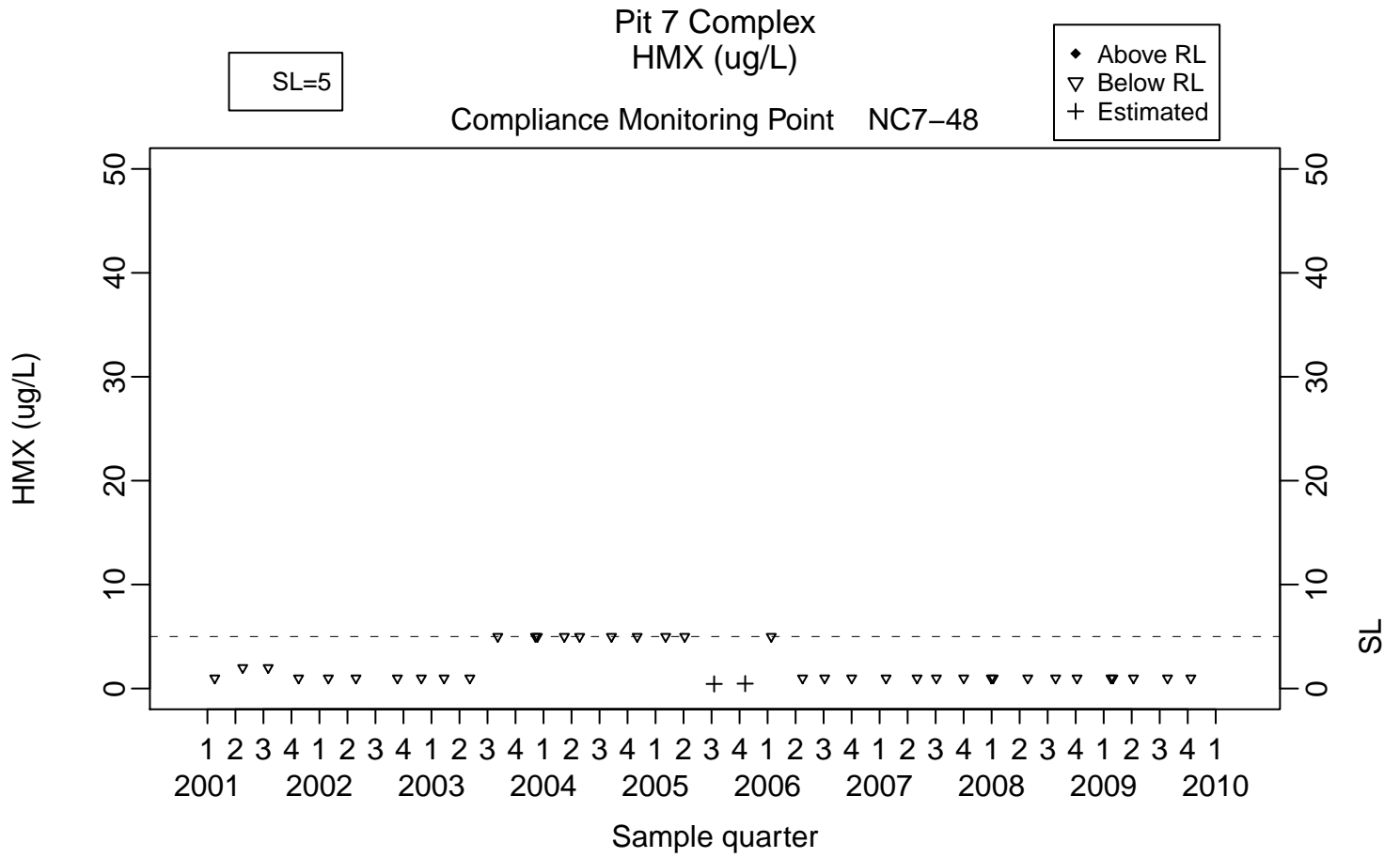
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Compliance Monitoring Point NC7-47

