Department of Energy

Portsmouth/Paducah Project Office
1017 Majestic Drive, Suite 200
Lexington, Kentucky 40513
(859) 219-4000

NOV 2 2 2011

Mr. Wm. Turpin Ballard
Remedial Project Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

PPPO-02-1303603-11

Mr. Edward Winner, FFA Manager
Kentucky Department for Environmental Protection
Division of Waste Management
200 Fair Oaks Lane, 2nd Floor
Frankfort, Kentucky 40601

Dear Mr. Ballard and Mr. Winner:

TRANSMITTAL OF THE ACTION MEMORANDUM ADDENDUM FOR THE C-340 METALS REDUCTION PLANT COMPLEX AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY (DOE/LX-07-0290&D2/A1)

Please find enclosed for your review the *Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-0290&D2/A1. This document was prepared to provide a basis for revising the method of accomplishment to demolish the C-340 Metals Reduction Plant Complex.

The proposed method involves addressing transite in a manner that requires applicable or relevant and appropriate requirement (ARAR) waivers. The work controls included in the proposed method of accomplishment will provide equal standards of performance to human health and the environment that would be provided if the demolition were to take place without the ARAR waivers. The proposed method of accomplishment also will reduce risks to workers by eliminating the requirement to remove transite panels by hand prior to bringing down the structures.

In order to accommodate our project schedules, please provide your comments as soon as possible, but no later than December 23, 2011. If you have any questions or require additional information, please contact Rob Seifert at (270) 441-6823.

Sincerely,

William E. Murphie
Manager
Portsmouth/Paducah Project Office

Enclosures:
1. Certification Page
2. Action Memorandum Addendum for C-340

e-copy w/enclosures:
ballard.turpin@epamail.epa.gov, EPA/Atlanta
brad.montgomery@lataky.com, LATA/Kevil
craig.jones@lataky.com, LATA/Kevil
edward.winner@ky.gov, KDEP/Frankfort
gaye.brewer@ky.gov, KDEP/PAD
jeffrey.gibson@ky.gov, KDEP/Frankfort
leo.williamson@ky.gov, KDEP/Frankfort
mark.duff@lataky.com, LATA/Kevil
mike.auble@lataky.com, LATA/Kevil
pad.dmc@swiftstaley.com, SST/Kevil
patricia.goddard@lataky.com, LATA/Kevil
reinhard.knerr@lex.doe.gov, PPPO/PAD
rob.seifert@lex.doe.gov, PPPO/PAD
todd.mullins@ky.gov, KDEP/Frankfort
tufts.jennifer@epamail.epa.gov, EPA/Atlanta

CERTIFICATION

DOCUMENT IDENTIFICATION: ***Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0290&D2/A1**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

LATA Environmental Services of Kentucky, LLC

Mark J. Duff, Paducah Project Manager

11-21-11
Date Signed

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

U.S. Department of Energy (DOE)

William E. Murphie, Manager
Portsmouth/Paducah Project Office

11/22/11
Date Signed

DOE/LX/07-0290&D2/A1
Primary Document

Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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U.S. Department of Energy Office of Environmental Management

Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0290&D2/A1
Primary Document

Subject: Change in Scope of Removal Action
Action Memorandum

Date: November 2011

1. PURPOSE

This Action Memorandum Addendum (Addendum) was prepared in accordance with U.S. Environmental Protection Agency's (EPA's) *Superfund Removal Procedures Action Memorandum Guidance,* EPA/540/P-90/004, (EPA 1990) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and serves to modify the *Action Memorandum for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter Non-Time-Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-0290&D2, signed on May 6, 2010 (DOE 2010a; Attachment 1). The non-time-critical removal action is being performed pursuant to the U.S. Department of Energy's (DOE's) removal authority under Executive Order 12580 and in accordance with the *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*, Section X.E., Non-Time-Critical Removal Actions, (EPA 1998) and National Contingency Plan (NCP) regulations. This project is consistent with the joint DOE and EPA policy (DOE and EPA 1995) and the Site Management Plan for the Paducah Gaseous Diffusion Plant (PGDP) (DOE 2011).

The three purposes of this Addendum are as follows:

(1) Document the decision to remove the transite panels (cement-asbestos board) on the C-340 Complex differently than described in the currently approved Action Memorandum (AM) document,

(2) Present justification for a waiver of applicable or relevant and appropriate requirements (ARARs) that pertain to removing and handling transite to allow facility demolition by the method described in this document, and

(3) Add an applicable and relevant and appropriate requirement (ARAR) to address surface water discharges of asbestos-contaminated wastewater.

The decision to remove the transite panels differently is based on improved safety for workers and costs savings realized by mechanical removal. Safety improves when workers no longer are required to remove heavy, cumbersome, transite panels while working on hanging scaffolding. The transite panels on the C-340 Complex are approximately 170 lb and are 3.5 ft x 12 ft (there are several different sizes made by different manufacturers). The configuration of the C-340 Complex requires that window-washer scaffolding that hangs from the roof of the structure be used, which is unstable and has a short, narrow, working surface. Because of the heights of the C-340 Complex, approximately 120 ft, DOE is concerned

about the safety of its workforce when working on hanging scaffolding, especially while handling transite panels. An additional ARAR is needed because of the increased volumes of water that will be generated to minimize asbestos fiber releases and control dust while implementing the alternative work practices.

CERCLA regulations [40 *CFR* § 300.430(f)(1)(ii)(c)] state that an alternative that does not meet an ARAR under federal or state environmental or facility siting laws may be selected if conditions of specific ARAR waivers are met. The ARAR waiver for which conditions are met by the proposed alternative is 40 *CFR* § 300.430(f)(1)(ii)(c) (4), as follows:

> (4) The alternative will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, or limitation through use of another method or approach.

This waiver is described by EPA as the "Equivalent Standard of Performance" waiver (EPA 1988). The alternate work controls described herein are expected to achieve the same standard of performance that would be achieved by the ARAR-compliant method. As part of the alternate work controls, DOE will collect air monitoring samples to ensure that asbestos levels remain below 0.01 fibers/cc of asbestos or no more than background, whichever is greater, in ambient air outside of the asbestos-regulated area (ARA). This level of 0.01 fibers/cc is established by the Occupational Safety and Health Administration (OSHA) and EPA's Asbestos in Schools rules for unrestricted occupancy of a facility from which asbestos has been abated. Background levels of asbestos are the levels of asbestos measured in the ambient air outside the ARA and upwind of any asbestos disturbing activity. The threshold of 0.01 fibers/cc or background will be maintained outside the ARA and will be achieved by applying work controls inside the boundary of the ARA, which will be described more fully in this document. Controls such as the ones described in this document were used at DOE Richland Operations Office's (DOE/RL's) Hanford Site and indicated effectiveness in preventing airborne releases above the clearance levels.

The ARARs for which waivers are requested include regulations requiring removal of transite prior to demolition and those that specify the means by which transite is lowered to the ground after being removed. Specifically, the regulations are these:

40 *CFR* § 61.145(c)(1)	401 *KAR* 58:040 § 4(2)(a)
40 *CFR* § 61.145(c)(2)(ii)	401 *KAR* 58:040 § 4(1)(i)
40 *CFR* § 61.145(c)(6)(ii) and (iii)	401 *KAR* 58:040 § 4(1)(j)

The Kentucky regulation 401 *KAR* 58:025 § 2 incorporates by reference all of the federal asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulation; therefore, the aspects of the regulations cited above that also would be included in 401 *KAR* 58:025 § 2 are being included in this waiver request.

With the exception of the above-mentioned ARAR waiver, this action will meet all ARARs listed in the signed AM and this Addendum; however, Paragraph XXI.A of the Federal Facility Agreement requires DOE to identify permits that would otherwise be required in the absence of CERCLA Section 121(e)(1). Based on the work controls being proposed under this Addendum, the potential exists for generation and controlled discharge of asbestos-contaminated wastewater to surface waters through existing Kentucky Pollutant Discharge Elimination System (KPDES) outfalls. Therefore, in the absence of Section 121(e)(1), a modification to the KPDES permit otherwise would have been required to add asbestos as a pollutant of discharge. DOE will comply with the substantive requirements for such discharges through adding and implementing the asbestos-related requirement contained in Table 1 of 401 *KAR* 10:031 § 6, which establishes the in-stream concentration of asbestos to be 7 million fibers/L. This ARAR will be used to ensure that extra water generated during the alternate work practices described in later sections of this document do not pose additional hazards to human health and the environment.

Current plans are to remove the transite panels with heavy equipment, such as an excavator with a grapple, thumb and bucket, or other attachment, by raking or peeling the asbestos off the structure from the top down prior to demolition. Care will be taken to minimize the damage to transite material during demolition and waste packaging, to the extent practicable. In areas that are not paved with asphalt, concrete, or compacted gravel, the plan is to place at least one layer of heavy plastic under the area where transite panels are being removed. Paved areas are expected to be cleaned with heavy equipment then cleaned further either by vacuuming or wet sweeping. After an area of transite panels has been removed from the structure, the plan is to place transite into piles on plastic (regardless of whether it was removed from an area over a paved surface or otherwise) and the plastic will be loaded into trucks, where each load will be disposed of as asbestos-containing material (ACM) in the C-746-U Landfill, if authorized limits and all waste acceptance criteria (WAC) are met. After all transite has been removed from one of the main buildings that comprise the C-340 Complex, such as A, B, or C, remaining visible asbestos, such as transite panel pieces, will be removed from the floors of the structure by a response action worker by either picking it up or vacuuming it up. The structure from which the asbestos has been removed will be demolished and the resulting debris will be disposed of according to its waste type, which is expected to be polychlorinated biphenyl (PCB) bulk product waste, PCB remediation waste, radiologically contaminated waste, nonhazardous solid waste, or any combination of these.

A demolition zone and ARA will be established based on the approach described above. The demolition zone may incorporate an ARA for purposes of collecting ACM and will include other areas, such as those needed to collect transite, to bring down the structures, to handle waste, to manage water, and to support operations. Personnel showers, crew break trailers, and any other functional areas needed to complete the project successfully, safely, and compliantly will be located outside the demolition zone and ARA to ensure safe and compliant operations.

The ARA is the area that has an increased threat of airborne asbestos due to the close proximity of the work activities. Therefore, personal protective equipment (PPE), such as full-body suits with booties,

hoods, gloves, and powered air-purifying respirators (PAPRs), will be worn until it is cleared for non-asbestos activities.

The original AM of May 2010 explained DOE's decision to demolish the C-340 Complex. This decision has not changed; only the method of addressing transite panels is being proposed as a change to the original plans for the C-340 Complex. Section 2 of this document, Site Conditions and Background, explains that the previously approved project has not changed, except as it pertains to transite removal and asbestos release controls. Additionally, meteorological conditions at PGDP that may contribute to off-site dispersal of contamination are described.

2. SITE CONDITIONS AND BACKGROUND

This section discusses the operational history and resulting contaminants in the C-340 Complex, as well as meteorological conditions that could contribute to contaminant dispersion during demolition of the complex.

