



August 18, 2016

Mr. Todd Davis
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U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

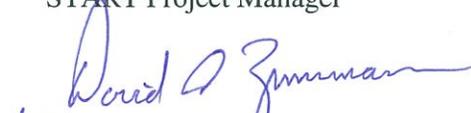
**Subject: Phase II Targeted Brownfields Assessment – Hazardous Materials Survey
Elkem Carbide
Keokuk, Lee County, Iowa
EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0002.019.017
Task Monitor: Todd Davis, Site Assessment Manager**

Dear Mr. Davis:

Tetra Tech, Inc. is pleased to submit the enclosed Phase II Targeted Brownfields Assessment (TBA) – Hazardous Materials Survey report regarding the structures at the Elkem Carbide site in Keokuk, Iowa. If you have any questions or comments regarding this submittal, please call me at (816) 412-1775.

Sincerely,


for Rob Monnig, PE
START Project Manager


for Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

**HAZARDOUS MATERIALS SURVEY
FOR PHASE II TARGETED BROWNFIELDS ASSESSEMENT**

**ELKEM CARBIDE
KEOKUK, IOWA**

**Superfund Technical Assessment and Response Team (START) 4 Contract
Contract No. EP-S7-13-06, Task Order 0002.019.017**

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
11201 Renner Boulevard
Lenexa, Kansas 66219

August 18, 2016

Prepared By:

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EXECUTIVE SUMMARY

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to perform asbestos and lead-based paint (LBP) inspections, and a household hazardous waste (HHW) inventory as part of a Phase II Targeted Brownfields Assessment (TBA) of the Elkem Carbide site in Keokuk, Iowa. The primary purpose of the survey was to assess potential impacts of asbestos, LBP, and HHW on the structures.

The following findings and recommendations are based on observations during the survey and analytical results from samples collected at the subject property buildings:

- Regulated asbestos-containing material (ACM) was identified within Building 1 on the subject property in approximately 110 square feet (ft²) of 12" X 12" orange patterned floor tile in the kitchen. The floor tile was represented by sample 1-FT6-1. Laboratory results indicated that the floor tile contained 5-percent chrysotile asbestos. Because of asbestos in the floor tile, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified within Building 1 on the subject property in approximately 800 ft² of 9" X 9" brown floor tile in the south entrance and conference room. The floor tile was represented by samples 1-FT7-1, -2, and -3. Laboratory results indicated that the floor tile contained 6-percent chrysotile asbestos. Because of asbestos in the floor tile, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified on the exterior windows of Building 3 on the subject property in approximately 20 linear feet of window glaze. The window glaze was represented by samples 3-WG-1, -2, and -3. Laboratory results indicated that the window glaze contained 4-percent chrysotile asbestos. Because of asbestos in the window glaze, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified within Building 4 on the subject property in approximately 800 ft² of wall mastic behind paneling in the offices. The wall mastic was represented by samples 4-WM-1, -2, and -3. Laboratory results indicated that the wall mastic contained 12-percent chrysotile asbestos. Because of asbestos in the wall mastic, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified within Building 9 on the subject property in approximately 10,000 ft² of transite paneling. The transite paneling was represented by samples 9-TR-1, -2,

and -3. Laboratory results indicated that the transite paneling contained 20-percent chrysotile asbestos. Because of asbestos in the transite paneling, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.

- The Department of Housing and Urban Development (HUD) considers LBP as paint with lead levels above 1.0 mg/cm². If the LBP surfaces are impacted during the renovations, or if the buildings are going to be demolished, Tetra Tech recommends the contractor conducting the renovation/demolition, comply with the Occupational Safety and Health Administration (OSHA) Lead in Construction Standard, Title 29 of Code of Federal Regulations (CFR), Part 1926.62. In addition, Tetra Tech recommends a sample be collected from the debris pile for a Toxicity Characteristic Leaching Procedure (TCLP) analysis (Title 40 CFR 261.24) prior to transport to the landfill. A representative sample should be collected and analyzed for all eight metals specified in 40 CFR Part 261.24 (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). This would allow determination of the proper method of disposal of the materials. Of the 224 XRF readings from painted surfaces, 43 lead concentrations exceeded 1.0 mg/cm². The following is a summary of those positive readings:
 - LBP was identified in Building 1 on white concrete walls in the northeast open area and south entry; off-white plaster ceiling, green wall concrete, and white wall concrete at the bottom of the stairs; red metal door in the kitchen; and tan support pole in the covered parking area totaling approximately 3,980 square feet (ft²).
 - LBP was identified in Building 2 on grey metal support beams; yellow concrete floor; and yellow metal door frame on the south garage door totaling approximately 3,060 ft².
 - LBP was identified in Building 3 on tan and white brick walls, tan and white concrete pillars, tan ceramic walls, and tan wood walls in the locker room; brown and beige ceramic wall tile, brown and white concrete pillars, blue concrete ceiling, and brown and tan brick walls in the entryway; brown wood exterior windows; blue brick walls on the west side; white brick walls and blue and white wood walls on the lab side; black wood door and brown wood screen door on the exterior west lab; light brown metal support beam, light brown wood overhand, and tan wood window frames on the exterior totaling approximately 9,794 square ft².
 - LBP was identified in Building 6 on grey metal doors and door frames on the exterior east side; yellow and brown/red metal stair railing and white concrete ceiling in the storage room; red/brown metal support beams in the 2nd floor storage room; and white metal door in the hall to the storage room totaling approximately 1,295 ft².
 - LBP was identified in Building 7 on yellow metal support beams totaling approximately 20 ft².
 - LBP was identified in Building 8 on yellow metal support beams in the main warehouse; yellow metal support beams and railings in the east/center stairwell; yellow metal door frame on the southeast side; red metal door and door frame in the north office area; and white metal support beams in the outer area totaling approximately 16,100 ft².
 - LBP was identified in Building 9 on yellow concrete post in the main plant, yellow metal door in the south garage, yellow metal stair railing and concrete guard post in the north

plant, blue metal guard post in the north plant, and yellow metal door in the north garage totaling approximately 80 ft².

- HHW and hazardous materials were inventoried during the survey. Tetra Tech recommends proper disposal of the materials based on their characteristics prior to renovation or demolition of the subject property buildings.

1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to perform asbestos and lead-based paint (LBP) inspections, and a household hazardous waste (HHW) inventory as part of a Phase II Targeted Brownfields Assessment (TBA) of the Elkem Carbide site in Keokuk, Iowa. The primary purpose of the survey was to assess potential impacts of asbestos, LBP, and HHW on the structures.

The survey team included Mr. Jeffrey Mitchell, Licensed State of Iowa Asbestos Inspector and Licensed EPA LBP Inspector, and Ms. Kaitlyn Bahr, Ms. Joann Jeplawy, and Mr. Tommy Rebecchi, all licensed Asbestos Inspectors. Inspector certifications are in Appendix A. Survey strategy and sample methodology were developed based on planned reuse of the structures at this address. Because of limitations on destructive sampling methods, additional suspect materials may be present within walls, voids, or other concealed areas. Assumptions and deviations regarding the subject property survey are identified in Section 10.0. Prior to future remodeling or demolition of the structures, further survey work may be needed to comply with all local, state, and federal requirements regulating asbestos containing materials (ACM), LBP, and HHW.

Tetra Tech conducted the survey on June 27 and 28, 2016. The purpose of the survey was to evaluate the subject property for presence, quantity, locations, and characterization of ACM that may require abatement prior to any remodeling or demolition activities, in accordance with National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations as adopted by the U.S. Environmental Protection Agency (EPA). The intent of the asbestos NESHAP regulations is to protect the public (and workers) by minimizing release of asbestos fibers during activities involving processing, handling, and disposal of ACM. Inhalation of asbestos fibers can cause cancer and other lung diseases (Agency for Toxic Substances and Disease Registry [ATSDR] 2008). The survey was completed in accordance with industry standard practice for hazardous materials surveys. Asbestos samples were collected in accordance with NESHAP regulations as adopted by the EPA.

Tetra Tech also conducted a screening for presence, quantity, and locations of LBP exceeding lead hazard levels, which would require Occupational Safety and Health Administration (OSHA) worker safety precautions during remodeling or demolition activities. The LBP survey was conducted according to protocols similar to the single-family housing inspection procedures in Department of Housing and Urban Development (HUD) guidelines (HUD 1997) by use of an XT-260 x-ray fluorescence (XRF)

spectrometer manufactured by Innov-X Systems, Inc. (Innov-X). The Innov-X is a state-of-the-art XRF spectrum analyzing system for quantitative measurement of lead in paint on various substrates.

Finally, as part of the survey, Tetra Tech completed an inventory of HHW and hazardous materials in the structure. The inventory included but was not limited to the following types of materials: thermostats and fluorescent light bulbs possibly containing mercury, fluorescent light ballasts potentially containing polychlorinated biphenyls (PCB), emergency lighting and exit signs that house batteries containing heavy metals, appliances containing Freon, product containers holding hazardous materials (such as cleaning supplies, paint, etc.), and any other HHW items.

A site-specific work plan and quality assurance project plan (QAPP) in support of survey activities were submitted to EPA on March 30, 2016, and were approved on June 8, 2016, prior to the survey at the subject property (Tetra Tech 2016). Field activities accorded with the QAPP, except where noted. Tetra Tech prepared this report in accordance with generally accepted industrial hygiene practice and procedures. This report does not cover or comment on structural areas not assessed either visibly or by sample collection. The data evaluation and assessment stated herein constitute a professional opinion; no other warranty is expressed or implied. Assumptions and deviations regarding the subject property building surveyed are identified in Section 10.0.

Tetra Tech provided these services consistent with the level and skill ordinarily exercised by members of the profession currently practicing under similar conditions. This statement is in lieu of other statements either expressed or implied. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document, the findings, conclusions, or recommendations is at the risk of said user. This survey report does not warrant against future operations or conditions that may not be consistent with its recommendations. Moreover, because of some limitations on destructive sampling during the survey, completion of the survey does not guarantee identification of all hazardous materials, ACMs, or LBP—hazardous materials may be present in voids of walls or ceilings.

Section 2.0 of this report discusses the site structures. Section 3.0 specifies field survey and analytical protocols for the asbestos survey. Section 4.0 presents the field survey and analytical protocols for the LBP screening. Section 5.0 describes procedures regarding the HHW and hazardous materials inventory. Section 6.0 presents asbestos findings. Section 7.0 describes LBP findings. Section 8.0 provides HHW and hazardous materials inventory findings. Section 9.0 offers recommendations based on survey

findings. Section 10.0 specifies assumptions and deviations, and Section 11.0 provides a list of references cited within this document.

2.0 SUBJECT PROPERTY BUILDINGS

The subject property hosts nine commercial buildings, all locations of which are depicted on Figure 3 in Appendix B:

- Building #1, the northernmost building, is a former office space. The building is generally finished with drywall walls, lay-in acoustic tile ceilings, and vinyl floor tile. Building #1 contains an assortment of office supplies left behind, including desks, filing cabinets, a copier, and a fax machine. The building is equipped with a heating, venting, and air conditioning (HVAC) system.
- Building #2, south of Building #1, is a warehouse with corrugated sheet metal siding. It was formerly used for carbide container storage (Terracon 2009).
- Building #3 was formerly a laboratory and first aid center. The paint on the interior is heavily flaking. Building #3 contains old laboratory supplies such as ovens, sampling equipment, and x-ray equipment. Standing water in the basement rendered the area inaccessible.
- Building #4 is a former office space. The interior of the building is finished with drywall and vinyl floor tile.
- Building #5 is the North Substation. The interior is finished with painted brick walls and concrete floors.
- Building #6 served as the receiving and maintenance building. The interior is generally finished with painted brick walls and concrete floors. Standing water in the basement rendered the area inaccessible.
- Building #7 is a shed with corrugated sheet metal siding currently used to store a few drums.
- Building #8, the southernmost building, formerly served as the carbon block manufacturing building. The building is made of corrugated sheet metal and brick.
- Building #9 is a manufacturing building with corrugated sheet metal siding formerly used for production of electrode paste.

3.0 ACM FIELD SURVEY AND ANALYTICAL PROTOCOLS

Tetra Tech made every effort to inspect all areas of the structures. Minor demolition of materials (destructive sampling) was required during the survey effort. The inspector took care to ensure that the structure remained unoccupied during sample collection. Asbestos samples were collected in accordance with NESHAP as adopted by EPA and Asbestos Hazard and Emergency Response Act of 1986 (AHERA) protocols. AHERA defines “asbestos containing material” (ACM) as any material or product that contains more than 1 percent (%) asbestos. Suspected ACMs were grouped as homogeneous areas if the material was similar in appearance and texture; however, if the inspector decided that a material (for example, wall texturing) was not similar in appearance and texture to other materials in the subject property building, the inspector distinguished the material as unique and collected samples of each unique material accordingly. Because of limitations on destructive sampling methods, additional suspect materials not detected may be present in walls, voids, or other concealed areas. Assumptions and deviations regarding the building surveys are identified in Section 10.0.

Bulk samples of suspected ACM were collected to ensure that each distinct layer of material was represented in the sample. A wetting agent was applied to friable surfaces prior to sample collection to reduce potential for fiber release. All samples collected were placed in plastic bags, labeled, and sealed immediately upon collection. To prevent cross-contamination between samples, the sampling instruments were wiped clean by use of a wet, lint-free cloth after collection of each sample. A unique sample identification number was assigned to each sample.

The samples remained in the inspector’s custody until sent to the laboratory. Upon completion of sampling activities, the bulk samples were sent, along with Tetra Tech’s chain-of-custody documentation, to Quantem Laboratories (Quantem) in Oklahoma City, Oklahoma. Suspect ACM samples were analyzed per EPA Method 600/R-93/116 by Quantem via Polarized Light Microscopy (PLM) analysis and, in some cases, 400 Point Count. Quantem is a National Voluntary Laboratory Accreditation Program (NVLAP)-certified laboratory, certification number 101959. Section 6.0 of this report summarizes ACM analytical results. Sample locations are shown on Figures 2a -2g in Appendix B. Appendix C includes ACM analytical results and chain-of-custody forms for the bulk samples.

4.0 LBP SCREENING AND ANALYTICAL PROTOCOLS

Tetra Tech made every effort to inspect all areas of the buildings. HUD *Guidelines for the Evaluation and Control of LBP in Housing* (1997) suggests that paint applied before 1978 could contain lead.

An XRF screening of suspected LBP was performed according to protocols similar to the single-family housing inspection procedures in the HUD *Guidelines*. Tetra Tech utilized an Innov-X XRF to perform the LBP screening. The Innov-X is a state-of-the-art XRF spectrum analyzing system for quantitative measurement of lead in paint on various substrates. Tetra Tech performed XRF screening of suspect painted surfaces that possibly would be impacted during renovation or demolition activities.

Tetra Tech utilized the XRF “Lead Paint Mode” for testing, standardized per the equipment instruction manual, and programmed the unit with an action level of 1.0 milligram per square centimeter (mg/cm²). The Innov-X automatically adjusts the measurement time to be the least time needed to make a definitive measurement based on the action level. Paint containing greater than or equal to 1.0 mg/cm² lead by XRF testing or 1.0 mg/cm² lead by laboratory analysis is considered LBP.

Tetra Tech performed XRF calibration checks on the Innov-X according to the manufacturer’s recommended protocol and the HUD *Guidelines*. These quality control readings were used to monitor performance of the Innov-X. Calibration-check readings were taken after every hour of operation with use of a Standard Reference Material (SRM) paint film, developed by the National Institute of Standards and Technology (NIST). Section 7.0 of this report summarizes results from XRF screening of samples of painted surfaces collected at the subject property.

5.0 HOUSEHOLD HAZARDOUS WASTE AND HAZARDOUS MATERIALS INVENTORY

Tetra Tech completed an inventory of HHW and other potentially hazardous materials in the structure. This inventory included but was not limited to the following types of materials: thermostats and fluorescent light bulbs possibly containing mercury, fluorescent light ballasts potentially containing PCBs, emergency lighting and exit signs that house batteries containing heavy metals, appliances containing Freon, product containers holding hazardous materials (such as cleaning supplies, paint, etc.), and any other HHW items that may have been present.

Tetra Tech used an inventory field sheet and went through every room in the structures identifying, categorizing, and quantifying HHW and hazardous materials. Tetra Tech made every effort to provide a complete inventory of these items; however, Tetra Tech cannot guarantee an accounting of every item. A summary of HHW and hazardous materials inventoried during the survey is in Section 8.0 of this report.

6.0 ACM FINDINGS

The laboratory report in Appendix C provides the PLM and/or 400 Point Count results from the ACM samples collected from the structures, which are summarized in Table 1 below. Bolded results in Table 1 indicate where asbestos was detected at a concentration greater than 1 percent.

