Environmental Functional Area

Water, Air, Monitoring & Analysis

UCRL-AR-10191-11-4

Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300)

Compliance Monitoring Program for Closed Pit 1 Landfill

Annual/Fourth Quarter Report for 2011

Author

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Summary

This combined fourth quarter and annual report for 2011 summarizes compliance activities performed at the Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) landfill known as Pit 1. Compliance activities at the pit consist of ground water sampling and analysis, pit cap inspections, and reporting of analytical results. Ground water measurements for the fourth quarter of 2011 are contained in **Appendix A, Tables A-1** to **A-4**.

No evidence of a new release of constituents of concern from Pit 1 is indicated by the fourth quarter ground water measurements and no constituents of concern were detected above statistical limits (SL) at Pit 1. Preliminary results for well K1-09 indicated that barium was above the SL, however the results from resamples taken on two different dates indicated they were below the SL and, therefore were not considered statistical evidence of a release from Pit 1.

The routine fourth quarter visual inspection of the Pit 1 cap was performed on October 12, 2011 by LLNL staff and no deficiencies were noted. No discrepancies were noted and the pit cap and drainage structures continue to function properly.

Introduction

This annual/fourth quarter report for 2011 summarizes compliance monitoring results for a closed landfill known as Pit 1 at LLNL's Site 300. Site 300 is a 28.3 square kilometer (km^2) (10.9 square miles [mi^2]) site located in the Altamont Hills approximately 10.5 km (6.5 mi) southwest of downtown Tracy, California (**Figure 1**). The landfill is located in the northern portion of the site (**Figure 2**). Closure of this unlined Class I waste management unit was completed with waste in place in December 1992 following a California Department of Health Services (now Department of Toxic Substances Control, or DTSC) approved RCRA Closure and Post-Closure Plan (PCP) using the LLNL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Federal Facilities Agreement (FFA) process. Site 300 is owned by the U.S. Department of Energy (U.S. DOE) and is operated by Lawrence Livermore National Security, LLC.

Figure 1. Location of LLNL Site 300.

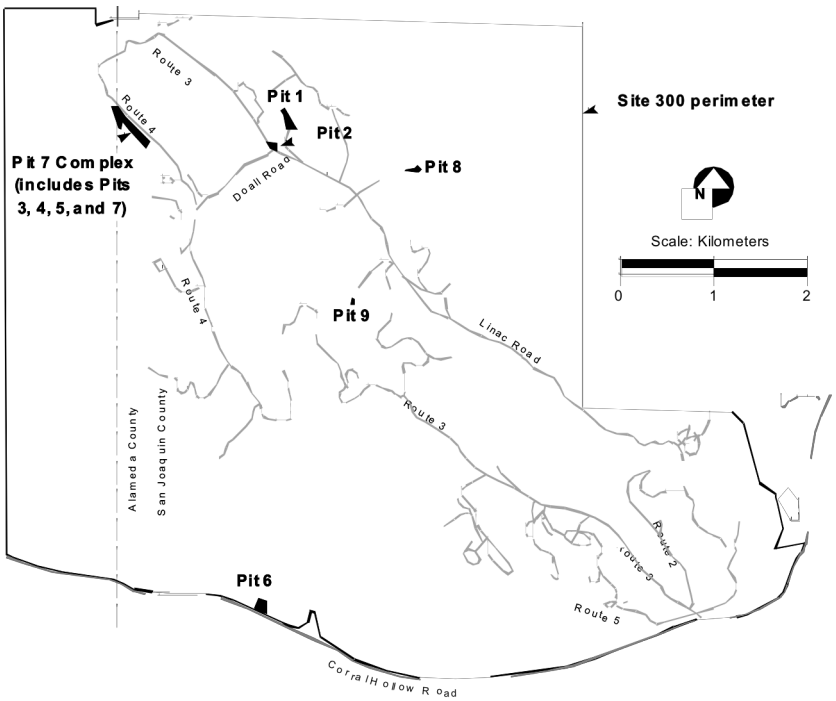

Figure 2. Location of closed landfill Pit 1 at LLNL Site 300.

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 **(Figure 3)**, following the inclination (dip) of underlying Miocene-age sedimentary rocks (Webster-Scholten, 1994).

The current monitoring network at Pit 1 consists of twelve monitoring wells. These include eight detection monitoring wells and four evaluation monitoring wells (**Figure 3)**. The detection monitoring wells that are used to sample the ground water in the vicinity of Pit 1 include: wells K1-01C and K1-07 located hydrologically upgradient from Pit 1; downgradient wells K1-02B, K1-04, K1-05, and W-PIT1-2326; and cross-gradient wells K1-08 and K1-09. The primary objective of the detection monitoring wells is to detect any new release of constituents of concern to ground water. Constituents of concern, as defined by Title 23 of the California Code of Regulations (CCR), Chapter 15, are waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste buried in the Pit 1 Landfill. LLNL collects, analyzes, and statistically evaluates one sample quarterly from each detection monitoring well.

The evaluation monitoring wells are all downgradient of Pit 1 wells and include K1-06, W-PIT1-2620, W-PIT1-2209, and W-865-2005 as required by the Monitoring Reporting Program (MRP). These evaluation monitoring wells were added to Pit 1 monitoring and reporting requirements to track existing plumes of perchlorate and tritium from an upgradient source. LLNL collects and analyzes one sample quarterly from each evaluation monitoring well and annually conducts trend analyses for tritium and perchlorate.

All of these wells are screened in the uppermost water-bearing zone in the Neroly Formation lower blue sandstone unit ($Tnbs_1$/$Tnbs_0$). 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 that is 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.

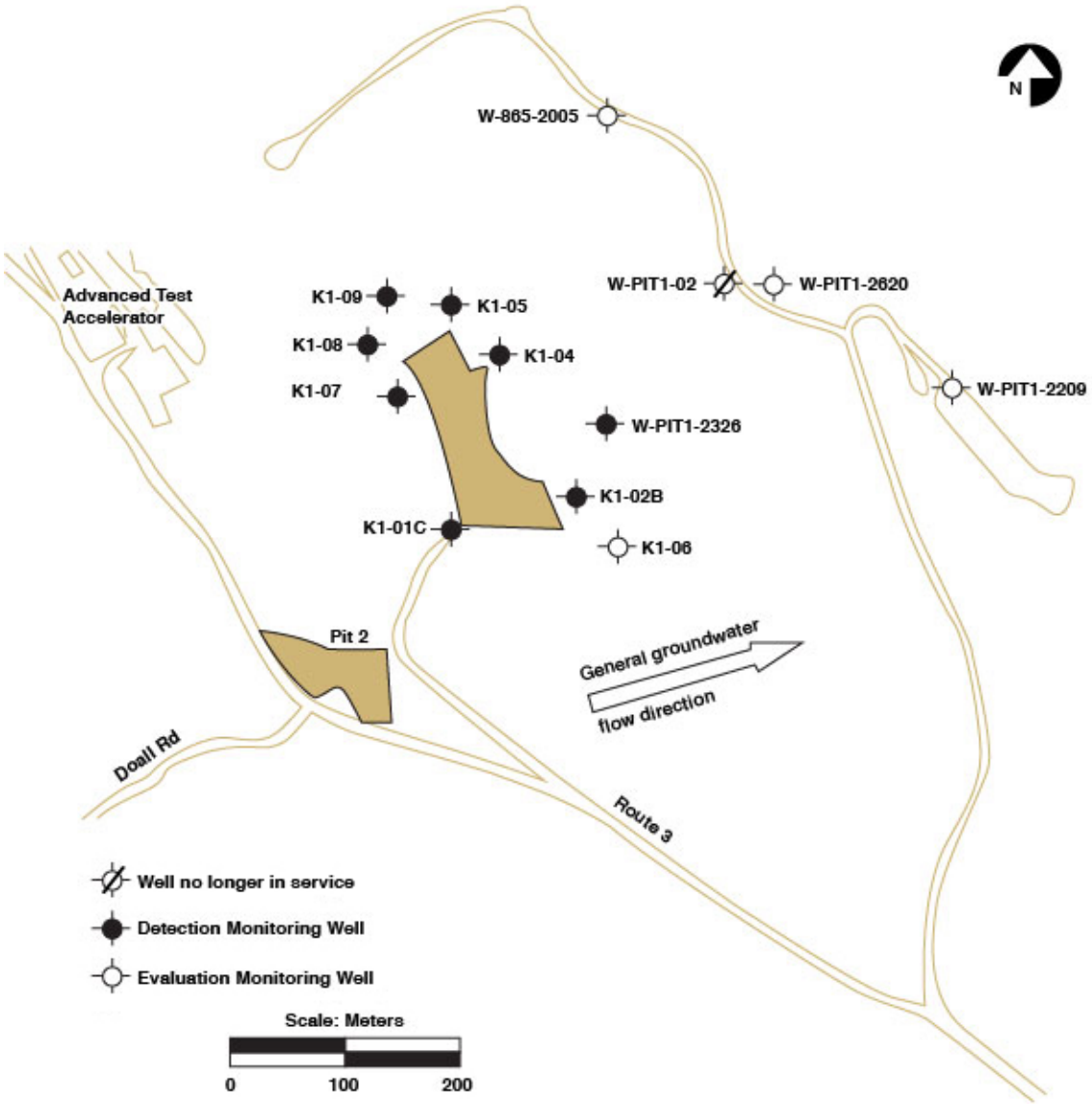

Figure 3. Locations of Pit 1 compliance monitoring wells.

Compliance Monitoring Program Overview

This report fulfills quarterly requirements set forth in the following two documents: (1) Waste Discharge Requirements (WDR) Order 93-100 and the February 18, 2010, MRP No. 93-100, administered by the California CVRWQCB (CVRWQCB 1993 and 2010) and (2) LLNL Site 300 RCRA Closure and Post-Closure Plans, Landfill Pits 1 and 7 (Rogers/Pacific Corporation 1990). The PCP was approved by the California Department of Health Services (currently the California Department of Toxic Substances Control). The combined requirements include quarterly ground water sampling and analyses to detect potential releases of constituents of concern from the landfill, quarterly and post-rain visual inspections of pit cap integrity, repairs as necessary to maintain the integrity of the landfill and its water-diversion system, 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, LLNL works within the established Quality Assurance (QA) program of the LLNL Environmental Functional Area (EFA). LLNL uses 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, 2009). 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. 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 Executive Order 12770, 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 of 2011 from detection monitoring and perchlorate and tritium in evaluation monitoring wells. Constituents of concern measurements that exceeded SLs or MCLs in drinking water are discussed in this report.

Appendix A contains the ground water analytical measurements for the fourth quarter of 2011. Pit 1 data are in **Tables A-1**, **A-2**, and **A-3**. **Table A-4** shows the sample dates for Pit 1, and **A-5** shows the reporting limits for the Pit 1 VOC contaminants of concern. Note that the **Appendix A** tables may include some small negative values for radioactivity measurements. These are below the method RLs and are calculated values. They simply indicate that the radioactivity for that ground water sample is less than a low reference standard. **Appendix A** also contains a ground water contour map of water levels from the $Tnbs_1/Tnbs_0$ Hydrostratigraphic Unit (HSU) at Pit 1.

Appendix B explains the methods used to determine the SL of concentration for a constituent of concern. Requirements for statistical treatment of ground water data are established in the CCR, Title 23, Division 3, Chapter 15, Section 2550.7. LLNL uses a statistical prediction limit method to implement intrawell comparisons. The method uses the average and standard deviation of historical measurements to calculate a SL value. 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.

Appendix C contains the results for QA sample analyses performed during the fourth quarter of 2011 at Pit 1 (**Table C-1**).

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

Appendix E consists of **Table E-1** and presents well specification and construction details for detection monitoring and evaluation monitoring wells.

Appendix F consists of **Table F-1** that displays hydrographs for all compliance monitoring wells.

Appendix G consists of **Table G-1** and includes field logs for all compliance monitoring wells.

Appendix H consists of **Table H-1** that includes analytical results from 2011 that were omitted from the **Appendix H** plots due to the use of specially reduced Y-axis plot limits. **Table H-2** contains the detection monitoring constituents of concern, monitoring wells, statistical methods, concentration limits, and statistical limits at Pit 1.

Summary of Analytical Results

This section summarizes the analytical results for Pit 1 for the fourth quarter of 2011 and reports on the requirements of the CVRWQCB Pit 1 MRP and post closure plan requirements. During the fourth quarter monitoring period, no new releases of constituents of concern to ground water from the pit are evident in the data. As part of the MRP, statistical limits (SLs) used to monitor ground water constituents of concern are shown on **Table A-1**. The MRP requires that two confirmation samples be collected from wells with constituents of concern exceeding SLs. If either of the two confirmation samples exceeds the statistical limit, a finding of statistically significant evidence of a release is confirmed and a seven-day notification letter must be submitted to the CVRWQCB. The statistical tests used to evaluate this data are those identified in **Appendix B**.

Detection Monitoring Wells

During the fourth quarter, analytical results indicate that no constituents of concern were detected above statistical limit (SL) from Pit 1 detection monitoring wells. Preliminary results for well K1-09 indicated that barium was above the SL (51 µg/L), with a result of 59 µg/L; however; resamples, taken on December 8 (48 µg/L) and December 15, 2011 (46 µg/L) were below the SL and are therefore not considered statistical evidence of a release from Pit 1.

Although tritium is currently below SL in all detection monitoring wells, and has been during the past two quarters, tritium was detected above the SL in detection monitoring well K1-09 (SL=8.66 Bq/L, [234 pCi/L]) during the second quarter 2011 from a routine sample. As noted in the second quarterly report (**Table A-1**), the well was resampled twice. The first retest sample was below the SL, however, the second resample was slightly above the SL. As noted in the second quarterly report, LLNL does not believe this tritium data is indicative of a statistically significant evidence of a release of tritium from Pit 1, but rather has been attributed to an upgradient source near Pit 7 and the Building 850 area. Tritium activities in well K1-09 have remained below the SL for the past two quarters. In addition to tritium, radium 226 was detected with an unusual result in the upgradient well, K1-07. Because this well is upgradient from Pit 1, the well has no SL and is generally unaffected by Pit 1. However, data from this well will be evaluated over the next few quarters to determine if this was a valid result.

Perchlorate is also identified as a constituent of concern in the MRP and is monitored in samples from the detection monitoring wells (**Table A-2**). This quarter, perchlorate was detected in samples from two downgradient detection monitoring wells: K1-02B (6.0 µg/L, [SL=10 µg/L]) and W-PIT1-2326 (5.4 µg/L, [SL=7.8 µg/L]). The detections were above the reporting limit (4.0 µg/L) but were below the SLs for the wells.

The concentrations of selected volatile organic compounds (VOCs) detected in ground water samples from detection monitoring wells are summarized and presented as total VOCs (**Table A-2**). VOCs were detected in the ground water samples from downgradient well K1-05 (19 µg/L) and cross-gradient wells K1-08 (28 µg/L) and K1-09 (160 µg/L). The only VOC observed in these samples was freon-113. 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, concentrations have generally decreased from historic maxima, and in the past few years the concentrations appear to be relatively stable. However the value at K1-09 (160 µg/L) this quarter is unusually elevated and therefore will be resampled and reported in the first quarter 2012 report. It seems unlikely that this value represents conditions at this well and may be an analytical error. The highest value that was previously reported for Freon-113 was 150 µg/L in October 1996.

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 458.1. For this annual report, Freon-113 results for ground waste samples collected from monitoring wells K1-05, K1-08, and K1-09 are plotted on **Figure 4**.

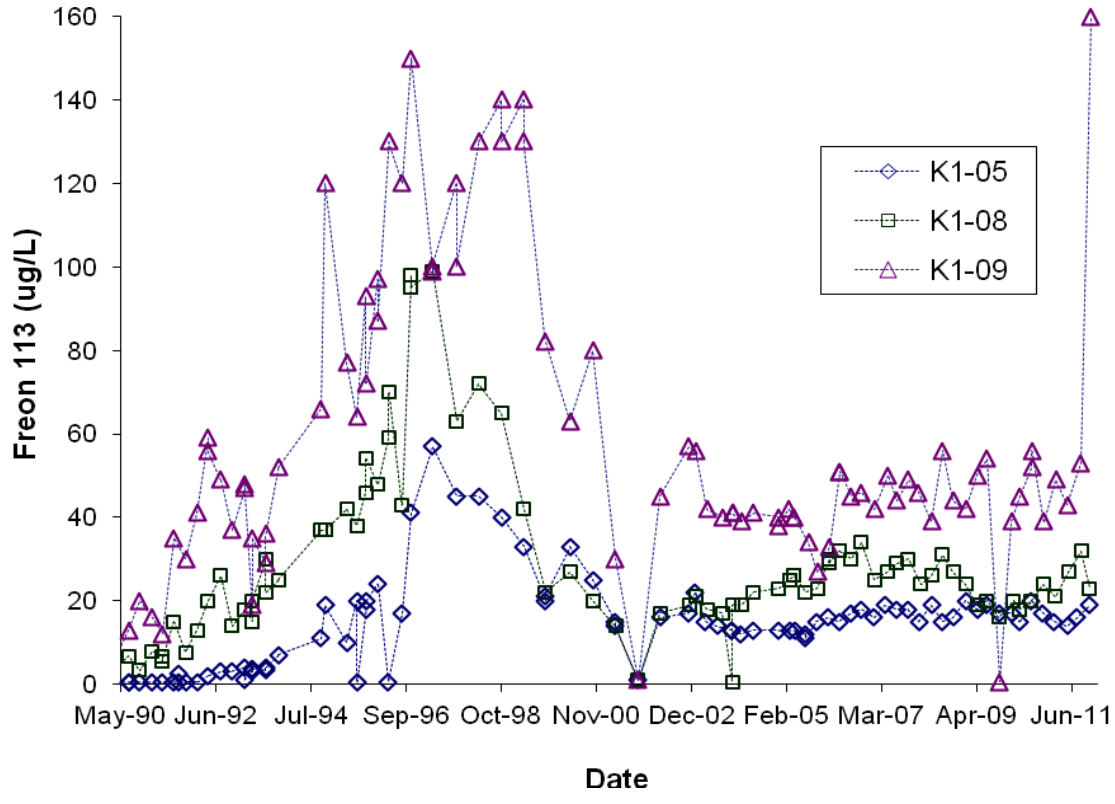

Figure 4. Freon-113 concentrations in water samples collected from detection ground water monitoring wells around Pit 1.

Evaluation Monitoring Wells

Evaluation monitoring wells are required by the MRP and sample analytical results from these wells are shown on **Table A-3**. The table lists physical parameters as well as the results of perchlorate and tritium analyses. These wells are used to track existing plumes of perchlorate and tritium from an upgradient source. As required by the MRP, annual trend analyses graphs for both percholorate and tritium evaluation monitoring wells are presented in this annual report.

The fourth quarter 2011 analytical results indicate that perchlorate concentrations in two of the four evaluation monitoring wells, K1-06 (5.2 µg/L) and W-PIT1-2620 (4.4 µg/L), exceeded the reporting limit of 4.0 µg/L, however, neither wells exceeded the 6.0 µg/L MCL for perchlorate. For this annual report, perchlorate results for ground waste samples collected from evaluation monitoring wells W-PIT1-02, W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620 are plotted on **Figure 5**.

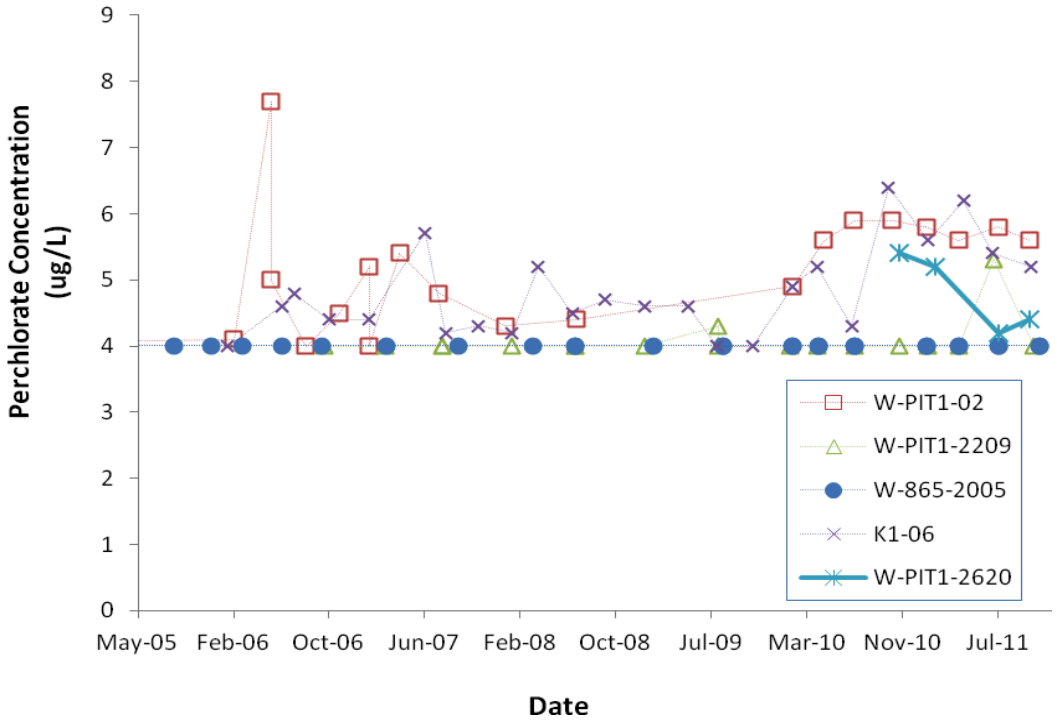

Figure 5. Perchlorate concentrations in water samples collected from detection ground water monitoring wells around Pit 1.

Tritium activities in samples from two of the four evaluation monitoring wells, K1-06 (115 Bq/L, [3108 pCi/L]) and W-PIT1-2620 (38.8 Bq/L [1048 pCi/L]) exceeded the detection limit of 3.7 Bq/L [100 pCi/L]. The tritium activities in wells K1-06 and WPIT1-2209 are similar to last quarter. For this annual report, tritium results for ground waste samples collected from evaluation monitoring wells W-PIT1-02, W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620 are plotted on **Figure 6**.

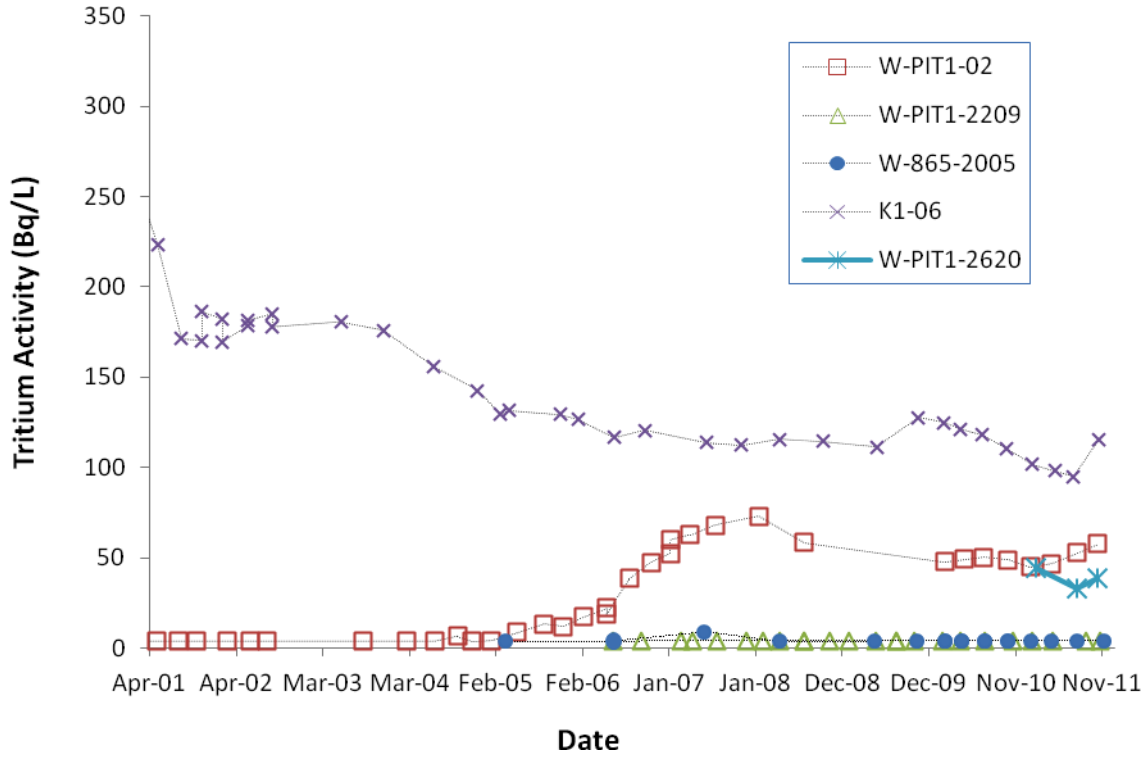

Figure 6. Tritium activities in water samples collected from detection ground water monitoring wells around Pit 1.

As reported last quarter, we officially replaced detection monitoring well W-PIT1-02 with W-PIT1-2620 because of the continued high pH value detected in well W-PIT1-02, apparently caused by cement grout in the screened casing of the well. The well has been replaced by W-PIT1-2620, which has been added to the Evaluation Monitoring Program as shown on **Figure 3**.

Inspection and Maintenance Summary

The routine fourth quarter visual inspection of the Pit 1 cap was performed on October 12, 2011 by LLNL staff and no deficiencies were noted. No discrepancies were noted and the pit cap and drainage structures continue to function properly.

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Acknowledgments

The compliance monitoring program for Pit 1 could not be conducted without the dedicated efforts of many people. Rosanne Depue provided essential administrative and editorial assistance. Don MacQueen provided detailed analytical information. Suzie Chamberlain provided detailed analytical information and performed quality reviews and data table preparation. Eric Walter coordinated the sampling activities. Mario Silva sampled the monitoring wells and packaged the samples for shipment. Della Burruss, Connie Wells, Beth Schad, Lisa Graves, and Becky Goodrich provided excellent data management support and ensured data quality. Off-site analytical support was provided by BC Laboratories, Inc., Eberline Lab, and Gel Laboratory. We thank John Scott, Karen Folks, and Dawn Chase at Site 300 for their cooperation in this effort. A draft of this report was reviewed by LLNL peers, including Suzie Chamberlain, Dawn Chase, and Leslie Ferry whose suggestions and improvements were incorporated.

Abbreviations and Acronyms

Bq	becquerel (international unit of radioactivity equal to 27 pCi)
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)
EFA	Environmental Functional Area (LLNL)
ERD	Environmental Restoration Department
FFA	Federal Facility Agreement
ft	foot (used as a measure of elevation above MSL)
HSU	Hydrostratigraphic Unit
km	kilometer
km^2	square kilometer
L	liter
LLNL	Lawrence Livermore National Laboratory
m	meter
m^2	square meter
MCL	maximum contaminant level (for drinking water)
mg	milligram
MRP	Monitoring and Reporting Plan
MSL	mean sea level (datum for elevation measurements)
µg	microgram
pCi	picocurie (unit of radioactivity equal to 0.037 Bq)
PCP	post-closure plan
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RL	reporting limit (contractual concentration near zero)
SI	*Système Internationale* (units of measurement)
Site 300	Experimental Test Site, LLNL
SL	statistically determined concentration limit
SOP	standard operating procedure
$Tnbs_0$	Neroly Formation basal sandstone
$Tnbs_1$	Neroly Formation lower blue sandstone
VOC	volatile organic compound
WDR	Waste Discharge Requirements (permit)

Appendix A

Tables and Figures of Ground Water Measurements

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2011.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Arsenic (µg/L)	K1-01C	—[a]	12	12	12	12
	K1-07	—[a]	13	13	13	13
	K1-02B	15	11	12	11	12
	K1-04	16	12	12	12	12
	K1-05	18	14	14	15	11
	K1-08	17	14	14	14	13
	K1-09	16	13	14	14	15
	W-PIT1-2326	14	12	12	11	12
Barium (µg/L)	K1-01C	–	<25	25	<25	<25
	K1-07	–	29	30	27	29
	K1-02B	26	25	<25	<25	25
	K1-04	32	27	28	28	29
	K1-05	43	39	37	37	38
	K1-08	49	42	40	43	44
	K1-09	51	45	45	46	59, 48, 46
	W-PIT1-2326	46	35	36	34	34
Beryllium (µg/L)	K1-01C	–	<0.5	<0.2	<0.5	<0.5
	K1-07	–	<0.5	<0.2	<0.5	<0.5
	K1-02B	0.5	<0.5	<0.5	<0.5	<0.5
	K1-04	0.5	<0.8	<0.5	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.2	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	0.5	<0.5	<0.2	<0.5	<0.5
Cadmium (µg/L)	K1-01C	–	<0.5	<0.5	<0.5	<0.5
	K1-07	–	<0.5	<0.5	<0.5	<0.5
	K1-02B	0.52	<0.5	<0.5	<0.5	<0.5
	K1-04	0.5	<1	<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	<0.5
Cobalt (µg/L)	K1-01C	–	<25	<25	<25	<25
	K1-07	–	<25	<25	<25	<25
	K1-02B	25	<25	<25	<25	<25
	K1-04	25	<1	<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	<25

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2011.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Copper (µg/L)	K1-01C	–	<10	<10	<10	<10
	K1-07	–	<10	<10	<10	<10
	K1-02B	60	12	31	10	<10
	K1-04	10	<10	<10	<10	<10
	K1-05	30	<10	<10	<10	<10
	K1-08	10	<10	<10	<10	<10
	K1-09	10	<10	<10	<10	<10
	W-PIT1-2326	10	<10	<10	<10	<10
Lead (µg/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	<2
Nickel (µg/L)	K1-01C	–	<5	<5	<5	<5
	K1-07	–	<5	<5	<5	<5
	K1-02B	9	<5	<5	<5	<5
	K1-04	5	2.4	<5	<5	<5
	K1-05	13	<5	<5	<5	<5
	K1-08	5	<5	<5	<5	<5
	K1-09	5	<5	<5	<5	<5
	W-PIT1-2326	5	<5	<5	<5	<5
Vanadium (µg/L)	K1-01C	–	67	64	66	67
	K1-07	–	65	68	63	63
	K1-02B	59	47	50	48	46
	K1-04	46	32	34	37	32
	K1-05	79	59	66	68	57
	K1-08	78	60	66	62	58
	K1-09	69	57	58	58	59
	W-PIT1-2326	63	48	49	49	48
Zinc (µg/L)	K1-01C	–	<20	<20	<20	<20
	K1-07	–	<20	<20	<20	<20
	K1-02B	98	<20	31	<20	<20
	K1-04	51	3.9	<20	<20	<20
	K1-05	24	<20	<20	<20	<20
	K1-08	20	<20	<20	<20	<20
	K1-09	20	<20	<20	<20	<20
	W-PIT1-2326	48	<20	<20	<20	<20

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2011.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Radium 226 (Bq/L)[(b)]	K1-01C	–	0.004	0.01	0.004	0.006
	K1-07	–	0.008	0.005	0.004	0.025
	K1-02B	0.012	0.005	0.003	0.005	0
	K1-04	0.012	0.006	0.008	0.005	0.007
	K1-05	0.012	0.004	0.003	0.002	0.004
	K1-08	0.009	0.003	0.006	0.005	0.002
	K1-09	0.012	0.01	0.004	0.008	0.01
	W-PIT1-2326	0.019	0.002	0.01	0.008	0.004
Tritium (Bq/L)	K1-01C	–	28.6	27.1	31.3	31.7
	K1-07	–	1.7	2.73	0.803	2.78
	K1-02B	158	139	130	127	125
	K1-04	19.2	17.6	14.4	16.9	15.8
	K1-05	11.4	6.07	5.81	6.36	9.32
	K1-08	10.7	6.88	7.73	5.48	9.58
	K1-09	8.66	6.73	8.70, 5.55, 9.88	7.51	6.22
	W-PIT1-2326	133	101	105	96.2	108
Uranium (total, Bq/L	K1-01C	–	0.139	0.162	0.135	0.142
	K1-07	–	0.115	0.1	0.11	0.13
	K1-02B	0.145	0.128, 0.128	0.160, 0.149, 0.167	0.165	0.143
	K1-04	0.085	0.071, 0.067	0.087, 0.072, 0.074	0.075	0.071
	K1-05	0.115	0.112	0.115	0.105	0.104
	K1-08	0.149	0.114	0.11	0.109	0.087
	K1-09	0.137	0.117	0.114	0.124	0.122
	W-PIT1-2326	0.115	0.119	0.119	0.12	0.1
Thorium 228 (Bq/L)	K1-01C	–	0	0	0	0.001
	K1-07	–	0.001	0.001	0	0
	K1-02B	0.003	0	0	0	0.001
	K1-04	0.005	-0.001	-0.001	0.001	0
	K1-05	0.003	0	0	0	0
	K1-08	0.004	-0.001	-0.001	0	0
	K1-09	0.008	0	0.001	0	0.002
	W-PIT1-2326	0.005	-0.001	0	0	0.001
Thorium 232 (Bq/L)	K1-01C	–	0	0	0.001	0
	K1-07	–	0	0	0	0
	K1-02B	0.004	0	0	0	0
	K1-04	0.001	0	0	0	0
	K1-05	0.004	0.001	0	0	0
	K1-08	0.004	0.001	0	0	0.001
	K1-09	0.002	0	0	0	0
	W-PIT1-2326	0.001	0	0	0	0

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2011.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
HMX (µg/L)	K1-01C	–	<1	<0.77	<1	<1
	K1-07	–	<1	<0.8	<0.83	<1
	K1-02B	1	<1.3	<1	<0.89	<0.99
	K1-04	1	<0.77	<1	<1	<1
	K1-05	1	<0.87	<1	<1.3	<1
	K1-08	1	<1	<0.68	<1	<1
	K1-09	1	<1	<1	<0.69	<0.81
	W-PIT1-2326	1	<1	<1	<1	<0.83
RDX (µg/L)	K1-01C	–	<1	<0.77	<1	<1
	K1-07	–	<1	<0.8	<0.83	<1
	K1-02B	1	<1.3	<1	<0.89	<0.99
	K1-04	1	<0.77	<1	<1	<1
	K1-05	1	<0.87	<1	<1.3	<1
	K1-08	1	<1	<0.68	<1	<1
	K1-09	1	<1	<1	<0.69	<0.81
	W-PIT1-2326	1	<1	<1	<1	<0.83
Perchlorate (µg/L)	K1-01C	–	<4	<4	<4	<4
	K1-07	–	<4	<4	<4	<4
	K1-02B	10	6.6	6.2	6.4	6
	K1-04	4	<4	<4	<4	<4
	K1-05	4	<4	<4	<4	<4
	K1-08	4	<4	<4	<4	<4
	K1-09	4	<4	<4	<4	<4
	W-PIT1-2326	7.8	5.5	6.6	5.7	5.4

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

[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 measured less than 0.0005 Bq/L.

Table A-2. Pit 1 additional PCP constituents for the fourth quarter 2011 analytical results for detection monitoring wells.

	Monitoring Well									
	K1-01C	**K1-07**	**K1-02B**	**K1-04**	**K1-05**	**K1-08**	**K1-09**	**K1-09**	**K1-09**	**W-PIT1-2326**
Date Sampled	21-Nov	25-Oct	15-Nov	25-Oct	25-Oct	25-Oct	1-Nov	8-Dec	15-Dec	14-Nov
Depth to water (ft)	108.12	141.74	138.83	157.16	171.81	156.7	161.97	162.02	162.1	179.73
Ground water elevation (ft)	973.82	967.89	968.4	965.51	959.05	966.04	964.71	964.66	964.58	968.06
Field pH (Units)	7.24	7.89	8.11	7.29	7.72	7.9	7.98	7.22	7.13	7.91
Field Specific Conductance (µmhos/cm)	706	610	721	614	6343	646	661	652	660	728
Field Temperature (Degrees C)	19.6	21.3	21.1	21.1	22.1	22.4	21.4	20.5	20.1	21
Gross alpha (Bq/L)	0.249	0.104	0.135	0.102	0.089	0.12	0.141	–	–	0.096
Gross beta (Bq/L)	0.11	0.135	0.134	0.136	0.138	0.101	0.097	–	–	0.098
Nitrate (as NO3) (mg/L)	35	30	33	30	35	33	33	–	–	32
Perchlorate (µg/L)	<4	<4	6	<4	<4	<4	<4	–	–	5.4
Total VOCs (calculated) (µg/L)	ND	ND	ND	ND	19	23	160	–	–	<1,000
Freon 113 (µg/L)	<0.5	<0.5	<0.5	<0.5	19	23	160	–	–	<0.5

Notes:
ND = Not detected above reporting limit. Reporting limits vary with individual VOCs.
(-) Analysis not required.

Table A-3. Pit 1 evaluation monitoring wells, constituents of concern, physical parameters, and analytical results for the fourth quarter, 2011.

	Monitoring Well			
	K1-06	**W-PIT1-2620**	**W-PIT1-2209**	**W-865-2005**
Date Sampled	18-Oct	17-Oct	26-Oct	10-Nov
Depth to water (ft)	116.05	230.9	215.8	327.15
Ground water elevation (ft)	973.49	*	950.25	947.72
Tritium (Bq/L)	115	38.8	2.12	-0.884
Field pH (Units)	7.81	6.76	7.78	6.23
Field Specific Conductance (µmhos/cm)	740	706	613	598
Field Temperature (Degrees C)	24.6	22.4	21.2	20.4
Perchlorate (µg/L)	5.2	4.4	<4	<4

* Surface completion in progress. No ground water elevation available.

Table A-4. Pit 1 ground water well routine sampling dates.

Location	Quarter	Sample Date
K1-01C	1	26-Jan-2011
	2	11-May-2011
	3	18-Aug-2011
	4	21-Nov-2011
K1-02B	1	11-Jan-2011
	2	26-Apr-2011
	3	18-Aug-2011
	4	15-Nov-2011
K1-04	1	5-Jan-2011
	2	28-Apr-2011
	3	19-Jul-2011
	4	25-Oct-2011
K1-05	1	11-Jan-2011
	2	26-Apr-2011
	3	11-Jul-2011
	4	25-Oct-2011
K1-07	1	19-Jan-2011
	2	10-May-2011
	3	13-Jul-2011
	4	25-Oct-2011
K1-08	1	20-Jan-2011
	2	9-May-2011
	3	17-Aug-2011
	4	25-Oct-2011
K1-09	1	24-Jan-2011
	2	28-Apr-2011
	3	15-Aug-2011
	4	1-Nov-2011
W-PIT1-2326	1	25-Jan-2011
	2	12-May-2011
	3	18-Aug-2011
	4	14-Nov-2011
K1-06	1	24-Jan-2011
	2	26-Apr-2011
	3	11-Jul-2011
	4	18-Oct-2011
W-PIT1-2209	1	24-Jan-2011
	2	14-Apr-2011
	3	14-Jul-2011
	4	26-Oct-2011
W-PIT1-02	1	18-Jan-2011
	2	13-Apr-2011
	3	*
	4	*
W-865-2005	1	18-Jan-2011
	2	14-Apr-2011
	3	25-Jul-2011
	4	10-Nov-2011
W-PIT1-2620	1	*
	2	*
	3	25-Jul-2011
	4	17-Oct-2011

* W-PIT1-02 replaced by W-PIT1-2620 in 3rd Quarter 2011.

Table A-5. Pit 1 VOC Reporting Limits (µg/L).

VOC/Location	K1-04	K1-05	K1-07	K1-02B	K1-09	K1-08	K1-01C	W-PIT1-2326
Acetonitrile	100	100	100	100	100	100	100	100
Acetone	10	10	10	10	10	10	10	10
Acrolein	50	50	50	50	50	50	50	50
Acrylonitrile	50	50	50	50	50	50	50	50
Benzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bromodichloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bromoform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bromomethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Butanone	10	10	10	10	10	10	10	10
Carbon disulfide	5	5	5	5	5	5	5	5
Carbon tetrachloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chlorobenzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Chloro-1,3-butadiene	5	5	5	5	5	5	5	5
Chloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Chloroethylvinylether	10	10	10	10	10	10	10	10
Chloroform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dibromo-3-chloropropane	1	1	1	1	1	1	1	1
Dibromochloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,4-Dichloro-2-butene	5	5	5	5	5	5	5	5
Dichlorodifluoromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1-Dichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
cis-1,2-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
trans-1,2-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dichloroethene (total)	1	1	1	1	1	1	1	1
1,2-Dichloropropane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
cis-1,3-Dichloropropene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
trans-1,3-Dichloropropene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,4-Dioxane	100	100	100	100	100	100	100	100
Ethanol	1000	1000	1000	1000	1000	1000	1000	1000
Ethylbenzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Freon 113	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Hexanone	10	10	10	10	10	10	10	10
4-Methyl-2-pentanone	10	10	10	10	10	10	10	10
Methylene chloride	1	1	1	1	1	1	1	1
Styrene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,1,2-Tetrachloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,2,2-Tetrachloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tetrachloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Trichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Toluene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,1-Trichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,2-Trichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Trichlorofluoromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Vinyl acetate	20	20	20	20	20	20	20	20
Vinyl chloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total xylene isomers	1	1	1	1	1	1	1	1

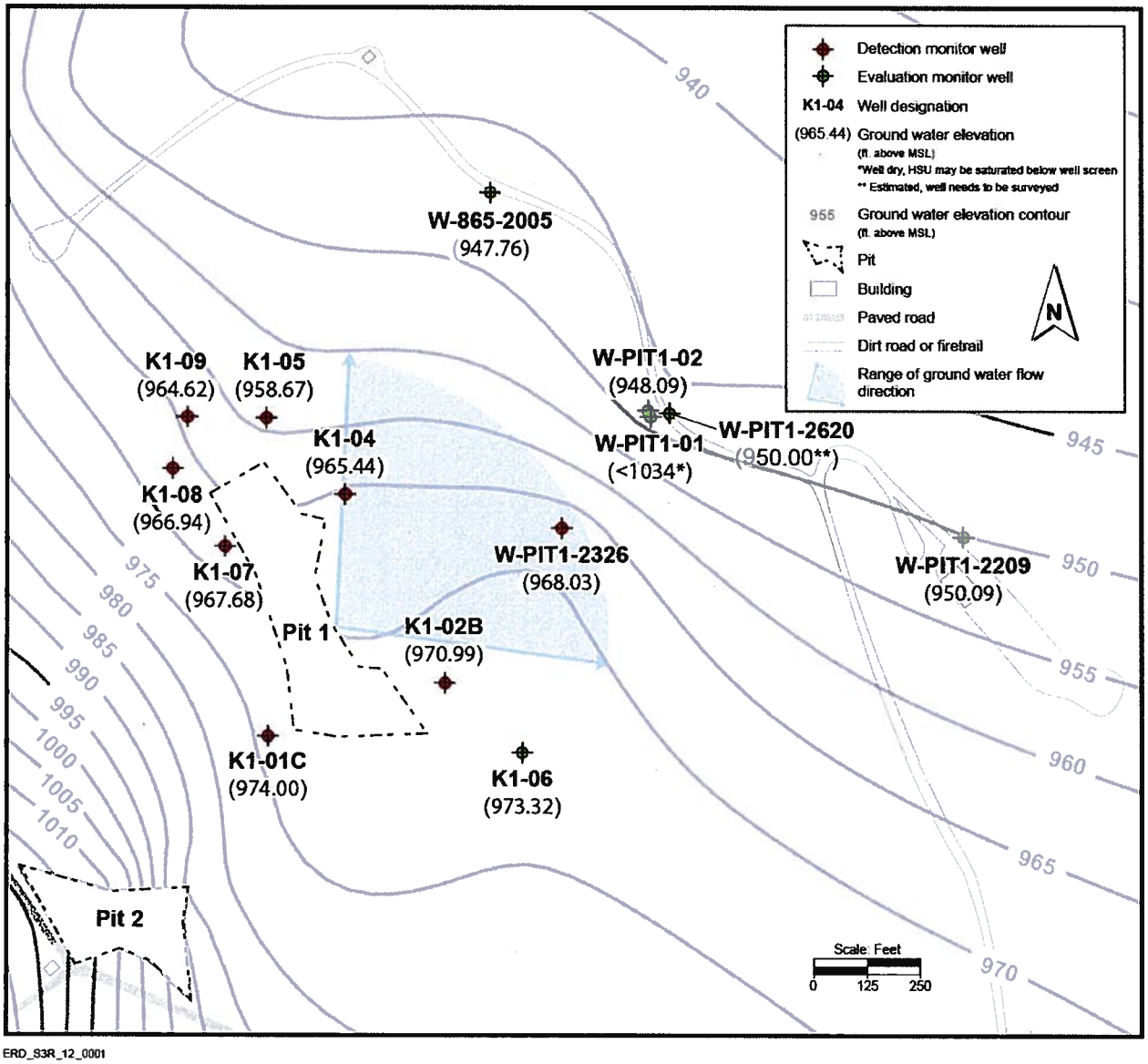


Figure A-1. Ground water elevation contour map for the $Tnbs_1/Tnbs_0$ HSU at Pit 1.

Appendix B

Statistical Methods for Release Detection

Appendix B

Statistical Methods for Release Detection

Statistical monitoring of the RCRA closure and PCP for the Pit 1 landfill is described in the Revised MRP No. 93-100 (February 18, 2010) to satisfy the provisions of CCR Title 23, Chapter 15, Section 2550.7.

LLNL uses an intrawell comparison for each analyte at each down-gradient and cross-gradient well to detect potential releases of constituents of concern to ground water. Intrawell tests compare each measurement at a well to past measurements at that well in order to detect increases in concentration that statistically exceed the variation historically seen at that well.

Where sufficient detections are available, LLNL uses a statistical prediction limit method to implement intrawell comparisons. The method uses the average and standard deviation of historical measurements to calculate a SL value. The SL is calculated so that it will be exceeded by approximately one percent of individual measurements when there has not been a release. When too few detections are available, either the analytical reporting limit or maximum recent detection is used as an SL. The SLs currently in use are documented in the MRP.

Each quarter, each measurement is compared with its associated SL. The SL comparison is augmented by a verification procedure containing two discreet retests, in accordance with CCR Title 23, Chapter 15, Section 2550.7. This protects against false positives due to other causes, such as analytical error in the laboratory. Retests are used when the original measurement exceeds the SL. If either or both of the retests also exceed the SL, the result is considered to be a "statistically significant evidence of a release."

Based on the MRP, monitoring is conducted to evaluate SL detections for all constituents of concern in **Table A-1** detection monitoring wells. In addition, sampling is performed to evaluate whether tritium and perchlorate results for ground water samples collected from evaluation monitoring wells near Pit 1 indicate a release from Pit 1 or another source.

A change of the SL for total uranium at well W-PIT1-2326 was sent to the CVRWQCB in a letter request on June 13, 2011 because the total uranium values at the well had been elevated for several quarters. However, the value was below the closed upgradient well. LLNL has not received a response from the CVRWQCB and is still operating under the old SL. In 2011, the SL was slightly elevated during the first, second, and third quarters. The fourth quarter sampling showed results below the SL for this well. LLNL has previously communicated with the CVRWQCB in past letters and quarterly reports that we do not believe that the total uranium activities in this monitoring well represent statistical evidence of a release from Pit 1. LLNL's conclusion is based on samples collected from upgradient wells, as well as the natural uranium-235/238 ratio at the well.

Appendix C

Quality Assurance Samples

Table C-1. Pit 1 quality assurance for routine, duplicate, and field blank samples for the fourth quarter 2011.

Constituent*	K1-01C Routine (Nov 21)	K1-01C Duplicate (Nov 21)	PIT1FB Field blank (Nov 15)	Units
Arsenic	12	12	<2	µg/L
Barium	<25	<25	<25	µg/L
Beryllium	<0.5	<0.5	<0.5	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	67	66	<25	µg/L
Zinc	<20	<20	<20	µg/L
Nitrate (as NO3)	35	33	<0.5	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	0.012 ± 0.006	0.000 ± 0.004	Bq/L
Tritium	31.7 ± 7.58	28.5 ± 6.99	7.51 ± 4.00	Bq/L
Uranium (total)	0.142 ± 0.018	0.134 ± 0.018	-0.001 ± 0.002	Bq/L
Thorium 228	0.001 ± 0.002	-0.001 ± 0.001	0.002 ± 0.003	Bq/L
Thorium 232	0.000 ± 0.001	0.000 ± 0.001	0.001 ± 0.001	Bq/L
Gross alpha	0.249 ± 0.108	0.194 ± 0.092	0.006 ± 0.022	Bq/L
Gross beta	0.110 ± 0.046	0.130 ± 0.052	0.037 ± 0.061	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.

* As standard QA protocol, trip blanks were submitted with all samples in Table C-1. This quarter, all trip blank analyses were non-detects.

Appendix D

Constituents of Concern and Monitoring Frequencies

Table D-1. Pit 1 constituents of concern and monitoring frequencies.[a]

Constituent	WDR[b]	PCP[c]	Pit 1
Arsenic	X		Q
Barium	X		Q
Beryllium	X		Q
Cadmium	X		Q
Chloride		X	A
Chromium		X	SA
Cobalt	X		Q
Copper	X		Q
Iron		X	SA
Lead	X		Q
Manganese		X	SA
Mercury		X	SA
Nickel	X		Q
Nitrate		X	SA
Selenium		X	SA
Silver		X	SA
Sodium		X	SA
Sulfate		X	A
Vanadium	X		Q
Zinc	X		Q
Total organic carbon (TOC)		X	A
Total organic halides (TOX)		X	A
EPA Method 601		X	
EPA Method 624		X	A
EPA Method 625		X	A
EPA Method 608		X	A
Gross alpha and gross beta		X	SA
Radium 226	X		Q
Thorium 228	X		Q
Thorium 232	X		Q
Tritium	X		Q
Perchlorate	X		Q
Uranium (total)	X		Q
HMX	X		Q
RDX	X		Q
Ground water elevation		X	SA
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 (CVRWQCB, 2010).

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

Appendix E

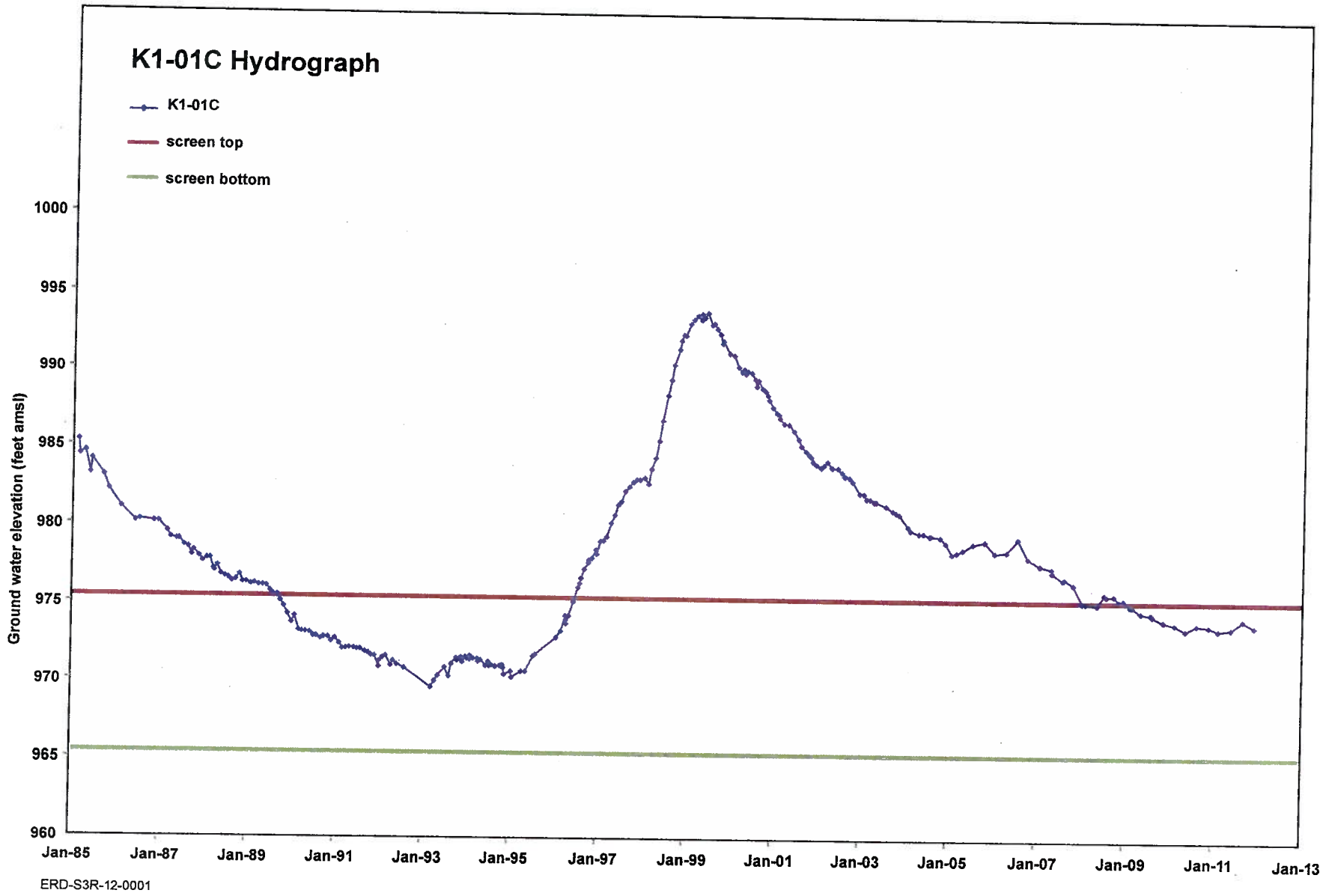
Well Specification and Construction Details for Detection Monitoring and Evaluation Monitoring Wells

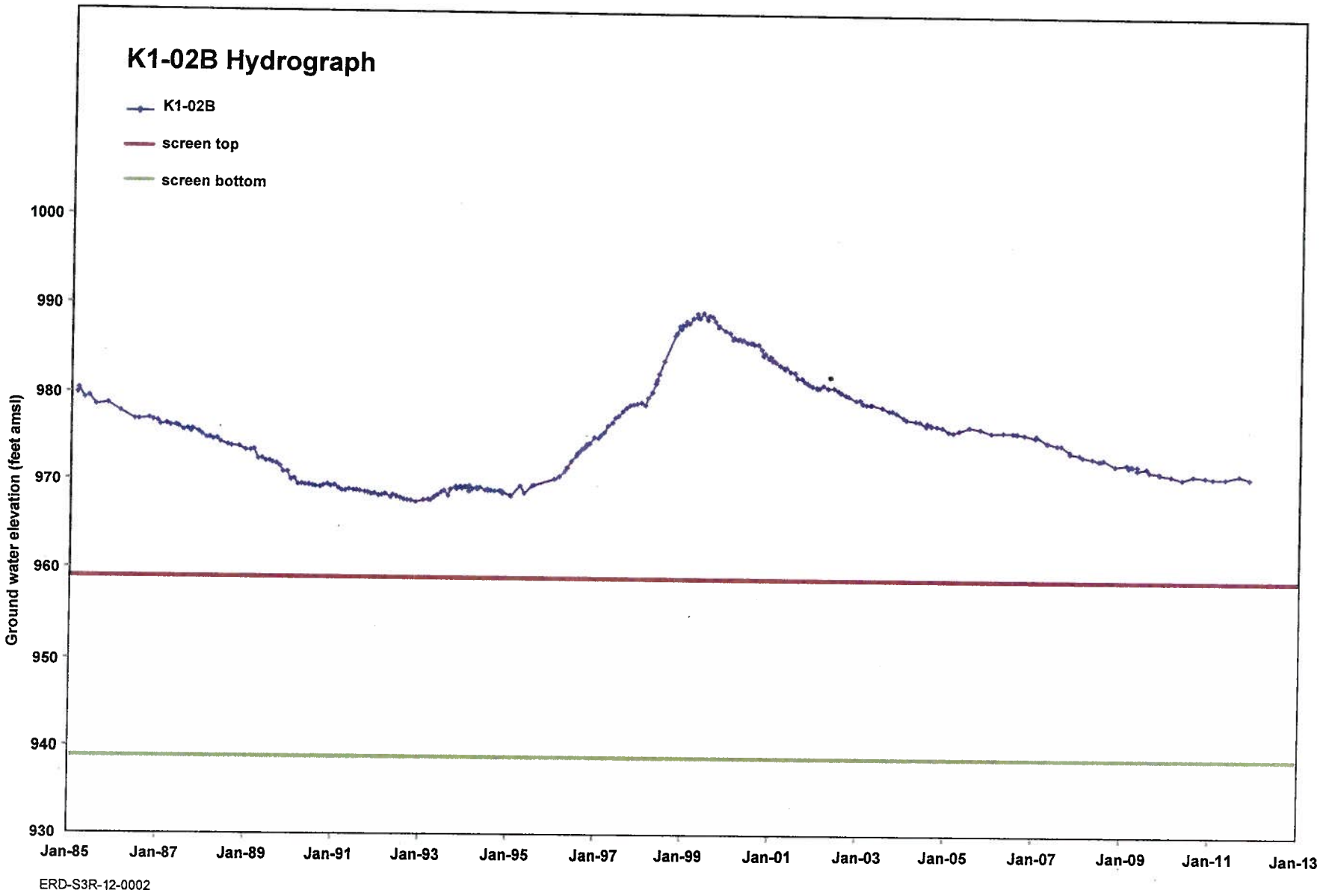
Table E-1. Well specification and construction details of the Pit 1 monitoring network.