SL=5

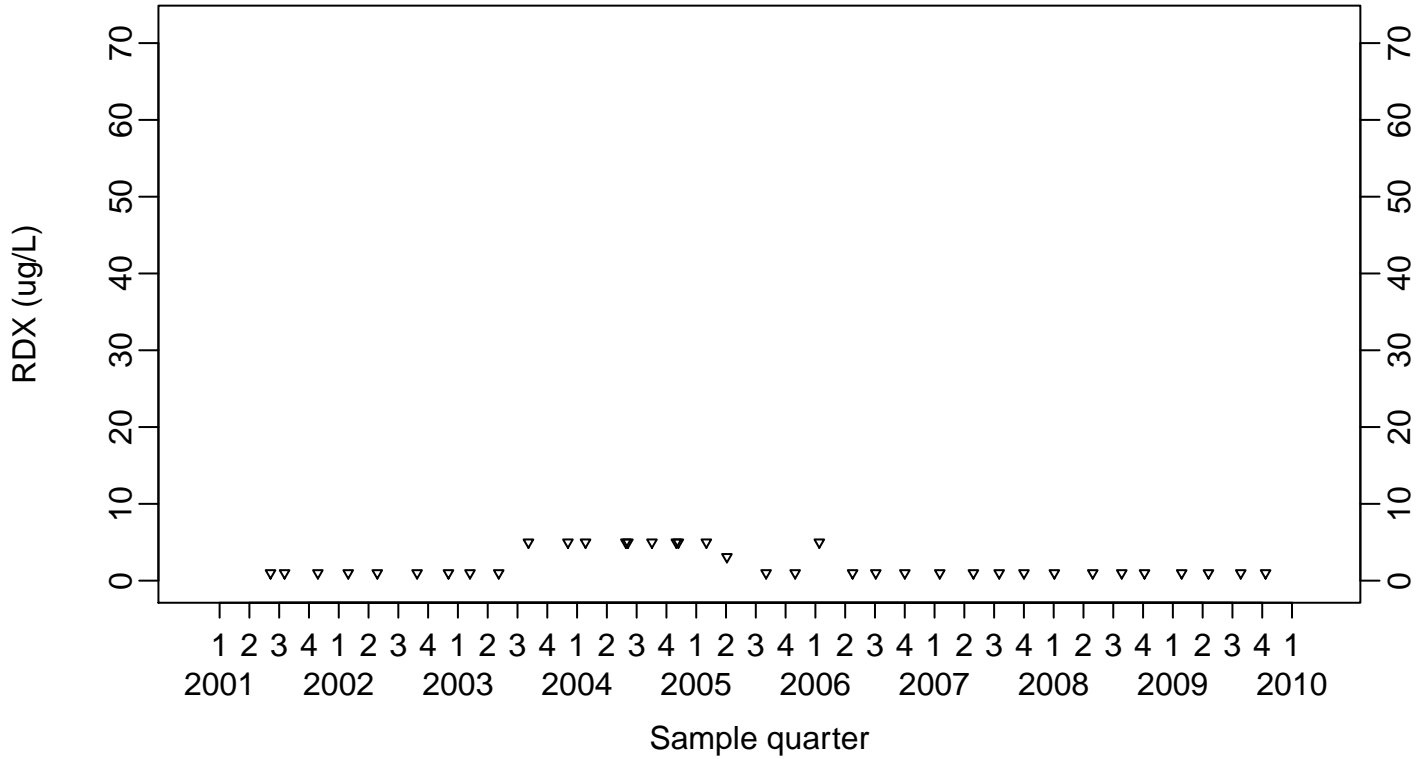




Pit 7 Complex RDX (ug/L)

