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Buckingham
Colorado Smelter
Reference 16

OCT 2 0 1995
HAZARDOUS MATERIALS
AND WASTE MANAGEMENT

ecology and environment, inc.
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International Specialists in the Environment

SITE SCREENING REPORT
BOSTON SMELTER SITE

TO: Steve Hawthorn, OSC

FROM: Karl Krafft, MSPH

DATE: October 4, 1995

SUBJECT: Boston Smelter Site Screening Report
TDD #T08-9503-020

Persons Responding:

U.S. Environmental Protection Agency, Region VIII
Al Lange, Senior Environmental Employee

Ecology and Environment, Inc., U.S. Environmental Protection Agency Technical Assistance Team (TAT), Region VIII
Karl Krafft, MSPH, Project Manager/Sampler
Jerry Goedert, PE, Project Surveyor/Sampler
Katherine Romine, XRF Operator/Sampler

Place Visited:

Boston Smelter, Pueblo, Colorado

Dates of Site Visits:

August 17, 18, 1995

Site Location:

The site is located in the Southwest Quarter of the Northwest Quarter of Section 1, Township 21 South, Range 64 West. The approximate coordinates are 38° 15′ 00" north latitude, 104° 36′ 32" west longitude. The former smelter is located south of the Arkansas River between Santa Fe Avenue and Denver and Rio Grande Railroad tracks to the west of 7400 Santa Fe Avenue and extending west and southwest of Santa Fe Avenue between Interstate 25; Pueblo, Colorado (Figure 1).

recycled paper

Background:

In 1883, the Colorado Smelting Company (also known as the Boston and Colorado Smelting Works) was established on a mesa north of the current CF&I steel mills and was taken over by the American Smelting and Refining Company (ASARCO) in 1889 (CDPHE 1995). In 1915, the Boston Smelter was dismantled although remnants of the former smelter remain and slag piles (30 feet high) exist along the west side of Santa Fe Avenue and extend in a south-west direction. The Denver and Rio Grande Railroad tracks and Interstate 25 are adjacent to the slag heap (CDPHE 1995).

The Colorado Department of Public Health and the Environment (CDPHE) is currently investigating the site. A reconnaissance of the area has documented that a surface water seep exits the slag waste 1/4 mile upgradient of a water culvert that helps drain the south bank of the Arkansas River. Water leaching through the slag pile may be impacting shallow ground water and may be a source of elevated iron and zinc concentrations found (1989) in discharge exiting the culvert into the Arkansas River.

In May 1995, the Ecology and Environment, Inc. Technical Assistance Team (E&E TAT) was tasked to assist in site assessment activities at and around the Boston Smelter site. Numerous soil samples analyzed from residential properties east of Arkansas Avenue and from the slag heap west of Arkansas Avenue. Elevated concentrations (2400 - 9700 mg/Kg) were detected by XRF analysis in the "ravine" area directly east of the slag pile and on the slag pile itself (E&E 1995). The TAT was tasked to further characterize this area of concern at the former Boston Smelter.

SITE ASSESSMENT ACTIVITIES

On August 16, 1995 the TAT arrived on site and met with EPA representative Al Lange. Because of the site's natural topography, the site was split into five sampling areas (Sample Areas A through E), shown in Figure 2. A systematic grid sampling approach was implemented for the majority of the site with the exception of the wetland area represented by Sampling area - B and in the southwest portion of the site represented by Sampling Area - E on Figure 2. Surveying by TAT member Jerry Goedert and Al Lange was initiated with Sampling Area - C (Figure 2). Surveying of sampling locations on grid lines A through E were spaced 100 feet apart using a total station surveying apparatus. Point A-1 was arbitrarily assigned the coordinate 0,0. The orientation of the grid was established by assuming the fence line where grid line A is located had a north-south alignment.

Because of the dramatic increase in tree coverage and vegetation in the southwest portion of the site, the use of surveying equipment was reduced to establishing base points Z through O. A compass and tape measure was then used to establish sampling locations at approximate 100 foot intervals along east-west grid lines. Table 1 presents surveyed coordinates for grid points along Lines A through E and base points Z through O. Sampling locations shown on Figure 2 for grid lines Z through O are approximate due to inherent distance errors caused by use of a tape measure. Other factors affecting the accuracy of sampling locations are the sharp embankments and trees located in the grid lines. Wooden stakes were driven into the ground and labeled at the base points Z through O and grid points in lines A through E which would allow the grid to be re-established if needed.