Well	HSU	Northing	Easting	Ground Surface Evaluation	Reference Evaluation	Elevation of Screen Top	Elevation of Screen Bottom	Elevation of Bentonite Top	Elevation of Bentonite Bottom	Elevation of Filter Pack Top	Elevation of Filter Pack Bottom	Elevation of Casing Bottom
K1-01C	$Tnbs_1/Tnbs_0$	427774.28	1699062.3	1078.92	1081.94	975.42	965.42	998.92	986.92	986.92	955.92	965.42
K1-02B	$Tnbs_1/Tnbs_0$	427893.78	1699452.58	1105.23	1107.23	958.73	938.73	985.23	982.13	982.13	932.73	938.73
K1-04	$Tnbs_1/Tnbs_0$	428315.51	1699231.7	1120	1122.67	937	920	978	968	968	919	919
K1-05	$Tnbs_1/Tnbs_0$	428485.47	1699057.58	1128.86	1130.86	965.86	944.86	None	None	972.86	941.86	944.86
K1-06	$Tnbs_1/Tnbs_0$	427736.68	1699627.38	1087.54	1089.54	982.54	972.54	None	None	995.54	971.54	972.54
K1-07	$Tnbs_1/Tnbs_0$	428199.97	1698965.54	1106.63	1109.63	978.63	958.63	985.63	983.93	983.93	956.63	956.63
K1-08	$Tnbs_1/Tnbs_0$	428373.1	1698848.94	1120.72	1122.74	979.72	954.72	991.22	985.72	985.72	952.72	952.72
K1-09	$Tnbs_1/Tnbs_0$	428488.09	1698880.26	1124.68	1126.68	969.68	934.68	978.18	975.68	975.68	932.68	932.68
W-865-2005	$Tnbs_1/Tnbs_0$	428990.64	1699555.36	1272.87	1274.87	942.87	922.87	954.87	950.87	950.87	919.87	921.87
W-PIT1-02	$Tnbs_1/Tnbs_0$	428494.39	1699912.16	1179.3	1181.3	929.3	919.3	942.3	934.3	934.3	911.3	918.3
W-PIT1-2209	$Tnbs_1/Tnbs_0$	428221.94	1700615.69	1164.05	1166.05	919.05	899.05	939.05	929.05	929.05	896.05	898.05
W-PIT1-2326	$Tnbs_1/Tnbs_0$	428240.21	1699717.26	1145.79	1147.79	930.79	911.09	960.79	949.79	949.79	905.79	910.67

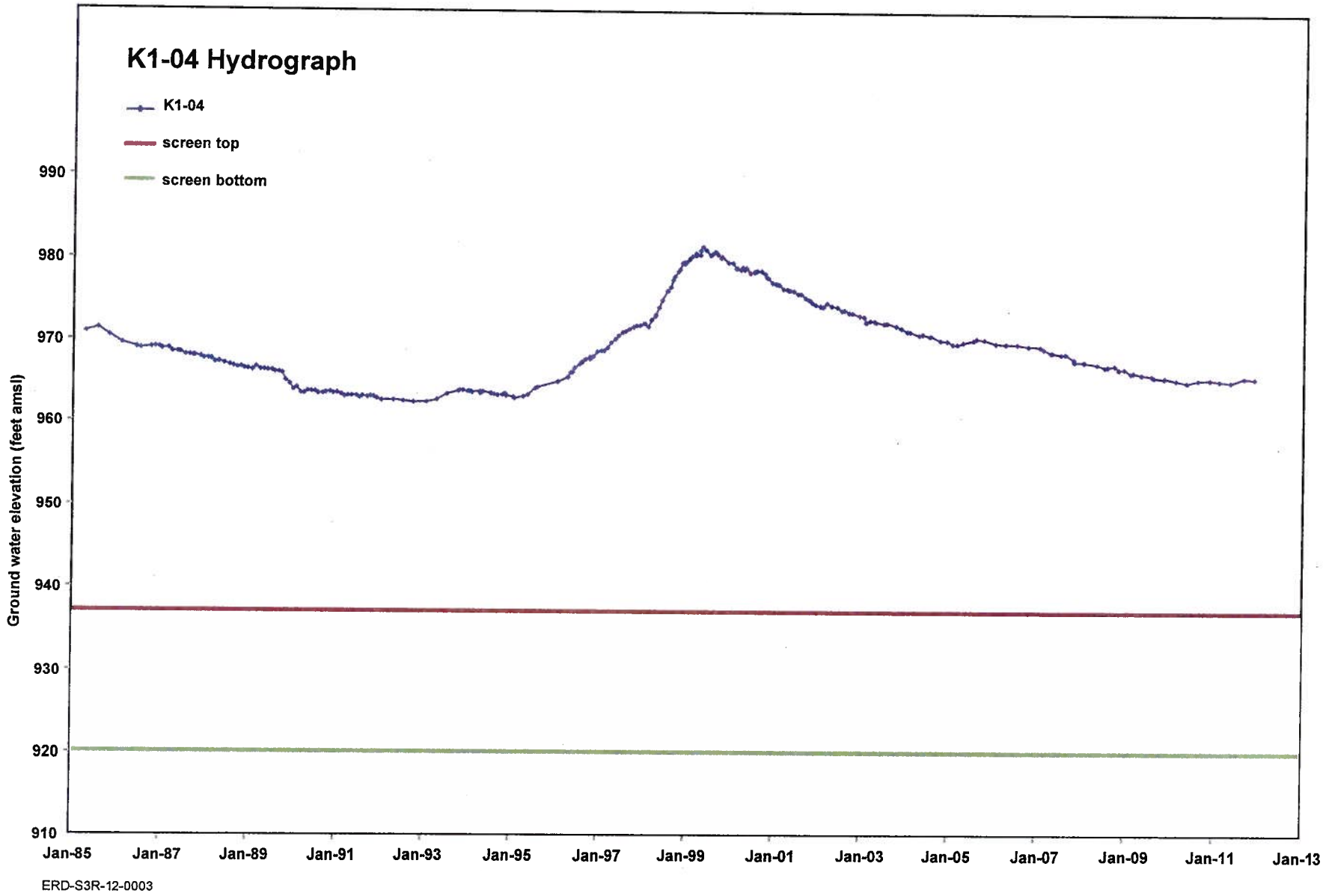
Appendix F

Hydrographs for All Compliance Monitoring Wells

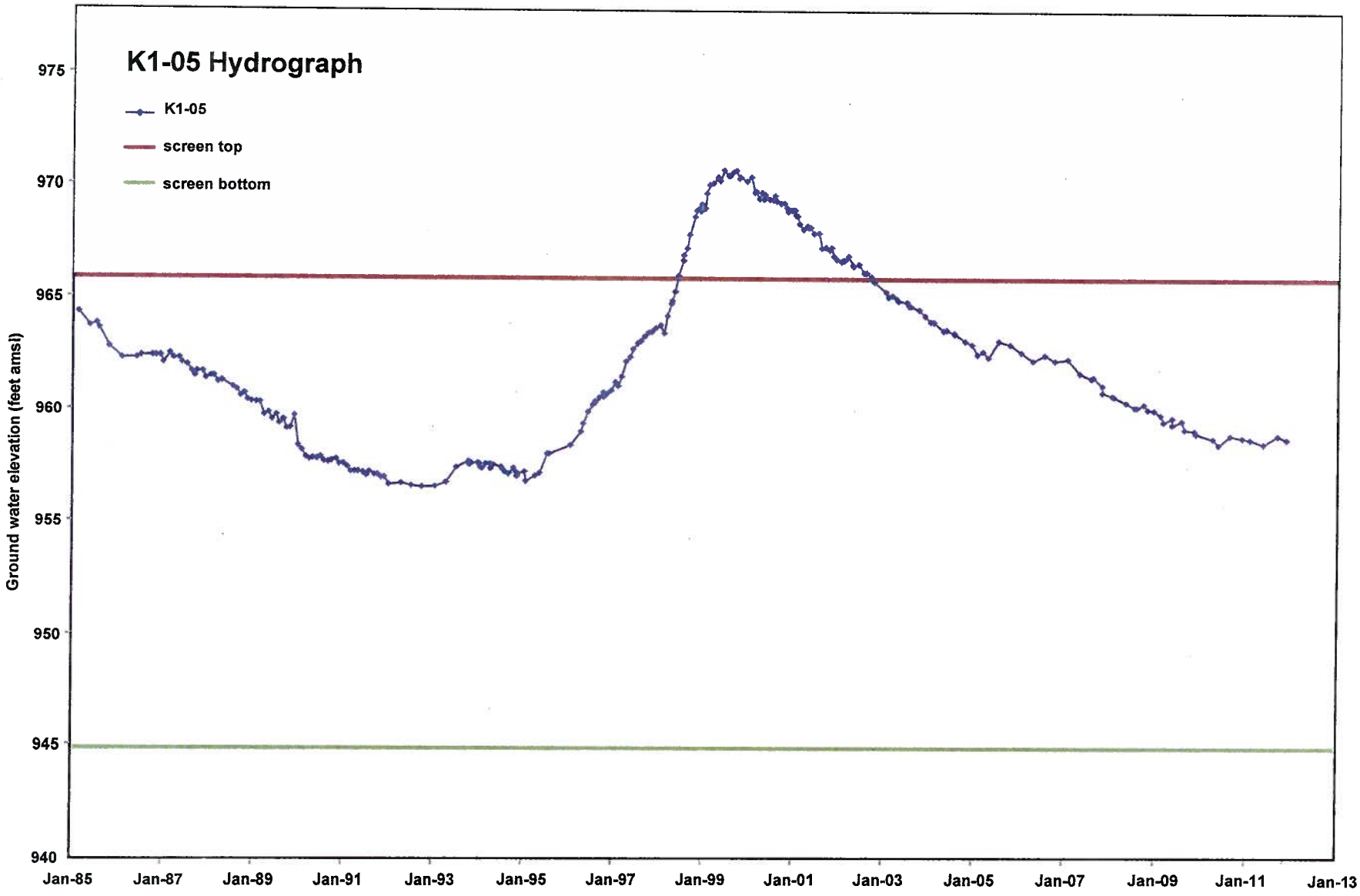

K1-01C Hydrograph
K1-01C
screen top
screen bottom
Ground water elevation (feet amsl)
1000
995
990
985
980
975
970
965
960
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-12-0001



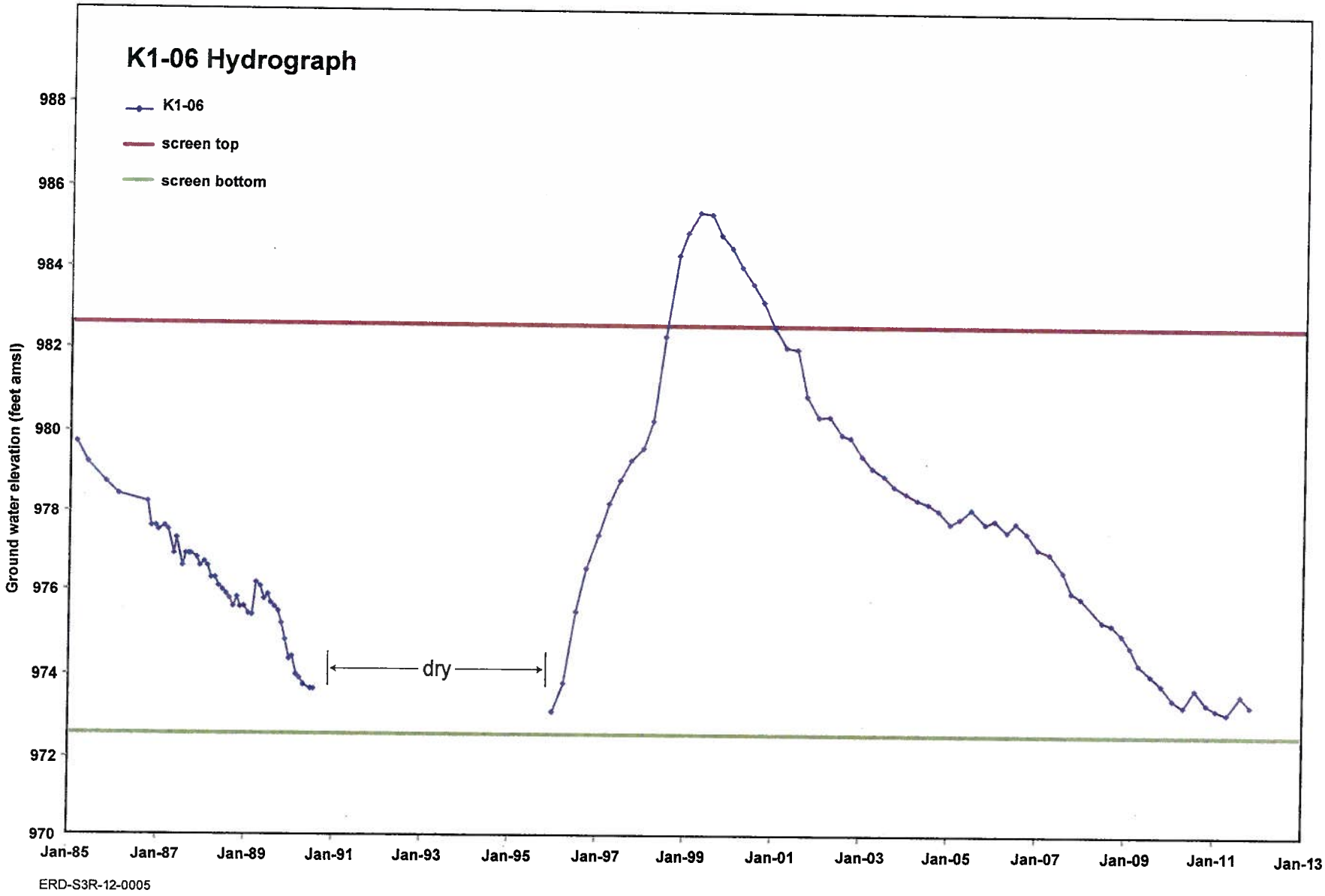
ERD-S3R-12-0002

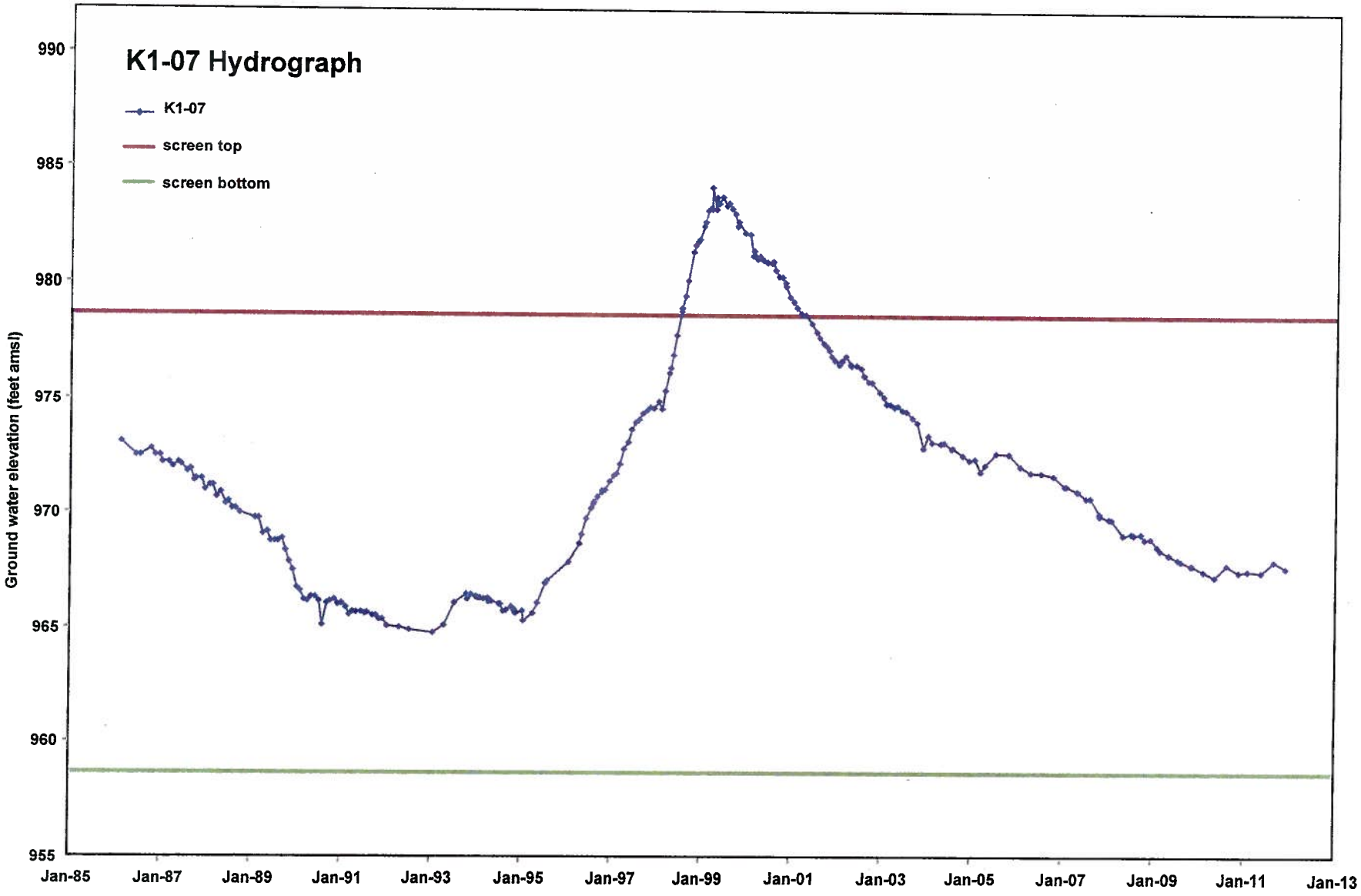


ERD-S3R-12-0003

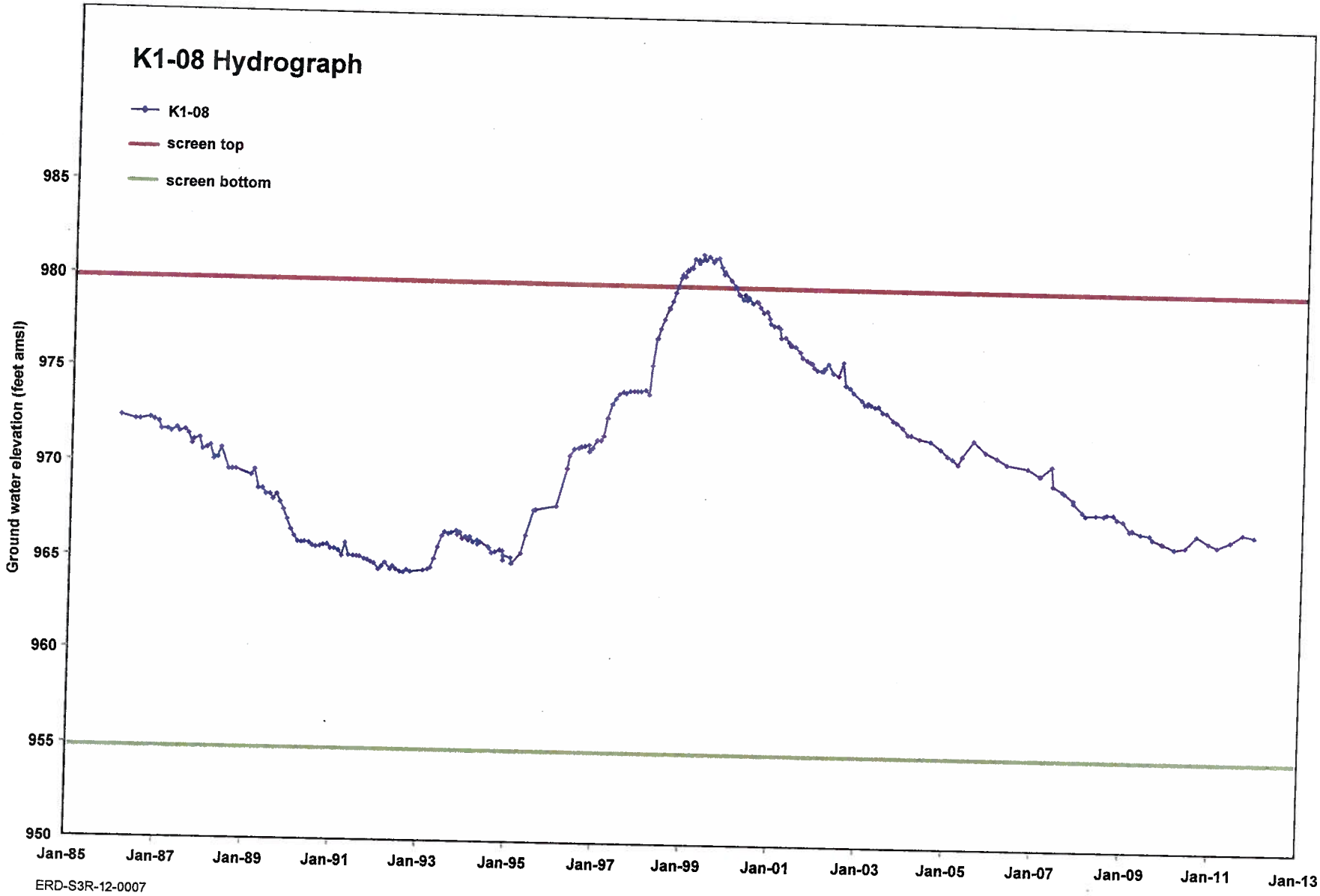


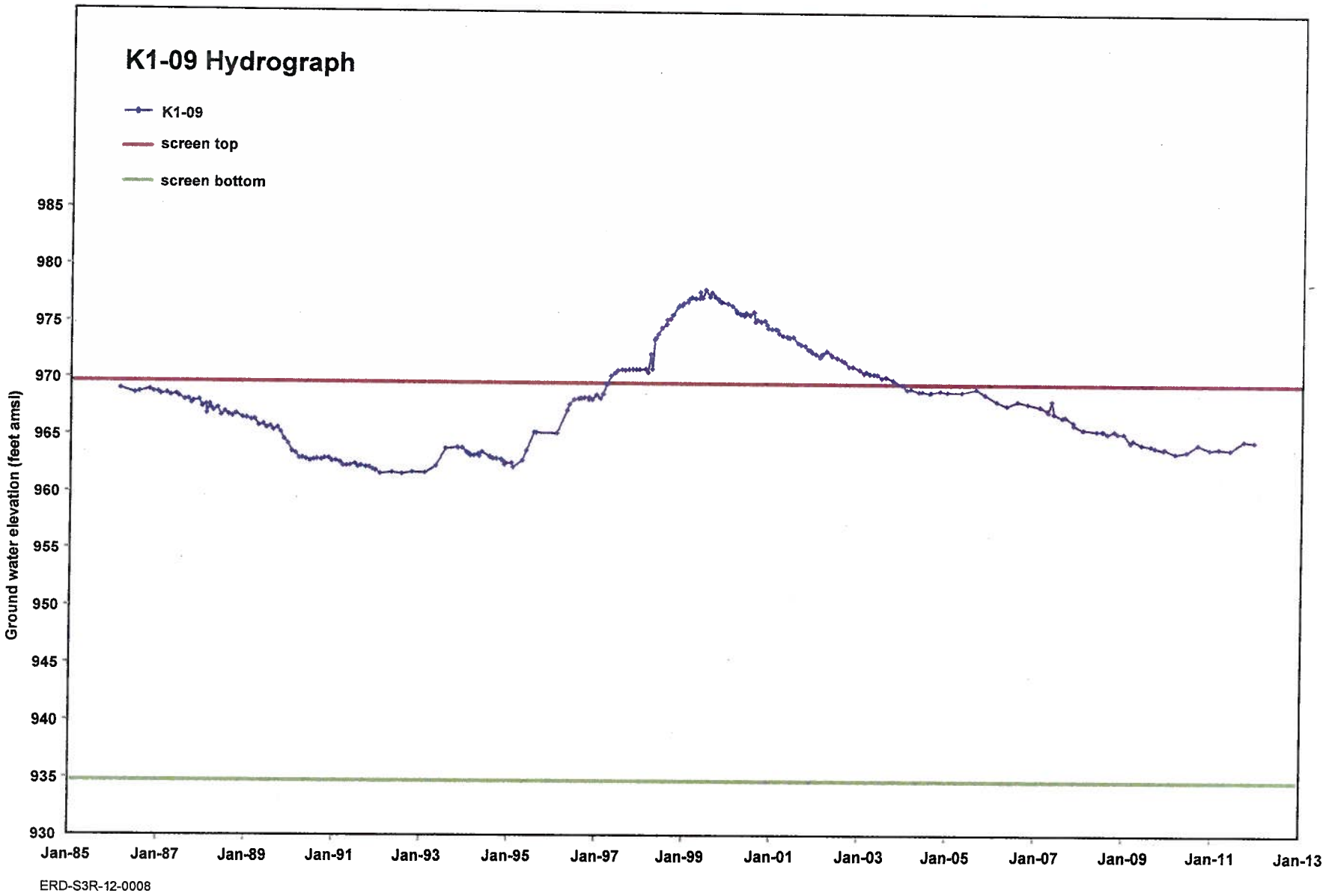
ERD-S3R-12-0004


K1-06 Hydrograph
K1-06
screen top
screen bottom
Ground water elevation (feet amsl)
988
986
984
982
980
978
976
974
972
970
dry
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-12-0005

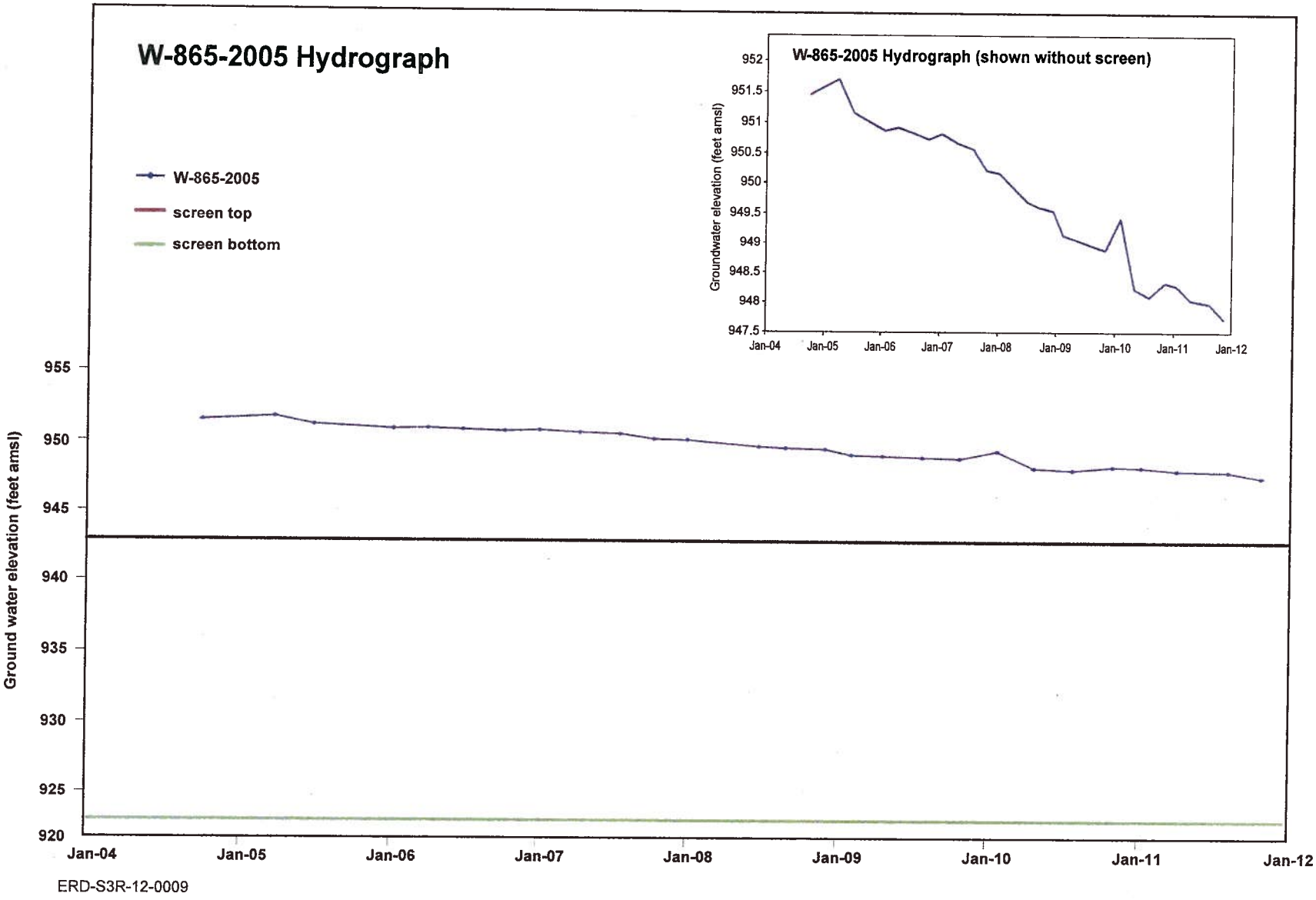


ERD-S3R-12-0006

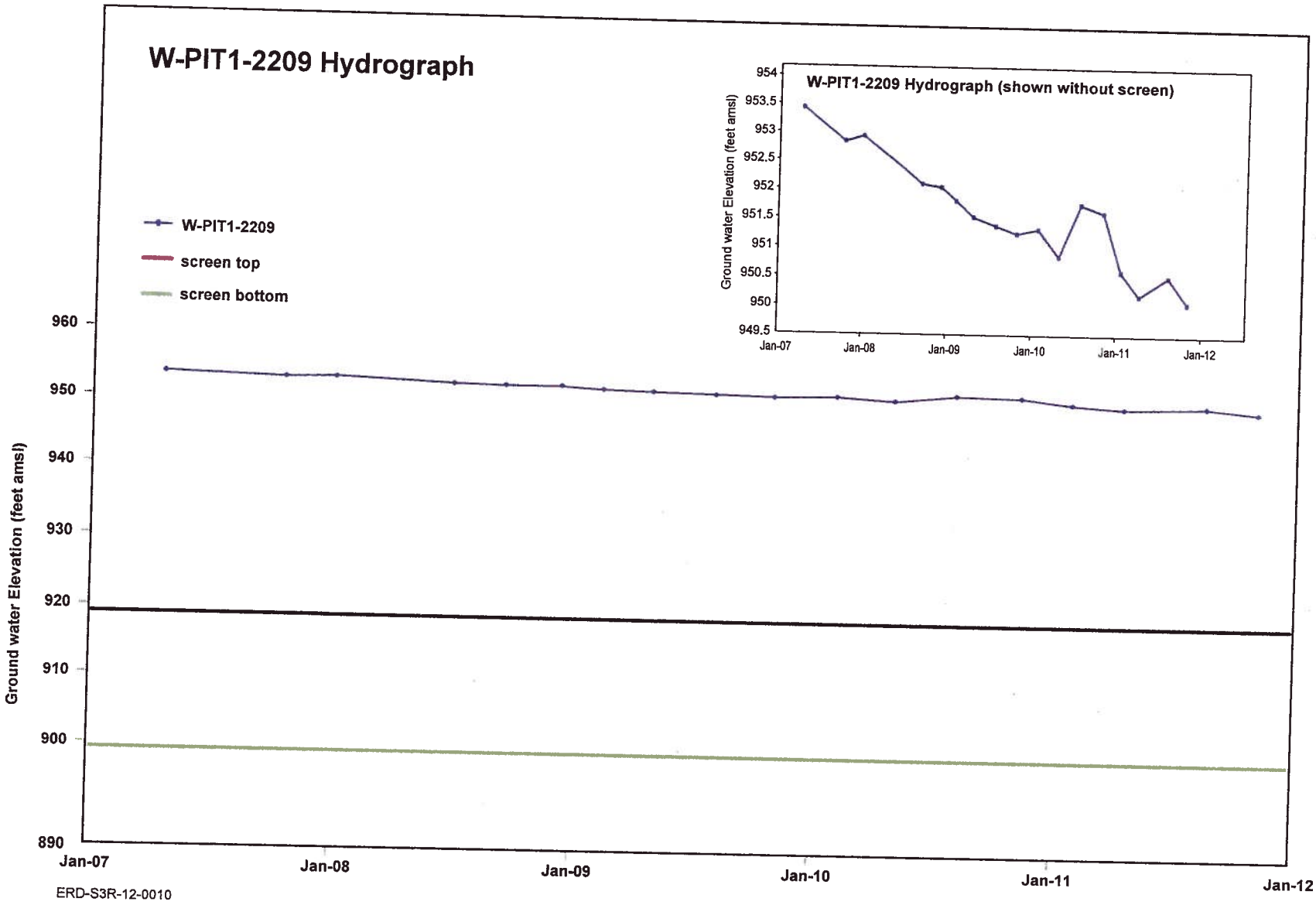

K1-08 Hydrograph
K1-08
screen top
screen bottom
Ground water elevation (feet amsl)
985
980
975
970
965
960
955
950
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-12-0007



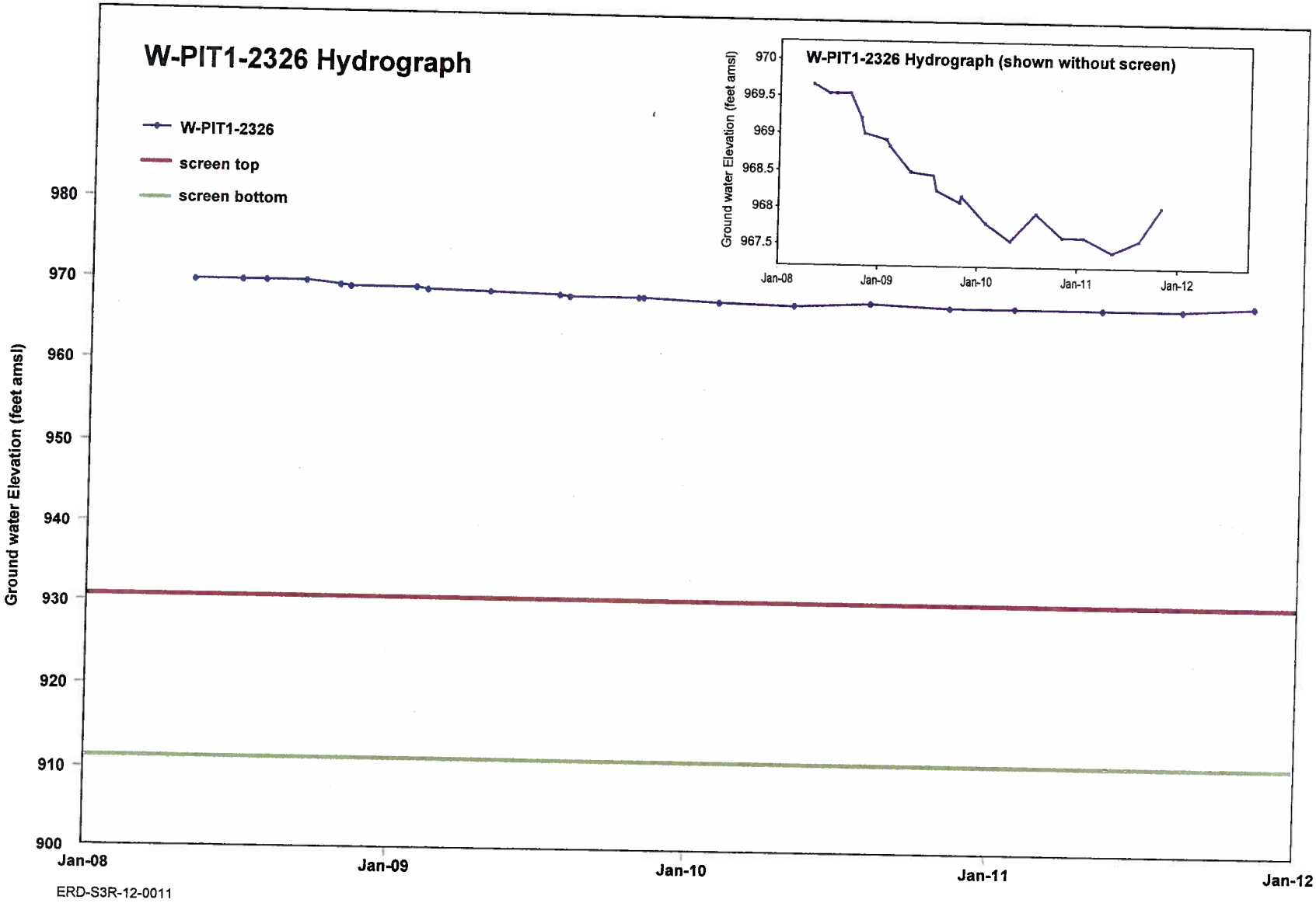
ERD-S3R-12-0008



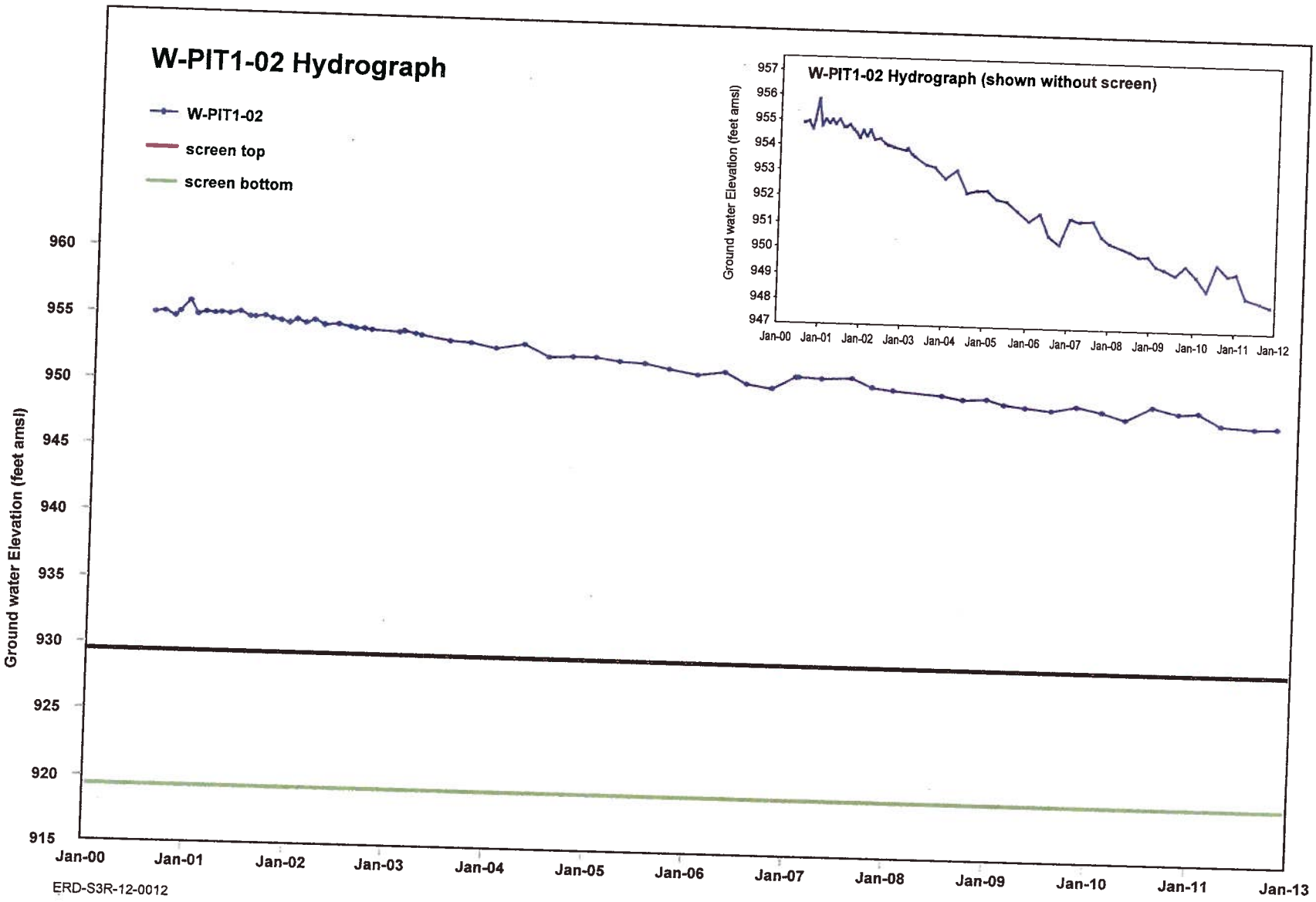
ERD-S3R-12-0009



ERD-S3R-12-0010



ERD-S3R-12-0011


W-PIT1-02 Hydrograph
W-PIT1-02
screen top
screen bottom
Ground water Elevation (feet amsl)
960
955
950
945
940
935
930
925
920
915
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-13
W-PIT1-02 Hydrograph (shown without screen)
Ground water Elevation (feet amsl)
957
956
955
954
953
952
951
950
949
948
947
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
ERD-S3R-12-0012

Appendix G

Field Logs for Compliance Monitoring and Evaluation Monitoring Wells

All Ground Water Sampling Data

WGMP

Target Sample Date: 21-Nov-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-01C AREA INFO: S300/EWFA/PIT1

DATE: 21-Nov-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23012

PURGE METHOD/SAMPLE METHOD: RF / GRVS CONTAMINANT PRESENT: NO3-37/3H<1000 pCi/L

SCREENED INTERVAL: 106.82 - 116.82 PUMP INTAKE DEPTH: 112.30

CASING DEPTH(calc)/(fbgs): 116.82 / 113.5 CASING DIAMETER/TCASING HT(in): 3.5 / 3.02

DEPTH TO WATER(fbmp): 107.64 on 18-AUG-11 108.12 VOLUME FACTOR: 0.500

WATER IN CASING (ft): 8.88 8.70 CASING VOL (Gal/Time): 4.44 4.35 Gal

TIME PUMP ON: 0950 INITIAL FLOW RATE (Q=GPM): —

TIME PUMP OFF: 1013 MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
0953		—	—	7.24	19.6	706.5	70	1	113.19

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 0.00 / None

TF LOCATION: Ground

QC SAMPLE ID: K1-78Y QC LAB(S): EBERLINE, BCLABS-BAK, GEL QC SAMPLE TIME: 1123

SAMPLE ID (VERIFY): K1-01C / GRVS TIME COLLECTED: 1013

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

WGMD

Target Sample Date: 15-Nov-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-02B AREA INFO: S300/EWFA/PIT1

DATE: 15-Nov-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23009

PURGE METHOD/SAMPLE METHOD: ST / 3VES CONTAMINANT PRESENT: NO3-33/PERC-6.4/H3>1000 PCi/L

SCREENED INTERVAL: 148.80 - 168.80 PUMP INTAKE DEPTH: 147.30

CASING DEPTH(calc)/(fbgs): 168.80 / 166.5 CASING DIAMETER/TCASING HT(in): 3.5 / 2.00

DEPTH TO WATER(fbmp): 136.03 on 16-AUG-11 138.83 VOLUME FACTOR: 0.500

WATER IN CASING (ft): 32.47 29.97 CASING VOL (Gal/Time): 16.23 15 x 3 = 45 Gal

TIME PUMP ON: 1330 INITIAL FLOW RATE (Q=GPM): 1.6

TIME PUMP OFF: MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1340		15	1	8.19	23.1	716.9	210	1	138.89
1349		30	2	8.07	21.1	721.9	215	1	139.70
1359		45	3	8.12	21.0	720.8	212	1	140.18
1401				8.12	21.1	721.2	210	1	
1403				8.11	21.1	720.9	211	1	

METER SERIAL # CALIBRATED

pH : Q10883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 48.69 / PIT7-SRC

TF LOCATION: PIT7-SRC

QC SAMPLE ID: PIT1FB QC LAB(S): EBERLINE, BCLABS-BAK, GEL QC SAMPLE TIME: 1415

SAMPLE ID (VERIFY): K1-02B / 3VES TIME COLLECTED: 1415

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

WGMD

All Ground Water Sampling Data

Target Sample Date: 25-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-04 AREA INFO: S300/EWFA/PIT1

DATE: 25-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: ZI023

PURGE METHOD/SAMPLE METHOD: ST / 3VES CONTAMINANT PRESENT: NO3-28

SCREENED INTERVAL: 185.97 - 202.97 PUMP INTAKE DEPTH: 186.00

CASING DEPTH(calc)/(fbgs): 203.97 / 201 ~~157.16~~ CASING DIAMETER/TCASING HT(in): 3.5 / 2.67

DEPTH TO WATER(fbmp): 157.00 on 16-AUG-11 157.16 VOLUME FACTOR: 0.500

WATER IN CASING (ft): 46.67 46.84 CASING VOL (Gal/Time): 23.33 23.4 x 3 = 70.2

TIME PUMP ON: 0944 INITIAL FLOW RATE (Q=GPM): 2 8 Q

TIME PUMP OFF: MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
0954		23.4	1	6.25	20.9	596.3	11	1	178.02
1002		46.8	2	6.94	21.2	605.1	-15	1	178.55
1012		70.2	3	7.23	21.1	613.2	-21	1	Probe Sticking No QC
1014				7.27	21.3	613.4	10 "	1	
1016				7.29	21.1	614.3	12 "	1	

METER SERIAL # CALIBRATED

pH : 6105883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 69.98 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-04/3VES TIME COLLECTED: 1023

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

WELLS

Target Sample Date: 25-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-05 AREA INFO: S300/EWFA/PIT1

DATE: 25-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: ZI023

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-19.0/NO3-37

SCREENED INTERVAL: 165.30 - 186.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 186.30 / 184 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 172.02 on 16-AUG-11 171.81 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 13.98 14.49 CASING VOL (Gal/Time): 14.26 14.8 x 3 = 44.4 Gal

TIME PUMP ON: 1044 INITIAL FLOW RATE (Q=GPM): 1.0 Q

TIME PUMP OFF: 1143 MEASURED BY: (FLOW METER) GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1100		14.8	1	7.75	20.5	629.8	63	1	NM Probe Sticking
1116		29.6	2	7.72	21.6	632.2	112	1	NM Probe Sticking
1132		44.4	3	7.68	22.0	636.2	115	1	NM Probe Sticking
1134				7.71	22.0	634.8	112	1	
1136				7.72	22.1	634.3	115	1	

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 42.78 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-05 / 3VES TIME COLLECTED: 1143

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

Max GPM is 1.0

Have to turn off purge water in order to obtain a Sample from the sampling port.

Revision: 07/08/2011

All Ground Water Sampling Data

WQMD

Target Sample Date: 18-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-06 AREA INFO: S300/EWFA/PIT1

DATE: 18-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: AA21159

PURGE METHOD/SAMPLE METHOD: PB / GRBA CONTAMINANT PRESENT: 3H>1000pCi/L

SCREENED INTERVAL: 107.30 - 117.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 117.30 / 115 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 115.97 on 16-AUG-11 116.05 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 1.03 CASING VOL (Gal/Time): 1.05

TIME PUMP ON: — INITIAL FLOW RATE (Q=GPM): —

TIME PUMP OFF: — MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1339		—	—	7.81	24.6	740.4	52	1	—

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: N/A

PURGE VOL/EXCESS H2O DEST: 0.00 / None

TF LOCATION: Ground

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-06/GRBA TIME COLLECTED: 1347

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER

NOTE:

Purge rate/time: N/A since est_sus_flow = 0

Purge Volume: 0 gal.

Revision: 07/08/2011

All Ground Water Sampling Data

WGMD

Target Sample Date: 25-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-07 AREA INFO: S300/EWFA/PIT1

DATE: 25-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: ZI023

PURGE METHOD/SAMPLE METHOD: GP / 3VES CONTAMINANT PRESENT: NO3-34

SCREENED INTERVAL: 131.30 - 151.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 153.30 / 150 CASING DIAMETER/TCASING HT(in): 4.5 / 3.00

DEPTH TO WATER(fbmp): 141.71 on 16-AUG-11 141.74 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 11.29 11.56 CASING VOL (Gal/Time): 9.33 9.5 X 3 = 28.5 Gal

TIME PUMP ON: 1312 INITIAL FLOW RATE (Q=GPM): 2.0 Q

TIME PUMP OFF: MEASURED BY: (FLOW METER) GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1317		9.5	1	8.10	20.8	608.5	-15	1	145.40
1322		19 Gal	2	7.94	21.1	610.7	-15	1	145.93
1327		28.5	3	7.91	21.3	611.7	-7	1	146.04
1329				7.88	21.4	611.8	13	1	
1331				7.89	21.3	610.3	14	1	

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 27.98 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-07 / 3VES TIME COLLECTED: 1346

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

WGMD

Target Sample Date: 25-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-08 AREA INFO: S300/EWFA/PIT1

DATE: 25-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: ZI023

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-37/NO3-36

SCREENED INTERVAL: 143.32 - 168.32 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 170.32 / 168 CASING DIAMETER/TCASING HT(in): 4.5 / 2.02

DEPTH TO WATER(fbmp): 155.48 on 17-AUG-11 156.70 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 14.54 13.62 CASING VOL (Gal/Time): 12.01 11.2 1 Cav = 33.6

TIME PUMP ON: 1222 INITIAL FLOW RATE (Q=GPM): 1.45 Q

TIME PUMP OFF: MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1230		11.2	to 1	8.01	20.9	638.9	17	1	157.59
1238		22.4	2	7.94	21.7	648.9	24	1	157.72
1246		33.6	3	7.91	22.2	644.7	31	1	Probe Sticking NOISE
1248				7.91	22.4	644.1	8	1	
1250				7.90	22.4	645.7	15	1	

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 36.04 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-08 / 3065 TIME COLLECTED: 1258

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

WGMD

Target Sample Date: 01-Nov-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-09 AREA INFO: S300/EWFA/PIT1

DATE: 01-Nov-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23003

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-120.0

SCREENED INTERVAL: 157.30 - 192.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 4.5 / 2.00

DEPTH TO WATER(fbmp): 161.93 on 16-AUG-11 161.97 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 32.07 32.33 CASING VOL (Gal/Time): 26.50 26.7 X 3 = 80.1

TIME PUMP ON: 1314 INITIAL FLOW RATE (Q=GPM): 20

TIME PUMP OFF: 1409 MEASURED BY: (FLOW METER) GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1328		26.7	1	8.01	21.2	656.7	25	1	166.88
1341		53.4	2	7.99	21.5	660.9	18	1	166.90
1354		80.1	3	7.99	21.7	660.1	21	1	167.03
1356				7.97	21.5	660.8	20	1	
1358				7.98	21.4	661.2	20		

METER SERIAL # CALIBRATED

pH : 0610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 79.49 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-09 | 3ES TIME COLLECTED: 1409

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data — 1st Retest

WGMD

Target Sample Date: 08-Dec-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-09 AREA INFO: S300/EWFA/PIT1

DATE: 08-Dec-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23018

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-120.0

SCREENED INTERVAL: 157.30 - 192.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 4.5 / 2.00

DEPTH TO WATER(fbmp): 161.93 on 16-AUG-11 162.02 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 32.07 32.28 CASING VOL (Gal/Time): 26.50 26.6 x 3cu = 80.0

TIME PUMP ON: 1158 INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: 1247 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1211		26.6	1	6.91	20.9	657.0	66	1	171.41
1225		53.2	2	7.21	20.6	660.2	61	1	173.94
1239		80.0	3	7.18	20.6	659.3	60	1	Nm
1241				7.12	20.6	654.8	57	1	
1243				7.22	20.5	651.7	57	1	

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 79.49 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-09 | 3045 TIME COLLECTED: 1247

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	BCLABS-BAK	E200.7:BA	1	1L Polyethylene
3EMG	BCLABS-BAK	E200.7:FILTER	0	1L Polyethylene

RE-Sample

2nd Retest

ETHWAMA

All Ground Water Sampling Data

Target Sample Date: 15-Dec-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: K1-09 AREA INFO: S300/EWFA/PIT1

DATE: 15-Dec-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23021

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-120.0

SCREENED INTERVAL: 157.30 - 192.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/CASING HT(in): 4.5 / 2.00

DEPTH TO WATER(fbmp): 161.93 on 16-AUG-11 162.10 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 32.07 32.2 CASING VOL (Gal/Time): 26.50 26.6 x 3 = 79.8 Gal

TIME PUMP ON: 1114 INITIAL FLOW RATE (Q=GPM): 2.4 a

TIME PUMP OFF: 1153 MEASURED BY (FLOW METER) / GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1125		26.6	1	6.83	19.8	653.8	65	1	171.43
1136		53.2	2	7.11	19.8	659.3	62	1	NM
1147		80.0	3	7.09	20.1	662.6	61	1	NM
1149				7.12	20.0	660.3	60	1	
1151				7.13	20.1	660.5	60	1	

METER SERIAL # CALIBRATED

pH : 010883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 79.49 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-09 3EM1 TIME COLLECTED: 1153

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	BCLABS-BAK	E200.7:BA	1	1L Polyethylene
3EMG	BCLABS-BAK	E200.7:FILTER	0	1L Polyethylene

RE-Sample

All Ground Water Sampling Data

WGMD

Target Sample Date: 26-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: W-PIT1-2209 AREA INFO: S300/EWFA/PIT1

DATE: 26-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23001

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT:

SCREENED INTERVAL: 247.30 - 267.30 PUMP INTAKE DEPTH: 265.20

CASING DEPTH(calc)/(fbgs): 268.20 / 266 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 215.49 on 30-AUG-11 215.80 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 52.51 52.40 CASING VOL (Gal/Time): 53.56 53.44 x 3 = 160.32 GL

TIME PUMP ON: 1045 INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1112		53.5	1	7.45	21.6	608.3	52	1	230.19
1125		107.0	2	7.81	20.7	615.3	47	1	233.53
1138		160.5	3	7.79	21.1	613.5	38	1	NM Probe sticking
1140				7.82	21.1	612.8	39	1	
1142				7.78	21.2	612.7	33		

METER SERIAL # CALIBRATED

pH : 616883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG 3CMP 3GIV

SAMPLE PRESERVATION/AMT of REAGENT: N/A

PURGE VOL/EXCESS H2O DEST: 160.68 / None

TF LOCATION: Ground

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): W-PIT1-2209 | 3065 TIME COLLECTED: 1149

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3CMP	GEL	AS:FILTER	0	1L Polyethylene
3CMP	GEL	AS:UISO	2	1L Polyethylene
3CMP	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3GIV	BCLABS-BAK	E601	3	40 mL Glass VOA vial
3EMG	GEL	E906	1	250 ml GLASS-AMBER

All Ground Water Sampling Data

WAMS

Target Sample Date: 14-Nov-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: W-PIT1-2326 AREA INFO: S300/EWFA/PIT1

DATE: 14-Nov-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23008

PURGE METHOD/SAMPLE METHOD: BS / 3VES CONTAMINANT PRESENT:

SCREENED INTERVAL: 217.30 - 237.02 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 237.42 / 235.12 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 179.81 on 18-AUG-11 179.73 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 57.31 57.69 CASING VOL (Gal/Time): 58.46 59 + 3cu = 177 Gal

TIME PUMP ON: 1258 INITIAL FLOW RATE (Q=GPM): 3.0 @

TIME PUMP OFF: 1412 MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1319		59	1	7.97	21.5	717.2	81	1	183.57
1339		118	2	7.89	20.8	723.6	78	1	187.30
1358		177	3	7.90	20.9	728.3	77	1	189.92
1400				7.91	20.8	728.1	70	1	
1402				7.91	21.0	728.3	73	1	

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 175.37 / PIT7-SRC

TF LOCATION: PIT7-SRC

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): U-PIT1-2326 / 3VES TIME COLLECTED: 1412

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

WGMD

All Ground Water Sampling Data

Target Sample Date: 10-Nov-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: W-865-2005 AREA INFO: S300/EWFA/865

DATE: 10-Nov-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23007

PURGE METHOD/SAMPLE METHOD: PB / GRBA CONTAMINANT PRESENT:

SCREENED INTERVAL: 332.30 - 352.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 353.20 / 351 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 326.89 on 16-AUG-11 327.15 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 26.11 CASING VOL (Gal/Time): 26.63

TIME PUMP ON: — INITIAL FLOW RATE (Q=GPM): —

TIME PUMP OFF: — MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1341		—	—	6.23	20.4	598.3	64	1	—

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 0.00 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID:W-865-64Y 865FB QC LAB(S): GEL, CALTEST QC SAMPLE TIME: 1447

SAMPLE ID (VERIFY): W-865-2005/GRAB TIME COLLECTED: 1349

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER

All Ground Water Sampling Data

WGMD

Target Sample Date: 17-Oct-2011 Month: Norm Qtr: 4 Norm Year: 2011

WELL ID: W-PIT1-2620 AREA INFO: S300/EWFA/PIT1

DATE: 17-Oct-2011 LOG BOOK (DOCUMENT CONTROL) #: AA21158

PURGE METHOD/SAMPLE METHOD: PB/ ~~SVES~~ GRBA CONTAMINANT PRESENT:

SCREENED INTERVAL: 247.30 - 262.20 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 262.62 / 260.32 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 231.32 on 25-JUL-11 230.90 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 31.00 31.72 CASING VOL (Gal/Time): 31.62

TIME PUMP ON: — INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: — MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1309		—	—	6.76	22.4	705.9	47	1	—

METER SERIAL # CALIBRATED

pH : 610883 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: —

PURGE VOL/EXCESS H2O DEST: 94.86 / PIT7-SRC

TF LOCATION: PIT7-SRC

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): W-PIT1-~~2625~~ 2620 TIME COLLECTED: 1312

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER

PB/GRBA 200 pump was installed.