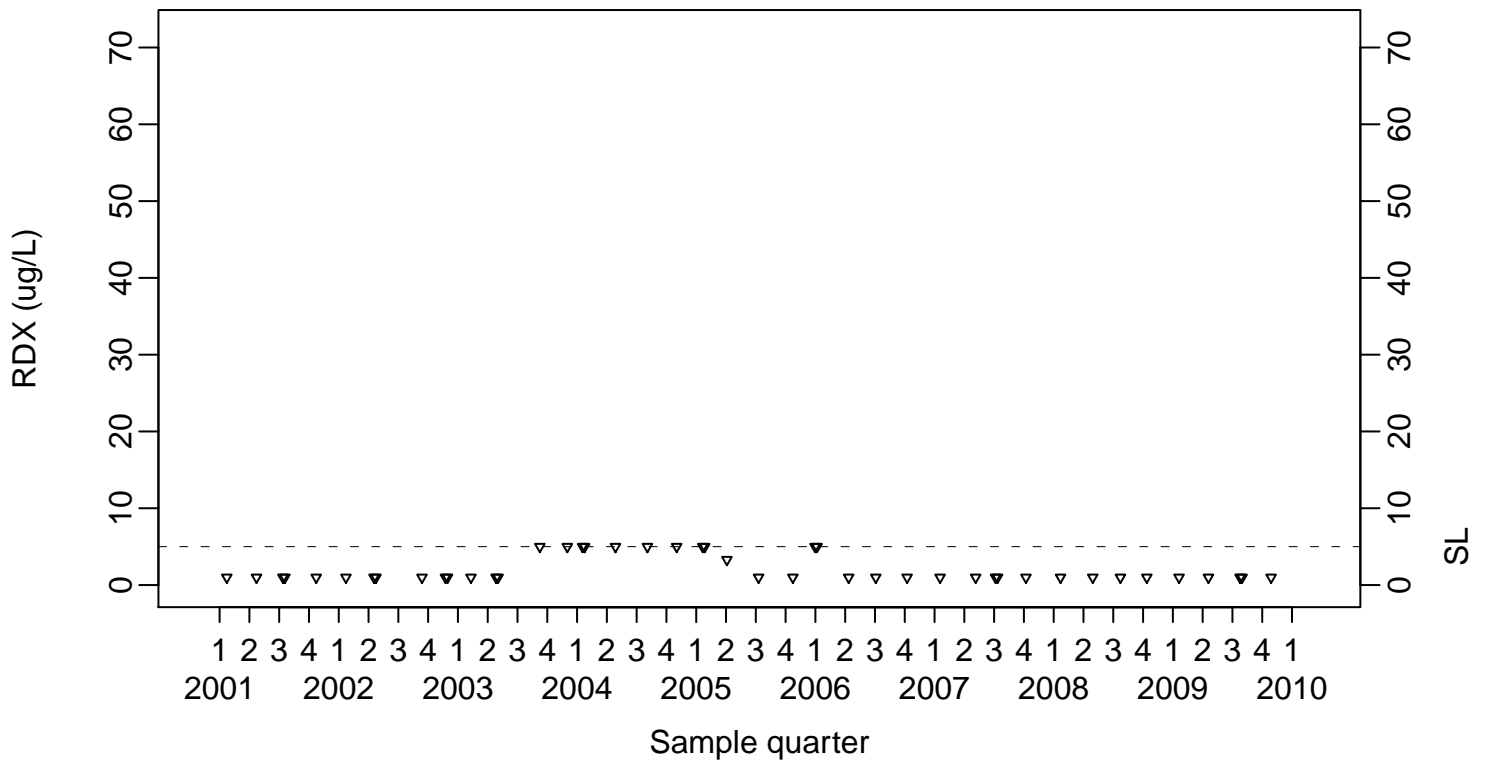
Background Monitoring Point K7-06

◆ Above RL
▽ Below RL



SL=5

