[redacted]

Environmental Engineering Resources

[redacted]

November 4, 2008

[redacted]
[redacted] Department Of Health and Environment
Voluntary Cleanup and Redevelopment Act Unit
[redacted]

Subject: Request for No Further Action Determination, 10th and Osage Properties, 944 and 1001 Osage Street, [redacted]

Dear [redacted]

[redacted] Environmental Engineering Resources, Inc. [redacted], on behalf of the City and County of [redacted] respectfully submits this request for a No Further Action Determination (NFAD), in accordance with the terms of the Voluntary Clean-Up (VCUP) Application, dated May 8, 2008, for the 10th and Osage Properties (Brown, 2008). The VCUP Application was approved by the [redacted] Department of Public Health and Environment (CDPHE) in a letter dated July 3, 2008 (Attachment A). Corrective action, in accordance with the VCUP Application, was initiated on August 29, 2008, and completed on October 7, 2008.

According to data presented in the VCUP Application, soil impacts at the site, above the CCoD Residential/Unrestricted Land Use Soil Screening Levels (SSLs) for arsenic (As), lead (Pb), and polycyclic-aromatic hydrocarbons (PAHs), uniformly extended to three feet below surface grade (ft bsg). Therefore, the approved corrective action for the site included excavation of soils to three ft bsg, followed by confirmation sampling. In areas where the analytical results from the initial confirmation samples exceeded the SSLs, up to an additional two feet of soil were to be removed. The activities associated with the corrective action are described below.

Methods

On August 28, 2008, ET Technologies (ET), of [redacted] mobilized to the site and established excavation grids for both 1001 and 944 Osage Street (Figures 1 and 2). Each grid section was no greater than 5,000 square feet. Beginning with the northern grids of 1001 Osage Street, on September 2, 2008, soil was removed to three ft bsg, using a front-end loader and track-mounted excavator. The excavated soil was stockpiled, on site, and then disposed of at the [redacted] Arapahoe Disposal Site (DADS), in [redacted] Waste Manifests are included as Attachment B.

Following excavation, a five-point composite confirmation soil sample was collected from each grid section by ET personnel. Samples were collected from each grid section, as they were completed,

using a properly decontaminated steel shovel, and then placed into labeled, laboratory supplied containers, stored on in a cooler, on ice. The samples were delivered, under proper chain-of-custody procedures, to ESC Lab Sciences (ESC), in [redacted] for analysis of As and Pb, using EPA Method 6010; and PAHs, using EPA Method 8270 SIM (Tables 1a and 2a, Attachment C).

In grid sections where the concentrations detected in the confirmation samples exceeded the SSLs, up to an additional two feet of soil was removed and a second confirmation sample was collected and analyzed as discussed above (Tables 1b and 2b, Attachment C). The total depth of excavation did not exceed five feet on either site. Following excavation and receipt of confirmation samples, documenting levels below the SSLs, the grid sections were backfilled with clean material, compacted, and graded.

The excavation of impacted soil from 1001 Osage Street was completed on September 18, 2008. Excavation of 944 Osage Street was initiated on September 16, 2008, and completed on October 6, 2008. Both sites were backfilled, compacted, and graded by October 7, 2008. A total of 5,457cubic yards of potentially impacted soil was removed from the 1001 Osage Street parcel, and 8,534 cubic yards of potentially impacted soil was removed from the 944 Osage Street parcel (Attachment B).

Results

Twelve grid sections were established on the 1001 Osage Street parcel (N1 through N12) (Figure 1). Of those, concentrations in the initial confirmation sample from three of the grid sections (N4, N8, and N9) exceeded the SSL for benzo(a)pyrene (Table 1a). Additionally, concentrations in the sample from grid section N4 exceeded the SSLs for Pb, benzo(a)anthracene, and benzo(b)fluoeanthene. An additional two feet of soil was removed from grid section N4 and an additional six inches of soil was removed from grid sections N8 and N9. The concentrations detected in the secondary confirmation samples from each of these grid sections were below the SSLs for all of the analytes (Table 1a).