TABLE 1
SUMMARY OF SUSPECT ACM LABORATORY ANALYSIS
ELKEM CARBIDE – KEOKUK, IOWA

Figure Key	Sample ID	Material Description	Material Locations	Analytical Result (% ACM*)	Quantity**
Building 1					
1	1-CBM-1	Brown Cove Base with Mastic	Throughout top floor and kitchen	ND	NA
2	1-CBM-2	Brown Cove Base with Mastic	Throughout top floor and kitchen	ND	NA
3	1-CBM-3	Brown Cove Base with Mastic	Throughout top floor and kitchen	ND	NA
4	1-FT-1	12" X 12" Brown Vinyl Floor Tile with Adhesive	West half of top floor	ND	NA
5	1-FT-2	12" X 12" Brown Vinyl Floor Tile with Adhesive	West half of top floor	ND	NA
6	1-FT-3	12" X 12" Brown Vinyl Floor Tile with Adhesive	West half of top floor	ND	NA
7	1-CT-1	2' X 4' Pinhole/Fissure Ceiling Tile	Throughout top floor and basement	ND	NA
8	1-CT-2	2' X 4' Pinhole/Fissure Ceiling Tile	Throughout top floor and basement	ND	NA
9	1-CT-3	2' X 4' Pinhole/Fissure Ceiling Tile	Throughout top floor and basement	ND	NA
10	1-ST-1	Stair Tread	Top floor	ND	NA
11	1-ST-2	Stair Tread	Top floor	ND	NA
12	1-ST-3	Stair Tread	Top floor	ND	NA
13	1-CT2-1	2' X 2' Pinhole/Fissure Ceiling Tile	Open office area, top floor, and conference room	ND	NA
14	1-CT2-2	2' X 2' Pinhole/Fissure Ceiling Tile	Open office area, top floor, and conference room	ND	NA
15	1-CT2-3	2' X 2' Pinhole/Fissure Ceiling Tile	Open office area, top floor, and conference room	ND	NA
16	1-FT2-1	12" X 12" Grey Vinyl Floor Tile with Adhesive	Conference room and south entrance	ND	NA
17	1-FT2-2	12" X 12" Grey Vinyl Floor Tile with Adhesive	Conference room and south entrance	ND	NA
18	1-FT2-3	12" X 12" Grey Vinyl Floor Tile with Adhesive	Conference room and south entrance	ND	NA
19	1-CBM2-1	Grey Cove Base with Mastic	Conference room and south entrance	ND	NA
20	1-CBM2-2	Grey Cove Base with Mastic	Conference room and south entrance	ND	NA
21	1-CBM2-3	Grey Cove Base with Mastic	Conference room and south entrance	ND	NA
22	1-DWJC-1	Drywall and Joint Compound	Throughout top floor and basement	ND	NA
23	1-DWJC-2	Drywall and Joint Compound	Throughout top floor and basement	ND	NA
24	1-DWJC-3	Drywall and Joint Compound	Throughout top floor and basement	ND	NA

TABLE 1 (Continued)

**SUMMARY OF SUSPECT ACM LABORATORY ANALYSIS
ELKEM CARBIDE – KEOKUK, IOWA**

Figure Key	Sample ID	Material Description	Material Locations	Analytical Result (% ACM*)	Quantity**
25	1-PLSC-1	Plaster and Skim Coat	Top floor ceiling and basement ceiling (above drop ceiling)	ND	NA
26	1-PLSC-2	Plaster and Skim Coat	Top floor ceiling and basement ceiling (above drop ceiling)	ND	NA
27	1-PLSC-3	Plaster and Skim Coat	Top floor ceiling and basement ceiling (above drop ceiling)	ND	NA
28	1-GP-1	Glue Puck	Top floor ceiling and basement ceiling	ND	NA
29	1-GP-2	Glue Puck	Top floor ceiling and basement ceiling	ND	NA
30	1-GP-3	Glue Puck	Top floor ceiling and basement ceiling	ND	NA
31	1-FT3-1	9" X 9" Brown Vinyl Floor Tile with Adhesive	East office, closet, and bathroom	ND	NA
32	1-FT3-2	9" X 9" Brown Vinyl Floor Tile with Adhesive	East office, closet, and bathroom	ND	NA
33	1-FT3-3	9" X 9" Brown Vinyl Floor Tile with Adhesive	East office, closet, and bathroom	ND	NA
34	1-FT4-1	9" X 9" Grey Vinyl Floor Tile with Adhesive	East office, closet, and bathroom	ND	NA
35	1-FT4-2	9" X 9" Grey Vinyl Floor Tile with Adhesive	East office, closet, and bathroom	ND	NA
36	1-FT4-3	9" X 9" Grey Vinyl Floor Tile with Adhesive	East office, closet, and bathroom	ND	NA
37	1-CA-1	Carpet Adhesive	East office	ND	NA
38	1-CA-2	Carpet Adhesive	East office		
39	1-CA-3	Carpet Adhesive	East office		
40	1-ST2-1	Stair Tread	South entrance	ND	NA
41	1-ST2-2	Stair Tread	South entrance		
42	1-ST2-3	Stair Tread	South entrance		
43	1-FT5-1	12" X 12" Orange Vinyl Floor Tile with Adhesive	Kitchen	ND	NA
44	1-FT6-1	12" X 12" Orange Patterned Vinyl Floor Tile with Adhesive	Kitchen	Floor Tile: 5% Chry; Adhesive: ND	110 SF
45	1-CT3-1	2' X 2' Pinhole/Fissure Ceiling Tile	Kitchen	ND	NA
46	1-CT3-2	2' X 2' Pinhole/Fissure Ceiling Tile	Kitchen	ND	NA
47	1-CT3-3	2' X 2' Pinhole/Fissure Ceiling Tile	Kitchen	ND	NA
48	1-CBM3-1	White Cove Base with Mastic	Basement	ND	NA
49	1-CBM3-2	White Cove Base with Mastic	Basement	ND	NA

TABLE 1 (Continued)

**SUMMARY OF SUSPECT ACM LABORATORY ANALYSIS
ELKEM CARBIDE – KEOKUK, IOWA**

Figure Key	Sample ID	Material Description	Material Locations	Analytical Result (% ACM*)	Quantity**
50	1-CBM3-3	White Cove Base with Mastic	Basement	ND	NA
51	1-CT4-1	2' X 4' Pinhole Ceiling Tile	Basement	ND	NA
52	1-CT4-2	2' X 4' Pinhole Ceiling Tile	Basement	ND	NA
53	1-CT4-3	2' X 4' Pinhole Ceiling Tile	Basement	ND	NA
54	1-PW-1	Partial Wall Panel	Throughout	ND	NA
55	1-PW-2	Partial Wall Panel	Throughout	ND	NA
56	1-PW-3	Partial Wall Panel	Throughout	ND	NA
57	1-WC-1	Window Caulk	Exterior wood windows	ND	NA
58	1-WC-2	Window Caulk	Exterior wood windows	ND	NA
59	1-WC-3	Window Caulk	Exterior wood windows	ND	NA
60	1-FT7-1	9" X 9" Brown Vinyl Floor Tile with Adhesive	South entrance and conference room	Floor Tile: 6% Chry; Mastic: 0.50% Chry***	800 SF
61	1-FT7-2	9" X 9" Brown Vinyl Floor Tile with Adhesive	South entrance and conference room	Floor Tile: 6% Chry; Mastic: 0.25% Chry***	
62	1-FT7-3	9" X 9" Brown Vinyl Floor Tile with Adhesive	South entrance and conference room	Floor Tile: 6% Chry; Mastic: 0.50% Chry***	
63	1-FP-1	Floor Paper	East office, closet, and bathroom	ND	NA
64	1-FP-2	Floor Paper	East office, closet, and bathroom	ND	NA
65	1-FP-3	Floor Paper	East office, closet, and bathroom	ND	NA
66	1-CBM4-1	Black Cove Base with Mastic	East office, closet, and bathroom	ND	NA
67	1-FT8-1	12" X 12" Brown Vinyl Floor Tile with Adhesive	East half of top floor	ND	NA
68	1-FT8-2	12" X 12" Brown Vinyl Floor Tile with Adhesive	East half of top floor	ND	NA
69	1-FT8-3	12" X 12" Brown Vinyl Floor Tile with Adhesive	East half of top floor	ND	NA
Building 2					
1	2-WG-1	Window Glaze	Exterior windows	ND	NA
2	2-WG-2	Window Glaze	Exterior windows	ND	NA
3	2-WG-3	Window Glaze	Exterior windows	ND	NA

TABLE 1 (Continued)

SUMMARY OF SUSPECT ACM LABORATORY ANALYSIS
ELKEM CARBIDE – KEOKUK, IOWA

Figure Key	Sample ID	Material Description	Material Locations	Analytical Result (% ACM*)	Quantity**
Building 3					
1	3-CT-1	2' X 4' Pinhole/Fissure Ceiling Tile	Lab tech offices	ND	NA
2	3-CT-2	2' X 4' Pinhole/Fissure Ceiling Tile	Lab tech offices	ND	NA
3	3-CT-3	2' X 4' Pinhole/Fissure Ceiling Tile	Lab tech offices	ND	NA
4	3-TSI-1	Thermal Systems Insulation	Locker room duct	ND	NA
5	3-TSI-2	Thermal Systems Insulation	Locker room duct	ND	NA
6	3-TSI-3	Thermal Systems Insulation	Locker room duct	ND	NA
7	3-WG-1	Grey Window Glaze	Exterior	4% Chry	20 LF
8	3-WG-2	Grey Window Glaze	Exterior		
9	3-WG-3	Grey Window Glaze	Exterior		
10	3-TSI2-1	White Casing around Foam	Lab room duct work	ND	NA
11	3-TSI2-2	White Casing around Foam	Lab room duct work	ND	NA
12	3-TSI2-3	White Casing around Foam	Lab room duct work	ND	NA
Building 4					
1	4-FT-1	12" X 12" Brown Vinyl Floor Tile with Adhesive	Throughout offices	ND	NA
2	4-FT-2	12" X 12" Brown Vinyl Floor Tile with Adhesive	Throughout offices	ND	NA
3	4-FT-3	12" X 12" Brown Vinyl Floor Tile with Adhesive	Throughout offices	ND	NA
4	4-CT-1	2' X 4' Pinhole/Fissure Ceiling Tile	Throughout	ND	NA
5	4-CT-2	2' X 4' Pinhole/Fissure Ceiling Tile	Throughout	ND	NA
6	4-CT-3	2' X 4' Pinhole/Fissure Ceiling Tile	Throughout	ND	NA
7	4-DWJC-1	Drywall and Joint Compound	Throughout	<0.25% Chry***	NA
8	4-DWJC-2	Drywall and Joint Compound	Throughout	<0.25% Chry***	
9	4-DWJC-3	Drywall and Joint Compound	Throughout	0.25% Chry***	
10	4-CBM-1	4" Brown Cove Base with Mastic	Throughout	ND	NA
11	4-CBM-2	4" Brown Cove Base with Mastic	Throughout	ND	NA
12	4-CBM-3	4" Brown Cove Base with Mastic	Throughout	ND	NA
13	4-FT2-1	12" X 12" Brick Red Vinyl Floor Tile	Entrance hallway and custodian closet	ND	NA
14	4-FT2-2	12" X 12" Brick Red Vinyl Floor Tile	Entrance hallway and custodian closet	ND	NA
15	4-FT2-3	12" X 12" Brick Red Vinyl Floor Tile	Entrance hallway and custodian closet	ND	NA
16	4-WM-1	Wall Mastic	Behind wood paneling in offices	12% Chry	800 SF
17	4-WM-2	Wall Mastic	Behind wood paneling in offices		
18	4-WM-3	Wall Mastic	Behind wood paneling in offices		

TABLE 1 (Continued)

**SUMMARY OF SUSPECT ACM LABORATORY ANALYSIS
ELKEM CARBIDE – KEOKUK, IOWA**

Figure Key	Sample ID	Material Description	Material Locations	Analytical Result (% ACM*)	Quantity**
Building 6					
1	6-WG-1	Window Glaze	Exterior	ND	NA
2	6-WG-2	Window Glaze	Exterior	ND	NA
3	6-WG-3	Window Glaze	Exterior	ND	NA
4	6-CT-1	2' X 4' Pinhole/Fissure Ceiling Tile	Office	ND	NA
5	6-CT-2	2' X 4' Pinhole/Fissure Ceiling Tile	Office	ND	NA
6	6-CT-3	2' X 4' Pinhole/Fissure Ceiling Tile	Office	ND	NA
Building 8					
1	8-TSI-1	Thermal Systems Insulation	Boiler	ND	NA
2	8-TSI-2	Thermal Systems Insulation	Boiler	ND	NA
3	8-TSI-3	Thermal Systems Insulation	Boiler	ND	NA
4	8-CT-1	2' X 2' White Ceiling Tile	Bathroom, hallway, and 2 nd floor office	ND	NA
5	8-CT-2	2' X 2' White Ceiling Tile	Bathroom, hallway, and 2 nd floor office	ND	NA
6	8-CT-3	2' X 2' White Ceiling Tile	Bathroom, hallway, and 2 nd floor office	ND	NA
7	8-CBM-1	4" Brown Cove Base with Mastic	Bathroom, hallway, and 2 nd floor office	ND	NA
8	8-CBM-2	4" Brown Cove Base with Mastic	Bathroom, hallway, and 2 nd floor office	ND	NA
9	8-CBM-3	4" Brown Cove Base with Mastic	Bathroom, hallway, and 2 nd floor office	ND	NA
10	8-WG-1	Window Glaze	Exterior 2 nd floor windows	ND	NA
11	8-WG-2	Window Glaze	Exterior 2 nd floor windows	ND	NA
12	8-WG-3	Window Glaze	Exterior 2 nd floor windows	ND	NA
13	8-CT2-1	2' X 4' White Pinhole/Fissure Ceiling Tile	2 nd floor office	ND	NA
14	8-CT2-2	2' X 4' White Pinhole/Fissure Ceiling Tile	2 nd floor office	ND	NA
15	8-CT2-3	2' X 4' White Pinhole/Fissure Ceiling Tile	2 nd floor office	ND	NA
16	8-DWJC-1	Drywall and Joint Compound	1 st and 2 nd floor offices (1 wall in each)	ND	NA
17	8-DWJC-2	Drywall and Joint Compound	1 st and 2 nd floor offices (1 wall in each)	ND	NA
18	8-DWJC-3	Drywall and Joint Compound	1 st and 2 nd floor offices (1 wall in each)	ND	NA
19	8-FT-1	12" X 12" Silver Vinyl Floor Tile	1 st and 2 nd floor offices	ND	NA
20	8-FT-2	12" X 12" Silver Vinyl Floor Tile	1 st and 2 nd floor offices	ND	NA
21	8-FT-3	12" X 12" Silver Vinyl Floor Tile	1 st and 2 nd floor offices	ND	NA
22	8-CTX-1	Ceiling Texture	1 st and 2 nd floor offices	ND	NA
23	8-CTX-2	Ceiling Texture	1 st and 2 nd floor offices	ND	NA
24	8-CTX-3	Ceiling Texture	1 st and 2 nd floor offices	ND	NA

TABLE 1 (Continued)

**SUMMARY OF SUSPECT ACM LABORATORY ANALYSIS
ELKEM CARBIDE – KEOKUK, IOWA**

Figure Key	Sample ID	Material Description	Material Locations	Analytical Result (% ACM*)	Quantity**
25	8-CBM2-1	4" Black Cove Base with Mastic	1 st and 2 nd floor offices	ND	NA
26	8-CBM2-2	4" Black Cove Base with Mastic	1 st and 2 nd floor offices	ND	NA
27	8-CBM2-3	4" Black Cove Base with Mastic	1 st and 2 nd floor offices	ND	NA
28	8-VER-1	Vermiculite	In cinderblock throughout	0.50% Actinolite/Tremolite ***	NA
29	8-VER-2	Vermiculite	In cinderblock throughout	ND	NA
30	8-VER-3	Vermiculite	In cinderblock throughout	0.75% Actinolite/Tremolite ***	NA
Building 9					
1	9-CT-1	2' X 4' Pinhole/Fissure Ceiling Tile	Office	ND	NA
2	9-CT-2	2' X 4' Pinhole/Fissure Ceiling Tile	Office	ND	NA
3	9-CT-3	2' X 4' Pinhole/Fissure Ceiling Tile	Office	ND	NA
4	9-DW-1	Drywall	Office	ND	NA
5	9-DW-2	Drywall	Office	ND	NA
6	9-DW-3	Drywall	Office	ND	NA
7	9-TR-1	Transite Panel	North side of building	20% Chry	10,000 SF
8	9-TR-2	Transite Panel	North side of building		
9	9-TR-3	Transite Panel	North side of building		

Notes:

Bolded results indicate that ACM was detected.

* AHERA defines ACM as any material or product that contains more than 1 percent asbestos.

** This is only an estimated quantity of this material and should not be used for bidding purposes. Tetra Tech recommends any contractor bidding on removal of this material visually verify the quantity.

*** AHERA defines ACM as greater than 1% asbestos. These materials contain <1% asbestos; therefore, the material is not regulated for disposal purposes. However, the material does contain asbestos, so if the material is disturbed, OSHA regulations must be followed and personal protective equipment must be used.

%	Percent	LF	Linear feet
ACM	Asbestos containing material	NA	Not applicable
AHERA	Asbestos Hazard and Emergency Response Act of 1986	ND	Not detected
ID	Identification	SF	Square feet
Chry	Chrysotile		
EPA	U.S. Environmental Protection Agency		
OSHA	Occupational Safety and Health Administration		

7.0 LBP FINDINGS

Results of XRF screening at the subject property are summarized in Table 2 below.

TABLE 2

**SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA**

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm ²)	Damaged*	Quantity**
Building 1						
White	West Entry	Wall Border	Wood	0.00	NA	NA
White	West Entry	Wall	Concrete	0.78	NA	NA
Varnish	Traffic Office	Door	Wood	0.03	NA	NA
White	Traffic Office	Door Frame	Wood	0.00	NA	NA
Varnish	Traffic Office	Wall	Wood	0.05	NA	NA
White	Southeast Reception	Wall	Drywall	0.00	NA	NA
Varnish	Northwest Office	Wall	Wood	0.04	NA	NA
White	North Central Office	Wall	Drywall	0.00	NA	NA
White	North Central Office	Wall	Wood	0.00	NA	NA
White	North Central Office	Window Frame	Wood	0.00	NA	NA
White	North Windows	Window Frame	Wood	0.00	NA	NA
White	Northeast Open Area	Walls (Original)	Concrete	>5.00	No	1,200 SF (exposed)
Varnish	Northeast Office	Wall	Wood	0.00	NA	NA
Varnish	Northeast Office	Door	Wood	0.00	NA	NA
Varnish	Northeast Office	Door Frame	Wood	0.00	NA	NA
White	Northeast Office	Door Frame	Wood	0.00	NA	NA
Varnish	Southeast Office	Door Frame	Wood	0.00	NA	NA
Varnish	Southeast Office	Wall	Wood	0.00	NA	NA
White	Bathrooms	Door Frame	Wood	0.00	NA	NA
White	Bathrooms	Walls	Drywall	0.00	NA	NA
White	South Offices	Window Frame	Wood	0.00	NA	NA
White	South Entry	Wall	Cinderblock	0.02	NA	NA
White	South Entry	Wall	Concrete	>5.00	No	500 SF
White	Conference Room	Wall	Drywall	0.00	NA	NA
Off-White	Bottom of Stairs	Ceiling	Plaster	>5.00	Yes	1,800 SF
White	Bottom of Stairs	Wall	Drywall	0.00	NA	NA
Green	Bottom of Stairs	Wall	Concrete	>5.00	No	400 SF (exposed)
White	Bottom of Stairs	Wall	Concrete	>5.00	No	20 SF (exposed)

TABLE 2 (Continued)

**SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA**

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm²)	Damaged*	Quantity**
Tan	North East Office	Door Frame	Wood	0.00	NA	NA
Grey	North East Office	Floor	Concrete	0.06	NA	NA
White	North East Office	Window Frame	Wood	0.00	NA	NA
Tan	Engineering	Door Frame	Wood	0.00	NA	NA
Tan	Engineering	Support Pole	Metal	0.00	NA	NA
White	Engineering	Wall	Cinderblock	0.00	NA	NA
White	Engineering	Trim	Wood	0.00	NA	NA
Red	Kitchen	Door	Metal	>5.00	No	10 SF
Tan	Kitchen	Door Frame	Wood	0.00	NA	NA
Tan	Exterior	Wall	Cinderblock	0.00	NA	NA
Brown	Exterior	Window Trim	Wood	0.00	NA	NA
Brown	Exterior	Support Beam	Metal	0.00	NA	NA
Brown	Exterior	Hand Railing	Metal	0.00	NA	NA
Brown	Covered Parking	Wall	Wood	0.00	NA	NA
Tan	Covered Parking	Support Pole	Metal	2.69	No	50 SF
Tan	Covered Parking	Wall	Wood	0.02	NA	NA
Building 2						
Grey	Warehouse	Support Beam	Metal	>5.00	Yes	3,000 SF
Yellow	Warehouse	Post	Concrete	0.00	NA	NA
Yellow	Warehouse	Floor	Concrete	2.65	Yes	50 SF
Light Brown	Warehouse	Post	Concrete	0.00	NA	NA
Yellow	South Garage Door	Door Frame	Metal	>5.00	Yes	10 SF
Building 3						
Green	North Office	Door	Metal	0.00	NA	NA
Green	North Office	Door Frame	Metal	0.00	NA	NA
Green	North Office	Wall	Concrete	0.00	NA	NA
White	North Office	Wall	Concrete	0.00	NA	NA
Green	North Office	Radiator	Metal	0.07	NA	NA
Green	North Office	Window Frame	Wood	0.74	NA	NA
Green	North Office	Door Frame	Wood	0.00	NA	NA
Green	North Office	Wall Panel	Wood	0.00	NA	NA
White	North Office	Pipe	Wood	0.04	NA	NA
Tan	Locker Room	Wall	Brick	>5.00	No	800 SF