TAT members Krafft and Romine established sampling locations in Sampling Area - B using a tape measure. The source of the wetland appears to come from a natural spring located between Sample Areas B and C on Figure 2. Sample locations were measured at approximate 100 foot intervals throughout the wetland area estimated to be 3,387 square feet. Samples could not be obtained if water was too deep or if reed vegetation was too thick or high. Wooden stakes were used to mark sampling locations.

The northern portion of the site was approximately measured to be 150 feet by 300 feet, bordered by a 30 foot slag wall to the west. Sample Area - A on Figure 2 was surveyed and samples were obtained at 100 foot intervals (north/south) and at 50 foot intervals (east/west). Three composite samples from the north, center, and south wall of the slag pile, located west of Sample Area - A were also obtained and depicted in Figure 2.

All samples were placed in zip-lock plastic bags, labeled appropriately, and brought back to Denver where the soil and sediment samples were dried, prepared into sampling cups and analyzed using an X-ray Fluorescence Spectrometer (XRF) Spectrace 9000 instrument. Seventeen samples, spatially selected from the across the site, were sent to an approved laboratory for confirmatory analysis. Table 2 presents a linear regression analysis between the laboratory-analyzed sample concentrations and the XRF-analyzed sample concentrations. There was very good correlation (R Squared) between the two analyses for lead. The data from the XRF for arsenic and cadmium is highly suspect due to the poor correlation of the lab data and XRF data. When analyzing for arsenic using the XRF, lead spectral peaks will overlap with the arsenic spectral peaks, making the XRF a poor analytical instrument when lead is present. The cadmium data is also highly suspect because of the poor correlation between the XRF and lab data, most likely due to the large difference in detection limits between the two analyses. Therefore, in addition to the laboratory-analyzed concentrations of lead, arsenic, and cadmium, only lead XRF concentrations were utilized in this report.

Tables 3 and 4 present the qualified XRF inorganic results of lead, arsenic, and cadmium. Average concentrations for the five Sampling Areas A through E are also presented. The mean concentration ranges for Sample Areas A,B,C,D,E are 511 parts per million (ppm), 798 ppm, 3323 ppm, 1244 ppm, and 1124 ppm, respectively. The average concentration for the slag composite samples is 660 ppm.

Pathway Analysis

Soil Pathway: The soil pathway is potentially impacted by the former smelting activities the site, as indicated by elevated lead concentrations in Tables 3 and 4. The highest lead surface soil concentrations were 12,500 and 14,700 and were laboratory-analyzed as shown in Table 2. Slag is observable in large piles throughout the site, especially at the southern and western perimeters. Table 1 also presents laboratory-analyzed arsenic concentrations which range from 14 to 1,460 ppm. Cadmium concentrations ranged from 0.14 to 28 ppm.

Soil pathway targets are minimal. Although the site is not fenced, it is not readily accessible due to its topography. A transient population rarely frequents the site, (based on observation from local business on Santa Fe Avenue) and neighborhood children no longer trespass across the site. A local business parking lot was extended and cut-off a dirt path on the upper ridge of the eastern perimeter of the ravine that children used as a path to and from a school located at the southwest corner/perimeter of the site. There are no residents on or within 200 feet of contaminated soil.

Surface Water: A principle surface water target in which various plant and animal species inhabit or frequent is an approximate 3,387 square feet isolated wetland area on site. This wetland has a mean lead concentration of 660 ppm, with lead concentrations ranging from 96 to 3500 ppm (Table 4). Three sediment sample (SE-01, SE-02, and SE-09) concentrations were 640, 830, and 1200 ppms, respectively. A laboratory-analyzed arsenic concentration of 51 ppm was detected at sediment sample SE-02 location. Prior investigations have stated that water may exit and leach from the slag pile as a surface water feature approximately 1/4 mile upgradient of a culvert which discharges into the Arkansas River (CDPHE 1995). The Arkansas River, located 1/4 mile from the site, was not evaluated at the time of this site assessment.