Ten grid sections were established on the 944 Osage Street parcel (S1 through S10) (Figure 2). Of those, concentrations in the initial confirmation samples from three of the grid sections (S3, S9, and S10) exceeded the SSL for benzo(a)pyrene (Table 2a). An additional six inches of soil were removed from each of these grid sections. Benzo(a)pyrene was not detected in any of the secondary confirmation samples.

Conclusions and Recommendations

A total of 5,457 cubic yards of potentially impacted soil was removed from the 1001 Osage Street parcel, and 8,534 cubic yards of potentially impacted soil was removed from the 944 Osage Street parcel. Confirmation samples from the base of the excavation of each of these sites indicated that soil, impacted with Pb, As, and PAHs above the established SSLs has been removed from the site, in accordance with the CDPHE approved VCUP application.

Based on the information collected, and on our observations during the excavation of the site, Pinyon feels that this property is protective of human health and the environment. On behalf of the City and County of [redacted] Pinyon Environmental Engineering Resources, Inc., respectfully requests a No Further Action Determination for the 10th and Osage properties.

Thank you, and should you have any questions, please do not hesitate to contact me.

Sincerely,

[redacted] ENVIRONMENTAL ENGINEERING RESOURCES, INC.

[redacted]

Geologist

Attachments: Table 1a - Initial Confirmation Sampling Results, 1001 Osage Street
Table 1b - Secondary Confirmation Sampling Results, 1001 Osage Street
Table 2a - Initial Confirmation Sampling Results, 1001 Osage Street
Table 2b - Secondary Confirmation Sampling Results, 1001 Osage Street
Figure 1- 1001 Osage Street Sampling Locations
Figure 2- 944 Osage Street Sampling Locations
Attachment A - VCUP Approval Letter
Attachment B - Waste Disposal Manifests
Attachment C - Laboratory Analytical reports

cc: [redacted] City and County of [redacted]

References

Brown, 2008. "Voluntary Cleanup Program Application, 10th & Osage Properties, 944 and 1001 Osage Street, [redacted] May 8, 2008.

Table 1a
Initial Confirmation Sampling Results
1001 Osage Street

SAMPLE	N1	N2	N2-DUP (080.8)	N3	N4	N5	N6	N7	N8	N9	N10	N10-DUP (N10-F)	N11	N12
SAMPLE DATE	05/08/08	05/08/08	05/08/08	05/10/08	05/05/08	04/11/08	04/11/08	05/7/08	04/11/08	05/05/08	05/05/08	05/05/08	05/05/08	05/07/08
DEPTH	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	2 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT

ANALYTE	RESULT (mg/kg)														CCaD	CDPHE
Arsenic	BDL	BDL	BDL	2.4	2.9	BDL	2.2	1.6	2	4.8	2.5	2.9	2.6	1.5	24*	0.39
Lead	21	78	84	25	510	15	14	9.9	12	59	170	150	62	34	400	400
Anthracene	BDL	0.014	0.013	BDL	0.32	BDL	BDL	BDL	0.088	0.028	0.019	0.016	0.014	BDL	1,000	NA
Acenaphthene	BDL	BDL	0.0081	BDL	0.13	BDL	BDL	BDL	0.027	BDL	0.0088	BDL	BDL	BDL	1,000	NA
Acenaphthylene	BDL	0.0069	0.0076	BDL	0.021	BDL	BDL	BDL	BDL	0.014	0.053	0.014	0.0079	BDL	NA	NA
Benzo [a] anthracene	BDL	0.05	0.061	0.018	0.49	BDL	BDL	BDL	0.23	0.093	0.087	0.058	0.056	0.011	0.61	0.27
Benzo [a] pyrene	BDL	0.045	0.053	0.018	0.52	BDL	BDL	BDL	0.18	0.091	0.014	0.069	0.054	0.011	0.99	0.027
Benzo [b] fluoranthene	BDL	0.07	0.071	0.023	0.71	BDL	BDL	BDL	0.21	0.14	0.23	0.11	0.075	0.014	0.61	0.27
Benzo [g,h, i] perylene	BDL	0.026	0.028	0.017	0.11	BDL	BDL	BDL	0.09	0.051	0.076	0.03	0.022	BDL	87	NA
Benzo [k] fluoranthene	BDL	0.017	0.033	0.011	0.14	BDL	BDL	BDL	0.092	0.041	0.076	0.028	0.035	0.01	9.99	2.7
Chrysene	BDL	0.055	0.069	0.02	0.51	BDL	BDL	BDL	0.16	0.091	0.21	0.074	0.05	0.011	87	27
Dibenz [a,h] anthracene	BDL	0.0072	0.01	BDL	0.047	BDL	BDL	BDL	0.018	0.01	0.021	0.01	0.0067	BDL	0.96	0.027
Fluoranthene	BDL	0.079	0.1	0.029	1.0	BDL	BDL	BDL	0.54	0.14	0.48	0.1	0.082	0.018	1,000	1,000
Fluorene	BDL	BDL	BDL	BDL	0.12	BDL	BDL	BDL	0.052	0.0066	0.0086	BDL	BDL	BDL	1,000	NA
Indeno (1,2,3-cd) pyrene	BDL	0.021	0.024	0.011	0.11	BDL	BDL	BDL	0.086	0.038	0.071	0.027	0.017	BDL	0.61	0.27
Naphthalene	BDL	0.0077	0.017	BDL	0.024	BDL	BDL	BDL	0.027	0.0072	0.0099	BDL	BDL	BDL	184	NA
Phenanthrene	BDL	0.051	0.083	0.015	1.1	BDL	BDL	BDL	0.53	0.089	0.37	0.06	0.052	0.0097	NA	NA
Pyrene	BDL	0.083	0.095	0.03	1.2	BDL	BDL	BDL	0.4	0.15	0.4	0.13	0.096	0.019	1,000	1,000
1-Methylnaphthalene	BDL	0.0075	0.017	BDL	0.027	BDL	BDL	BDL	0.017	BDL	0.0073	BDL	BDL	BDL	829	NA
2-Methylnaphthalene	BDL	0.0093	0.018	BDL	0.031	BDL	BDL	BDL	0.016	0.0067	0.009	BDL	BDL	BDL	824	NA
2-Chloronaphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA

BDL: *Below detection limits*
mg/kg: *milligrams per kilogram*
[redacted] *Soil Screening Standard for Residential/Unrestricted Use, mg/kg*
* *CCaD special case soil screening standard for arsenic*
[redacted] *Department of Public Health and Environment, Soil Evaluation Values (Residential Standard), mg/kg*

Table 1b
Secondary Confirmation Sampling Results
1001 Osage Street

SAMPLE					N4				N8	N9				
DATE					5-FT				3.5 FT	3.5 FT				
DEPTH					09/10/08				09/10/08	09/10/08				

ANALYTE	RESULT (mg/kg)														CCaD	CDPHE
Arsenic					2.8				BDL	2.1					24*	0.39
Lead					31				15	17					400	400
Anthracene					0.0091				BDL	0.014					1,000	N/A
Acenaphthene					BDL				BDL	BDL					1,000	N/A
Acenaphthylene					BDL				BDL	BDL					N/A	N/A
Benzo (a) anthracene					0.029				0.009	0.053					0.63	0.23
Benzo (a) pyrene					0.025				0.01	0.048					0.06	0.023
Benzo (b) fluoranthene					0.032				0.012	0.061					0.63	0.23
Benzo (g,h, i) perylene					0.015				0.0061	0.028					63	N/A
Benzo (k) fluoranthene					0.0095				0.0073	0.025					0.09	2.3
Chrysene					0.024				0.0091	0.043					63	23
Dibenz (a,h) anthracene					BDL				BDL	BDL					0.09	0.023
Fluoranthene					0.038				0.016	0.091					1,000	1,000
Fluorene					BDL				BDL	BDL					1,000	N/A
Indeno (1,2,3-cd) pyrene					0.0068				BDL	0.037					0.63	0.23
Naphthalene					BDL				BDL	BDL					164	N/A
Phenanthrene					0.032				0.0088	0.056					N/A	N/A
Pyrene					0.041				0.014	0.094					1,000	1,000
1-Methylnaphthalene					BDL				BDL	BDL					329	N/A
2-Methylnaphthalene					BDL				BDL	BDL					329	N/A
2-Chloronaphthalene					BDL				BDL	BDL					N/A	N/A

