Onondaga County Health Department

Division of Environmental Health
421 Montgomery Street
Syracuse, New York 13202

Incinerator Monitoring Program

2007
Summary Report

November 6, 2008

Submitted To: Cynthia B. Morrow, M.D., M.P.H.
Commissioner of Health

Submitted By: Gary R. Sauda, P.E.
Director, Division of Environmental Health

Summary Statement:
The monitoring conducted to date has shown all organic and metal levels to be below those associated with health risks. No relationship has been established between the operation of the incinerator and any significant increased levels of constituents in the environment.

Introduction

The Onondaga County Health Department initiated an incinerator monitoring program in 1994, the year prior to the Waste to Energy (WTE) facility being placed into operation. In 2003, the monitoring program for air, soil and ash was reevaluated, and a more effective and efficient program was developed and implemented starting in 2004. As an alternative to offsite air monitoring, direct interaction was established with the Onondaga County Resource Recovery Agency (OCCRA) and the New York State Department of Environmental Conservation (DEC) in providing stack monitoring results and improved assurance on reporting of adverse events and equipment failures. This allows for evaluation of short-term changes in the incinerator emissions, an effective alternative to the previous limited scope offsite air monitoring conducted over a nine year period.

Long-term deposition impacts continue to be evaluated by soil and ash monitoring. The only change made to this monitoring for purposes of efficiency was a reduction starting in 2004 in the number of soil and ash route sampling sites, and a reduction in the frequency of sampling for ash route sites only. All soil and ash route samples are analyzed for metals, and the spring collection of soil and ash is analyzed for organics. Under present contracts, organic analysis is performed by Axys Analytical Services, LTD, and metal analysis is performed by Life Science Laboratories, Inc. The collection of soil is performed by Onondaga County Health Department, Division of Environmental Health staff, while collection of the ash is the responsibility of Covanta Energy System under New York State Department of Environmental Conservation protocols.

Air Monitoring

During 2007, the department interacted directly with OCCRA and DEC in review of the stack monitoring results and reporting of adverse events and equipment failures by the facility operator, Covanta Energy. The department also reviewed both the monitoring conducted at the stack on a continuous basis and reported quarterly to DEC, as well as the annual stack test that is performed by an independent contractor. **At no time did the monitoring indicate constituents above levels of health concern**. The annual stack test incorporates an extensive list of analytes that includes metals and organics. **All of the analytes were well below permit limits.**

Soil and Ash Testing for Organics

Soil was sampled at both routine soil sites associated with the incinerator operation and additional sites associated with transport of ash from the incinerator to the county border

en route to the Seneca Meadows landfill. Soil from fourteen routine soil sites and four ash route soil sites collected in the spring of 2007 was analyzed for dioxins/furans (PCDD/PCDF), polychlorinated biphenyls (PCB's), and polycyclic aromatic hydrocarbons (PAH's). Ash, also collected in the spring of 2007, was analyzed for the same constituents.

Organic sample results are compared to published background data and U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles. **The reported concentrations of all organic compounds in soil are within expected background levels and are below significant health risk levels.** In general, little change in levels of these compounds have been observed from background through the present organic screening period. The levels of organics in the ash were similar to reports for ash identified by other investigators and reported in published literature.

Each form of dioxin/furan has associated with it a toxic equivalency factor that is used to calculate a total toxic equivalency (TEQ) for each sample. Attachment A shows the historical dioxin/furan TEQ values for routine soil sites, ash route soil sites, and ash samples. All levels remain well below the ATSDR and EPA action levels and there is no indication of a trend. For ash, dioxin/furan total TEQ and PCB's remain fairly consistent. Ash is not homogeneous and an inconsistent result occurs occasionally. The results are similar to those reported by other investigators.

Attachment B shows the historical PCB values for routine soil sites, ash route soil sites, and ash samples.

Soil and Ash Testing for Metals

Soil from the eighteen soil sites and ash were analyzed for ten different metals twice during the year (Spring and Fall). The metal results are issued in two different reports, one for soils and one for ash.

Metal results are compared to background levels and published national averages for urban areas. Soil and ash are not homogeneous and can contain materials that can account for an occasional inconsistent result. Hence, a single elevated or depressed value will not be assumed to be indicative of a change at a specific site. Rather, the pattern of values for that specific element must demonstrate a statistically significant difference, which may be indicative of a real environmental change. **In general, the metal results for 2007 fall within the expected range of values for urban areas and demonstrate no significant variation from background levels.**

Attachments C-1 and C-2 show the historical levels for the ten metals at the routine soil sites and ash route soil sites respectively. Due to the volume of data, the mean (average) of all routine sites and all routine control sites for each year is presented. The complete report includes all of the data for each site.

Attachment D shows the historical levels of the ten metals in ash.

Summary and Conclusions

The organic and metal results for this monitoring period are within the expected range for urban environments and are below any levels associated with health risk. Any variation in sample results appears to be a reflection of the low levels detected and expected variation as a result of sample collection, preparation and laboratory procedures. The results should be viewed in the context of an ongoing program of environmental monitoring performed by the Onondaga County Health Department as a part of its overall Incinerator Monitoring Program. **In the monitoring conducted to date, no relationship has been established between the operation of the incinerator and any significant increased levels of constituents in the environment.**

The following are the detailed Incinerator Monitoring Program reports that have been issued on the 2007 soil and ash testing:

2007 Screening Summary for Organic Constituents
2007 Soil Metals Analysis Summary
2007 Ash Characterization Summary

Copies of these reports are available upon request.

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The following abbreviations may be used in this report:

As	Arsenic.
ATSDR	Agency for Toxic Substances and Disease Registry
Be	Beryllium.
Cd	Cadmium.
CES	Certified Environmental Services.
Cr	Chromium.
CV	Coefficient of Variation.
ELS	Environmental Laboratory Services.
Hg	Mercury.
LD	Limit of Detection.
ND	None Detected.
ug/g	micrograms per gram.
Ni	Nickel.
OCCF	Onondaga County Correctional Facility.
OCHD	Onondaga County Health Department.
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PCDD/PCDF	Polychlorinated Dibenzo-p-Dioxins/Dibenzofurans
Pb	Lead.
pg/g	picograms per gram
PPM	parts per million.
SD	Standard Deviation.
Se	Selenium.
SHFD	Sentinel Heights Fire Department
V	Vanadium.
WTE	Waste to Energy Facility.
Zn	Zinc.
~	approximately.
<	Less than.
>	Greater than.
NA	Not applicable.
NS	Not sampled.

IV. Soil Sample Site Locations:

Routine Soil Monitoring Sites (*Denotes Control Sites):

1. ***Beaver Lake:** Beaver Lake County Park is located approximately 13 miles NW of the City of Syracuse in the Town of Lysander. The sample site is located in the overflow parking area, in the SE corner of the park.

2. **Clark Reservation:** Clark Reservation State Park is located approximately 0.5 miles SE of the WTE facility on Route 173. The sample site is in an open grassy area, adjacent to the basketball court.

3. ***Dutch Hill Road:** The sampling site is located on the Dutch Hill Road Radio Tower site, approximately 11 miles SSW of the City of Syracuse, in the Town of Otisco.

4. **Jamesville Beach:** The Jamesville Beach County Park is located on the western shore of the Jamesville Reservoir, off Apulia Road. The sample site is near the entrance of the park.

5. **Jamesville-DeWitt H.S.:** The Jamesville-DeWitt High School is approximately 3.5 miles ENE of the WTE facility. The sample site is located on the southern edge of the property, near the bus garage.