Revision: 07/08/2011

Appendix H

Statistical Limits and Graphs of Ground Water Measurements

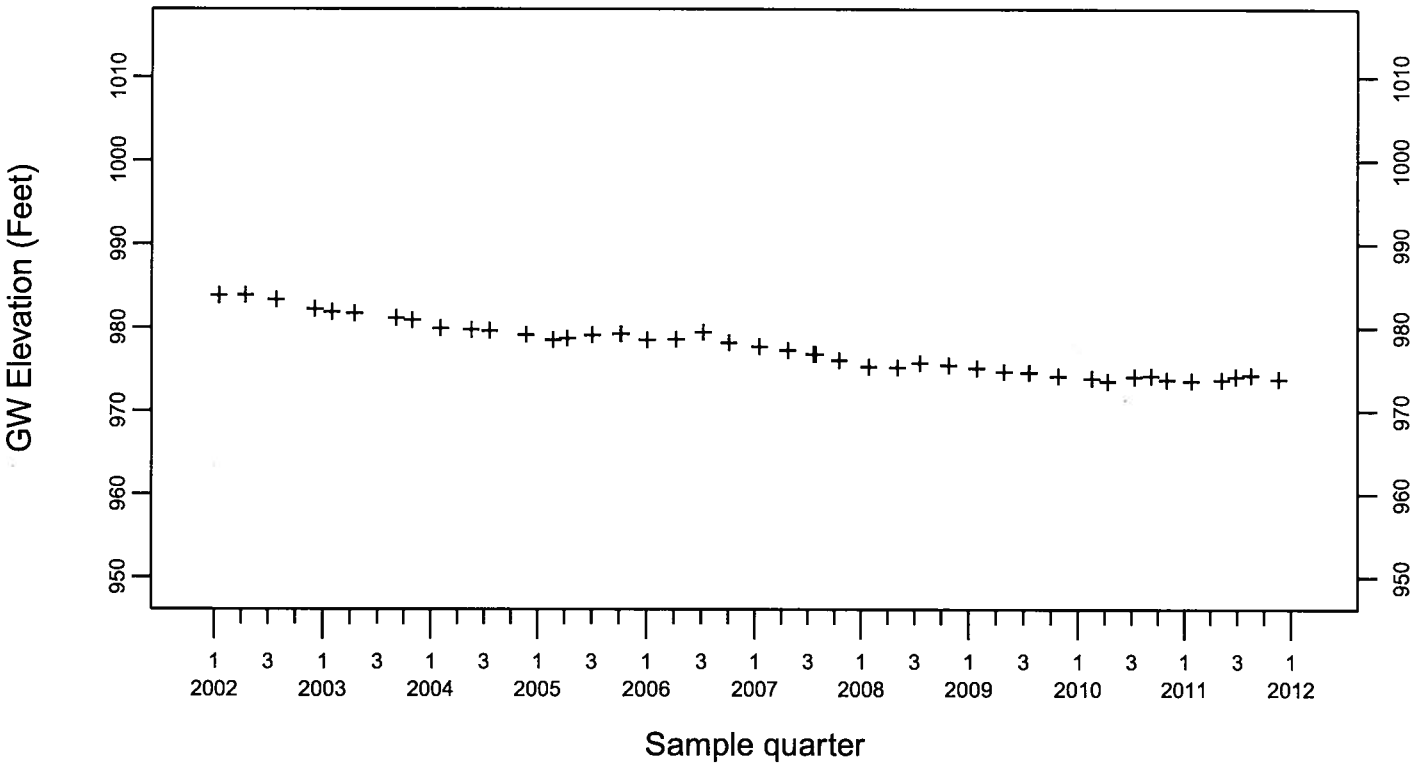
Table H-1. Analytical results from 2011 that were omitted from the Appendix H plots due to the use of specially reduced Y-axis plot limits.

Pit Area	Constituent	Monitoring Well	Date Sampled	Result	Units[a]
Pit 1	Arsenic	W-PIT1-2326	7/29/2008	<50	ug/L
Pit 1	Barium	K1-04	4/18/2003	<100	ug/L
Pit 1	Barium	K1-05	4/18/2003	<100	ug/L
Pit 1	Cobalt	K1-04	4/18/2003	<50	ug/L
Pit 1	Cobalt	K1-05	4/18/2003	<50	ug/L
Pit 1	Nickel	W-PIT1-2326	7/29/2008	<100	ug/L
Pit 1	Lead	K1-04	4/18/2003	<5	ug/L
Pit 1	Lead	K1-05	4/18/2003	<5	ug/L
Pit 1	Lead	W-PIT1-2326	7/29/2008	<5	ug/L

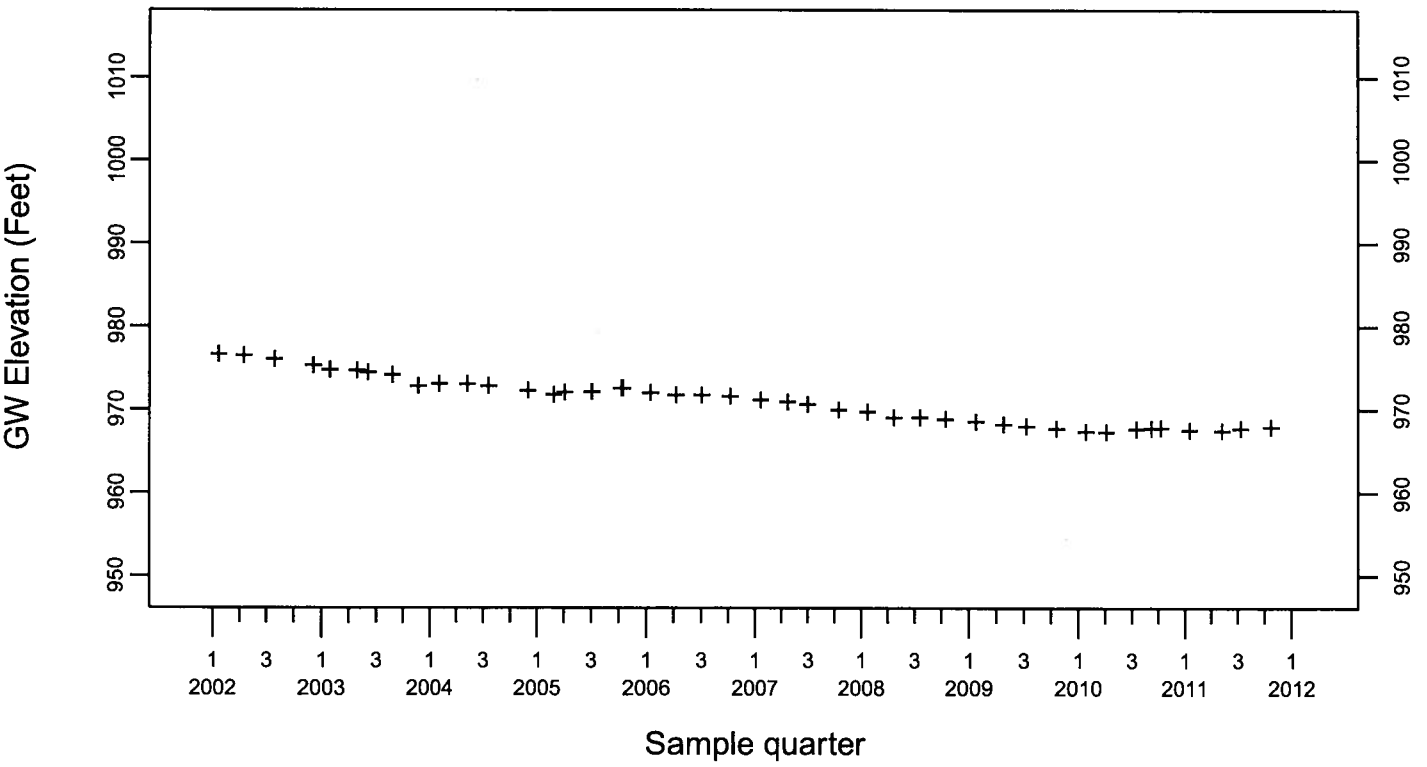
[a] Results labled as "<" had high reporting limits (RLs) for that particular analytical result. These values were not included in the plots. These results if plotted would have significantly altered the y-axis scale.

Pit 1 Area
GW Elevation (Feet)

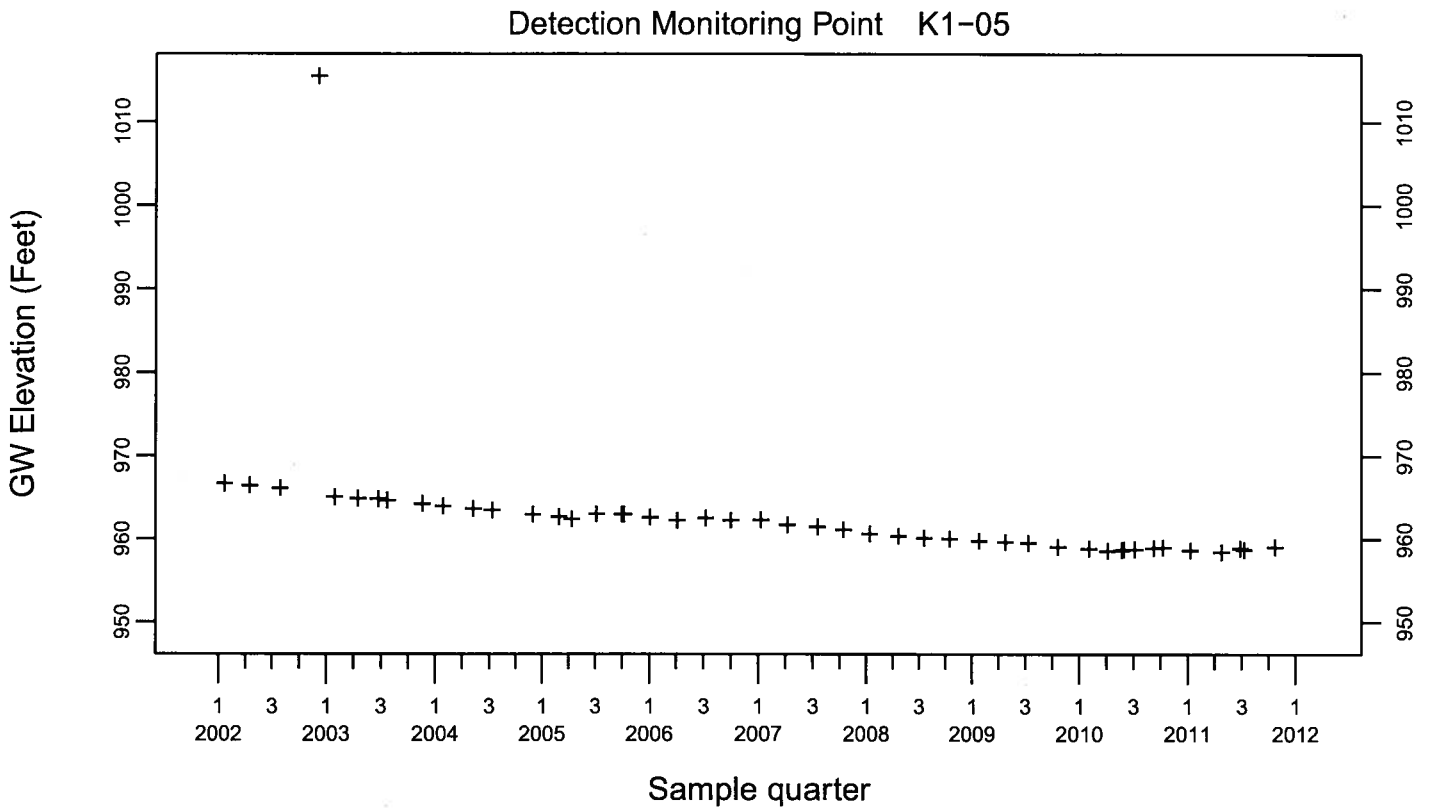
Background Monitoring Point K1-01C

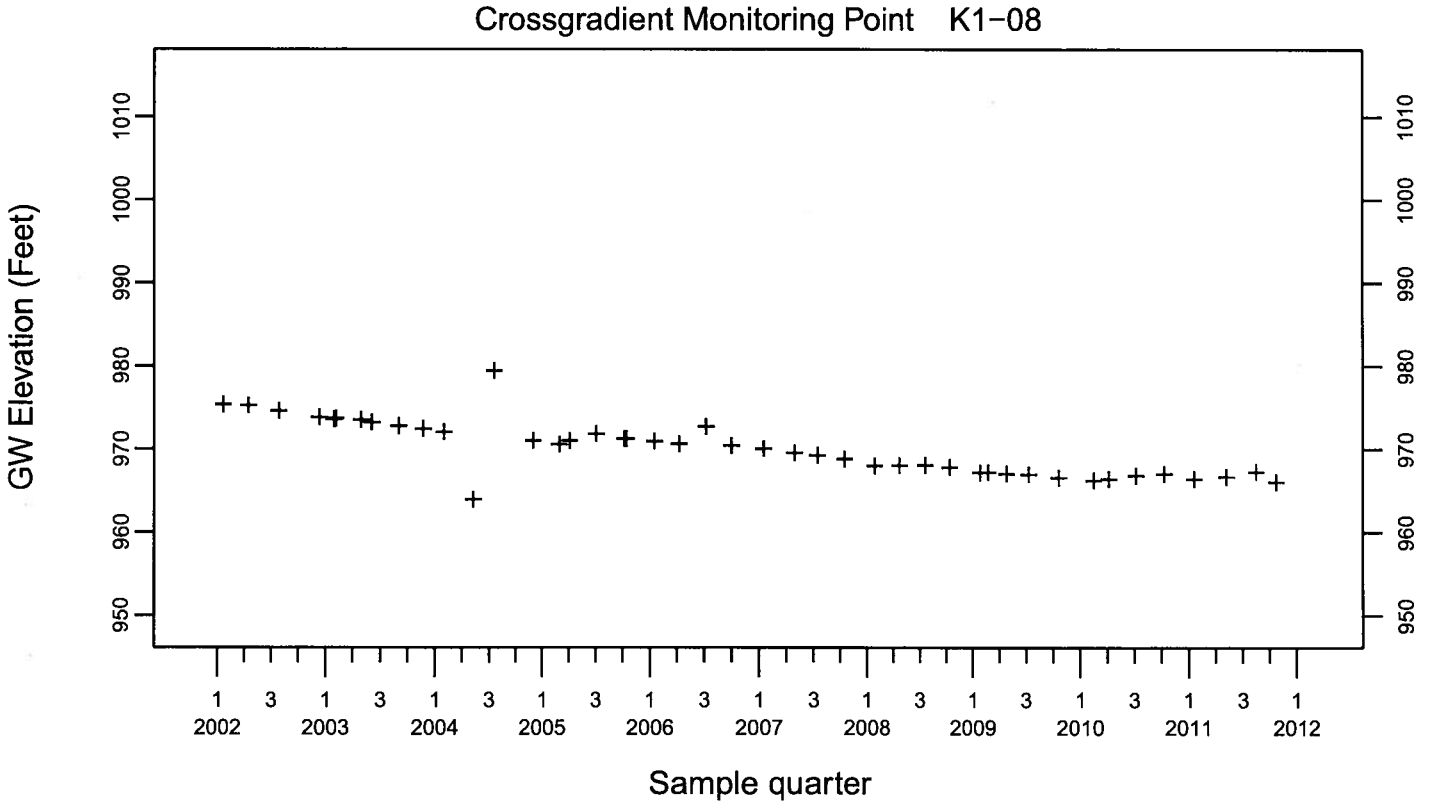


Background Monitoring Point K1-07



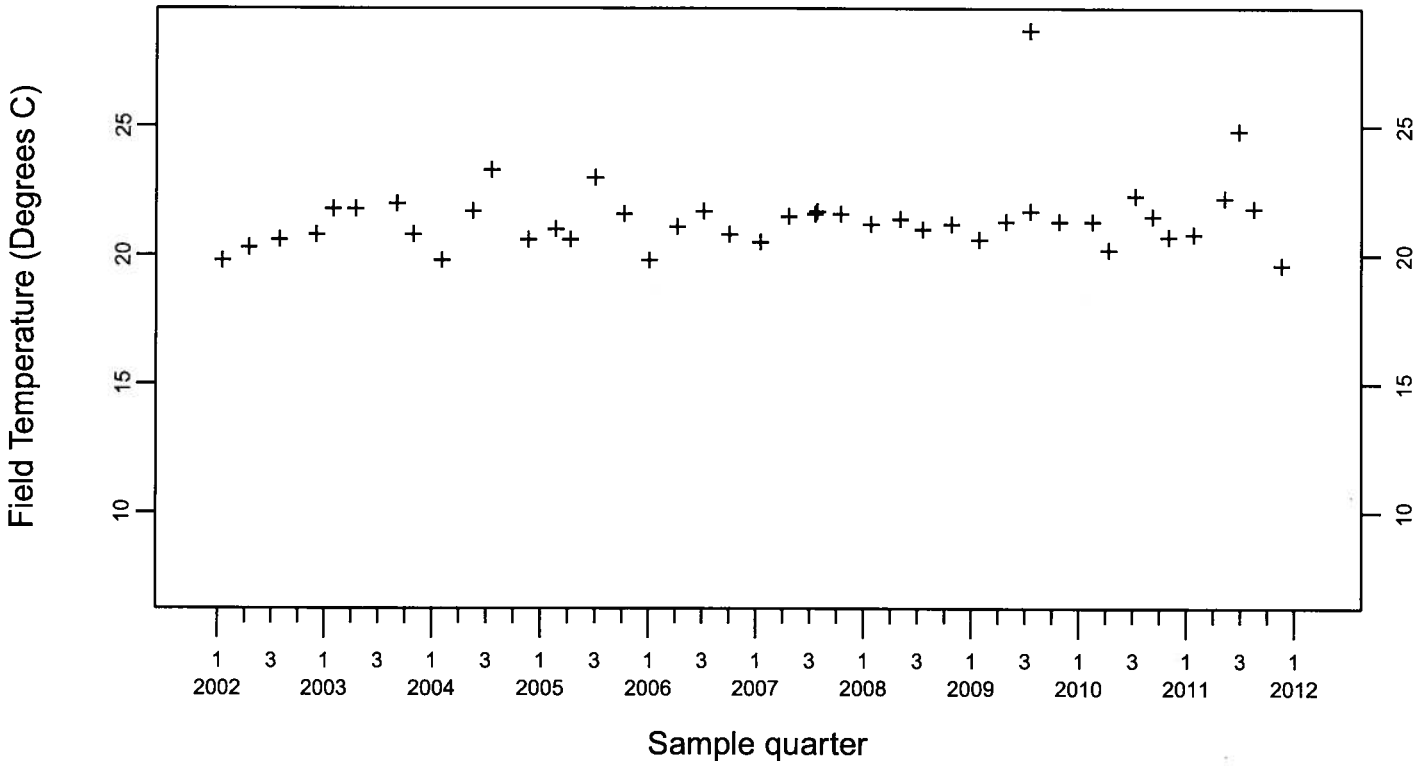
Pit 1 Area
GW Elevation (Feet)



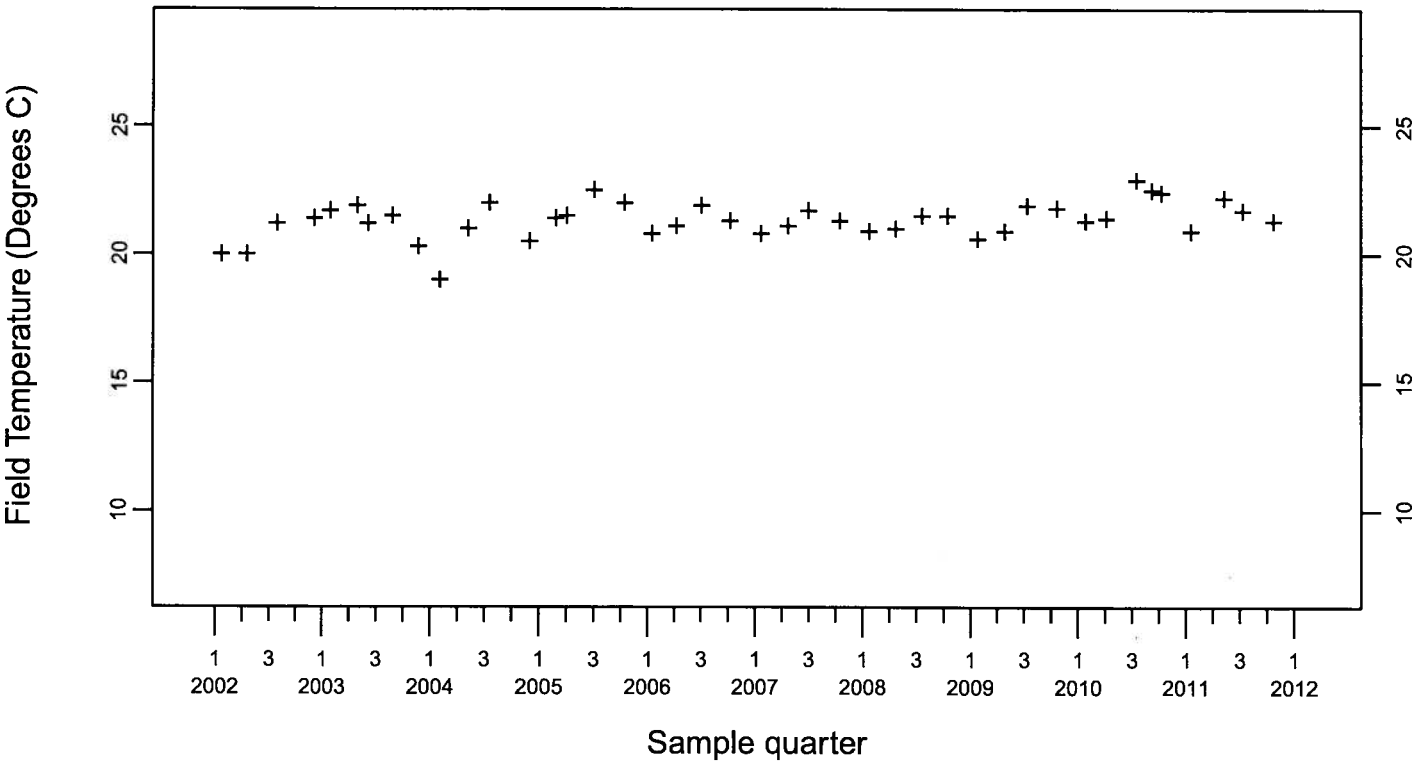


Pit 1 Area
Field Temperature (Degrees C)

Background Monitoring Point K1-01C

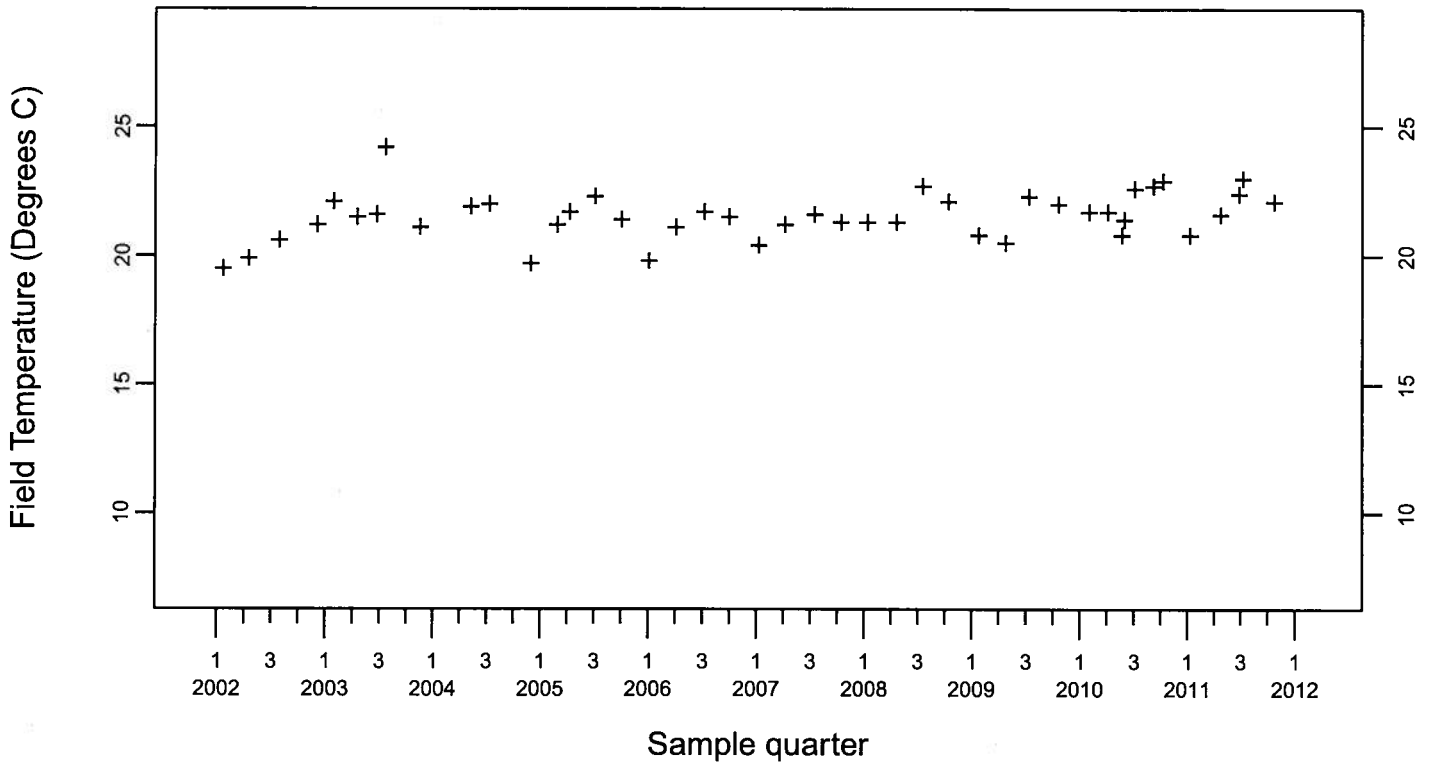


Background Monitoring Point K1-07

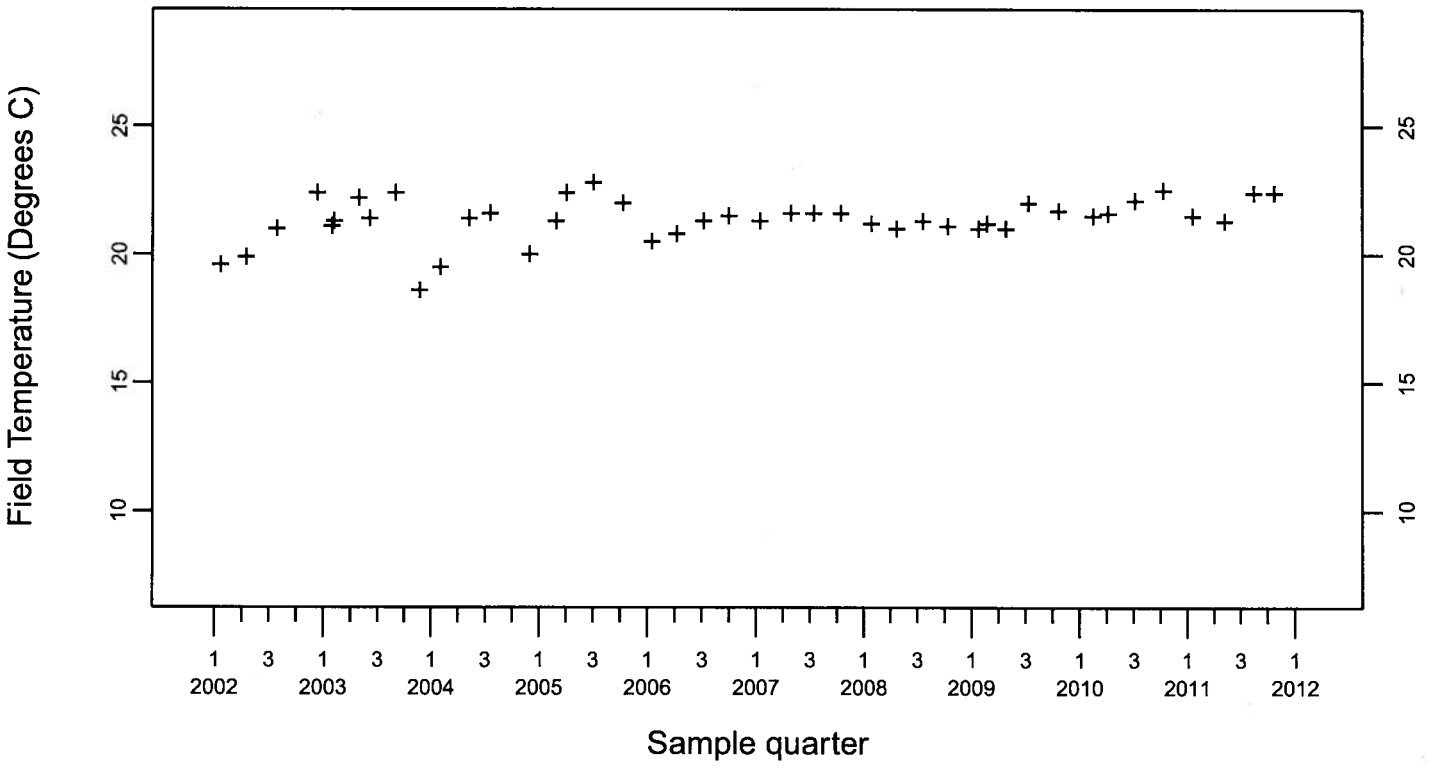


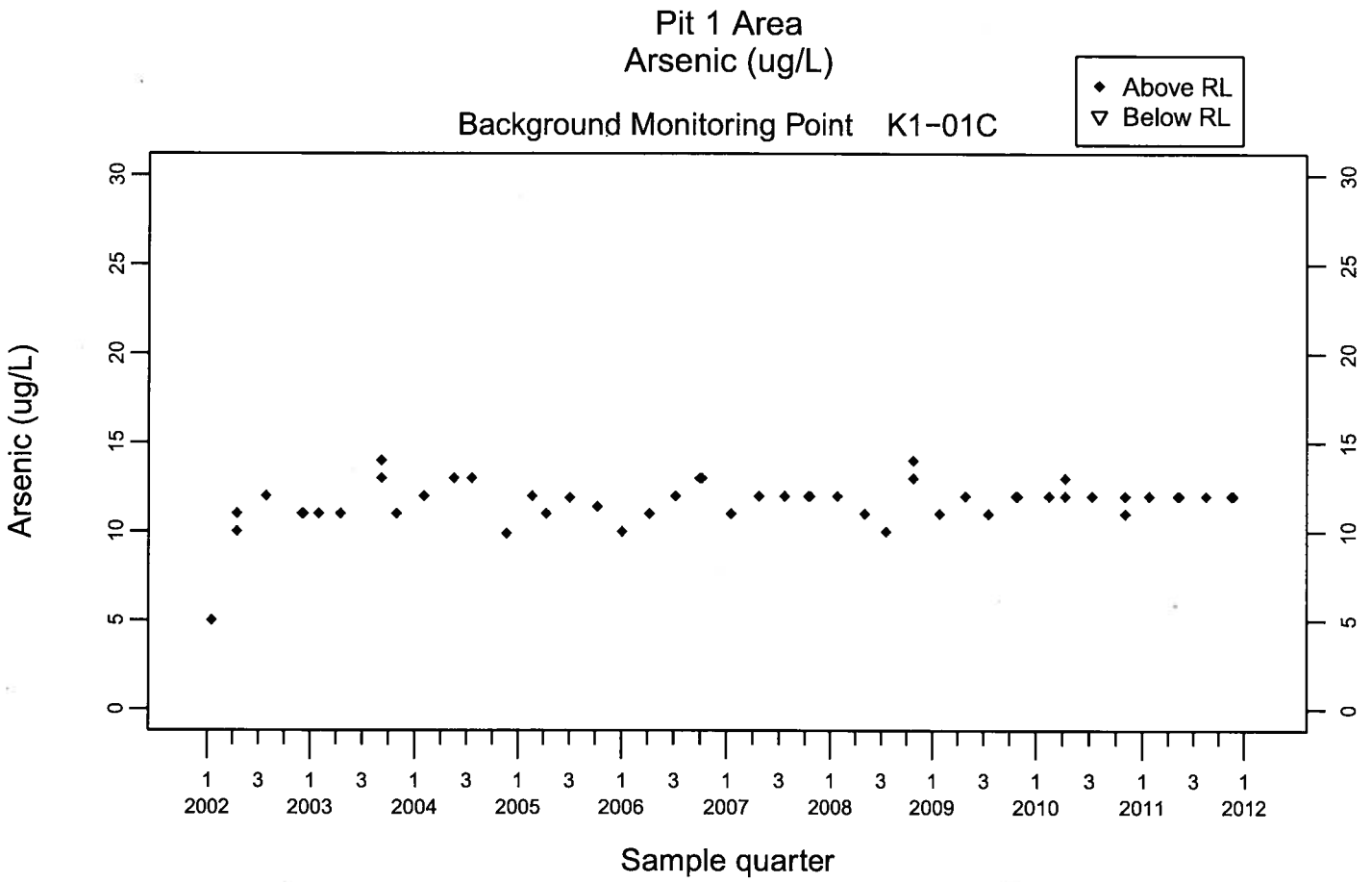
Pit 1 Area
Field Temperature (Degrees C)

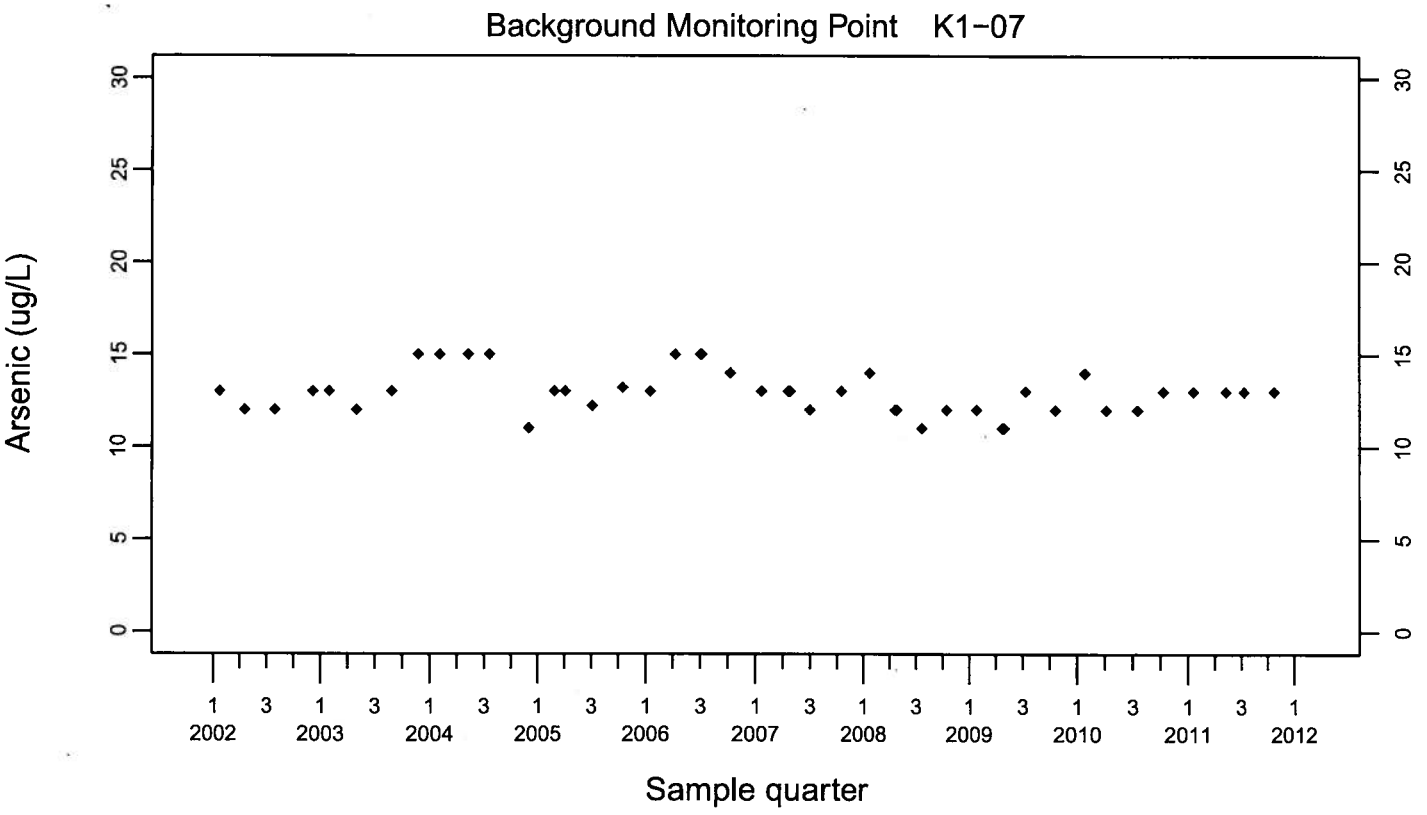
Detection Monitoring Point K1-05

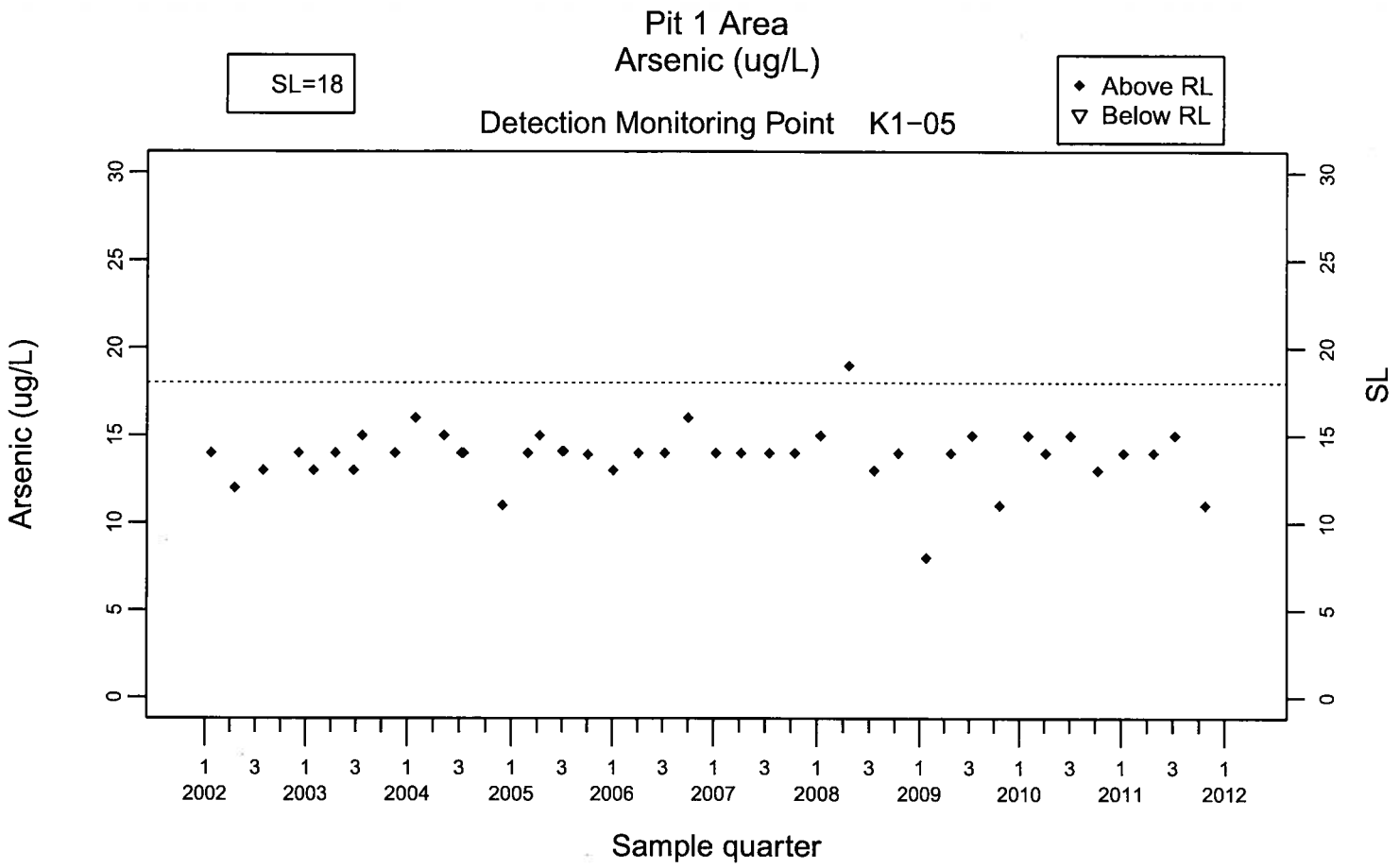


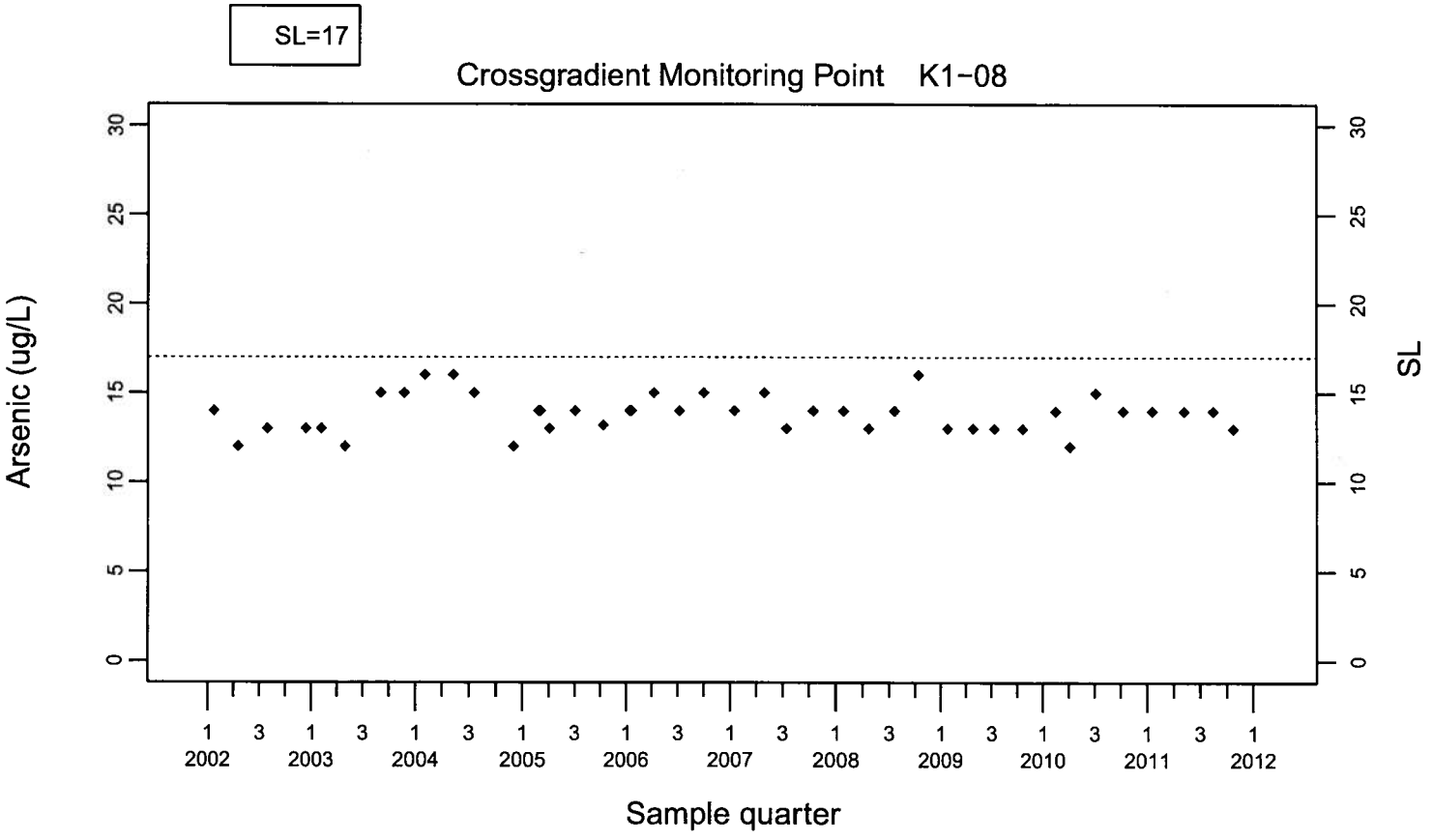
Crossgradient Monitoring Point K1-08

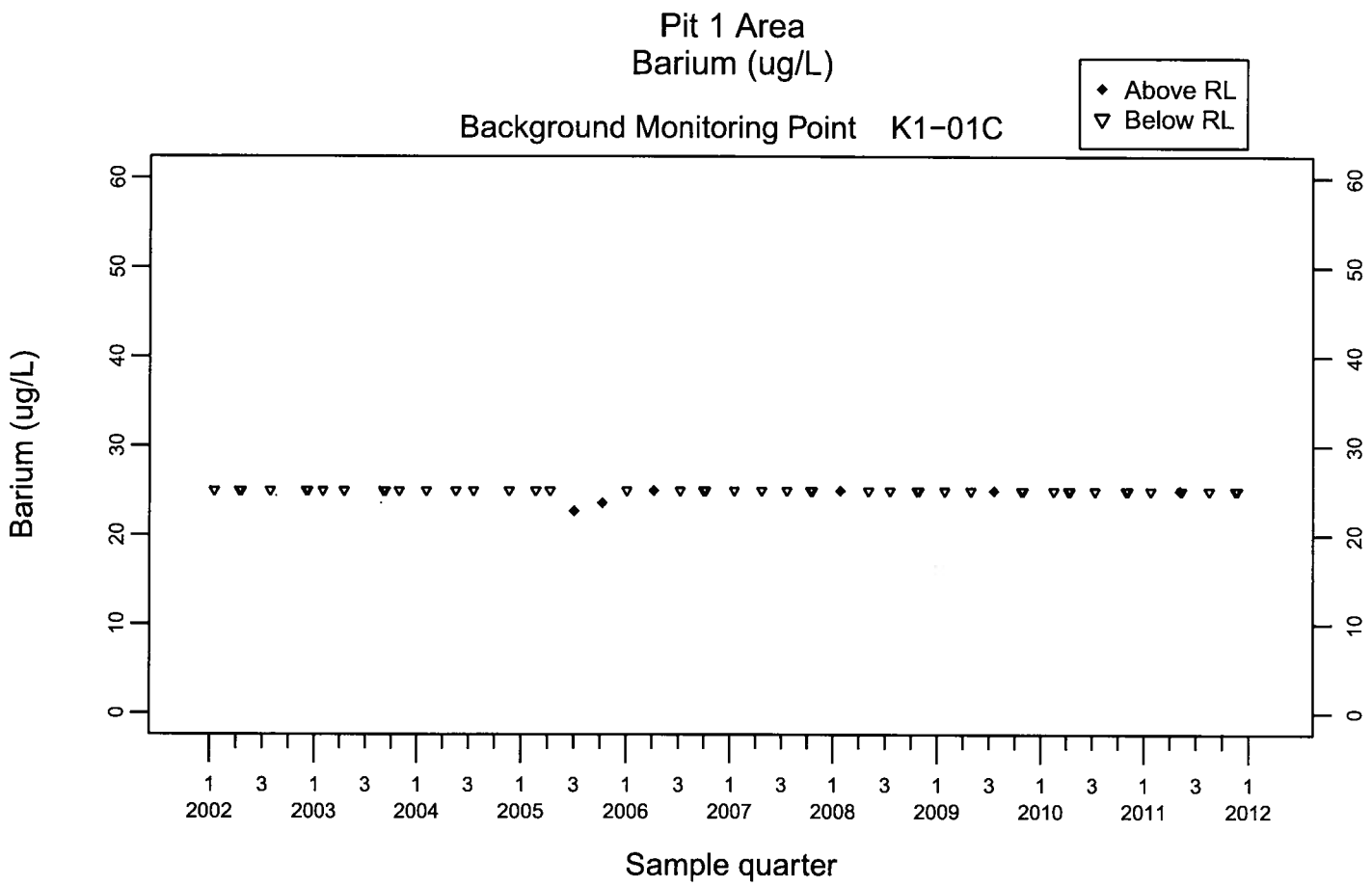


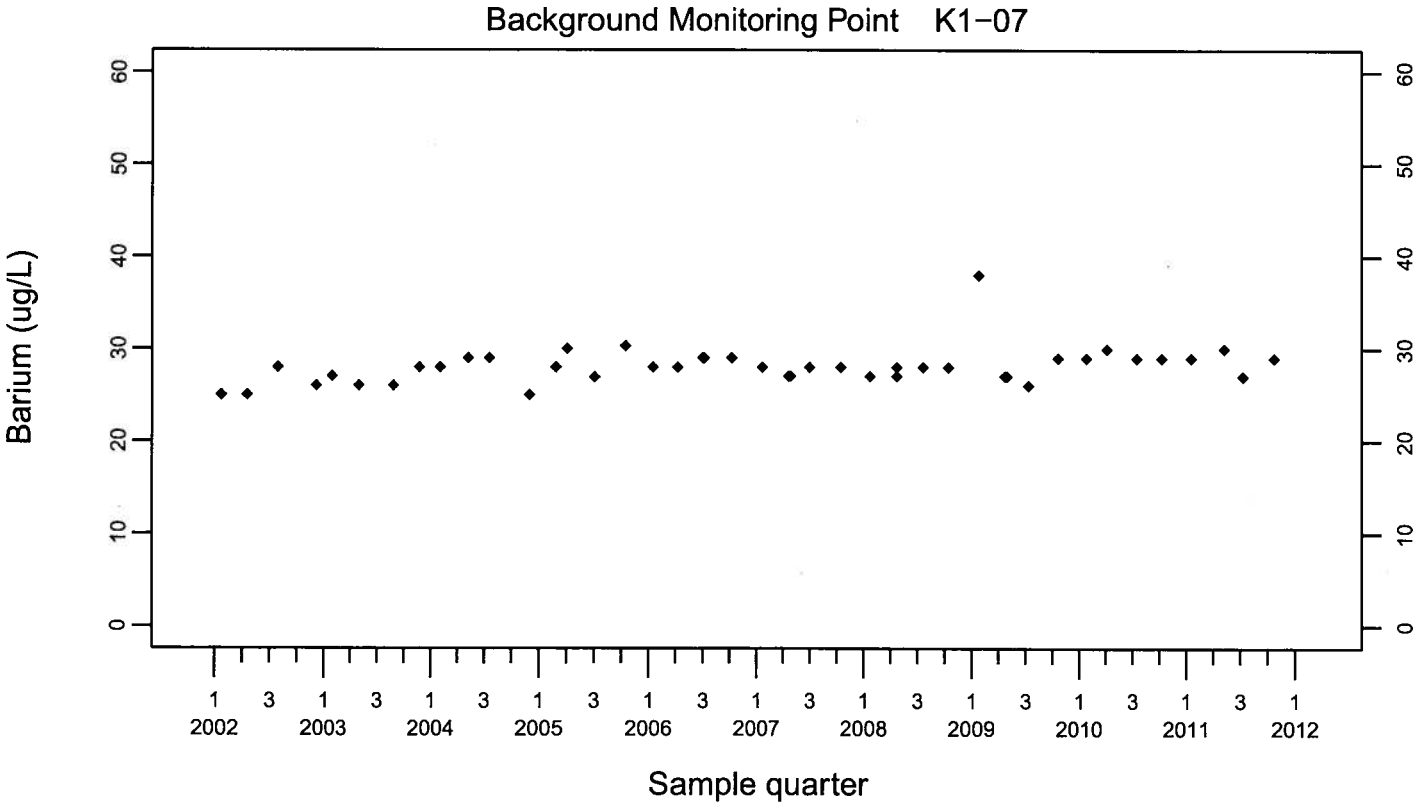

Pit 1 Area
Arsenic (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Arsenic (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