2.1 C-340 METALS REDUCTION COMPLEX OPERATIONAL HISTORY

The C-340 Metals Reduction Plant Complex is located on the east side of PGDP. The buildings that comprise the complex have a combined footprint of approximately 65,000 ft^2. The complex is made up of the C-340-A Powder Building (42,000 ft^2); C-340-B Metals Building (17,920 ft^2); and the C-340-C Slag Building (4,400 ft^2) (Figure 1). These buildings are physically adjoining structures. They are metal frame structures with exterior walls made of transite and built-up roofs. C-340-A consists of seven floors. C-340-B is a single-level structure with operating platforms. C-340-C has four floors. A photograph of C-340 is shown in Figure 2.

The C-340 Metals Reduction Plant Complex was operated to convert depleted uranium hexafluoride to uranium tetrafluoride (UF_4) using a hydrogenation process and to convert UF_4 to uranium metal by reaction with magnesium.

The C-340 Metals Reduction Plant Complex operated from 1956 into the 1980s, although the building remained in use for other purposes until 1991. The early operations are the source of contamination in the C-340 Complex structures. Contamination resulting from historic operations could pose a potential or actual risk to human health and the environment should this contamination be released by a breach in the walls, windows, and/or roof that would lead to dispersion of contaminants from wind and/or precipitation. It is expected that demolition of the C-340 Metals Reduction Plant Complex structure could generate up to 253,000 ft^3 of ACM, radiologically contaminated waste, PCB bulk product waste, PCB remediation waste, nonhazardous solid waste, or any combination of these.

Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0290&D2/A1
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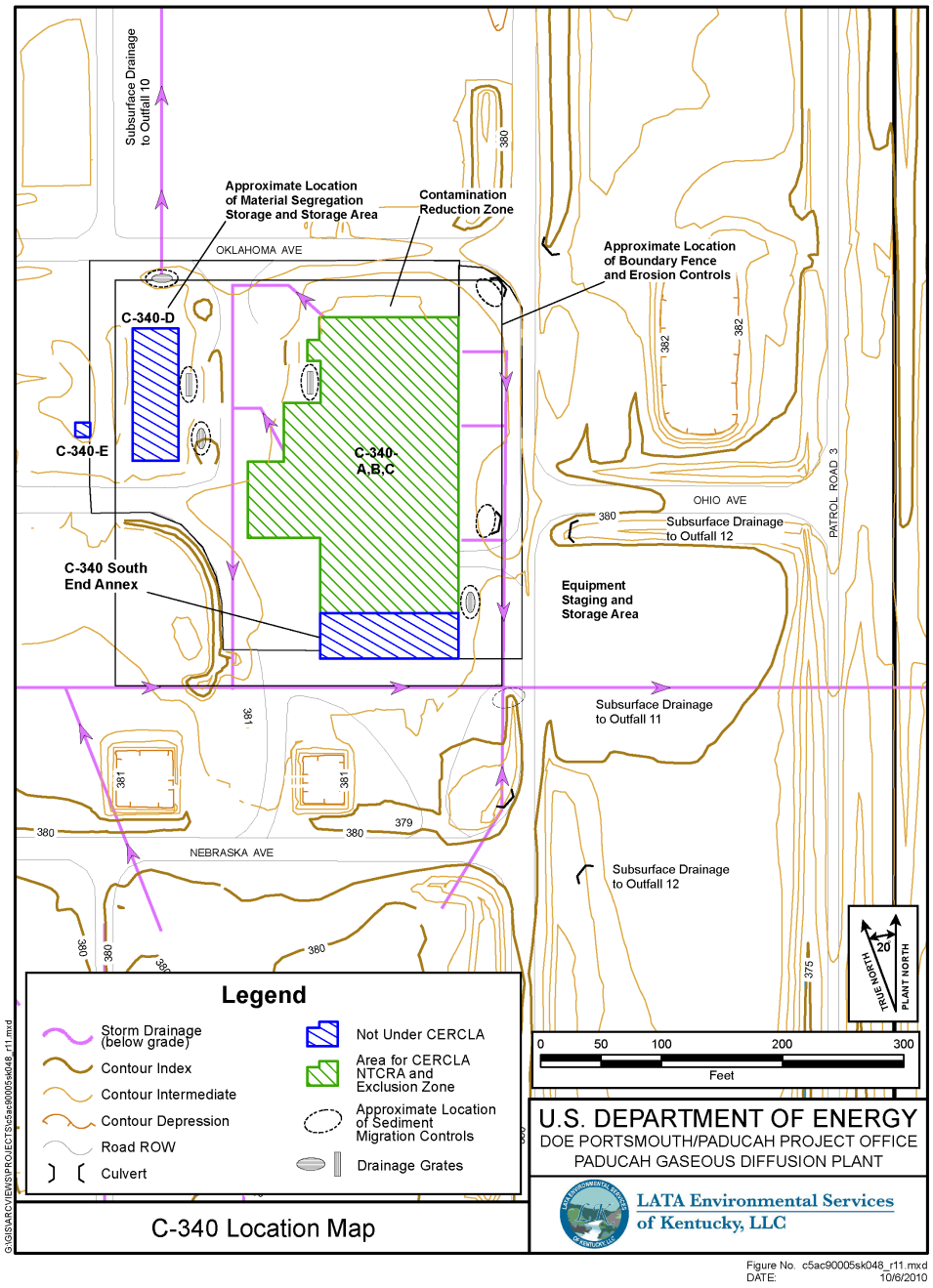

Figure 1. Location of the C-340 Complex Removal Areas

Figure 2. C-340 Building Looking East

The radiological contamination in the C-340 Metals Reduction Plant Complex is comprised of surface contamination from the historical processes performed in the facility. Uranium currently present in the C-340 Metals Reduction Plant Complex exists as residual UF_4 powder, present in the facility as residual/leftover material in process equipment and uranium metal. The chemical hazards that are known to exist in the C-340 Metals Reduction Plant Complex include lead and/or other heavy metals and PCBs in paint; ACM in the transite siding; mercury; and metals-contaminated dusts (potentially containing lead, arsenic, beryllium, or other heavy metals). The presence of contamination is known based on process knowledge and data from sample analyses. A summary of the data was presented in the Engineering Evaluation/Cost Analysis (EE/CA) (DOE 2010b; Attachment 2).

2.2 C-340 COMPLEX DEACTIVATION AND DEMOLITION

The approved AM (DOE 2010a) documented the decision to demolish the C-340 Complex to ground, and the EE/CA (DOE 2010b) provided the justification for that decision. The demolition, as planned, would leave the C-340 Complex in a safe configuration, with basements and foundations remaining and subgrade pits filled in with flowable fill. The slabs and basements will be addressed by post-PGDP response actions. Additionally, the stored materials and waste, along with any contaminated process equipment, have been removed under DOE's authority and in accordance with all applicable regulations. The stored material and contaminated equipment removal was referred to as "deactivation" in the current AM. The decision to demolish the C-340 structure has not changed. The deactivation activities proceeded as described in the 2010 AM and are complete. As plans were developed for demolition of the structure, the risk to response action workers became a concern and alternate methods of transite removal were developed. This Addendum is being presented to propose an alternate transite removal approach that will address those concerns.

2.3 METEOROLOGIC CONDITIONS AT PGDP

Information on wind direction and speed was obtained from the on-site meteorological tower that was maintained at PGDP from 1989 to 1993. The data is from 60 ft above ground surface. Figure 3 illustrates the wind rose for the average annual wind speed and direction. The average prevailing wind has a speed of 9.8 miles per hour and blows from directions varying from south to southwest. Generally, stronger winds are observed when the winds are from the southwest.

3. THREATS TO PUBLIC HEALTH AND THE ENVIRONMENT

The threats to public health and the environment posed by the C-340 Complex have not changed since there were described originally in the currently approved AM (DOE 2010a) and EE/CA (DOE 2010b).

4. STATUTORY LIMITS ON REMOVAL ACTIONS

Because the removal action will be performed and funded by DOE, it is not subject to the fund-financed cost limitations of 12 months and $2 million prescribed in 40 *CFR* § 300.415(a)(5). The original ARARs from the EE/CA remain in effect, except for those waived, as described in Sections 1 and 5 of this document. One ARAR is being added, as well.

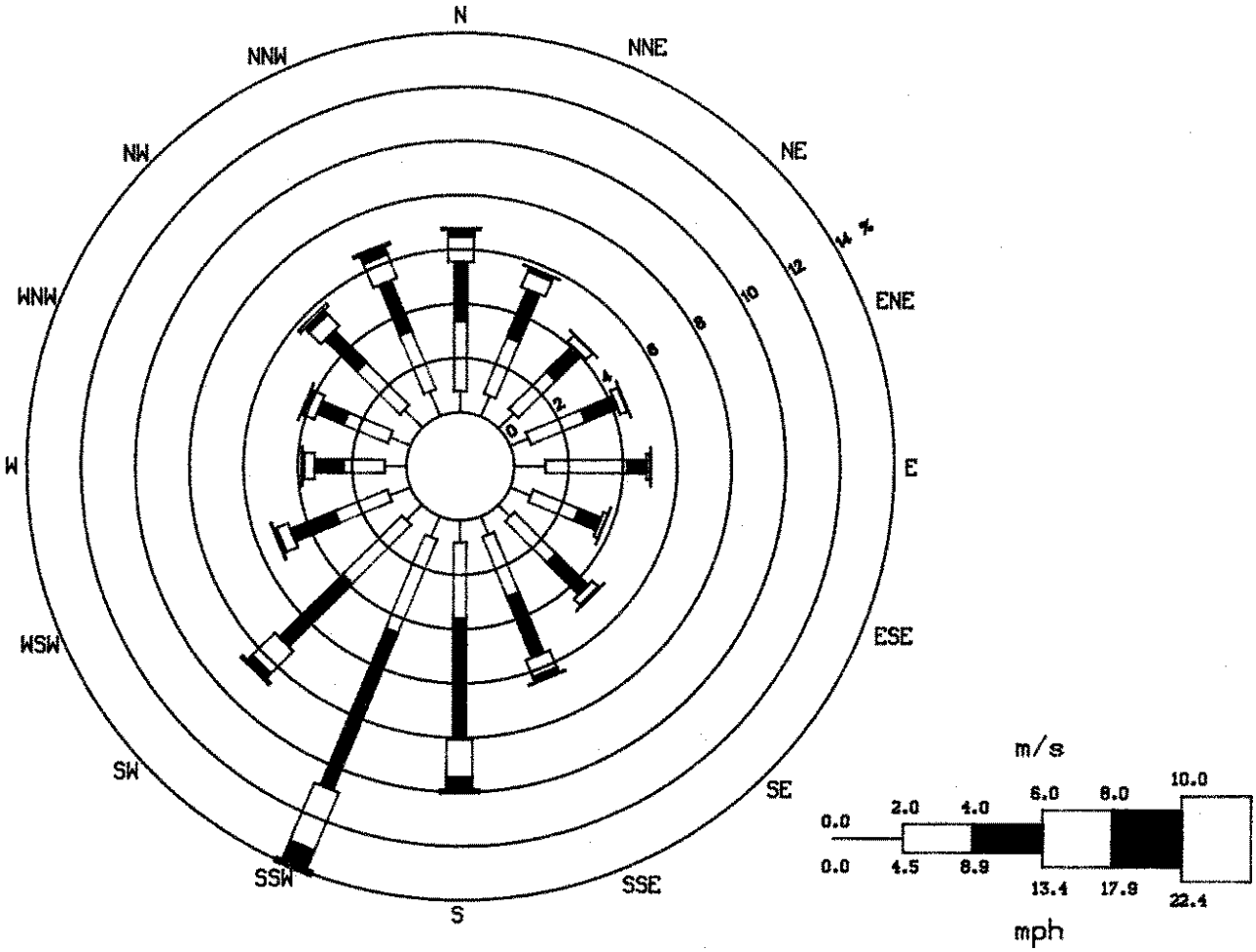

Figure 3. Wind Rose of PGDP

5. PROPOSED ACTIONS AND ESTIMATED COSTS

As stated previously, there are three purposes for this Addendum:

(1) Document the decision to remove the transite panels by peeling them off the sides of the C-340 Complex with heavy equipment using enhanced work controls to minimize the potential for prior to demolishing the C-340 Complex. This is a change in the removal action described in the airborne asbestos releases, rather than removing them manually and then lowering each board to the ground AM signed on May 6, 2010 (DOE 2010a).