TABLE 2 (Continued)

**SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA**

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm²)	Damaged*	Quantity**
White	Locker Room	Wall	Brick	>5.00	No	1,000 SF
White	Locker Room	Ceiling	Concrete	0.00	NA	NA
Tan	Locker Room	Pillar	Concrete	>5.00	No	100 SF
White	Locker Room	Pillar	Concrete	>5.00	No	100 SF
Tan	Locker Room	Wall	Ceramic	>1.00	No	800 SF
Tan	Locker Room	Wall	Wood	>5.00	No	200 SF
Brown	Locker Closet	Door	Wood	0.00	NA	NA
White	Locker Closet	Door Frame	Metal	0.00	NA	NA
Yellow	Locker Closet	Wall	Cinderblock	0.08	NA	NA
Grey	Locker Closet	Wall	Cinderblock	0.05	NA	NA
Yellow	Locker Closet	Pipe	Metal	0.00	NA	NA
Yellow	Locker Closet	Wall	Brick	0.00	NA	NA
Grey	Locker Closet	Pipe	Metal	0.00	NA	NA
Tan	Hallway	Wall	Cinderblock	0.00	NA	NA
Off-White	Hallway	Wall	Cinderblock	0.00	NA	NA
Brown	Entryway	Wall	Ceramic	>1.00	No	100 SF
Beige	Entryway	Wall	Ceramic	>1.00	No	100 SF
Brown	Entryway	Door	Wood	0.00	NA	NA
Brown	Entryway	Door Frame	Wood	0.00	NA	NA
Brown	Entryway	Wall	Drywall	0.00	NA	NA
Off-White	Entryway	Wall	Drywall	0.00	NA	NA
Brown	Entryway	Wall	Cinderblock	0.00	NA	NA
Brown	Entryway	Wall	Cinderblock	0.00	NA	NA
Brown	Entryway	Pillar	Concrete	>5.00	No	20 SF
White	Entryway	Pillar	Concrete	>5.00	No	20 SF
Blue	Entryway	Ceiling	Concrete	>5.00	No	500 SF
Brown	Entryway	Window Frame	Wood	0.00	NA	NA
Brown	Entryway	Wall	Brick	>5.00	No	1,200 SF
Tan	Entryway	Wall	Brick	>5.00	No	100 SF
Brown	Hallway	Door	Metal	0.00	NA	NA
Brown	Hallway	Door Frame	Metal	0.00	NA	NA
Yellow	Locker Room	Wall Tile	Ceramic	0.04	NA	NA
Yellow	Locker Room	Wall	Brick	0.00	NA	NA

TABLE 2 (Continued)

SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm ²)	Damaged*	Quantity**
Tan	Exterior	Door	Metal	0.00	NA	NA
Brown	Exterior	Door Frame	Wood	0.00	NA	NA
Brown	Exterior	Window	Wood	>5.00	No	12 SF
Blue	West Side	Door	Metal	0.00	NA	NA
Blue	West Side	Door Frame	Metal	0.01	NA	NA
Blue	West Side	Wall	Brick	>5.00	No	1,000 SF
White	Lab Side	Wall	Brick	>5.00	No	1,000 SF
White	Lab Side	Wall	Wood	>5.00	No	800 SF
Blue	Lab Side	Wall	Wood	>5.00	No	800 SF
White	Lab Side	Wall	Cinderblock	0.00	NA	NA
Blue	Lab Side	Door	Wood	0.00	NA	NA
Blue	Lab Side	Door Frame	Wood	0.00	NA	NA
Blue	Lab Side	Wall	Cinderblock	0.00	NA	NA
Blue	Lab Side	Window Frame	Wood	0.00	NA	NA
Black	West Lab Exterior	Door	Wood	>5.00	Yes	20 SF
Brown	West Lab Exterior	Screen Door	Wood	>5.00	Yes	10 SF
White	West Lab Exterior	Wall	Cinderblock	0.00	NA	NA
Brown	West Lab Exterior	Wall	Brick	0.00	NA	NA
Brown	West Lab Exterior	Window	Wood	0.00	NA	NA
Brown	West Lab Exterior	Door Frame	Wood	0.00	NA	NA
Tan	Exterior	Wall	Brick	0.00	NA	NA
Tan	Exterior	Wall	Cinderblock	0.00	NA	NA
Light Brown	Exterior	Support Beam	Metal	>5.00	No	100 SF
Light Brown	Exterior	Wood Overhang	Wood	1.62	No	1,000 SF
Tan	Exterior	Window Frame	Wood	>5.00	No	12 SF
Building 4						
White	Conference Room	Wall	Drywall	0.00	NA	NA
Brown	Conference Room	Door Frame	Wood	0.00	NA	NA
Grey	Conference Room	Door Frame	Metal	0.00	NA	NA
Grey	Conference Room	Door	Metal	0.00	NA	NA
Off-White	Offices	Wall	Drywall	0.00	NA	NA
Varnish	Offices	Door	Wood	0.00	NA	NA
Varnish	Offices	Window Frame	Wood	0.00	NA	NA

TABLE 2 (Continued)

SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm ²)	Damaged*	Quantity**
Beige	Offices	Wall	Drywall	0.00	NA	NA
Brown	Offices	Wall	Drywall	0.00	NA	NA
Off-White	Offices	Interior Wall	Cinderblock	0.00	NA	NA
Yellow	Bathroom	Wall	Concrete	0.06	NA	NA
Green	Bathroom	Ceiling	Concrete	0.02	NA	NA
Brown	Bathroom	Door	Metal	0.04	NA	NA
Brown	Bathroom	Door Frame	Metal	0.00	NA	NA
Yellow	Exterior	Wall	Cinderblock	0.02	NA	NA
Yellow	Exterior	Wall	Metal	0.12	NA	NA
Brown	Exterior	Wall	Concrete	0.00	NA	NA
Building 5						
Tan	Interior	Wall	Cinderblock	0.00	NA	NA
Tan	Interior	Door	Metal	0.00	NA	NA
Tan	Interior	Door Frame	Metal	0.00	NA	NA
Grey	Interior	Door Frame	Metal	0.00	NA	NA
Grey	Interior	Door	Metal	0.00	NA	NA
Yellow	Interior	Wood	Cinderblock	0.12	NA	NA
Beige	Exterior	Wall	Cinderblock	0.00	NA	NA
Building 6						
Yellow	Exterior	Wall	Brick	0.00	NA	NA
Yellow	Exterior	Wall	Cinderblock	0.00	NA	NA
Silver	Exterior	Door Frame	Metal	0.00	NA	NA
Grey	Exterior (East Side)	Door	Metal	>5.00	No	20 SF
Grey	Exterior (East Side)	Door Frame	Metal	>5.00	No	5 SF
White	Interior	Wall	Brick	0.00	NA	NA
White	Interior	Door Frame	Metal	0.00	NA	NA
White	Interior	Door	Metal	0.00	NA	NA
Blue	Stock Room	Beam	Metal	0.00	NA	NA
Black	Stock Room	Door	Metal	0.00	NA	NA
Black	Stock Room	Door Frame	Metal	0.00	NA	NA
White	Stock Room	Door	Metal	0.00	NA	NA
White	Stock Room	Door Frame	Metal	0.00	NA	NA
White	Stock Room	Wall	Cinderblock	0.00	NA	NA

TABLE 2 (Continued)

**SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA**

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm²)	Damaged*	Quantity**
White	Stock Room	Ceiling Beams	Metal	0.00	NA	NA
Yellow	Storage Room	Stair Rail	Metal	4.70	No	30 SF
Brown/Red	Storage Room	Stair Rail	Metal	>5.00	No	10 SF
White	Storage Room	Ceiling	Concrete	>5.00	NA	1,200 SF
White	Storage Room	Pipe	Metal	0.00	No	NA
Red/Brown	2nd Floor Storage Room	Support Beam	Metal	>5.00	No	30 SF
White	Garage	Stairs	Metal	0.00	NA	NA
Yellow	Bathroom	Wall Tile	Ceramic	0.03	NA	NA
Grey	Bathroom	Door	Metal	0.00	NA	NA
White	Bathroom	Door Frame	Metal	0.00	NA	NA
Grey	Garage	Support Beam	Metal	0.02	NA	NA
White	Garage	Door	Metal	0.01	NA	NA
White	Garage	Wall	Metal	0.00	NA	NA
Brown	Hall to Office	Door Frame	Wood	0.00	NA	NA
White	Hall to Storage Room	Door	Metal	4.44	No	10 SF
White	Hall to Storage Room	Door Frame	Metal	0.11	NA	NA
Brown	Hall to Office	Window Frame	Wood	0.06	NA	NA
Brown	Hall to Office	Door	Wood	0.10	NA	NA
Orange	Office	Wall	Brick	0.08	NA	NA
Blue	Office	Door Frame	Wood	0.00	NA	NA
Blue	Office	Door	Wood	0.12	NA	NA
Blue	Office	Window	Wood	0.16	NA	NA
White	Hall to Office	Ceiling	Wood	0.06	NA	NA
Building 7						
Yellow	Building 7	Support Beam	Metal	2.17	Yes	20 SF
Silver	Building 7	Support Beam	Metal	0.00	NA	NA
Silver	Building 7	Siding	Metal	0.00	NA	NA
Building 8						
Yellow	Main Warehouse	Support Beam	Metal	1.47	Yes	12,000 SF
Yellow	Main Warehouse	Post	Concrete	0.45	NA	NA
Yellow	East/Center Stairwell	Support Beams and Railings	Metal	1.56	Yes	200 SF
Yellow	East Stairwell	Steps	Metal	0.00	NA	NA

TABLE 2 (Continued)

**SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA**

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm²)	Damaged*	Quantity**
White	Main Warehouse Upper Offices	Wall	Drywall	0.00	NA	NA
Grey	Main Warehouse Upper Offices	Window Frame	Wood	0.00	NA	NA
Grey	Main Warehouse Upper Offices	Door Frame	Wood	0.00	NA	NA
White	Main Warehouse Upper Offices	Ceiling	Drywall	0.00	NA	NA
Grey	Main Warehouse Lower Offices	Door	Metal	0.00	NA	NA
Yellow	Southeast	Door Frame	Metal	2.19	Yes	200 SF
White	Southeast	Door	Metal	0.87	NA	NA
Red	North Office Area	Door	Metal	1.13	No	500 SF
Red	North Office Area	Door Frame	Metal	1.30	No	200 SF
Tan	North Office Area	Wall	Cinderblock	0.00	NA	NA
White	North Office Area	Wall	Cinderblock	0.00	NA	NA
Teal	North Office Area	Wall	Cinderblock	0.00	NA	NA
Beige	North Bathroom	Wall Tile	Ceramic	0.00	NA	NA
White	North Bathroom	Ceiling	Drywall	0.00	NA	NA
White	Outer Area	Support Beam	Metal	2.11	No	3,000 SF
White	Exterior	Wall	Cinderblock	0.00	NA	NA
Off-White	Exterior	Wall	Metal	0.06	NA	NA
Tan	North Central 2 nd Floor Offices	Window Frame	Wood	0.00	NA	NA
Building 9						
Yellow	Main Plant (NE)	Post	Concrete	1.90	Yes	30 SF
Yellow	South Garage	Door	Metal	1.90	Yes	10 SF
Grey	South Side	Support Beam	Metal	0.00	NA	NA
Brown/Red	South Side	Support Beam	Metal	0.00	NA	NA
Yellow	Main Plant	Support Beam	Metal	0.00	NA	NA
Yellow	Main Plant	Support Column	Concrete	0.00	NA	NA
Yellow	Main Plant	Guard Rail	Metal	0.00	NA	NA
Grey	North Plant	Support Beam	Metal	0.24	NA	NA
Grey	North Plant	Door	Metal	0.00	NA	NA
Grey	North Plant	Door Frame	Metal	0.00	NA	NA
Yellow	North Plant	Stair Railing	Metal	1.91	No	10 SF
Grey	North Plant	Wall	Cinderblock	0.04	NA	NA
Yellow	North Plant	Guard Post	Concrete	3.58	Yes	10 SF
Blue	North Plant	Exterior Wall	Cinderblock	0.00	NA	NA

TABLE 2 (Continued)

**SUMMARY OF LBP SCREENING
ELKEM CARBIDE – KEOKUK, IOWA**

Paint Color	Location	Component	Substrate	XRF Reading (mg/cm²)	Damaged*	Quantity**
Blue	North Plant	Guard Post	Metal	3.73	Yes	10 SF
Yellow	North Garage	Door	Metal	1.42	No	10 SF
Blue	North Plant	Door Frame	Metal	0.00	NA	NA
Red	Exterior North	Support Beam	Metal	0.04	NA	NA
Blue	Northeast Side	Wall	Cinderblock	0.00	NA	NA
Blue	Northwest Side	Wall	Cinderblock	0.00	NA	NA
Black	Northwest Office	Door	Metal	0.00	NA	NA

Notes:

Bolded results indicate positive identification of LBP (>1 mg/cm²).

* This column identifies LBP surfaces that are damaged. If no damage is present prior to demolition activities, preliminary removal of chipping and peeling paint is not necessary.

** This is only an estimated quantity of this material and should not be used for bidding purposes. Tetra Tech recommends any contractor bidding on removal of this material visually verify the quantity.

- > Greater than
- mg/cm² Milligrams per square centimeter
- LBP Lead-based paint
- NA Not applicable
- SF Square feet
- XRF X-ray fluorescence

8.0 HAZARDOUS MATERIALS INVENTORY FINDINGS

The HHW and hazardous materials inventory is summarized in Tables 3A-3I below.

TABLE 3A

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 1
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	360
Compact Fluorescent (CFL)	
Neon	
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	12
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Other	1 Water Heater
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	180
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC) Refrigerants	
Air Conditioners	
Water Fountains	1
Fire Extinguishers	2
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	6
Other electronic recyclables	3 Printers
Oils, containers	
Paints	
Solvents	2 – latex
Hydraulic lifts	
Tanks (aboveground, underground)	

TABLE 3B

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 2
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	
Fire Extinguishers	2
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	21: 55-gallon drums
Paints	
Solvents	
Hydraulic lifts	
Tanks (aboveground, underground)	

TABLE 3C

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 3
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	60
Compact Fluorescent (CFL)	
Neon	
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	30
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	1
Water Fountains	1
Fire Extinguishers	1
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	1 ISCO sampler
Oils, containers	
Paints	3: 1-gallon cans
Solvents	1 gallon dimethylformamide
Hydraulic lifts	
Tanks (aboveground, underground)	
Other	2.5 liters ammonium hydroxide; x-ray equipment; lab equipment

TABLE 3D

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 4
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	120
Compact Fluorescent (CFL)	
Neon	
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	60
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	1
Fire Extinguishers	
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	
Paints	
Solvents	
Hydraulic lifts	
Tanks (aboveground, underground)	

TABLE 3E

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 5
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	
Fire Extinguishers	1
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	
Paints	
Solvents	
Hydraulic lifts	
Tanks (aboveground, underground)	

TABLE 3F

**SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 6
ELKEM CARBIDE – KEOKUK, IOWA**

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	64
Compact Fluorescent (CFL)	
Neon	
Other	10 halogen
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Other	10 halogen
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	1 tractor
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	32
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	
Fire Extinguishers	3
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	Four 1-gallon oil; one 2-gallon oil; three 55-gallon oil; two 5-gallon oil
Paints	Two 1-gallon primer
Solvents	55-gallon Aqua-Sol
Hydraulic lifts	2
Tanks (aboveground, underground)	3 propane tanks
Other	Three 1-gallon antifreeze; one 55-gallon antifreeze; one 5-gallon waterproofing sealer; harvesting lubricant; one 5-gallon transmission fluid

TABLE 3G

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 7
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	
Fire Extinguishers	
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	55-gallon oil; 2-gallon gasoline; motor with oil
Paints	
Solvents	
Hydraulic lifts	
Tanks (aboveground, underground)	
Other	6 unlabeled drums

TABLE 3H

SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 8
ELKEM CARBIDE – KEOKUK, IOWA

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	22
Compact Fluorescent (CFL)	
Neon	
Other	40 halogen
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Other	40 halogen
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	9
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	
Fire Extinguishers	
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	Two 5-gallon oil; one 55-gal oil
Paints	
Solvents	
Hydraulic lifts	
Tanks (aboveground, underground)	

TABLE 3I

**SUMMARY OF HAZARDOUS MATERIALS INVENTORY – BUILDING 9
ELKEM CARBIDE – KEOKUK, IOWA**

Type of Household Hazardous Waste	Assessed Quantity
Lamps	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Other	59 halogen
Non-PCB Ballasts	
Fluorescent	
Compact Fluorescent (CFL)	
Neon	
Other	59 halogen
Batteries	
Smoke Detectors	
Exit Signs	
Automobile	
Heating Ventilation and Air Conditioning	
Thermostats	
Boilers, Furnaces, Water Heaters, and Tanks	
Mercury flame sensor (adjacent to pilot lights)	
Control Switches	
Polychlorinated Biphenyls (PCB): transformers, light ballasts	
Transformers	
PCB Ballasts	
Non-PCB Ballasts	
Chlorofluorocarbons (CFC) and Hydrochlorofluorocarbons (HCFC)	
Air Conditioners	
Water Fountains	
Fire Extinguishers	1
Other: misc. hazardous wastes, household hazardous wastes, oils	
Computers	
Other electronic recyclables	
Oils, containers	
Paints	
Solvents	
Hydraulic lifts	
Tanks (aboveground, underground)	1 aboveground storage tank (AST), 3 air compressors; 1 South LeRoi compressor
Other	13 tires, 55-gallon drum (1/3 full) unlabeled

9.0 RECOMMENDATIONS

Based on survey observations and sample analytical results, Tetra Tech recommends the following actions before remodeling or demolition of the subject property buildings:

9.1 ACM

- Regulated ACM was identified within Building 1 on the subject property in approximately 110 ft² of 12" X 12" orange patterned floor tile in the kitchen. The floor tile was represented by sample 1-FT6-1. Laboratory results indicated that the floor tile contained 5-percent chrysotile asbestos. Because of asbestos in the floor tile, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified within Building 1 on the subject property in approximately 800 ft² of 9" X 9" brown floor tile in the south entrance and conference room. The floor tile was represented by samples 1-FT7-1, -2, and -3. Laboratory results indicated that the floor tile contained 6-percent chrysotile asbestos. Because of asbestos in the floor tile, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified on the exterior windows of Building 3 on the subject property in approximately 20 linear feet of window glaze. The window glaze was represented by samples 3-WG-1, -2, and -3. Laboratory results indicated that the window glaze contained 4-percent chrysotile asbestos. Because of asbestos in the window glaze, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified within Building 4 on the subject property in approximately 800 ft² of wall mastic behind paneling in the offices. The wall mastic was represented by samples 4-WM-1, -2, and -3. Laboratory results indicated that the wall mastic contained 12-percent chrysotile asbestos. Because of asbestos in the wall mastic, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.
- Regulated ACM was identified within Building 9 on the subject property in approximately 10,000 ft² of transite paneling. The transite paneling was represented by samples 9-TR-1, -2, and -3. Laboratory results indicated that the transite paneling contained 20-percent chrysotile asbestos. Because of asbestos in the transite paneling, it should be removed by a licensed asbestos abatement contractor before any renovation or demolition disturbs the material. The removed waste must be transported to a disposal site able to accept non-friable ACM. If the material is not to be disturbed, it may remain in place.