6. **Nob Hill:** The Nob Hill Apartments are located between Seneca Turnpike and Lafayette Road. The sampling site is located near the rental office building.

7. **Nottingham:** The Nottingham Retirement Complex is located approximately 2 miles ENE of the WTE facility on Nottingham Road. The sample site is in the NE corner of the property, adjacent to the maintenance garage.

8. **Syracuse University:** The Syracuse University site is located approximately 1/2 mile north of the WTE facility, near the Skytop administrative building. The sample site is adjacent to the radio towers.

9. **Channel 3 Tower:** The Channel 3 Tower site (formerly Tennessee Gas site) is approximately 4 miles south of the WTE on Sentinel Heights Road. The tower site is just south of the Sentinel Heights Road / Bull Hill Road intersection.

10. **Jamesville Pen.:** The Jamesville Penitentiary (Onondaga County Correctional Facility) is located on Route 173, just east of the village of Jamesville. The sample site is adjacent to the sewage treatment plant.

11. **Southwood:** The Southwood Park is located approximately 1 mile south of the WTE facility, off Barker Hill Road and Southwood Park Drive. The sample site is adjacent to the picnic area.

12. Sentinel Heights: The Sentinel Heights Fire Department is located on Dave Tilden Road, approximately 2.5 miles SSW of the WTE facility. The sampling site is on the lawn, just east of the building.

13. DOT @ Jaquith: The Onondaga County DOT property site borders Brighton Ave, the Jaquith Industries property and Route 81, near the Route 481 - Route 81 interchange. The sampling site is located in the middle of the grassy open field.

14. Pratts Falls: The Pratts Falls County Park is located approximately 2 miles NNE of the Village of Pompey. The sample site is in the center of the park, in an open recreation area.

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Ash Route Monitoring Sites (* Denotes Control Sites):

A-1. Rt 81 \ Rt 481: The Brighton Ave. site is located off Brighton Ave. at the Route 81 North on-ramp. This site was previously referred to as "Brighton Ave".

A-2. Jones Road: The Jones Road site is located along the New York State Thruway at the Jones Road Exit.

A-4. Jordan - Thruway: The Jordan site is located along the New York State Thruway in the Jordan area. The sample site is a grassy area near mile post 200.4.

A.-5. *Exit 34A: The Exit 34A site is located along the New York State Thruway at Exit 34A. The sample site is along the eastbound off-ramp.

Attachment A

Attachment A

Dioxin/Furnan TEQ Soil Results through Year 2007 (pg/g dry weight)

Routine Soil Sites

Site	Year								
	1994	1999	2000	2001	2002	2004	2005	2006	2007
Clark Reservation	1.8	1.2	2.27	1.42	1.23	2.03	1.90	1.76	1.73
Jamesville Beach	0.6	0.5	1.09	0.82	0.70	0.71	0.97	0.86	0.93
OCCF	0.79	2.2	1.68	1.47	1.26	1.38	5.54	1.52	1.94
DOT @ Jaquith	2		1.5	1.64	3.41	2.41	3.78	3.38	1.73
Dutch Hill *	**0.77**		**1.41**	**1.16**	**1.40**	**1.03**	**1.26**	**1.02**	**1.02**
Erie - Poolsbrook *	**1.39**		**1.5**	**1.14**	**1.86**	**	**	**	**
Nottingham	0.51		0.78	0.79	0.80	0.70	0.94	0.85	0.84
SHFD	12		8.02	9.89	9.72	7.02	8.09	6.27	7.20
Sevier Rd	1.8		2.07	2.58	2.56	**	**	**	**
Beaver Lake *			**0.51**	**0.53**	**0.85**	**0.70**	**0.72**	**0.64**	**0.69**
Ch. 3 Towers			3.36	3.88	3.35	9.66	7.79	7.69	5.39
General Crushed Stone			2.77	1.98	2.13	**	**	**	**
Highland Forest			1.18	1.24	0.96	**	**	**	**
JD High School			1.32	1.29	1.12	1.10	1.48	1.16	1.06
Nob Hill			0.93	0.91	0.90	6.83	1.01	1.00	1.07
Pratts Falls			0.91	0.98	0.77	0.87	0.98	0.83	0.94
Southwood			0.6	1.14	1.01	1.08	1.05	0.97	1.09
Syracuse University			3.11	6.97	9.47	13.89	3.14	3.66	12.96

Ash Route Soil Sites

Site	Year								
	1995	1999	2000	2001	2002	2004	2005	2006	2007
Thruway - Exit 34A *	**1.2**	**1.8**	**1.47**	**1.72**	**1.32**	**1.60**	**1.66**	**1.58**	**1.61**
Metro. Water Board *	**0.68**		**0.84**	**1.03**	**0.67**	**	**	**	**
Thruway - Jordan	1.46		1.78	2.02	1.66	1.61	1.66	1.51	1.69
BrightonAve (Rt 81 \ Rt 481)		8.4	3.9	6.80	8.66	5.47	7.11	12.51	8.39
Thruway - Pottery Rd		2.21	1.86	1.84	1.70	**	**	**	**
Jones Rd			5.16	3.24	4.93	3.50	8.73	7.60	5.00

* Denotes Control Sites
** Site no longer sampled due to program re-evaluation

Combined Ash

Site	Year								
	1999-Spring	1999-Fall	2000-Fall	2001-Fall	2002-Fall	2004-Spring	2005-Spring	2006-Spring	2007-Spring
Day 1 and 2	256	153	109	123	177	72	191	246	250
Day 3, 4, and 5	242	205	154	137	220	445	142	148	276

Note: For reference purposes, the ATSDR investigation level for Dioxin/Furan TEQ is 50 pg/g and the EPA clean up level is 1,000 pg/g.

Attachment B

Attachment B

PCB Results through Year 2007 (pg/g dry weight)

Routine Soil Sites

Site							
	2000	2001	2002	2004	2005	2006	2007
Clark Reservation	6010	2360	3150	2780	3610	2770	4110
Jamesville Beach	1260	644	683	703	1110	781	1220
OCCF	3080	5230	2000	2310	6940	3120	6320
DOT @ Jaquith	16100	15400	45100	9220	67100	49100	18000
Dutch Hill *	**2210**	**1170**	**1400**	**1200**	**1380**	**1140**	**1450**
Erie - Poolsbrook *	**2620**	**1400**	**2020**	**	**	**	**
Nottingham	2140	2280	3610	1640	7380	2850	3050
SHFD	3080	2970	1760	1900	2730	1610	2510
Sevier Rd	1870	1600	2250	**	**	**	**
Beaver Lake *	**1970**	**1210**	**5250**	**2650**	**1420**	**1360**	**1360**
Ch. 3 Towers	3360	2310	2490	1620	1830	1730	2220
General Crushed Stone	9430	3160	5450	**	**	**	**
Highland Forest	2120	1210	1270	**	**	**	**
JD High School	3580	1780	1732	1810	2640	1780	1720
Nob Hill	3500	2480	2500	3440	2810	2970	2830
Pratts Falls	1890	1840	1440	1620	1650	1220	1450
Southwood	2240	2160	1150	1480	1470	1470	2750
Syracuse University	10700	114000	11000	9510	6940	11400	10900