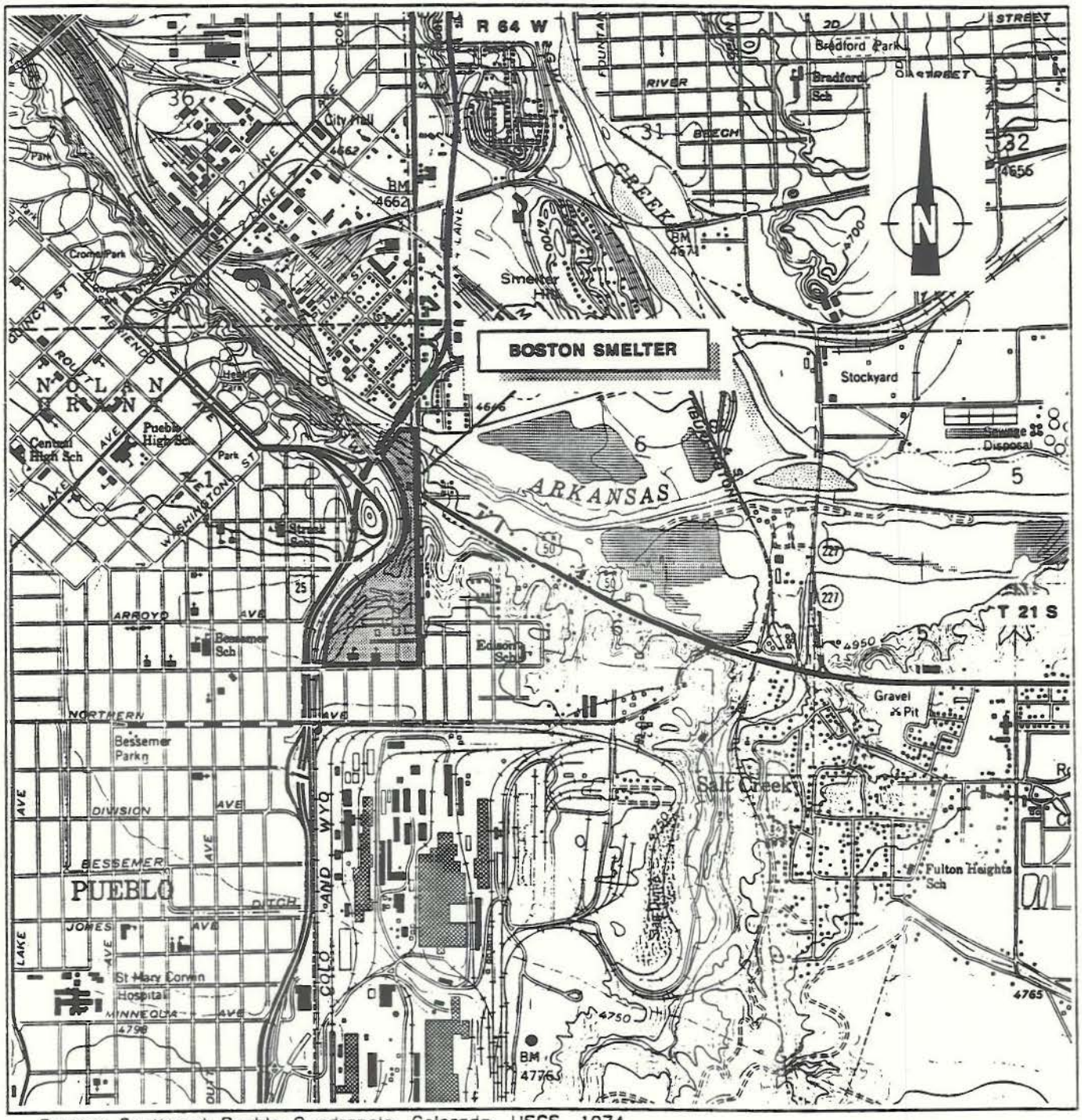
Ground Water: This pathway was not considered to be a potential pathway due to the lack of targets and was not investigated.

Air Pathway: This pathway was not considered to be a potential pathway since the site is currently not operational. Although the people residing within a 1/4 mile of the site in homes located east of Santa Fe Avenue are considered to be air pathway targets, the lead contained in the slag matrix is not regarded as an airborne contaminant.

REFERENCES

Colorado Department of Public Health and the Environment (CDPHE) 1995. Analytical Results Report, Boston Smelter, February 22, 1995.