9.2 LBP

- The Department of Housing and Urban Development (HUD) considers LBP as paint with lead levels above 1.0 mg/cm². If the LBP surfaces are impacted during the renovations, or if the buildings are going to be demolished, Tetra Tech recommends the contractor conducting the renovation/demolition, comply with the Occupational Safety and Health Administration (OSHA) Lead in Construction Standard, Title 29 of Code of Federal Regulations (CFR), Part 1926.62. In addition, Tetra Tech recommends a sample be collected from the debris pile for a Toxicity Characteristic Leaching Procedure (TCLP) analysis (Title 40 CFR 261.24) prior to transport to the landfill. A representative sample should be collected and analyzed for all eight metals specified in 40 CFR Part 261.24 (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). This would allow determination of the proper method of disposal of the materials. Of the 224 XRF readings from painted surfaces, 43 lead concentrations exceeded 1.0 mg/cm². The following is a summary of those positive readings:
 - LBP was identified in Building 1 on white concrete walls in the northeast open area and south entry; off-white plaster ceiling, green wall concrete, and white wall concrete at the bottom of the stairs; red metal door in the kitchen; and tan support pole in the covered parking area totaling approximately 3,980 square feet (ft²).
 - LBP was identified in Building 2 on grey metal support beams; yellow concrete floor; and yellow metal door frame on the south garage door totaling approximately 3,060 ft².
 - LBP was identified in Building 3 on tan and white brick walls, tan and white concrete pillars, tan ceramic walls, and tan wood walls in the locker room; brown and beige ceramic wall tile, brown and white concrete pillars, blue concrete ceiling, and brown and tan brick walls in the entryway; brown wood exterior windows; blue brick walls on the west side; white brick walls and blue and white wood walls on the lab side; black wood door and brown wood screen door on the exterior west lab; light brown metal support beam, light brown wood overhand, and tan wood window frames on the exterior totaling approximately 9,794 square ft².
 - LBP was identified in Building 6 on grey metal doors and door frames on the exterior east side; yellow and brown/red metal stair railing and white concrete ceiling in the storage room; red/brown metal support beams in the 2nd floor storage room; and white metal door in the hall to the storage room totaling approximately 1,295 ft².
 - LBP was identified in Building 7 on yellow metal support beams totaling approximately 20 ft².
 - LBP was identified in Building 8 on yellow metal support beams in the main warehouse; yellow metal support beams and railings in the east/center stairwell; yellow metal door frame on the southeast side; red metal door and door frame in the north office area; and white metal support beams in the outer area totaling approximately 16,100 ft².
 - LBP was identified in Building 9 on yellow concrete post in the main plant, yellow metal door in the south garage, yellow metal stair railing and concrete guard post in the north plant, blue metal guard post in the north plant, and yellow metal door in the north garage totaling approximately 80 ft².

9.3 HHW

HHW and hazardous materials were inventoried during the survey. Tetra Tech recommends proper disposal of the materials based on their characteristics prior to demolition of the subject property buildings.

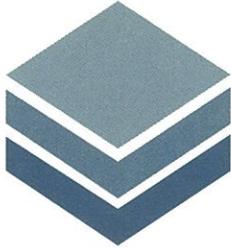
10.0 ASSUMPTIONS AND DEVIATIONS

All subject property buildings were visually surveyed for suspect ACM and LBP. Because of limitations on destructive sampling methods, additional suspect materials may be present but not detected in the walls, voids, or other concealed areas. An inventory of all HHW and other potentially hazardous materials was also performed. Standing water in the basements of Buildings 3 and 6 rendered the areas inaccessible. All other areas were accessible and inspected.

11.0 REFERENCES

- Agency for Toxic Substance and Disease Registry (ATSDR). 2008. Asbestos: Health Effects. Accessed February 10, 2014. http://www.atsdr.cdc.gov/asbestos/asbestos/health_effects/
- Terracon Consultants, Inc. (Terracon). 2009. Phase I Environmental Site Assessment. Former Elkem Carbide.
- Tetra Tech Inc. (Tetra Tech). 2016. *Quality Assurance Project Plan for Phase II Targeted Brownfields Assessment, Former Elkem Carbide*. March.
- U.S. Department of Housing and Urban Development (HUD). 1997. *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

APPENDIX A
INSPECTOR CERTIFICATIONS



M·E·T·A
 Mayhew Environmental Training Associates
 I N C O R P O R A T E D

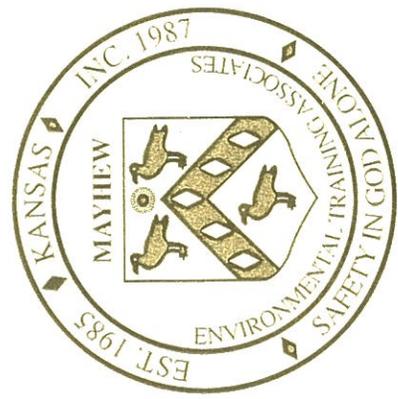
Certificate # MEEEDA6BDC5FDEDED467

Kaitlyn Bahr

has on 6/16/2016, in Lawrence, KS
 completed the requirements for asbestos accreditation under Section 206 of TSCA Title II, 15 USC 2646

4-hr. Asbestos Building Inspector Refresher

as approved by MO & the US EPA under 40 CFR 763 (AHERA) from 6/16/2016 to 6/16/2016
 and
 passed the associated exam on 6/16/2016 with a score of at least 70%



Dean C. Althage

Dean Althage
 Instructor

Thomas Mayhew

Thomas Mayhew
 President

SSN: XXX-XX-7582
 Expiration: 6/16/2017

P.O. Box 4693 - Lawrence, KS. 66047 - 800.444.6382

www.metaenvironmental.net



M·E·T·A
 Mayhew Environmental Training Associates
 I N C O R P O R A T E D

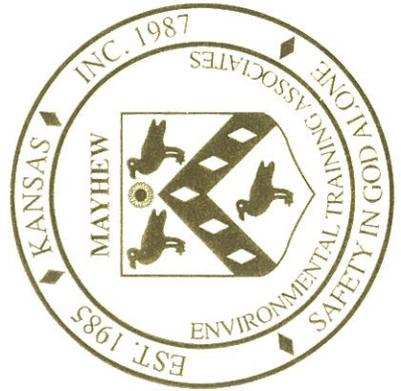
Certificate # MED5E1B3A730C34CD

Joann R. Jeplawy

*has on 1/6/2016, in Lawrence, KS
 completed the requirements for asbestos accreditation under Section 206 of TSCA Title II, 15 USC 2646*

3-day Asbestos Building Inspector Initial

*as approved by MO & the US EPA under 40 CFR 763 (AHERA) from 1/4/2016 to 1/6/2016
 and
 passed the associated exam on 1/6/2016 with a score of at least 70%*



Bob Baer

Bob Baer
 Instructor

Thomas Mayhew

Thomas Mayhew
 President

SSN: XXX-XX-2734
 Expiration: 1/6/2017

P.O. Box 4693 - Lawrence, KS. 66047 - 800.444.6382
www.metaenvironmental.net



M·E·T·A
 Mayhew Environmental Training Associates
 I N C O R P O R A T E D

Certificate # ME321F4A260641424

Jeffrey Mitchell

has on 1/27/2016, in Lawrence, KS
 completed the requirements for asbestos accreditation under Section 206 of TSCA Title II, 15 USC 2646

4-hr. Asbestos Building Inspector Refresher

as approved by MO & the US EPA under 40 CFR 763 (AHERA) from 1/27/2016 to 1/27/2016
 and
 passed the associated exam on 1/27/2016 with a score of at least 70%



SSN: XXX-XX-1403
 Expiration: 1/27/2017

P.O. Box 4693 - Lawrence, KS. 66047 - 800.444.6382
www.metaenvironmental.net

[Signature]

Thomas Mayhew
 Instructor

[Signature]

Thomas Mayhew
 President

JEFFREY MITCHELL

DOB: 04-05-1977

Issued: 02-01-2016



This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
INSPECTOR	16-5894	01-27-2017


Asbestos

Michael A. Mauro
Michael A. Mauro
Labor Commissioner



M·E·T·A
 Mayhew Environmental Training Associates
 I N C O R P O R A T E D

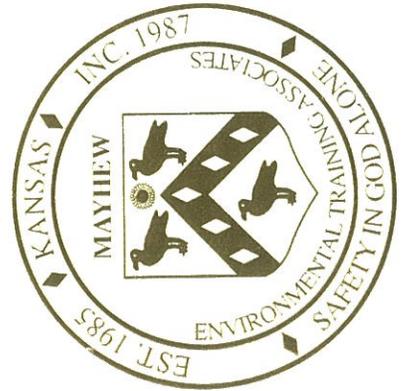
Certificate # MEB25263C06FCF4CA

Thomas Rebecchi

has on 8/12/2015, in Lawrence, KS
 completed the requirements for asbestos accreditation under Section 206 of TSCA Title II, 15 USC 2646

3-day Asbestos Building Inspector Initial

as approved by MO & the US EPA under 40 CFR 763 (AHERA) from 8/10/2015 to 8/12/2015
 and
 passed the associated exam on 8/12/2015 with a score of at least 70%



SSN: XXX-XX-4202
 Expiration: 8/12/2016

P.O. Box 4693 - Lawrence, KS. 66047 - 800.444.6382
www.metaenvironmental.net

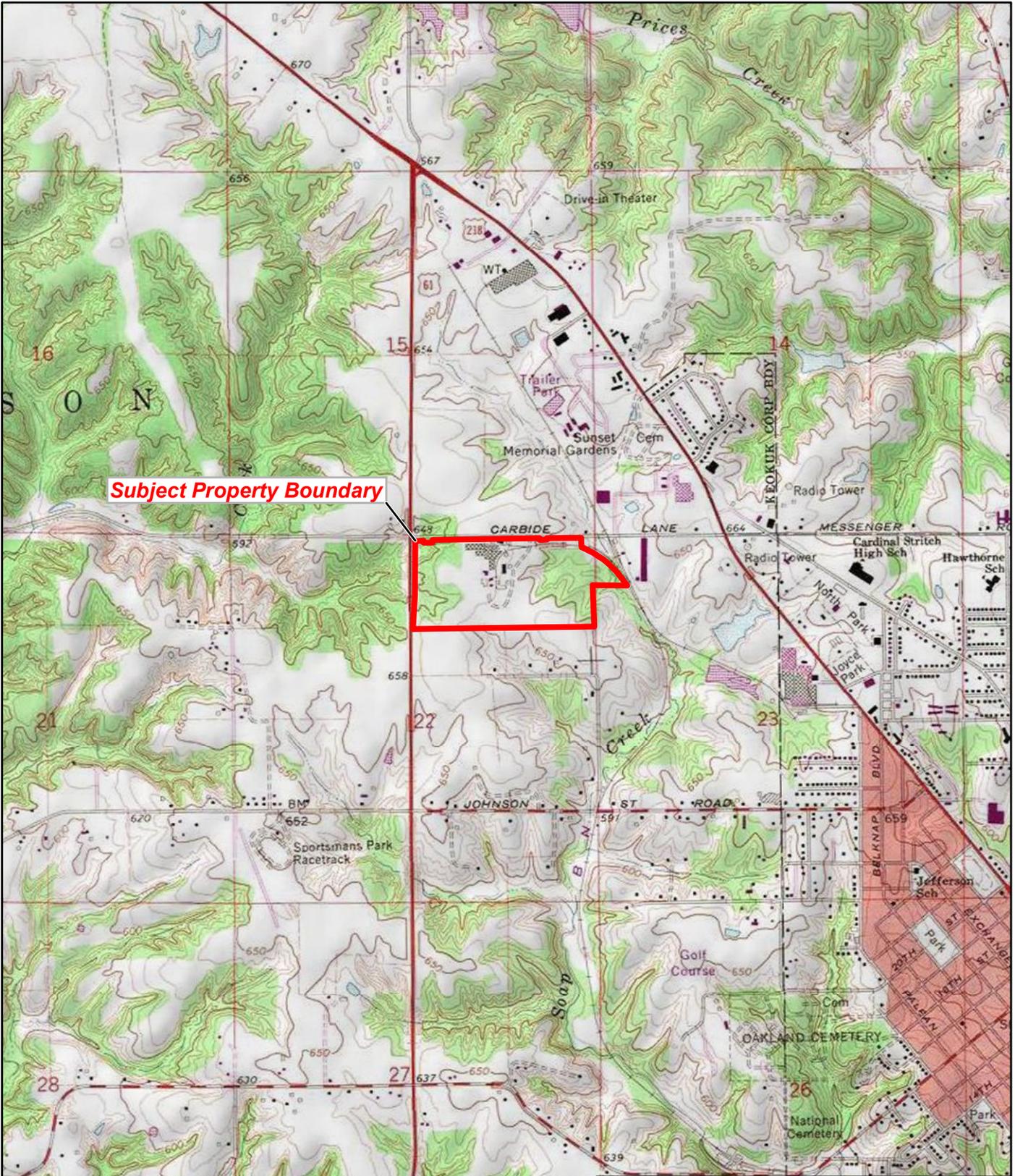
Dean C. Althage

Dean Althage
 Instructor

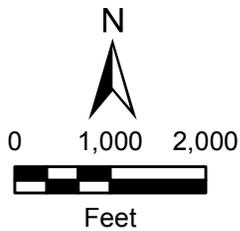
Thomas Mayhew
 Thomas Mayhew
 President

APPENDIX B

FIGURES



Subject Property Boundary



Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

Figure 1
Site Location Map

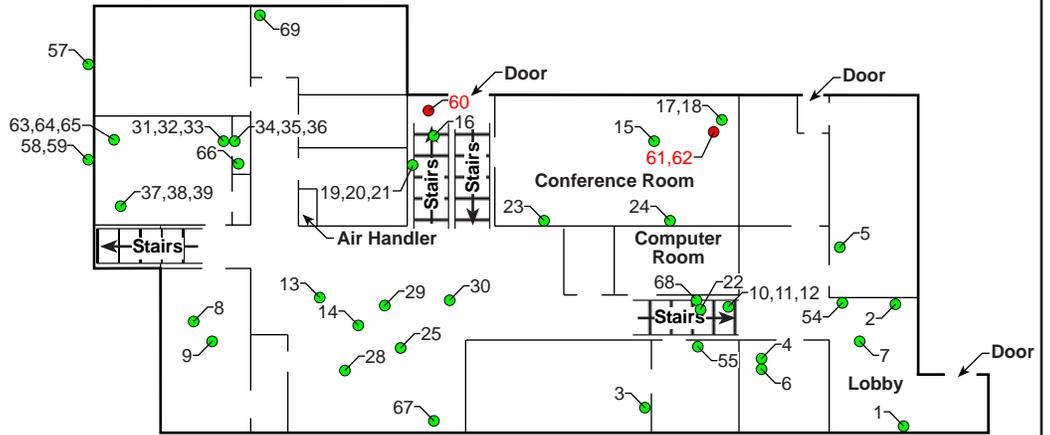


Sample Key Table

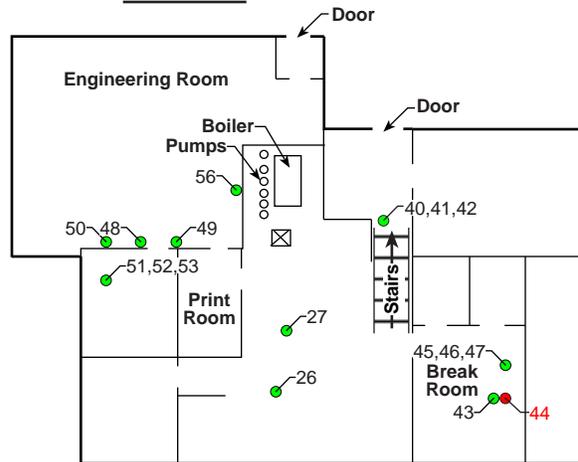
Key	Sample No.
Asbestos	
1	1-CBM-1
2	1-CBM-2
3	1-CBM-3
4	1-FT-1
5	1-FT-2
6	1-FT-3
7	1-CT-1
8	1-CT-2
9	1-CT-3
10	1-ST-1
11	1-ST-2
12	1-ST-3
13	1-CT2-1
14	1-CT2-2
15	1-CT2-3
16	1-FT2-1
17	1-FT2-2
18	1-FT2-3
19	1-CBM2-1
20	1-CBM2-2
21	1-CBM2-3
22	1-DWJC-1
23	1-DWJC-2
24	1-DWJC-3
25	1-PLSC-1
26	1-PLSC-2
27	1-PLSC-3
28	1-GP-1
29	1-GP-2
30	1-GP-3
31	1-FT3-1
32	1-FT3-2
33	1-FT3-3
34	1-FT4-1
35	1-FT4-2
36	1-FT4-3
37	1-CA-1
38	1-CA-2
39	1-CA-3
40	1-ST2-1

41	1-ST2-2
42	1-ST2-3
43	1-FT5-1
44	1-FT6-1
45	1-CT3-1
46	1-CT3-2
47	1-CT3-3
48	1-CBM3-1
49	1-CBM3-2
50	1-CBM3-3
51	1-CT4-1
52	1-CT4-2
53	1-CT4-3
54	1-PW-1
55	1-PW-2
56	1-PW-3
57	1-WC-1
58	1-WC-2
59	1-WC-3
60	1-FT7-1
61	1-FT7-2
62	1-FT7-3
63	1-FP-1
64	1-FP-2
65	1-FP-3
66	1-CBM4-1
67	1-FT8-1
68	1-FT8-2
69	1-FT8-3

Main Floor



Basement



Legend

- Asbestos Containing Material Sample Location
- Non-asbestos Containing Material Sample Location



NOT TO SCALE

Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

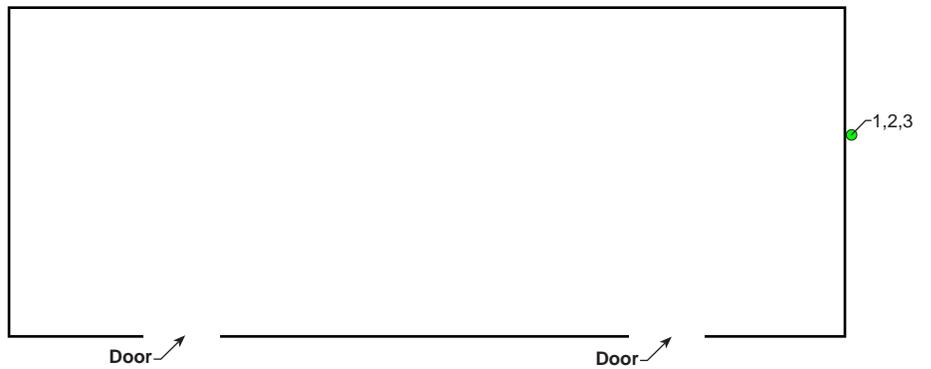
Figure 2a
Asbestos Sample Location Map - Building 1



Note: Refer to Sample Key Table for corresponding sample numbers.

Sample Key Table

Key	Sample No.
Asbestos	
1	2-WG-1
2	2-WG-2
3	2-WG-3



Legend

- Non-asbestos Containing Material Sample Location



NOT TO SCALE

Note: Refer to Sample Key Table for corresponding sample numbers.