Ash Route Soil Sites

Site							
	2000	2001	2002	2004	2005	2006	2007
Thruway - Exit 34A *	**5880**	**3400**	**4430**	**8630**	**3960**	**3030**	**3760**
Metro. Water Board *	**2240**	**653**	**603**	**	**	**	**
Thruway - Jordan	7730	6390	6070	4470	5050	4060	3590
BrightonAve (Rt 81 \ Rt 481)	2240	55000	100000	64900	53700	62200	54000
Thruway - Pottery Rd	15900	6400	7390	**	**	**	**
Jones Rd	1950	2130	2930	1780	2980	2190	2010

* Denotes Control Sites
** Site no longer sampled due to program re-evaluation

Combined Ash

Site							
	2000-Fall	2001-Fall	2002-Fall	2004-Spring	2005-Spring	2006-Spring	2007-Spring
Day 1 and 2	79000	22000	13600	7850	2470	5770	3080
Day 3, 4, and 5	4700	7020	6580	38000	33000	57000	3060

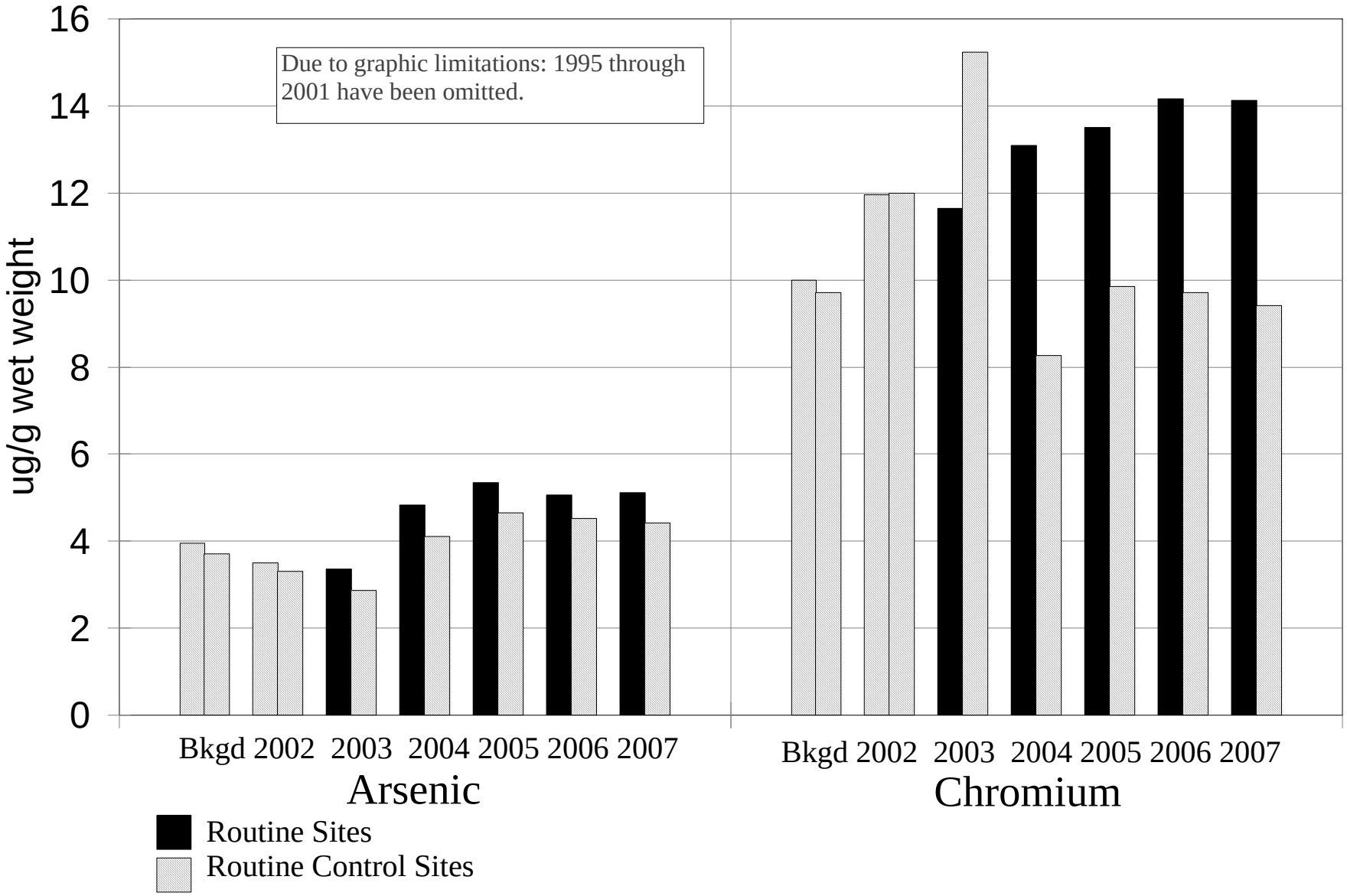
***** PCB results prior to 2000 were all less than detection limits. Starting in 2000 detection limits were lowered so that usable concentrations were available.**

Note: For reference purposes, the ATSDR indicates that typical mean PCB concentrations in background soil are less than 100,000 pg/g

Attachment
C-1

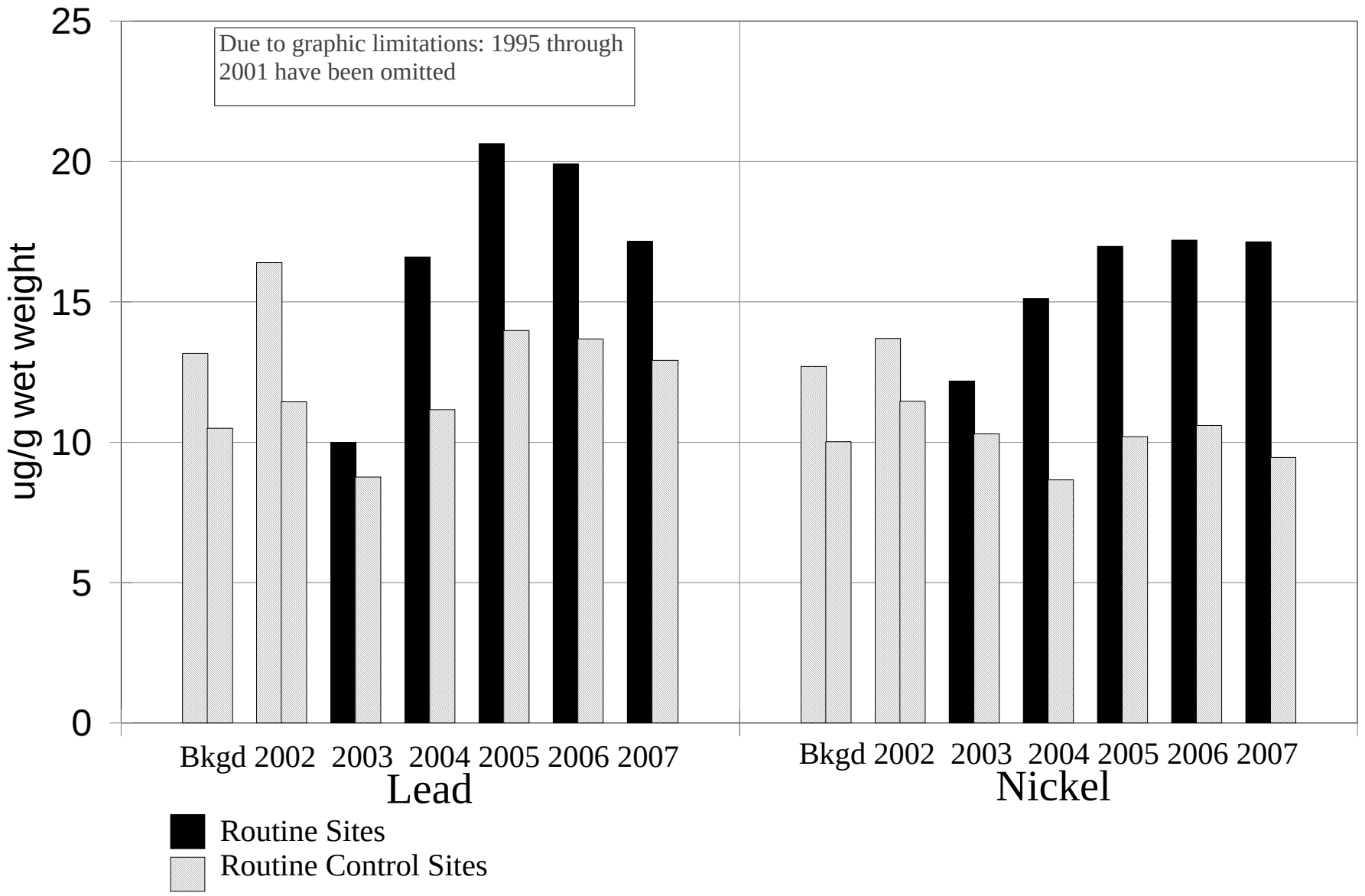
VII.A.

