Analysis of Brownfields Cleanup Alternatives

FORT WORTH CONVENTION CENTER
1201 HOUSTON STREET
FORT WORTH, TEXAS 76106
March 26, 2024

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1.0 INTRODUCTION AND BACKGROUND

This Analysis of Brownfield Cleanup Alternatives (ABCA) is in support of evaluating cleanup alternatives and establishing the costs to support the cleanup necessary to support redevelopment of the Fort Worth Convention Center located at 1201 Houston Street in Fort Worth, Tarrant County, TEXAS. The City of Fort Worth (City) intends to remove the hazardous building materials from the site in support of their goal to partially demolish and renovate the current site structure for its continued Convention Center use.

This ABCA is intended to briefly summarizes information about the site and contamination issues, cleanup standards, applicable laws, cleanup alternatives considered, and the proposed cleanup, and includes information on the effectiveness, the ability of the grantee to implement each alternative, the cost of each proposed cleanup alternative, an evaluation of how commonly accepted climate change conditions might impact proposed cleanup alternatives, and an analysis of the reasonableness of the various cleanup alternatives considered, including the one chosen. The ABCA is intended as a brief preliminary document summarizing the larger and more detailed technical and financial evaluations performed in addressing each of these areas. The ABCA may be modified technically and financially or in more depth relative to each of these areas upon award of funding and in response to community interaction.

Cleanup alternatives were evaluated in accordance with EPA Region 6 protocols and general guidance required prior to implementation of a cleanup design using EPA Brownfields Grant funding. More specifically, this ABCA summarizes viable cleanup alternatives based on site-specific conditions, technical feasibility, resiliency to climate change conditions, and preliminary cost/benefit analyses. Specific cleanup alternatives and associated recommendations are presented in the applicable sections of this report.

1.1 Background

The site is located at 1201 Houston Street in Fort Worth, Tarrant County, TEXAS. Based on information from the Tarrant Appraisal District website, the site consists of one parcel identified as Tarrant County Parcel No. 40127842 totaling approximately 573,950 square-feet of convention center space located on approximately 15.68 acres of land. The Convention Center has been utilized since 1968 for the following activities:

- Exhibit Hall - 253,226 square-feet
- Meeting Spaces - 58,849 square-feet
- Ballroom - 28,160 square-feet
- Breakout Rooms - 38
- Multi-functional Arena - 13,000 Seat Capacity
- Events Plaza - 55,000 square-feet that Connects to the Fort Worth Water Gardens

The parcel has been owned by the City of Fort Worth since 1997.

1.2 Site Assessment Findings

A 2004 Comprehensive Asbestos Survey performed by IHST, Inc. and a 2017 Limited Asbestos Survey performed by TRC were completed to ascertain the asbestos containing materials (ACM) within the structure that would be impacted by demolition or renovation activities.

The asbestos surveys identified asbestos in the spray-on fire proofing, texture on concrete, spray-on acoustic ceiling texture, thermal insulation on pipe fitting, and floor tile and mastic. The asbestos survey reports recommended that that identified asbestos containing materials (ACM) be removed prior to demolition/renovation of the structure and the preparation of an asbestos abatement Scope of Work.

The Texas Asbestos Health Protection Rules (TAHPR) require that confirmed or assumed ACM be abated prior to renovation or demolition activities that will disturb those materials. The abatement must be performed by a TDSHS licensed asbestos contractor in accordance with a project design prepared by a TDSHS licensed asbestos consultant. In addition, a TDSHS licensed asbestos consultant agency must perform third-party air monitoring during the abatement.

The following table provides a summary of the ACM that were identified in the structure.

Description	Analytical Result	Location	Condition	Estimated Quantity
Floor Tile and Black Mastic	Tile – 1%-10% Chrysotile Mastic – 3%-5% Chrysotile	Various Rooms	Good	40,920 s.f.
White and Painted Tan Spray-On Acoustic Ceiling Texture	Acoustic - 5% Chrysotile	Concourse	Good	22,020 s.f.
Spray-On Fireproofing	Fireproofing - 5% Chrysotile	Throughout	Enclosed	23,848 s.f.
Texture on Concrete	Texture - 5% Chrysotile	Awnings	Good	9,013 s.f.
Thermal System Insulation (TSI)	TSI - 1%-65% Chrysotile 1%-3% Amosite	Numerous Locations	Good to Damaged	~800 Fittings and 972 L.F.
Texture on Plaster Ceiling	**Texture - 5% Chrysotile**	**Alleyway**	**Good**	**Removed in Prior Abatement**
Pink Sink Undercoating	Undercoating - 6% Chrysotile	Sinks Throughout	Good	40 s.f (~20 sinks)