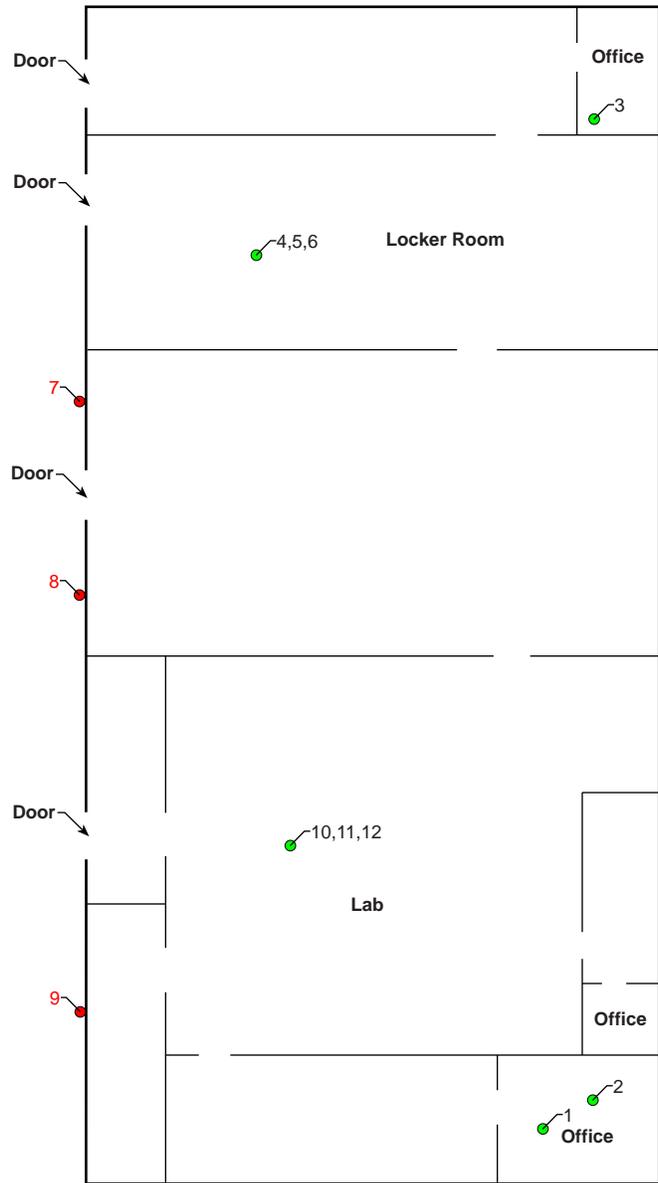
Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

Figure 2b
Asbestos Sample Location Map - Building 2



Sample Key Table

Key	Sample No.
Asbestos	
1	3-CT-1
2	3-CT-2
3	3-CT-3
4	3-TSI-1
5	3-TSI-2
6	3-TSI-3
7	3-WG-1
8	3-WG-2
9	3-WG-3
10	3-TSI2-1
11	3-TSI2-2
12	3-TSI2-3



Legend

- Asbestos Containing Material Sample Location
- Non-asbestos Containing Material Sample Location

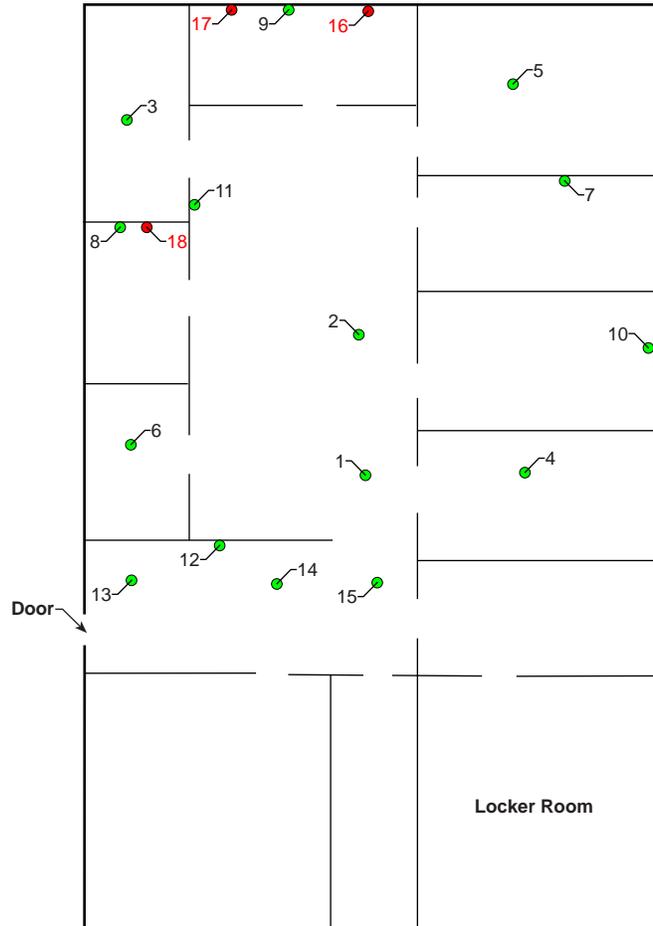


Note: Refer to Sample Key Table for corresponding sample numbers.

Elkem Carbide 365 Carbide Lane Keokuk, Iowa
Figure 2c Asbestos Sample Location Map - Building 3
Date: 8/8/16 Drawn By: Nick Wiederholt Project No: X9025.14.0002.019.017

Sample Key Table

Key	Sample No.
Asbestos	
1	4-FT-1
2	4-FT-2
3	4-FT-3
4	4-CT-1
5	4-CT-2
6	4-CT-3
7	4-DWJC-1
8	4-DWJC-2
9	4-DWJC-3
10	4-CBM-1
11	4-CBM-2
12	4-CBM-3
13	4-FT2-1
14	4-FT2-2
15	4-FT2-3
16	4-WM-1
17	4-WM-2
18	4-WM-3



Legend

- Asbestos Containing Material Sample Location
- Non-asbestos Containing Material Sample Location



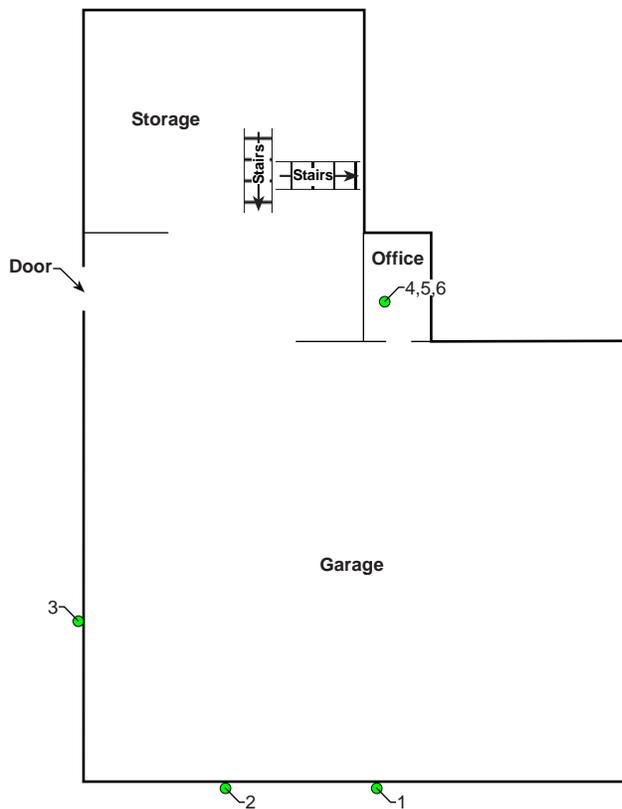
Note: Refer to Sample Key Table for corresponding sample numbers.

Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

Figure 2d
Asbestos Sample Location Map - Building 4



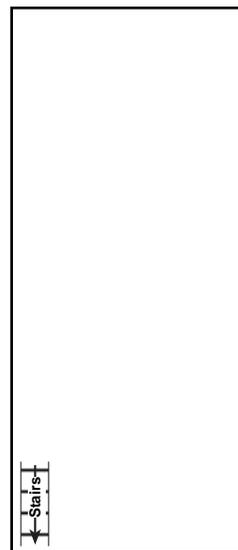
First Floor



Sample Key Table

Key	Sample No.
Asbestos	
1	6-WG-1
2	6-WG-2
3	6-WG-3
4	6-CT-1
5	6-CT-2
6	6-CT-3

Second Floor



Legend

- Non-asbestos Containing Material Sample Location



NOT TO SCALE

Note: Refer to Sample Key Table for corresponding sample numbers.

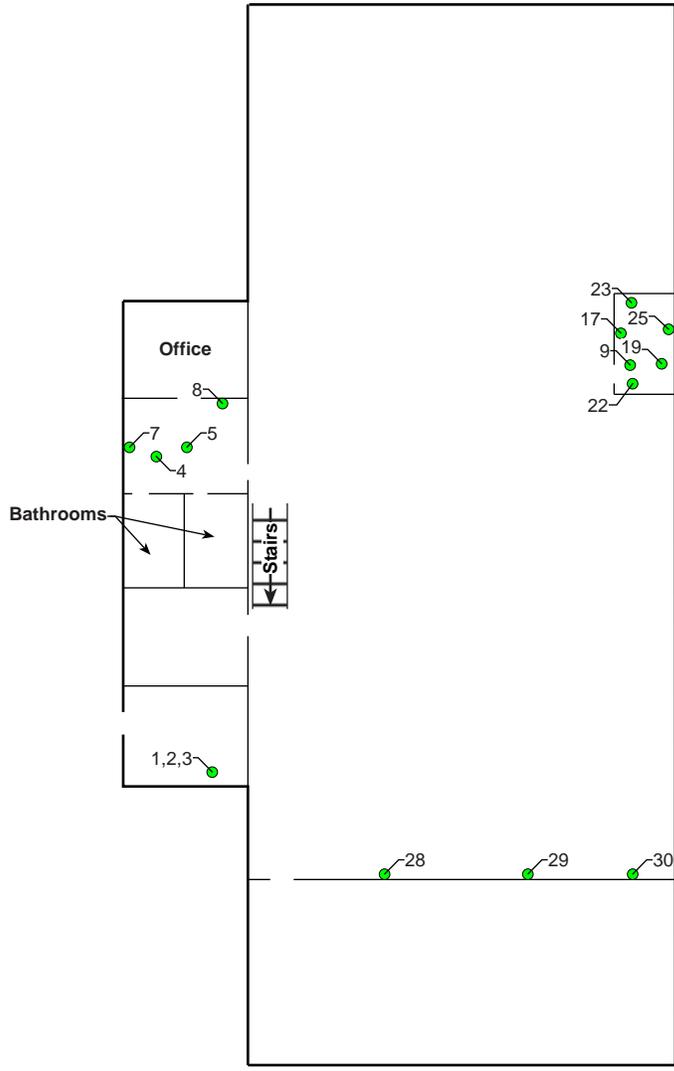
Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

Figure 2e
Asbestos Sample Location Map - Building 6

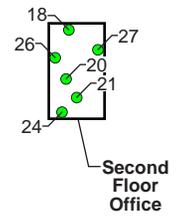
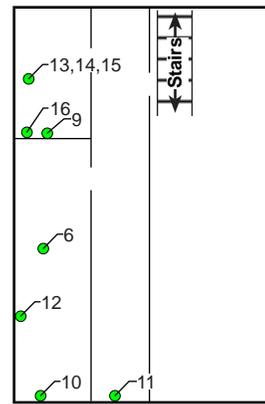


First Floor

Sample Key Table	
Key	Sample No.
Asbestos	
1	8-TSI-1
2	8-TSI-2
3	8-TSI-3
4	8-CT-1
5	8-CT-2
6	8-CT-3
7	8-CBM-1
8	8-CBM-2
9	8-CBM-3
10	8-WG-1
11	8-WG-2
12	8-WG-3
13	8-CT2-1
14	8-CT2-2
15	8-CT2-3
16	8-DWJC-1
17	8-DWJC-2
18	8-DWJC-3
19	8-FT-1
20	8-FT-2
21	8-FT-3
22	8-CTX-1
23	8-CTX-2
24	8-CTX-3
25	8-CBM2-1
26	8-CBM2-2
27	8-CBM2-3
28	8-VER-1
29	8-VER-2
30	8-VER-3



Second Floor - Office Area



- Legend**
- Non-asbestos Containing Material Sample Location



Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

Figure 2f
Asbestos Sample Location Map - Building 8

TETRA TECH

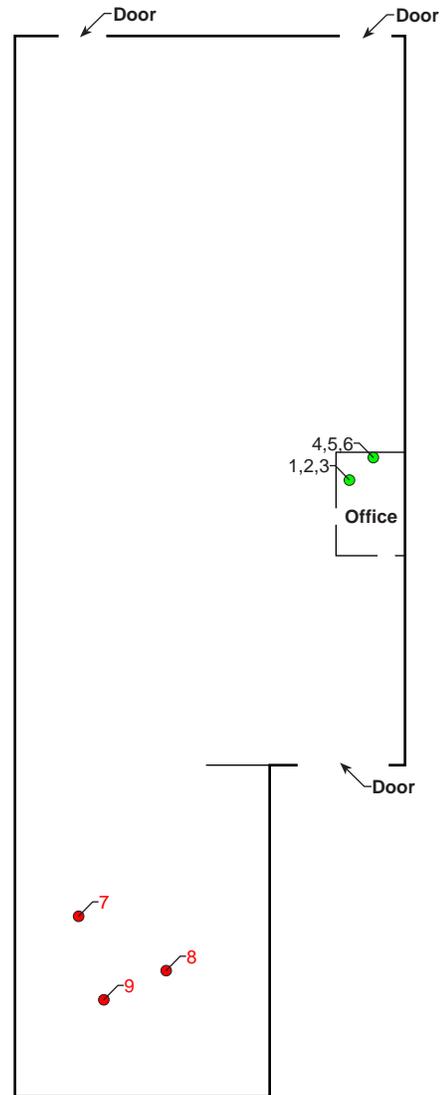
Date: 8/8/16 Drawn By: Nick Wiederholt Project No: X9025.14.0002.019.017

X:\GIS\2502019\017\FH10\Figure2f\FH10

Note: Refer to Sample Key Table for corresponding sample numbers.

Sample Key Table

Key	Sample No.
Asbestos	
1	9-CT-1
2	9-CT-2
3	9-CT-3
4	9-DW-1
5	9-DW-2
6	9-DW-3
7	9-TR-1
8	9-TR-2
9	9-TR-3



Legend

- Asbestos Containing Material Sample Location
- Non-asbestos Containing Material Sample Location



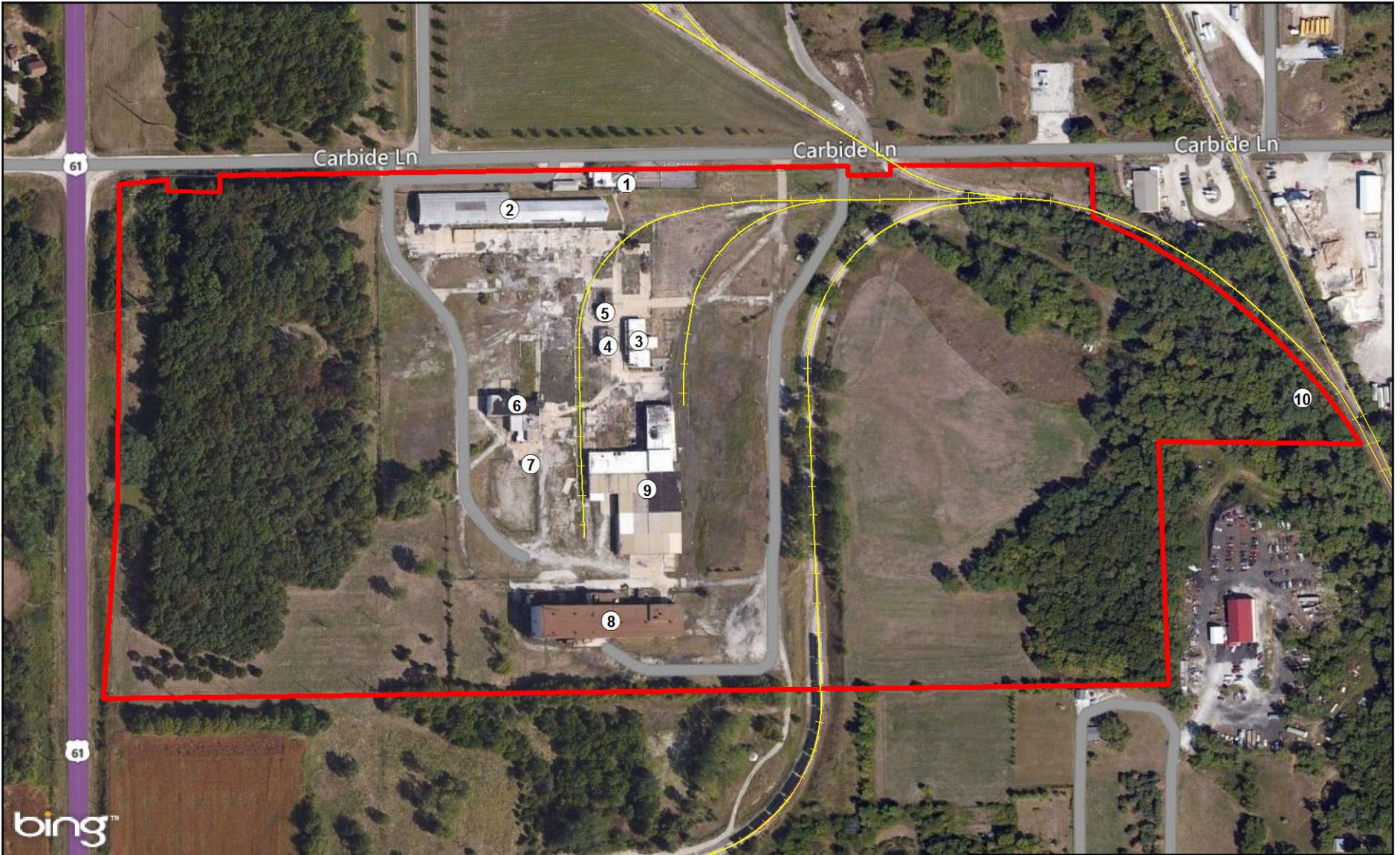
NOT TO SCALE

Note: Refer to Sample Key Table for corresponding sample numbers.

Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

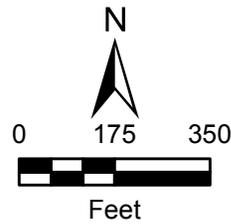
Figure 2g
Asbestos Sample Location Map - Building 9





Legend

- 2 Building ID
- +— Railroad
- Subject property boundary



Elkem Carbide
365 Carbide Lane
Keokuk, Iowa

Figure 3
Building Location Map



X:\G\9025\0002\0190\TP\Projects\mxd\Figure3.mxd

APPENDIX C

ACM ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS



2033 HERITAGE PARK DR, OKLAHOMA CITY, OK 73120 | 1.800.822.1650

Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265857	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	1-CBM-1	Layered	Brown Cove Base	Asbestos Not Present	NA	CaCO3 Vinyl
001a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
002	1-CBM-2	Layered	Brown Cove Base	Asbestos Not Present	NA	CaCO3 Vinyl
002a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
003	1-CBM-3	Layered	Brown Cove Base	Asbestos Not Present	NA	CaCO3 Vinyl
003a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
004	1-FT-1	Layered	Red Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl

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Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
004a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
005	1-FT-2	Layered	Red Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
005a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
006	1-FT-3	Layered	Red Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
006a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
007	1-CT-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 40 Glass Fiber 40	Paint

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Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
008	1-CT-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 40 Glass Fiber 40	Paint
009	1-CT-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 40 Glass Fiber 40	Paint
010	1-ST-1	Layered	Pink Stair Tread	Asbestos Not Present	NA	Vinyl CaCO3
010a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
011	1-ST-2	Layered	Pink Stair Tread	Asbestos Not Present	NA	Vinyl CaCO3
011a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
012	1-ST-3	Layered	Pink Stair Tread	Asbestos Not Present	NA	Vinyl CaCO3

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
012a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
013	1-CT2-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 50 Glass Fiber 30	Perlite Paint
014	1-CT2-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 50 Glass Fiber 30	Perlite Paint
015	1-CT2-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 50 Glass Fiber 30	Perlite Paint
016	1-FT2-1	Layered	Gray Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
016a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
017	1-FT2-2	Layered	Gray Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
017a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
018	1-FT2-3	Layered	Gray Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
018a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
019	1-CBM2-1	Layered	Gray Cove Base	Asbestos Not Present	NA	CaCO3 Vinyl
019a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
020	1-CBM2-2	Layered	Gray Cove Base	Asbestos Not Present	NA	CaCO3 Vinyl

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
020a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
021	1-CBM2-3	Layered	Gray Cove Base	Asbestos Not Present	NA	CaCO3 Vinyl
021a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
022	1-DWJC-1	Layered	White Joint Compound	Asbestos Not Present	NA	CaCO3
022a		Layered	White Sheetrock	Asbestos Not Present	Cellulose 15	Gypsum
023	1-DWJC-2	Layered	White Joint Compound	Asbestos Not Present	NA	CaCO3

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Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
023a		Layered	White Sheetrock	Asbestos Not Present	Cellulose 15	Gypsum
024	1-DWJC-3	Layered	White Joint Compound	Asbestos Not Present	NA	CaCO3
024a		Layered	White Sheetrock	Asbestos Not Present	Cellulose 15	Gypsum
025	1-PLSC-1	Layered	Tan Skim Coat	Asbestos Not Present	NA	CaCO3 Sand
025a		Layered	Gray Plaster	Asbestos Not Present	Hair 2	CaCO3 Sand
026	1-PLSC-2	Layered	Tan Skim Coat	Asbestos Not Present	NA	CaCO3 Sand
026a		Layered	Gray Plaster	Asbestos Not Present	Hair 2	CaCO3 Sand

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
027	1-PLSC-3	Layered	Tan Skim Coat	Asbestos Not Present	NA	CaCO3 Sand
027a		Layered	Gray Plaster	Asbestos Not Present	Hair	2 CaCO3 Sand
028	1-GP-1	Homogeneous	Brown Mastic	Asbestos Not Present	NA	Glue
029	1-GP-2	Homogeneous	Brown Mastic	Asbestos Not Present	NA	Glue
030	1-GP-3	Homogeneous	Brown Mastic	Asbestos Not Present	NA	Glue
031	1-FT3-1	Layered	Brown Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3

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Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
031a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue
031b		Layered	Black Paper	Asbestos Not Present	Cellulose 90	Tar
032	1-FT3-2	Layered	Brown Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
032a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue
032b		Layered	Black Paper	Asbestos Not Present	Cellulose 90	Tar
033	1-FT3-3	Layered	Brown Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
033a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue

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Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
033b		Layered	Black Paper	Asbestos Not Present	Cellulose 90	Tar
034	1-FT4-1	Layered	Gray Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
034a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue
035	1-FT4-2	Layered	Gray Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
035a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue
036	1-FT4-3	Layered	Gray Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
036a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue
037	1-CA-1	Homogeneous	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
038	1-CA-2	Homogeneous	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
039	1-CA-3	Homogeneous	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
040	1-ST2-1	Layered	Gray Stair Tread	Asbestos Not Present	NA	Vinyl CaCO3
040a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue CaCO3
041	1-ST2-2	Layered	Gray Stair Tread	Asbestos Not Present	NA	Vinyl CaCO3

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
041a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue CaCO3
042	1-ST2-3	Layered	Gray Stair Tread	Asbestos Not Present	NA	Vinyl CaCO3
042a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue CaCO3
043	1-FT5-1	Layered	Orange Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
043a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
044	1-FT6-1	Layered	Brown Floor Tile	Asbestos Present Chrysotile 5	NA	CaCO3 Vinyl

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Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
044a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue CaCO3
045	1-CT3-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 50 Glass Fiber 30	Perlite Paint
046	1-CT3-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 50 Glass Fiber 30	Perlite Paint
047	1-CT3-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 50 Glass Fiber 30	Perlite Paint
048	1-CBM3-1	Layered	White Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
048a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue CaCO3
049	1-CBM3-2	Layered	White Cove Base	Asbestos Not Present	NA	Vinyl CaCO3

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

Quantem is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.



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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265857	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
049a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue CaCO3
050	1-CBM3-3	Layered	White Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
050a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue CaCO3
051	1-CT4-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 90	Paint
052	1-CT4-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 90	Paint
053	1-CT4-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 90	Paint

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265857	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
054	1-PW-1	Homogeneous	White Wallboard	Asbestos Not Present	Cellulose 70	CaCO3
055	1-PW-2	Homogeneous	White Wallboard	Asbestos Not Present	Cellulose 70	Binder
056	1-PW-3	Homogeneous	White Wallboard	Asbestos Not Present	Cellulose 70	Binder
057	1-WC-1	Homogeneous	White Caulk	Asbestos Not Present	NA	CaCO3 Binder
058	1-WC-2	Homogeneous	White Caulk	Asbestos Not Present	NA	CaCO3 Binder
059	1-WC-3	Homogeneous	White Caulk	Asbestos Not Present	NA	CaCO3 Binder
060	1-FT7-1	Layered	Brown Floor Tile	Asbestos Present Chrysotile 6	NA	CaCO3 Vinyl

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265857	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
060a		Layered	Black Mastic	Asbestos Present Chrysotile 2	NA	Tar
061	1-FT7-2	Layered	Brown Floor Tile	Asbestos Present Chrysotile 6	NA	CaCO3 Vinyl
061a		Layered	Black Mastic	Asbestos Present Chrysotile 2	NA	Tar
062	1-FT7-3	Layered	Brown Floor Tile	Asbestos Present Chrysotile 6	NA	CaCO3 Vinyl
062a		Layered	Black Mastic	Asbestos Present Chrysotile 2	NA	Tar
063	1-FP-1	Homogeneous	Black Paper	Asbestos Not Present	Cellulose 70	Tar

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265857	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
064	1-FP-2	Layered	Black Paper	Asbestos Not Present	Cellulose 70	Tar
064a		Layered	Tan Mastic	Asbestos Not Present	NA	Glue
065	1-FP-3	Layered	Black Paper	Asbestos Not Present	Cellulose 70	Tar
065a		Layered	Tan Mastic	Asbestos Not Present	NA	Glue
066	1-CB34-1	Layered	Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
066a		Layered	Brown Mastic	Asbestos Not Present	NA	Glue
067	1-FT8-1	Layered	Brown Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265857	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
067a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
068	1-FT8-2	Layered	Brown Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
068a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
069	1-FT8-3	Layered	Brown Floor Tile	Asbestos Not Present	NA	CaCO3 Vinyl
069a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue

Dee Ammerman

Dee Ammerman, Analyst

7/8/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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 (800) 822-1650 • (405) 755-7272 • Fax: (405) 755-2058

LEGAL DOCUMENT - PLEASE PRINT LEGIBLY

Contact Information Company: Tetra Tech Contact: Jeff Mitchell Account #: _____ Phone: (816) 412-1773 Cell Phone: _____ E-mail: jeffrey.mitchell@tetratech.com Date: 6/28/16		Project Information Project Name: Elkem Carbide Bldg 1 Project Location: Keokuk, IA Project ID: _____ PO. Number: X9025.14.0002.019.017	
SAMPLED BY: Name: Jeff Mitchell		Report Results (<input checked="" type="checkbox"/> one box) <input checked="" type="checkbox"/> Quantem Website <input checked="" type="checkbox"/> Email jeffrey.mitchell@tetratech.com <input type="checkbox"/> Other _____	

RELINQUISHED BY	VIA	RECEIVED BY	DATE & TIME
		<i>[Signature]</i>	7/11/16 10:00

REQUESTED SERVICES (Please the Appropriate Boxes)

	PLM		PLM		TEM		TEM		TURNAROUND TIME					
	<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/> Vermiculite Attic Insulation (EPA 600/R-04/004)	<input type="checkbox"/> 400 Point Count	<input type="checkbox"/> Other	<input type="checkbox"/> Air-AHERA	<input type="checkbox"/> Air-NIOSH 7402	<input type="checkbox"/> Air-ISO 10312	<input type="checkbox"/> Drinking Water-EPA 100.2	<input type="checkbox"/> Waste Water-EPA 600/4-83-043	<input type="checkbox"/> Rush	<input type="checkbox"/> Same Day	<input type="checkbox"/> 24-Hour	<input type="checkbox"/> 3-Day	<input checked="" type="checkbox"/> 5-Day *
<input type="checkbox"/> Gravimetric Preparation	PCM													
<input type="checkbox"/> Particle ID	NIOSH 7400													

No.	Sample ID (10 Characters Max)	To Be Analyzed <input checked="" type="checkbox"/>	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	1-CBM-1	<input checked="" type="checkbox"/>		COVE BASE MASTIC		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		FLOOR TILE		
4	1-FT-1	<input type="checkbox"/>		↓		
5	↓ -2	<input type="checkbox"/>		↓		
6	↓ -3	<input type="checkbox"/>		↓		
7	1-CT-1	<input type="checkbox"/>		WALLING TILE		
8	↓ -2	<input type="checkbox"/>		↓		
9	↓ -3	<input type="checkbox"/>		↓		
10	1-ST-1	<input checked="" type="checkbox"/>		STAIR TREAD		

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& per J. Mitchell 7/11/16



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For Lab Use Only
 Lab No. 205807
 Accept Reject

Project Information				Project Location:	Comments / Notes
Company:	Tetra Tech	Project Name:	Elkem Carbide	Volume / Area (as applicable)	
No.	Sample ID (10 Characters Max)	To Be Analyzed	Description	Volume / Area (as applicable)	Comments / Notes
11	1-ST-2	<input checked="" type="checkbox"/>	stair tread		
12	↓ -3	<input type="checkbox"/>	↓		
13	1-CT2-1	<input type="checkbox"/>	ceiling tile		
14	↓ -2	<input type="checkbox"/>	↓		
15	↓ -3	<input type="checkbox"/>			
16	1-FT2-1	<input type="checkbox"/>	floor tile		
17	↓ -2	<input type="checkbox"/>	↓		
18	↓ -3	<input type="checkbox"/>			
19	1-CBM2-1	<input type="checkbox"/>	cove base mastic		
20	↓ -2	<input type="checkbox"/>	↓		
21	↓ -3	<input type="checkbox"/>			
22	1-DWJC-1	<input type="checkbox"/>	drywall joint compound		
23	↓ -2	<input type="checkbox"/>	↓		
24	↓ -3	<input type="checkbox"/>			
25	1-PLSC-1	<input type="checkbox"/>	plaster skim coat		
26	↓ -2	<input type="checkbox"/>	↓		
27	↓ -3	<input type="checkbox"/>			
28	1-GP-1	<input type="checkbox"/>	glue puck		
29	↓ -2	<input type="checkbox"/>	↓		
30	↓ -3	<input checked="" type="checkbox"/>			



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For Lab Use Only
Lab No. <u>20887</u>
<input checked="" type="radio"/> Accept <input type="radio"/> Reject

Project Information		Project Name:	Project Location:	Comments / Notes		
Company: Tetra Tech		Elkem Carbide	Wovuk, RA			
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
31	1-FT3-1	<input checked="" type="checkbox"/>		floor tile		
32	↓ -2	<input type="checkbox"/>				
33	↓ -3	<input type="checkbox"/>				
34	1-FT4-1	<input type="checkbox"/>				
35	↓ -2	<input type="checkbox"/>				
36	↓ -3	<input type="checkbox"/>				
37	1-CA-1	<input type="checkbox"/>		carpet adhesive		
38	↓ -2	<input type="checkbox"/>				
39	↓ -3	<input type="checkbox"/>				
40	1-ST2-1	<input type="checkbox"/>		stair tread		
41	↓ -2	<input type="checkbox"/>				
42	↓ -3	<input type="checkbox"/>				
43	1-FT5-1	<input type="checkbox"/>		floor tile		
44	1-FT6-1	<input type="checkbox"/>		ceiling tile		
45	1-CT3-1	<input type="checkbox"/>				
46	↓ -2	<input type="checkbox"/>				
47	↓ -3	<input type="checkbox"/>				
48	1-CBM3-1	<input type="checkbox"/>		core base mastic		
49	↓ -2	<input type="checkbox"/>				
50	↓ -3	<input checked="" type="checkbox"/>				



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For Lab Use Only

Lab No. 21058057

Accept Reject

Project Information		Project Name:	Description	Volume / Area (as applicable)	Comments / Notes
Company: Tetra Tech		Gilman Carbone			Keduk, BA
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color		
51	1-CT4-1	<input checked="" type="checkbox"/>			ceiling tile
52	↓ -2	<input type="checkbox"/>			↓
53	↓ -3	<input type="checkbox"/>			
54	1-PW-1	<input type="checkbox"/>			wall panel
55	↓ -2	<input type="checkbox"/>			↓
56	↓ -3	<input type="checkbox"/>			
57	1-WE-1	<input type="checkbox"/>			caulke
58	↓ -2	<input type="checkbox"/>			↓
59	↓ -3	<input type="checkbox"/>			
60	1-FT7-1	<input type="checkbox"/>			floor tile
61	↓ -2	<input type="checkbox"/>			↓
62	↓ -3	<input type="checkbox"/>			
63	1-FP-1	<input type="checkbox"/>			floor paper
64	↓ -2	<input type="checkbox"/>			↓
65	↓ -3	<input type="checkbox"/>			
66	1-CBM4-1	<input type="checkbox"/>			cove base mastic
67	1-FT8-1	<input type="checkbox"/>			floor tile
68	↓ -2	<input type="checkbox"/>			↓
69	↓ -3	<input checked="" type="checkbox"/>			
70		<input type="checkbox"/>			



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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265852	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/11/2016	Project: Elkem Carbide Bldg 2
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	2-WG-1	Homogeneous	Pink Window Glazing	Asbestos Not Present	NA	CaCO3 Binder
002	2-WG-2	Homogeneous	Pink Window Glazing	Asbestos Not Present	NA	CaCO3 Binder
003	2-WG-3	Homogeneous	Pink Window Glazing	Asbestos Not Present	NA	CaCO3 Binder

Dee Ammerman

Dee Ammerman, Analyst

7/11/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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LEGAL DOCUMENT - PLEASE PRINT LEGIBLY

Contact Information Company: Tetra Tech Contact: Jeff Mitchell Account #: _____ Phone: (816) 412-1773 Cell Phone: _____ E-mail: jeffrey.mitchell@letratech.com Date: 6/27/16		Project Information Project Name: Elkem Carbide Bldg 2 Project Location: Keokuk, IA Project ID: _____ PO. Number: X9025.14.0002.019.017	
SAMPLED BY: Name: Kaitlyn Bahr		Report Results (☑ one box) <input checked="" type="checkbox"/> Quantem Website <input checked="" type="checkbox"/> Email jeffrey.mitchell@letratech.com <input type="checkbox"/> Other _____	

RELINQUISHED BY	VIA	RECEIVED BY	DATE & TIME
		<i>[Signature]</i>	7/11/16 10:00

REQUESTED SERVICES (Please ☑ the Appropriate Boxes)

PLM	PLM	TEM	TEM	TURNAROUND TIME
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/> Vermiculite Attic Insulation (EPA 600/R-04/004)	<input type="checkbox"/> Air-AHERA	<input type="checkbox"/> Bulk-Presence / Absence EPA600/R-93/116	<input type="checkbox"/> Rush
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/> Other	<input type="checkbox"/> Air-NIOSH 7402	<input type="checkbox"/> Bulk-Quantitative [weight%]- Chatfield	<input type="checkbox"/> Same Day
<input type="checkbox"/> 1000 Point Count	<input type="checkbox"/> PCM	<input type="checkbox"/> Air-ISO 10312	<input type="checkbox"/> Dust-Presence / Absence	<input type="checkbox"/> 24 - Hour
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/> NIOSH 7400	<input type="checkbox"/> Drinking Water- EPA 100.2	<input type="checkbox"/> Dust-Quantitative [fibers/sq.cm]- ASTM D5755	<input type="checkbox"/> 3 - Day
<input type="checkbox"/> Particle ID		<input type="checkbox"/> Waste Water- EPA 600/4-83-043	<input type="checkbox"/> Other	<input checked="" type="checkbox"/> 5 - Day

No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	2-WG-1	<input checked="" type="checkbox"/>		Window glaze		
2	↓ -2	<input type="checkbox"/>				
3	↓ -3	<input checked="" type="checkbox"/>				
4		<input type="checkbox"/>				
5		<input type="checkbox"/>				
6		<input type="checkbox"/>				
7		<input type="checkbox"/>				
8		<input type="checkbox"/>				
9		<input type="checkbox"/>				
10		<input type="checkbox"/>				

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Per J. Mitchell 7/11/16



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Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 265853	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/11/2016	Project: Elkem Carbide Bldg 3
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	3-CT-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
002	3-CT-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
003	3-CT-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
004	3-TSI-1	Layered	White Wrap	Asbestos Not Present	Cellulose 20 Glass Fiber 30	CaCO3 Binder Foil
004a		Layered	Pink Insulation	Asbestos Not Present	Glass Fiber 100	
005	3-TSI-2	Layered	White Wrap	Asbestos Not Present	Cellulose 20 Glass Fiber 30	CaCO3 Binder Foil
005a		Layered	Pink Insulation	Asbestos Not Present	Glass Fiber 100	

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265853	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/11/2016	Project: Elkem Carbide Bldg 3
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
006	3-TSI-3	Layered	White Wrap	Asbestos Not Present	Cellulose 20 Glass Fiber 30	CaCO3 Binder Foil
006a		Layered	Pink Insulation	Asbestos Not Present	Glass Fiber 100	
007	3-WG-1	Layered	Black Caulk	Asbestos Not Present	NA	CaCO3 Binder
007a		Layered	Gray Window Glazing	Asbestos Present Chrysotile 4	NA	CaCO3
008	3-WG-2	Homogeneous	Gray Window Glazing	Asbestos Present Chrysotile 4	NA	CaCO3
009	3-WG-3	Layered	Black Caulk	Asbestos Not Present	NA	CaCO3 Binder

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265853	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/11/2016	Project: Elkem Carbide Bldg 3
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
009a		Layered	Gray Window Glazing	Asbestos Present Chrysotile 4	NA	CaCO3
010	3-TSI2-1	Layered	White Coating	Asbestos Not Present	Cellulose	2 Sand Gypsum Paint
010a		Layered	Yellow Insulation	Asbestos Not Present	NA	Foam
011	3-TSI2-2	Layered	White Coating	Asbestos Not Present	Cellulose	2 Sand Gypsum Paint
011a		Layered	Yellow Insulation	Asbestos Not Present	NA	Foam
012	3-TSI2-3	Layered	White Coating	Asbestos Not Present	Cellulose	2 Sand Gypsum Paint

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

QuantEM is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.