Comparison of Annual Mean Values
Routine and Routine Control Sites



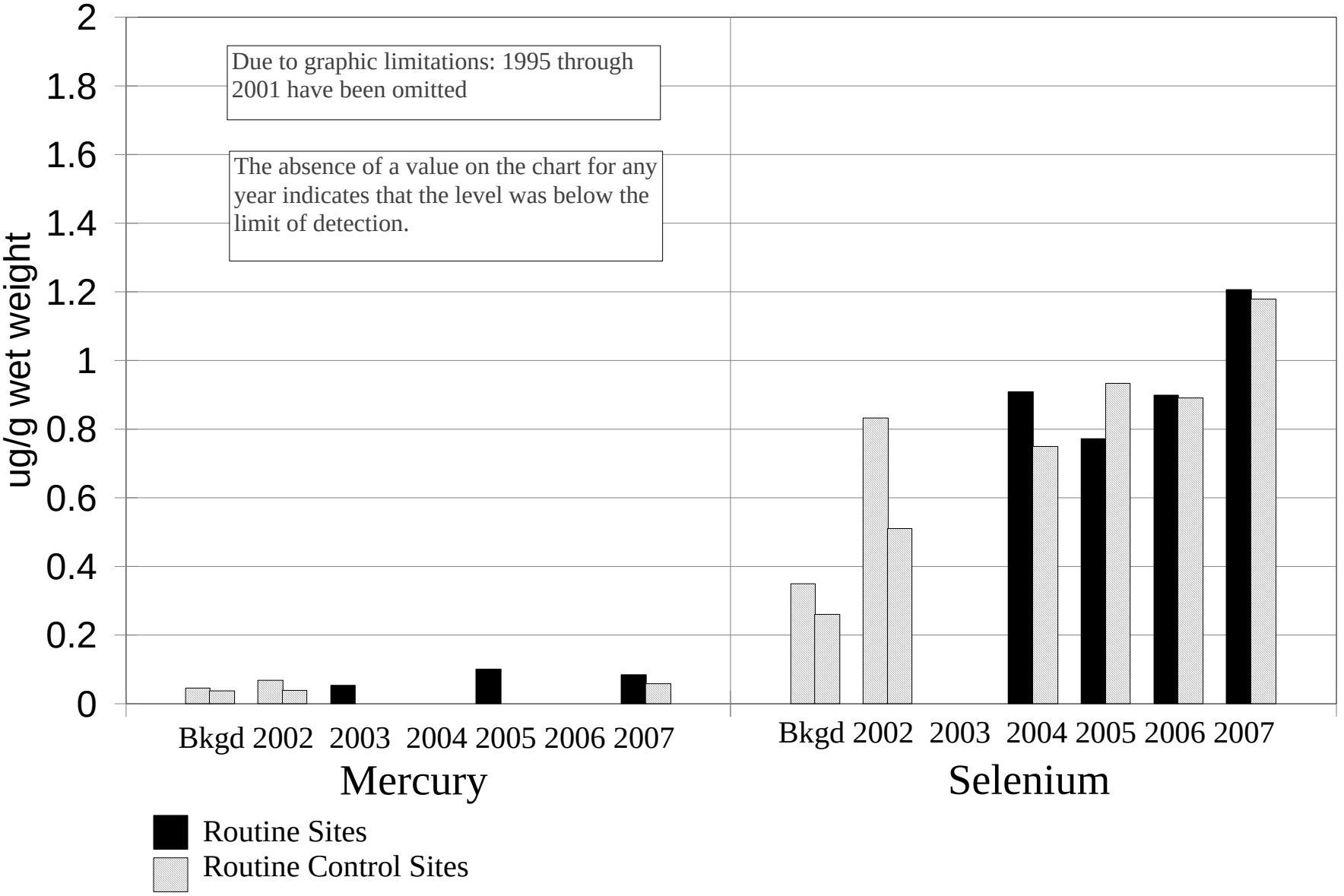
VII.C.

Comparison of Annual Mean Values
Routine and Routine Control Sites



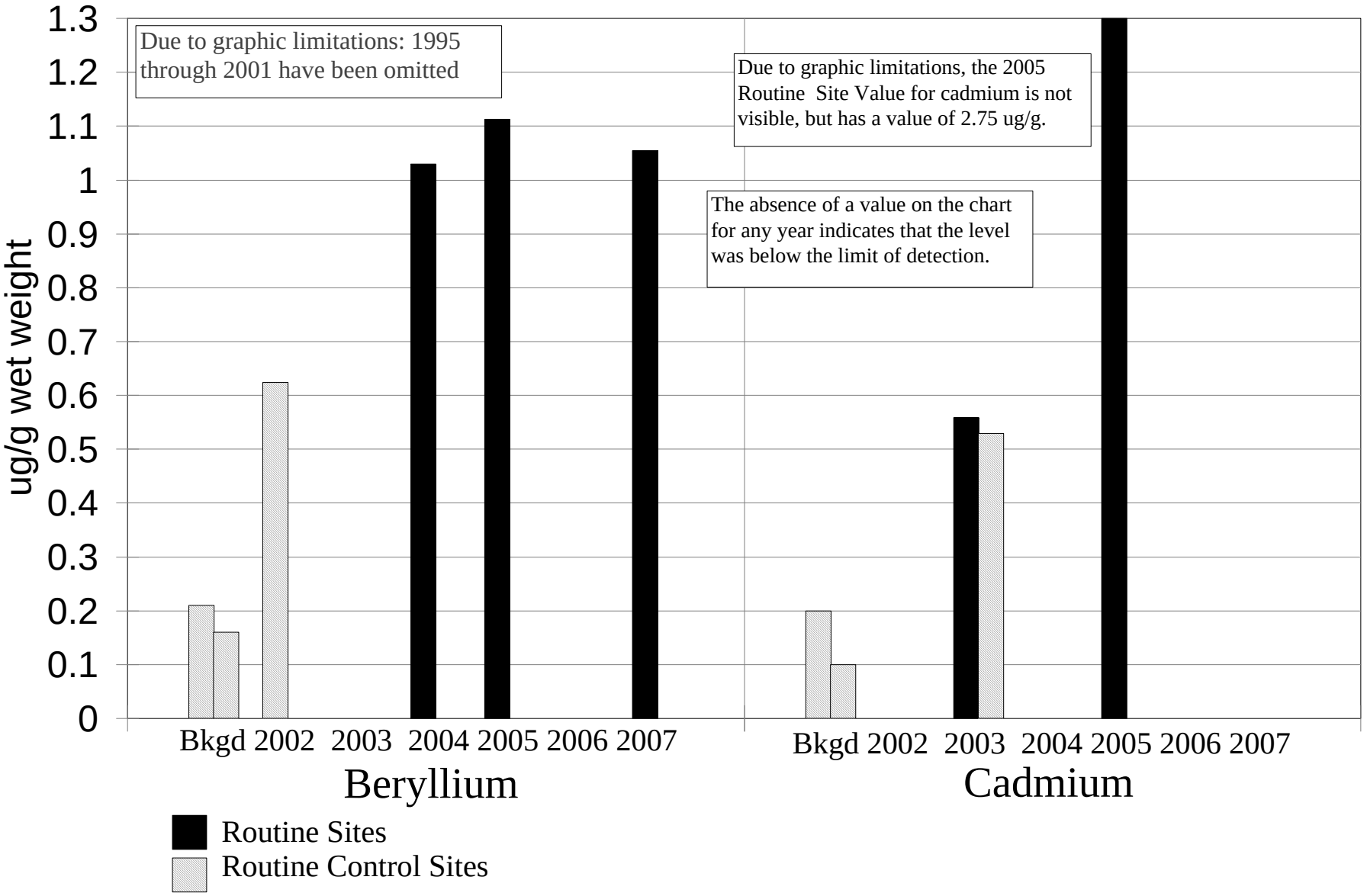
VII.D.