BDL: *below detection limits*
mg/kg: *milligrams per kilogram*
[redacted] *Soil Screening Standard for Residential/Unrestricted Use, mg/kg*
* *CCaD special case soil screening standard for arsenic*
[redacted] *Department of Public Health and Environment, Soil Evaluation Values (Residential Standard), mg/kg*

Table 2a
Initial Confirmation Sampling Results
944 Osage Street

SAMPLE	S1	S2	S3	S4	S5	S6	S7	S8	S8 DUP (751-8)	S9	S10
SAMPLE DATE	09/18/08	09/17/08	09/22/08	09/18/08	09/22/08	09/26/08	09/24/08	09/26/08	09/26/08	09/24/08	09/26/08
DEPTH	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT	3 FT

ANALYTE	RESULT (mg/kg)											CCoD	CDPHE
Arsenic	BDL	BDL	2.3	BDL	1.1	2.1	1.2	2.5	1.7	BDL	1.7	24*	0.39
Lead	7.1	36	18	8.8	8.7	6.8	13	7	8.3	7.9	20.0	400	400
Anthracene	BDL	BDL	0.073	BDL	BDL	BDL	0.008	BDL	BDL	0.087	0.021	1,000	NA
Acenaphthene	BDL	BDL	0.02	BDL	BDL	BDL	BDL	BDL	BDL	0.033	0.007	1,000	NA
Acenaphthylene	BDL	BDL	0.029	BDL	BDL	BDL	BDL	BDL	BDL	0.029	0.0075	NA	NA
Benzo (a) anthracene	BDL	0.0082	0.2	BDL	BDL	BDL	0.043	BDL	BDL	0.29	0.071	0.61	0.22
Benzo (a) pyrene	BDL	0.0084	0.16	BDL	0.0063	BDL	0.044	BDL	BDL	0.22	0.066	0.06	0.022
Benzo (b) fluoranthene	BDL	0.0089	0.18	BDL	0.0069	BDL	0.053	BDL	BDL	0.26	0.069	0.61	0.22
Benzo (g,h, i) perylene	BDL	BDL	0.071	BDL	BDL	BDL	0.017	BDL	BDL	0.15	0.042	61	NA
Benzo (k) fluoranthene	BDL	0.0077	0.093	BDL	BDL	BDL	0.019	BDL	BDL	0.092	0.022	6.09	2.2
Chrysene	BDL	0.0088	0.16	BDL	BDL	BDL	0.038	BDL	BDL	0.2	0.07	61	22
Dibenz (a,h) anthracene	BDL	BDL	0.013	BDL	BDL	BDL	BDL	BDL	BDL	0.022	0.007	0.06	0.022
Fluoranthene	BDL	0.016	0.35	BDL	0.0099	BDL	0.064	BDL	BDL	0.6	0.14	1,000	1,000
Fluorene	BDL	BDL	0.028	BDL	BDL	BDL	BDL	BDL	BDL	0.025	0.0064	1,000	NA
Indeno (1,2,3-cd) pyrene	BDL	BDL	0.064	BDL	BDL	BDL	0.016	BDL	BDL	0.12	0.036	0.61	0.22
Naphthalene	BDL	BDL	0.02	BDL	BDL	BDL	BDL	BDL	BDL	0.031	BDL	284	NA
Phenanthrene	BDL	0.014	0.3	BDL	BDL	BDL	0.031	BDL	BDL	0.53	0.083	NA	NA
Pyrene	BDL	0.015	0.34	BDL	0.011	BDL	0.08	BDL	BDL	0.55	0.12	1,000	1,000
1-Methylnaphthalene	BDL	BDL	0.011	BDL	BDL	BDL	BDL	BDL	BDL	0.014	BDL	325	NA
2-Methylnaphthalene	BDL	BDL	0.012	BDL	BDL	BDL	BDL	BDL	BDL	0.012	BDL	325	NA
2-Chloronaphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA

BDL: *below detection limits*
mg/kg: *milligrams per kilogramlow detection limits*
[redacted] *Soil Screening Standard for Residential/Unrestricted Use, mg/kg*
* *CCaD special case soil screening standard for arsenic*
[redacted] *Department of Public Health and Environment, Soil Evaluation Values (Residential Standard), mg/kg*

Table 2b

Secondary Confirmation Sampling Results

944 Osage Street

SAMPLE	S1	S2	S3	S4	S5	S6	S7	S8	S8-DUP (TS1-B)	S9	S10
SAMPLE DATE			10/07/08							10/06/08	10/01/08
DEPTH			3.5 FT							3.5 FT	3.5 FT

ANALYTE	RESULT (mg/kg)											CCoD	CDPHE
Arsenic			5.7							1.7	BDL	*24**	*0.39*
Lead			12							8.2	6.30	*400*	*400*
Anthracene			BDL							BDL	BDL	*1,000*	*NA*
Acenaphthene			BDL							BDL	BDL	*1,000*	*NA*
Acenapthylene			BDL							BDL	BDL	*NA*	*NA*
Benzo (a) anthracene			BDL							BDL	BDL	*0.61*	*0.22*
Benzo (a) pyrene			BDL							BDL	BDL	*0.06*	*0.022*
Benzo (b) fluoranthene			BDL							BDL	BDL	*0.61*	*0.22*
Benzo (g,h, i) perylene			BDL							BDL	BDL	*61*	*NA*
Benzo (k) fluoranthene			BDL							BDL	BDL	*6.09*	*2.2*
Chrysene			BDL							BDL	BDL	*61*	*22*
Dibenz (a,h) anthracene			BDL							BDL	BDL	*0.06*	*0.022*
Fluoranthene			BDL							BDL	BDL	*1,000*	*1,000*
Fluorene			BDL							BDL	BDL	*1,000*	*NA*
Indeno (1,2,3-cd) pyrene			BDL							BDL	BDL	*0.61*	*0.22*
Naphthalene			BDL							BDL	BDL	*164*	*NA*
Phenanthrene			BDL							BDL	BDL	*NA*	*NA*
Pyrene			BDL							BDL	BDL	*1,000*	*1,000*
1-Methylnaphthalene			BDL							BDL	BDL	*321*	*NA*
2-Methylnaphthalene			BDL							BDL	BDL	*321*	*NA*
2-Chloronaphthalene			BDL							BDL	BDL	*NA*	*NA*