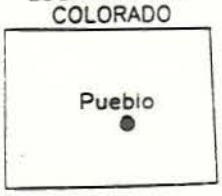
Ecology and Environment, Inc. (E&E) 1995. Analytical Results Report, Boston Smelter, July 20, 1995.



Source: Southeast Pueblo Quadrangle, Colorado. USGS, 1974

0 1/2 1 MILE

LOCATION MAP
COLORADO



LEGEND

Site location

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE, REMOVAL AND PREVENTION
EPA CONTRACT 68-WO-0037

TITLE:

BOSTON SMELTTER
Pueblo, Colorado
SITE LOCATION MAP

T.D.D. T08-9503-020A ZTBOSTON

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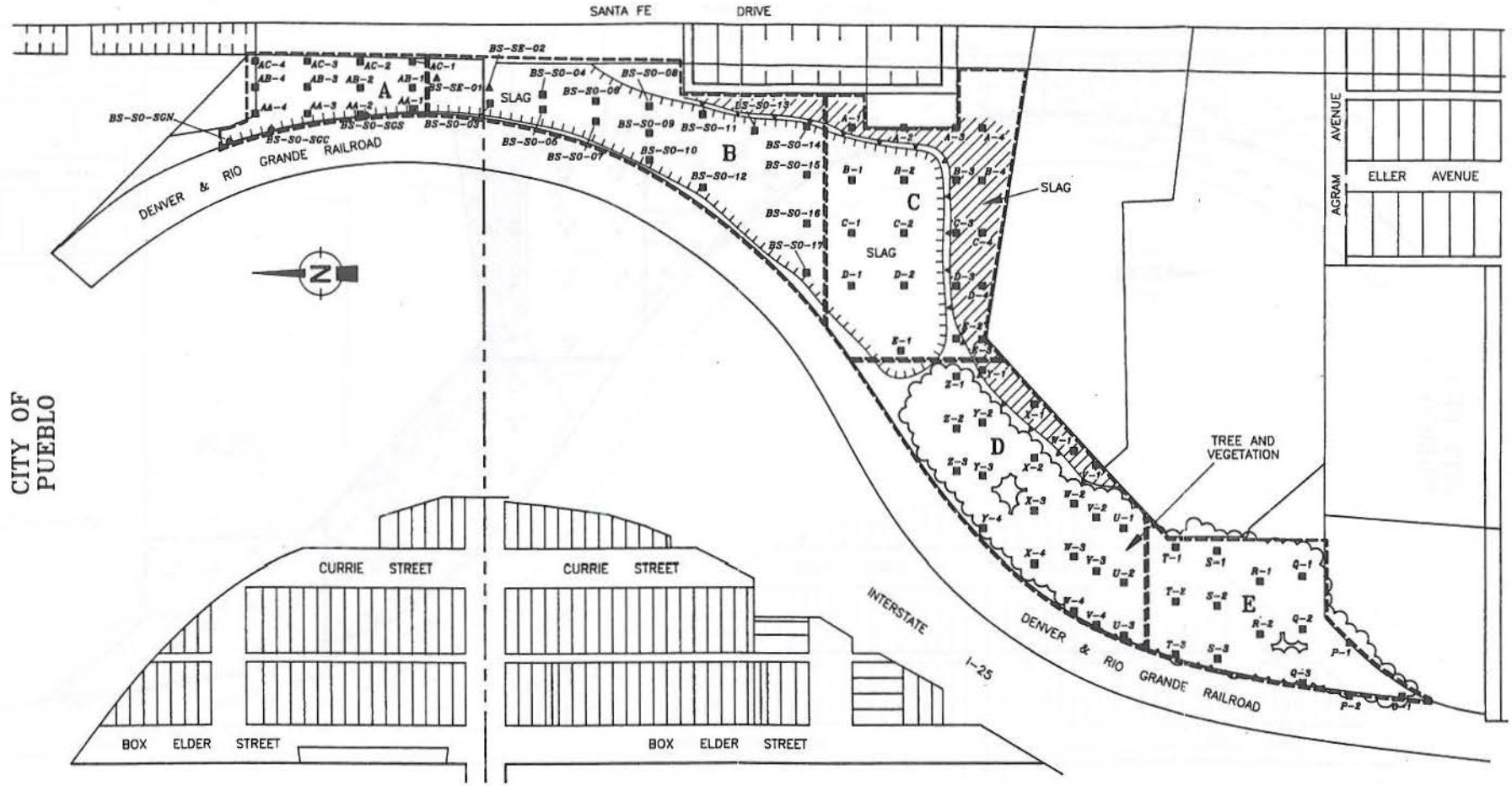
FIG. 1