(2) Present justification for an ARAR waiver that pertains to removal and handling of transite and will be necessary to conduct the demolition with alternate work practices.

(3) Add an ARAR relating to the maximum allowed concentration of asbestos in wastewater to account for the increased volumes of water that will be generated while implementing the alternative work practices described below.

5.1 BASIS FOR PROPOSAL

Transite panels are considered Category II nonfriable ACM and, as such, EPA guidance states that demolition activities using heavy equipment could cause it to become regulated ACM. Therefore, state and federal guidelines require that transite panels be removed manually and lowered to the ground prior to demolishing the structure to which they are attached to prevent the panels from being crumbled, pulverized, or reduced to powder. The request for a waiver to the specific ARARs listed in Section 2.1 includes a commitment to use alternate work practices to ensure that asbestos fibers outside the demolition zone or ARA will not have concentrations above 0.01 fiber/cc or no more than background, whichever is greater. This level of 0.01 fibers/cc is established by OSHA and EPA's Asbestos in Schools rules for unrestricted occupancy of a facility from which asbestos has been abated [401 *KAR* 58:040 § 4(1)(s); 29 *CFR* § 1926.1101(g)(4)(ii)(B); and 40 *CFR* § 763.90(i)(5)].

Transite panels will be removed prior to structural demolition with heavy equipment, such as an excavator with a grapple, thumb and bucket, or other attachment, by raking or peeling the asbestos off the structure from the top down prior to demolition. The work controls that will be implemented during the transite removal activities are described in the following section and will result in a standard of protection to human health and the environment that is equivalent to that which would be achieved by manual removal of transite panels, which is 0.01 fibers/cc, or no more than background, whichever is greater, as stated previously.

5.2 CONTROLS DURING DEMOLITION

Controls employed during demolition of the C-340 Complex and disposal of the resulting wastes will consist of engineered work controls, administrative controls, and PPE controls. These work controls will reduce the potential for releases to the environment and provide the same protection to human health and the environment as would be provided if ARAR-related work practices were implemented. Controls similar to the ones described below were used at DOE/RL's Hanford Site and indicated effectiveness in preventing airborne releases above the clearance levels (0.01 fibers/cc) or no more than background, whichever is greater. The level of 0.01 fibers/cc is found in 401 *KAR* 58:040 § 4(1)(s) for abatements and in 29 *CFR* § 1926.1101(g)(4)(ii)(B), which points to 40 *CFR* § 763.90(i)(5). This concentration is required by OSHA and EPA's Asbestos in Schools rules for occupancy of a facility from which asbestos has been abated.

The potential for accidents from health and safety hazards also will be reduced by implementation of these controls. Each type of control is discussed in the following subsections.

5.2.1 Engineered Work Controls

The following work controls will be executed sequentially during demolition of the C-340 Complex.

- Applying fixative—Fiberlock Technologies Asbestos Binding Compound (ABC®) Fiberspray[1] has been used on all of the interior and exterior surfaces of the C-340 Complex to minimize releases of asbestos fibers and radiologically contaminated particles during demolition. The fixative consists of a surface coating that binds the outer most layers of surfaces together, making the particles that are released during demolition heavier and less likely to become airborne. During demolition, this fixative or an equivalent will be used, according to conditions each day. Figures 4 and 5 show the C-340 Complex before and after ABC® Fiberspray was applied. Attachment 3 includes the manufacturer's description and specifications sheet for ABC® Fiberspray, as well as literature about other products made by other manufacturers that are expected to be used throughout this project.

- Using personal decontamination units for site access and egress—Personal decontamination units will be placed at the job site through which personnel who enter or leave will be required to go to change into or out of the PPE required for an asbestos abatement, chemical contamination, and radiological contamination job. PPE requirements are discussed below. The decontamination units are expected to be placed in the southeastern corner and are expected to be trailer-mounted units.

[1] Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof or its contractors or subcontractors.

Figure 4. C-340 Complex before Application of ABC® Fiberspray

- Establishing boundaries—The boundaries of the demolition zones and ARAs are expected to be established at approximately 75–100 ft from area of the C-340 Complex where demolition is occurring on any given day. An ARA will be established inside or parallel to this boundary. Employees entering the ARA will have, at a minimum, asbestos awareness training. The employees who will be physically involved with transite removal, debris cleanup, and waste packaging will be asbestos-certified workers, in accordance with 29 *CFR* § 1926.

- Excavating a water collection trench—A trench will be excavated around the C-340 Complex, where necessary, to collect the water used for dust suppression during demolition. It will be located close to the exterior wall and will drain to one or more collection basins. The water in the collection basins will be filtered down in successive units to a 5-micron screen. Other treatment will be performed, as needed, to meet KPDES discharge requirements or, if discharge is not feasible, the water will be treated off-site. The trench will catch small pieces of transite that come off during its removal and will divert water used during demolition. The trench will be marked as a tripping hazard.

Figure 5. C-340 Complex after Application of ABC® Fiberspray

Upon completion of the job, the trench will be excavated, backfilled with clean material, and the excavated material will be disposed of as asbestos waste, radiologically contaminated waste, PCB waste, or any combination of these waste types.

- Placing heavy plastic sheeting on unpaved areas under transite removal areas—While transite panels are being removed from the building structure, at least one layer of plastic sheeting will be put on unpaved areas to collect them. After an area has been cleared of transite, the plastic will be rolled up and the transite/plastic package will be disposed of as ACM. This will minimize the release of asbestos fibers to surrounding soil.

- Staging equipment to use water for asbestos fiber and dust suppression—In order to minimize the release of asbestos fibers and radiological contamination into the atmosphere, water will be used at the working face of the transite removal process and on demolition debris piles on the ground.

- Combined use of a fogger, such as a DustBoss®, and a fire hose will ensure that adequate amounts of water are applied at various places in the demolition area to prevent asbestos fibers and dust particles from becoming airborne.

- Placing transite panels on plastic prior to disposal—Transite panels located over paved areas around the C-340 Complex will be placed on plastic after they have been removed. The plastic will be rolled up and the transite/plastic package will be disposed of as ACM. The areas onto which the transite panels fall after being taken off of the structure are expected to be cleaned either by vacuuming or wet sweeping.

- Putting all ACM waste going to the C-746-U Landfill in a dust-tight bag, such as Lift-Liner™, Super Sack®, or their equivalent—In order to ensure that no asbestos fibers become airborne during transport to the C-746-U Landfill, the transite/plastic package will be transported to the C-746-U Landfill in a bag such as a Lift-Liner™, Super Sack®, or their equivalent. Manufacturer's literature for both of these products is included in Attachment 3. Whenever feasible, intact or nearly intact transite panels will be stacked, double wrapped, and transported to the C-746-U Landfill in a manner that will minimize release of asbestos fibers. For waste that requires off-site disposal, all shipping will be done in accordance with U.S. Department of Transportation regulations.

- Capturing water used for asbestos control—The water used to control the release of asbestos fibers and dust, as well as the precipitation that falls on the demolition area, will be collected, filtered to remove asbestos fibers, and treated to meet KPDES discharge limits, if necessary. The resulting filter cake will be disposed of as ACM, radiologically contaminated waste, PCB waste, or any combination of these, as required.

- Verifying the structure is not ACM—Upon complete removal of the transite from the main structures of the C-340 Complex, such as A, B, or C, the remaining structure will be inspected visually and monitoring results will be verified that they are equal to or less than 0.01 fibers/cc or no more than background, whichever is greater, prior to down-posting the ARA.

The following activities will be implemented throughout the proposed project.

- Control of vehicle access—Traffic will be limited to a single direction while at the demolition area. This will minimize the possibility of accidents caused by heavy and/or uncontrolled vehicular traffic on the demolition area.

- Vehicles leaving the job site—After being loaded with waste transite, the tires on the vehicles transporting it to the C-746-U Landfill may be washed, wiped, or inspected to ensure removal of any asbestos fibers that may have adhered to the tires while it was in the ARA. A waste loading area will be designated for this purpose, and it is expected to be in northwest of the C-340 Complex. The water

used, if any, will be collected and filtered to remove asbestos. Other treatment will be conducted, as necessary, to meet KPDES discharge limits or for off-site treatment, as required.

- Using wet methods during demolition—A mister and fire hose serve the same purpose as applying fixative, but are used during demolition, rather than prior to it. The water droplets that are disbursed over the area of the structure being demolished will cling to particles that are released when surfaces are broken, and the dust particles become heavier and fall to the ground more quickly than they would without the water. Chemicals may be added to the water to make it cling more readily to the surfaces undergoing demolition. Multiple DustBosses® or an equivalent misting apparatus and at least one fire hose will be used during the demolition to control dust and the release of asbestos fibers. Figure 6 shows misting with a DustBoss® and Figure 7 shows dust suppression using a fire hose.

Figure 6. A DustBoss® Being Used for Dust Suppression

- Using wet methods during waste handling—Wet methods during waste handling serve the same function and purpose as they do during demolition.

- Minimizing the demolition area—The areas where the buildings are razed will be kept to a minimum, keeping the area where contamination might be spread as small as possible.