2.0 PROJECT GOAL AND RE-USE PLAN

The City of Fort Worth owns the site and is planning to renovate and expand the convention center as follows:

- Overall Renovation of the Current Facility
- Construction of New Food & Beverage Facilities
- Relocation of Adjacent City Street (for a future convention center hotel)
- Re-build the Loading Docks
- Demolition of the 1968 Arena to Create:
  - 97,000+ square-feet of Total Exhibit Hall Space
  - Additional Flexible Meeting Rooms
  - New 60,000 square-foot ballroom

EPA brownfield cleanup funding will be used to abate the ACM from the site structure prior to renovations and/or demolition, which will be using other funding sources. This allows immediate and definitive resolution of the public health issue, while final renovations can then proceed on a schedule that time and resources allow without worry or expense of maintaining and isolating damaged materials from public exposure.

3.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

The regulated contaminant of concern for remedy is asbestos. Asbestos is the name given to a group of six different fibrous minerals that occur naturally in the environment. Asbestos minerals have separable long fibers that are strong and flexible enough to be spun and woven and are heat resistant. Because of these characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building, friction products, heat-resistant fabrics, packaging, gaskets, and coatings. Asbestos fibers can enter the air or water from the breakdown of natural deposits and manufactured asbestos products. Asbestos fibers do not evaporate into air or dissolve in water. Small diameter fibers and particles may remain suspended in air for a long time and be carried long distances by wind or water before settling down. Larger diameter fibers and particles tend to settle more quickly. Asbestos fibers are not able to move through soil. Asbestos fibers are generally not broken down to other compounds and will remain virtually unchanged over long periods. Exposure to asbestos usually occurs by breathing contaminated air in workplaces that make or use asbestos. Asbestos is also found in the air of buildings containing asbestos that are being torn down or renovated. Asbestos exposure can cause serious lung problems and cancer. More detailed information on asbestos is attached as the Agency for Toxic Substance and Disease Registry's ToxFAQ™ for Asbestos.

3.1 Cleanup Responsibility

The City of Fort Worth will be the cooperative agreement recipient responsible for hiring contractors. The City will use a qualified Environmental Professional to assist with contracting documents, cleanup contractor oversight and final documentation. The cleanup will be conducted by a TDSHS licensed asbestos abatement contractor. A notification to the will be provided to the Texas Department of State Health Services (TDSHS) prior to abatement activities.

3.2 Cleanup Standards

Title 25, Part 1, Chapter 296, the Texas Asbestos Health Protection Rules (TAHPR), regulates asbestos fiber emission and asbestos waste disposal practices for public buildings. The TAHPR also require the identification and classification of existing asbestos-containing building materials prior to demolition or renovation activity. Under TAHPR, asbestos containing building materials are classified as either friable or nonfriable ACM containing 1% or more asbestos. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

The TAHPR require that any asbestos-related activity be performed by TDSHS licensed individuals. An asbestos related activity consists of the disturbance (whether intentional or unintentional), removal, encapsulation, or enclosure of asbestos, including preparations or final clearance activities, the performance of asbestos surveys, the development of management plans and response actions, asbestos project design, the collection or analysis of asbestos samples, monitoring for airborne asbestos, bidding for a contract for any of these activities, or any other activity required to be licensed under TAHPR.

The TAHPR require abatement in public buildings be performed by a TDSHS licensed asbestos abatement contractor in accordance with a project design prepared by a TDSHS licensed asbestos consultant. In addition, a TDSHS licensed asbestos consultant agency must perform third party air monitoring during the abatement activities.

The TAHPR require that written notification be submitted before beginning renovation projects which include the disturbance of any quantity of ACM in a public or commercial building or facility, and before the demolition of a building or facility, even when no asbestos is present. This written notification must be provided to the TDSHS at least 10 working days prior to the commencement of asbestos abatement or demolition activities.