Comparison of Annual Mean Values
Routine and Routine Control Sites



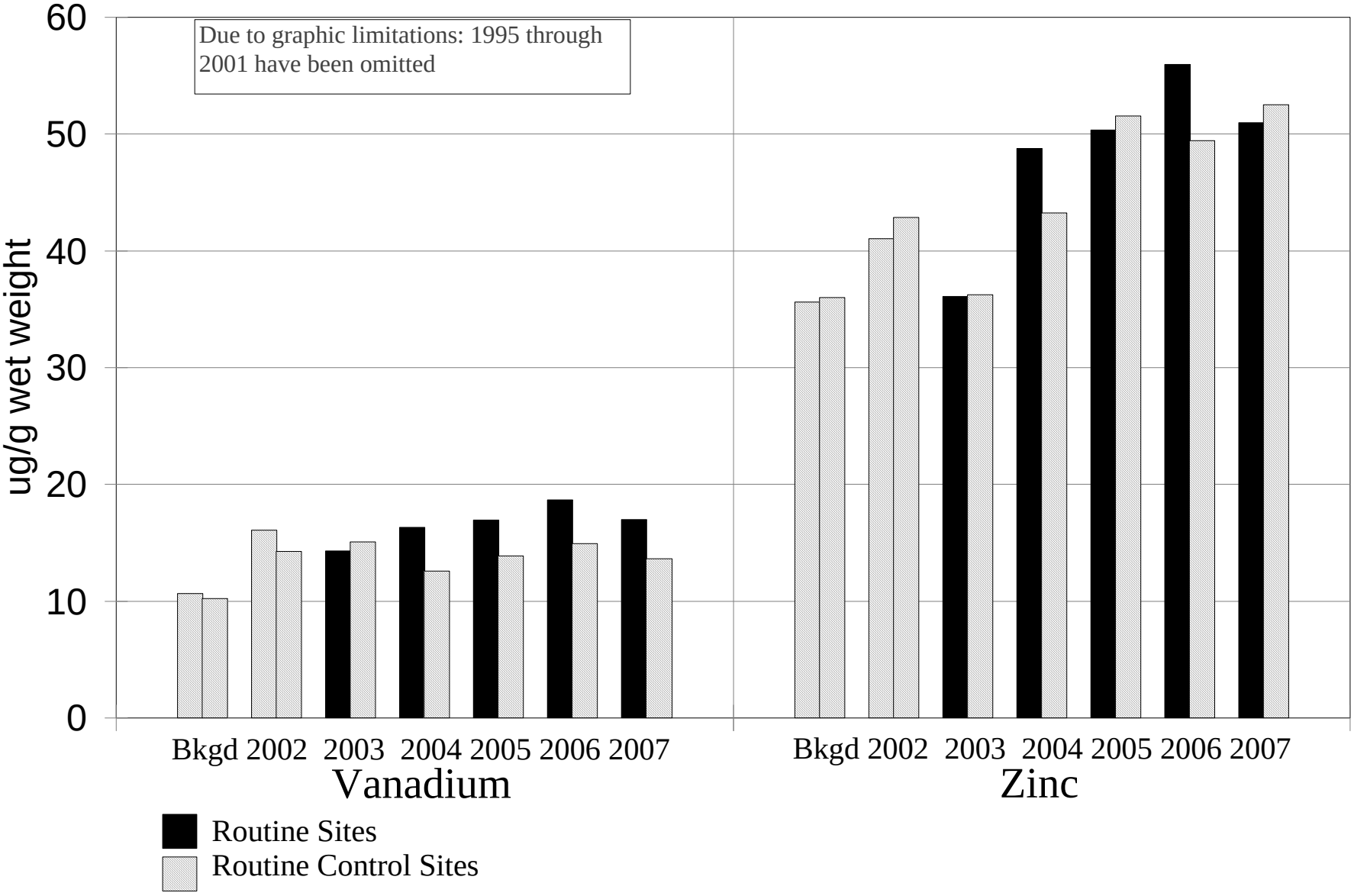
VII.B.

Comparison of Annual Mean Values
Routine and Routine Control Sites



VII.E.