Figure 7. Using a Fire Hose for Dust Suppression during Building Demolition

- Applying an alternative daily cover at the demolition area—In the event that circumstances, such as the quick onset of bad weather, prevent asbestos-containing demolition debris from being packaged on the same day that it is generated, Posi-Shell® mineral mortar coating, or a similar alternative daily cover, will be applied to prevent any fibers from becoming airborne while the pile is unattended. The alternative daily cover may be used periodically during a work shift if conditions, such as high winds, warrant its use. Figure 8 shows an application of alternative daily cover at a landfill. A description and brief specs for Posi-Shell® are included in Attachment 3 of this document.

The following will be the final work control practice during the C-340 Complex demolition.

- Cleaning tools and equipment exiting the ARA—All smaller materials, such as hand-held instruments and tools, will be inspected visually and wet wiped prior to leaving the ARA.

Figure 8. An Example of Applying Alternative Daily Cover at a Landfill

5.2.2 Administrative Controls

At least two administrative controls will be used throughout the demolition of the C-340 Complex:

(1) Reducing personnel in demolition zone will minimize foot traffic in areas where heavy equipment with limited visibility is operating, and

(2) Ensuring that all personnel in the work zone are trained in asbestos recognition and handling, per 29 *CFR* § 1926.1101, will prevent the inadvertent release of fibers by uninformed response action workers.

5.2.3 Personal Protective Equipment Controls

While demolition and waste handling are underway, all personnel within the ARA will be required to wear PPE appropriate for his/her assignment. Personnel in the ARA will be required to wear a full-body suit with hood, gloves, booties, and a PAPR while asbestos activities are underway. The same

requirements will apply at the C-746-U Landfill, if wastes disposed of there are primarily ACM. PPE requirements in the ARA will remain in effect until the area is cleared for non-asbestos activities. Figure 9 shows a PGDP worker in PPE, as described above.

Perimeter monitoring of the ARA and personnel monitoring, as described in the forthcoming revised RAWP, will be used to verify the effectiveness of the controls during removal of transite panels. Monitoring results will be reviewed in a timely manner and the results will be made available to the workers and management, in accordance with 29 *CFR* § 1910 and 29 *CFR* § 1926.

Figure 9. A PGDP Worker in Full-Body Suit with Gloves, Hood, Booties and a PAPR

5.3 ARAR WAIVER

As stated, this ARAR waiver request is based on a provision of CERCLA: 40 *CFR* § 300.430(f)(1)(ii)(c)(4). This is known as the "Equivalent Standard of Performance" waiver (EPA 1988) and is described below along with a description of methods to address transite panels using alternate work practices to ensure that the criteria for applying the waiver are met.

The ARARs for which waivers are requested include regulations requiring removal of transite prior to demolition and those that specify the means by which it is lowered to the ground after being removed. Specifically, the regulations are these:

40 *CFR* § 61.145(c)(1)	401 *KAR* 58:040 § 4(2)(a)
40 *CFR* § 61.145(c)(2)(ii)	401 *KAR* 58:040 § 4(1)(i)
40 *CFR* § 61.145(c)(6)(ii) and (iii)	401 *KAR* 58:040 § 4(1)(j)

The Kentucky regulation 401 *KAR* 58:025 § 2 incorporates by reference all of the federal asbestos NESHAPs regulation; therefore, the aspects of the regulations cited above that also would be included in 401 *KAR* 58:025 § 2 are being included in this waiver request.

Work practice standards, instead of emission standards, are used to control releases of asbestos fibers into the atmosphere. The work practice standards were developed per Section 112 (e) of the Clean Air Act and are promulgated in 40 *CFR* Part 61, Subpart M. The work practice standard states that all regulated ACM must be removed prior to demolition or renovation of any facility, unless it is a Category II nonfriable ACM and the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition. Transite panels, such as those on the exterior walls of the C-340 Complex, are considered Category II nonfriable ACM; however, EPA guidance states that demolition activities using heavy equipment could cause such material to become regulated ACM. Therefore, state and federal guidelines require that it be removed manually and lowered to the ground prior to demolishing the structure to which they are attached so that is does not become crumbled, pulverized, or reduced to powder. The request for a waiver to the specific ARARs listed above includes a commitment to use the alternate work practices listed in Section 5.1 and air monitoring described in Section 5.2 to ensure that asbestos fibers are not released outside the ARA boundary above the threshold values of 0.01 fiber/cc or no more than background, whichever is greater. This level of 0.01 fibers/cc is established by OSHA and EPA's Asbestos in Schools rules for unrestricted occupancy of a facility from which asbestos has been abated [401 *KAR* 58:040 § 4(1)(s); 29 *CFR* § 1926.1101(g)(4)(ii)(B); and 40 *CFR* § 763.90(i)(5)].

5.4 ARAR ADDITION

Based on the work controls being proposed under this Addendum, the potential exists for generation and controlled discharge of asbestos-contaminated wastewater to surface waters through existing KPDES outfalls. DOE will comply with the substantive requirements for such discharges by adding and implementing the following in-stream asbestos-related requirements contained in Table 1 of 401 *KAR* 10:031 § 6 (see Table 1 below).

Table 1. Additional ARAR Proposed for C-340 Demolition

Action	Requirement	Prerequisite	Citation
Discharge of wastewater to Surface Water	Numeric water quality standards in Table 1 of 401 *KAR* 10:031 § 6 establishes an allowable in-stream concentration of 7 million fibers/liter for asbestos in surface waters or discharged into surface waters	Discharge of asbestos contaminated wastewater to surface waters—applicable	401 *KAR* 10:031 § 6, Table 1

5.5 EQUIVALENT STANDARD OF PERFORMANCE

According to EPA guidance, this waiver may be used in situations where an ARAR stipulates use of a particular design or operating standard, but equivalent or better response results could be achieved using an alternative design or operating standard (EPA 1988). This waiver applies when a response action that does not comply with a particular federal or state standard or requirement of environmental law provides the same level of control as that standard or requirement through an alternative means of control. This allows flexibility in the choice of removal method, provided it achieves the same level of protectiveness. EPA guidance identifies the following factors for consideration when evaluating application of this waiver:

- The time required to achieve beneficial results using the alternative remedy is equal to or less than the original ARAR. An alternative that achieved similar results in significantly less time should be considered as advantageous;

- Degree of protection of health, welfare, and the environment (e.g., environmental concentration achieved) is equal to or greater than that under the original ARAR;

- Level of performance achieved compared to that specified in the ARAR (e.g., concentration of residuals); and

- Reliability of the remedy. The potential for the alternative ARAR to continue to be protective into the future is equal to or greater than that afforded by the ARAR to be waived (EPA 1988).

5.5.1 Time Required

The time required for manual transite panel removal from C-340 is approximately 40–60 days. The alternate work practice is to remove the transite with long-reach heavy equipment, after which it will be dropped to the ground or paved surface. The total time required to remove the transite from each of the structures that comprises the C-340 Complex using heavy equipment will be approximately 15 days. This results in an approximate time savings for the project of 25–45 days.

5.5.2 Degree of Protection

The degree of protection to human health and the environment will be the same for either of the methods of addressing transite. Experience with other projects at PGDP has shown that manual removal of asbestos panels is likely to result in breaking most of them because they are very heavy (approximately 170 lb) and handling them is cumbersome; therefore, some asbestos fibers will be released. Furthermore, large area misting of the work surface during manual removal is not feasible because the water would impede the workers' ability to see and handle the panels. Also, because of winds at the height of the C-340 Complex, fibers released during manual removal will not be controlled and may disperse farther than they would if the panels were removed by a method that would allow large area misting. By removing the panels from the structure with long-reach heavy equipment and misting the working face of the removal area, the release of asbestos fibers to the atmosphere will be minimized. The panels will be wet when they are dropped, thereby minimizing the release of asbestos fibers. The broken panels will be wrapped so that asbestos fiber releases are minimized. Removing the panels with long-reach heavy equipment protects the environment because it allows for large area misting while panels are being removed.

The degree of worker protection from exposure to asbestos fibers for either method of addressing transite is essentially the same because PPE requirements will remain the same. DOE requires all personnel in the ARA to wear full-body protective suits, including gloves, booties, hoods, and PAPRs with lapel samplers. It is DOE's policy that all personnel in the ARA be monitored for potential exposures in accordance with 29 *CFR* §1926.1101, *Asbestos*. Asbestos air sampling will be conducted at the perimeter of the ARA to verify that the proper controls are in place and to ensure that there is no migration of airborne asbestos from the ARA above the 0.01 fibers/cc limit, or background, whichever is greater. Upon completion of demolition and waste handling operations, the regulated areas will be cleared for normal occupancy in accordance with 29 *CFR* § 1926.1101, *Asbestos*.

Ambient air sampling will be conducted in addition to ARA perimeter monitoring to determine the effects of the alternate work practices at the locations depicted in Figure 10.

5.5.3 Level of Performance

Two relevant standards to measure the level of performance for the different methods of addressing transite are as follows:

(1) The *releases of asbestos fibers* into the atmosphere, and
(2) The *exposure to the fibers*.

Releases of fibers. Experience with manual removal of transite panels on other buildings at PGDP has shown that there will be some breakage and release of asbestos fibers because the 50-year-old panels are heavy and cumbersome to handle. This will result in releases of fibers to the environment, which cannot be controlled by large area misting because that would impede the workers' ability to see and handle the panels. The alternate work practices proposed in this document will prevent releases of asbestos fibers into the environment beyond the demolition zone/ARA by application of fixative and using wet methods, whenever feasible.

Exposure to the fibers. Exposure of collocated workers to asbestos fibers at PGDP will be controlled by limiting access and ensuring that no unauthorized personnel are in the area during demolition and waste handling operations. Application of fixative to the interior and exterior surfaces of the transite panels and large area misting will minimize the release of fibers during demolition, waste handling operations, and waste transportation operations. Exposure of nearby populations will be controlled by application of fixative prior to demolition and using wet methods of dust suppression during transite removal and demolition. Ambient air sampling will be conducted in addition to ARA perimeter monitoring to determine the effects of the alternate work practices at locations distant from the demolition zone and ARA.

Response action workers will be protected from exposure to asbestos fibers by the same PPE, training, and administrative controls regardless of the method used to address transite panels. The alternative work controls implemented to control releases of fibers will result in minimizing the probability of exposure of workers to those fibers.

5.5.4 Reliability of the Remedy

The long-term reliability of the remedy, demolition, is not affected by the manner of transite removal used. Either method of transite removal that could be used during building demolition will result in eliminating the risks posed by uncontrolled releases from the deteriorating structure. The proposed alternate transite removal method is a reliable method for minimizing risks to workers and off-site populations.