40 CFR Part 61 Subpart M, the asbestos NESHAP, regulates asbestos fiber emission and asbestos waste disposal practices for commercial buildings and facilities. The NESHAP requires the identification and classification of existing asbestos containing building materials prior to demolition or renovation activity. Under NESHAP, building materials containing >1% asbestos are classified as either friable, Category I nonfriable or Category II nonfriable ACM. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Category I nonfriable ACM includes packing, gaskets, resilient floor coverings and asphalt roofing products. Category II nonfriable ACM are any nonfriable materials other than those classified as Category I materials.

Friable ACM, Category I and II nonfriable ACM in poor condition, that have become friable, or which will be subject to drilling, sanding, grinding, cutting, or abrading and which could be crushed or pulverized during anticipated renovation or demolition activities are considered regulated ACM (RACM).

The NESHAP requires that written notification be submitted before beginning renovation projects which include the disturbance of greater than 160 square feet, 260 linear feet, or 35 cubic feet of RACM in any building or facility, or before the demolition of any building or facility, even when no asbestos is present. This written notification must be provided to the TDSHS at least 10 working days prior to the commencement of asbestos abatement or demolition activities.

29 CFR 1926.1101, the Occupational Safety and Health Administration (OSHA) Asbestos standard for the construction industry, regulates workplace exposure to asbestos. The OSHA standard classifies construction and maintenance activities which could disturb ACM and specifies work practices and precautions employers must follow when engaging in each class of regulated work. The OSHA standard also requires employee exposure to airborne asbestos fibers be maintained below the Permissible Exposure Limit (PEL) of 0.1 asbestos fibers per cubic centimeter (f/cc) of air as an 8-hour Time Weighted Average (TWA).

- These standards may be found at http://www.osha.gov.

3.3 Laws & Regulations Applicable to the Cleanup

The following work practices should be followed prior to the initiation of renovation or demolition activities on the project site:

- Asbestos abatement specifications prepared by a TDSHS licensed asbestos consultant;
- Notify the TDSHS of intention to conduct abatement activities and perform partial demolition of the structure;
- Remove all ACM that may be impacted by renovation/demolition activities before disruptive activities begin;
- Handle and dispose of ACM in accordance with applicable TAHPR, US EPA NESHAP and OSHA regulations;
- Conduct abatement activities in accordance with applicable OSHA regulations;
- Third-party asbestos air monitoring performed by a TDSHS licensed asbestos consultant agency

prior to, during, and at the conclusion of the abatement activities; and,

- Asbestos abatement and air monitoring report prepared by a TDSHS licensed asbestos consultant agency at the conclusion of the project.

4.0 EVALUATION OF CLEANUP ALTERNATIVES

Asbestos is considered a hazardous substance relative to cleanup grant funding. EPA proposal guidance requires the ABCA, at a minimum, to consider two different cleanup remedies and a "no action" alternative. Asbestos mitigation in the environmental industry is an established practice. Due to its chemical and physical nature, asbestos can, generally speaking, only be managed. Unlike chemical contamination, it cannot be readily altered or broken down. The industry has historically evolved two basic approaches: removal with off-site management and in-place isolation and on-site management.

In addition to effectiveness, implementability, and cost considerations, consideration was given to the sustainability of cleanup alternatives in regard to current and future climate change concerns. According to the National Oceanic and Atmospheric Administration's (NOAA) National Climate Assessment, the primary climate change conditions identified for the southwest region include increased temperature and decreased water availability. Increased temperature and decreased water availability have been identified as site-specific climate change considerations and the resiliency of each cleanup alternative will be evaluated against these considerations.

Cleanup Alternatives Considered

To address hazardous substances at the Site, three different alternatives were considered. These alternatives are outlined below. The following subsections present each alternative in greater detail, including estimated costs and potential contingency items:

- Cleanup Alternative A: ACM Removal Pre-Renovation/Demolition
- Cleanup Alternative B: ACM Encapsulation
- Cleanup Alternative C: No Action

4.1 Cleanup Alternative A: ACM Removal Pre-Renovation/Demolition

Alternative A includes conventional removal/abatement of ACMs using standard industry practices. Abatement areas would be contained prior to the removal using polyethylene sheeting, controlled negative pressure conditions and/or other applicable measures to prevent asbestos fiber migration beyond the work zone. Abatement procedures require wet removals to further control potential spreading of damaged or friable asbestos and airborne particulates. During and following the abatement, ACM dust, particulates and other residual materials would be vacuumed and filtered out using a high efficiency particulate air (HEPA) filtration system.