Compliance Monitoring Point K7-01

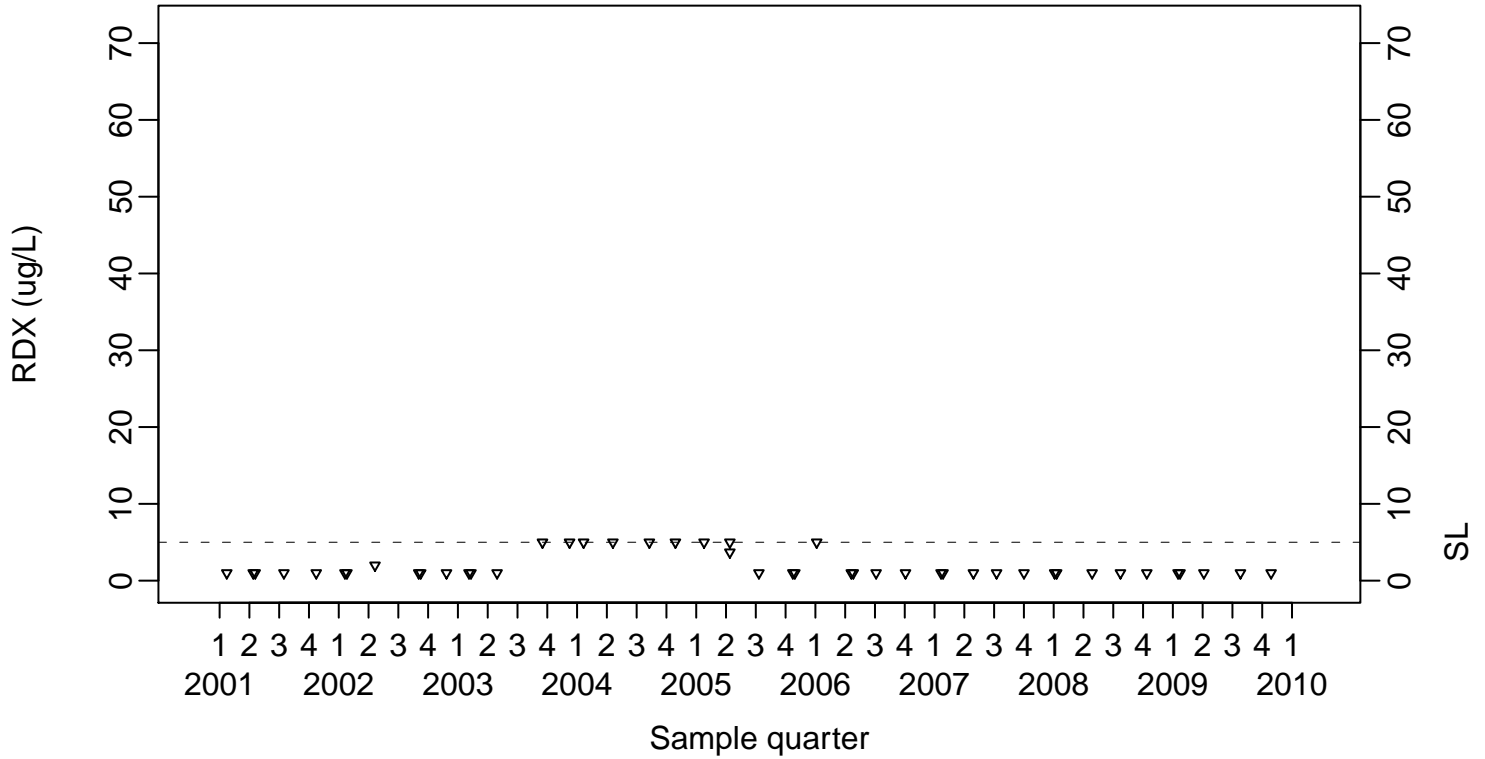


Pit 7 Complex RDX (ug/L)