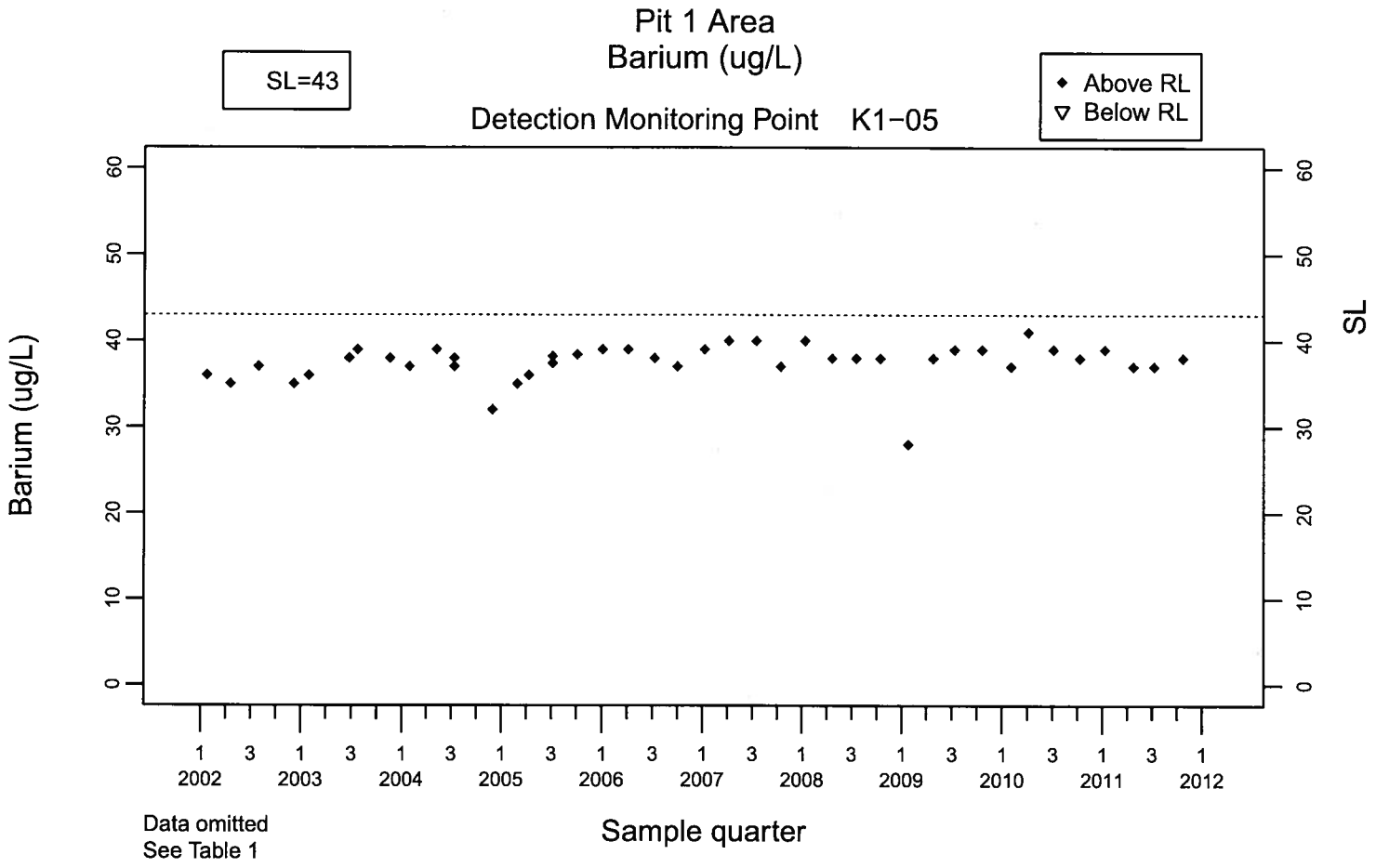

Background Monitoring Point K1-07
Arsenic (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


Pit 1 Area
Arsenic (ug/L)
SL=18
Above RL
Below RL
Detection Monitoring Point K1-05
Arsenic (ug/L)
SL
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

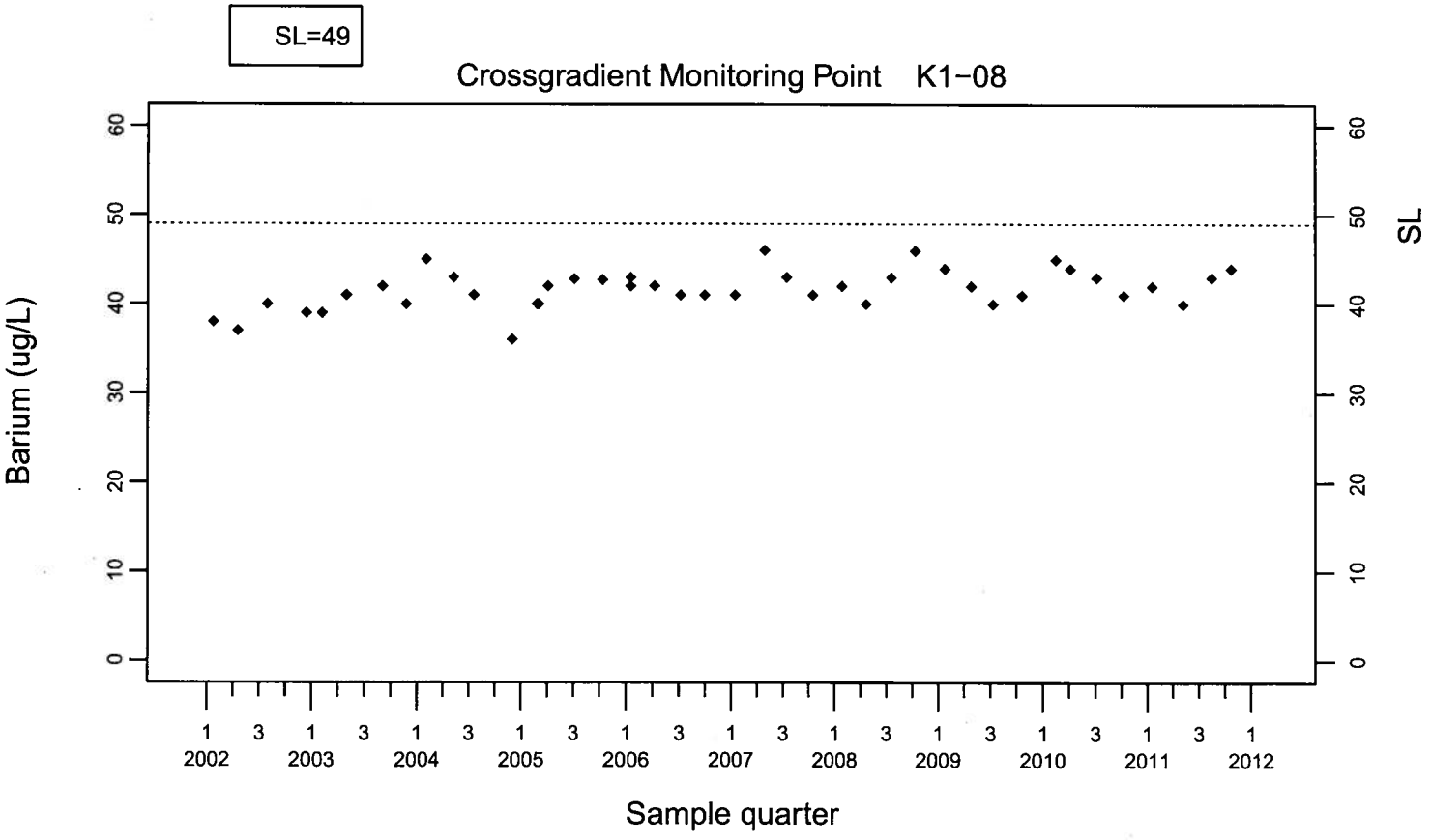

SL=17
Crossgradient Monitoring Point K1-08
Arsenic (ug/L)
SL
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

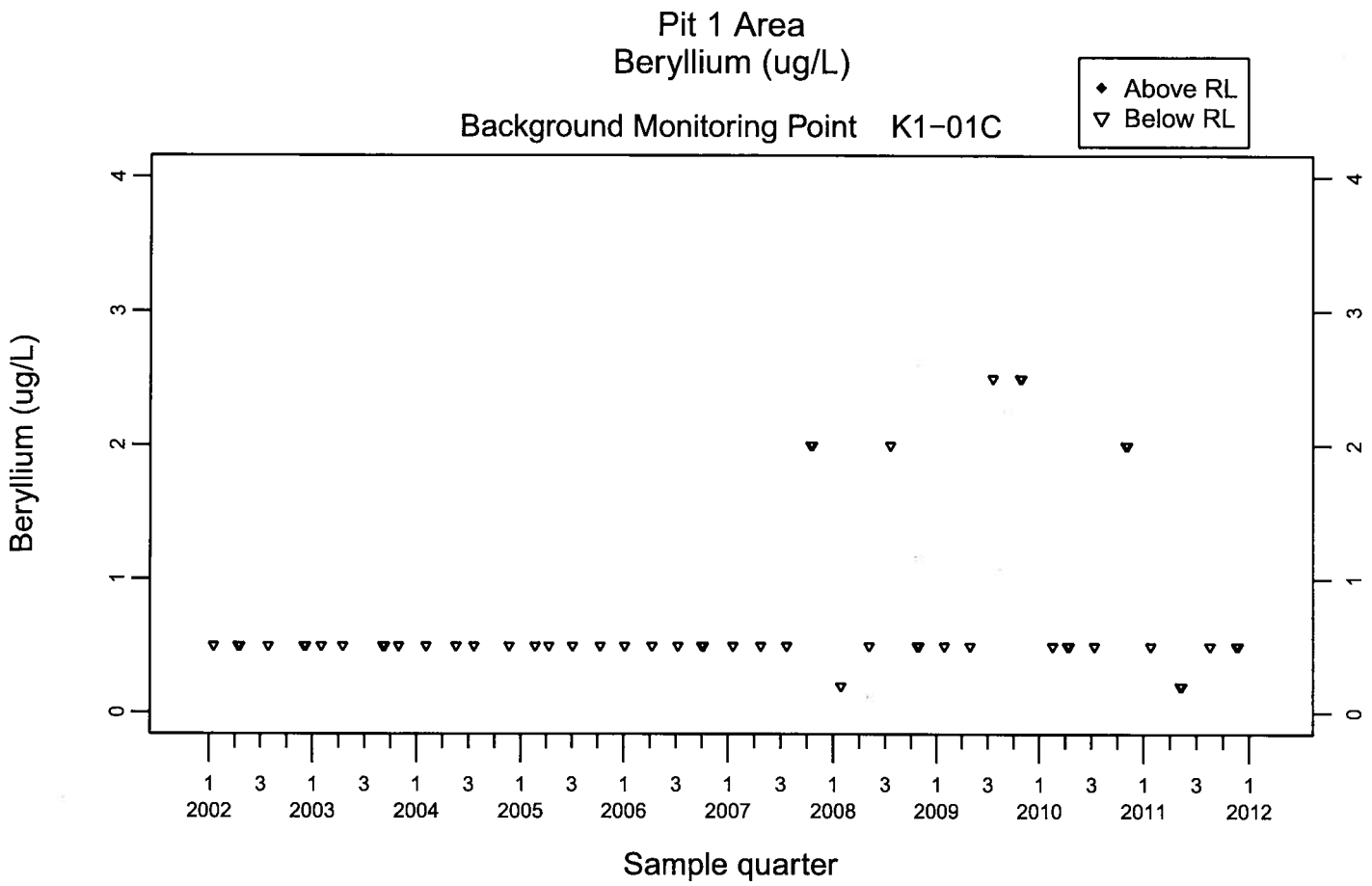

Pit 1 Area
Barium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Barium (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

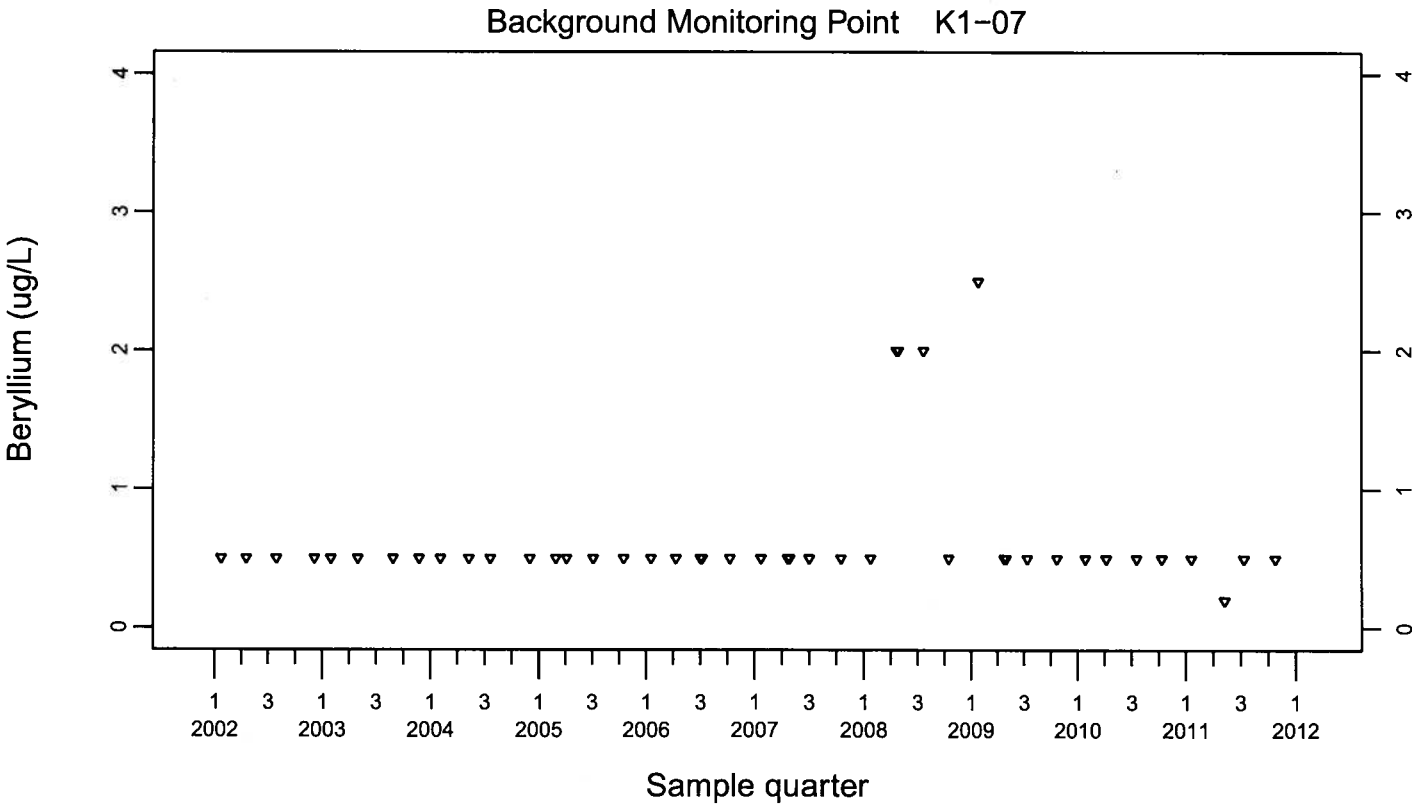

Background Monitoring Point K1-07
Barium (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

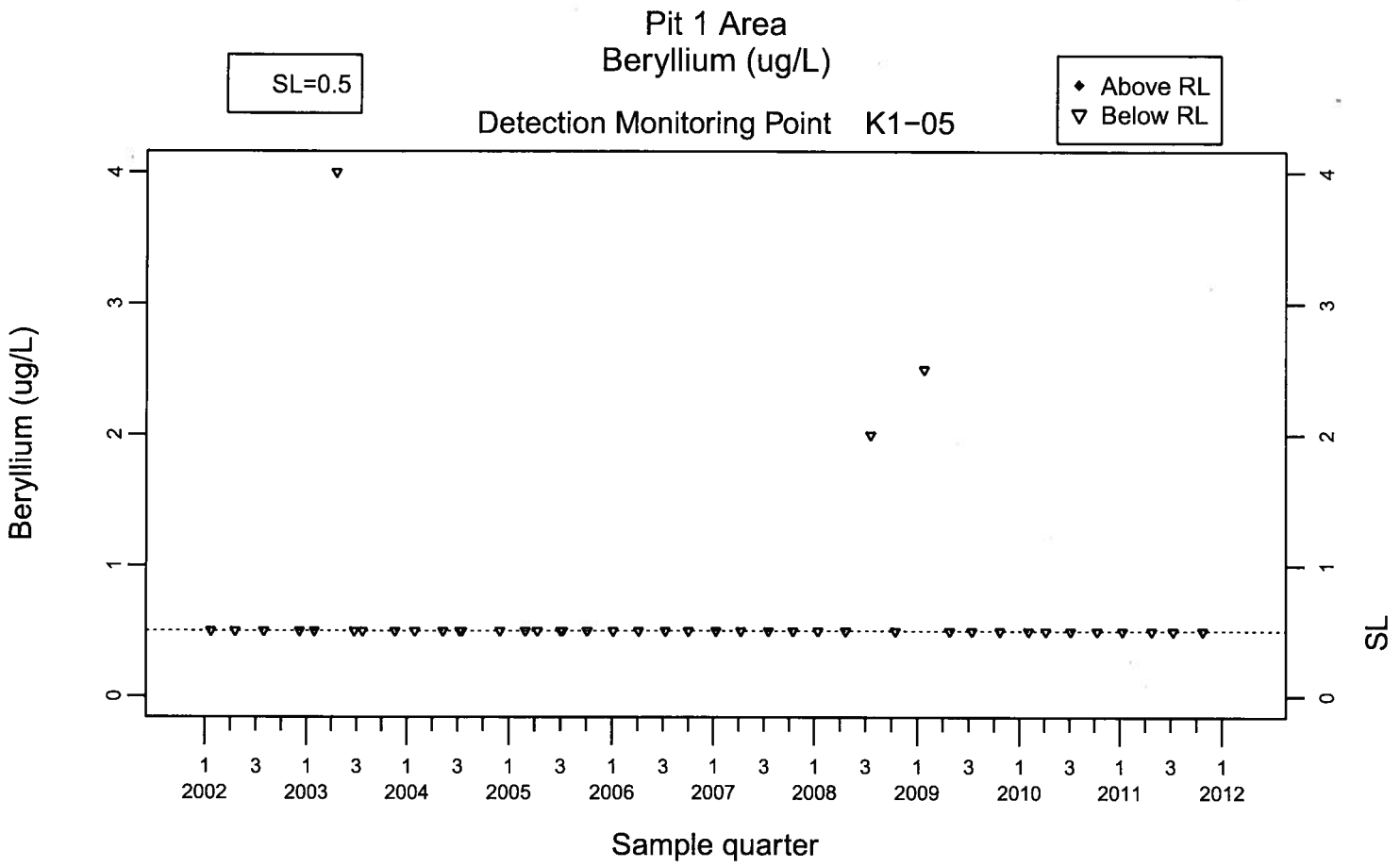


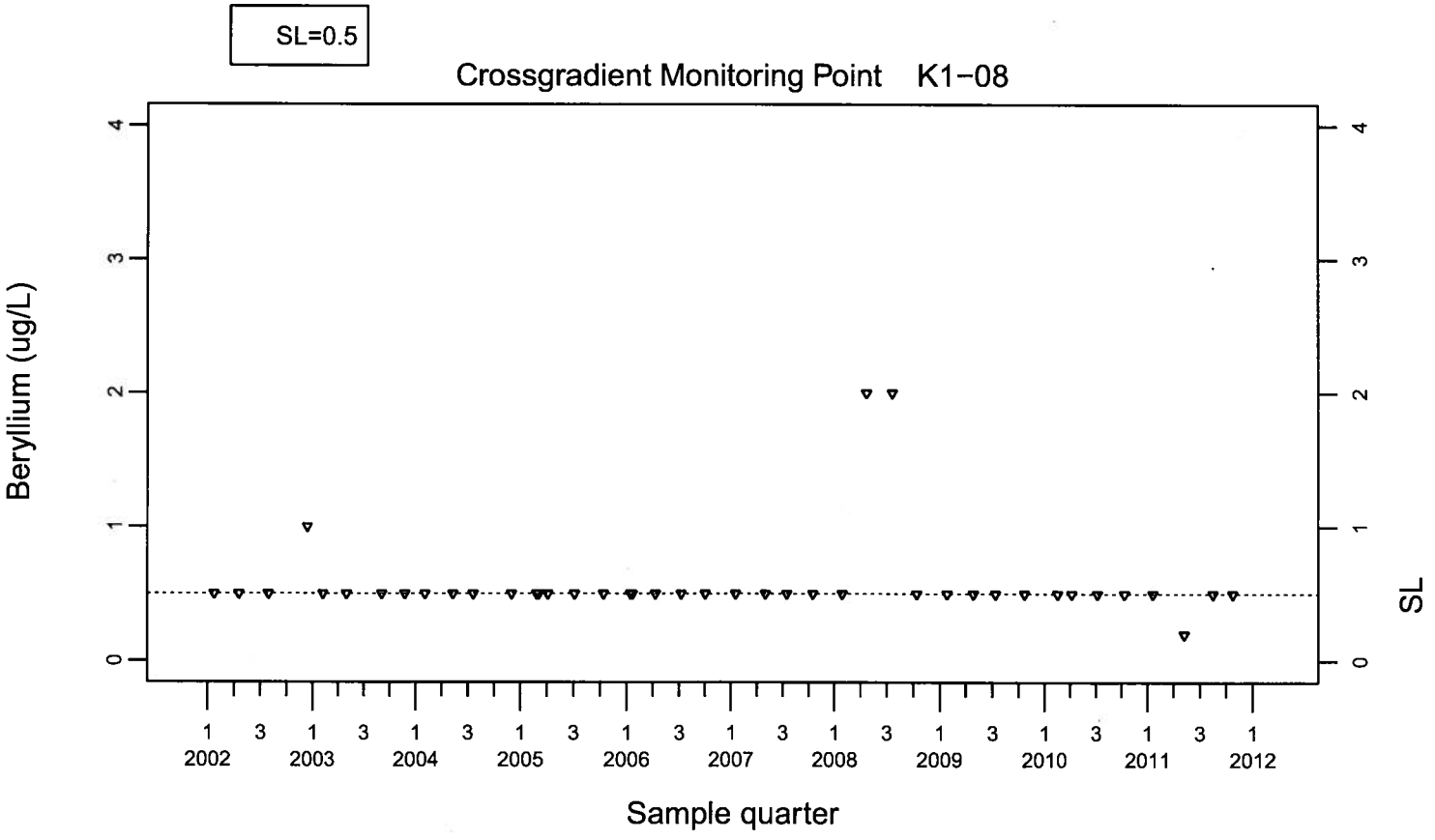
Data omitted
See Table 1

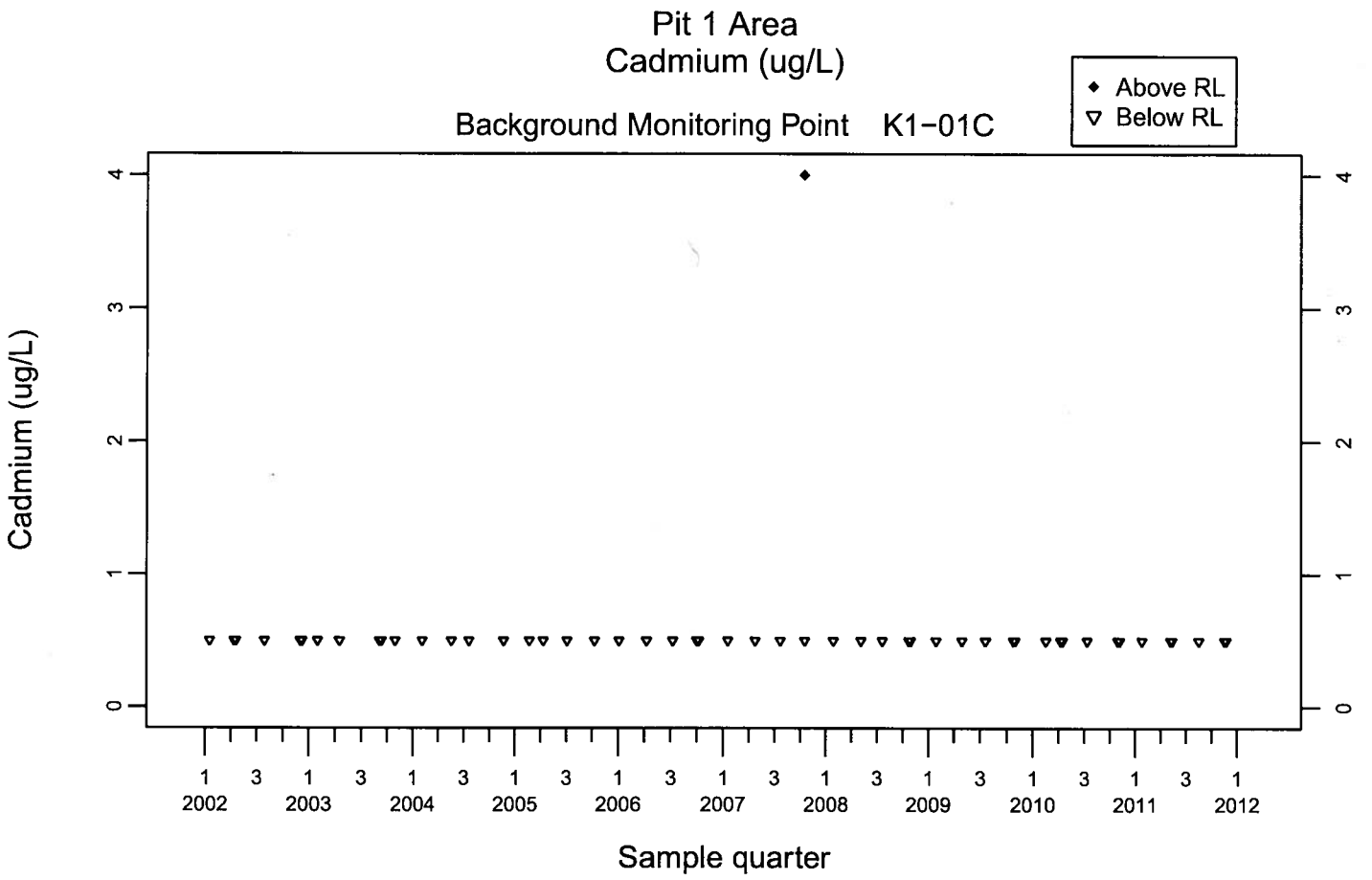


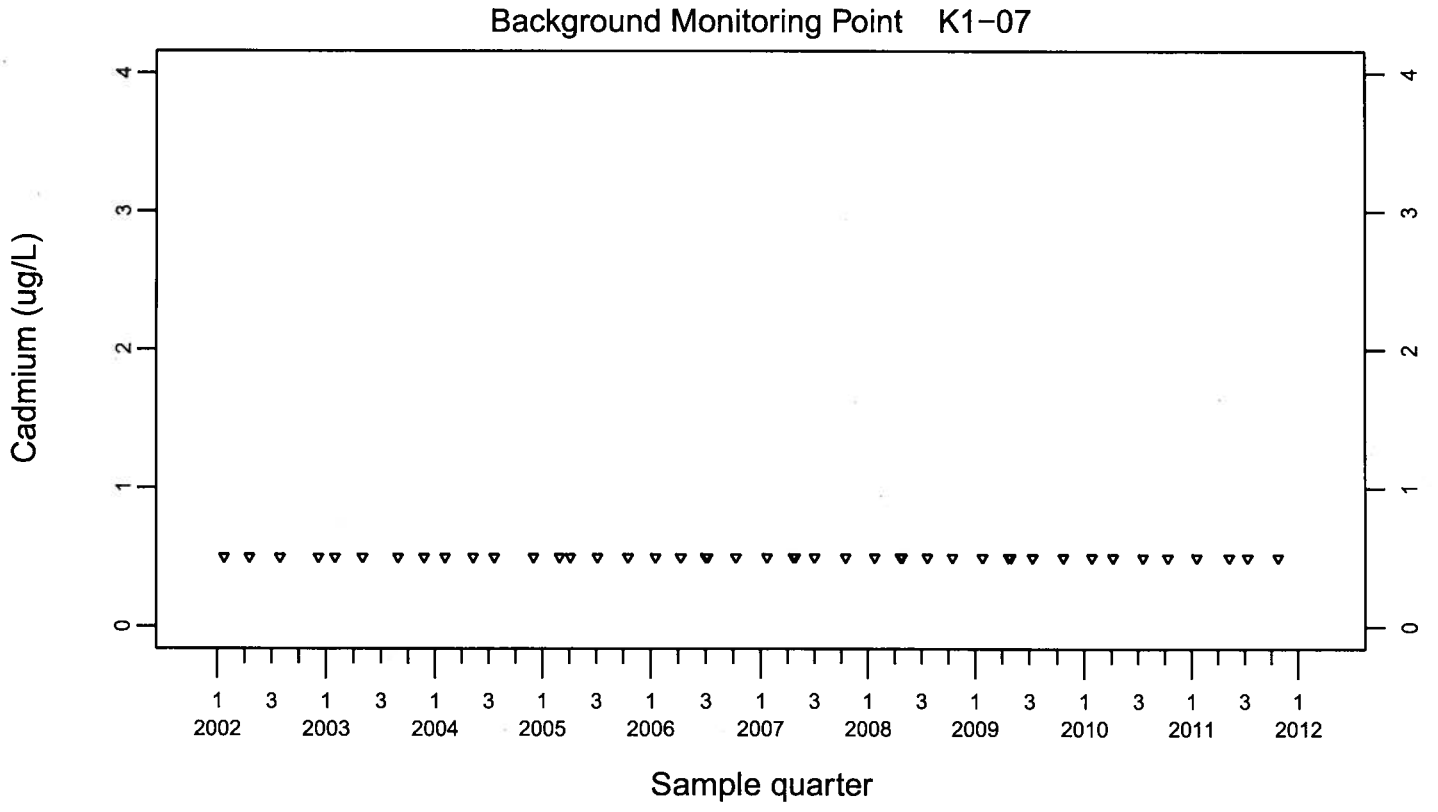

Pit 1 Area
Beryllium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Beryllium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

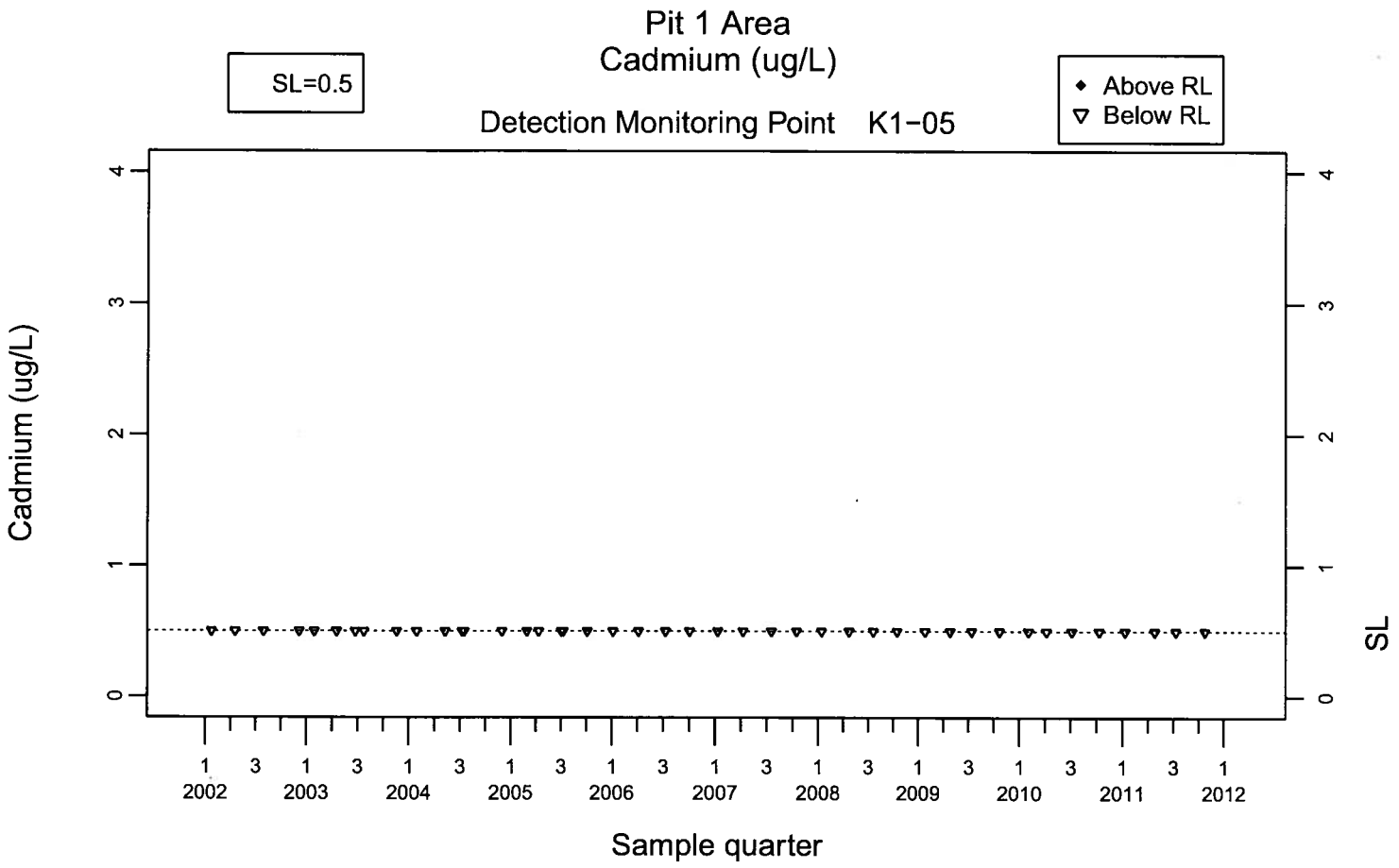

Background Monitoring Point K1-07
Beryllium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

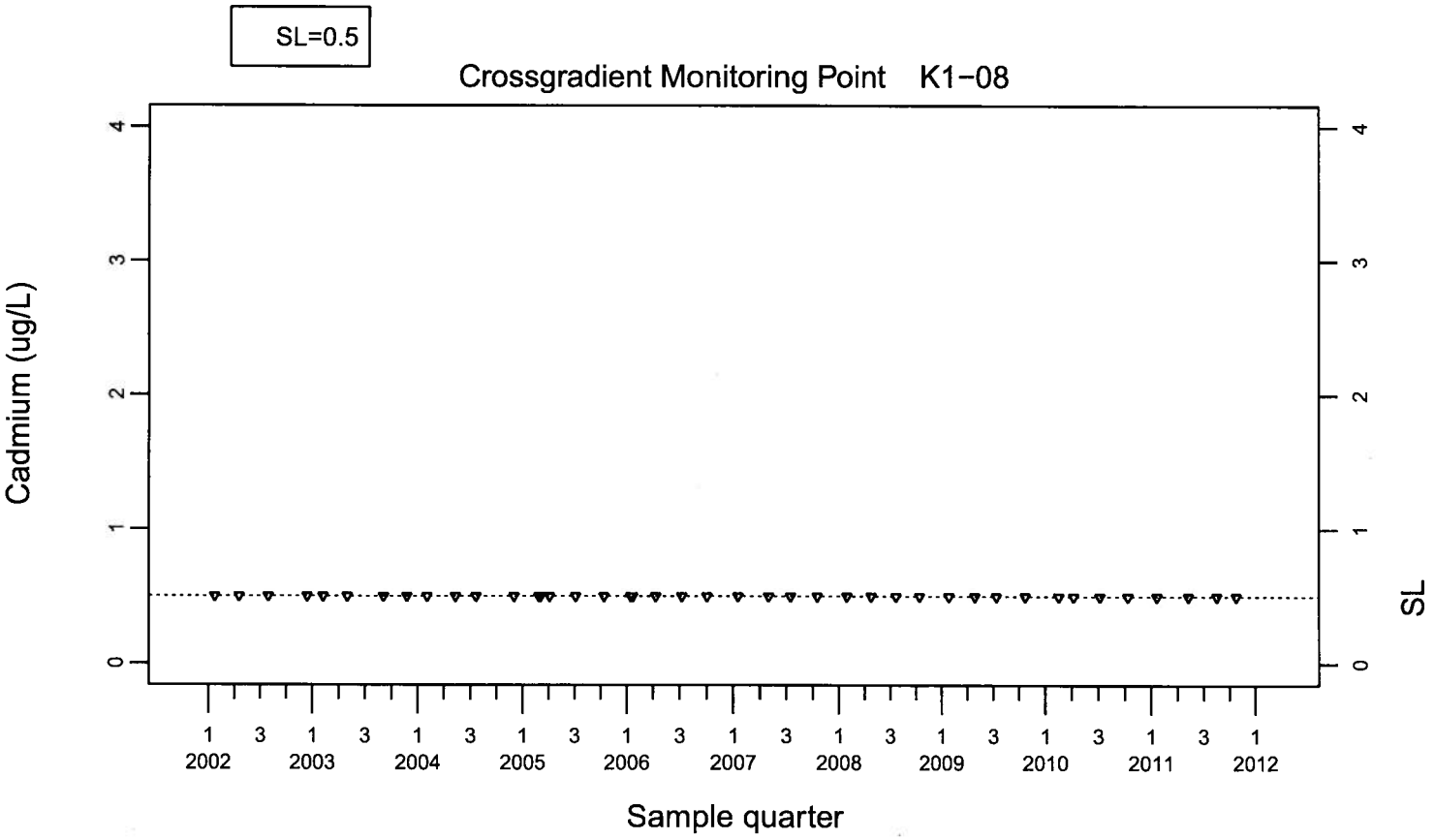

Pit 1 Area
Beryllium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1-05
Beryllium (ug/L)
SL
Sample quarter
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

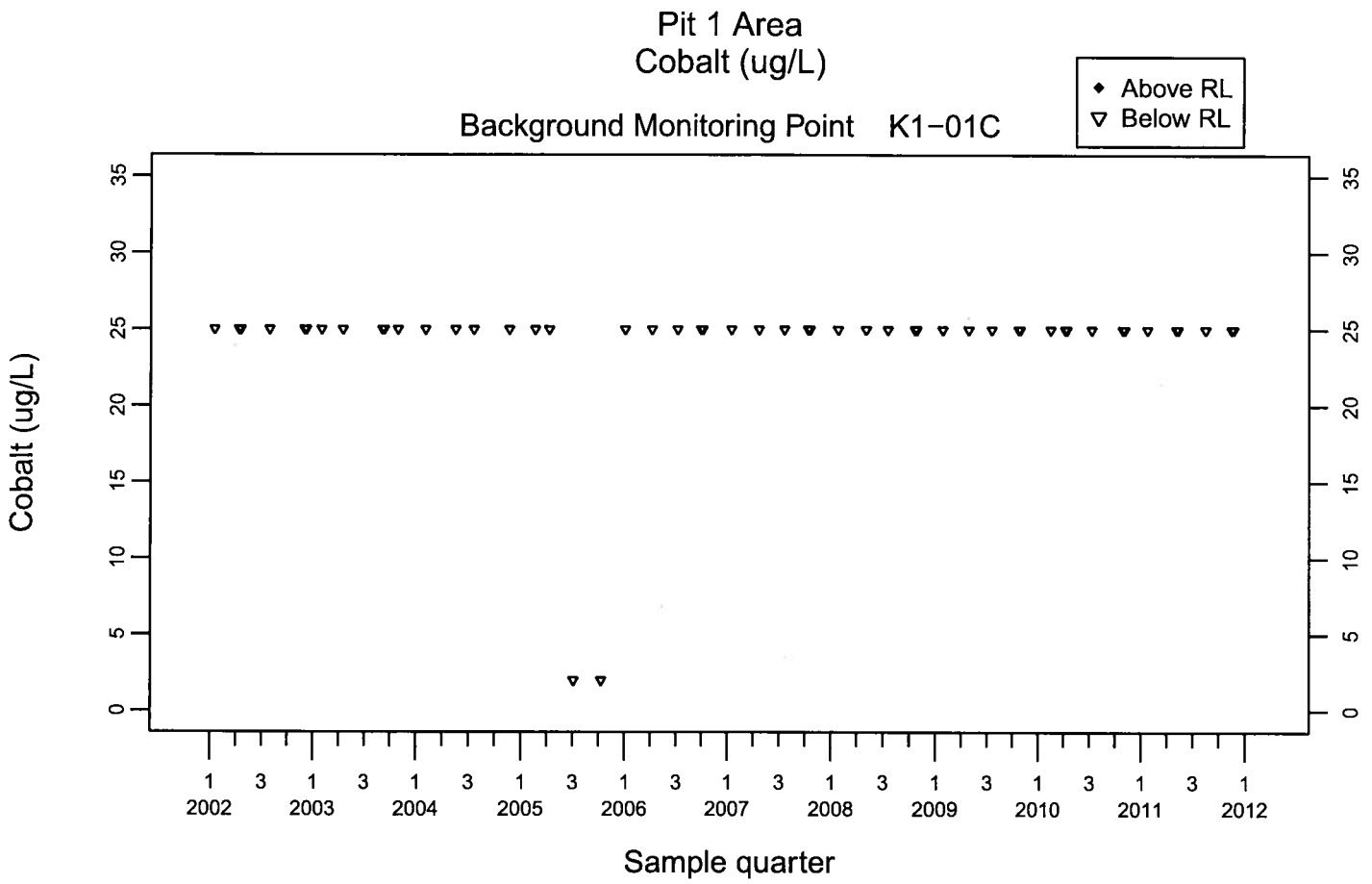

SL=0.5
Crossgradient Monitoring Point K1-08
Beryllium (ug/L)
SL
Sample quarter
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

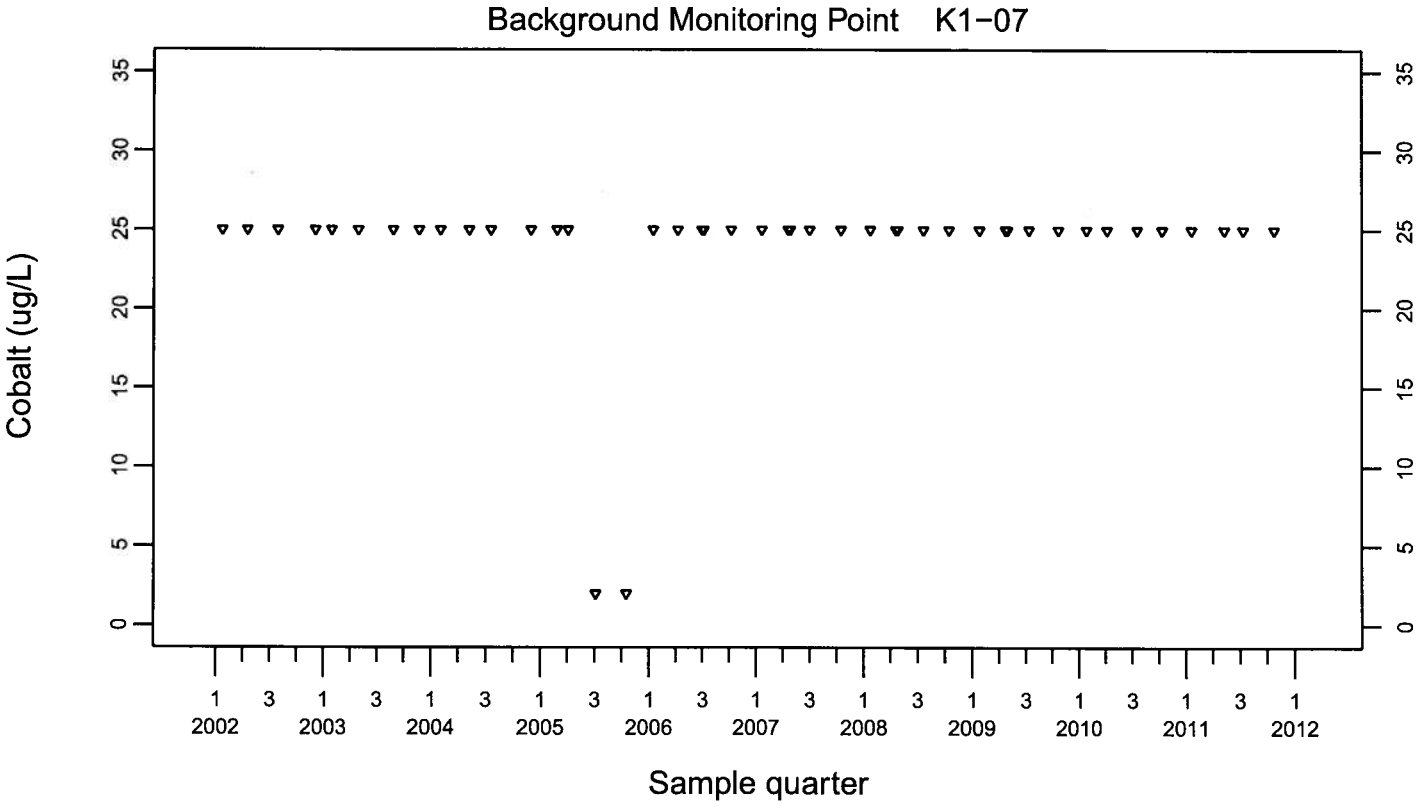

Pit 1 Area
Cadmium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Cadmium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

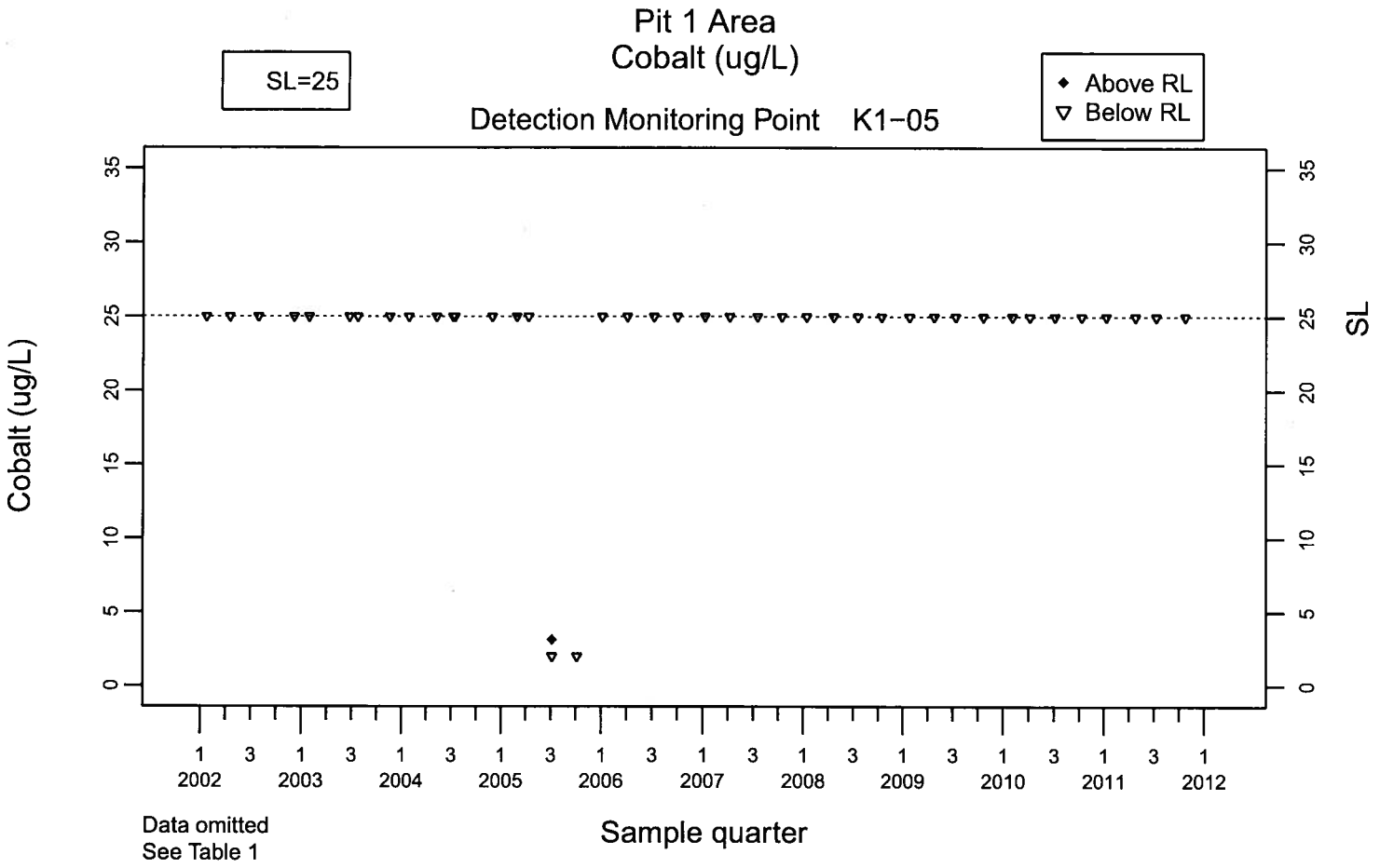

Background Monitoring Point K1-07
Cadmium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


Pit 1 Area
Cadmium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1-05
Cadmium (ug/L)
SL
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

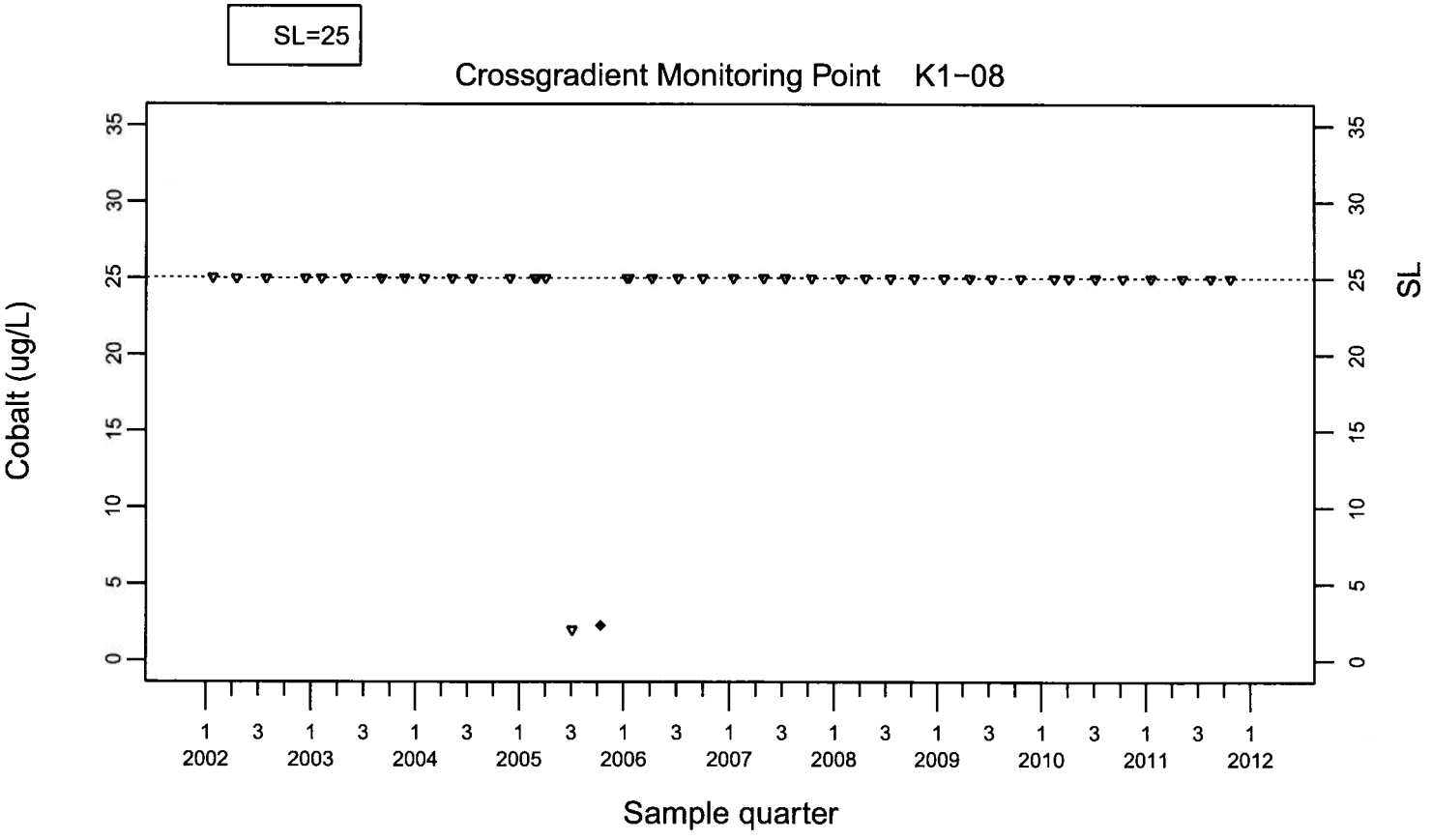

SL=0.5
Crossgradient Monitoring Point K1-08
Cadmium (ug/L)
SL
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

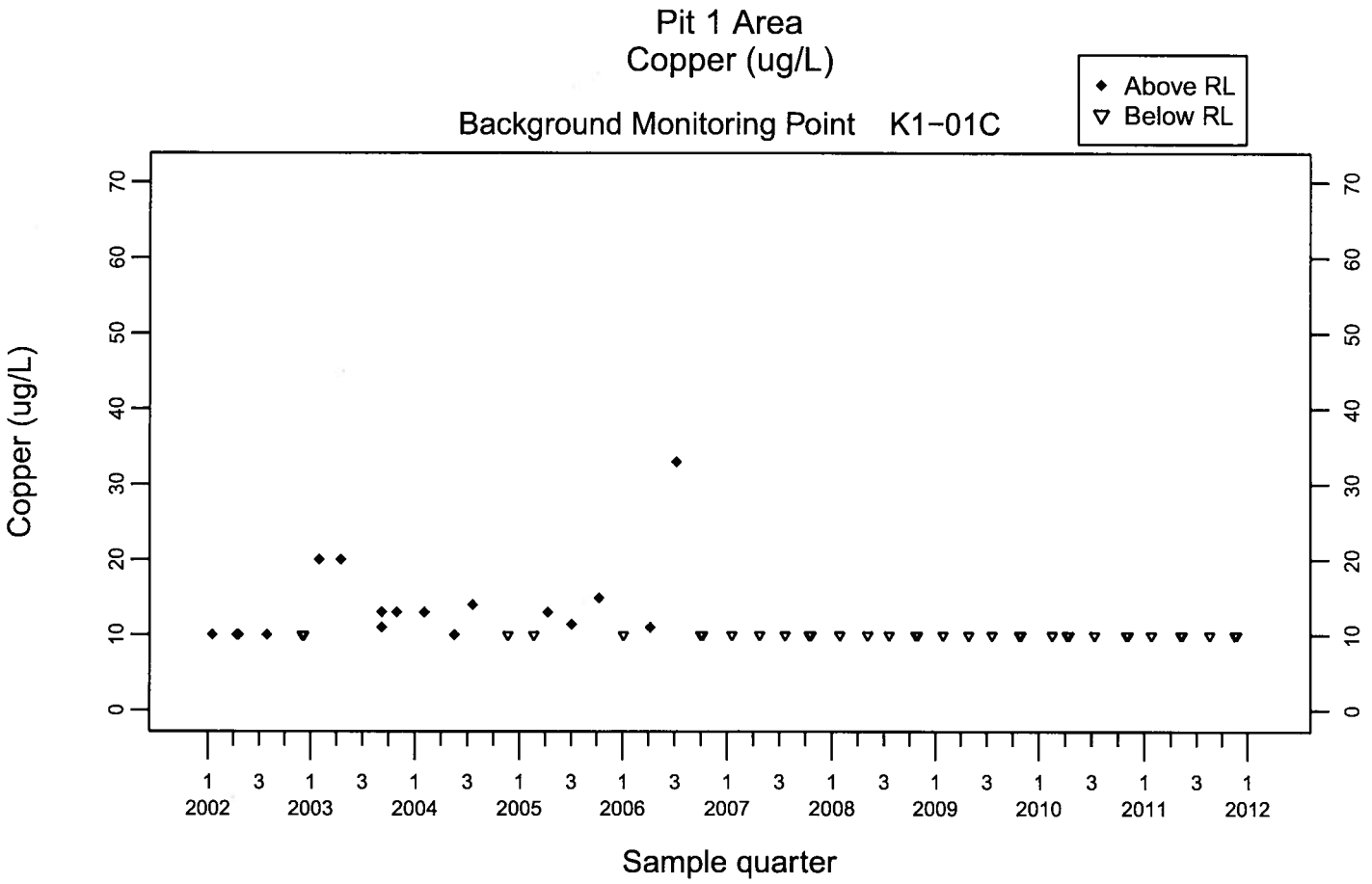

Pit 1 Area
Cobalt (ug/L)
Above RL
Below RL
Background Monitoring Point K1-01C
Cobalt (ug/L)
0
5
10
15
20
25
30
35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