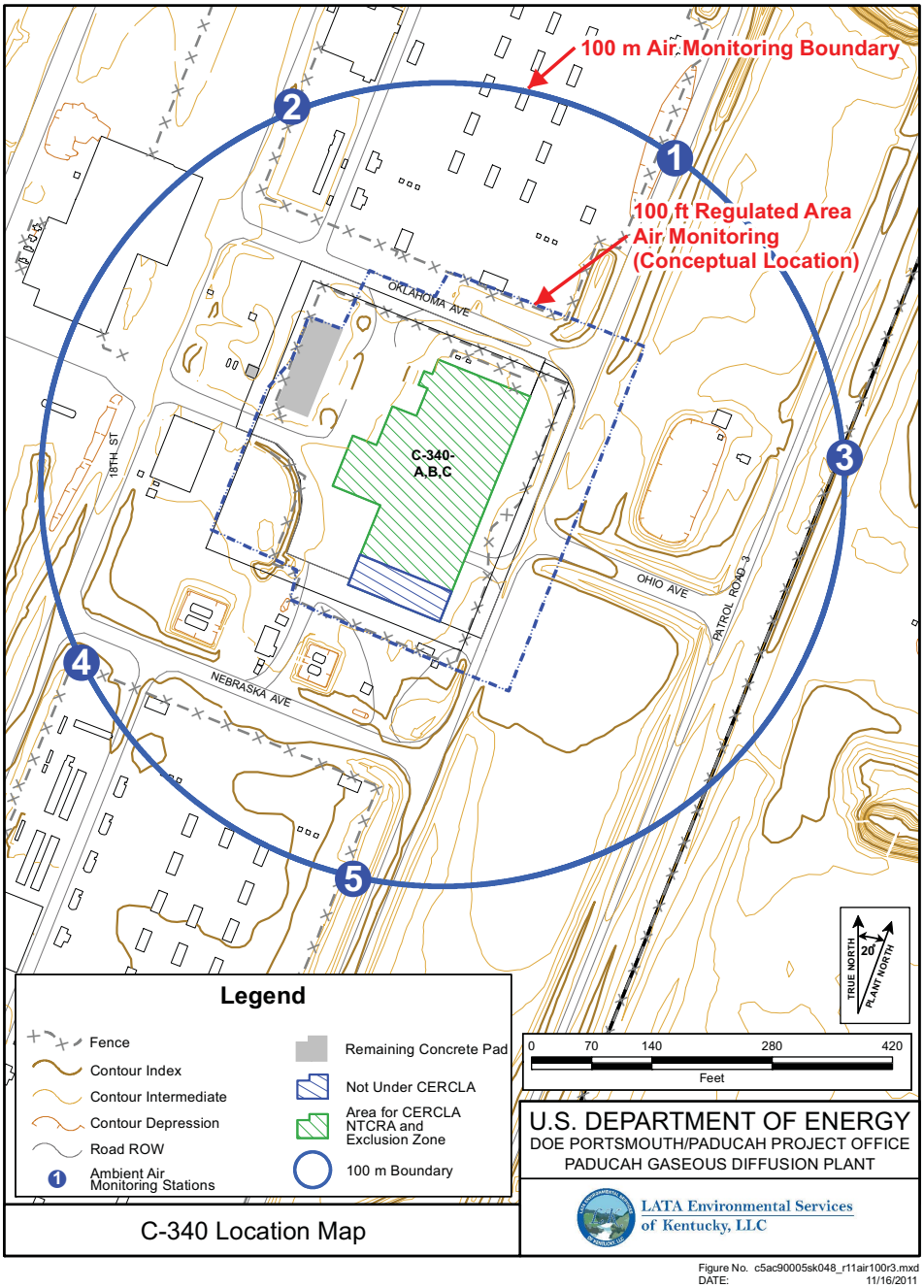

Figure 10. Ambient Air Sampling Locations

5.6 DESCRIPTION OF AIR MONITORING DURING TRANSITE REMOVAL AND DISPOSAL

Two types of air monitoring will be conducted during the C-340 Complex demolition: ARA perimeter monitoring and ambient air monitoring. The ARA perimeter monitoring is required by OSHA during asbestos removal activities and is used to ensure that proper controls are in place and are effective. Ambient air monitoring will be conducted during the C-340 demolition to determine the effects, if any, at locations distant from the demolition area and the ARA, where the proposed alternate work practices for transite removal will be implemented.

5.6.1 Asbestos Regulated Area Sampling and Monitoring

The boundaries of the demolition zones and ARAs are expected to be established at approximately 75–100 ft from the area of the C-340 Complex where demolition is occurring on any given day. The actual boundaries of the zones will change according to the planned activities and wind conditions each day. The ARA will be established by the asbestos supervisor and industrial hygiene during asbestos removal and handling activities. Asbestos air sampling will be conducted at the perimeter of the ARA to verify that the proper controls are in place and to ensure that there is no migration of airborne asbestos from the regulated area above the 0.01 fibers/cc limit, or no more than background, whichever is greater.

In the event that the air sampling results are above the established limit outside the ARA boundary, the work will be stopped temporarily; the current controls will be assessed; current controls will be modified, as necessary, such as applying more water or fixative; and the regulated area may be expanded. Additional air samples also may be collected to ensure that asbestos fibers are less than 0.01 fibers/cc or no more than background, whichever is greater.

5.6.2 Ambient Air Monitoring

Ambient air sampling will be conducted in addition to ARA perimeter monitoring to determine the effects of the alternate work practices at locations distant from the demolition zone and ARA. The proposed ambient air sampling locations for the C-340 demolition are based on the meteorological conditions described in Section 2.2 and are shown in Figure 10. Sampling units 1, 2, and 3 are located approximately 330 ft downwind of the C-340 facility. Units 4 and 5 are located approximately 330 ft upwind of the C-340 Complex, based on the prevailing wind directions at PGDP. Because the second most prevalent wind direction is from an arc from northwest to north, locations 1, 2, and 3 may become the upwind samplers and locations 4 and 5 will become the downwind samplers should that occur.

5.7 COSTS

The total estimated cost to demolish the C-340 Complex is $10.6 million. The cost of manual removal is approximately $1 million more than mechanical removal. Because cost is dependent on the actual waste type and volume, the estimated cost may vary after the wastes are characterized fully and the actual waste volumes are known. Because this action will take place in the near-term, the escalated and unescalated/present worth costs are identical.

6. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Should demolition of the building structures be implemented without using alternate transite panel work practices, workers will be subject to additional risk because of the necessity of using "window-washer" scaffolding that hangs from the roof of the structure on the C-340 Complex. Because this type of scaffolding is unstable, the primary risk from manually removing the transite will be that of falling from the high elevations. These risks are eliminated by using alternate work practices along with alternate work controls to prevent releases of and exposure to asbestos fibers.

During alternate methods of addressing transite, the risks of serious injuries and fatalities from falls are largely eliminated. The risks that remain during the alternate work practices for addressing transite are much less severe. The probability of a serious injury or fatality from falls by personnel stationed on the ground is much less than for those on elevated work stations up to 120-ft high.

7. PUBLIC PARTICIPATION

The regulations contained in the NCP of CERCLA (Subpart E of 40 *CFR* § 300) do not address explicitly the public participation requirements for issuing an Addendum to a previously approved Action Memorandum that changes the method of accomplishment of the original removal action. In regulation, 40 *CFR* § 300.820 (a)(4), it does indicate that documents generated or received after the decision document is signed shall be added to the Administrative Record file only, as provided in 40 *CFR* § 300.825, which, in turn, references 40 *CFR* § 300.435(c)—the community relations requirements for remedial action.

DOE has considered public participation requirements established for changes to signed decision documents for remedial actions as a guideline for this change. Accordingly, this Addendum will follow a similar process to that under 40 *CFR* § 300.435(c)(2)(i), which provides for issuing an explanation of

significant differences when the proposed change does not alter fundamentally the basic features of the selected response action with respect to scope, performance, or cost. Additionally, DOE also plans to hold a public meeting to solicit public comments on the proposed change. The proposed change to the C-340 Metals Reduction Plant Complex Removal Action will continue to implement the fundamental components of the originally selected action—dismantlement and disposition of the facility. Changing the manner in which transite panels are addressed does not alter fundamentally the management approach for any hazardous waste, result in generation of different classifications of waste streams, or adopt the use of any new or different treatment or disposal methods.

Upon approval of this Addendum by the Kentucky Department for Environmental Protection and EPA, a public notice will be published in the *Paducah Sun,* or other appropriate local newspaper, briefly summarizing the difference described in Section 5, including the reasons for the difference. The Addendum also will be made available to the public in the Administrative Record file at DOE's Environmental Information Center in Paducah, Kentucky; the McCracken County Public Library also in Paducah; and the Kentucky Division of Waste Management in Frankfort, Kentucky.

8. RECOMMENDATION

This decision document represents the selected removal action, as modified, for the C-340 Complex in Paducah, Kentucky, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the site. The costs savings for this recommendation are described in Section 5.7 above. The effectiveness, implementability, and endangerment determination of the modified action have not changed from the original action as described in the 2010 AM. A request to waive certain ARARs, as well as adding one more, is included in the action described in this document.

The change for the removal action as described in this Addendum provides for both short-term and long-term protectiveness; meets the NCP criteria contained in 40 *CFR* § 300.415(b)(2); and is consistent with the joint DOE and EPA policy (DOE and EPA 1995), dated May 22, 1995, for conducting decommissioning activities under CERCLA.

Approval

William E. Murphie, Manager
Portsmouth/Paducah Project Office
U.S. Department of Energy

11/22/11
Date

Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0290&D2/A1
Primary Document

The following attachments are enclosed with this Action Memorandum Addendum.

1. *Action Memorandum for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter Non-Time Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0290&D2, U.S. Department of Energy, Paducah, KY, May.

2. *Engineering Evaluation/Cost Analysis for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0131&D2/R1, U.S. Department of Energy, Paducah, KY, March.

3. Specification Sheets for ABC® and Posi-Shell® and Container Sizing Information for Super Sack® and Lift-Liner™.

9. REFERENCES

DOE (U.S. Department of Energy) and EPA (U.S. Environmental Protection Agency) 1995. *Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, Washington, DC, May.

DOE 2010a. *Action Memorandum for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter Non-Time Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0290&D2, U.S. Department of Energy, Paducah, KY, May.

DOE 2010b. *Engineering Evaluation/Cost Analysis for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0131&D2/R1, U.S. Department of Energy, Paducah, KY, March.

DOE 2010c. *Removal Action Work Plan for the C-340 Complex Decommissioning Project at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0344&D2, U.S. Department of Energy, Paducah, KY, October.

DOE 2011. *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0348&D2/R1, U.S. Department of Energy, Paducah, KY, May.

EPA 1988. *CERCLA Compliance with other Laws Manual*: Interim Final, EPA/540/G-89/009, August.

EPA 1990. *Superfund Removal Procedures Action Memorandum Guidance*, EPA/540/P-90/004, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, DC, December.

EPA 1998. *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*. U.S. Environmental Protection Agency, Atlanta, GA, February 13.