Compliance Monitoring Point K7-03

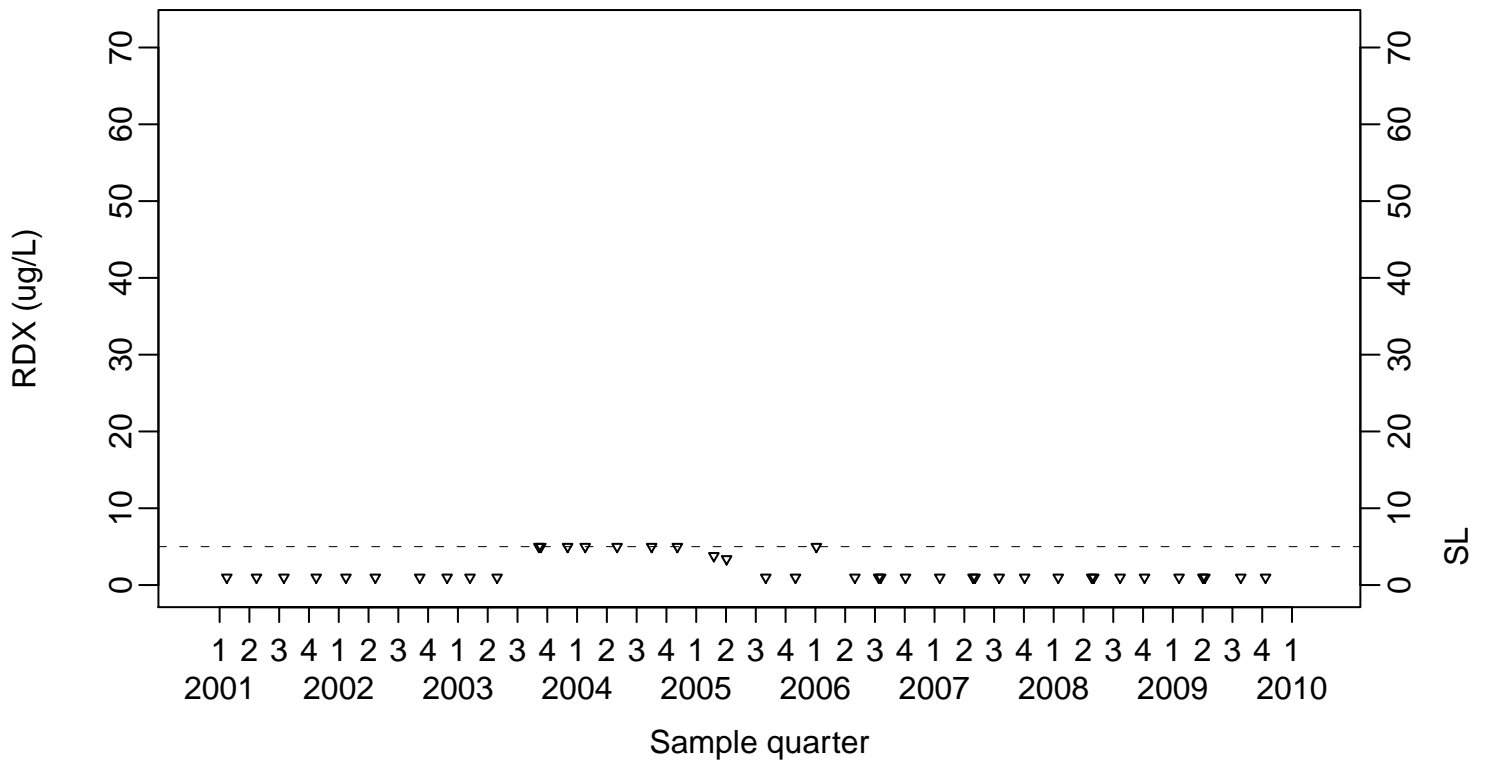
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