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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265853	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/11/2016	Project: Elkem Carbide Bldg 3
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
012a		Layered	Yellow Insulation	Asbestos Not Present	NA	Foam

Carter Cox

Carter W. Cox, Analyst

7/11/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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For Lab Use Only
Lab No. _____
Accept <input type="checkbox"/> Reject <input type="checkbox"/>

Project Information		Project Name:	Project Location:	Volume / Area (as applicable)	Comments / Notes
Company:	Tetra Tech	Gillem Carbide	Neokuk, IA		
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	
11	3-TSII2-2	<input checked="" type="checkbox"/>		insulation	
12	↓ -3	<input checked="" type="checkbox"/>		↓	
13		<input type="checkbox"/>			
14		<input type="checkbox"/>			
15		<input type="checkbox"/>			
16		<input type="checkbox"/>			
17		<input type="checkbox"/>			
18		<input type="checkbox"/>			
19		<input type="checkbox"/>			
20		<input type="checkbox"/>			
21		<input type="checkbox"/>			
22		<input type="checkbox"/>			
23		<input type="checkbox"/>			
24		<input type="checkbox"/>			
25		<input type="checkbox"/>			
26		<input type="checkbox"/>			
27		<input type="checkbox"/>			
28		<input type="checkbox"/>			
29		<input type="checkbox"/>			
30		<input type="checkbox"/>			



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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265854	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 4
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	4-FT-1	Layered	Tan Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
001a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
002	4-FT-2	Layered	Tan Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
002a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
003	4-FT-3	Layered	Tan Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
003a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
004	4-CT-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265854	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 4
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
005	4-CT-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
006	4-CT-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
007	4-DWJC-1	Composite	White Joint Compound / Sheetrock	Asbestos Present Chrysotile <1	NA	CaCO3 Gypsum
008	4-DWJC-2	Composite	White Joint Compound / Sheetrock	Asbestos Present Chrysotile <1	NA	CaCO3 Gypsum
009	4-DWJC-3	Composite	White Joint Compound / Sheetrock	Asbestos Present Chrysotile <1	NA	CaCO3 Gypsum
010	4-CBM-1	Layered	Dark Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265854	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 4
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
010a		Layered	Brown Cove Base Mastic	Asbestos Not Present	NA	Glue
011	4-CBM-2	Layered	Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
011a		Layered	Brown Cove Base Mastic	Asbestos Not Present	NA	Glue
012	4-CBM-3	Layered	Dark Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
012a		Layered	Brown Cove Base Mastic	Asbestos Not Present	NA	Glue
013	4-FT2-1	Layered	Orange Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265854	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 4
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
013a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
014	4-FT2-2	Layered	Orange Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
014a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
015	4-FT2-3	Layered	Orange Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
015a		Layered	Yellow Mastic	Asbestos Not Present	NA	Glue
016	4-WM-1	Homogeneous	Black Wall Mastic	Asbestos Present Chrysotile 12	NA	Binder
017	4-WM-2	Homogeneous	Black Wall Mastic	Asbestos Present Chrysotile 12	NA	Binder

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265854	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkem Carbide Bldg 4
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
018	4-WM-3	Homogeneous	Black Wall Mastic	Asbestos Present Chrysotile 12	NA	Binder

Cristal Veech

Cristal Veech, Analyst

7/8/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Contact Information	
Company: Tetra Tech	Phone: (816) 412-1773
Contact: Jeff Mitchell	Cell Phone:
Account #:	E-mail: jeffrey.mitchell@tetratech.com
SAMPLED BY: Name: Kaitlyn Bahr	Date: 6/27/16

Project Information	
Project Name: Elkem Carbide Bldg 4	Project ID:
Project Location: Keokuk, IA	PO Number: X9025.14.0002.019.017

Lab No. 205884	Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/>
Report Results (<input checked="" type="checkbox"/> one box)	Quantem Website <input checked="" type="checkbox"/>
Email jeffrey.mitchell@tetratech.com	Other <input type="checkbox"/>

RELINQUISHED BY	DATE & TIME	VIA	RECEIVED BY	DATE & TIME
			<i>[Signature]</i>	7/11/16 10:00

REQUESTED SERVICES (Please the Appropriate Boxes)

	PLM		TEM		TEM		TURNAROUND TIME	
	Bulk Analysis (EPA 600/R-93/116)	400 Point Count	Vermiculite Attic Insulation (EPA 600/R-04/004)	Air- AHERA	Bulk- Presence / Absence EPA600/R-93/116	Bulk- Quantitative [weight%]- Chatfield	Dust- Presence / Absence	Rush
<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

No.	Sample ID (10 Characters Max)	To Be Analyzed <input checked="" type="checkbox"/>	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	4-FT-1	<input checked="" type="checkbox"/>		floor tile		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		ceiling tile		
4	4-CT-1	<input type="checkbox"/>		↓		
5	↓ -2	<input type="checkbox"/>				
6	↓ -3	<input type="checkbox"/>				
7	4-DWJC-1	<input type="checkbox"/>		drywall joint compound		
8	↓ -2	<input type="checkbox"/>		↓		
9	↓ -3	<input type="checkbox"/>				
10	4-CBM-1	<input checked="" type="checkbox"/>		love base mastic		

SATURDAY FEDEX SAMPLE DELIVERY - CALL TO SCHEDULE • Use this address for Saturday Delivery only: 4220 N. Santa Fe Ave., Oklahoma City, OK 73105-8517 • Mark Package "Hold for Saturday Pickup"
Please Note - UPS and USPS are NOT available for Saturday Delivery

APR J. Mitchell 7/11/16



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For Lab Use Only
 Lab No. 205854
 Accept Reject

Project Information				Project Location:	Volume / Area (as applicable)	Comments / Notes
Company:	<u>Teva</u>	Tech	Project Name:	<u>gilem Carbide</u>		<u>Week, IA</u>
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description		
<u>11</u>	<u>4-IBM-2</u>	<input type="checkbox"/>		<u>cove base mastic</u>		
<u>12</u>	<u>↓ -3</u>	<input type="checkbox"/>		<u>↓</u>		
<u>13</u>	<u>4-FT2-1</u>	<input type="checkbox"/>		<u>floor tile</u>		
<u>14</u>	<u>↓ -2</u>	<input type="checkbox"/>		<u>↓</u>		
<u>15</u>	<u>↓ -3</u>	<input type="checkbox"/>		<u>wall mastic</u>		
<u>16</u>	<u>4-WM-1</u>	<input type="checkbox"/>		<u>↓</u>		
<u>17</u>	<u>↓ -2</u>	<input type="checkbox"/>				
<u>18</u>	<u>↓ -3</u>	<input type="checkbox"/>				
<u>19</u>		<input type="checkbox"/>				
<u>20</u>		<input type="checkbox"/>				
<u>21</u>		<input type="checkbox"/>				
<u>22</u>		<input type="checkbox"/>				
<u>23</u>		<input type="checkbox"/>				
<u>24</u>		<input type="checkbox"/>				
<u>25</u>		<input type="checkbox"/>				
<u>26</u>		<input type="checkbox"/>				
<u>27</u>		<input type="checkbox"/>				
<u>28</u>		<input type="checkbox"/>				
<u>29</u>		<input type="checkbox"/>				
<u>30</u>		<input type="checkbox"/>				



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Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 265855	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 6
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	6-WG-1	Homogeneous	White Window Glazing	Asbestos Not Present	NA	CaCO3
002	6-WG-2	Homogeneous	White Window Glazing	Asbestos Not Present	NA	CaCO3
003	6-WG-3	Homogeneous	White Window Glazing	Asbestos Not Present	NA	CaCO3
004	6-CT-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
005	6-CT-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
006	6-CT-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint

Carter Cox

Carter W. Cox, Analyst

7/8/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

Quantem is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.



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Lab No. <u>205855</u>	(Accept) <input checked="" type="checkbox"/> Reject <input type="checkbox"/>
Report Results (<input checked="" type="checkbox"/> one box)	
<input checked="" type="checkbox"/> QuanTEM Website	
<input checked="" type="checkbox"/> Email <u>jeffrey.mitchell@tetratech.com</u>	
<input type="checkbox"/> Other _____	

Contact Information		Project Information	
Company: Tetra Tech	Phone: (816) 412-1773	Project Name: Elkem Carbide	<u>Bdgie</u>
Contact: Jeff Mitchell	Cell Phone: _____	Project Location: Keokuk, IA	
Account #: _____	E-mail: <u>jeffrey.mitchell@tetratech.com</u>	Project ID: _____	
SAMPLED BY: Name: Kaitlyn Bahr	Date: 6/27/16	PO Number: X9025.14.0002.019.017	

RELINQUISHED BY	DATE & TIME	VIA	RECEIVED BY	DATE & TIME
			<u>[Signature]</u>	<u>7/11/16 10:00</u>

REQUESTED SERVICES (Please the Appropriate Boxes)

	PLM	PLM	TEM	TEM	TURNAROUND TIME									
					Bulk Presence / Absence EPA600/R-93/116	Bulk Quantitative [weight%]- Chatfield	Dust-Presence / Absence	Dust-Quantitative [fibers/sq.cm]- ASTM D5755	Other	Rush	Same Day	24 - Hour	3 - Day	5 - Day
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/> Vermiculite Attic Insulation (EPA 600/R-04/004)	<input type="checkbox"/> Air- AHERA	<input type="checkbox"/> Air- NIOSH 7402	<input type="checkbox"/> Bulk Presence / Absence EPA600/R-93/116	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/> Other	<input type="checkbox"/> Air- ISO 10312	<input type="checkbox"/> Drinking Water- EPA 100.2	<input type="checkbox"/> Bulk Quantitative [weight%]- Chatfield	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 1000 Point Count	<input type="checkbox"/> PCM	<input type="checkbox"/> Waste Water- EPA 600/4-83-043	<input type="checkbox"/>	<input type="checkbox"/> Dust-Presence / Absence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/> NIOSH 7400			<input type="checkbox"/> Dust-Quantitative [fibers/sq.cm]- ASTM D5755	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Particle ID				<input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Sample ID (10 Characters Max)	To Be Analyzed <input checked="" type="checkbox"/>	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	<u>6-WG-1</u>	<input checked="" type="checkbox"/>		<u>window glare</u>		
2	<u>↓ -2</u>	<input type="checkbox"/>		<u>↓</u>		
3	<u>↓ -3</u>	<input type="checkbox"/>		<u>ceiling tile</u>		
4	<u>6-CT-1</u>	<input type="checkbox"/>		<u>↓</u>		
5	<u>↓ -2</u>	<input type="checkbox"/>				
6	<u>↓ -3</u>	<input checked="" type="checkbox"/>				
7		<input type="checkbox"/>				
8		<input type="checkbox"/>				
9		<input type="checkbox"/>				
10		<input type="checkbox"/>				



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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	8-TSI-1	Homogeneous	White Insulation	Asbestos Not Present	Glass Fiber 60	Gypsum CaCO3
002	8-TSI-2	Homogeneous	White Insulation	Asbestos Not Present	Glass Fiber 60	Gypsum CaCO3
003	8-TSI-3	Homogeneous	White Insulation	Asbestos Not Present	Glass Fiber 60	Gypsum CaCO3
004	8-CT-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
005	8-CT-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
006	8-CT-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
007	8-CBM-1	Layered	Dark Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
007a		Layered	Brown Cove Base Mastic	Asbestos Not Present	NA	Glue
008	8-CBM-2	Layered	Dark Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
008a		Layered	Brown Cove Base Mastic	Asbestos Not Present	NA	Glue
009	8-CBM-3	Layered	Dark Brown Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
009a		Layered	Brown Cove Base Mastic	Asbestos Not Present	NA	Glue
010	8-WG-1	Homogeneous	White Window Glazing	Asbestos Not Present	Talc	2 CaCO3

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

Quantem is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.



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Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
011	8-WG-2	Homogeneous	White Window Glazing	Asbestos Not Present	Talc	2 CaCO3
012	8-WG-3	Homogeneous	White Window Glazing	Asbestos Not Present	Talc	2 CaCO3
013	8-CT2-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose Glass Fiber	30 Perlite 30 Paint
014	8-CT2-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose Glass Fiber	30 Perlite 30 Paint
015	8-CT2-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose Glass Fiber	30 Perlite 30 Paint
016	8-DWJC-1	Homogeneous	White Sheetrock	Asbestos Not Present	Cellulose	20 Gypsum
017	8-DWJC-2	Homogeneous	White Sheetrock	Asbestos Not Present	Cellulose	20 Gypsum Paint

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
018	8-DWJC-3	Layered	White Texture	Asbestos Not Present	NA	CaCO3 Paint
018a		Layered	White Sheetrock	Asbestos Not Present	Cellulose 20	Gypsum
019	8-FT-1	Layered	Black Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
019a		Layered	Black Mastic	Asbestos Not Present	NA	Tar
020	8-FT-2	Layered	Black Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
020a		Layered	Black Mastic	Asbestos Not Present	NA	Tar

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
021	8-FT-3	Layered	Black Floor Tile	Asbestos Not Present	NA	Vinyl CaCO3
021a		Layered	Black Mastic	Asbestos Not Present	NA	Tar
022	8-CTX-1	Homogeneous	White Ceiling Texture	Asbestos Not Present	NA	CaCO3 Paint
023	8-CTX-2	Homogeneous	White Ceiling Texture	Asbestos Not Present	NA	CaCO3 Paint
024	8-CTX-3	Homogeneous	White Ceiling Texture	Asbestos Not Present	NA	CaCO3 Paint
025	8-CBM2-1	Layered	Black Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
025a		Layered	Yellow Cove Base Mastic	Asbestos Not Present	NA	Glue

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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
025b		Layered	White Texture	Asbestos Not Present	NA	CaCO3 Paint
026	8-CBM2-2	Layered	Black Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
026a		Layered	Yellow Cove Base Mastic	Asbestos Not Present	NA	Glue
026b		Layered	White Texture	Asbestos Not Present	NA	CaCO3 Paint
027	8-CBM2-3	Layered	Black Cove Base	Asbestos Not Present	NA	Vinyl CaCO3
027a		Layered	Yellow Cove Base Mastic	Asbestos Not Present	NA	Glue

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265851	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Cristal Veech	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
027b		Layered	White Texture	Asbestos Not Present	NA	CaCO3 Paint
028	8-VER-1	Layered	Gold Insulation	Asbestos Present Actinolite/Tremolite <1	NA	Vermiculite
028a		Layered	Gray Plaster	Asbestos Not Present	NA	Sand CaCO3
029	8-VER-2	Homogeneous	Gold Insulation	Asbestos Not Present	NA	Vermiculite
030	8-VER-3	Homogeneous	Gold Insulation	Asbestos Present Chrysotile <1	NA	Vermiculite

Cristal Veech

Cristal Veech, Analyst

7/8/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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 Lab No. 205881
 Accept Reject

Report Results (one box)
 QuantEM Website
 Email jeffrey.mitchell@etratech.com
 Other _____

Contact Information		Project Information	
Company: Tetra Tech	Phone: (816) 412-1773	Project Name: Elkem Carbide Bldg 8	
Contact: Jeff Mitchell	Cell Phone: _____	Project Location: Keokuk, IA	
Account #: _____	E-mail: <u>jeffrey.mitchell@etratech.com</u>	Project ID: _____	
SAMPLED BY: Name: Kaitlyn Bahr	Date: 6/27/16	P.O. Number: X9025.14.0002.019.017	

RELINQUISHED BY	DATE & TIME	VIA	RECEIVED BY	DATE & TIME
			<i>[Signature]</i>	<u>7/11/16 10:00</u>

REQUESTED SERVICES (Please the Appropriate Boxes)

	PLM		TEM		TEM		TURNAROUND TIME
	Bulk Analysis (EPA 600/R-93/116)	Vermiculite Attic Insulation (EPA 600/R-04/004)	Air- AHERA	Air- NIOSH 7402	Bulk- Presence / Absence EPA600/R-93/116	Bulk- Quantitative [weight%]- Chatfield	
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Rush
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Same Day
<input type="checkbox"/> 1000 Point Count	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 24 - Hour
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 3 - Day
<input type="checkbox"/> Particle ID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 5 - Day ★

No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	8-TSI-1	<input type="checkbox"/>		insulation		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		ceiling tile		
4	8-CT-1	<input type="checkbox"/>		↓		
5	↓ -2	<input type="checkbox"/>				
6	↓ -3	<input type="checkbox"/>				
7	8-CBM-1	<input type="checkbox"/>		core base mastic		
8	↓ -2	<input type="checkbox"/>		↓		
9	↓ -3	<input type="checkbox"/>				
10	8-WG-1	<input type="checkbox"/>		windows glaze		

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A per J. Mitchell 7/11/16



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Lab No. 1105051

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Project Information		Project Name: Elkem Carbide	Project Location: Keokuk, IA		
No.	Sample ID (10 Characters Max)	Color	Description	Volume / Area (as applicable)	Comments / Notes
11	8-WG-2		↓ window glaze		
12	↓ -3				
13	8-CT2-1		↓ ceiling tile		
14	↓ -2				
15	↓ -3				
16	8-DWJC-1		↓ drywall joint compound		
17	↓ -2				
18	↓ -3				
19	8-FT-1		↓ floor tile		
20	↓ -2				
21	↓ -3				
22	8-CTX-1		↓ ceiling texture		
23	↓ -2				
24	↓ -3				
25	8-CBM2-1		↓ cove base mastic		
26	↓ -2				
27	↓ -3				
28	8-VER-1		↓ vermiculite		
29	↓ -2				
30	↓ -3				



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Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 265856	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 9
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	9-CT-1	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
002	9-CT-2	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
003	9-CT-3	Homogeneous	White Ceiling Tile	Asbestos Not Present	Cellulose 30 Glass Fiber 30	Perlite Paint
004	9-DW-1	Homogeneous	White Sheetrock	Asbestos Not Present	Cellulose 5	Gypsum
005	9-DW-2	Homogeneous	White Sheetrock	Asbestos Not Present	Cellulose 5	Gypsum
006	9-DW-3	Homogeneous	White Sheetrock	Asbestos Not Present	Cellulose 5	Gypsum
007	9-TR-1	Homogeneous	Gray Transit	Asbestos Present Chrysotile 20	NA	CaCO3

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 265856	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/01/2016	415 Oak Street
Received By: Peyton Awbrey	Kansas City, MO 64106
Date Analyzed: 07/08/2016	Project: Elkern Carbide Bldg 9
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: N/A

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
008	9-TR-2	Homogeneous	Gray Transite	Asbestos Present Chrysotile 20	NA	CaCO3
009	9-TR-3	Homogeneous	Gray Transite	Asbestos Present Chrysotile 20	NA	CaCO3

Carter Cox

Carter W. Cox, Analyst

7/8/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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Lab No. 2058