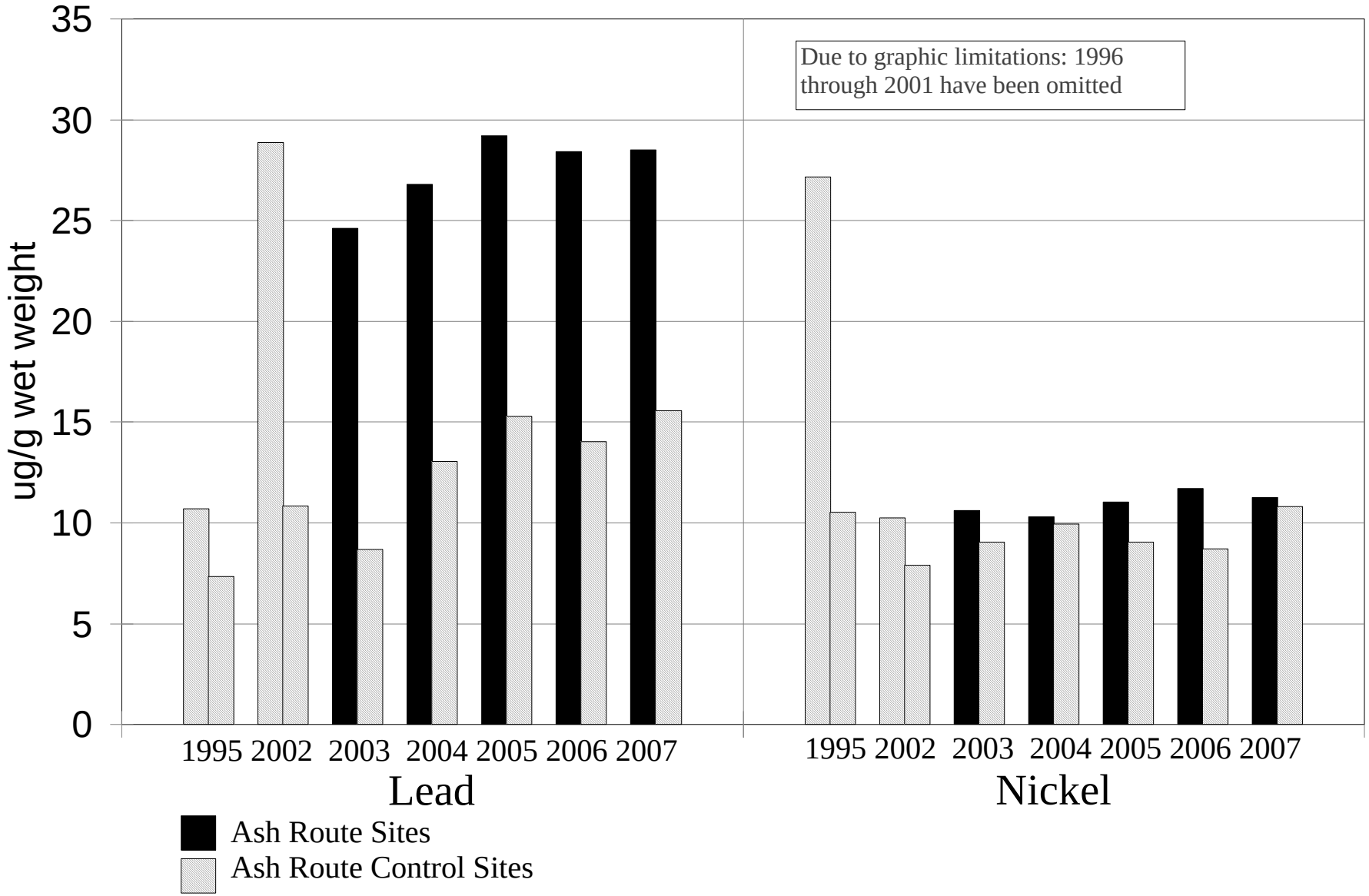
Comparison of Annual Mean Values
Routine and Routine Control Sites



Attachment
C-2

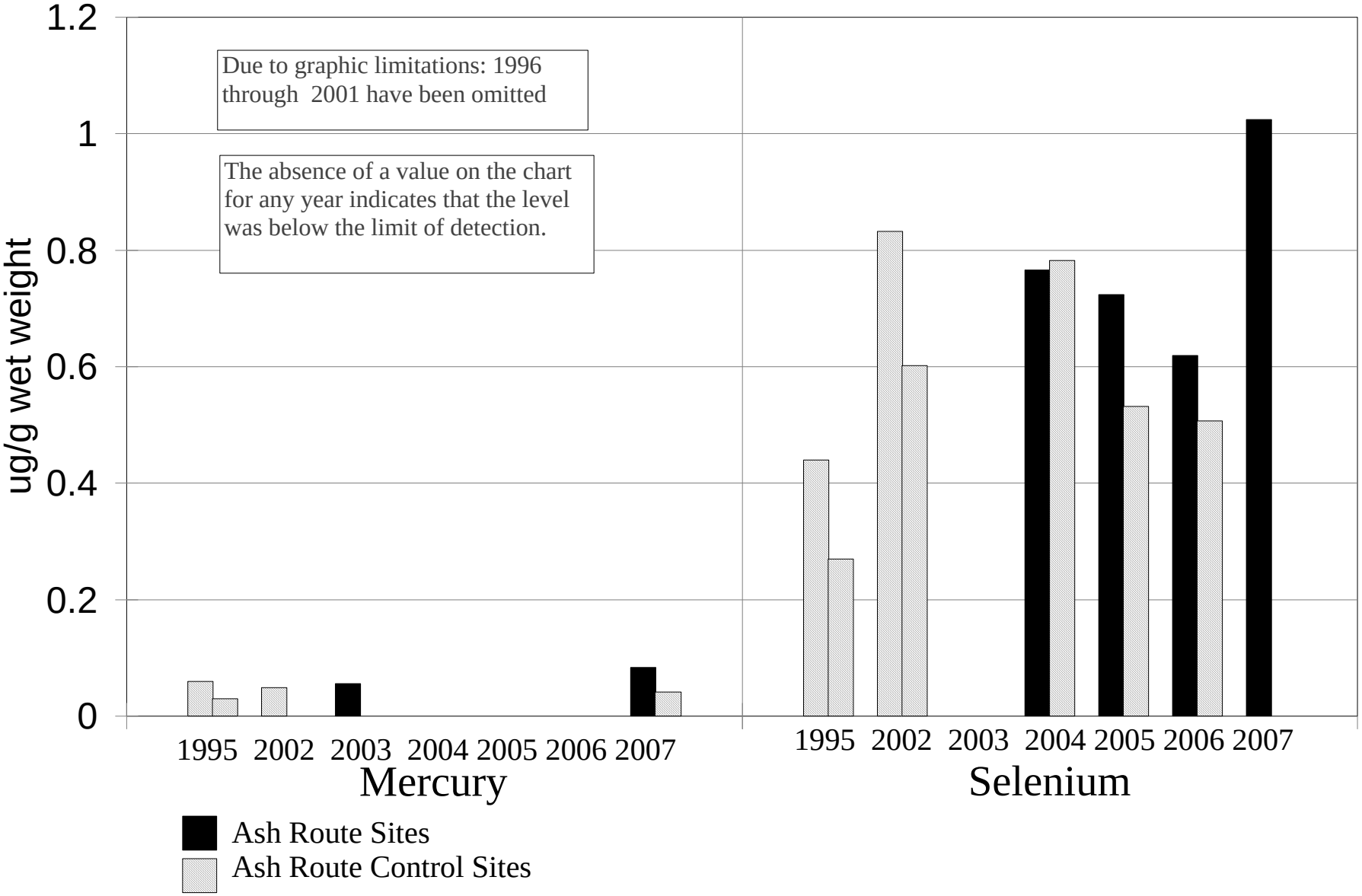
VIII.C.