Date: 07/19/95 Drawn by: RSM Scale:



0 100 200 400
SCALE : FEET

LEGEND
- Soil sample location
- Sediment sample location
- Slag sample location
- A–E Mean concentration area

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE, REMOVAL AND PREVENTION
EPA CONTRACT 68-WO-0037

TITLE:
BOSTON SMELTER
Pueblo, Colorado
SAMPLE LOCATION MAP

T.D.D. T08-9503-020A ZTBOST04

ecology & environment, inc.
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FIG. 2

Date: 08/23/95 Drawn by: RSM Scale:

TABLE 1
BOSTON SMELTER SITE
SURVEY POINT COORDINATES

Sample Location	COORDINATES X	COORDINATES Y	Sample Location	COORDINATES X	COORDINATES Y
BS–SO–A1	0	0	BS–SE–01	– 94	– 788
BS–SO–A2	0	+ 100	BS–SE–02	– 67	– 688
BS–SO–A3	0	+ 200	BS–SO–03	– 46	– 688
BS–SO–A4	0	+ 250	BS–SO–04	– 63	– 588
BS–SO–B1	+ 100	0	BS–SO–05	– 36	– 588
BS–SO–B2	+ 100	+ 100	BS–SO–06	– 50	– 488
BS–SO–B3	+ 100	+ 200	BS–SO–07	– 12	– 488
BS–SO–B4	+ 100	+ 250	BS–SO–08	– 39	– 388
BS–SO–C1	+ 200	0	BS–SE–09	+ 12	– 388
BS–SO–C2	+ 200	+ 100	BS–SO–10	+ 63	– 388
BS–SO–C3	+ 200	+ 200	BS–SO–11	– 23	– 288
BS–SO–C4	+ 200	+ 250	BS–SO–12	+ 115	– 288
BS–SO–D1	+ 300	0	BS–SO–13	+ 6	– 188
BS–SO–D2	+ 300	+ 100	BS–SO–14	– 1	– 88
BS–SO–D3	+ 300	+ 200	BS–SO–15	+ 91	– 88
BS–SO–D4	+ 300	+ 250	BS–SO–16	+ 183	– 88
BS–SO–E1	+ 423	+ 94	BS–SO–17	+ 275	– 88
BS–SO–E2	+ 400	+ 200			
BS–SO–E3	+ 400	+ 250			

Sample Location	COORDINATES X	COORDINATES Y	Grid ID	COORDINATES X	COORDINATES Y
BS–SO–AA1	– 35	– 838	Z	+ 471	+ 201
BS–SO–AA2	– 25	– 938	Y	+ 559	+ 250
BS–SO–AA3	– 25	– 1038	X	+ 575	+ 349
BS–SO–AA4	– 25	– 1138	W	+ 642	+ 423
BS–SO–AB1	– 75	– 838	V	+ 733	+ 466
BS–SO–AB2	– 75	– 938	U	+ 813	+ 517
BS–SO–AB3	– 75	– 1038	T	+ 842	+ 613
BS–SO–AB4	– 75	– 1138	S	+ 902	+ 693
BS–SO–AC1	– 125	– 838	R	+ 961	+ 774
BS–SO–AC2	– 125	– 938	Q	+ 1021	+ 854
BS–SO–AC3	– 125	– 1038	P	+ 1071	+ 944
BS–SO–AC4	– 125	– 1138	O	+ 1071	+ 1044

TABLE 2
BOSTON SMELTER SITE
REGRESSION ANALYSIS
LEAD, ARSENIC, CADMIUM (mg/Kg)