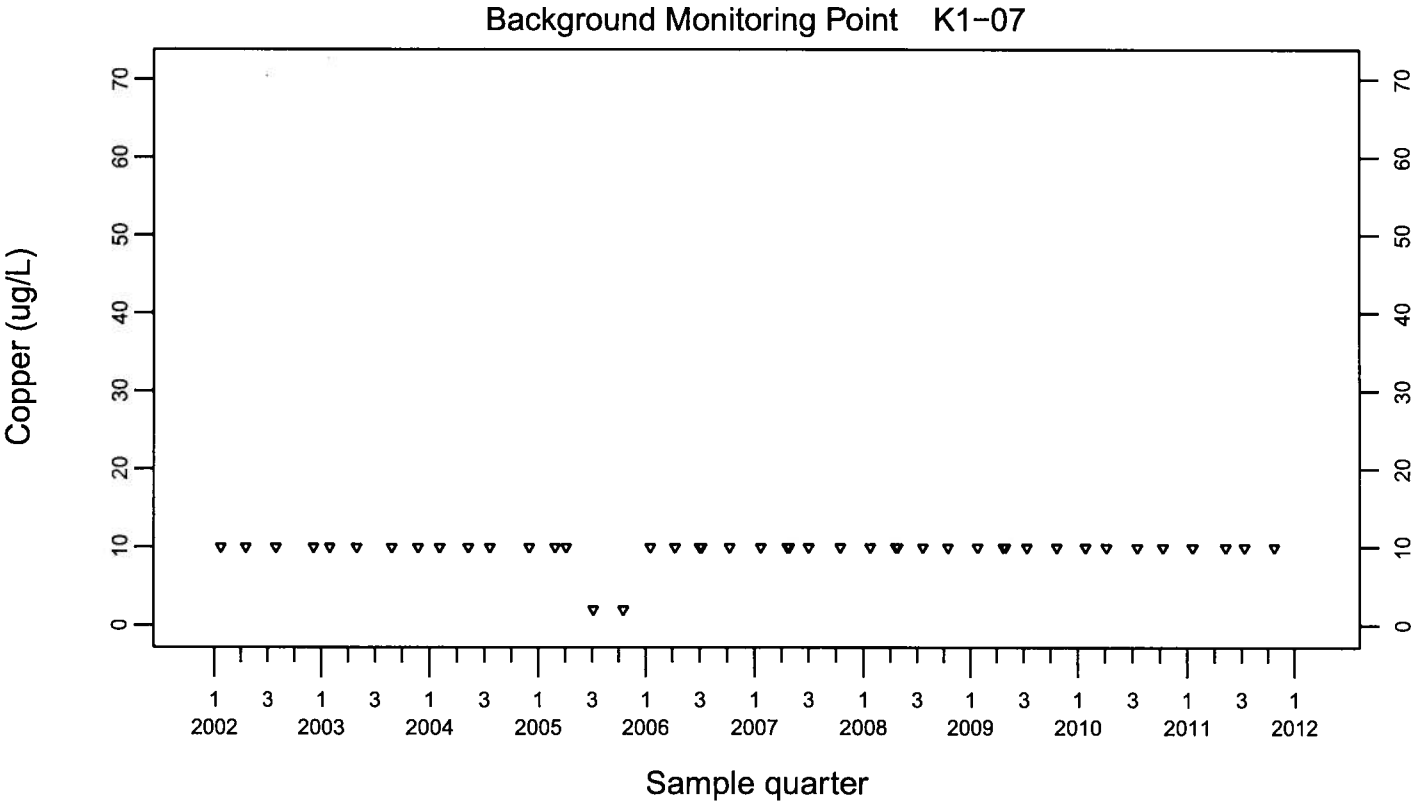

Background Monitoring Point K1-07
Cobalt (ug/L)
0
5
10
15
20
25
30
35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

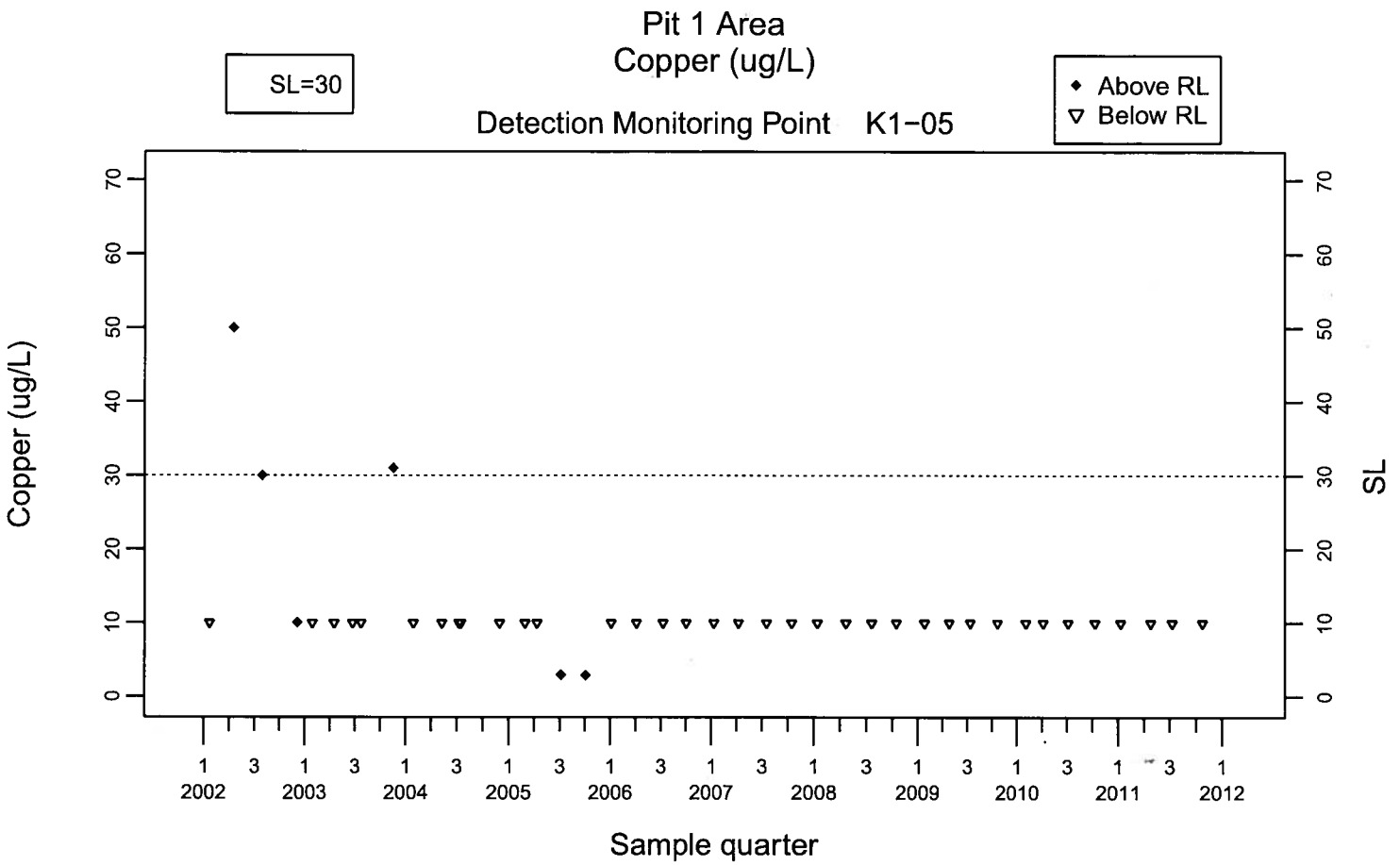


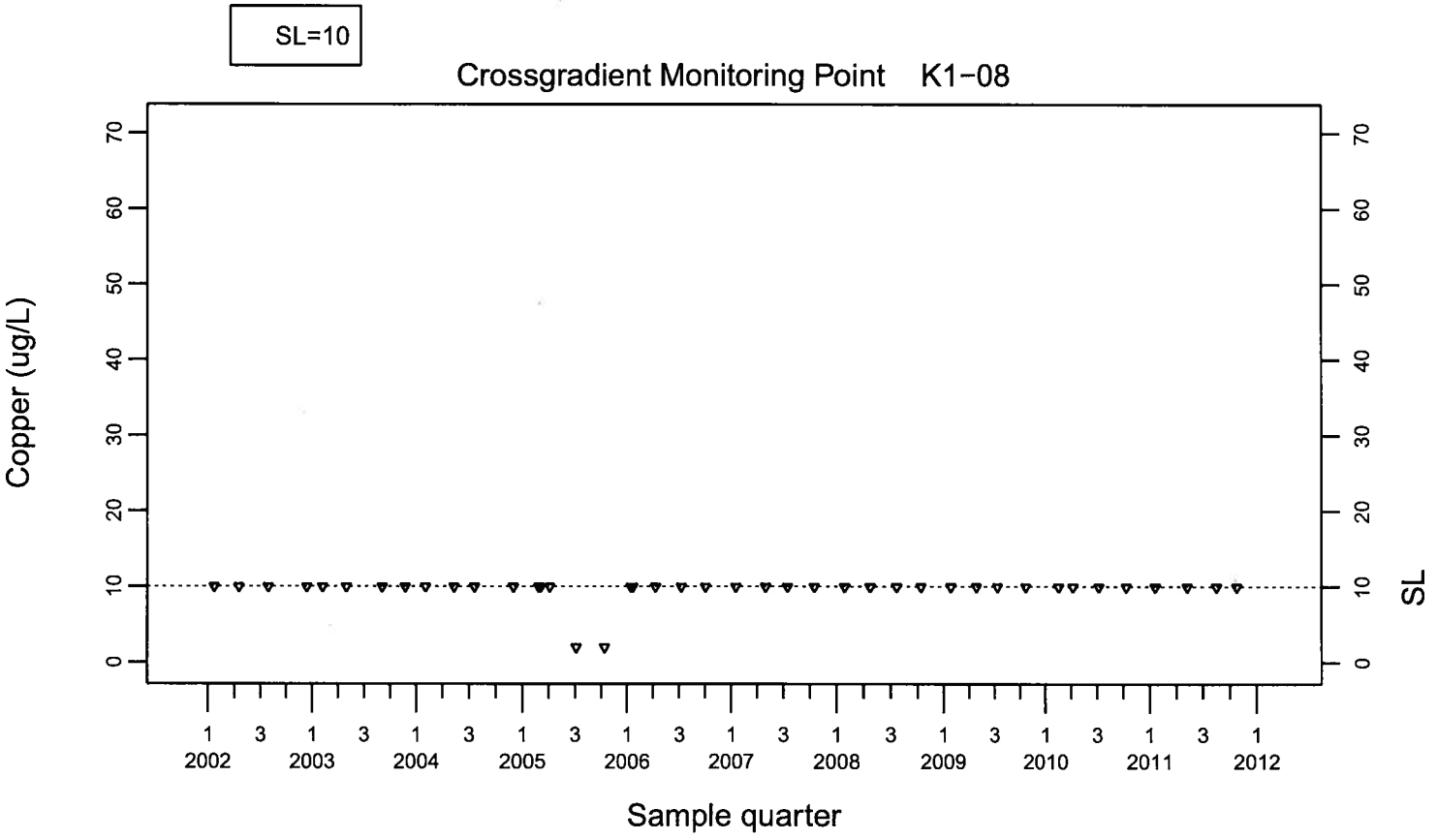
Data omitted
See Table 1

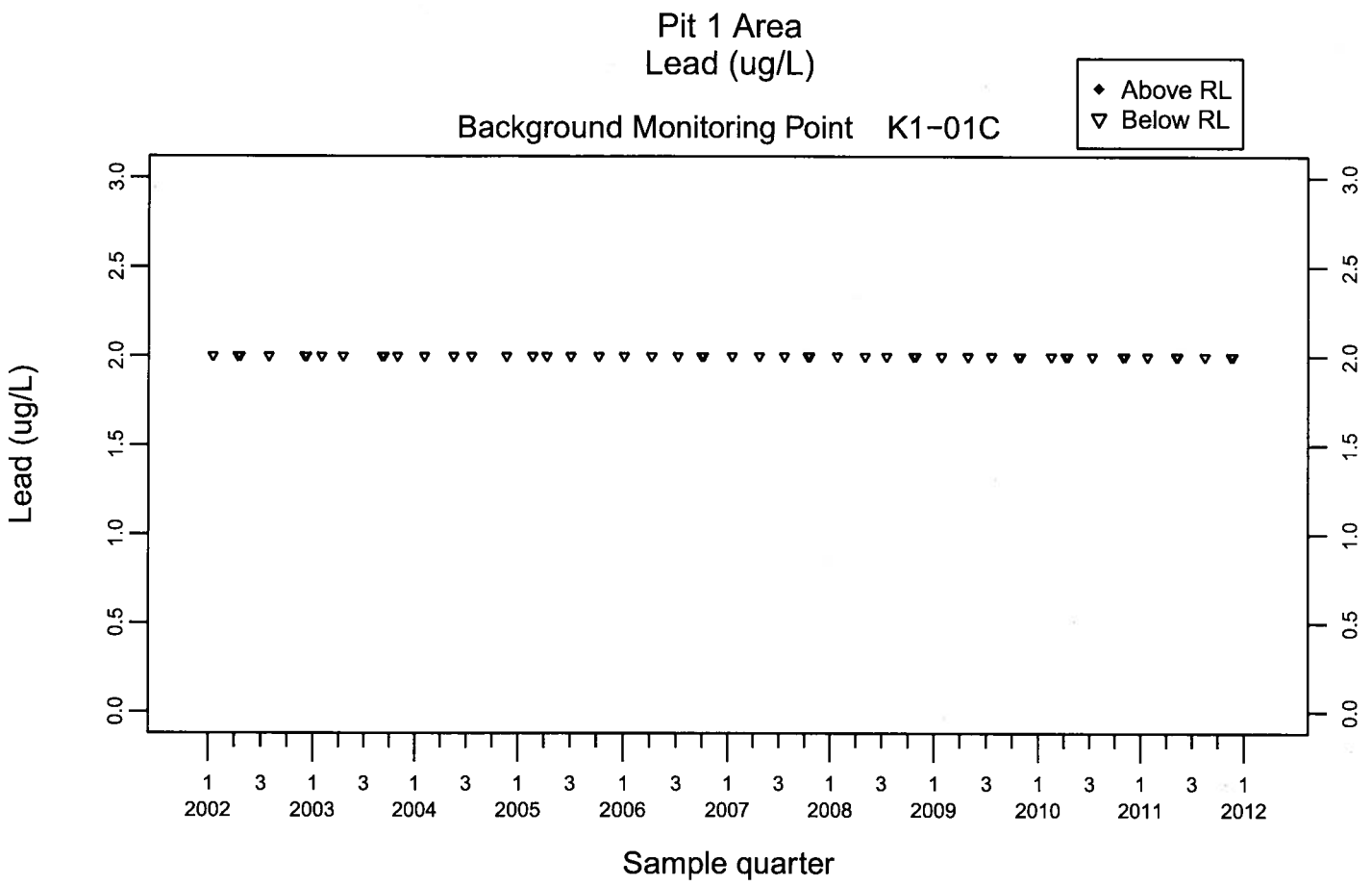


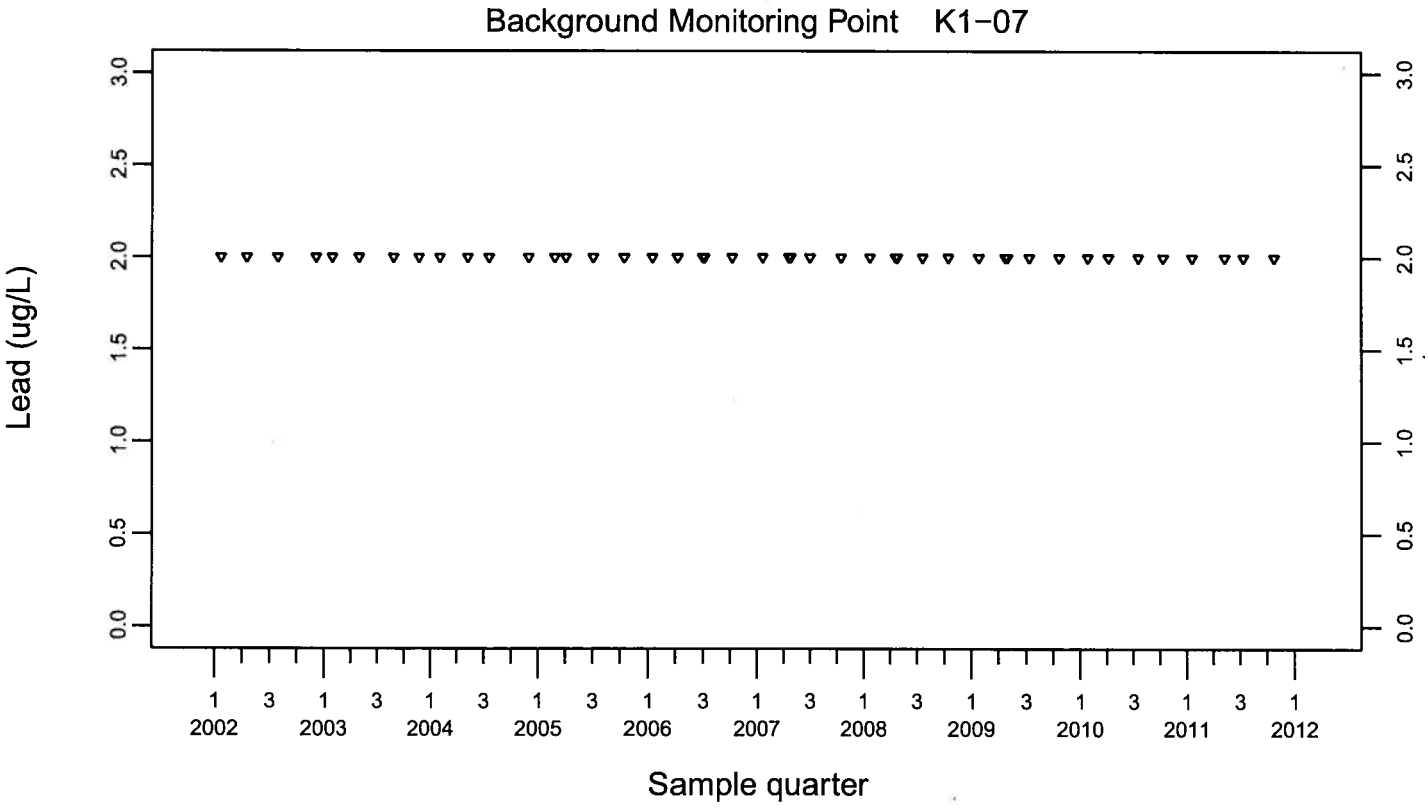

Pit 1 Area
Copper (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Copper (ug/L)
0
10
20
30
40
50
60
70
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

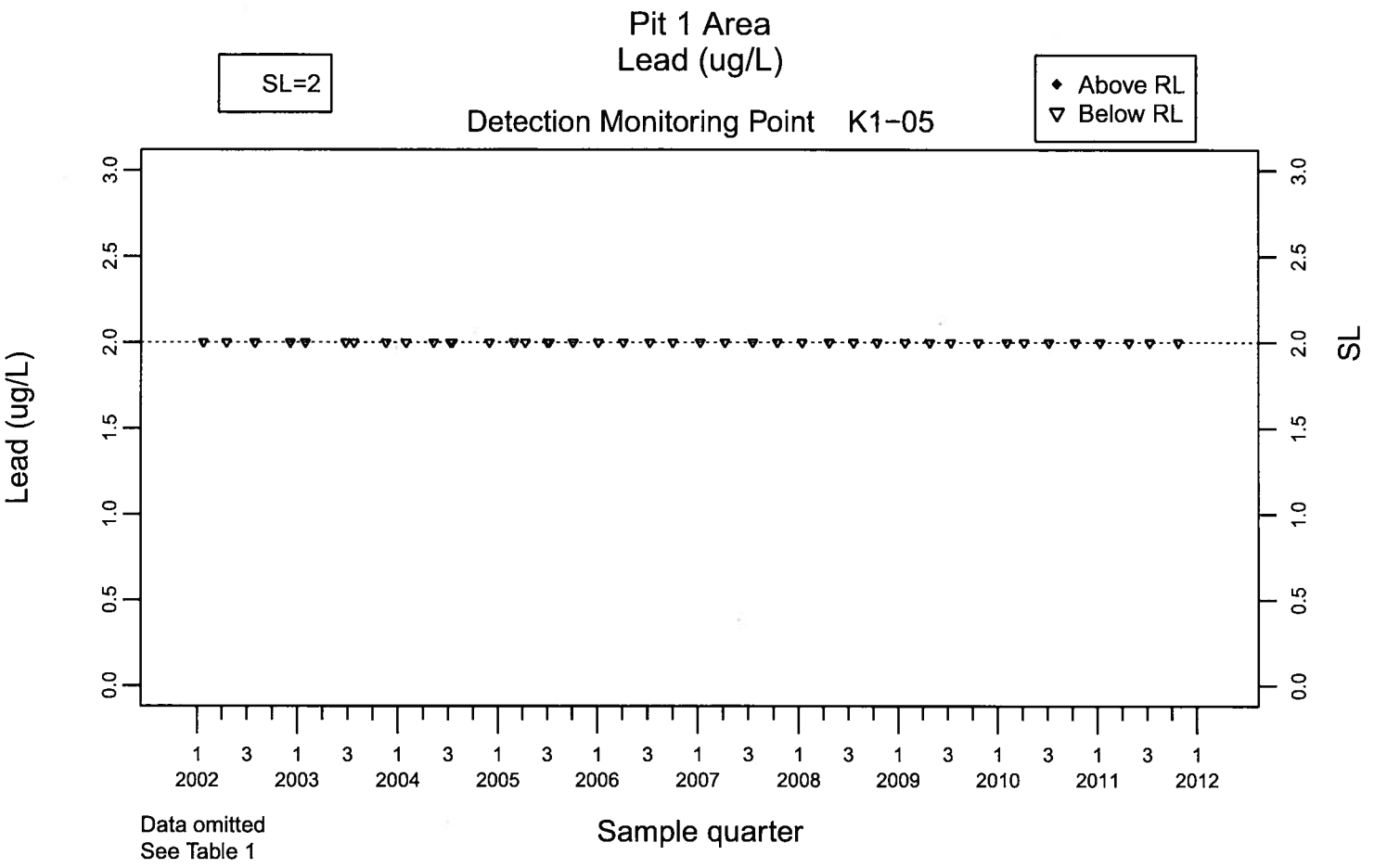

Background Monitoring Point K1-07
Copper (ug/L)
0
10
20
30
40
50
60
70
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


Pit 1 Area
Copper (ug/L)
SL=30
Above RL
Below RL
Detection Monitoring Point K1-05
Copper (ug/L)
SL
Sample quarter
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

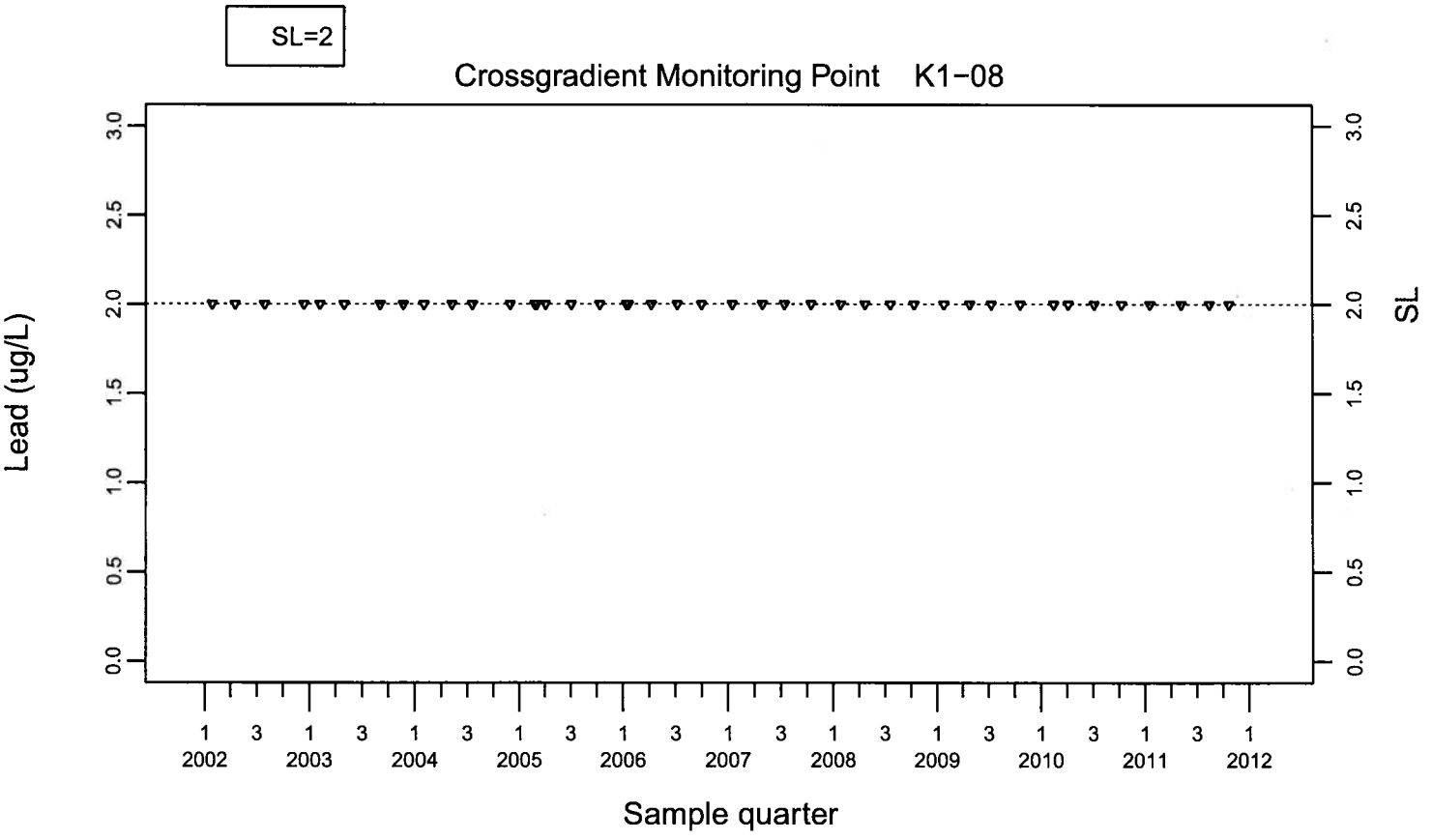

SL=10
Crossgradient Monitoring Point K1-08
Copper (ug/L)
SL
Sample quarter
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

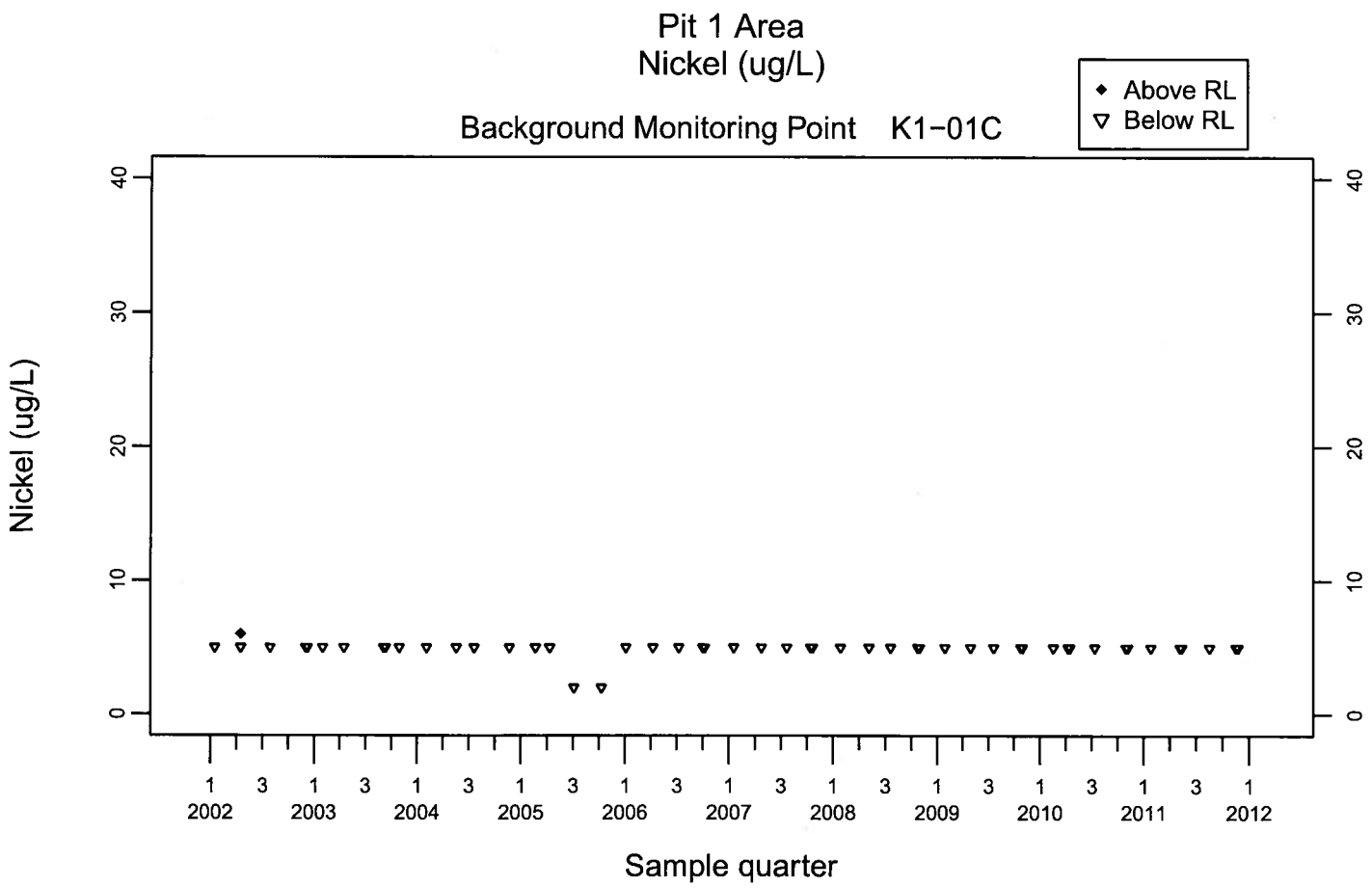

Pit 1 Area
Lead (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Lead (ug/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

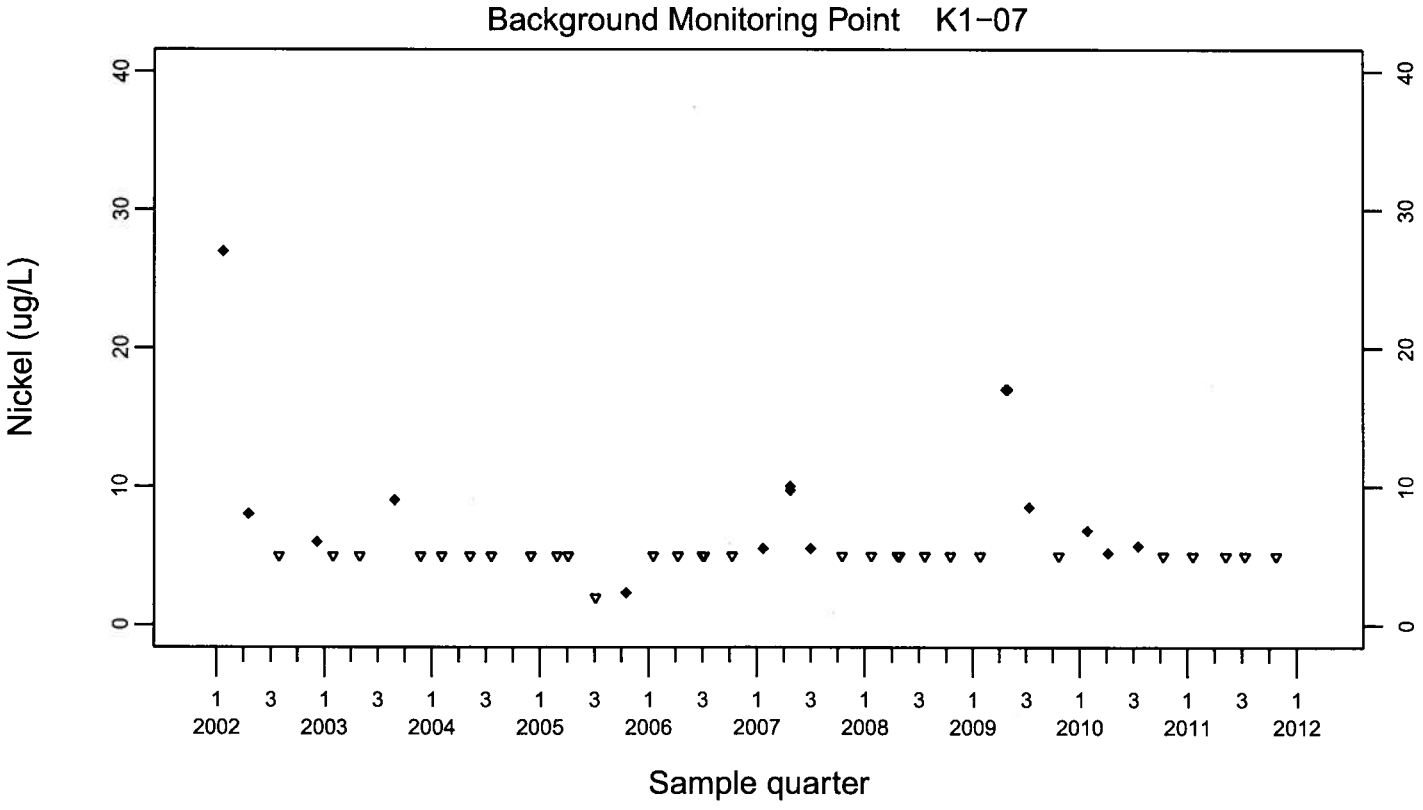

Background Monitoring Point K1-07
Lead (ug/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

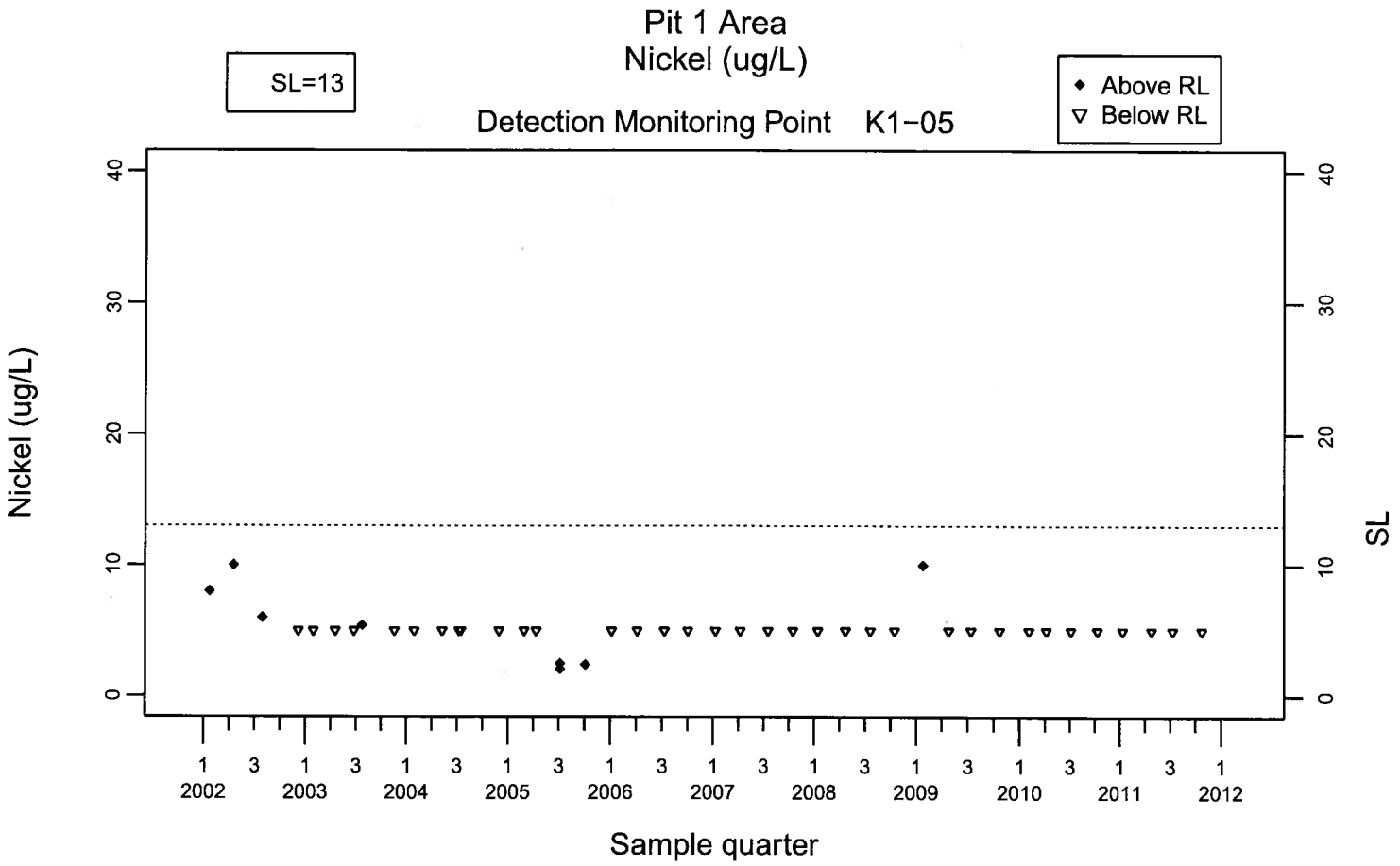


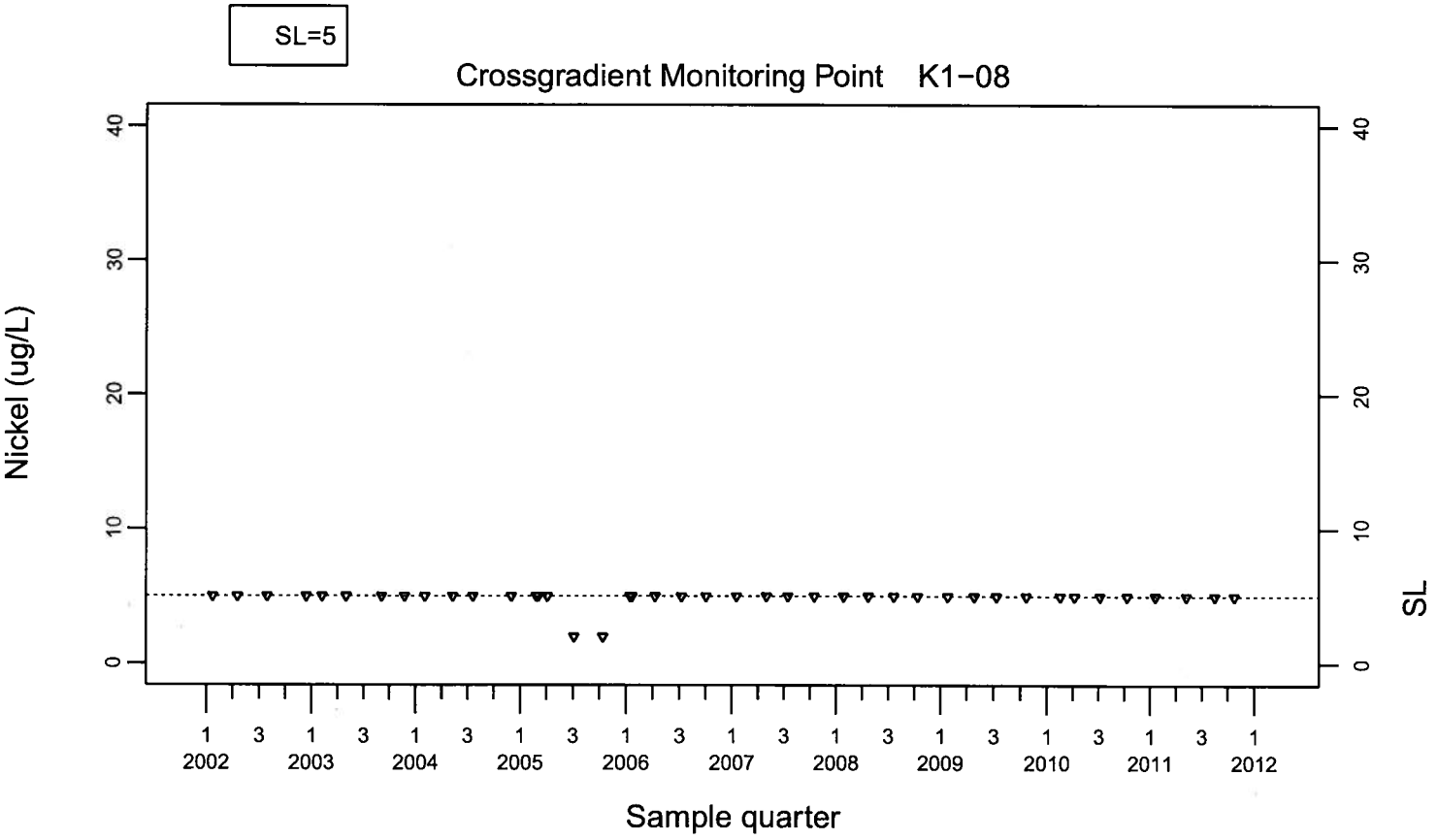
Data omitted
See Table 1

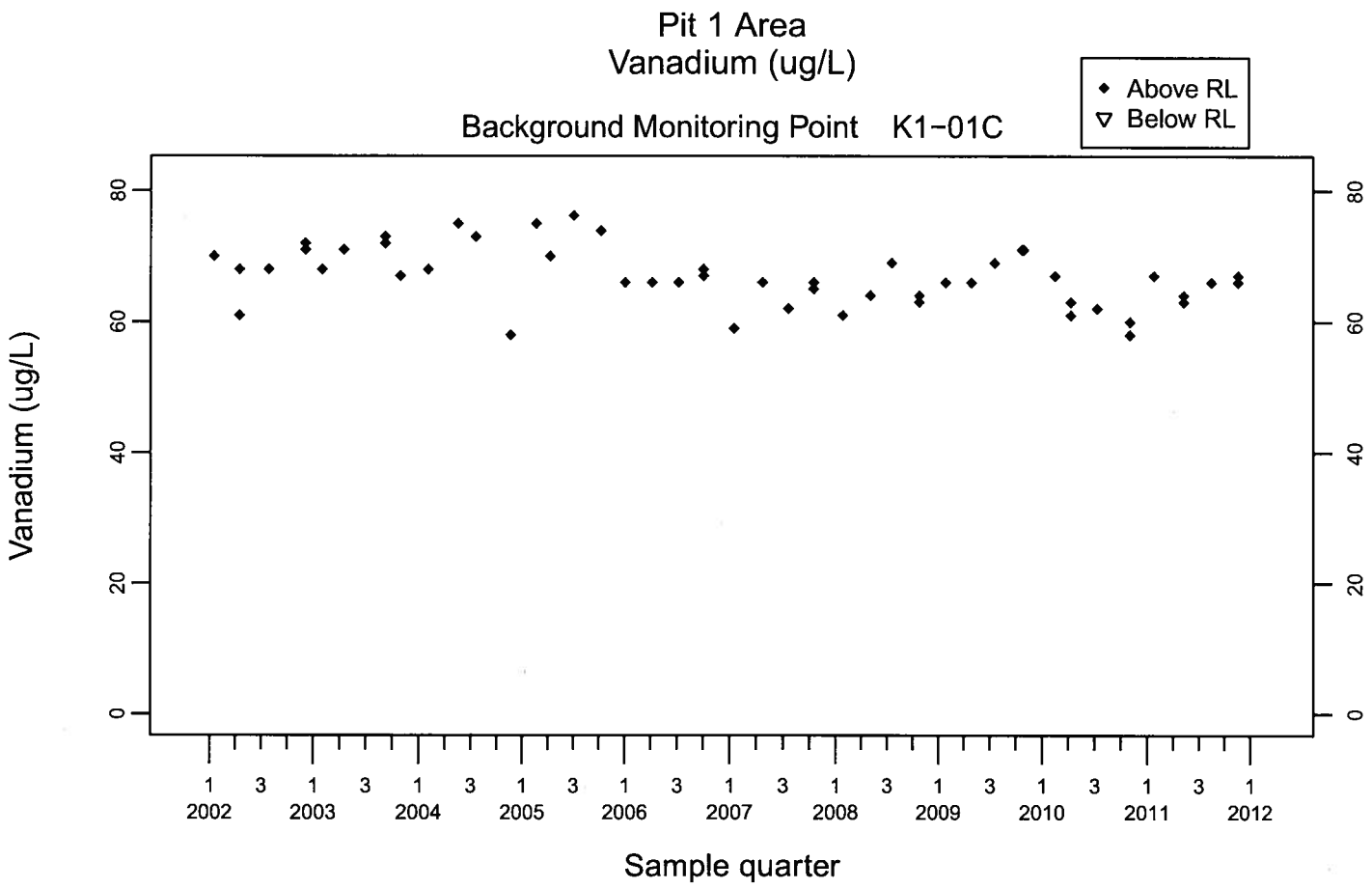


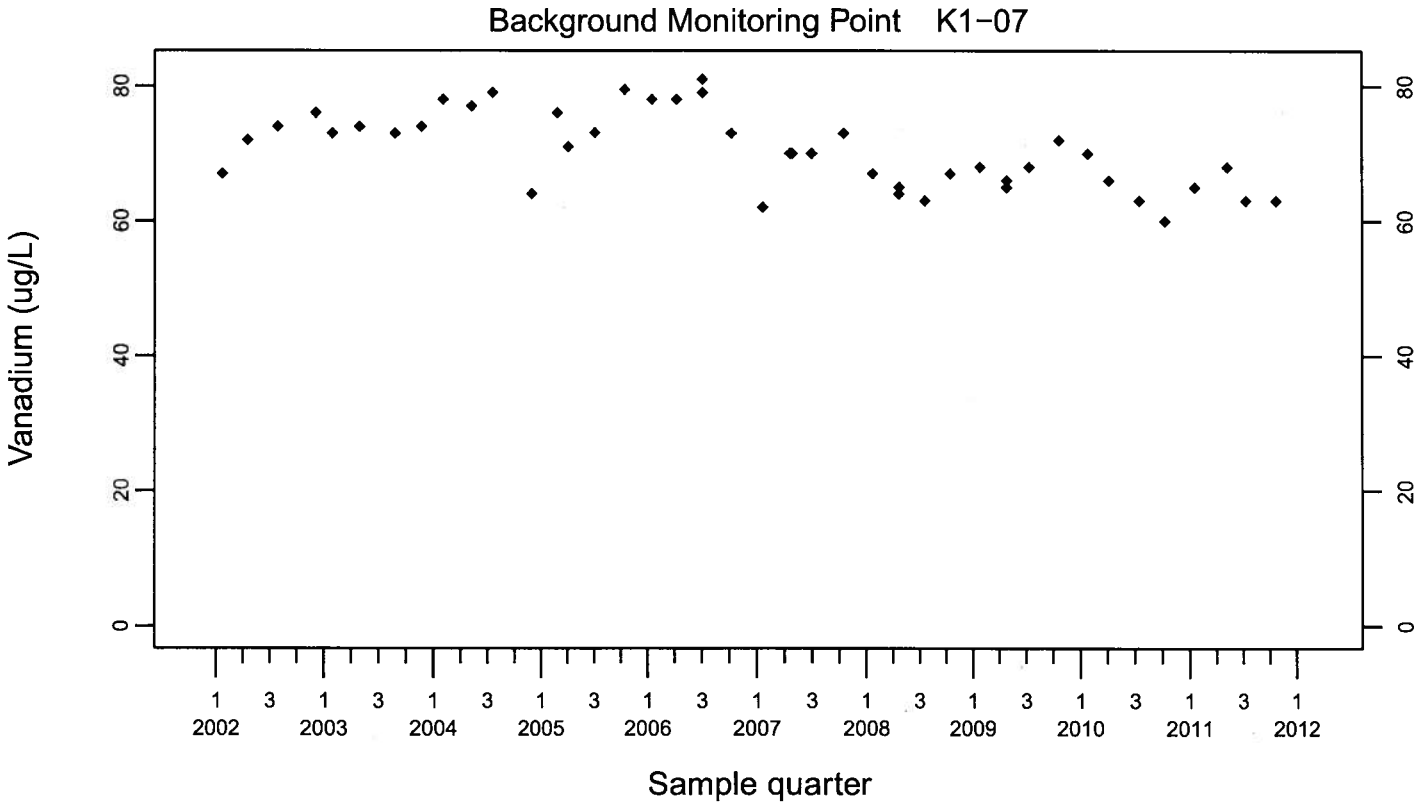

Pit 1 Area
Nickel (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Nickel (ug/L)
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

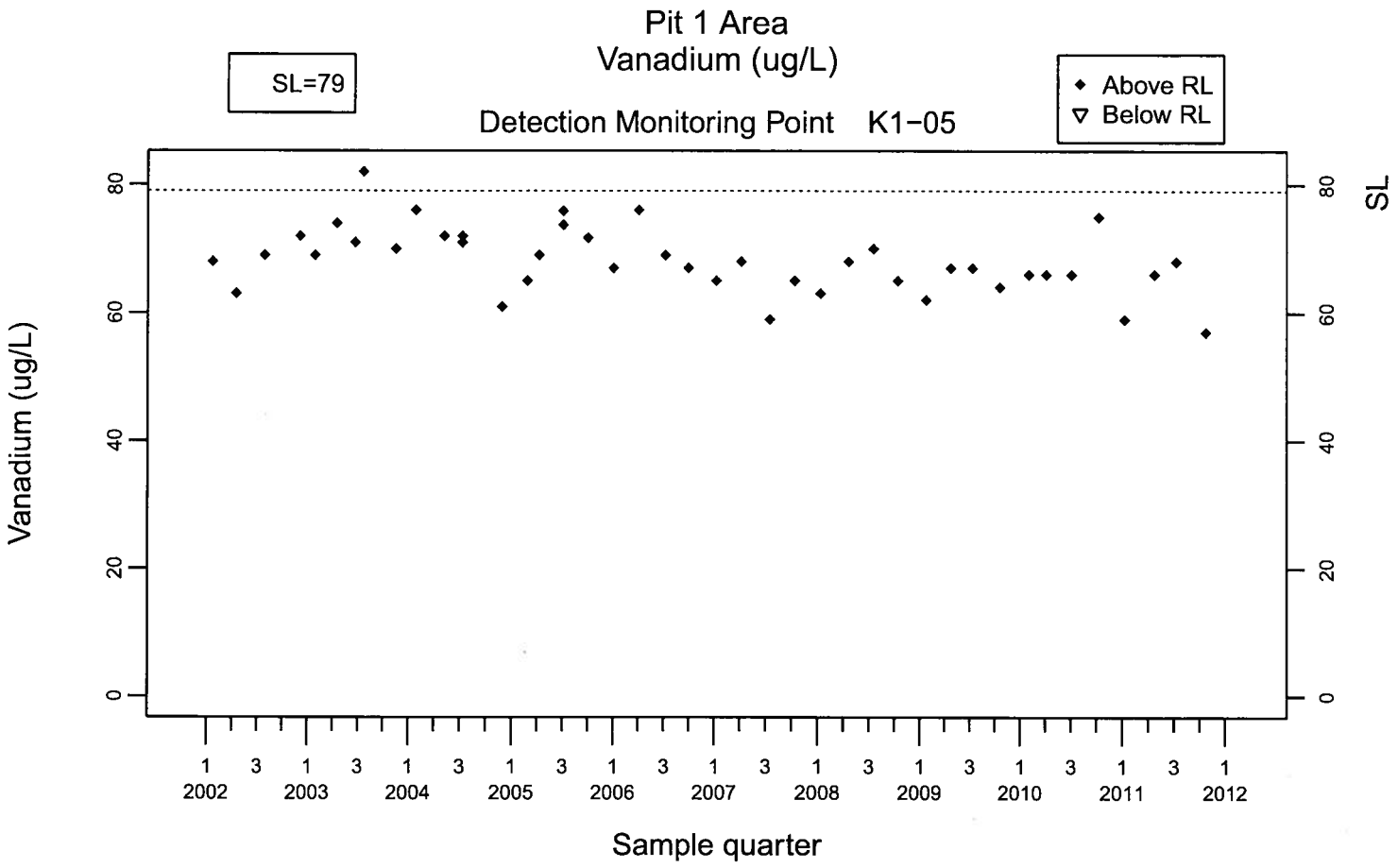

Background Monitoring Point K1-07
Nickel (ug/L)
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

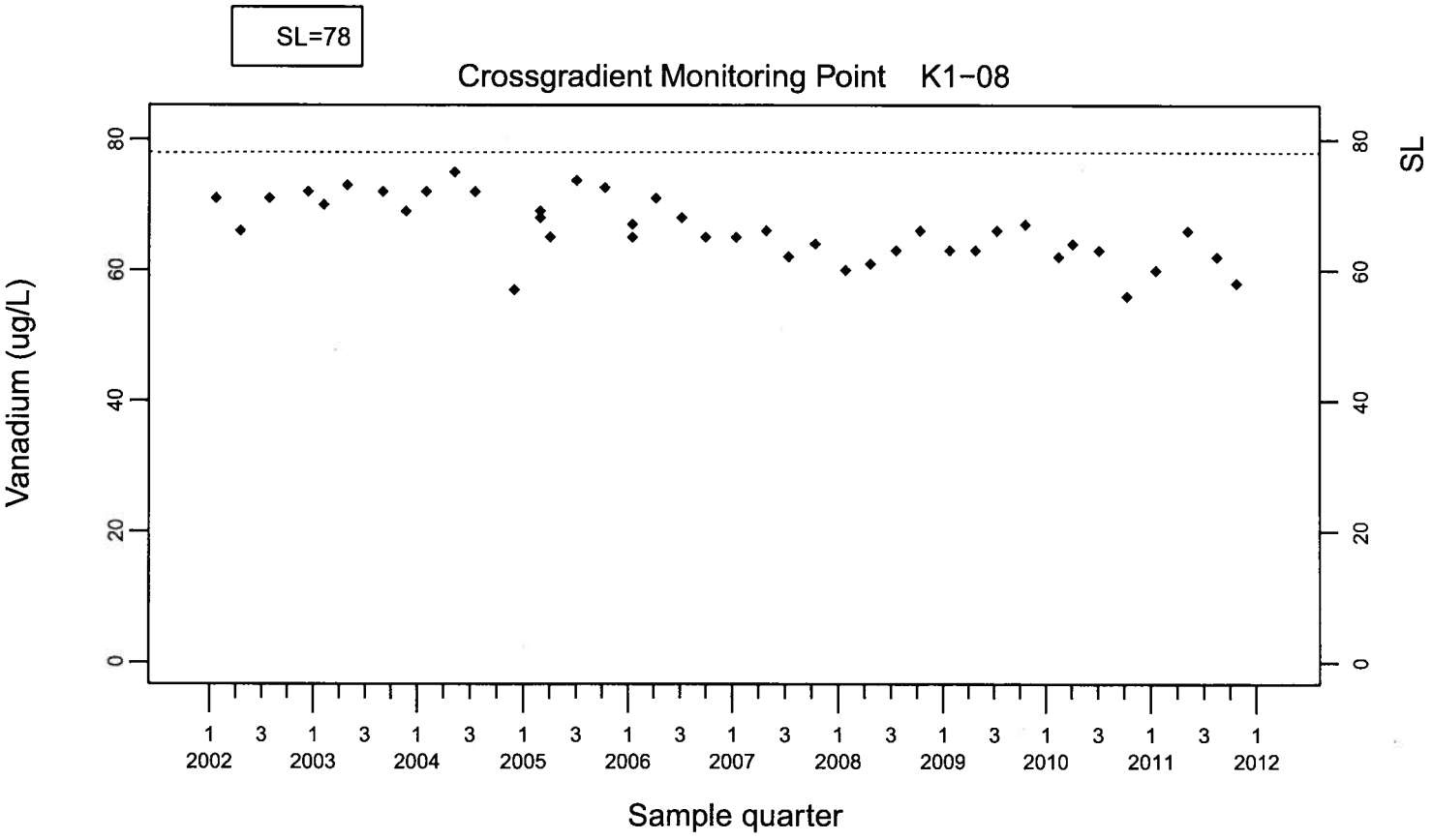

Pit 1 Area
Nickel (ug/L)
SL=13
Above RL
Below RL
Detection Monitoring Point K1-05
Nickel (ug/L)
SL
Sample quarter
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