ACM would be removed by a TDSHS licensed asbestos abatement contractor in compliance with a project specification prepared by a TDSHS licensed asbestos consultant, and containerized for off-site landfill disposal as a special or regulated waste. Waste will be containerized (commonly double bagged) to contain ACM in manageable quantities. Leak-tight containers may also be used. Landfill disposal authorizations would be secured prior to initiating the work. These authorizations are specific to the disposal facility.

ACM removal must be performed by a TDSHS-licensed abatement contractor. In addition, this work requires a 10-business day notification to the TDSHS Asbestos Section and appropriate coordination with TDSHS representatives, as needed, throughout the abatement project. An air monitoring program will be required throughout the period of abatement activities. Final clearance would be granted following a visual examination of the work area followed by receipt of acceptable air quality testing results.

4.1.1 Effectiveness – Including Climate Change Considerations

The ACM is permanently removed from the facility. This approach is technically effective as a definitive and direct physical elimination of the contaminants that produce unacceptable public risk. The remedy usually does not significantly alter structural conditions due to typical ACM uses.

Potential disadvantages; Disadvantages are minimum; however, errors during the abatement could potentially release asbestos fibers to the environment. This option creates a waste generation stream and associated liabilities for the generator.

The site-specific climate change conditions identified include increased weather activity which could affect building integrity (damaged from storms). Removal of ACM reduces the potential for environmental contamination.

4.1.2 Implementability

This alternative is technically achievable. It is a mature remedy common in the remediation industry. The approach requires specialized equipment readily available in the local demolition and engineering markets. A specialized labor force exists in TEXAS to accomplish the remedy. The implementation period is shorter-term and can be conducted during any time of the year.

4.1.3 Cost

Based upon Terracon's experience with similar projects and abatement estimates, the estimated cost to remove ACM from the structure is approximately **$944,175**, including interim security, professional environmental consulting services, and waste removal and disposal.

4.2 Cleanup Alternative B: ACM Encapsulation

Alternative B involves encapsulating the ACM within the structure. Encapsulation is defined as the treatment of ACM with a liquid that covers the surface with a protective covering or embeds the fibers with an adhesive matrix to prevent the release of asbestos fibers. Encapsulation of friable regulated materials is considered an abatement activity. Abatement areas would be contained prior to the encapsulation using polyethylene sheeting, controlled negative pressure conditions and/or other applicable measures to prevent asbestos fiber migration beyond the work zone. Abatement procedures require wet removals of damaged ACM or ACM debris to further control potential spreading of damaged or friable asbestos and airborne particulates. Following the removal of any damaged ACM or ACM debris the ACM would be sprayed with a bridging compound (similar to Fiberlock Asbestos Binding Compound). During and following the abatement, ACM dust, particulates and other residual materials would be vacuumed and filtered out using a high efficiency particulate air (HEPA) filtration system.

Encapsulation of ACM would be conducted by a TDSHS-licensed abatement contractor in compliance with

a project specification prepared by a TDSHS licensed asbestos consultant. Damaged ACM would be removed to stabilize the remaining ACM. This work will require a 10-business day notification to the TDSHS Asbestos Section and appropriate coordination with TDSHS representatives, as needed, throughout the abatement project. An air monitoring program will be required throughout the period of abatement activities. Final clearance would be granted following a visual examination of the work area followed by receipt of acceptable air quality testing results.

Any waste generated would be containerized for off-site landfill disposal as a special or regulated waste. Landfill disposal authorizations would be secured prior to initiating the work. These authorizations are specific to the disposal facility.

4.2.1 Effectiveness

The ACM is isolated in a manner in which the ACM does not come into direct contact with humans. This approach is technically effective as a direct physical elimination of the contaminants available to public exposures.