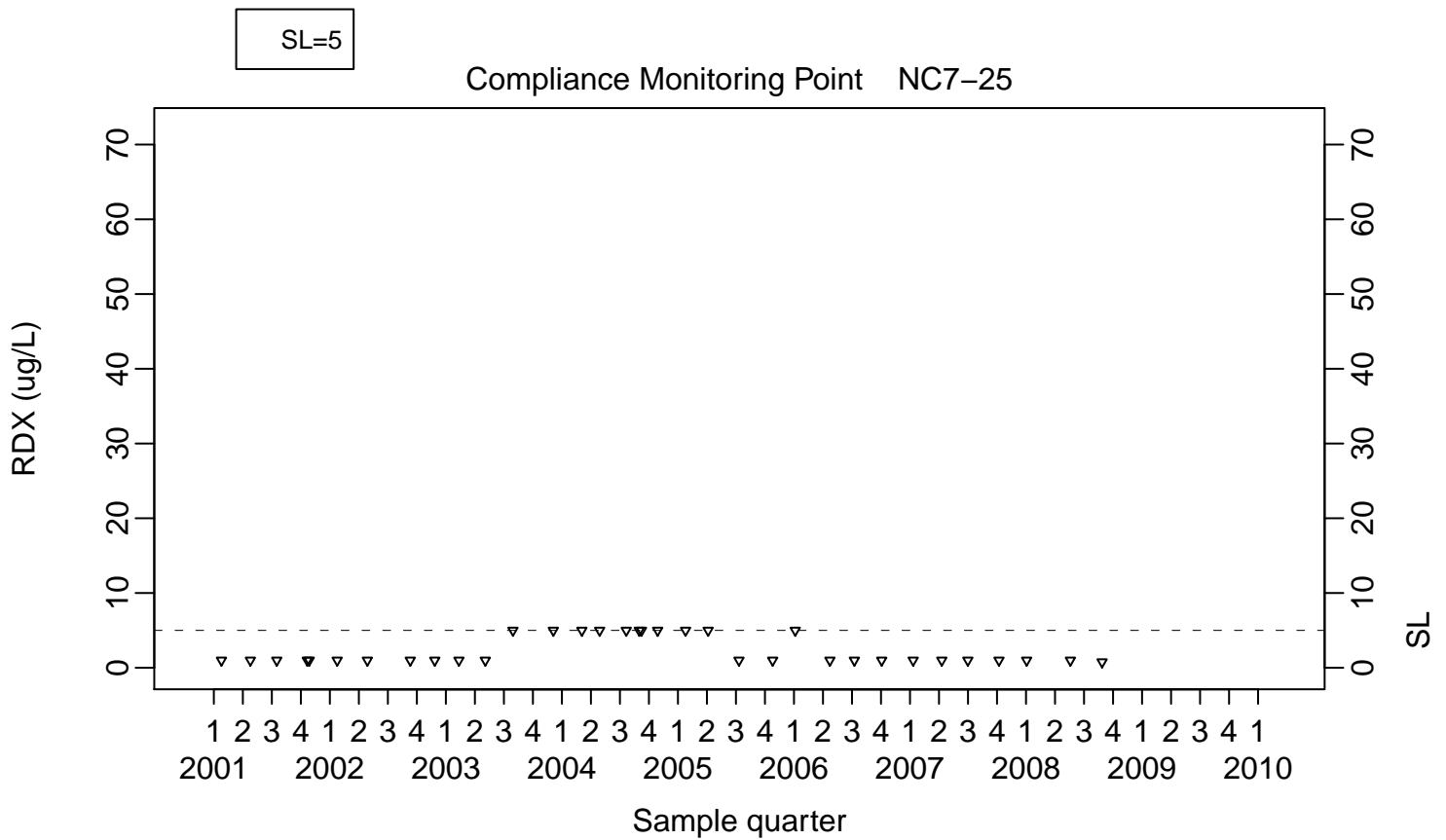
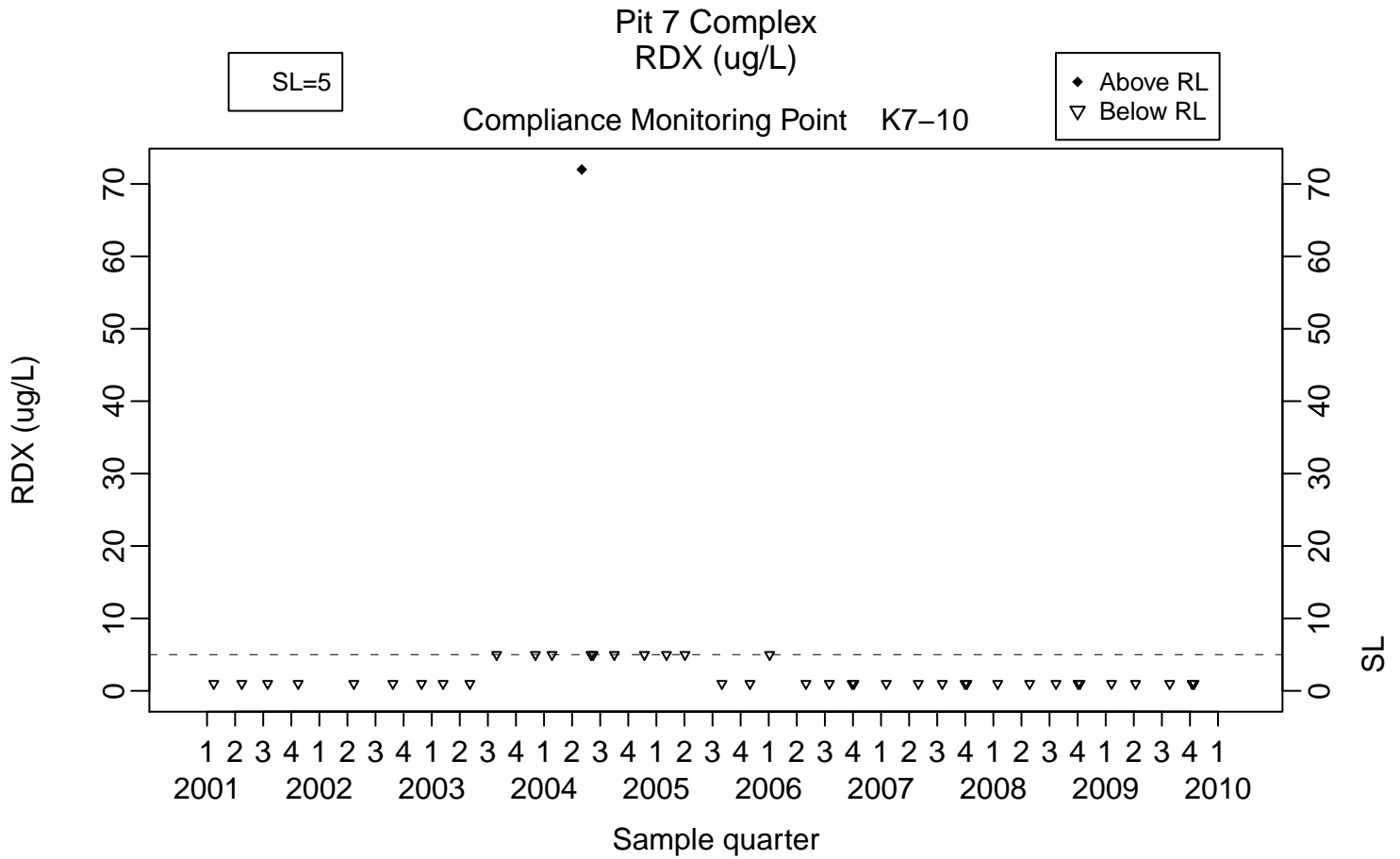
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SL=5