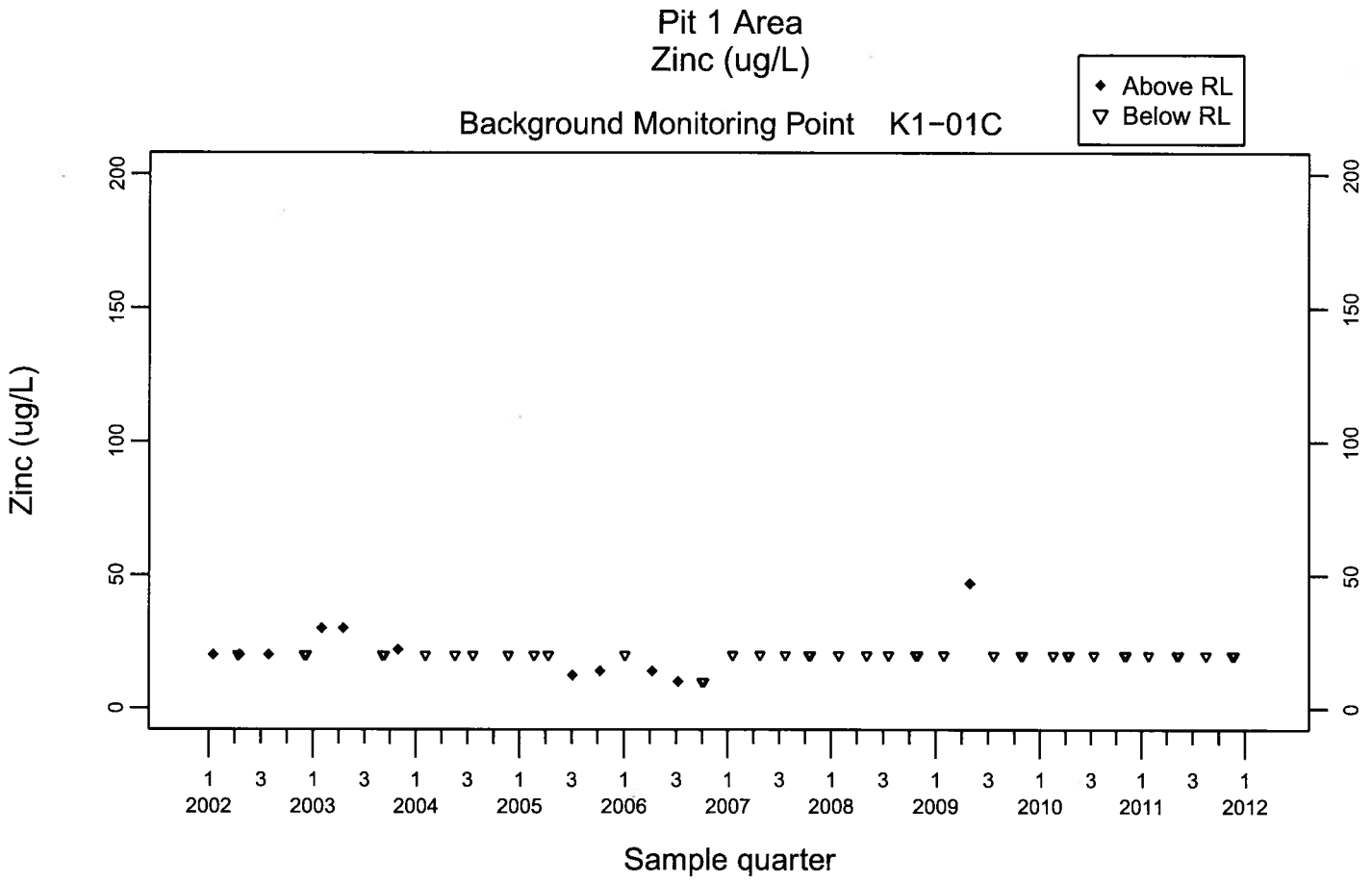

SL=5
Crossgradient Monitoring Point K1-08
Nickel (ug/L)
SL
Sample quarter
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

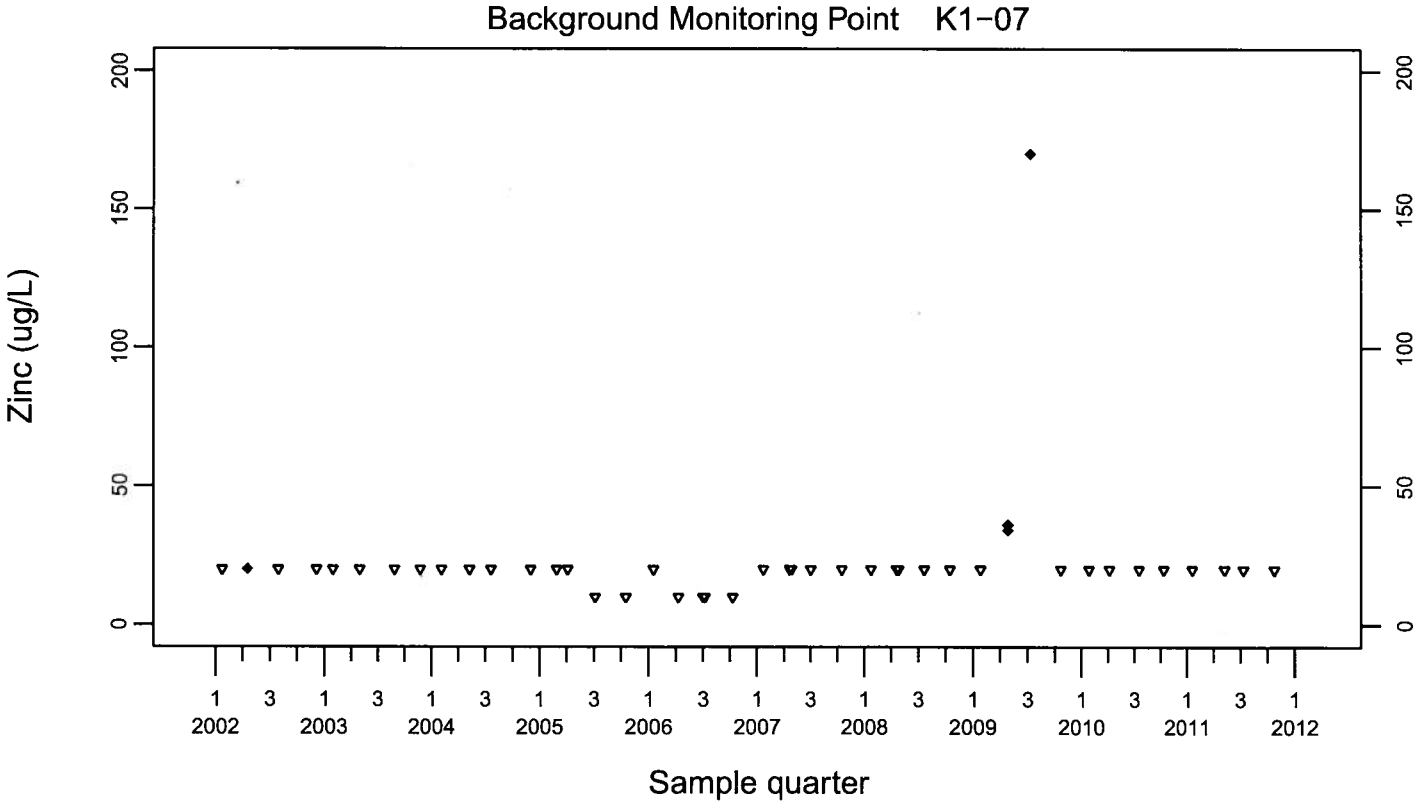

Pit 1 Area
Vanadium (ug/L)
Above RL
Below RL
Background Monitoring Point K1-01C
Vanadium (ug/L)
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

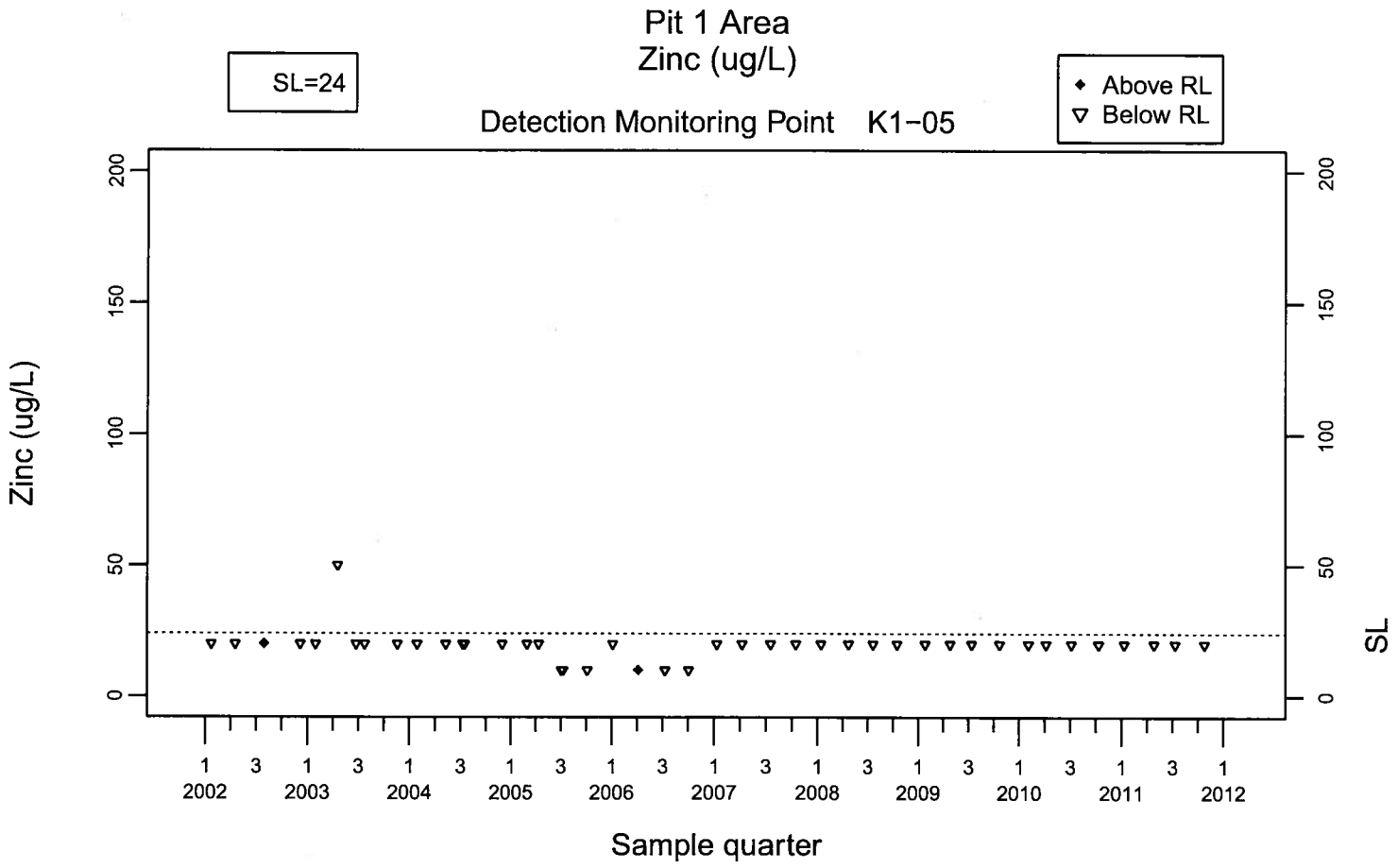

Background Monitoring Point K1-07
Vanadium (ug/L)
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

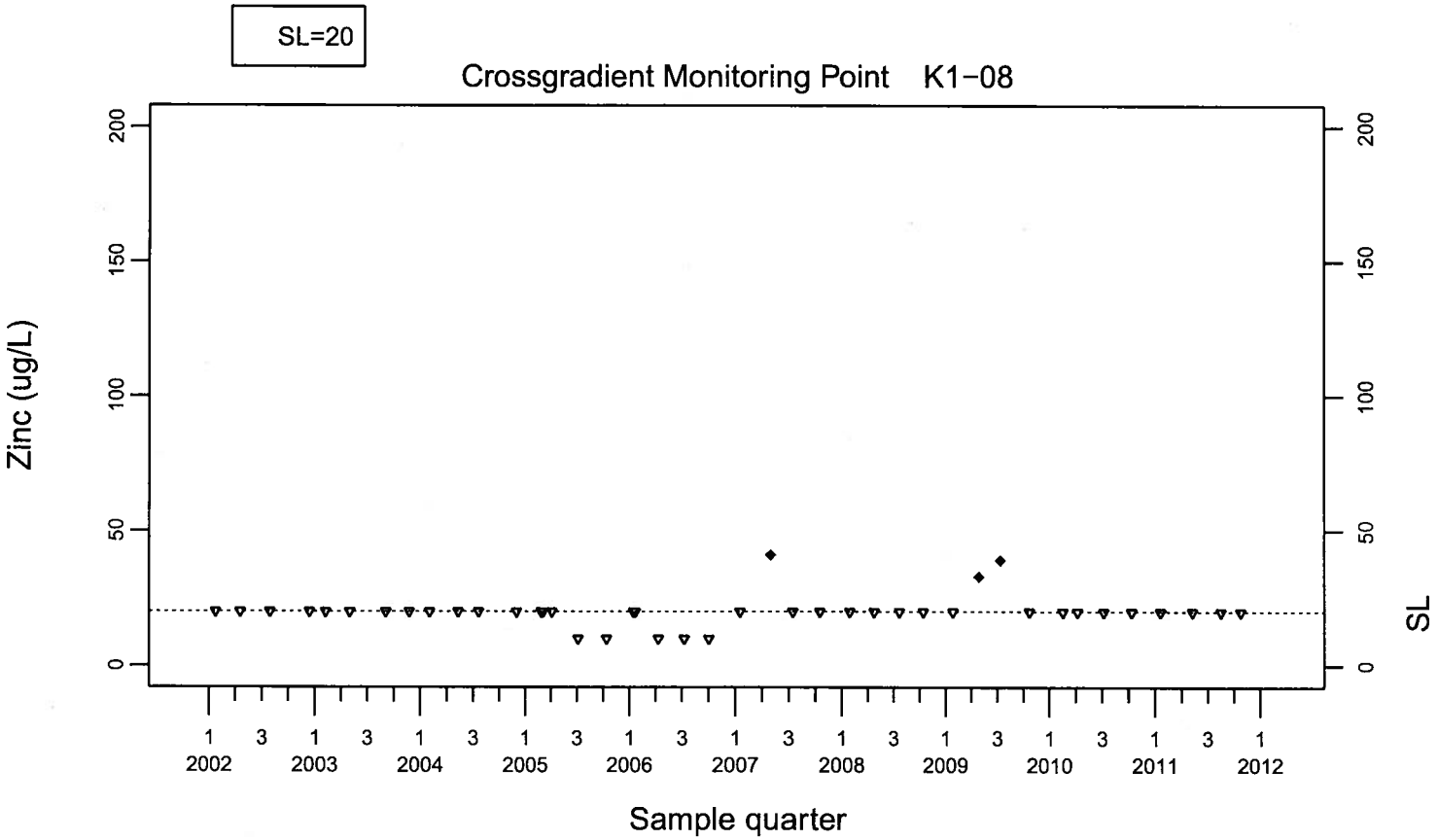

Pit 1 Area
Vanadium (ug/L)
SL=79
Above RL
Below RL
Detection Monitoring Point K1-05
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

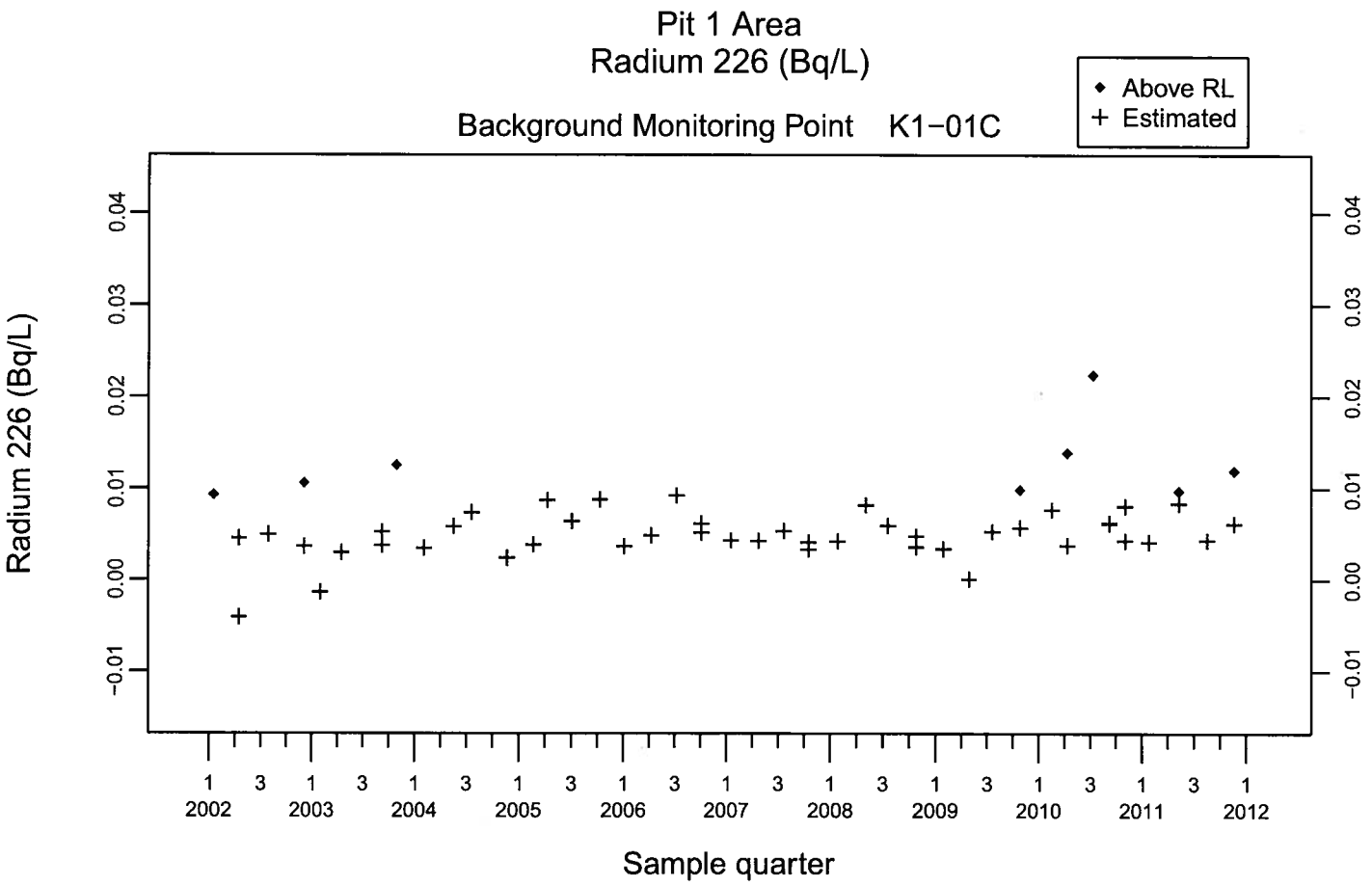

SL=78
Crossgradient Monitoring Point K1-08
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

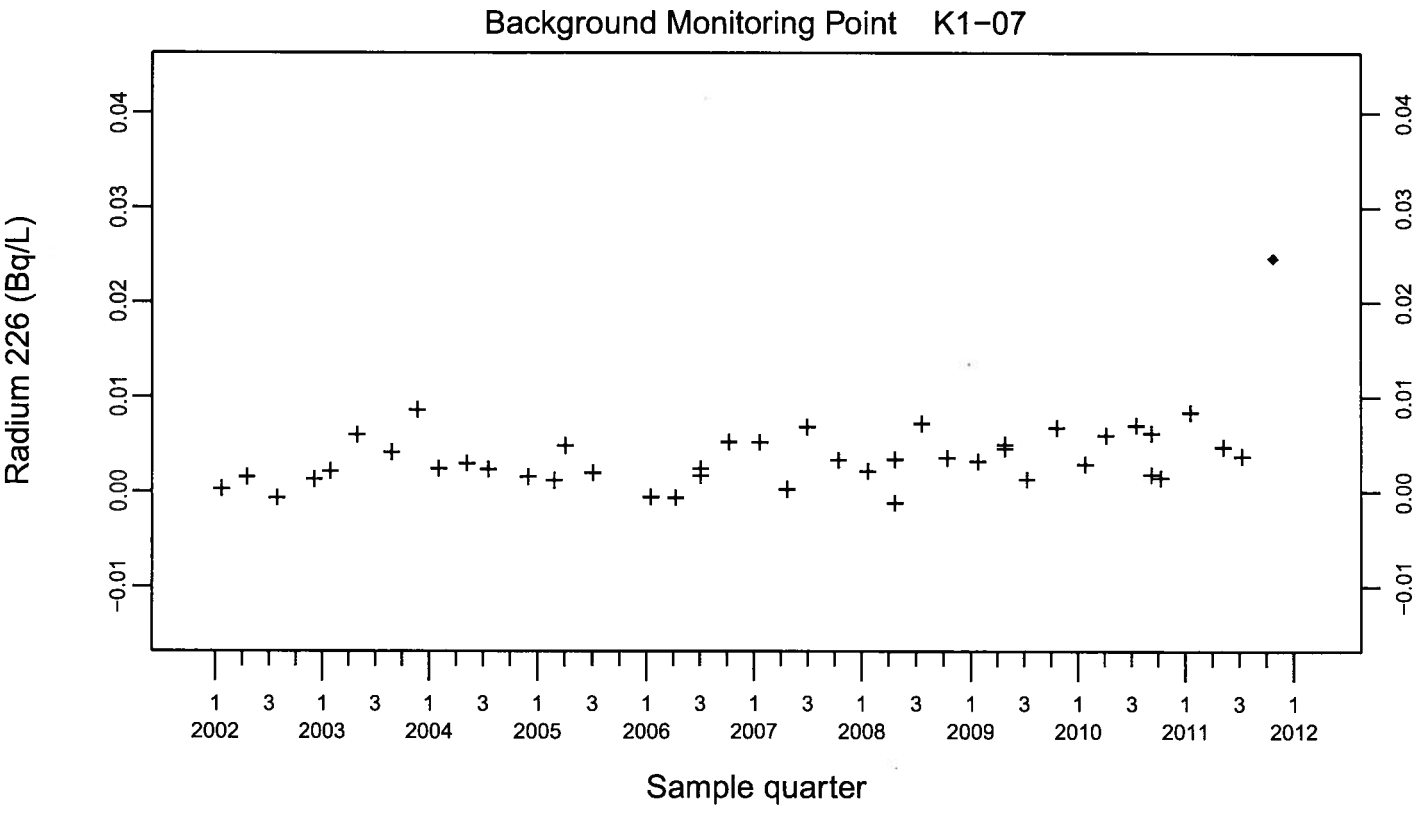

Pit 1 Area
Zinc (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Zinc (ug/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

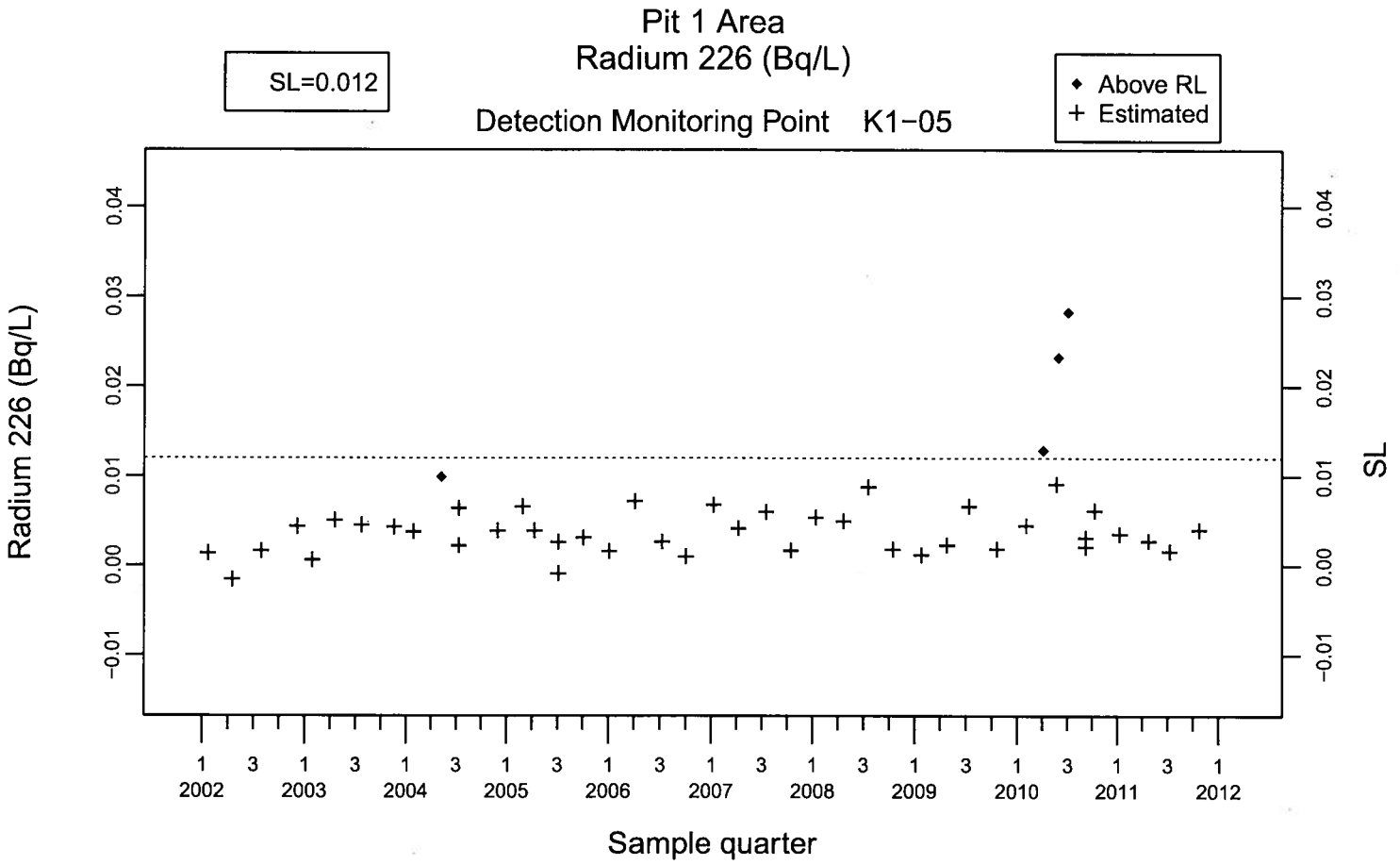

Background Monitoring Point K1-07
Zinc (ug/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

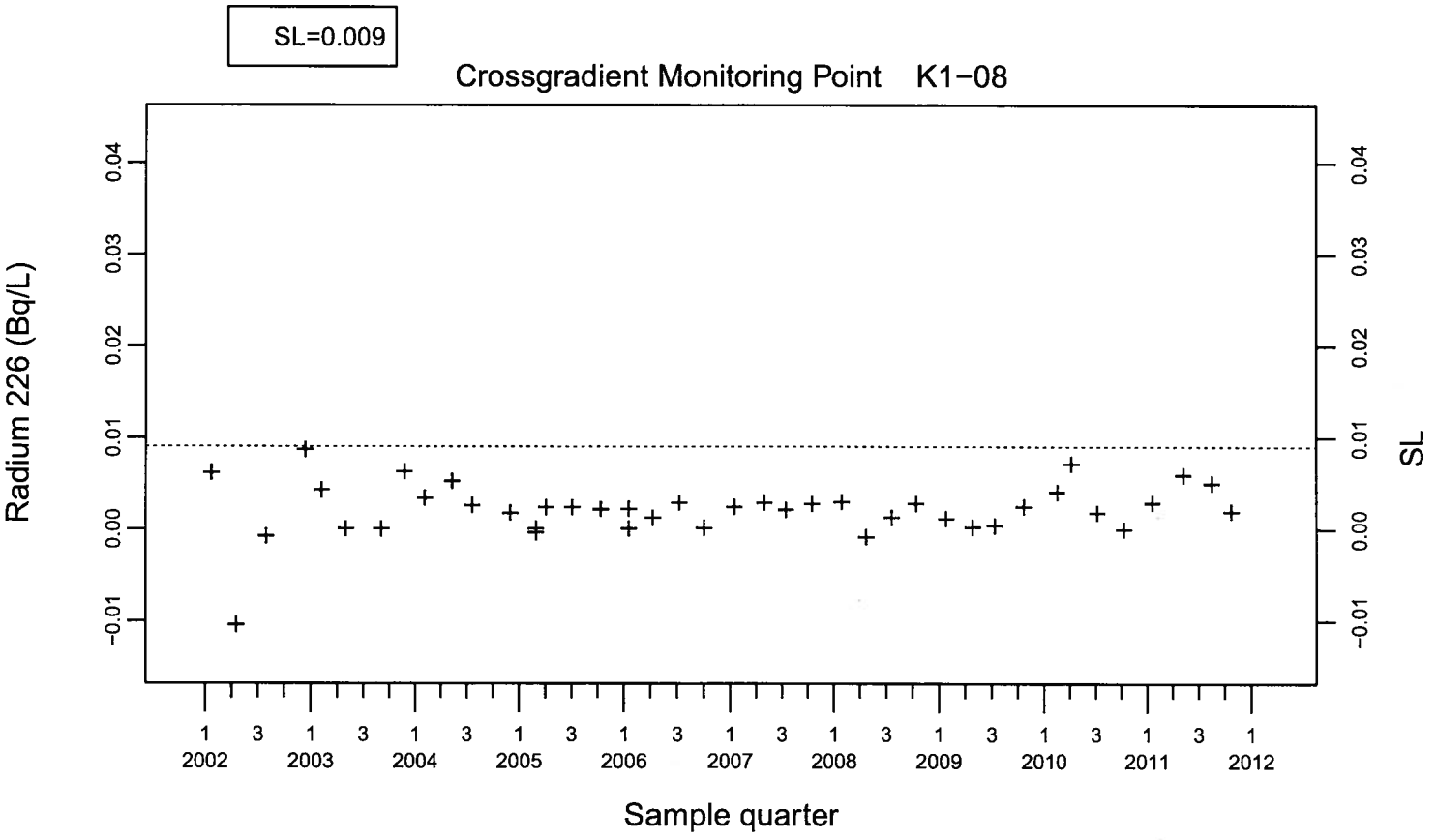

Pit 1 Area
Zinc (ug/L)
SL=24
Above RL
Below RL
Detection Monitoring Point K1-05
Zinc (ug/L)
SL
Sample quarter
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

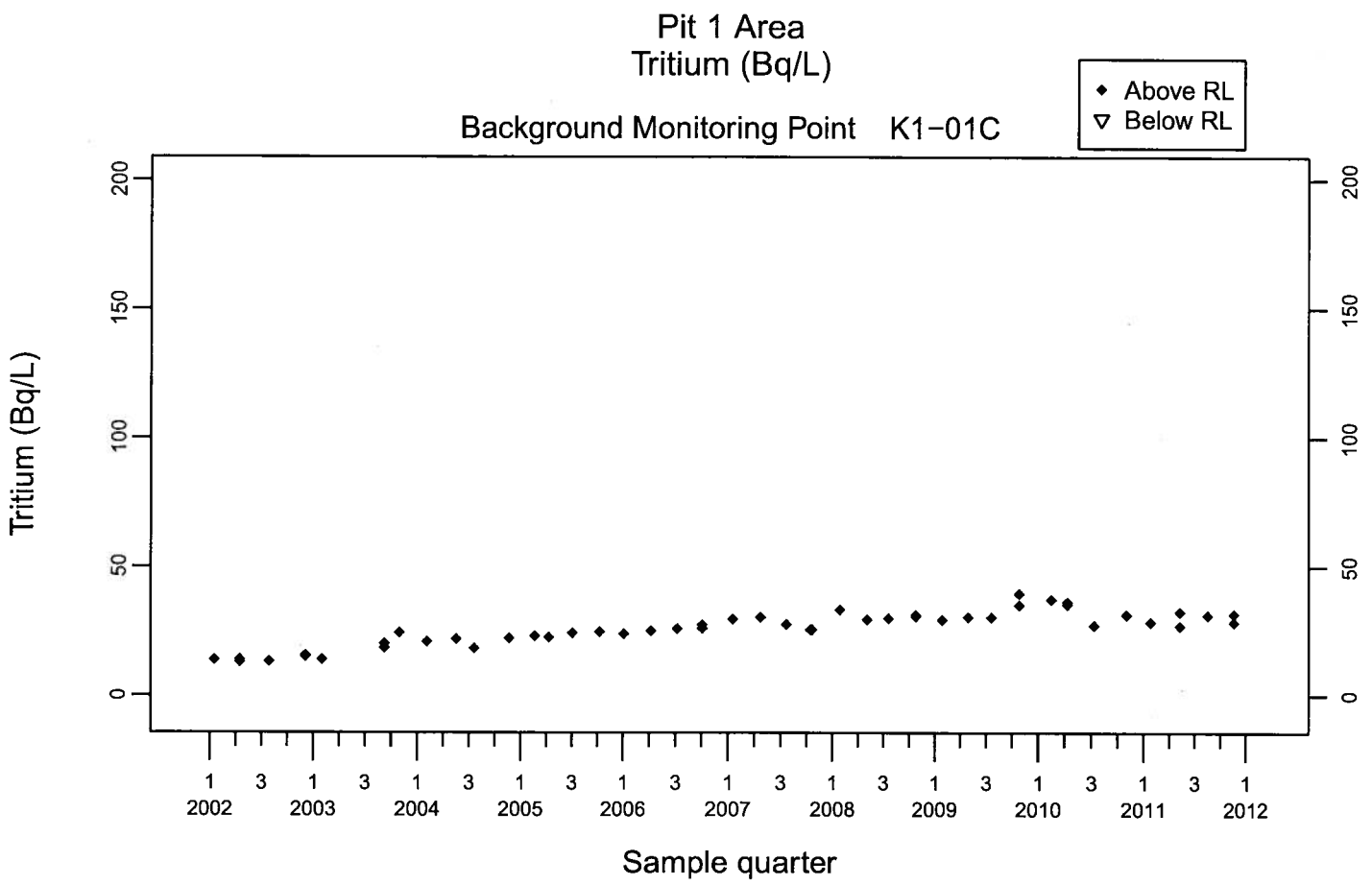

SL=20
Crossgradient Monitoring Point K1-08
Zinc (ug/L)
SL
Sample quarter
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

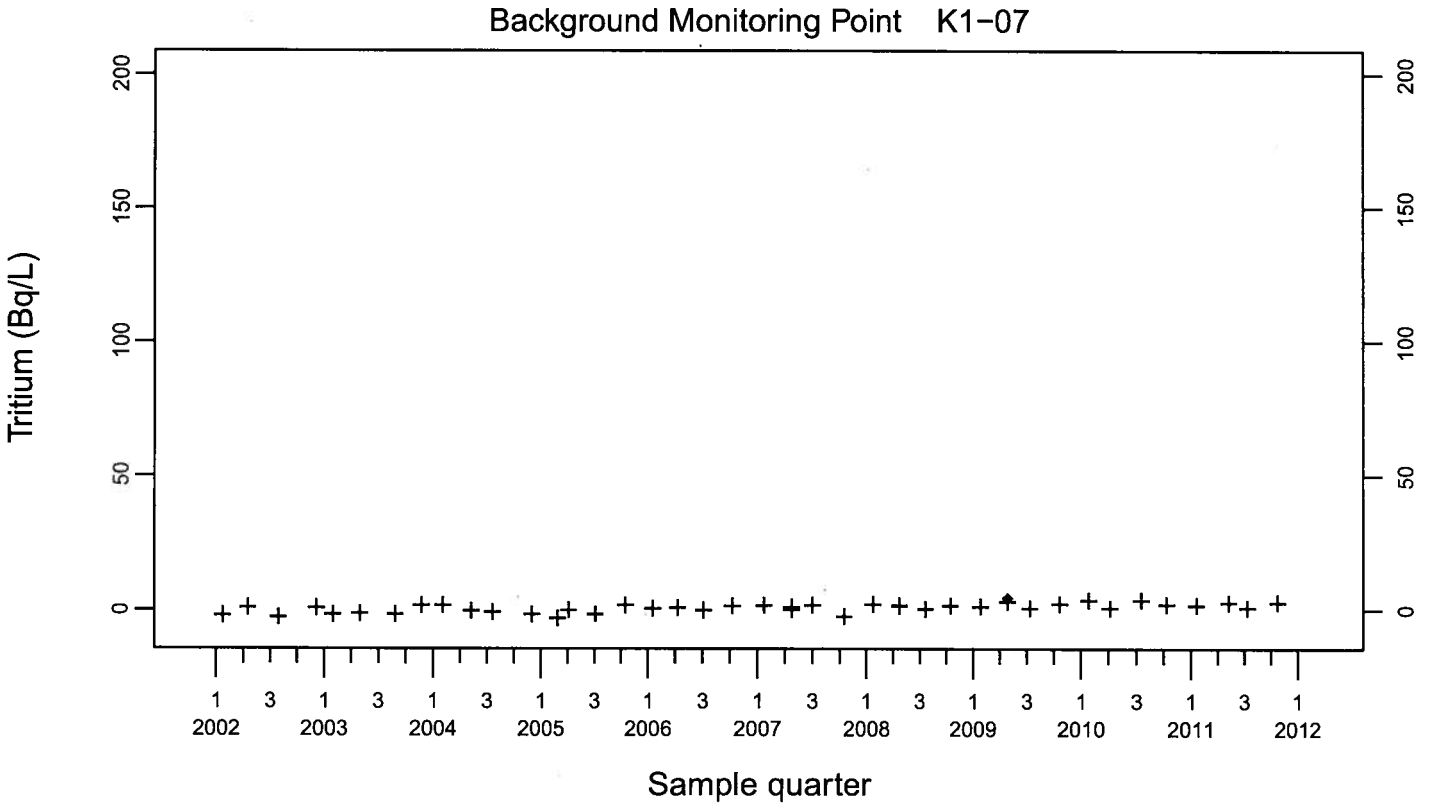

Pit 1 Area
Radium 226 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
Radium 226 (Bq/L)
0.04
0.03
0.02
0.01
0.00
-0.01
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

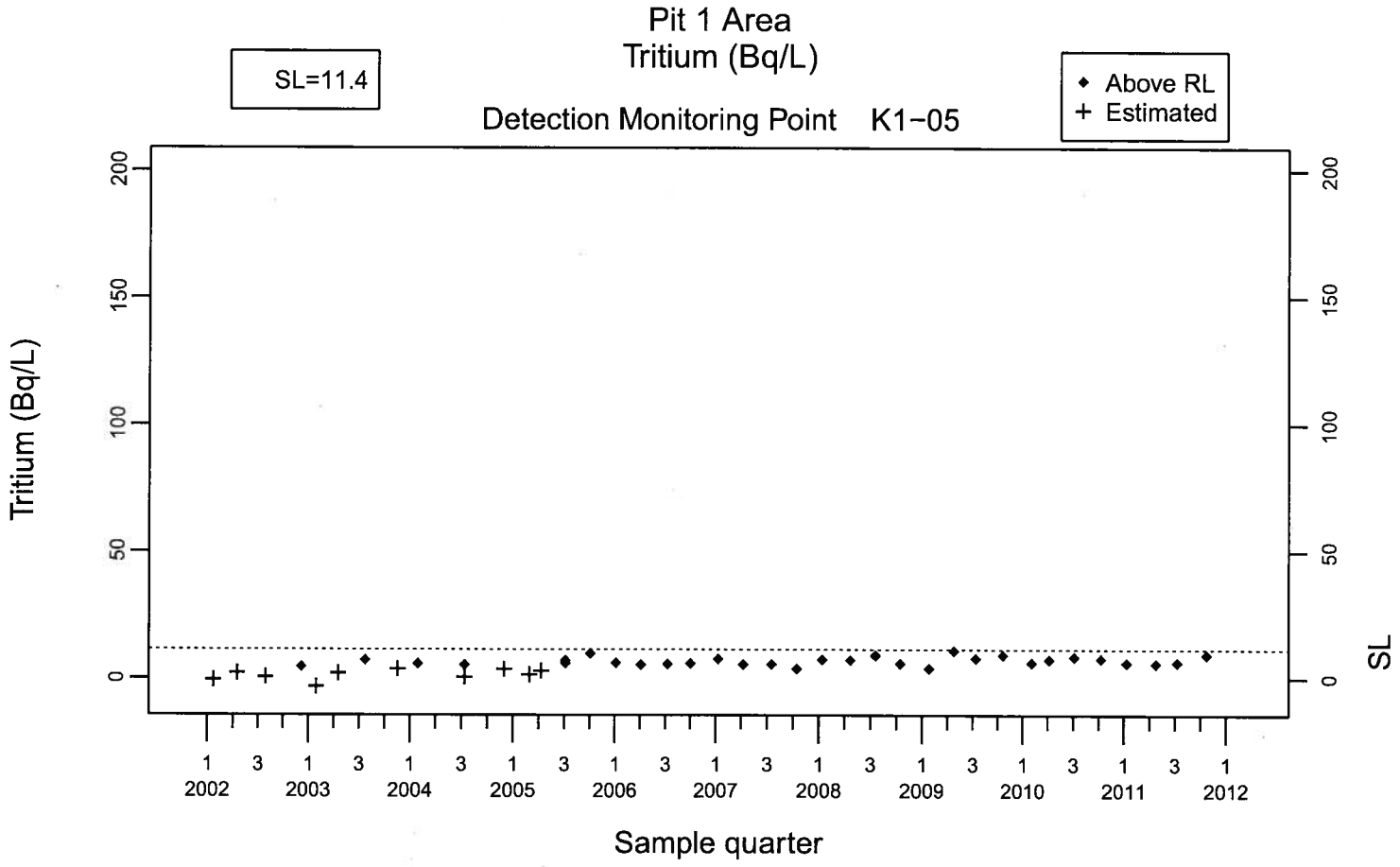

Background Monitoring Point K1-07
Radium 226 (Bq/L)
0.04
0.03
0.02
0.01
0.00
-0.01
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

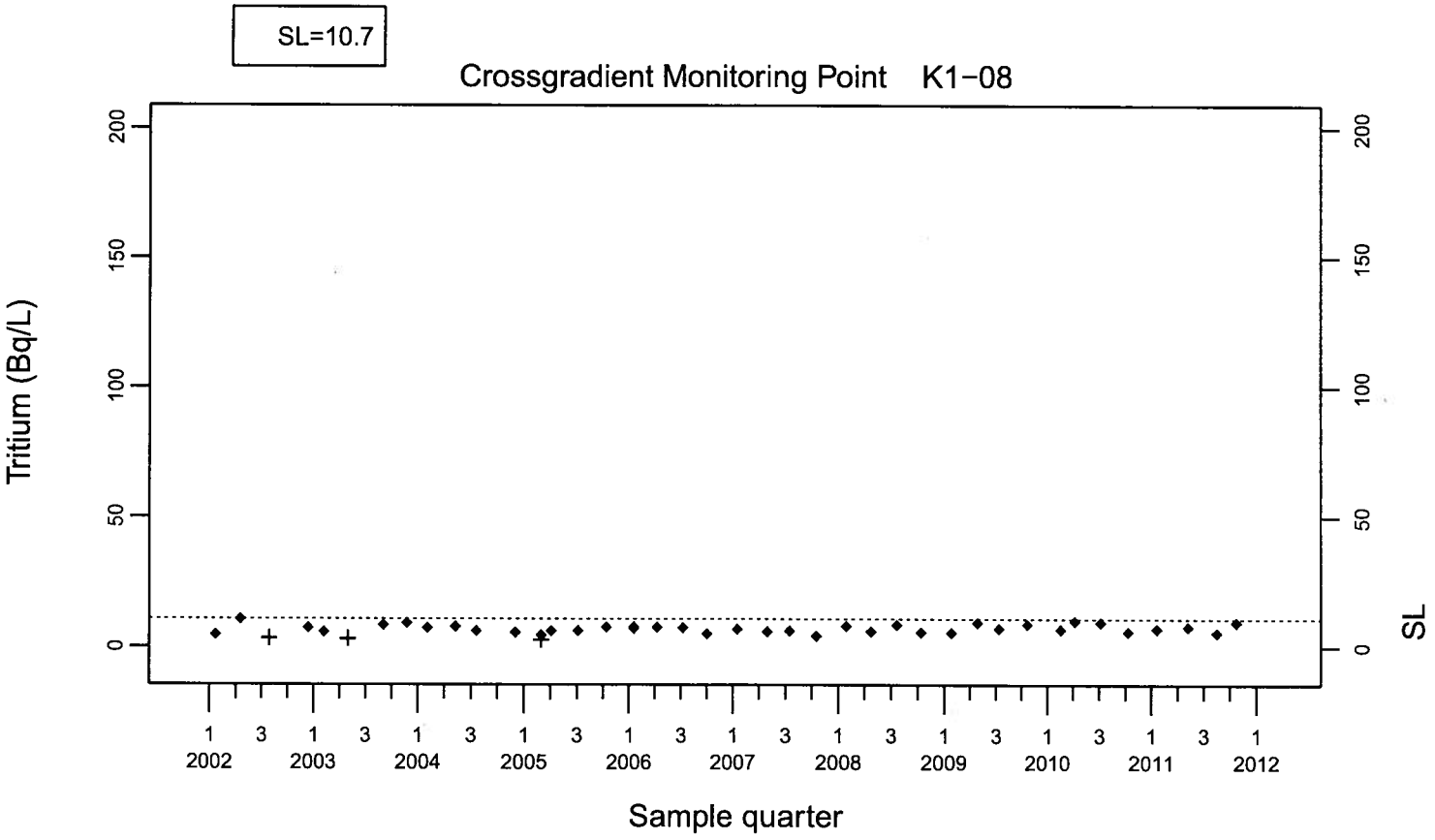

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Above RL
Estimated
Detection Monitoring Point K1-05
Radium 226 (Bq/L)
SL
0.04
0.03
0.02
0.01
0.00
-0.01
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

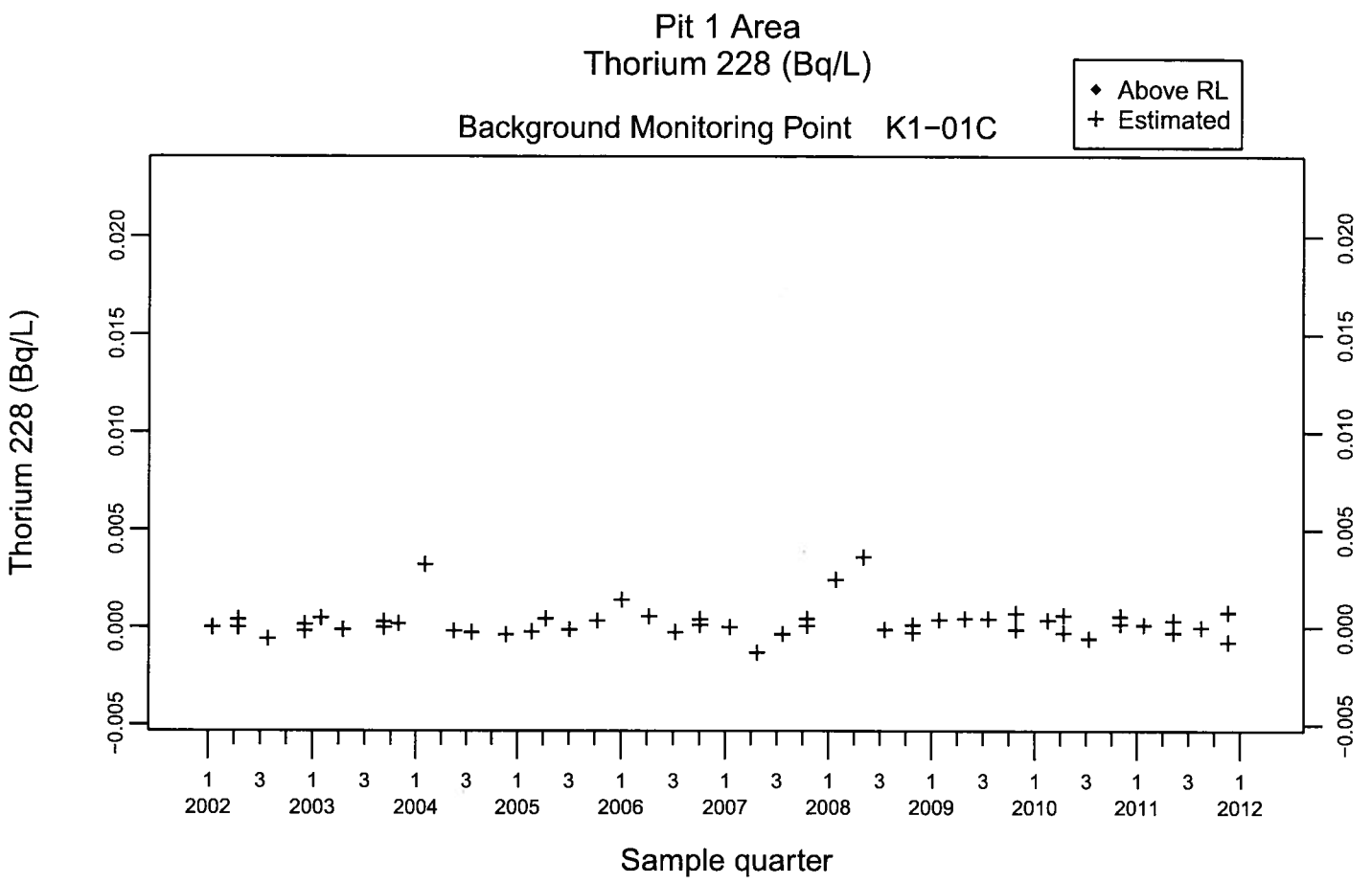

SL=0.009
Crossgradient Monitoring Point K1-08
Radium 226 (Bq/L)
SL
0.04
0.03
0.02
0.01
0.00
-0.01
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

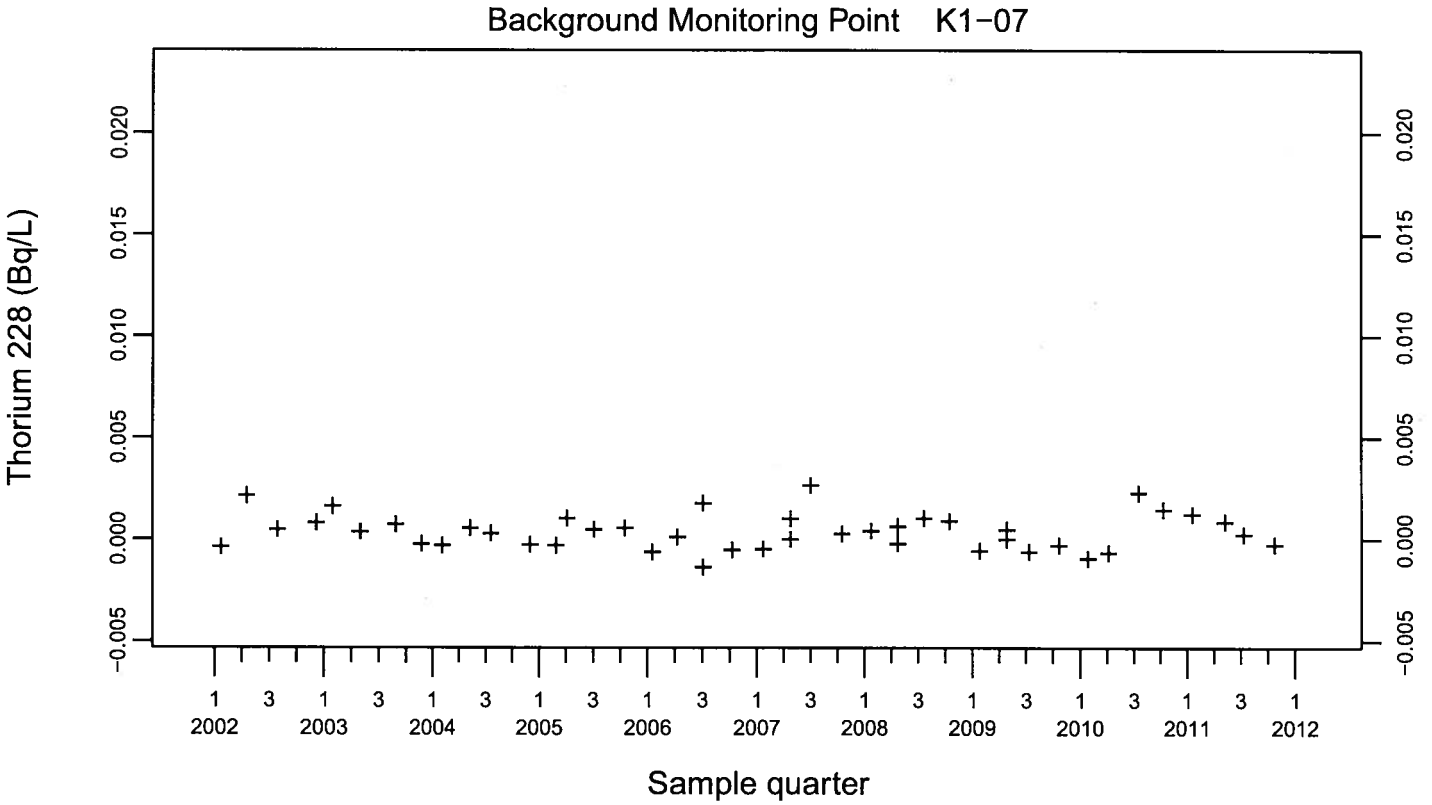

Pit 1 Area
Tritium (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Tritium (Bq/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

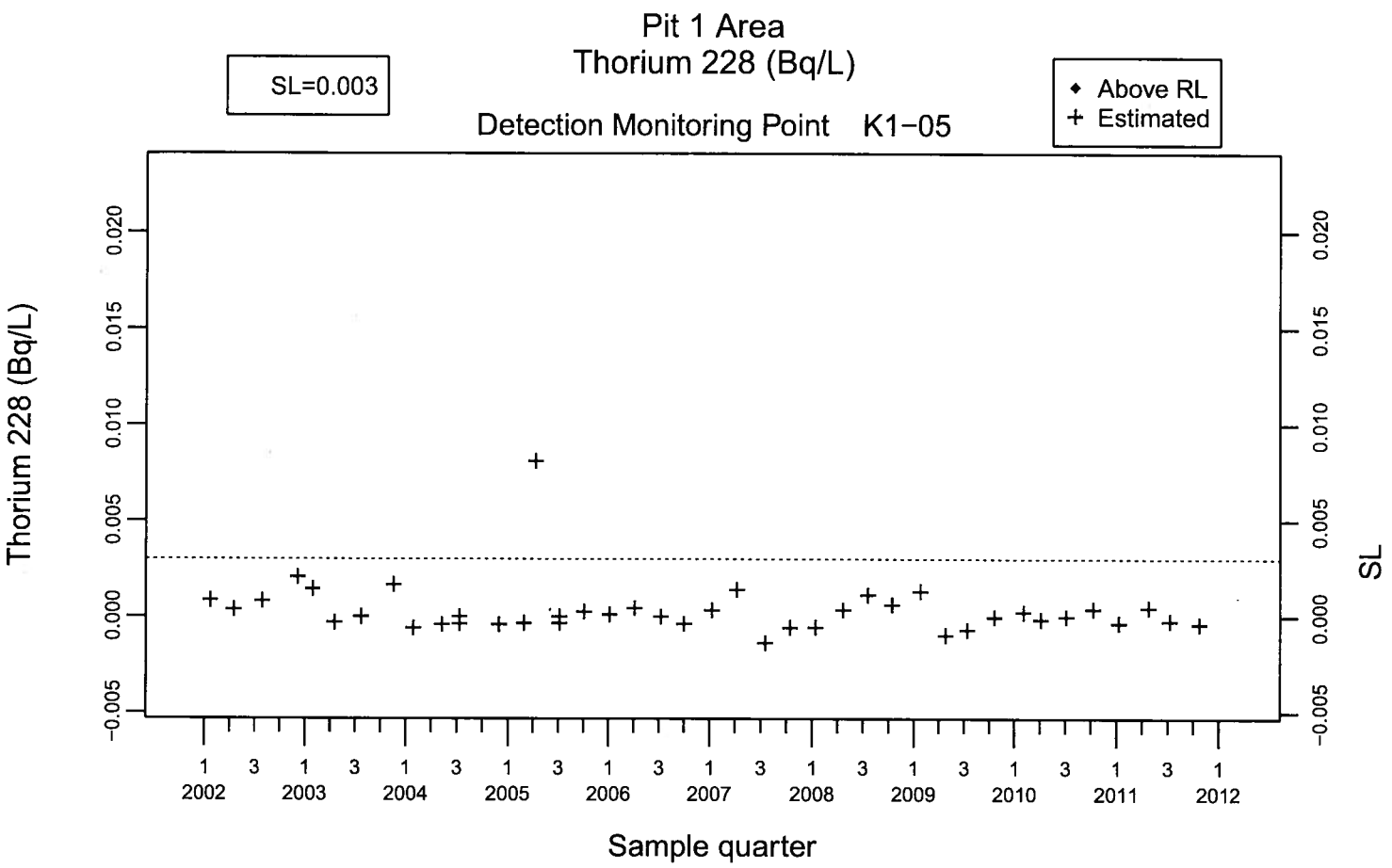

Background Monitoring Point K1-07
Tritium (Bq/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