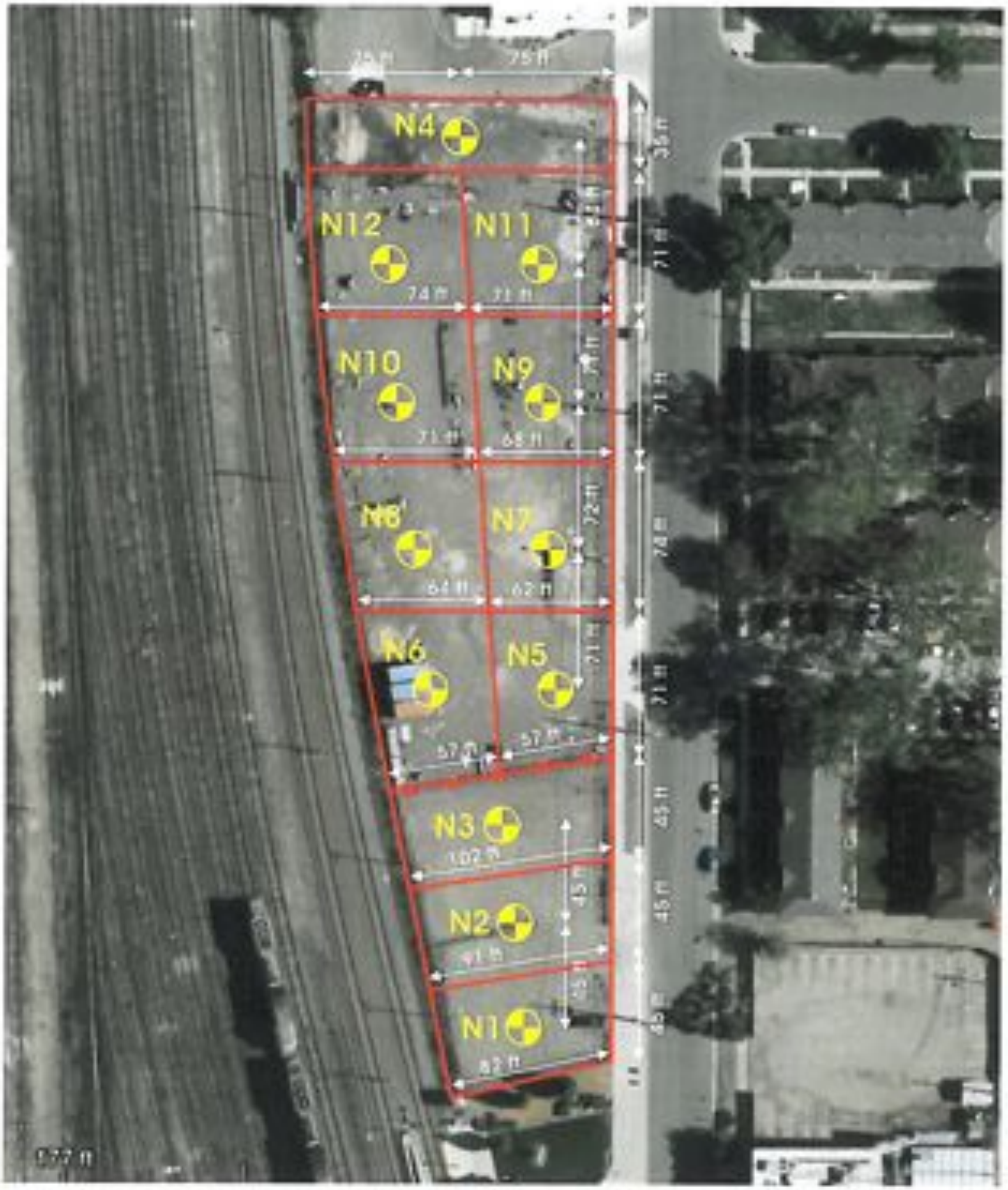
BDL: *below detection limits*

mg/kg: *milligrams per kilogramlow detection limits*

CCoD: City and County of [redacted] Soil Screening Standard for Residential/Unrestricted Use, mg/kg

* *CCoD special case soil screening standard for arsenic*

[redacted] Department of Public Health and Environment, Soil Evaluation Values (Residential Standard), mg/kg



Scale:	66 ft	Project:	CCoD
Date:	Jul 2008	Drawn By:	Cason

[redacted] Technologies, Inc.
[redacted]

Figure 1

1001 Osage Street
Sampling Locations

CCoD, 10th & Osage Properties, [redacted]

Scale:	52 ft	Project:	CCoD
Date:	Jul 2008	Drawn By:	Cason

E.T. Technologies, Inc.
10000 [redacted] Suite [redacted]
[redacted] 80134

Figure 2
944 Osage Street
Sampling Locations
CCoD, 10th & Osage Properties, [redacted]