Station Number	Lab Lead	XRF Lead	Lab Arsenic	XRF Arsenic	Lab Cadmium	XRF Cadmium
BS-SO-A4	181	190	14.2	13.5	0.5	95
BS-SO-E1	2500	1900	138	13.5	6.1	95
BS-SO-C2	12500	6400	799	230	7.1	95
BS-SO-15	2280	1600	183	120	5.5	135
BS-SO-X3	302	200	13.4	13.5	0.14	95
BS-SO-AA3	538	470	29.3	18	2.3	135
BS-SO-AC1	157	160	18.6	18	3.4	135
BS-SO-08	192	180	14.1	18	2.3	135
BS-SE-02	993	830	51.1	18	3.6	135
BS-SO-12	1970	1100	199	18	1.2	135
BS-SO-AB2	938	940	59.4	20.5	3.8	135
BS-SO-U1	14700	5200	1460	13.5	0.05	95
BS-SO-R1	3320	2400	106	13.5	28.1	95
BS-SO-CO (SGS)	370	310	16.4	13.5	1.2	95
BS-SO-CY (SGN)	2050	1400	32.9	13.5	0.05	95
BS-SO-CP (SGC)	393	270	8.3	13.5	0.05	95

Regression Output: LEAD		
Constant		376.3028
Std Err of Y Est		502.4691
R Squared		0.930054
No. of Observations		16
Degrees of Freedom		14
X Coefficient(s)	0.404047	
Std Err of Coef.	0.029614	

Regression Output: ARSENIC		
Constant		24.6886
Std Err of Y Est		55.86684
R Squared		0.136432
No. of Observations		16
Degrees of Freedom		14
X Coefficient(s)	0.055202	
Std Err of Coef.	0.037118	

Regression Output: CADMIUM		
Constant		114.0354
Std Err of Y Est		21.0479
R Squared		0.015524
No. of Observations		16
Degrees of Freedom		14
X Coefficient(s)	−0.37568	
Std Err of Coef.	0.799581	

TABLE 3
BOSTON SMELTER SITE
INORGANIC XRF RESULTS – LEAD, ARSENIC, CADMIUM (mg/Kg)

ID	TIME	DATE ANALYZED	As – Raw	As – Qual	Pb – Raw	Pb – Qual	Cd – Raw	Cd – Qual
SAMPLE AREA – C								
BS–SO–A1	1103	8/23/95	26.646	27 U	18.723	20 U	–121.16	190 U
BS–SO–A2	1107	8/23/95	–30.782	27 U	109.28	110	–130.95	190 U
BS–SO–A3	1111	8/23/95	–42.438	27 U	493.64	490	65.216	190 U
BS–SO–A4	1117	8/23/95	25.766	27 U	190.55	190	82.271	190 U
BS–SO–B1	1122	8/23/95	–74.119	27 U	1168.5	1200	–35.584	190 U
BS–SO–B2	1127	8/23/95	86.276	86 J	7544.2	7500	249.1	250 J
BS–SO–B3	1131	8/23/95	–222.29	27 U	3315.2	3300	93.946	190 U
BS–SO–B4	1136	8/23/95	89.975	90 J	2469.3	2500	–85.195	190 U
BS–SO–C1	1506	8/22/95	–147.64	36 U	5038.6	5000	45.052	270 U
BS–SO–C2	1141	8/23/95	225.97	230	6418.5	6400	102.86	190 U
BS–SO–C3	1146	8/23/95	–288.72	27 U	5116.9	5100	91.151	190 U
BS–SO–C4	1159	8/23/95	–12.228	27 U	231.41	230	–183.75	190 U
BS–SO–D1	1302	8/23/95	–240.21	27 U	4530.6	4500	–64.662	190 U
BS–SO–D2	1307	8/23/95	214.95	210	9291.2	9300	55.224	190 U
BS–SO–D3	1311	8/23/95	131.08	130	3249.7	3200	89.654	190 U
BS–SO–D4	1315	8/23/95	3386.2	3400	4112.7	4100	77.761	190 U
BS–SO–E1	1319	8/23/95	–38.444	27 U	1934.2	1900	–97.125	190 U
BS–SO–E2	1322	8/23/95	–112.95	27 U	4327.1	4300	63.693	190 U
BS–SO–E3	1326	8/23/95	49.155	49 J	3771.3	3800	–32.297	190 U
AVERAGE CONCENTRATION =						3323		