Report Results one box

QuantEM Website

Email jeffrey.mitchell@tetratech.com

Other _____

Contact Information		Project Information	
Company: Tetra Tech	Phone: (816) 412-1773	Project Name: Elkem Carbide Bldg 9	
Contact: Jeff Mitchell	Cell Phone: _____	Project Location: Keokuk, IA	
Account #: _____	E-mail: <u>jeffrey.mitchell@tetratech.com</u>	Project ID: _____	
SAMPLED BY: Kaitlyn Bahr	Date: 6/27/16	PO Number: X9025.14.0002.019.017	

RELINQUISHED BY	DATE & TIME	VIA	RECEIVED BY	DATE & TIME
			<i>[Signature]</i>	<u>7/1/16 10:00</u>

REQUESTED SERVICES (Please the Appropriate Boxes)

PLM	PLM	TEM	TEM	TURNAROUND TIME
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/> Vermiculite Attic Insulation (EPA 600/R-04/004)	<input type="checkbox"/> Air- AHERA	<input type="checkbox"/> Bulk- Presence / Absence EPA600/R-93/116	<input type="checkbox"/> Rush
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/> Other	<input type="checkbox"/> Air- NIOSH 7402	<input type="checkbox"/> Bulk- Quantitative [weight%]- Chatfield	<input type="checkbox"/> Same Day
<input type="checkbox"/> 1000 Point Count	<input type="checkbox"/> PCM	<input type="checkbox"/> Air- ISO 10312	<input type="checkbox"/> Dust- Presence / Absence	<input type="checkbox"/> 24 - Hour
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/> NIOSH 7400	<input type="checkbox"/> Drinking Water- EPA 100.2	<input type="checkbox"/> Dust- Quantitative [fibers/sq.cm]- ASTM D5755	<input type="checkbox"/> 3 - Day
<input type="checkbox"/> Particle ID		<input type="checkbox"/> Waste Water- EPA 600/4-83-043	<input type="checkbox"/> Other	<input checked="" type="checkbox"/> 5 - Day

No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	9-CT-1	<input checked="" type="checkbox"/>		leaving the		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		drywall		
4	9-DW-1	<input type="checkbox"/>		↓		
5	↓ -2	<input type="checkbox"/>				
6	↓ -3	<input type="checkbox"/>				
7	9-TR-1	<input type="checkbox"/>		transite panel		
8	↓ -2	<input type="checkbox"/>		↓		
9	↓ -3	<input checked="" type="checkbox"/>				
10		<input type="checkbox"/>				

Jeff requested all 7 bags are 5 day TA. CV 7/1/30 10:34am



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Polarized Light Microscopy Asbestos Analysis Report

QuantEM Lab No. 267547	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/29/2016	415 Oak Street
Received By: Rachel Brooks	Kansas City, MO 64106
Date Analyzed: 08/05/2016	Project: Elkern Carbide Bldg 1
Analyzed By: Dee Ammerman	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: PTCT for 265857

QuantEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	1-FT7-1	Homogeneous	Black Mastic	Asbestos Present Chrysotile 0.50 400 Point Count	NA	
002	1-FT7-2	Homogeneous	Black Mastic	Asbestos Present Chrysotile 0.25 400 Point Count	NA	
003	1-FT7-3	Homogeneous	Black Mastic	Asbestos Present Chrysotile 0.50 400 Point Count	NA	

Dee Ammerman, Analyst

8/5/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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 Accept Reject

Report Results (one box)
 QuanTEM Website
 Email jeffrey.mitchell@qtratech.com
 Other _____

Contact Information		Project Information	
Company: Tetra Tech	Phone: (816) 412-1773	Project Name: Elkem Carbide Bldg 1	
Contact: Jeff Mitchell	Cell Phone: _____	Project Location: Keokuk, IA	
Account #: _____	E-mail: <u>jeffrey.mitchell@qtratech.com</u>	Project ID: _____	
SAMPLED BY: Name: Jeff Mitchell	Date: 6/28/16	PC Number: X9025.14.0002.019.017	

RELINQUISHED BY	VIA	RECEIVED BY	DATE & TIME
		<i>[Signature]</i>	7/11/16 10:00

REQUESTED SERVICES (Please the Appropriate Boxes)

	PLM		TEM		TEM		TURNAROUND TIME
	Bulk Analysis (EPA 600/R-93/116)	Vermiculite Artic Insulation (EPA 600/R-04/004)	Air- AHERA	Air- NIOSH 7402	Bulk- Presence / Absence EPA 600/R-93/116	Rush	
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 1000 Point Count	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Particle ID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	1-CBM-1	<input checked="" type="checkbox"/>		cone base mastic		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		floor tile		
4	1-FT-1	<input type="checkbox"/>		↓		
5	↓ -2	<input type="checkbox"/>		ceiling tile		
6	↓ -3	<input type="checkbox"/>		↓		
7	1-CT-1	<input type="checkbox"/>				
8	↓ -2	<input type="checkbox"/>				
9	↓ -3	<input type="checkbox"/>				
10	1-ST-1	<input checked="" type="checkbox"/>		stair tread		

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per J. Mitchell 7/11/16



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<input checked="" type="radio"/> Accept <input type="radio"/> Reject

Project Information		Project Name:	Project Location:	Volume / Area (as applicable)	Comments / Notes
Company: <u>Tetra Tech</u>		<u>Elum Candice</u>	<u>Wokuk, IA</u>		
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	
11	1-ST-2	<input checked="" type="checkbox"/>		stair tread	
12	↓ -3	<input type="checkbox"/>		↓	
13	1-CT2-1	<input type="checkbox"/>		ceiling tile	
14	↓ -2	<input type="checkbox"/>		↓	
15	↓ -3	<input type="checkbox"/>			
16	1-FT2-1	<input type="checkbox"/>		floor tile	
17	↓ -2	<input type="checkbox"/>		↓	
18	↓ -3	<input type="checkbox"/>			
19	1-CBM2-1	<input type="checkbox"/>		cone base mastic	
20	↓ -2	<input type="checkbox"/>		↓	
21	↓ -3	<input type="checkbox"/>			
22	1-DWJC-1	<input type="checkbox"/>		drywall joint compound	
23	↓ -2	<input type="checkbox"/>		↓	
24	↓ -3	<input type="checkbox"/>			
25	1-PLSC-1	<input type="checkbox"/>		plaster skim coat	
26	↓ -2	<input type="checkbox"/>		↓	
27	↓ -3	<input type="checkbox"/>			
28	1-GP-1	<input type="checkbox"/>		gypsum	
29	↓ -2	<input type="checkbox"/>		↓	
30	↓ -3	<input checked="" type="checkbox"/>			



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For Lab Use Only

Lab No. 210887

Accept Reject

Project Information		Project Name:	Project Location:	Volume / Area (as applicable)	Comments / Notes
Company: Tetra Tech		Elmer Cavide	MOYU, DA		
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	
31	1-FT3-1	<input checked="" type="checkbox"/>		floor tile	
32	↓ -2	<input type="checkbox"/>			
33	↓ -3	<input type="checkbox"/>			
34	1-FT4-1	<input type="checkbox"/>			
35	↓ -2	<input type="checkbox"/>			
36	↓ -3	<input type="checkbox"/>			
37	1-CA-1	<input type="checkbox"/>		carpet adhesive	
38	↓ -2	<input type="checkbox"/>			
39	↓ -3	<input type="checkbox"/>			
40	1-ST2-1	<input type="checkbox"/>		shower tread	
41	↓ -2	<input type="checkbox"/>			
42	↓ -3	<input type="checkbox"/>			
43	1-FT5-1	<input type="checkbox"/>		floor tile	
44	1-FT6-1	<input type="checkbox"/>			
45	1-CT3-1	<input type="checkbox"/>		walling tile	
46	↓ -2	<input type="checkbox"/>			
47	↓ -3	<input type="checkbox"/>			
48	1-CBM3-1	<input type="checkbox"/>		concrete mastic	
49	↓ -2	<input type="checkbox"/>			
50	↓ -3	<input checked="" type="checkbox"/>			



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Page 4 of 4

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Lab No. <u>71080537</u>
Accept <input type="checkbox"/> Reject <input type="checkbox"/>

Project Information				Project Name:	Project Location:	Comments / Notes
Company: <u>Tetra Tech</u>				<u>Green Carole</u>	<u>Levick, PA</u>	
No.	Sample ID (10 Characters Max)	<input checked="" type="checkbox"/> To Be Analyzed	Color	Description	Volume / Area (as applicable)	
51	1-CT4-1	<input checked="" type="checkbox"/>		ceiling tile		
52	↓ -2	<input type="checkbox"/>				
53	↓ -3	<input type="checkbox"/>				
54	1-PW-1	<input type="checkbox"/>		wall panel		
55	↓ -2	<input type="checkbox"/>				
56	↓ -3	<input type="checkbox"/>				
57	1-WC-1	<input type="checkbox"/>		ceiling		
58	↓ -2	<input type="checkbox"/>				
59	↓ -3	<input type="checkbox"/>				
60	1-FT7-1	<input type="checkbox"/>		floor tile		
61	↓ -2	<input type="checkbox"/>				
62	↓ -3	<input type="checkbox"/>				
63	1-FP-1	<input type="checkbox"/>		floor paper		
64	↓ -2	<input type="checkbox"/>				
65	↓ -3	<input type="checkbox"/>				
66	1-CBMH-1	<input type="checkbox"/>		cone nose mastic		
67	1-FT8-1	<input type="checkbox"/>		floor tile		
68	↓ -2	<input type="checkbox"/>				
69	↓ -3	<input type="checkbox"/>				
70		<input type="checkbox"/>				

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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 267549	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/29/2016	415 Oak Street
Received By: Rachel Brooks	Kansas City, MO 64106
Date Analyzed: 08/05/2016	Project: Elkern Carbide Bldg 4
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: PTCT for 265854

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	4-DWJC-1	Composite	White Joint Compound / Sheetrock	Asbestos Present Chrysotile <0.25 400 Point Count	NA	
002	4-DWJC-2	Composite	White Joint Compound / Sheetrock	Asbestos Present Chrysotile <0.25 400 Point Count	NA	
003	4-DWJC-3	Composite	White Joint Compound / Sheetrock	Asbestos Present Chrysotile 0.25 400 Point Count	NA	

Carter Cox

Carter W. Cox, Analyst

8/5/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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 Lab No. 205884
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Report Results (one box)
 QuamTEM Website
 Email jeffrey.mitchell@tetratech.com
 Other _____

Contact Information		Project Information	
Company: Tetra Tech	Phone: (816) 412-1773	Project Name: Elkem Carbide Bldg 4	
Contact: Jeff Mitchell	Cell Phone: _____	Project Location: Keokuk, IA	
Account #: _____	E-mail: <u>jeffrey.mitchell@tetratech.com</u>	Project ID: _____	
SAMPLED BY: Name: Kaitlyn Bahr	Date: 6/27/16	PO. Number: X9025.14.0002.019.017	

RELINQUISHED BY	VIA	RECEIVED BY	DATE & TIME
		<i>[Signature]</i>	7/11/16 10:00

REQUESTED SERVICES (Please the Appropriate Boxes)

PLM	PLM	TEM	TEM	TURNAROUND TIME
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/> Vermiculite Attic Insulation (EPA 600/R-04/004)	<input type="checkbox"/> Air- AHERA	<input type="checkbox"/> Bulk- Presence / Absence EPA600/R-93/116	<input type="checkbox"/> Rush
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/> Other	<input type="checkbox"/> Air- NIOSH 7402	<input type="checkbox"/> Bulk- Quantitative [weight%]- Chatfield	<input type="checkbox"/> Same Day
<input type="checkbox"/> 1000 Point Count		<input type="checkbox"/> Air- ISO 10312	<input type="checkbox"/> Dust- Presence / Absence	<input type="checkbox"/> 24 - Hour
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/> PCM	<input type="checkbox"/> Drinking Water- EPA 100.2	<input type="checkbox"/> Dust- Quantitative (fibers/sq.cm)- ASTM D5755	<input type="checkbox"/> 3 - Day
<input type="checkbox"/> Particle ID	<input type="checkbox"/> NIOSH 7400	<input type="checkbox"/> Waste Water- EPA 600/4-83-043	<input type="checkbox"/> Other	<input checked="" type="checkbox"/> 5 - Day <input checked="" type="checkbox"/>

No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	4-FT-1	<input checked="" type="checkbox"/>		floor tile		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		venting tile		
4	4-CT-1	<input type="checkbox"/>		↓		
5	↓ -2	<input type="checkbox"/>		drywall joint compound		
6	↓ -3	<input type="checkbox"/>		↓		
7	4-DWJC-1	<input type="checkbox"/>				
8	↓ -2	<input type="checkbox"/>				
9	↓ -3	<input type="checkbox"/>				
10	4-CBM-1	<input checked="" type="checkbox"/>		love base mastic		

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APR J. MITCHELL 7/11/16



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Lab No. <u>205854</u>
<input checked="" type="radio"/> Accept <input type="radio"/> Reject

Project Information		Project Name:	Description	Volume / Area (as applicable)	Comments / Notes
Company:	<u>Teva</u>	<u>Tech</u>			
Sample ID (10 Characters Max)	<input checked="" type="checkbox"/> To Be Analyzed	Color			
<u>11</u>	<u>4-CBM-2</u>	<input type="checkbox"/>	<u>cove base mastic</u>		
<u>12</u>	<u>↓ -3</u>	<input type="checkbox"/>	<u>↓</u>		
<u>13</u>	<u>4-FT2-1</u>	<input type="checkbox"/>	<u>floor tile</u>		
<u>14</u>	<u>↓ -2</u>	<input type="checkbox"/>	<u>↓</u>		
<u>15</u>	<u>↓ -3</u>	<input type="checkbox"/>	<u>↓</u>		
<u>16</u>	<u>4-WM-1</u>	<input type="checkbox"/>	<u>wall mastic</u>		
<u>17</u>	<u>↓ -2</u>	<input type="checkbox"/>	<u>↓</u>		
<u>18</u>	<u>↓ -3</u>	<input type="checkbox"/>			
<u>19</u>		<input type="checkbox"/>			
<u>20</u>		<input type="checkbox"/>			
<u>21</u>		<input type="checkbox"/>			
<u>22</u>		<input type="checkbox"/>			
<u>23</u>		<input type="checkbox"/>			
<u>24</u>		<input type="checkbox"/>			
<u>25</u>		<input type="checkbox"/>			
<u>26</u>		<input type="checkbox"/>			
<u>27</u>		<input type="checkbox"/>			
<u>28</u>		<input type="checkbox"/>			
<u>29</u>		<input type="checkbox"/>			
<u>30</u>		<input type="checkbox"/>			



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Polarized Light Microscopy Asbestos Analysis Report

Quantem Lab No. 267548	Client: Tetra Tech EM, Inc
Account Number: B229	Jeff Mitchell
Date Received: 07/29/2016	415 Oak Street
Received By: Rachel Brooks	Kansas City, MO 64106
Date Analyzed: 08/05/2016	Project: Elkern Carbide Bldg 8
Analyzed By: Carter Cox	Project Location: Keokuk, IA
Methodology: EPA/600/R-93/116	Project Number: PTCT for 265851

Quantem Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
001	8-VER-1	Homogeneous	Gold Insulation	Asbestos Present Actinolite/Tremolite 0.50 400 Point Count	NA	
002	8-VER-3	Homogeneous	Gold Insulation	Asbestos Present Actinolite/Tremolite 0.75 400 Point Count	NA	

Carter Cox

Carter W. Cox, Analyst

8/5/2016

Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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 Other _____

Contact Information
 Company: **Tetra Tech** Phone: (816) 412-1773
 Contact: **Jeff Mitchell** Cell Phone: _____
 Account #: _____ E-mail: jeffrey_mitchell@iqrtech.com
 Project Name: **Elkem Carbide Bldg 8**
 Project Location: **Keokuk, IA**
 Project ID: _____
 SAMPLED BY: Name: **Kaitlyn Bahr** Date: **6/27/16**
 Project Information
 Project Name: _____
 Project Location: _____
 Project ID: _____
 P.O. Number: **X9025.14.0002.019.017**

RELINQUISHED BY _____ DATE & TIME _____ VIA _____ RECEIVED BY [Signature] DATE & TIME 7/11/16 10:00

REQUESTED SERVICES (Please the Appropriate Boxes)

PLM	PLM	TEM	TEM
<input checked="" type="checkbox"/> Bulk Analysis (EPA 600/R-93/116)	<input type="checkbox"/> Vermiculite Attic Insulation (EPA 600/R-04/004)	<input type="checkbox"/> Air-AHERA	<input type="checkbox"/> Bulk Presence / Absence EPA600/R-93/116
<input type="checkbox"/> 400 Point Count	<input type="checkbox"/> Other	<input type="checkbox"/> Air-NIOSH 7402	<input type="checkbox"/> Bulk-Quantitative [weight%]- Chatfield
<input type="checkbox"/> 1000 Point Count		<input type="checkbox"/> Air-ISO 10312	<input type="checkbox"/> Dust-Presence / Absence
<input type="checkbox"/> Gravimetric Preparation	<input type="checkbox"/> PCM	<input type="checkbox"/> Drinking Water- EPA 100.2	<input type="checkbox"/> Dust-Quantitative [fibers/sq.cm]- ASTM D5755
<input type="checkbox"/> Particle ID	<input type="checkbox"/> NIOSH 7400	<input type="checkbox"/> Waste Water- EPA 600/4-83-043	<input checked="" type="checkbox"/> 5 - Day *

No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	S-TSI-1	<input type="checkbox"/>		insulation		
2	↓ -2	<input type="checkbox"/>		↓		
3	↓ -3	<input type="checkbox"/>		↓		
4	S-CT-1	<input type="checkbox"/>		ceiling tile		
5	↓ -2	<input type="checkbox"/>		↓		
6	↓ -3	<input type="checkbox"/>		↓		
7	S-CBM-1	<input type="checkbox"/>		concrete base mastic		
8	↓ -2	<input type="checkbox"/>		↓		
9	↓ -3	<input type="checkbox"/>		↓		
10	S-WG-1	<input type="checkbox"/>		windows glaze		

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 * Per J. Mitchell 7/11/16



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Lab No. <u>115051</u>
<input checked="" type="radio"/> Accept <input type="radio"/> Reject

Project Information		Project Name: Elkem Carbide	Project Location: Keokuk, IA			
No.	Sample ID (10 Characters Max)	To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
11	S-WG-2	<input checked="" type="checkbox"/>		windows glaze		
12	↓ -3	<input type="checkbox"/>				
13	S-CT2-1	<input type="checkbox"/>		ceiling tile		
14	↓ -2	<input type="checkbox"/>				
15	↓ -3	<input type="checkbox"/>				
16	S-DWJC-1	<input type="checkbox"/>		drywall joint compound		
17	↓ -2	<input type="checkbox"/>				
18	↓ -3	<input type="checkbox"/>				
19	S-FT-1	<input type="checkbox"/>		floor tile		
20	↓ -2	<input type="checkbox"/>				
21	↓ -3	<input type="checkbox"/>				
22	S-CTX-1	<input type="checkbox"/>		ceiling texture		
23	↓ -2	<input type="checkbox"/>				
24	↓ -3	<input type="checkbox"/>				
25	S-CBM2-1	<input type="checkbox"/>		pipe base mastic		
26	↓ -2	<input type="checkbox"/>				
27	↓ -3	<input type="checkbox"/>				
28	S-VER-1	<input type="checkbox"/>		vermiculite		
29	↓ -2	<input type="checkbox"/>				
30	↓ -3	<input checked="" type="checkbox"/>				