U.S. Department of Energy Office of Environmental Management

Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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Attachment 1 on CD

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Attachment 2 on CD

Engineering Evaluation/Cost Analysis for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0131&D2/R1

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DOE/LX/07-0290&D2/A1

Primary Document

ATTACHMENT 3

SPECIFICATION SHEETS FOR ABC® AND POSI-SHELL® AND CONTAINER SIZING INFORMATION FOR SUPER SACK® AND LIFT-LINER™

U.S. Department of Energy Office of Environmental Management

Action Memorandum Addendum for the C-340 Metals Reduction Plant Complex at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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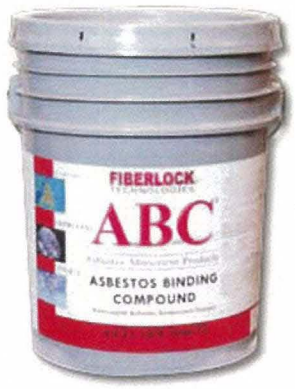
ABC®

Professional Asbestos Encapsulant/Sealant

10 Point Specification



1. Product Name
A-B-C® asbestos binding compound Encapsulant/Sealent System for Asbestos-Containing Materials

2. Manufacturer
Fiberlock Technologies, Inc.
150 Dascomb Road
Andover, MA 01810 USA
Toll Free: 800-342-3755
Fax: 978-475-6205
www.fiberlock.com

3. Product Description
BASIC USE
- A-B-C is a high-solids water-based encapsulant/sealant system designed for multiple uses including penetrating and bridging for most types of asbestos-containing materials (ACM).
- In 1978, A-B-C was tested by Battelle Laboratories of Columbus, Ohio, and found to meet or exceed the requirements for the effective encapsulation of asbestos-containing materials.
- A-B-C is class "A" fire rated.

COMPOSITION & MATERIALS
A-B-C is a water-based coating formulated with advanced 100% acrylic resins.

SIZE
Packaged in 5 gallon pails and 55 gallon drums.

YIELD
The coverage of A-B-C varies depending upon the porosity of the substrate. As a penetrating encapsulant for fibrous asbestos, estimate 50-75 sq.ft./gal. after dilution. For well-adhered asbestos, A-B-C should be applied full strength as a bridging agent at a rate of 50-100 sq. ft./gal.

COLORS
A-B-C is available in off-white (#6421), clear (#6422) and green (#6423), or can be custom tinted.

LIMITATIONS
Do not use A-B-C on surfaces which are not in a condition suitable for encapsulation. Do not apply A-B-C when the atmosphere and surface temperatures are below 50°F. The maximum surface temperature limits for A-B-C are 180°F constant, or 250°F intermittent.

4. Technical Data
PHYSICAL/CHEMICAL PROPERTIES
Refer to Table 1 for physical and chemical properties of A-B-C.

APPROVALS
- A-B-C has been tested at Battelle Laboratories, and met or surpassed the EPA requirements for effective asbestos encapsulation.
- German approval: iBMB-TU- Braunschweig.

FIRE RATING
A-B-C has a Class "A" fire rating when tested in accordance with ASTM E84-81a, with a Flame Spread of "10" and Smoke Developed of "5".

ENVIRONMENTAL CONSIDERATIONS
A-B-C is a VOC compliant water-based non-toxic coating.

5. Installation
PREPARATORY WORK
Prior to application, it is important to determine if the existing asbestos matrix is well-adhered to the substrate.

SURFACE PREPARATION
Correct any surface defects and clean all surfaces thoroughly with an approved vacuum or wet rag. Do not air clean or sand surfaces, this could increase asbestos exposure.

MIXING
Stir A-B-C thoroughly to achieve a uniform consistency.

APPLICATION METHODS
A-B-C can be successfully applied using all professional brands of airless spray equipment. See Table 2 for recommended settings.

ENCAPSULATION INSTRUCTIONS

PENETRANT- For most fibrous asbestos applications such as "cotton candy" style fireproofing or compressed acoustic material less than 2 inches thick, add 1 part water to 1 part ABC. Using the proper spray equipment settings listed, apply ABC to the ACM until saturated. Multiple passes may be required, allowing time between passes for dissipation of the solution into the matrix. Full saturation is achieved when the ACM will not absorb any more of the encapsulant into the matrix. Coverage, depending on thickness and porosity of the material, can vary between 50 - 75 sq. ft./gal.

BRIDGING AGENT- A qualified asbestos professional should determine the necessary dry film thickness for individual abatement projects. The necessary dry film thickness of a bridging encapsulant for asbestos containing materials (ACM) will vary from project to project as ACM

Properties

Product Specifications	
Solids by Weight ± 2%:	51.4%
Solids by Volume ± 2%:	44.0%
Viscosity at 70°F:	60-75 Kreb Units
Specular Gloss:	82° ± 5 @ 60°
Flash Point:	Non-combustible
Shelf Life:	36 Months Min. (Original Sealed Containers)
Calculated VOC:	56-64* grams/liter

* ABC Calculated VOC dependent on color

ABC complies with the requirements for LEED® EQ Credit 4.2, low-emitting materials: paints and coatings.

Coverage	
Smooth Surfaces:	50-100 ft²/gal
Porous Surfaces:	50-75 ft²/gal

Drying Times (@ 70 - 77°F , 50% R.H.)	
To Touch:	1-2 hours
To Recoat:	12-24 hours
Minimum Application Temperature:	50°F (10°C)

Available Package Sizes	
5 gallon containers	
Weight Per Gallon ± 0.5 lbs:	9.6 lbs/gal

Product Testing	
Fire Rating:	ASTM E84 Class A
Flame Spread:	10
Fuel Contribution:	10
Smoke Density:	5
Test Facility:	Southwest Research Institute

ABC

Professional Asbestos Encapsulant / Sealant

can have a wide range of characteristics, including density, porosity, and surface profile. In the EPA's Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560 / 5-84024, June 1985), the primary instruction regarding dry film thickness states that when encapsulating ACM, the coating is to be applied "considerably thicker than recommended for painting. Coverage should be no more than 100 sq. ft. per gallon and should create a continuous, unbroken coating" (Section 5.1.3, page 5-8).

For bridging applications, apply ABC at full strength with an airless sprayer in accordance with the settings listed below. Typical bridging applications are applied at a coverage rate of 75-100 sq. ft./gallon, which yields a dry film thickness between 6-10 mils on hard, cementitious ACM. For more information, contact Fiberlock or visit our website for the complete Specification for ABC.

REMOVAL/LOCKDOWN

Removal is recommended for loosely adhered ACM. Mix 4 parts water to 1 part ABC and apply to ACM. ABC will facilitate removal by penetrating into the ACM keeping it moist and sticky. After the ACM has been removed, apply 1 part ABC diluted with 1 part water to seal residual fibers left on substrate.

SOIL ENCAPSULATION INSTRUCTIONS

PENETRANT- For encapsulation of soil contaminated with asbestos, add 2 parts water to 1 part ABC. Saturate the soil by applying liberally over the intended areas. Multiple coats can be applied in one application. Coverage is dependent upon the moisture content of the soil. If the soil is damp, expect higher coverage rates.

BRIDGING AGENT- Apply ABC at full strength with an airless sprayer in accordance with the settings listed. If the encapsulated surface is expected to receive repeated foot traffic, apply multiple coasts for additional protection.

PRECAUTIONS

A-B-C must be applied when the atmosphere and surface temperatures during application and for 12 hours thereafter are above 50°F. Protect from freezing. Keep container tightly sealed when not in use. For professional use only.

6. Availability and Cost

AVAILABILITY

A-B-C is available through a network of authorized abatement distributors. Contact Fiberlock Technologies, Inc. at 1-800-342-3755 to locate a distributor in your area.

COST

Material cost can be estimated by dividing the price per gallon from an authorized distributor by the square footage for the particular application.

7. Warranty

Fiberlock Technologies, Inc., warrants A-B-C Asbestos Binding Compound for a minimum of ten (10) years from the date the product is applied to encapsulate asbestos as prescribed in Fiberlock's latest product literature. The warranty described in this paragraph, expressed or implied, is including but not limited to the implied warranties of the salability and fitness for a particular purpose. User shall determine the suitability of A-B-C's use and assume any and all risks and liabilities which may arise in connection with the application of A-B-C. This warranty is extended only to the purchaser of A-B-C and does not apply to any damages which are a direct result of improper surface preparation and or application, including, but not limited to:

1. The failure to properly apply A-B-C Asbestos Binding Compound to a sound surface, which has been cleaned of foreign matter and dry at the time of application.
2. The failure to apply A-B-C Asbestos Binding Compound during non-freezing temperatures appropriate for the product application.
3. The failure to apply A-B-C Asbestos Binding Compound in full accordance with Fiberlock Technologies written application instructions and guidelines.

This warranty does not extend to, nor shall Fiberlock Technologies be liable for any damage resulting from any abuse of the encapsulated surface by tenants or occupants, improper maintenance, water damage, or other conditions beyond Fiberlock Technologies' control. The sole and only liability under this warranty shall be, at Fiberlock Technologies' option, either to replace the product if proved defective or to refund the purchase price paid. The purchaser of this product must notify Fiberlock at 150 Dascomb Road, Andover, Massachusetts 01810 (978-623-9987) within 45 days to advise of any suspected manufacturing defects. This warranty gives the purchaser specific legal rights and possible additional rights which may vary from state to state.

8. Maintenance

If surfaces coated with A-B-C are damaged, repair and re-apply A-B-C immediately. Inspect for damage periodically.

9. Technical Services

Fiberlock Technologies, Inc. employs a knowledgeable factory trained team of field representatives. In addition, technical questions can be answered by one of our full time technical service representatives by calling 800-342-3755. Complete specifications and technical information can also be obtained online at www.fiberlock.com.

10. Filing System

Additional information is available upon request.

TABLE 1 PHYSICAL/CHEMICAL PROPERTIES OF A-B-C ASBESTOS BINDING COMPOUND

Property	A-B-C
Percent Solids	60 ±2% by weight
Volatile	Principally water
Average Particle Size	0.2 microns
Weight at 78°F	9.1 ±0.2 lbs/gal
Viscosity at 78°F	60-65 KU
Flash Point	Noncombustible (Water-based)
Minimum Shelf Life at 78°F	36 months
Finish	moderate gloss
Drying time at 78°F	1-2 hours

TABLE 2 RECOMMENDED SPRAY SETTINGS FOR A-B-C

Penetrating	Bridging	Removal/Lockdown
Pressure: 1300 - 1400 psi	Pressure: 2200 - 2300 psi	Pressure: 2200 - 2300 psi
Hose length: 100 feet	Hose length: 100 feet	Hose length: 100 feet
Hose diameter: 1/4 inch	Hose diameter: 1/4 inch	Hose diameter: 1/4 inch
Tip/orifice size: .017 - .021	Tip/orifice size: .017 - .023	Tip/orifice size: .015 - .025
Fan size: 12 inches	Fan size: 12 inches	Fan size: 12 inches

1049-1119

FIBERLOCK TECHNOLOGIES

Product Testing & Application Methods
ABC Asbestos Binding Compound & ABC Fiberspray

ABC® Asbestos Binding Compound

ABC® Fiberspray

Laboratory Product Testing

EPA Requirements

ABC has been tested at Battelle Laboratories, and met or surpassed the EPA requirements for effective asbestos encapsulation.