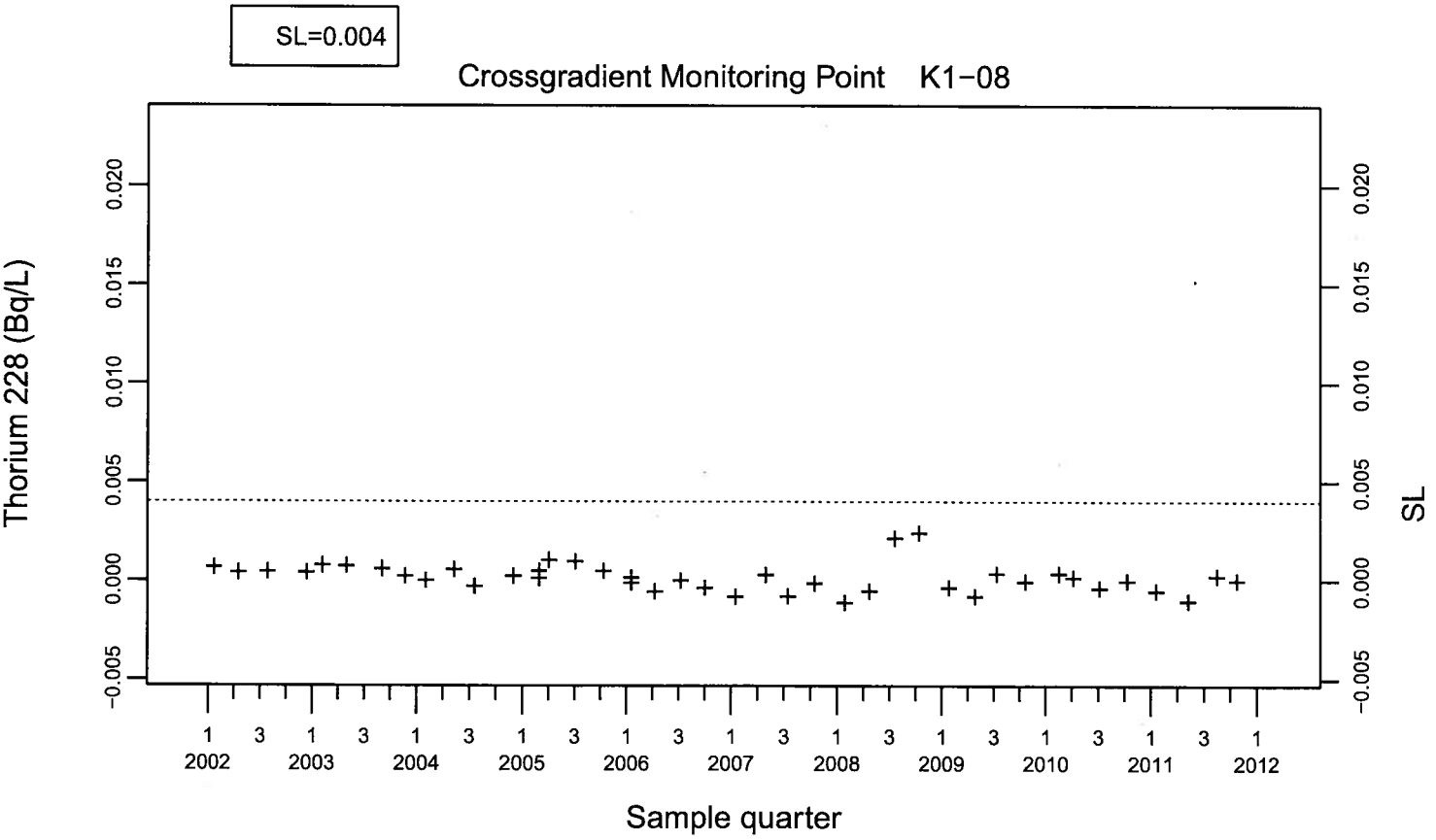

Pit 1 Area
Tritium (Bq/L)
SL=11.4
Detection Monitoring Point K1-05
Above RL
Estimated
Tritium (Bq/L)
SL
Sample quarter
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

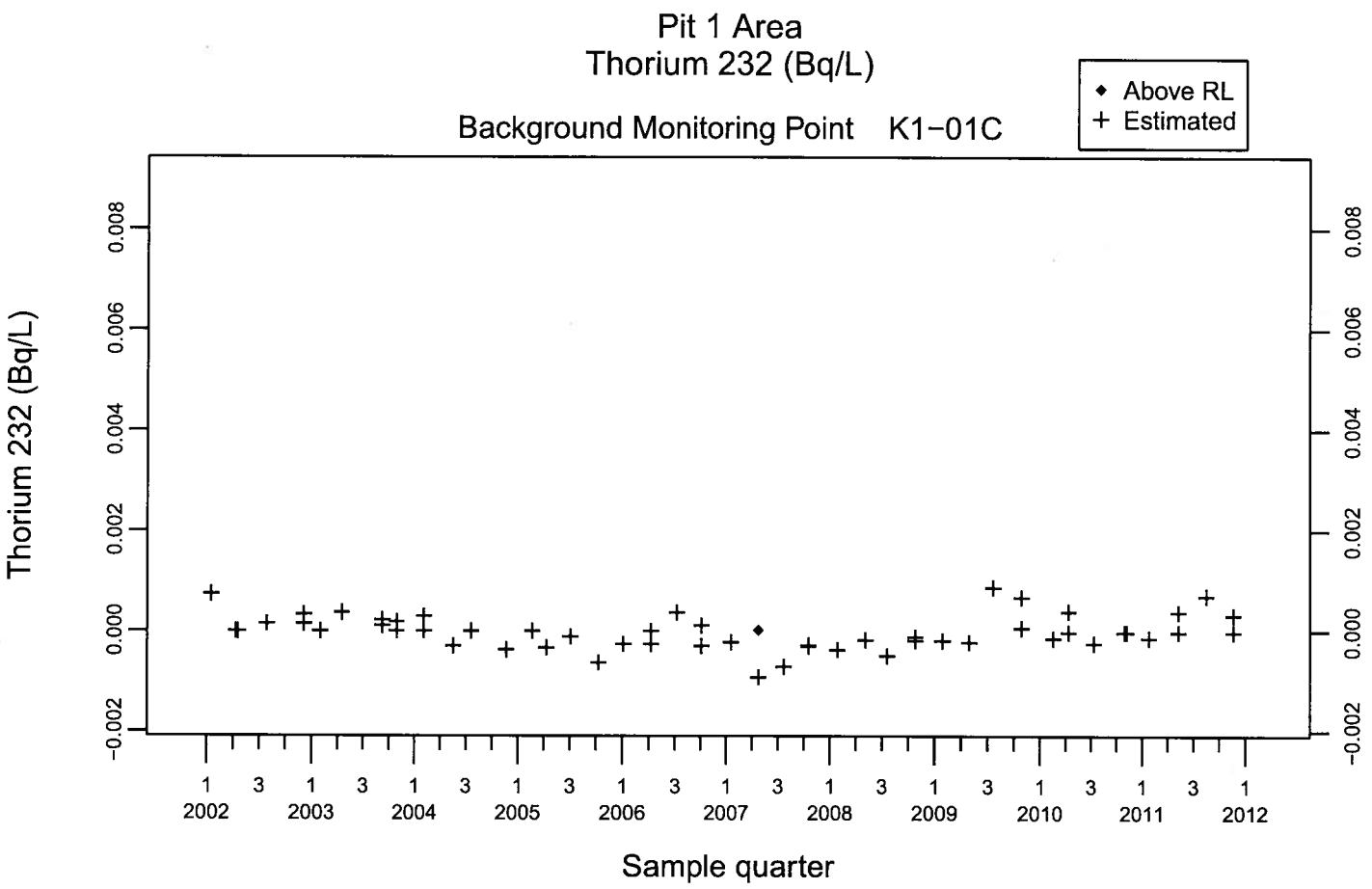

SL=10.7
Crossgradient Monitoring Point K1-08
Tritium (Bq/L)
SL
Sample quarter
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

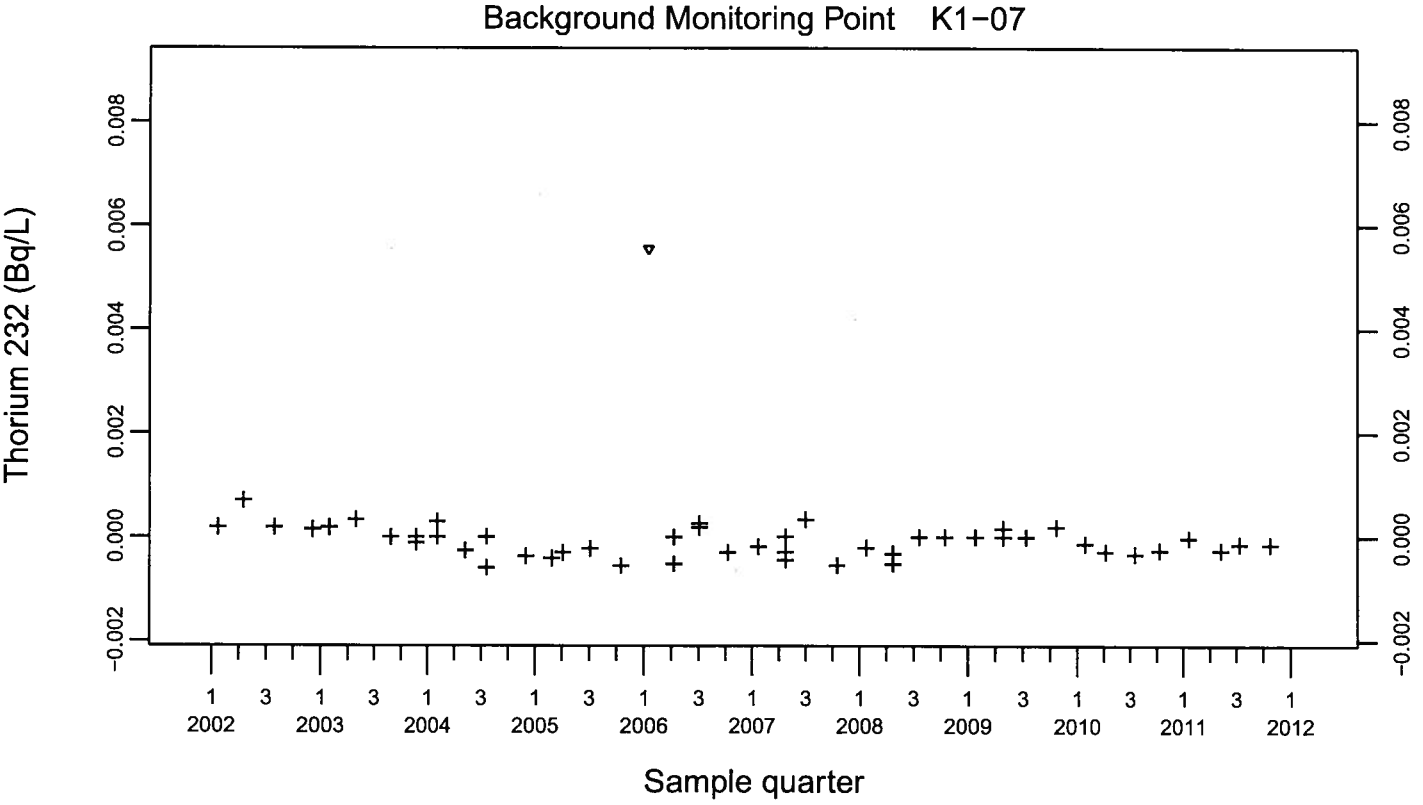

Pit 1 Area
Thorium 228 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
Thorium 228 (Bq/L)
0.020
0.015
0.010
0.005
0.000
-0.005
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

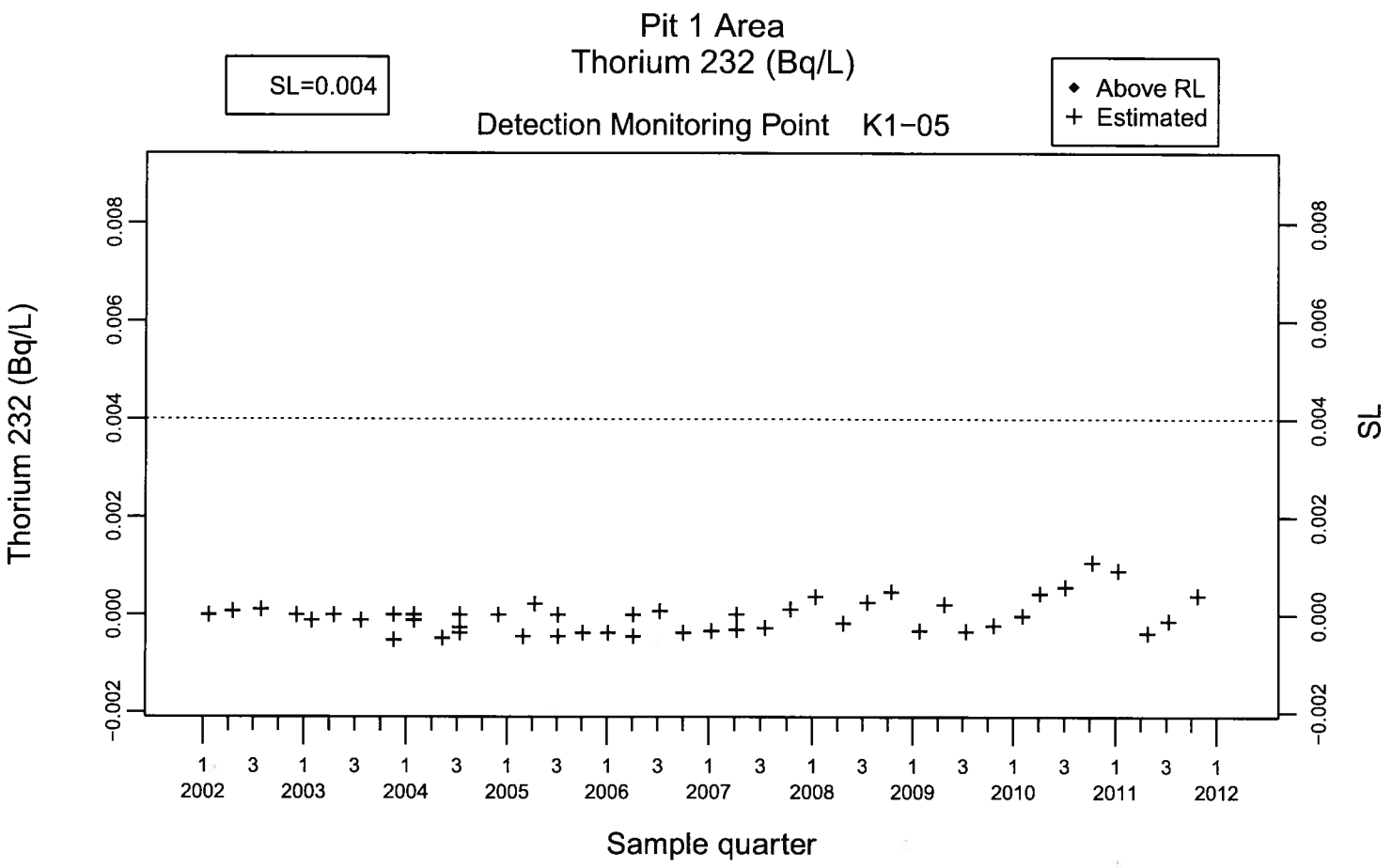

Background Monitoring Point K1-07
Thorium 228 (Bq/L)
0.020
0.015
0.010
0.005
0.000
-0.005
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

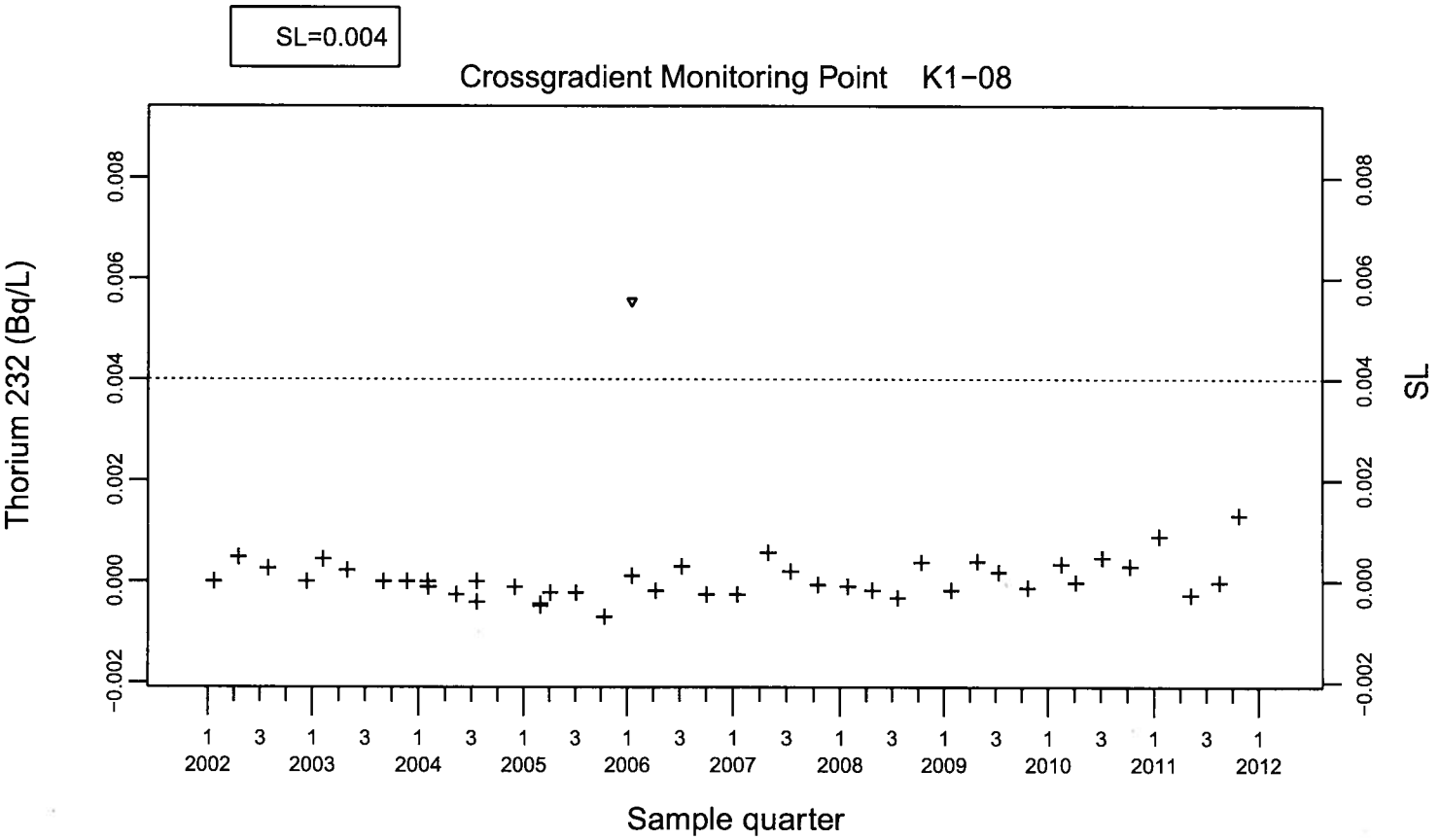

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.003
Detection Monitoring Point K1-05
Above RL
Estimated
Thorium 228 (Bq/L)
SL
0.020
0.015
0.010
0.005
0.000
-0.005
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

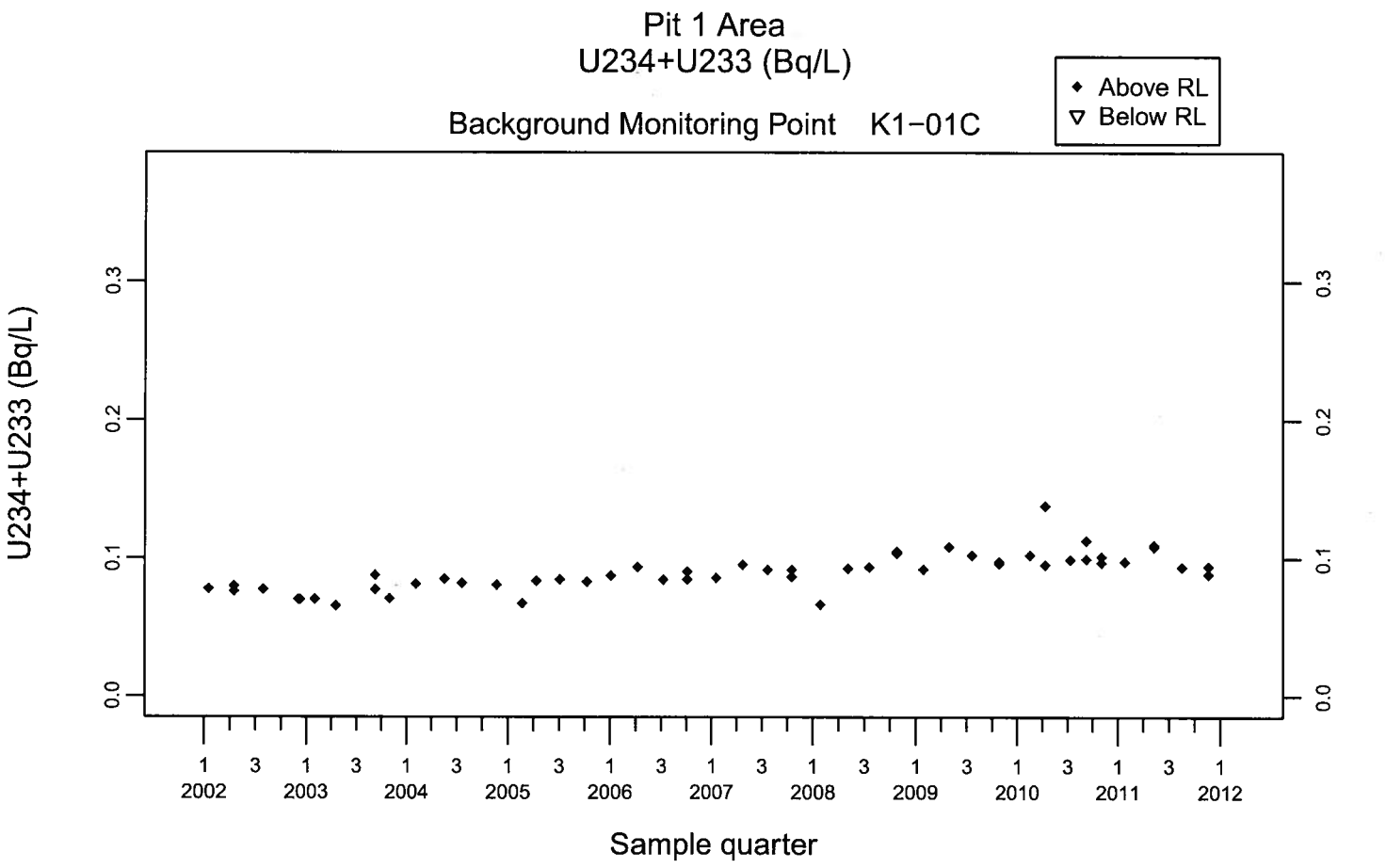

SL=0.004
Crossgradient Monitoring Point K1-08
Thorium 228 (Bq/L)
SL
0.020
0.015
0.010
0.005
0.000
-0.005
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

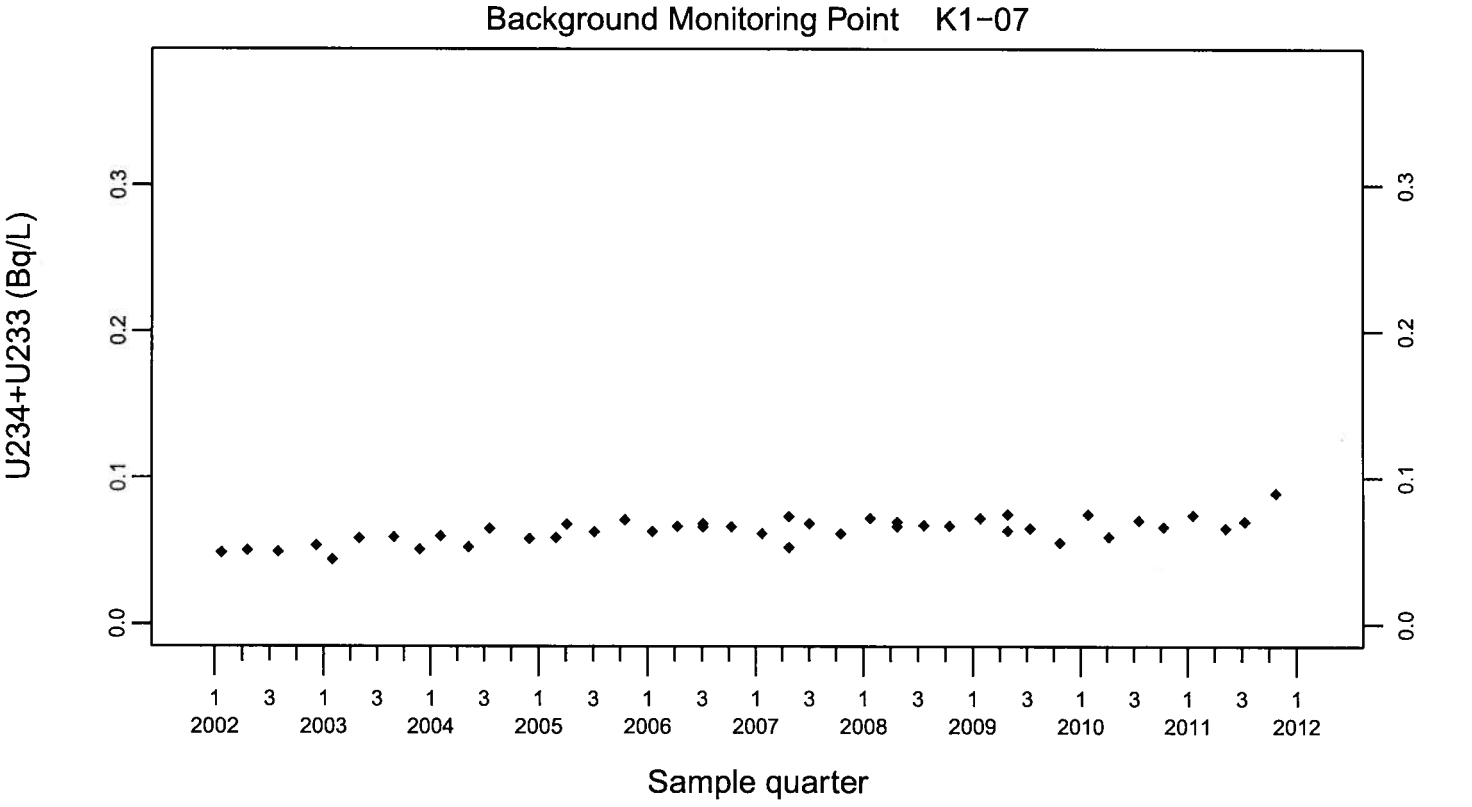

Pit 1 Area
Thorium 232 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
-0.002
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

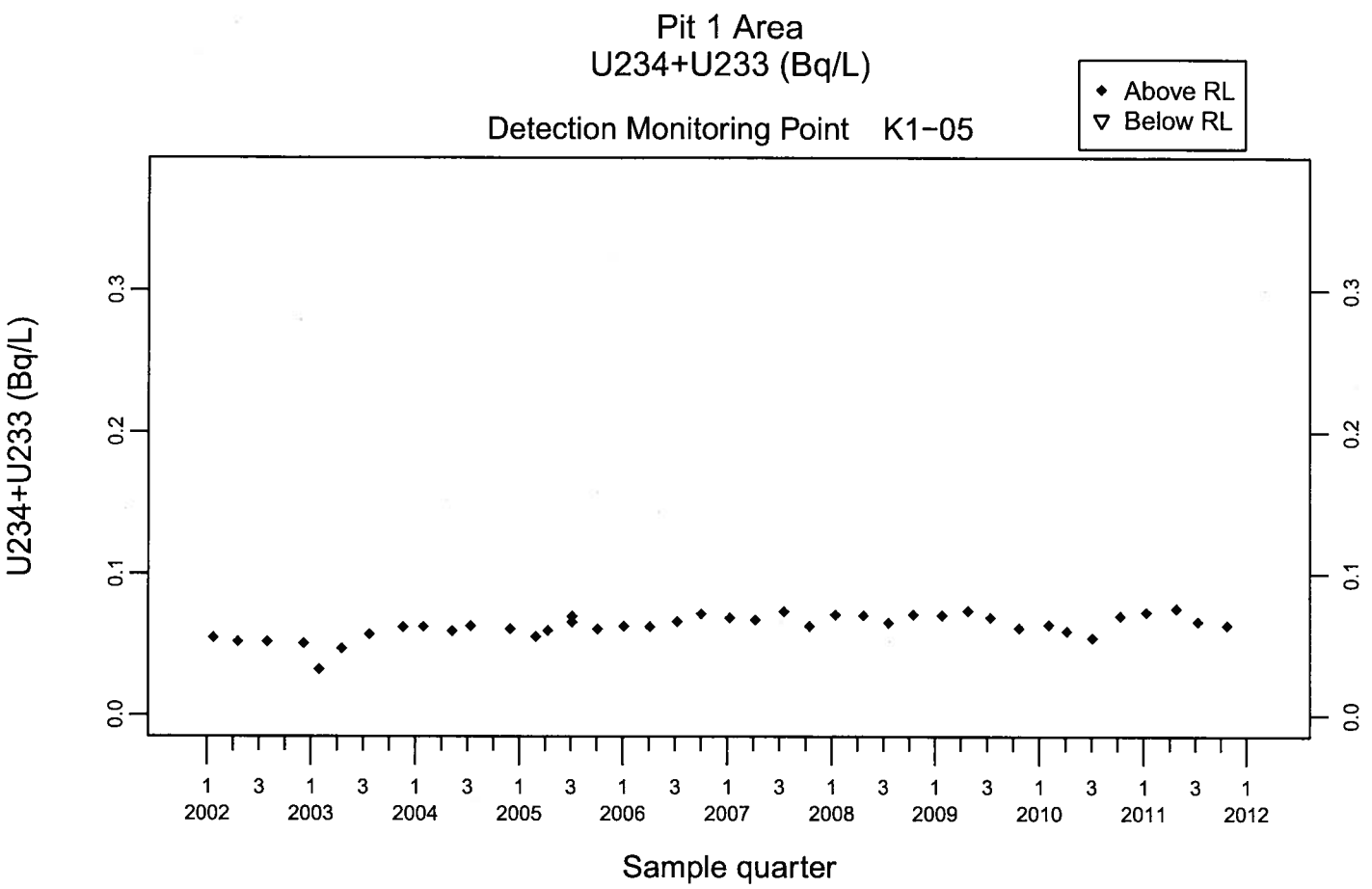

Background Monitoring Point K1-07
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
-0.002
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

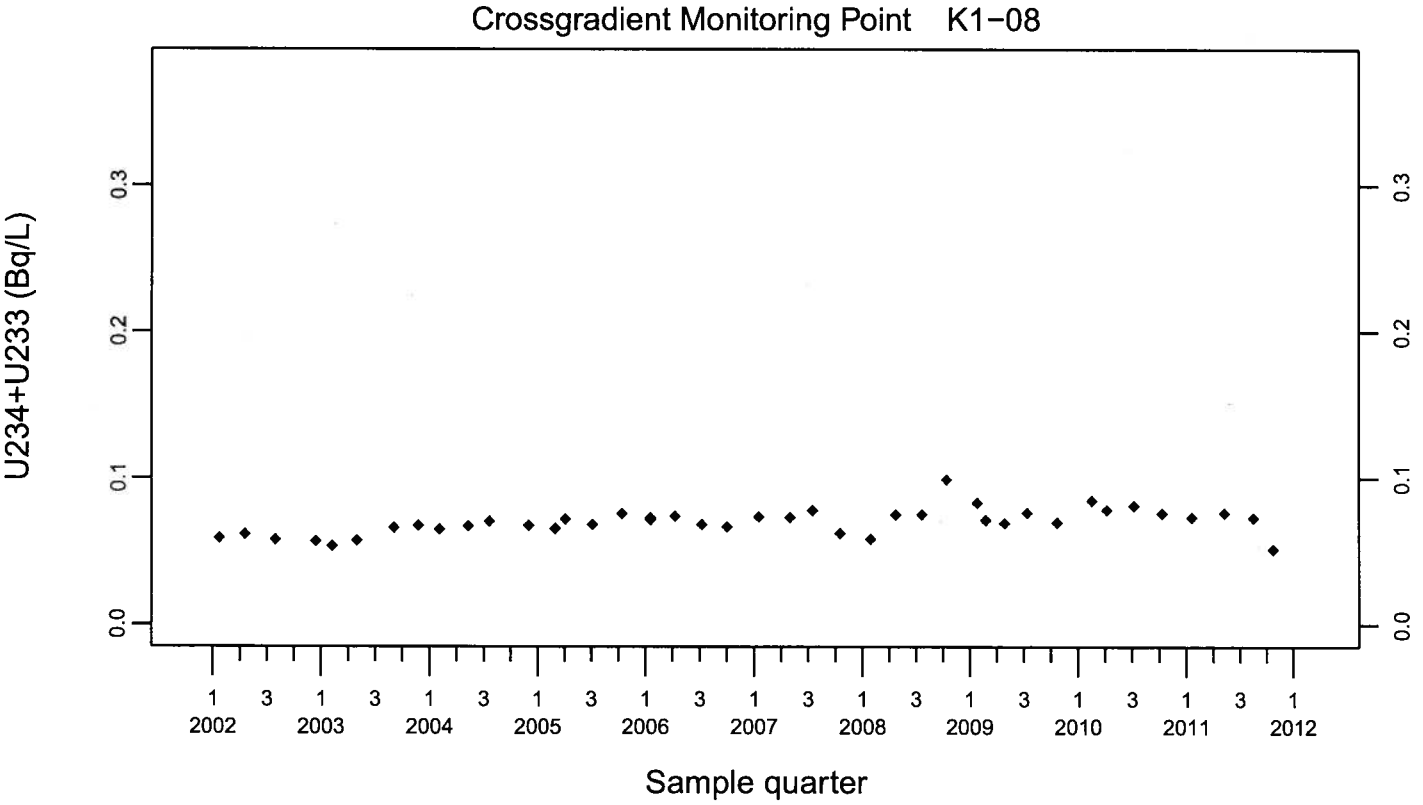

Pit 1 Area
Thorium 232 (Bq/L)
SL=0.004
Detection Monitoring Point K1-05
Above RL
Estimated
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
-0.002
SL
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


SL=0.004
Crossgradient Monitoring Point K1-08
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
-0.002
SL
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

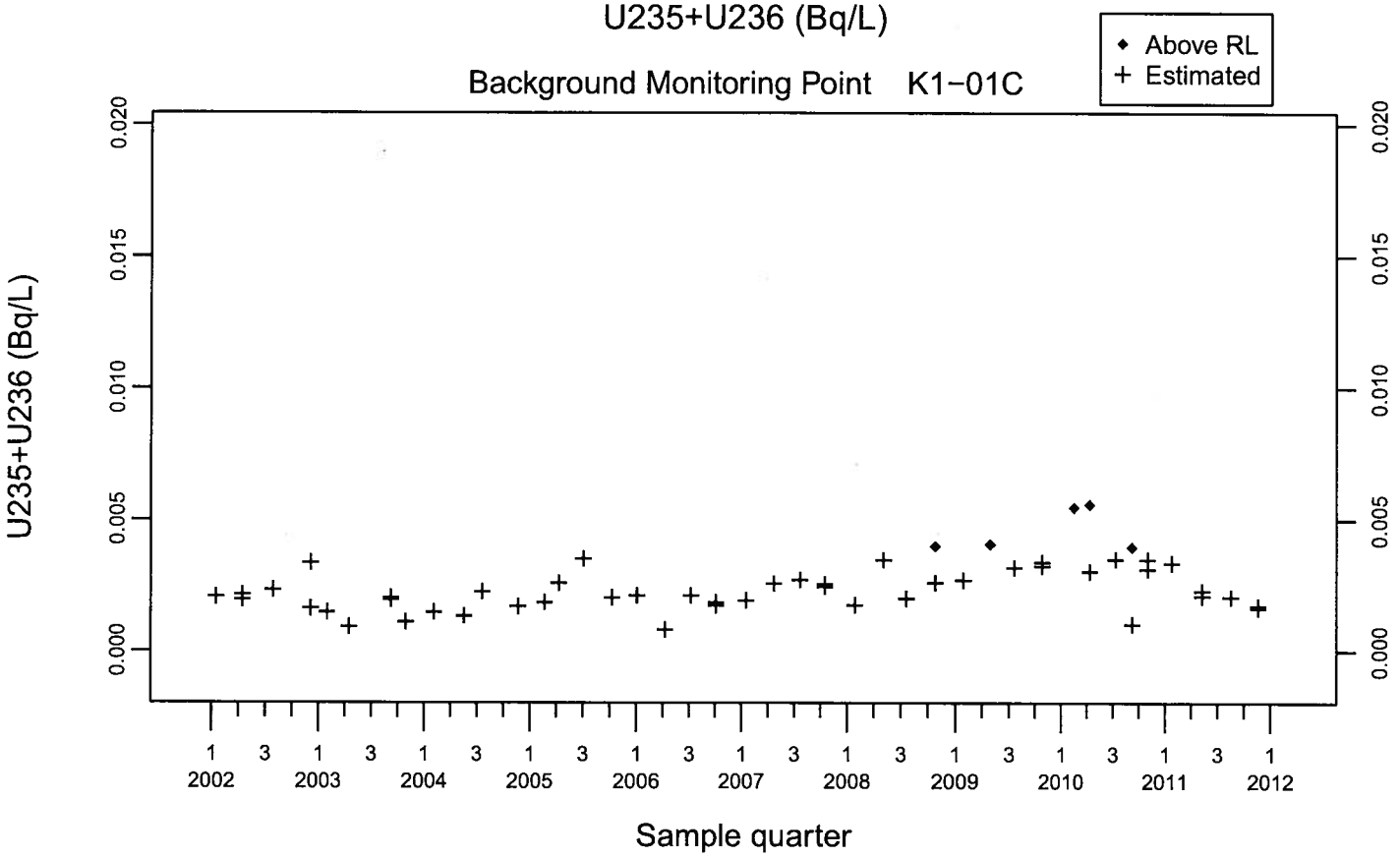

Pit 1 Area
U234+U233 (Bq/L)
Above RL
Below RL
Background Monitoring Point K1-01C
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

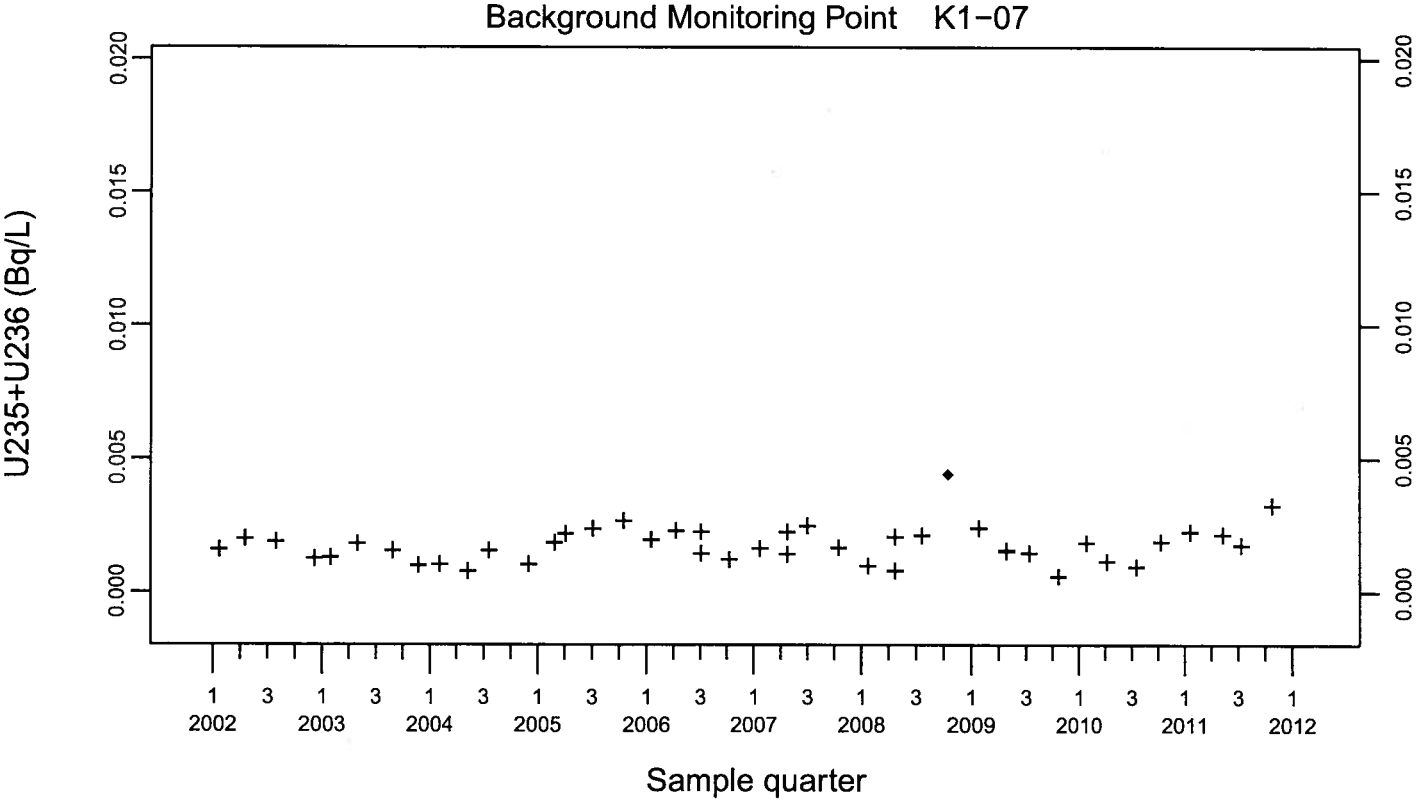

Background Monitoring Point K1-07
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

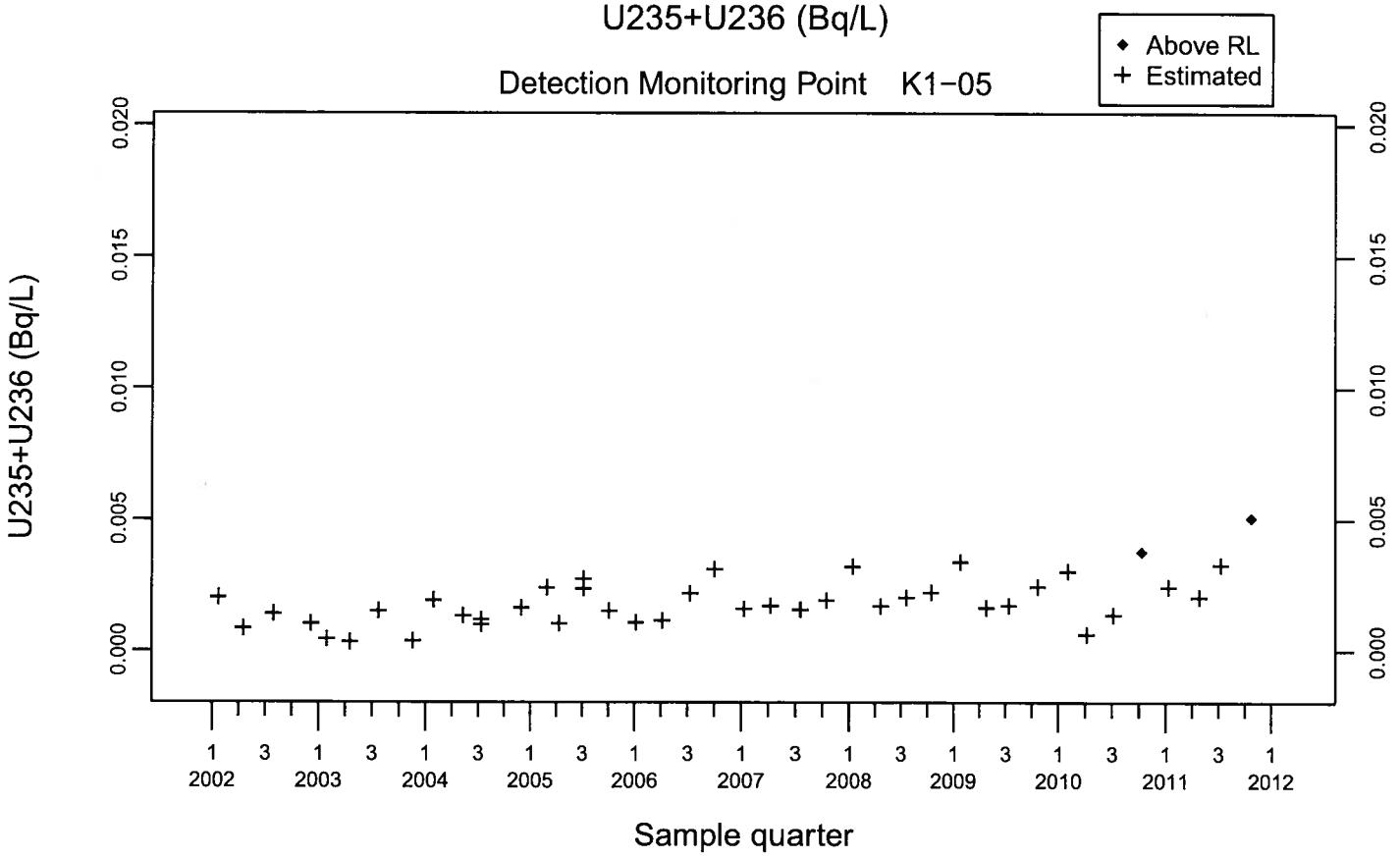

Pit 1 Area
U234+U233 (Bq/L)
Detection Monitoring Point K1-05
Above RL
Below RL
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

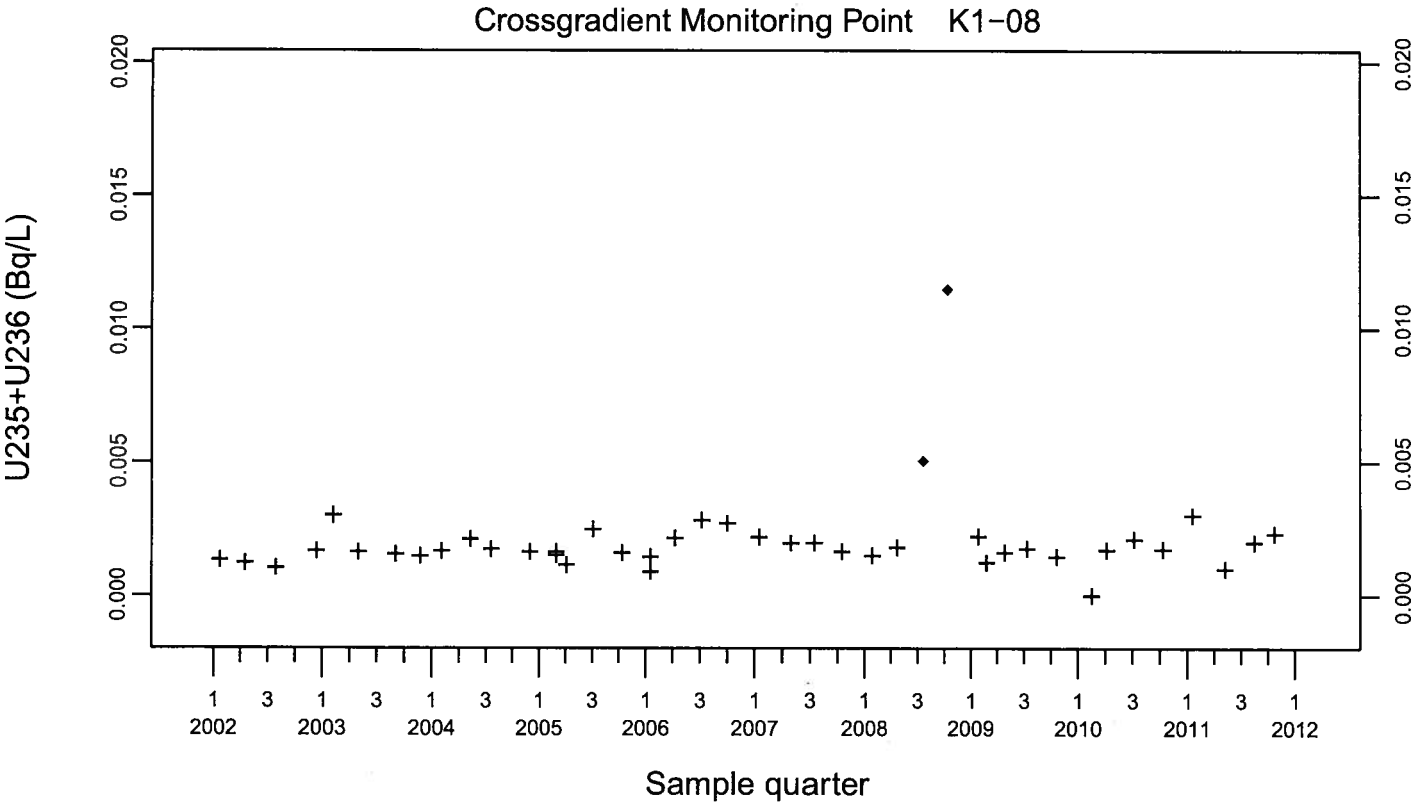

Crossgradient Monitoring Point K1-08
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

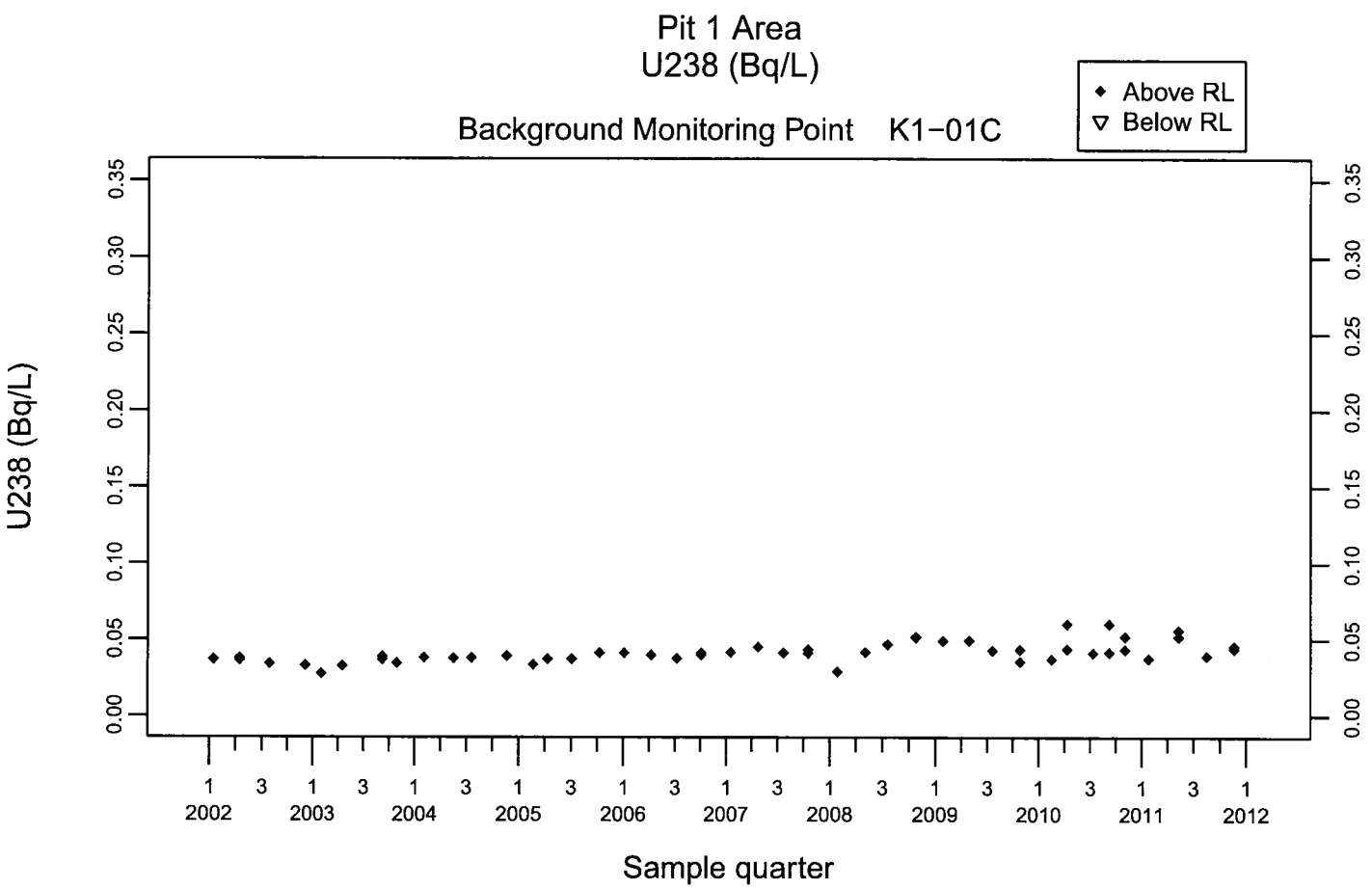
Pit 1 Area
U235+U236 (Bq/L)