Potential disadvantages include errors during the stabilization of damaged materials could potentially release asbestos fibers to the environment, the encapsulant may be applied incorrectly or may not fully adhere to the substrate, the encapsulant may not be durable enough for building use patterns, encapsulating materials is not a long term solution and encapsulants may fail without proper maintenance or in un-occupied environments. In addition, delamination of the material may occur during encapsulation. This option still creates a waste generation stream from removal of damaged materials and associated liabilities for the generator. Asbestos will remain and will need to be managed in place. follow-up inspections and maintenance would be required. Damaged materials will still require abatement, and future renovations to the structure can potentially disturb the ACM and cause a fiber release. Therefore, based on the current damage and potential disturbance of the ACM and would render this alternative an ineffective option. Also, since a portion of the building (arena) will be demolished, this is not alternative is not acceptable for demolition purposes.

The site-specific climate change conditions identified include increased weather activity which could affect building integrity (damaged from storms). Encapsulation still leaves the asbestos-containing materials in place and has the potential for environmental contamination with damage.

4.2.2 Implementability

This alternative is technically achievable as asbestos-containing materials in the structure would be released during demolition activities.

4.2.3 Cost

Based upon Terracon's experience with similar projects, the estimated cost to encapsulate ACM from the structure is approximately $120,000, including interim security and professional environmental consulting services.

4.3 Cleanup Alternative C: No Action

The "no action" scenario is required by the EPA ABCA process. This alternative is to not address contaminants and trust that exposures as airborne particulate/fibers or dust through further weathering and degradation of the structure does not make contaminants available for human exposure by inhalation.

4.3.1 Effectiveness

This alternative is deemed ineffective and unacceptable for continued Brownfield redevelopment for this Site because:

- It is likely to be considered unacceptable to the community because citizens, nearby workers and construction workers could unknowingly be placed at risk in the future. No-action provides neither remedy nor preventive value to site conditions or in support of improved public health.
- This approach is unacceptable technically in that the microscopic asbestos fibers are known human carcinogens and provide no readily discernable exposure warning mechanism such as odor or other sensory identification. Without an expensive and long-term air/dust sampling program, there is no ability to identify if and when residual contaminants may be available for exposure.
- The continued presence of ACM in the building would continue to pose a long-term health risk to the public and also to visitors and workers entering the building. The No Action Alternative would make no progress toward achieving the goals of reduction of health risks to the surrounding public and facilitating the demolition of the building for redevelopment.

4.3.2 Implementability

By its definition, taking no action precludes a discussion of implementation. The identified ACM would still pose a hazard to those entering the building and asbestos fibers would continue to be released to ambient air. The value of the building would continue to decrease due to deterioration.

4.3.3 Cost

By its definition, taking no action precludes a discussion of cost to implement. This cleanup alternative would not include any specific efforts to remove or maintain ACM in place. There would be no direct cleanup costs associated with this alterative. Further, this alternative may later result in demolition complications, delays and increased demolition costs due to ACM remaining within the structures. Direct costs associated with the No Action Alternative and associated non-use of the building would consist of providing site security.

Expanded costs could occur if fugitive asbestos is released during future storms or weathering of damaged structures that might result in secondary deposition and contamination of soils. This would impair re-use and value of surrounding property adjacent to the structure.

4.4 Cost Comparison of Alternatives

The table below presents a summary of the estimated costs for all alternatives under consideration. There would be no capital cost if the site were to remain as an unused, vacant building.

ALTERNATIVE	CAPITAL COST	ANNUAL COST
A – ACM Removal Pre-Renovation /Demolition	$944,175	$0
B – ACM Encapsulation	$120,000	$4,000‡
C – No Action	$0	$4,000‡

‡ - Includes costs for annual re-inspection of ACMs to document current condition.

5.0 RECOMMENDED CLEANUP ALTERNATIVE

The recommended cleanup approach is Alternative A: Asbestos Removal Prior to Renovation and/or Demolition. This alternative would address exposure risks using a proven approach consistent with recognized industry standards. This alternative would address exposure risks using a proven approach consistent with recognized industry and regulatory standards (e.g., TAHPR, NESHAP, OSHA). This option would remain comparably cost-effective under almost all abatement scenarios and building conditions. ACM removal would not require the need for subsequent inspections, maintenance and/or regulatory oversight. This alternative addresses ACM liabilities, potential contaminant sources or potential limitations to future land use and brownfields redevelopment potential consistent with the City's goals and re-use planning.