Comparison of Annual Mean Values
Ash Route and Ash Route Control Sites



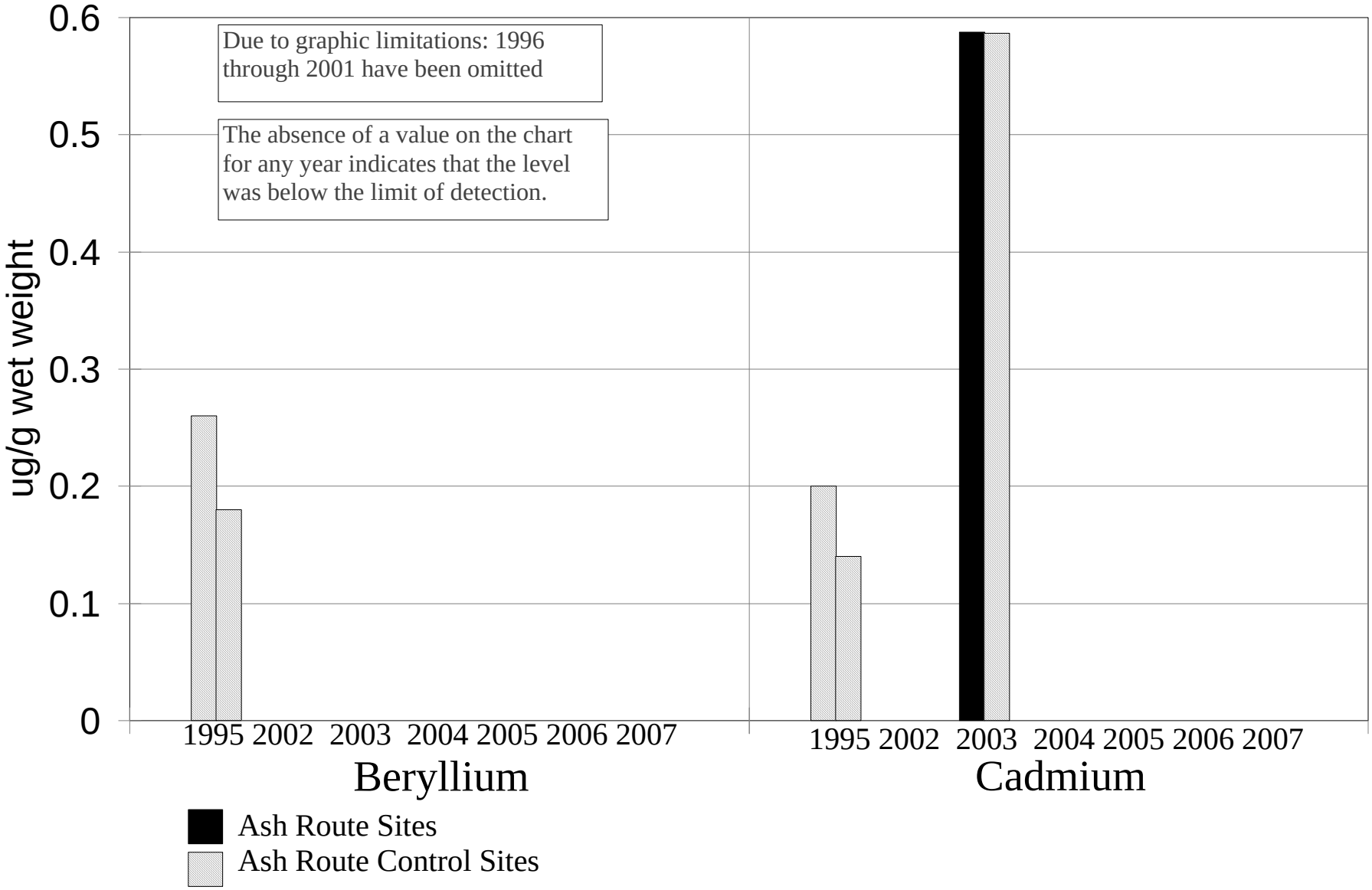
VIII.D.

Comparison of Annual Mean Values
Ash Route and Ash Route Control Sites



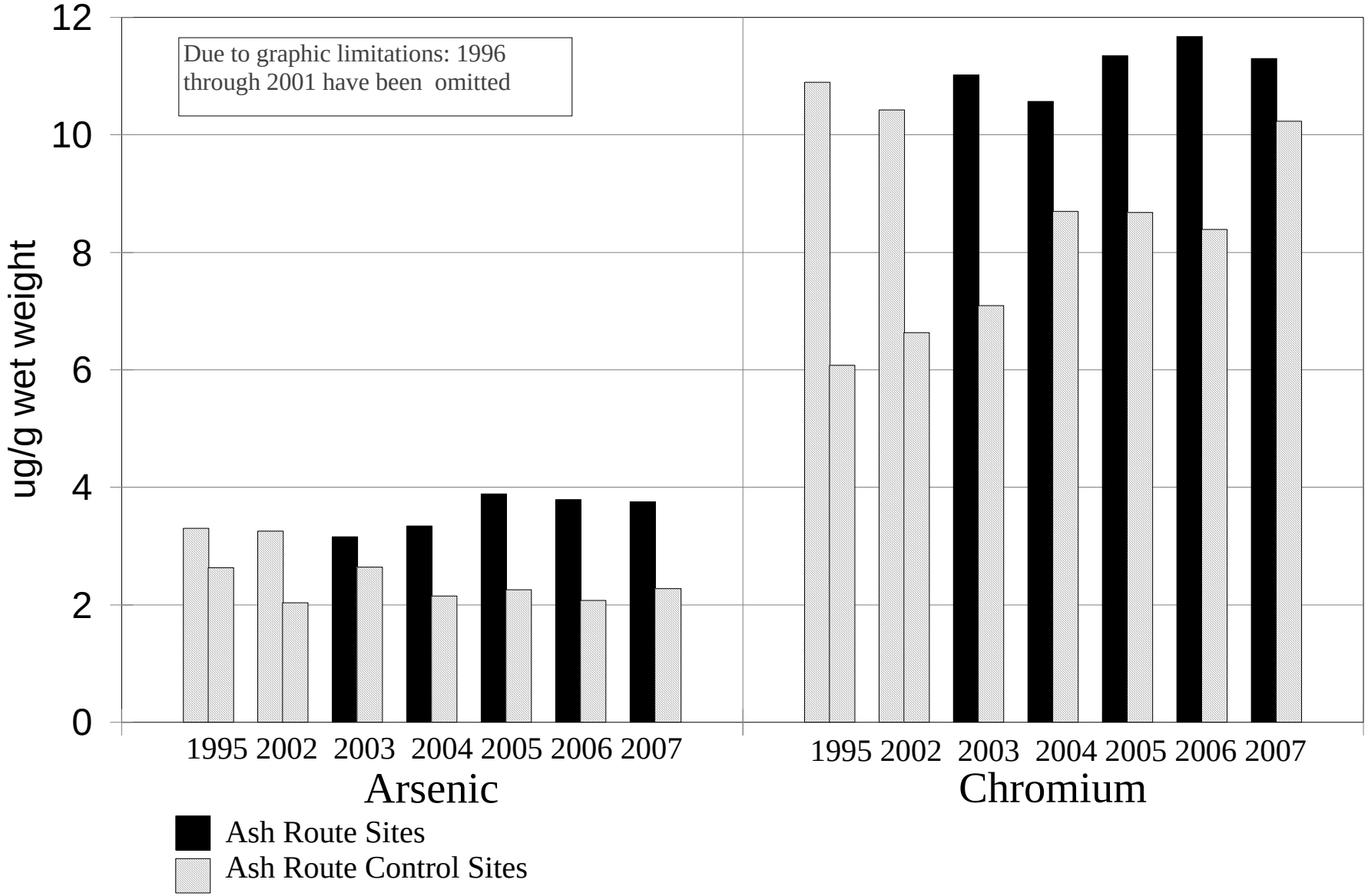
VIII.B.