Compliance Monitoring Point K7-09



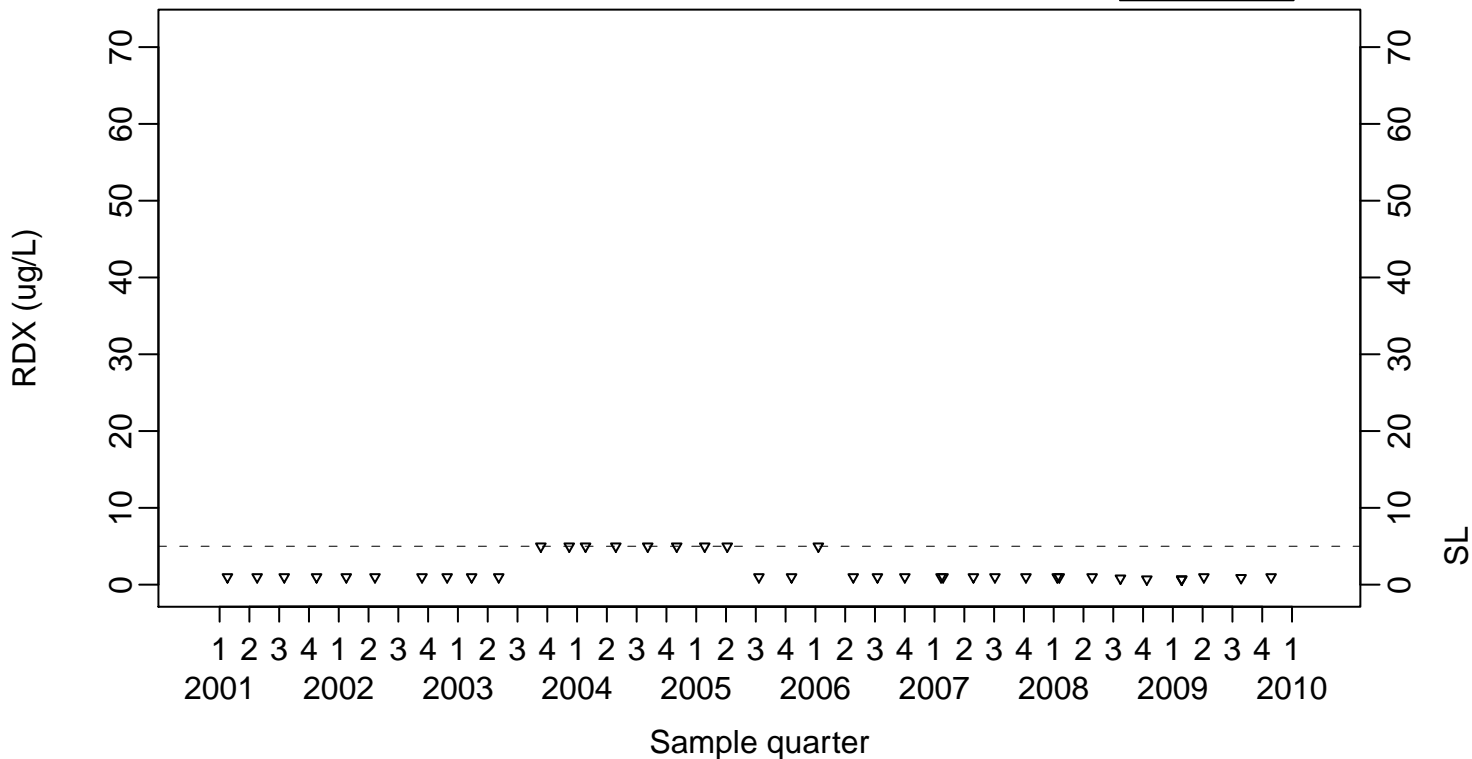


Pit 7 Complex RDX (ug/L)