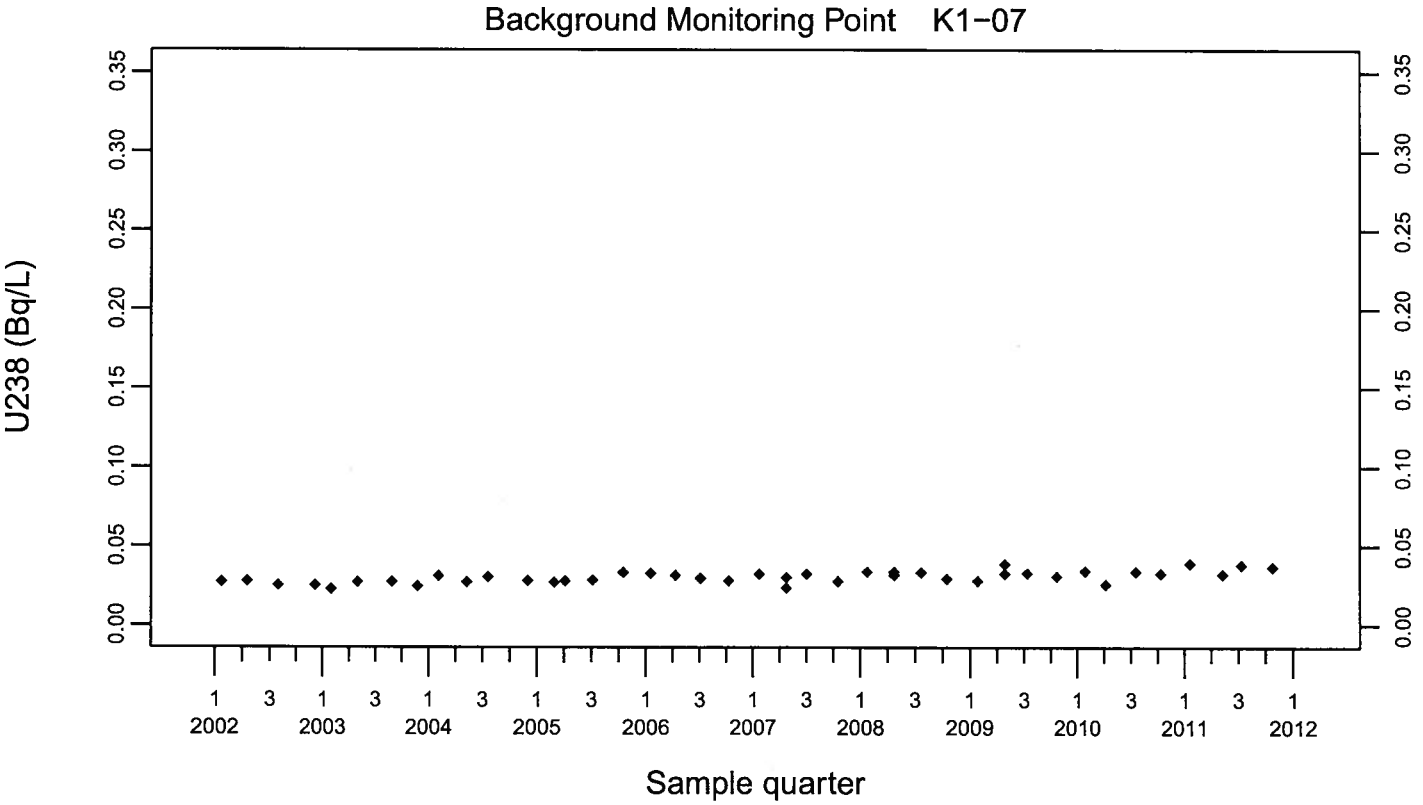


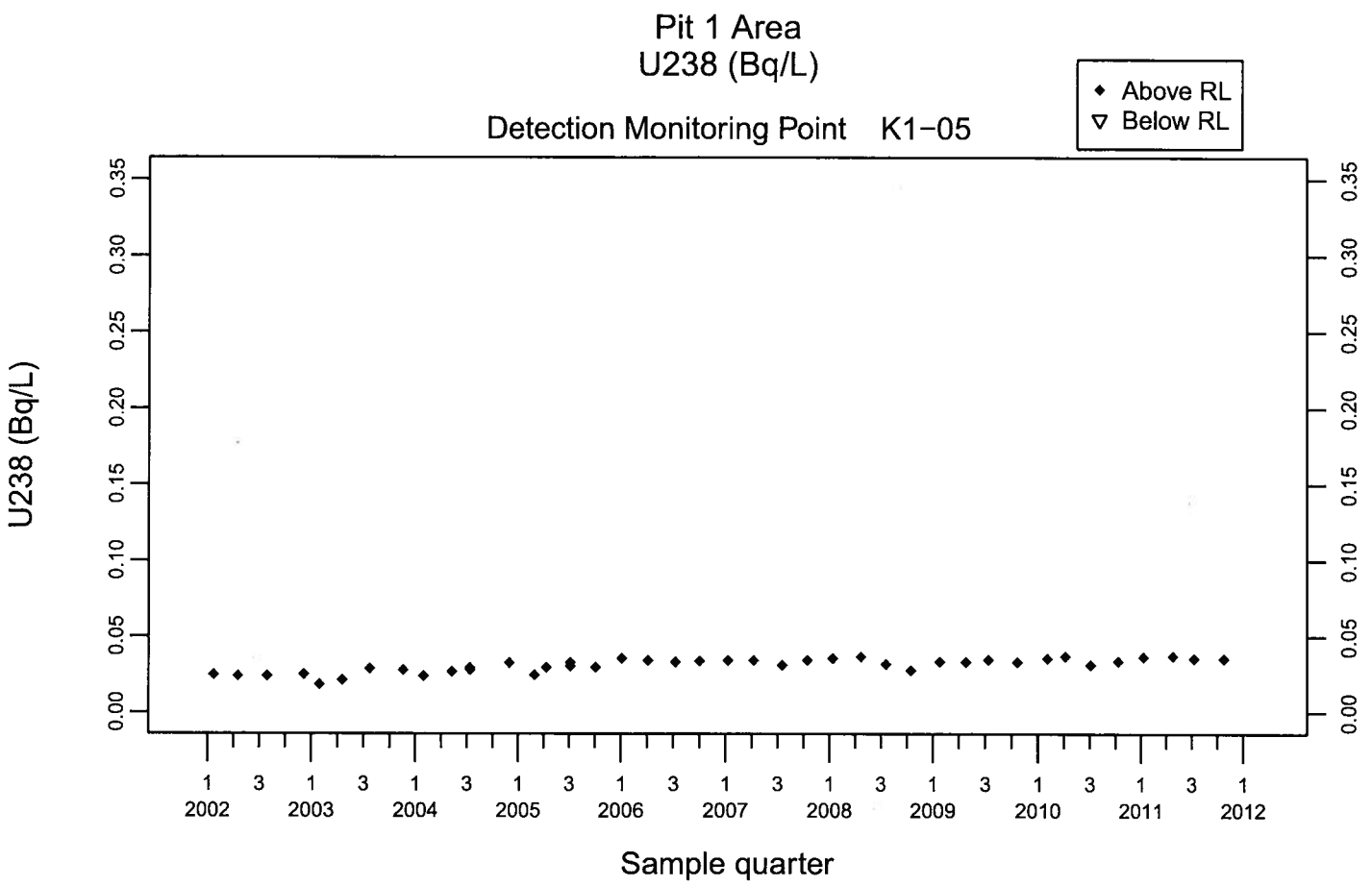


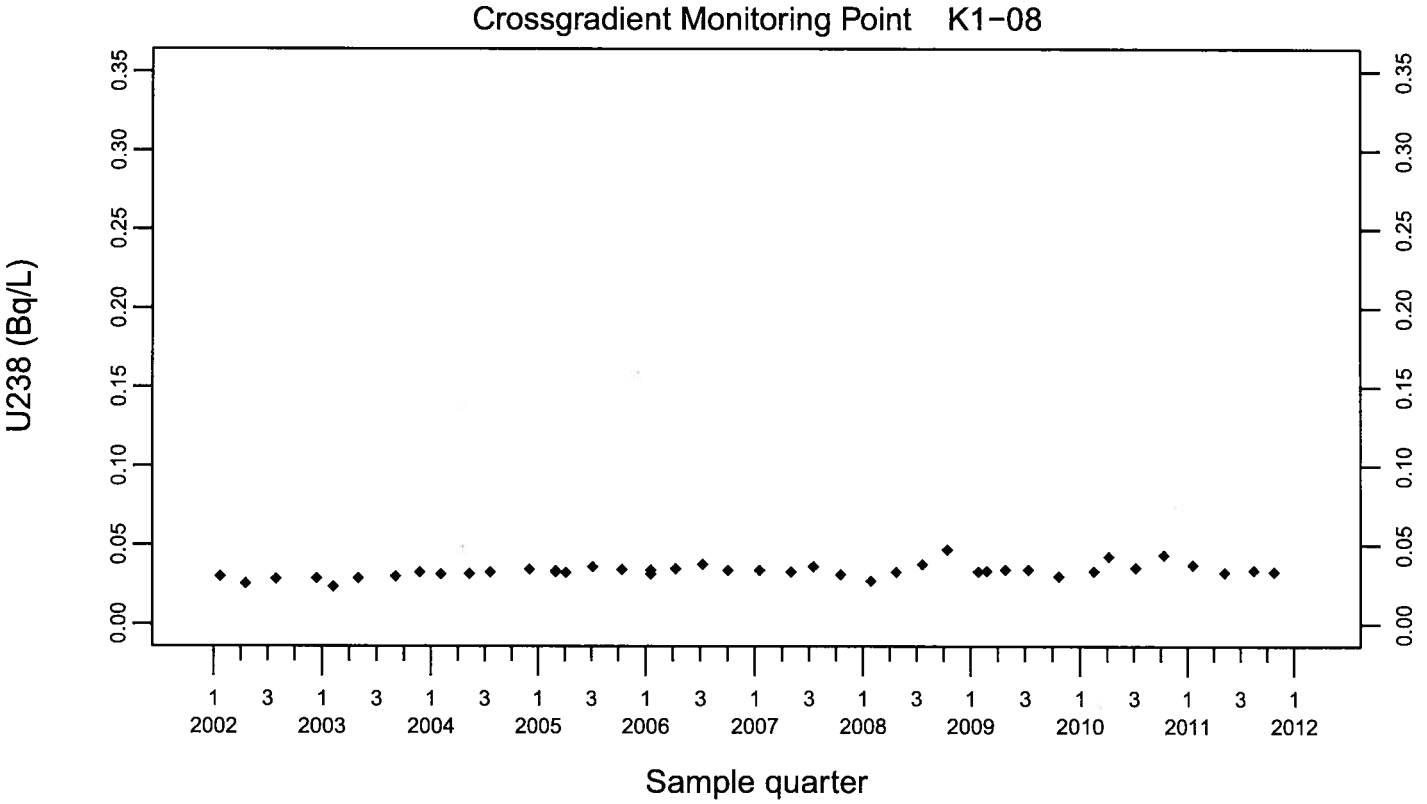

Pit 1 Area
U235+U236 (Bq/L)
Above RL
Estimated
Detection Monitoring Point K1-05
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

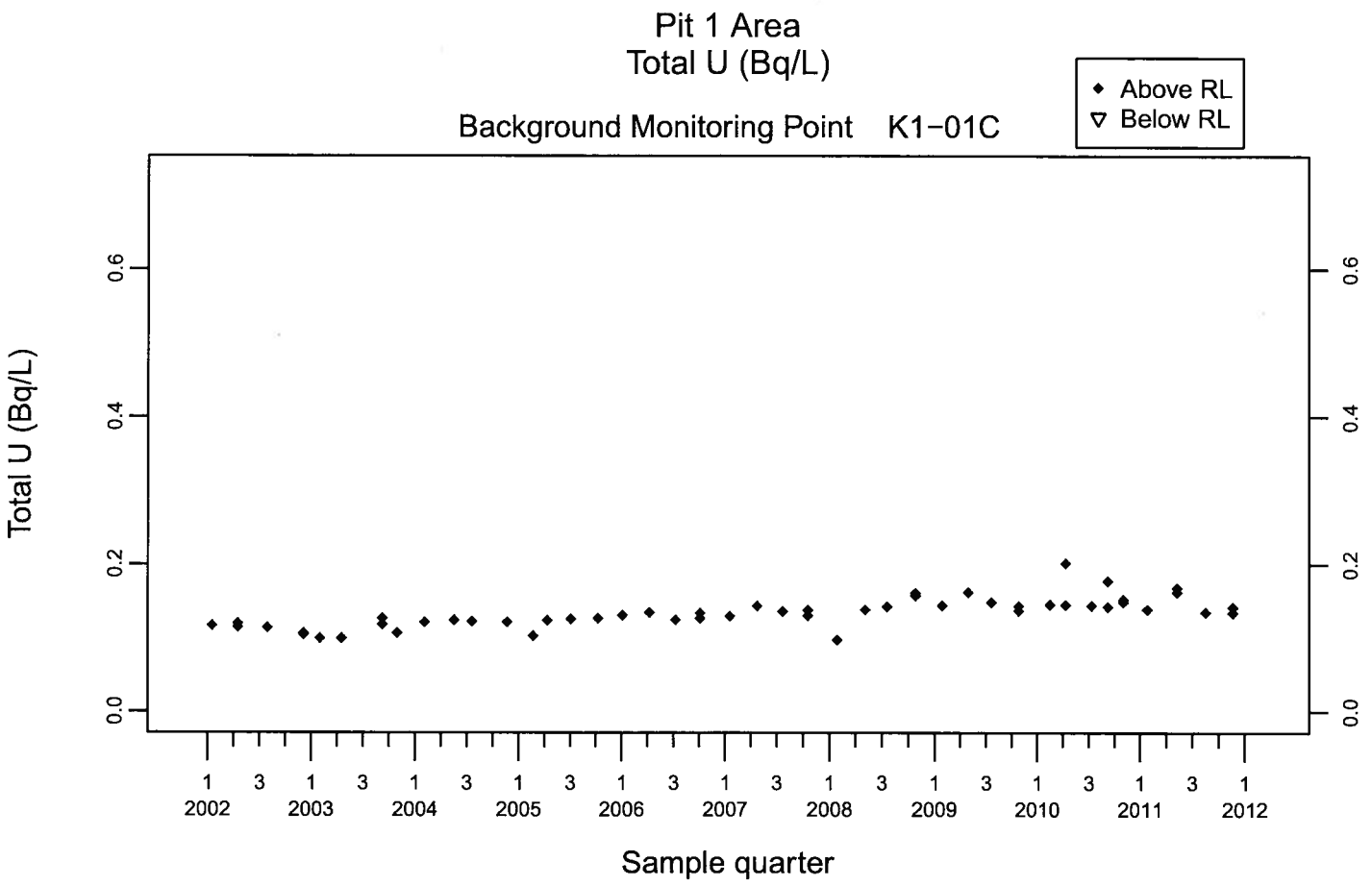

Crossgradient Monitoring Point K1-08
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

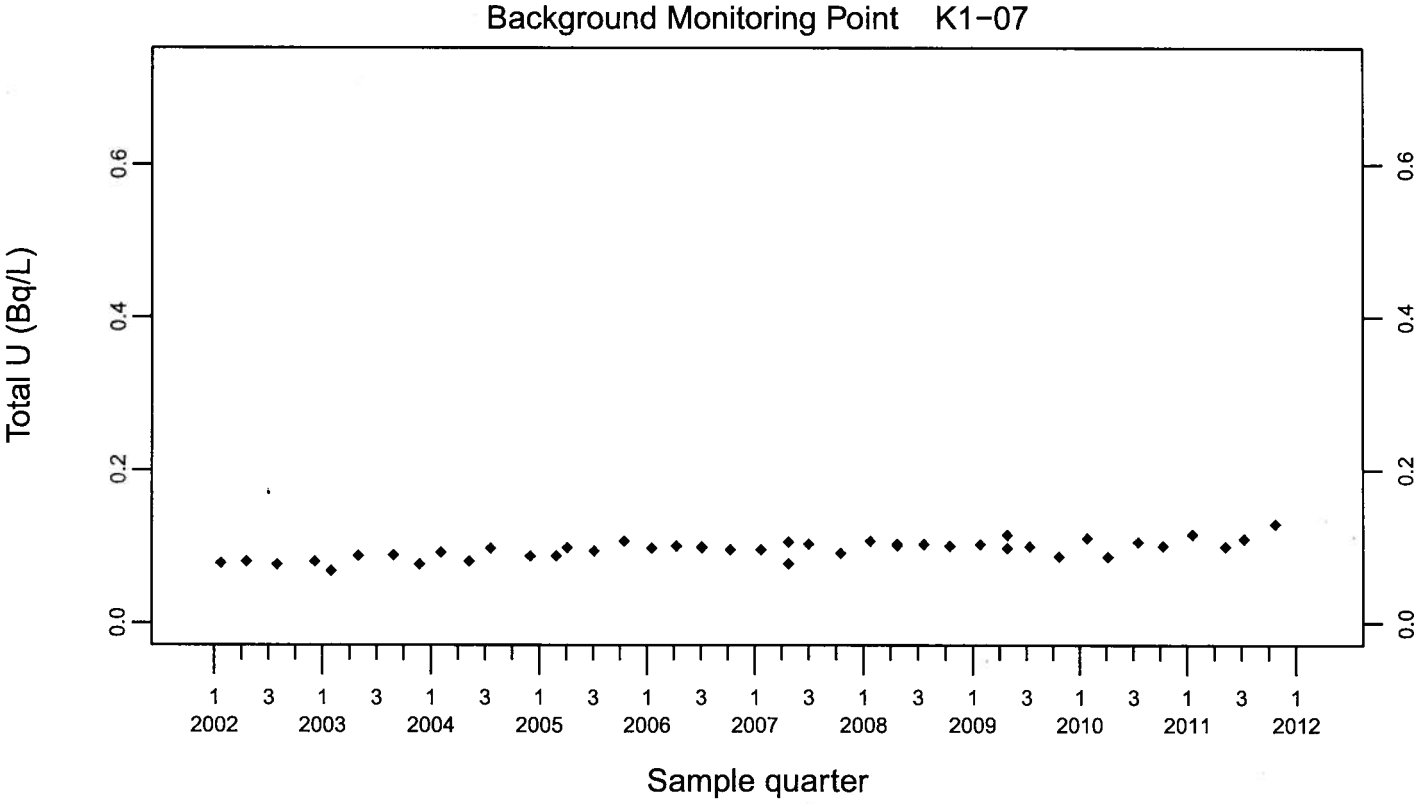

Pit 1 Area
U238 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

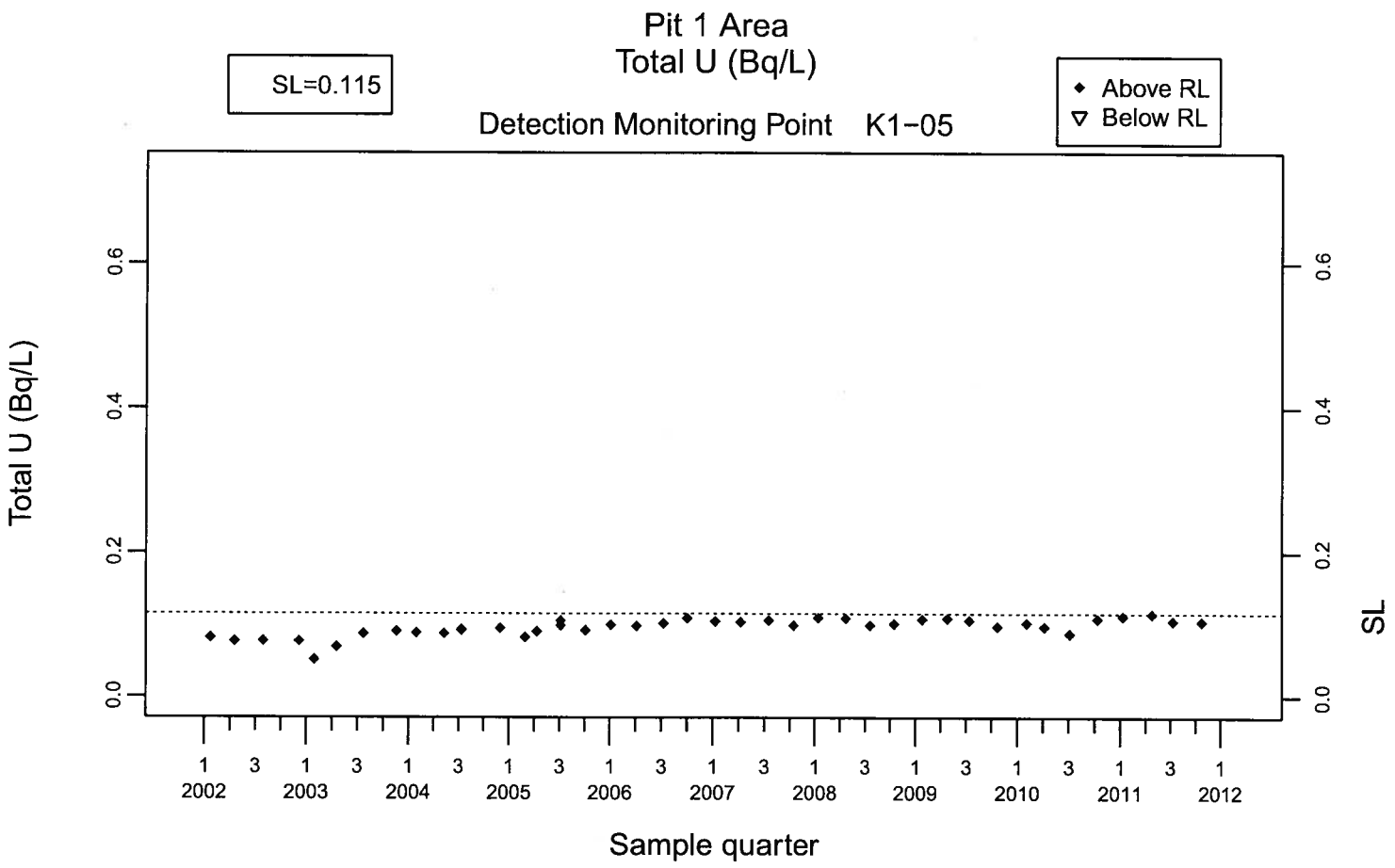

Background Monitoring Point K1-07
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

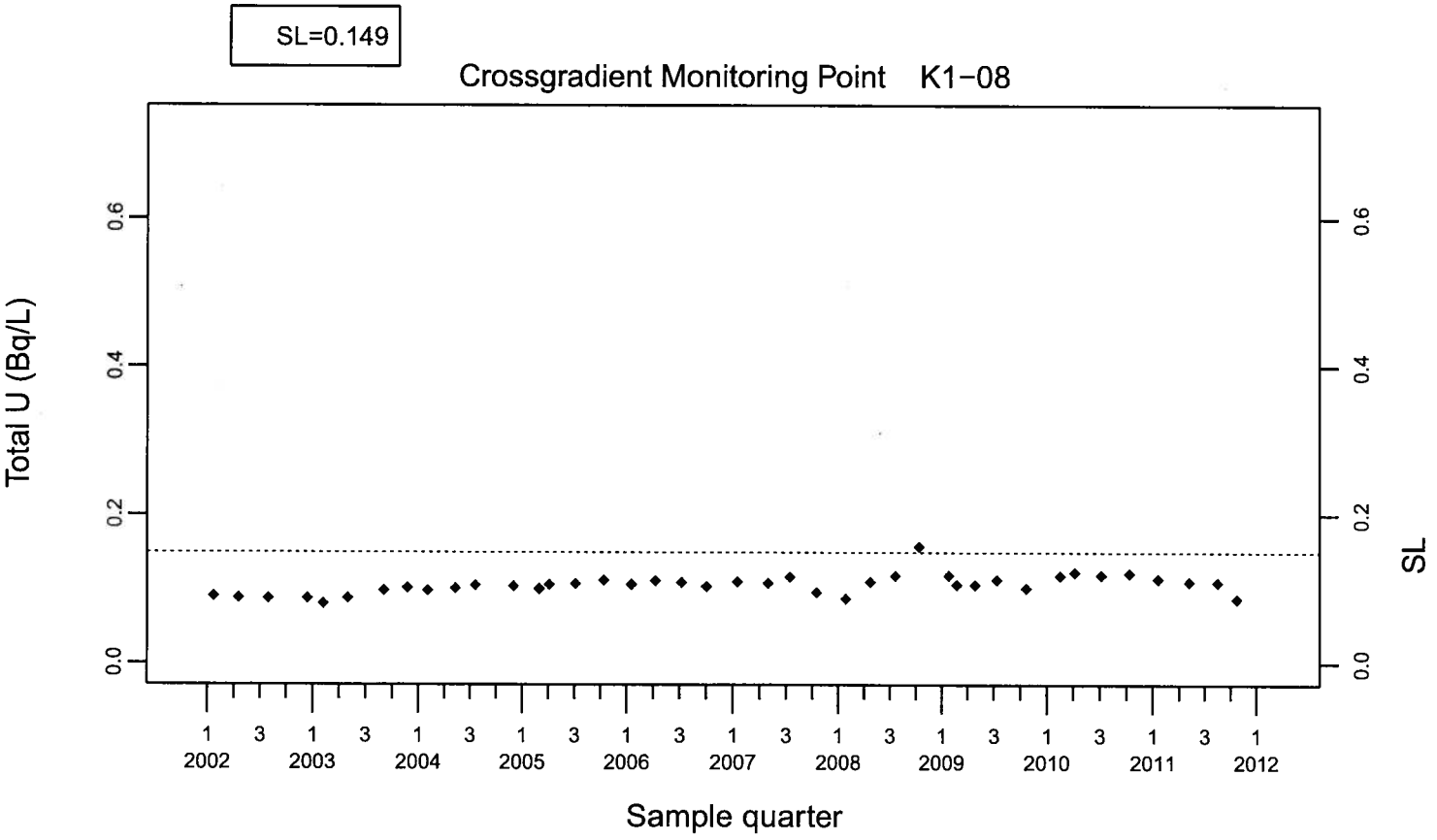

Pit 1 Area
U238 (Bq/L)
Detection Monitoring Point K1-05
Above RL
Below RL
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

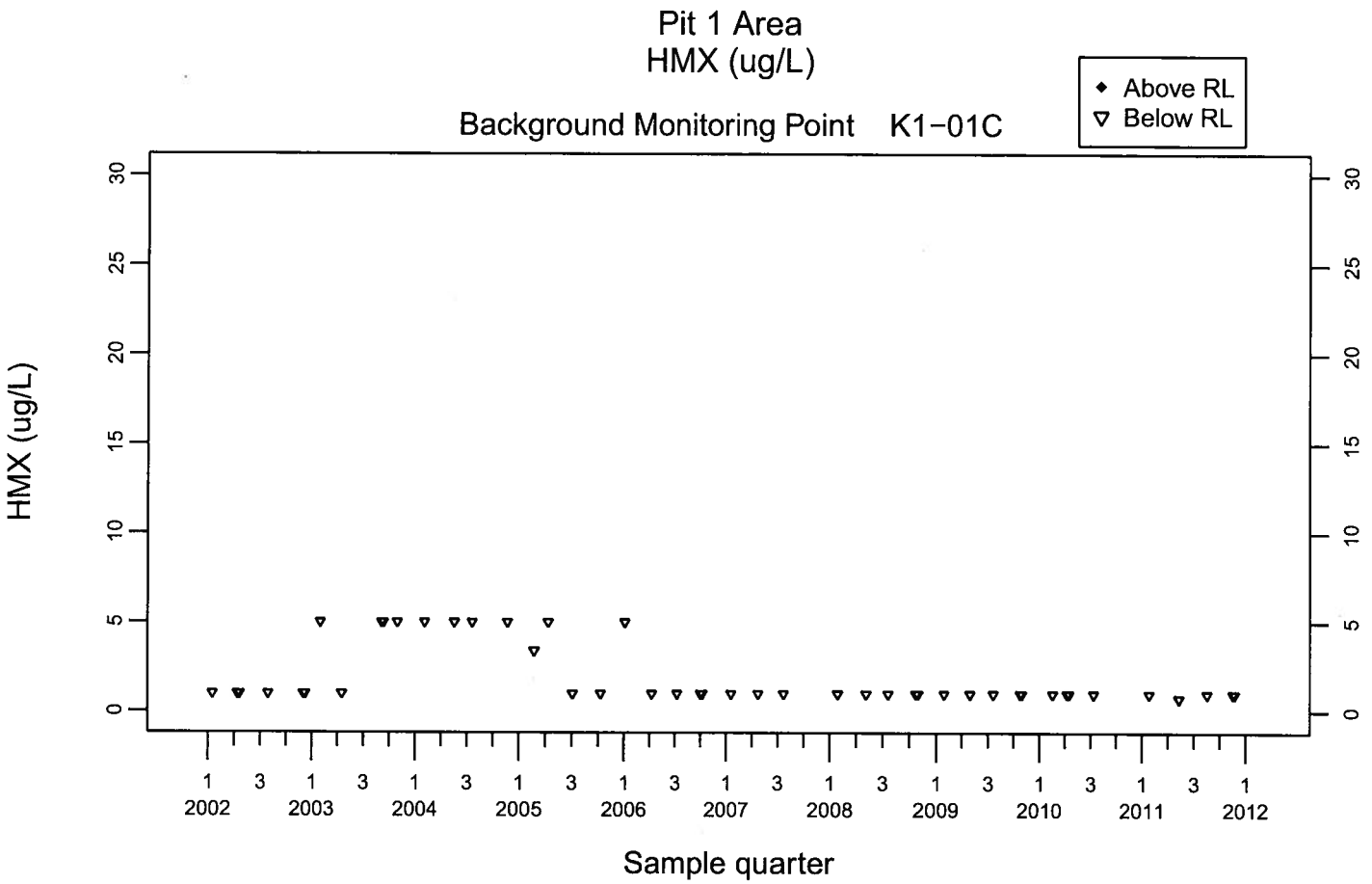

Crossgradient Monitoring Point K1-08
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

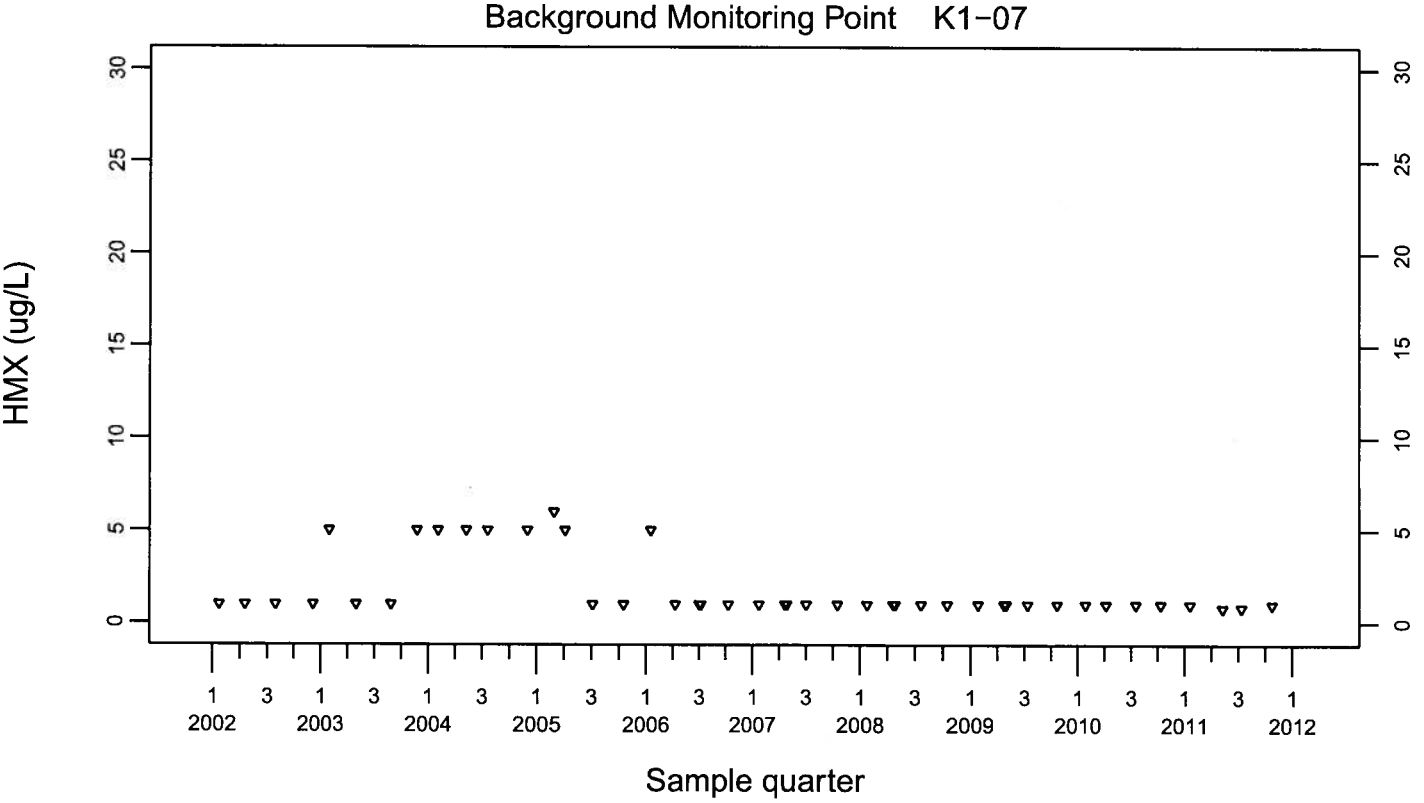

Pit 1 Area
Total U (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Total U (Bq/L)
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

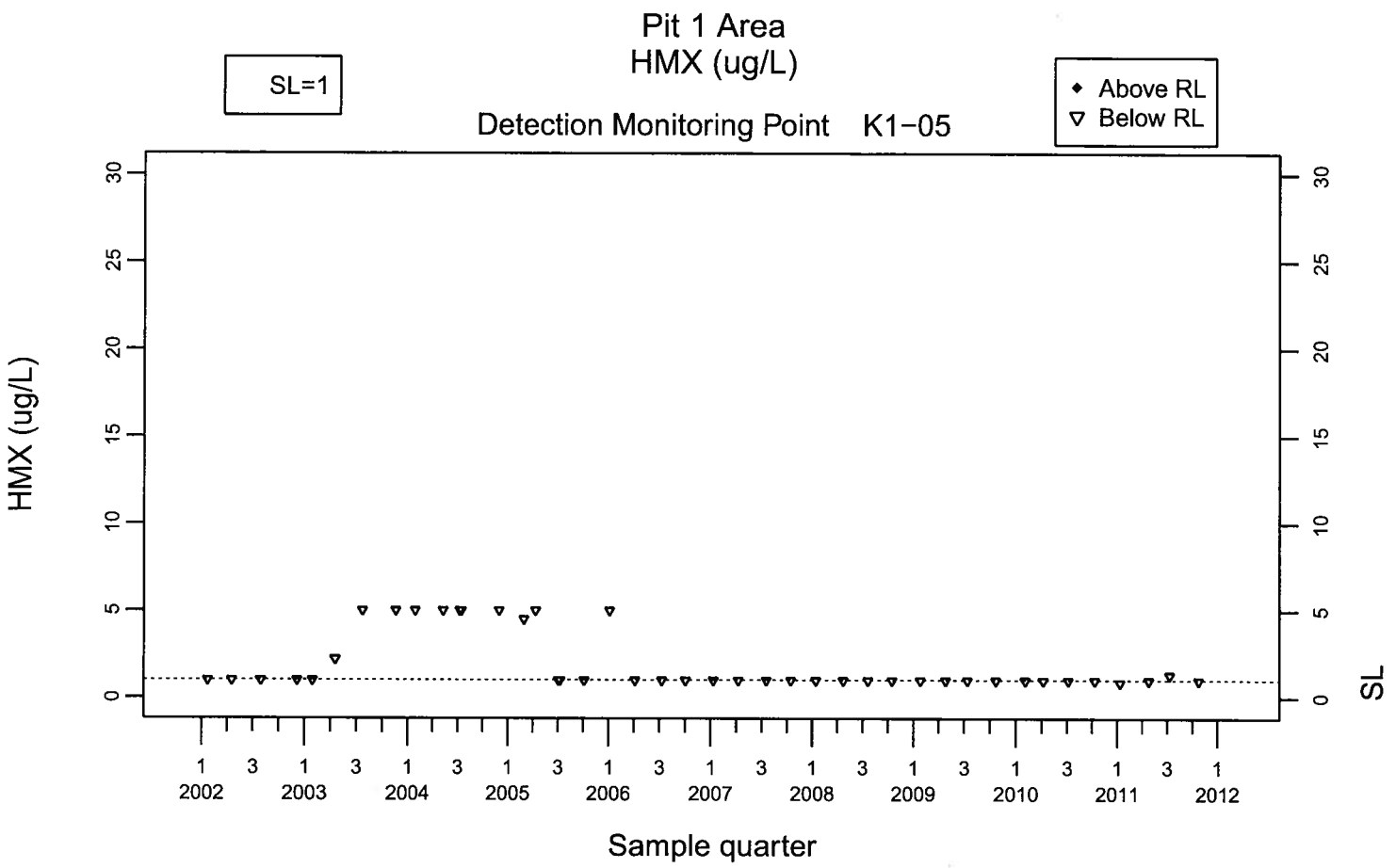

Background Monitoring Point K1-07
Total U (Bq/L)
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

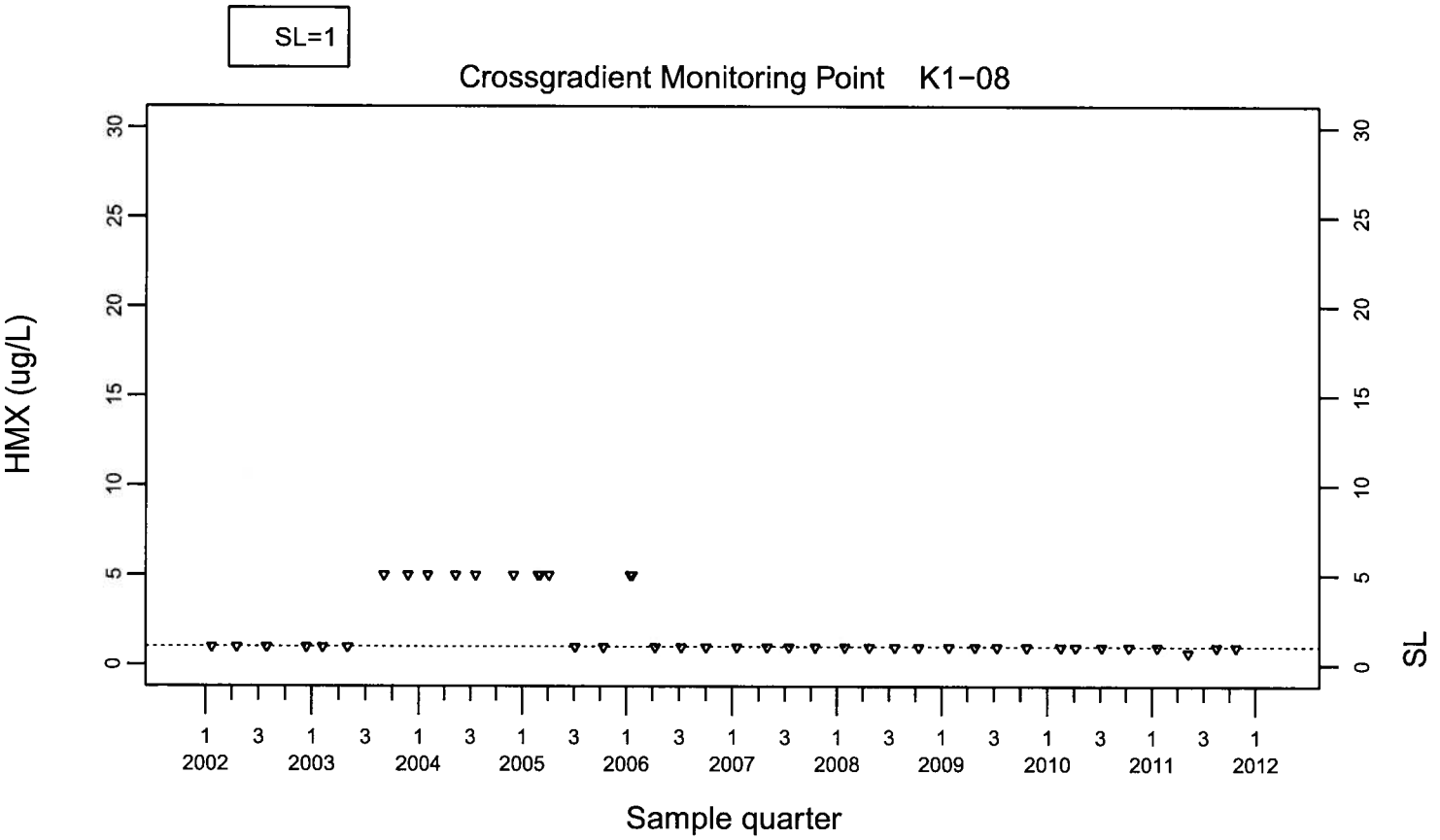

Pit 1 Area
Total U (Bq/L)
SL=0.115
Above RL
Below RL
Detection Monitoring Point K1-05
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

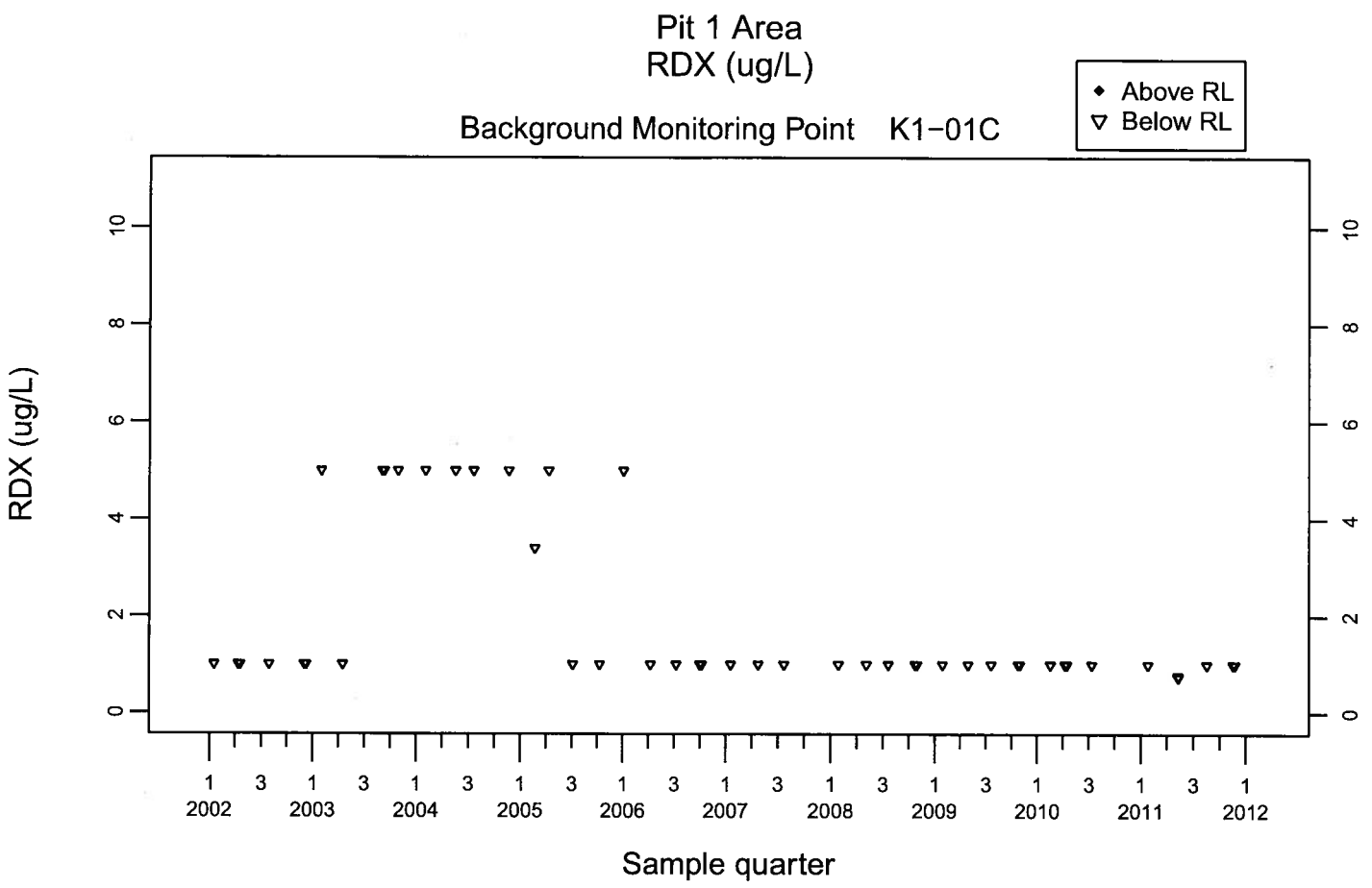

SL=0.149
Crossgradient Monitoring Point K1-08
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

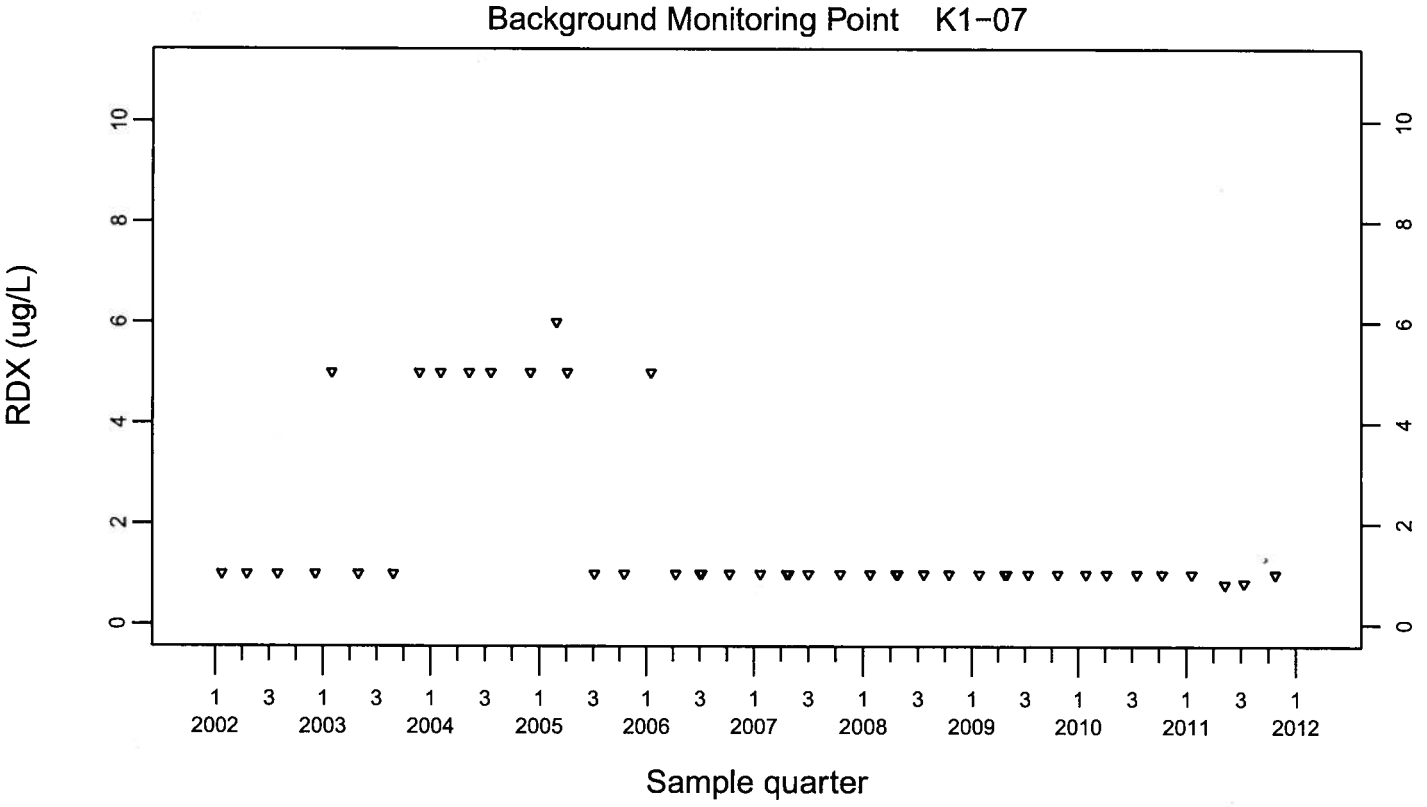

Pit 1 Area
HMX (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
HMX (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

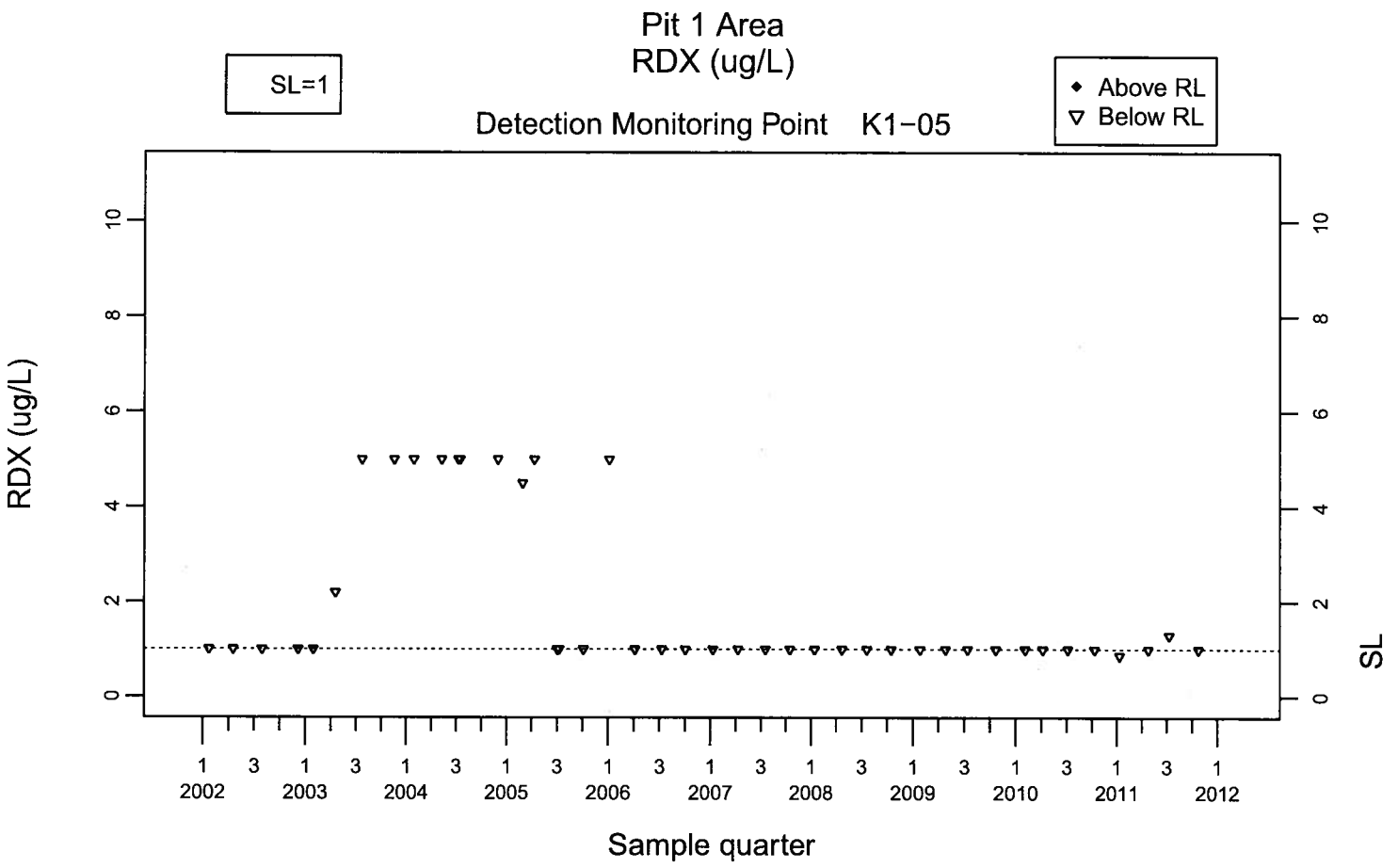

Background Monitoring Point K1-07
HMX (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

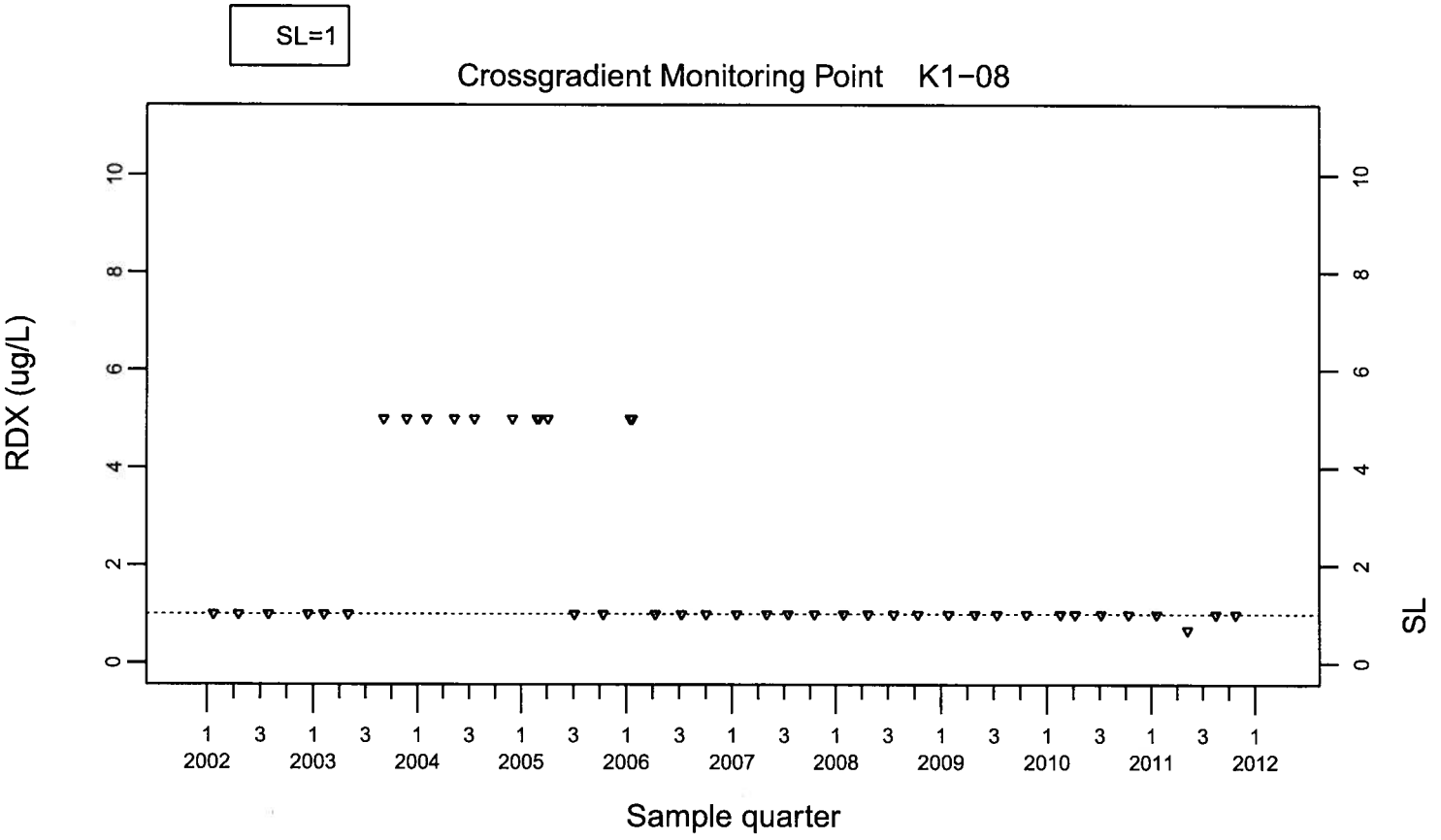

Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1-05
HMX (ug/L)
SL
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


SL=1
Crossgradient Monitoring Point K1-08
HMX (ug/L)
SL
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


Pit 1 Area
RDX (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
RDX (ug/L)
0
2
4
6
8
10
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


Background Monitoring Point K1-07
RDX (ug/L)
0
2
4
6
8
10
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


Pit 1 Area
RDX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1-05
RDX (ug/L)
SL
0
2
4
6
8
10
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter


SL=1
Crossgradient Monitoring Point K1-08
RDX (ug/L)
SL
0
2
4
6
8
10
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Sample quarter

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