ID	TIME	DATE ANALYZED	As – Raw	As – Qual	Pb – Raw	Pb – Qual	Cd – Raw	Cd – Qual
SAMPLE AREA – D								
BS–SO–U1	1506	8/23/95	–225.49	27 U	5219.2	5200	–18.661	190 U
BS–SO–U2	1514	8/23/95	–2.8633	27 U	156.47	160	–100.4	190 U
BS–SO–U3	1518	8/23/95	–7.6776	27 U	319.83	320	105.67	190 U
BS–SO–V1	1526	8/23/95	–347.02	27 U	1557.5	1600	26.56	190 U
BS–SO–V2	1530	8/23/95	–194.72	27 U	923.78	920	–96.382	190 U
BS–SO–V3	1534	8/23/95	28.818	29 J	593.12	590	–14.127	190 U
BS–SO–V4	1538	8/23/95	76.322	76 J	570.74	570	–150.2	190 U
BS–SO–W1	1545	8/23/95	–77.831	27 U	1306.2	1300	–31.413	190 U
BS–SO–W2	1549	8/23/95	–31.47	27 U	600.13	600	–158.08	190 U
BS–SO–W3	1553	8/23/95	–37.359	27 U	287.44	290	–92.461	190 U
BS–SO–W4	1557	8/23/95	–27.355	27 U	514.64	510	–105.01	190 U
BS–SO–X1	1600	8/23/95	45.884	46 J	1337.2	1300	–84.963	190 U
BS–SO–X2	1603	8/23/95	162.87	160	2282.4	2300	194.74	190 J
BS–SO–X3	1609	8/23/95	–1.2827	27 U	204.55	200	–269.61	190 U
BS–SO–X4	1615	8/23/95	25.692	27 U	483.57	480	–58.406	190 U
BS–SO–Y1	1619	8/23/95	–53.675	27 U	2747.6	2700	59.75	190 U
BS–SO–Y2	1622	8/23/95	–0.33767	27 U	190.57	190	91.846	190 U
BS–SO–Y3	1630	8/23/95	38.906	39 J	224.94	220	–322.61	190 U
BS–SO–Y4	1633	8/23/95	–68.807	27 U	420.05	420	–64.744	190 U
BS–SO–Z1	1637	8/23/95	–241.36	27 U	4252.9	4300	153.64	190 U
BS–SO–Z2	1643	8/23/95	–91.302	27 U	2805.3	2800	–49.024	190 U
BS–SO–Z3	1653	8/23/95	–1.4166	27 U	387.22	390	–198.24	190 U
AVERAGE CONCENTRATION =						1244		

ID	TIME	DATE ANALYZED	As – Raw	As – Qual	Pb – Raw	Pb – Qual	Cd – Raw	Cd – Qual
SAMPLE AREA – E								
BS–SO–O1	1539	8/22/95	–99.303	36 U	1500.2	1500	–87.282	270 U
BS–SO–P1	1330	8/23/95	–11.479	27 U	215.19	220	79.535	190 U
BS–SO–Q1	1333	8/23/95	–78.686	27 U	718.9	720	179.16	190 U
BS–SO–Q2	1348	8/23/95	10.677	27 U	4649.6	4600	–254.89	190 U
BS–SO–Q3	1352	8/23/95	–68.281	27 U	512.87	510	–13.123	190 U
BS–SO–R1	1359	8/23/95	–80.629	27 U	2431.1	2400	–40.766	190 U
BS–SO–R2	1420	8/23/95	–17.457	27 U	1648.1	1600	–61.566	190 U
BS–SO–S1	1423	8/23/95	75.473	75 J	655.08	660	280.79	280 J
BS–SO–S2	1432	8/23/95	49.684	50 J	486.25	490	–194.32	190 U
BS–SO–S3	1435	8/23/95	–65.102	27 U	618.13	620	3.4423	190 U
BS–SO–S4	1443	8/23/95	46.359	46 J	319.56	320	–60.019	190 U
BS–SO–T1	1447	8/23/95	48.045	48 J	342.6	340	–45.571	190 U
BS–SO–T2	1458	8/23/95	–174.7	27 U	1291	1300	–47.173	190 U
BS–SO–T3	1502	8/23/95	–54.861	27 U	448.51	450	–83.939	190 U
AVERAGE CONCENTRATION =						1124		