Battelle Columbus Laboratories under Government Contract #68-03-2552-T2005, Judged to be acceptable June 9, 1981.

Final Report on Evaluation of Encapsulants for Sprayed-on Asbestos Containing Materials in Buildings

The only government evaluation of bridging encapsulants available then and now. Of the eleven encapsulants (out of over 100 products tested) then judged by Battelle to be acceptable, ABC is one of the few still manufactured today. ABC was the only acrylic resin emulsion coating given an acceptable rating by Battelle. Other acceptable products were composed of lesser vinyl resins and other base materials.

Battelle's requirements for acceptable are/were as follows:

1. Class "A" fire Resistance (now referred to as Class "I")
2. Minimal smoke generation
3. Release of gases when burned well below any possible problem levels established by the National Academy of Sciences
4. Good surface integrity capable of either sealing the fibrous surface (as a bridging encapsulant) or of binding the fibers together by penetrating 0.5 inches or more into the test matrix (as a penetrating encapsulant).
5. Other criteria evaluated by Battelle for EPA
   - Viscosity
   - Solids Content by percentage
   - Minimum and Maximum Impact Resistance (Gardner Impact Tester; 60 and >60)

German Approval: iBMB-TU- Braunschweig

Fire Rating

Fire Rating:	ASTM E84 Class A
Flame Spread:	10
Fuel Contribution:	10
Smoke Density:	5
Test Facility:	Southwest Research Institute

(ASTM E 84 (Similar to ANSI 2.5, NFPA 255, UL 723, UBC Method 42-1) (May 1983), Project No. 01-7282-223)

Additional Testing:

Film Hardness (Sward Rocker):	2 (Excellent)
Water Resistance of Dry Film:	Excellent
pH:	4.6
Freeze-Thaw Stability:	3 cycles – Good
Heat Discoloration Effectiveness: (45 minutes @ 300°F)	Excellent
Average Particle Size:	0.2 microns

ABC - Asbestos Binding Compound

ABC Asbestos Binding Compound is a high solids asbestos encapsulant/sealant, designed to encapsulate friable Asbestos Containing Material (ACM) such as fireproofing and insulation material. The high solids, nonflammable composition of ABC allows for dilution with water to provide maximum flexibility for specific asbestos abatement needs, including lockdown/removal, penetrating encapsulation and bridging encapsulation.

Bridging Encapsulant

Used as a durable and contiguous barrier between asbestos-containing materials (ACM) and the living environment of buildings for the management of potentially friable asbestos in place. Bridging encapsulants are an excellent method for the abatement (making permanently safe) of sprayed-on fireproofing.

Penetrating Encapsulant

When properly diluted, can be used to enhance the dimensional stability of friable ACM. Dilution increases the capillary action and resulting penetrating of the ABC into less dense and more friable materials, including low and medium density fireproofing, some galbestos, and certain unpainted ceiling plasters (popcorn, textured, acoustic, etc.).

Lockdown Encapsulant

When properly diluted, ABC can be used as an economical coating applied at very high coverage rates to adhere any residual ACM particulate to substrates after asbestos removal. This can inhibit residual asbestos from becoming airborne and respirable. When used as a lockdown encapsulant, ABC can facilitate final clearance, and accept many water-based carpet and tile adhesives or leveling compounds used in the installation of new flooring systems.

Available Packaging & Colors

ABC is available in 5 gallon containers in three colors, Off-White (6421), Clear (6422), Green (6423). It is also available in cases of 7 oz spray cans in Off-White (6410). Custom colors are available on special order. ABC Off-White is tintable with up to two ounces of universal liquid colorant.

FIBERLOCK TECHNOLOGIES

Select List of References
ABC Asbestos Binding Compound

School Systems and Universities

Academy of Environmental Science, New York, NY
Arlington School District, Poughkeepsie, NY
Bedford School System, Bedford, NY
Berne College, Syracuse, NY
Brighton School, Rochester, NY
Bucks County School Department, Doylestown, PA
Centre Admin., Univ. of Sherbrooke, QC, Canada
Chandler School District 80, Chandler, AZ
Christian County School, Hopkinsville, KY
Clarkson College, Potsdam, NY
Corning Community College, Corning, NY
Greencastle School District, Greencastle, PA
Hancock School, Hancock, NY
Harpursville Schools, Harpursville, NY
Intern. School District 361, Intern. Falls, MN
Intern. School District 701, Hibbing, MN
Jefferson Parish School District, Marrero, LA
Lake Forest School District. 67, Lake Forest, IL
Little Rock School District, Little Rock, AR
Los Angeles Unified School District, Los Angeles, CA
Marshall Public Schools, Marshall, TX
Martin Luther King H.S., Philadelphia, PA
Mercer County Schools, Princeton, WV
N. Kossuth Comm. School District, Swea City, IA
N. Rockland School, Stony Point, NY
Norman Public Schools, Norman, OK
Penn Yan Elementary School, Penn Yan NY
Philadelphia School System, Philadelphia, PA
Pinkerton Academy, Derry, NH
Pottsgrove School, Pottstown, PA
Princeton Testing Laboratory, Princeton, NJ
Ridgewood School, Ridgewood, NJ
Rush-Henrietta School, Henrietta, NY
Sacred Heart School, Del Rio, TX
Shipley School, Philadelphia, PA
Skaneateles School, Skaneateles, NY
Town School, San Francisco, CA
Univ. of California, Davis, CA
Univ. of California, San Francisco, CA
Univ. of Rochester, Rochester, NY
Univ. of Vermont, Burlington, VT
White Plains School District, White Plains, NY

Commercial & Industrial Facilities

AOL Time Warner, New York City, NY
Bath Iron Works, Bath, ME
Bell Telephone, Pittsburg, PA
BF Goodrich, Independence, OH
Budd Company Red Lion Plant, Philadelphia, PA
Capitol Environmental, Roanoke, VA
Citibank Building, New York City, NY
Columbia Gas - Majorsville Compressor Station, Majorsville, WV
Command Industries, Lansing, MI
GM Clements, Petersburg, VA
Lieberman Brush Co., Philadelphia, PA
Morgan Stanley Building, New York City, NY
Owens Corning, Oak Park, MI
Owens Corning, San Antonio, TX
Owens IL Glass Container Division, Streator, IL
Packaging Corp. of America, Filer City, MI
Prudential Insurance Co., Boston, MA
Reynolds Metal Corp., Richmond, VA
Rohm & Haas Co., Bristol, PA
Sherwin Williams, Scotsbluff, NV
Sprague Electric, Worcester, MA
Sun Chemical, Cincinnati, OH
TU Electric, Dallas, TX

Public Buildings & Facilities

Archdiocese of Philadelphia, Philadelphia, PA
City Water Light & Power, Springfield, IL
Hynes Auditorium, Boston, MA
LaGuardia Airport, New York, NY
Los Angeles Dept. of Water & Power, Los Angeles, CA
Los Angeles GSA Federal Administration Building, Los Angeles, CA
Naval Air Station, Lemoore, CA
New Haven Hospital, New Haven, CT
NY State Electric & Gas, Binghamton, NY
NY State Electric & Gas, Lancaster, NY
Penfield Presbyterian, Penfield, NY
Portsmouth Federal Building, Portsmouth, NY
The White House, Washington, DC
Torrington Housing Authority, Torrington, CT
U.S. Air, Philadelphia International, Philadelphia, PA
U.S. Department of Energy, Savannah River, Aiken, GA

Fiberlock Technologies Inc.
150 Dascomb Rd.
Andover, MA 01810
800-342-3755
www.fiberlock.com

Posi-Shell®
COVER SYSTEM
ADVANCED FORMULATION

BRIEF SPECIFICATIONS

- Spray applied slurry consisting of approximately 10%-20% solids
- Excellent opacity and adhesion to any surface
- Fiber reinforced mixture incorporating quarter-inch very fine (1.5 ± 0.2) denier polyester fibers with proprietary finish for rapid, non-clumping, aqueous dispersal
- Complies with ASTM D6523 "Evaluation and Selection of Alternate Daily Covers (ADC) for Sanitary Landfills
- Non-flammable in accordance with ASTM D4982 "Flammability Potential Screening Analysis for Waste"
- Non-toxic as indicated by TCLP testing
- Can be applied with commonly available hydroseeding equipment, or with specialized landfill ADC machines

201010

Super Sack® Container Sizing Chart

Volume (cu. ft./liters)	Height Options (inches/mm)		Height Options (inches/mm)		Height Options (inches/mm)		Height Options (inches/mm)		Height Options (inches/mm)	
	28"x28" Base (711mm x 711mm) Empty, seam to seam **36**/914 Filled Diameter		**35"x35" Base** (889mm x 889mm) Empty, seam to seam **45**/1143 Filled Diameter		**38"x38" Base** (965mm x 965mm) Empty, seam to seam **48**/1219 Filled Diameter		**43"x43" Base** (1092mm x 1092mm) Empty, seam to seam **55**/1397 Filled Diameter		**35"x43" Base** (889mm x 1092mm) Empty, seam to seam **50**/1270 Oblong Filled Diameter	
	EH	**FH**	**EH**	**FH**	**EH**	**FH**	**EH**	**FH**	**EH**	**FH**
10/283	**21**/533	**17**/432								
15/425	**30**/762	**26**/660								
20/566	**38**/965	**34**/864	**26**/660	**22**/559	**23**/584	**19**/483			**22**/559	**18**/457
25/708	**47**/1194	**43**/1092	**31**/787	**27**/689	**28**/711	**24**/610	**22**/559	**18**/457	**26**/660	**22**/559
30/850	**55**/1397	**51**/1295	**37**/940	**33**/838	**32**/813	**28**/711	**26**/660	**22**/559	**31**/787	**27**/686
35/991	**64**/1626	**60**/1524	**42**/1067	**38**/965	**37**/940	**33**/838	**30**/762	**26**/660	**35**/889	**31**/787
40/1133			**48**/1219	**44**/1118	**42**/1067	**38**/965	**33**/838	**29**/737	**39**/991	**35**/889
45/1274			**53**/1346	**49**/1245	**46**/1092	**42**/1067	**37**/940	**33**/838	**44**/1118	**40**/1016
50/1416			**59**/1499	**55**/1397	**51**/1295	**47**/1194	**41**/1041	**37**/940	**48**/1219	**44**/1118
55/1557			**64**/1626	**60**/1524	**56**/1422	**52**/1321	**44**/1118	**40**/1016	**53**/1346	**49**/1245
60/1699			**70**/1778	**66**/1676	**60**/1524	**56**/1422	**48**/1219	**44**/1118	**57**/1448	**53**/1346
65/1841			**75**/1905	**71**/1803	**65**/1651	**61**/1549	**52**/1321	**48**/1219	**62**/1575	**58**/1473
70/1982			**81**/2057	**77**/1956	**70**/1778	**66**/1676	**55**/1397	**51**/1295	**66**/1676	**62**/1575
75/2124			**86**/2184	**82**/2083	**74**/1880	**70**/1778	**59**/1499	**55**/1397	**70**/1778	**66**/1676
80/2265			**91**/2311	**87**/2210	**79**/2007	**75**/1905	**63**/1600	**59**/1499	**75**/1905	**71**/1803
85/2407			**97**/2464	**93**/2362	**84**/2134	**80**/2032	**66**/1676	**62**/1575	**79**/2007	**75**/1905

Other sizes are available.