Compliance Monitoring Point NC7-26

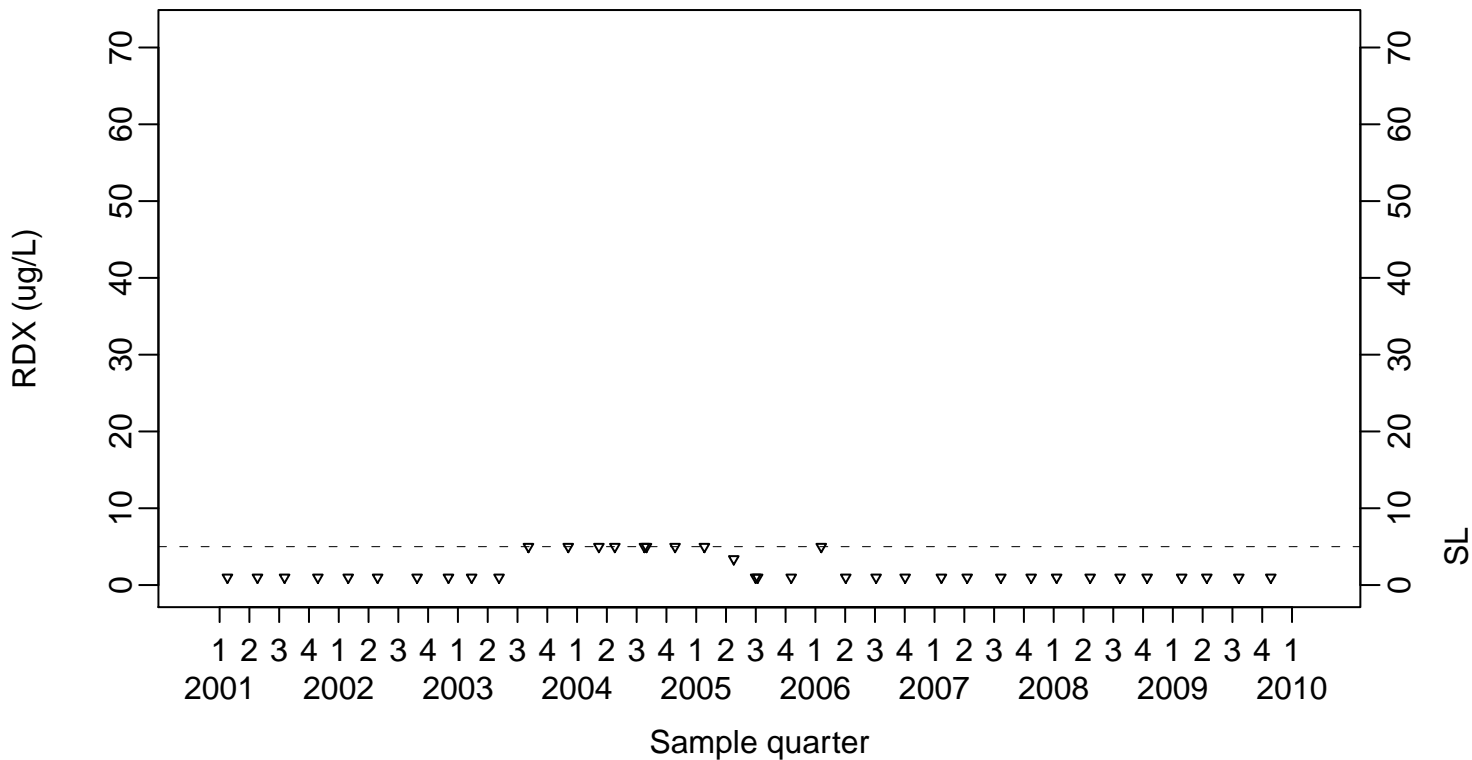
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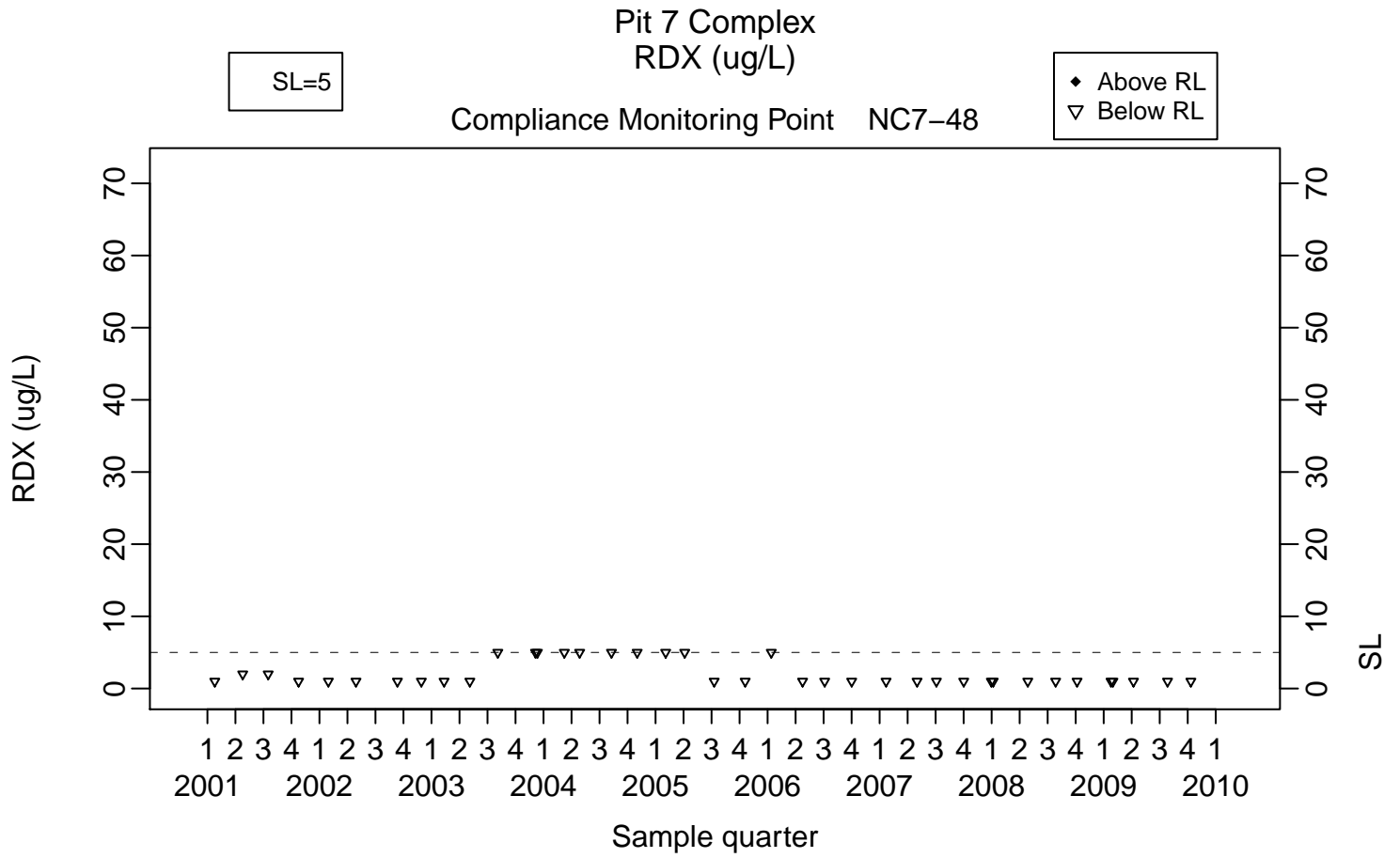
◆ Above RL
▽ Below RL



Compliance Monitoring Point NC7-47

SL=5







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