ID	TIME	DATE ANALYZED	As – Raw	As – Qual	Pb – Raw	Pb – Qual	Cd – Raw	Cd – Qual
SLAG PILE								
BS–SO–SGN	1707	8/23/95	–28.804	27 U	308.87	310	–61.042	190 U
BS–SO–SGC	1659	8/23/95	7.5681	27 U	267.08	270	–156.16	190 U
BS–SO–SGS	1703	8/23/95	–87.331	27 U	1412.9	1400	–148.01	190 U
AVERAGE CONCENTRATION =						660		

TABLE 4
BOSTON SMELTER SITE
INORGANIC XRF RESULTS: LEAD, ARSENIC, CADMIUM (mg/Kg)

ID	TIME	Date	As – Raw	As – Qual	Pb – Raw	Pb – Qual	Cd – Raw	Cd–Qual
SAMPLE AREA – A								
BS–SO–AA1	1615	8/22/95	45.069	45 J	56.114	56 J	–80.855	270 U
BS–SO–AA2	1632	8/22/95	43.002	43 J	78.16	78	–85.831	270 U
BS–SO–AA3	1636	8/22/95	–36.257	36 U	474.4	470	–222.3	270 U
BS–SO–AA4	1640	8/22/95	–49.908	36 U	1036.4	1000	–80.548	270 U
BS–SO–AB1	1559	8/22/95	–57.027	36 U	507.53	510	–104.86	270 U
BS–SO–AB2	1603	8/22/95	40.631	41 J	935.06	940	–17.589	270 U
BS–SO–AB3	1544	8/22/95	28.763	36 U	334.63	330	87.244	270 U
BS–SO–AB4	1608	8/22/95	–88.475	36 U	911.16	910	–24.326	270 U
BS–SO–AC1	1644	8/22/95	–24.056	36 U	164.35	160	–15.801	270 U
BS–SO–AC2	1649	8/22/95	7.0238	36 U	389.64	390	3.7231	270 U
BS–SO–AC3	1654	8/22/95	–6.4681	36 U	990.9	990	–105.57	270 U
BS–SO–AC4	1656	8/22/95	–26.768	27 U	301.71	300	–72.731	190 U
AVERAGE CONCENTRATION =						511.2		
ID	TIME	Date	As – Raw	As – Qual	Pb – Raw	Pb – Qual	Cd – Raw	Cd–Qual
SAMPLE AREA – B								
BS–SE–01WT	1452	8/22/95	27.629	36 U	636.3	640	–227.93	270 U
BS–SE–2WT	1456	8/22/95	–51.291	36 U	832.09	830	–24.568	270 U
BS–SO–03WT	1205	8/22/95	–53.652	36 U	655.41	660	–209.67	270 U
BS–SO–04WT	1211	8/22/95	14.416	36 U	186.75	190	–117.25	270 U
BS–SO–04WT	1308	8/22/95	16.047	36 U	195.79	200	25.509	270 U
BS–SO–5WT	1430	8/22/95	–60.934	36 U	1090.3	1100	–116.86	270 U
BS–SO–6WT	1436	8/22/95	–29.993	36 U	128.94	130	–70.698	270 U
BS–SO–7WT	1440	8/22/95	72.668	73 J	521.71	520	–132.09	270 U
BS–SO–8WT	1445	8/22/95	–3.8235	36 U	184.48	180	–40.838	270 U
BS–SE–9WT	1501	8/22/95	98.832	99 J	1203.6	1200	–192.19	270 U
BS–SO–10WT	1330	8/22/95	–94.019	36 U	793.81	790	47.854	270 U
BS–SO–11WT	1337	8/22/95	–129.24	36 U	3522	3500	48.735	270 U
BS–SO–12WT	1344	8/22/95	–106.31	36 U	1083.1	1100	13.274	270 U
BS–SO–13WT	1354	8/22/95	44.892	45 J	95.83	96	72.923	270 U
BS–SO–14WT	1359	8/22/95	–104.36	36 U	918.17	920	0.21151	270 U
BS–SO–15WT	1405	8/22/95	120.94	120	1626.1	1600	–42.082	270 U
BS–SO–16WT	1410	8/22/95	32.821	36 U	361.98	360	–143.88	270 U
BS–SO–17WT	1414	8/22/95	32.772	36 U	350.88	350	–130.64	270 U
AVERAGE CONCENTRATION =						798.1		