Comparison of Annual Mean Values
Ash Route and Ash Route Control Sites



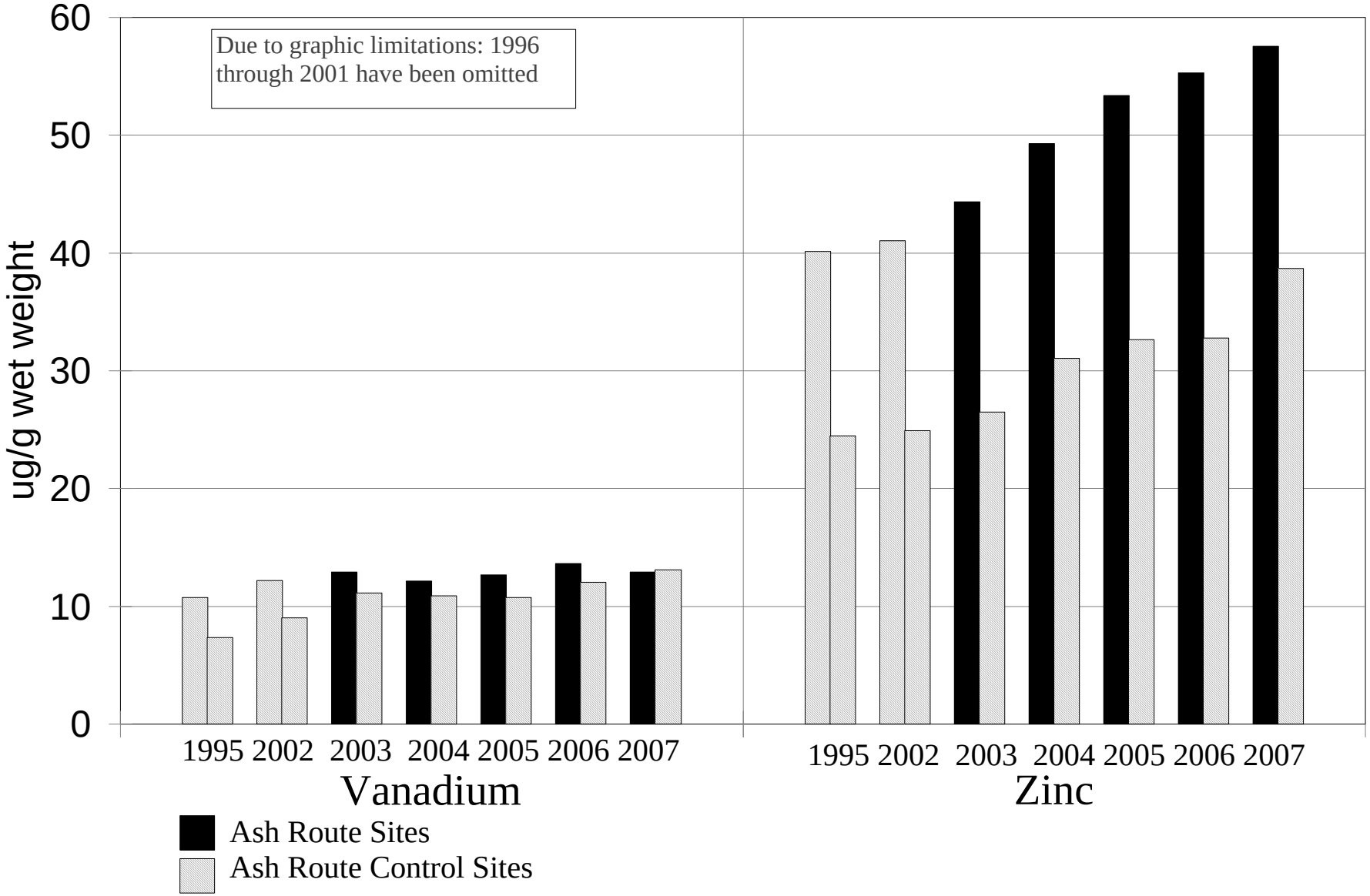
VIII.A.

Comparison of Annual Mean Values
Ash Route and Ash Route Control Sites



VIII.E.

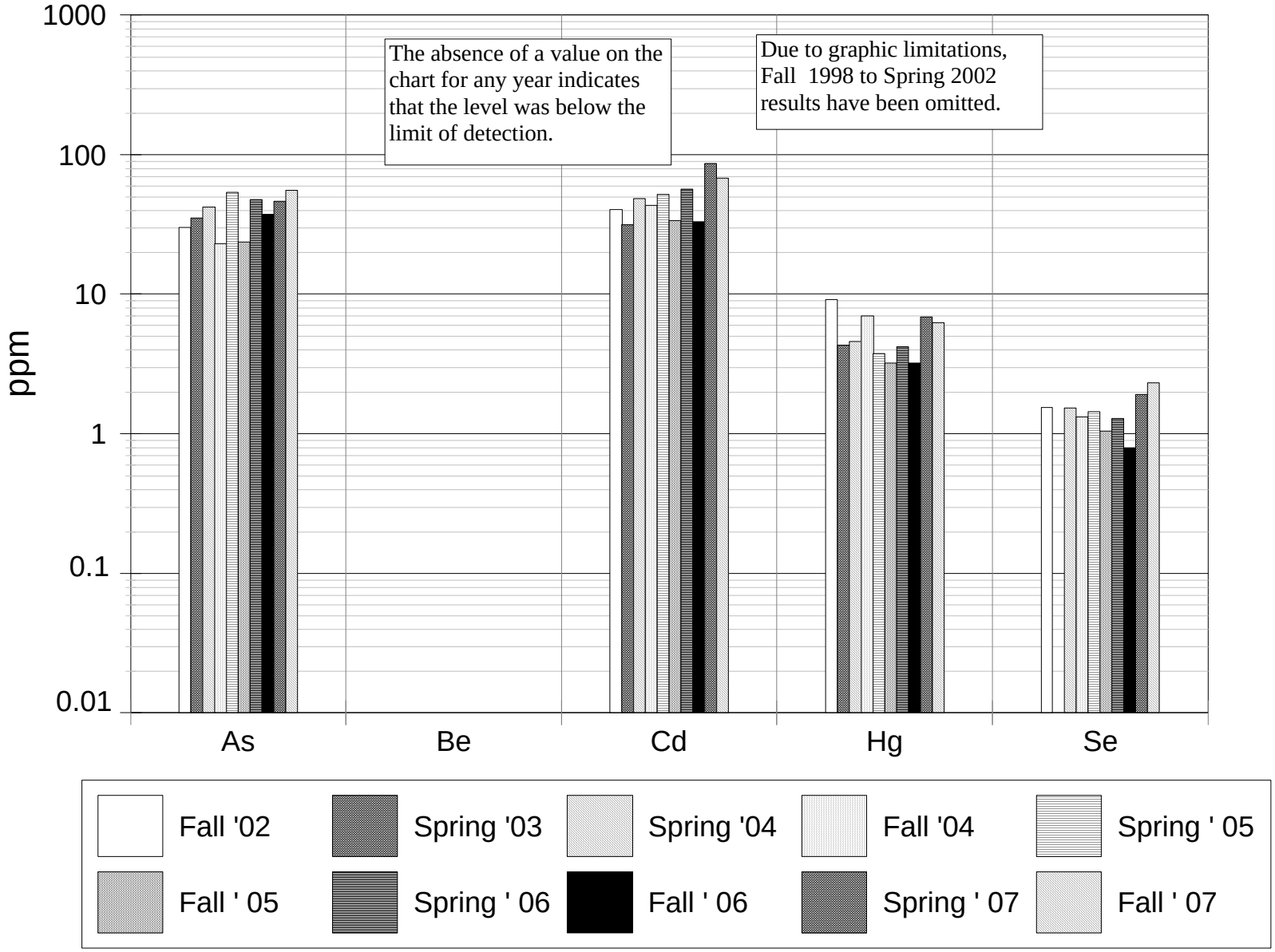
Comparison of Annual Mean Values
Ash Route and Ash Route Control Sites



Attachment D

VII.A. Mean Values Ash Data

(Values in ppm; ug/g dry wt)



VII.B. Mean Values Ash Data

(Values in ppm; ug/g dry wt)