Example:

Customer wants to ship 2,200 lbs. of alfalfa seed per container.

1. What size container do you need?
   2,200 lbs. / 48 lbs. per ft^3 (Bulk Density of Alfalfa Seed per ft^3) = 46 ft^3
   (Therefore a 46 ft^3 Super Sack container is needed).
2. Next you need to determine the FH and the EH.
   46 ft^3 / .92(factor - see chart below) = 50" FH (+4" = 54" EH)
3. Your size specification would be:
   35" x 35" x 54" (50" Filled Height) with a 45" Diameter, and
   2,200 lbs. product capacity.

LEGEND

EH	Empty Height
FH	Fill Height
LBS.	Pounds

Formulas:

Fill Height of FIBC:
Ft / Factor =FH"

Empty Height of FIBC:
FH" +4" = EH"

Cubic Feet of FIBC:
FH x Factor = Ft^3

Cubic Feet Capacity of FIBC:
Ultimate Weight of FIBC / Bulk Density of Product = Ft^3 Cap.

Diameter of FIBC:
Side Panel Width x Number of Panels / 3.1416 = Dia.

Diameter:	Factor:
36"	.588
45"	.915
48"	1.064
50"	1.128
55"	1.362
22"	.229 (Barrel Bag only)

Note:
A four-panel FIBC will round out after being filled. Sizing calculations are based on cylindrical formulas.

B.A.G.® CORP. HOME OF THE SUPER SACK® CONTAINER

Since 1969

www.bagcorp.com

General Offices: 11510 Data Drive, Dallas, TX 75218 (800)331-9200 or (214)340-7060 Fax: (214)340-4598 Facilities in the USA and Mexico, with partnerships around the world.

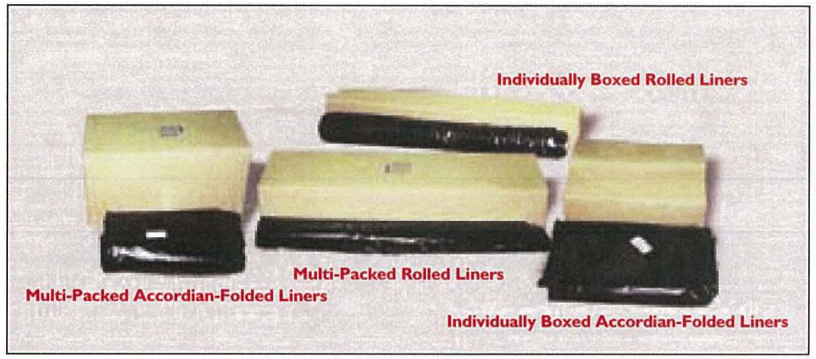
DISPOSABLE CONTAINER LINERS

Roll-offs, End Dumps and Intermodals

MHF-PS Liners are disposable polyethylene container liners used in the transportation of bulk solids and liquids. MHF-PS Liners can be utilized in roll-off containers, end dump trailers, intermodals and rail gondolas.

Features and Advantages

- Easy installation
- Form-fitted design
- Excellent leak protection
- Reduced washout costs
- Odor and freeze control
- Extended container life
- Helps meet regulations
- Various liner sizes and thicknesses available
- High quality, American-made product
- Huge inventory to ensure quick delivery
- Custom sizes welcomed



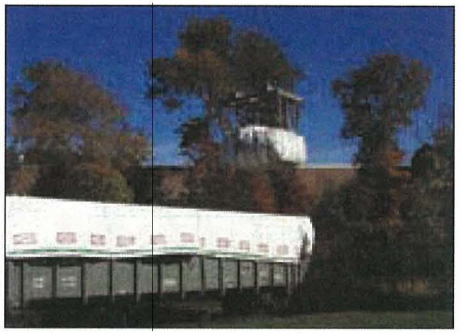
A3-9

LIFT-LINER™ SYSTEM

Up to 24,000 lbs. packaging

What is a Lift Liner™?

- A soft-sided package
- Interim packaging solution
- Efficient loading/unloading
- No decontamination



CAUTION: NOT ALL PACKAGING SYSTEMS ARE THE SAME

When You're Moving Sensitive Materials, It Pays to Look for Proven Safety and Reliability

Are all soft-sided packaging systems the same?

In a word, no.

Consider, for example, our patented Lift Liners™. They have earned their reputation for unsurpassed quality and reliability through the experience of our clients around the world. For more than a decade, our diverse clientele have used our Lift Liners™ to transport low-level radioactive waste and other types of hazardous materials.

Our clients — utilities, government agencies and others — rely on our Lift Liners™ because of their reliability and dependability in a wide range of applications. And because our Lift Liners™ are patented, their key design elements cannot be replicated.

Indeed, our Lift Liners™ are uniquely different than any soft-sided packaging that has come on the market in recent years.

Our enhanced tie system ensures that your package is closed and secured for the entire duration of its shipment.

A3-10

LINERS AND ACCESSORIES

Item #	Product Description
Liners	
LCY03C	3 mil, Low Density Polyethylene, Clear Cubic Yard Liner
LCY06B	6 mil, Low Density Polyethylene, Black Cubic Yard Liner
LCY08B	8 mil, Low Density Polyethylene, Black Cubic Yard Liner
LCY12PVC	12 mil, Heavy-Duty PVC Clear Cubic Yard Liner
Accessories	
HPAPOC	3 mil, Clear Polyethylene Outdoor Cubic Yard Cover
HPASB	Woven Polypropylene Bulk Sludge Bag
HPACC	Corrugated Cubic Yard Cap
PAN4W	New Pallet with 4-Way Entry

37 Cubic Yard Cargo Type A/7A

25.4 Cubic Yard Type A/7A Intermodals

25.4 Cubic Yard Intermodals

20 and 40 Foot "Strong-Tight" Cargo Container

A3-11

Our patented lift system includes independent straps that surround the load for maximum safety.

For example, our Lift Liner™ has 23 independent closure ties on the package. That means that the package will stay closed during handling and transport. Other manufacturers use one dependent zipper, and if any part of that zipper becomes damaged or the zipper's teeth do not hold during handling and transportation, you might be facing the unpleasant situation of spillage or noncompliance.

Another concern for safety could be the lifting and rigging of the package itself. Our Lift Liner™ has 18 independent lifting straps that run completely around the package, sewn in as an integral element of the lift system.

The system exceeds the requirements of STD1090 (the U.S. Department of Energy's lift and rigging standard).

There's a reason our Lift Liners™ are certified by the International Union of Operating Engineers, US Army Corps of Engineers and the U.S. Department of Energy, among others:

Simply put, our Lift Liners™ are the best on the market.

Lift Liner™ System Products

Item #	Name	Size	Rating	Closure
11-LL7224	Lift Liner	48 CF	IP1 or IP2	Tie
11-LL7248	Lift Liner	96 CF	IP1 or IP2	Tie
11-LL9666	Lift Liner	242 CF	IP1 or IP2	Tie
11-LL9688	Lift Liner	264 CF	IP1 or IP2	Tie
Optional Inner Liners (Geo Textile)				
11-IL7224-Geo	Geo Textile	48 CF		Fold
11-IL7248-Geo	Geo Textile	96 CF		Fold
11-IL9666-Geo	Geo Textile	242 CF		Fold
11-IL9688-Geo	Geo Textile	264 CF		Fold
Optional Inner Liners (Poly)				
11-IL9666-4EB	6 mil poly	242 CF		Twist/tie
11-IL9688-4EB	6 mil poly	264 CF		Twist/tie

Custom sizes, liners and closure systems available.

A3-12

ROLL-OFFS/CARGO CONTAINERS

Our containers are designed to be transported by truck, rail or ship — they're tough and can stand up to any shipping method.

All containers are fully certified by:

- The American Bureau of Shipping (marine)
- The American Association of Railroads (rail)
- The U.S. Department of Transportation (truck and other modes)

Because of the multiple certifications, our containers can be used for seamless, intermodal shipping (rail, truck and/or marine), which means you can avoid unnecessary loading and reloading.

Highlights

- 25 Cubic Yard Bulk Intermodal — our most popular container. Depending on the type of materials being transported, a variety of lid designs and configurations are available.
- "Seavan" Cargo Container — 10' and 20' designs, widely used in the nuclear industry for low-level radioactive waste. These containers are similar to ones you might see on ocean-crossing vessels. Also available in side-loading door systems.
- Shielded Type-A Container System — designed for radioactive waste and other hazardous materials, this top-loading, lead-lined container may be transported securely on rail cars, trucks and ships.

All containers are available through direct purchase, lease or lease-to-purchase.

HAZ-WASTE ENCAPSULATION BAGS

Roll-offs, End Dumps, Rail Gondolas and Lugger Boxes

MHF-PS Drawstring Liners

Our premium polyethylene container liners utilize a unique drawstring design to keep the liner in place, even under extreme conditions. After loading, the drawstring also provides a way to close off the liner and encapsulate the waste stream.

Features and Advantages

- Inexpensive option to costly bladder bags
- Helps meet regulations in "Dust Free" landfills
- Easy installation
- Excellent leak protection
- Reduced washout costs
- Odor and freeze control
- Extended container life
- Drawstring design to keep the liner in place
- Provides superior tear and burst resistance
- Various liner sizes and thicknesses available
- Huge inventory to ensure quick delivery
- Custom sizes available

"Dust Free" Disposal

The Flexi-drum™ 1.0 & 5.0 Cubic Yard Packages

One Cubic Yard Package

- 2000 lbs. capacity
- Tare weight 17 lbs.
- Empty size 2 cubic foot
- Loaded size 36" x 36" x 40" (L x W x H)
- Fabric is woven and coated polypropylene with 6 mil poly liner
- UN Certified 11HH/Y/0805/+AA4583/1814/915

Five Cubic Yard Package

- Five cubic yard volume
- 10,000 lbs. capacity
- Tare weight 48 lbs.
- Empty size 5 cubic foot
- Loaded size 8' x 4' x 4' (L x W x H)
- Fabric is woven and coated polypropylene
- Optional 6 mil liner can be used for asbestos waste containment
- Sift-proof certification meets a variety of contaminates, hazardous materials and waste products

The MHF Packaging Solutions self-standing five-yard package is an inexpensive package that we utilized on one of our environmental projects. MHF was able to quickly ship the package to our site for our needs, and the package worked very well. It was easy to use and allowed us to complete our task quickly and without any issues.

Pete Long
Account Executive
The Environmental Quality Company

WastePack™ 1.0 & 1.6 Cubic Yard Bags

- DOT/UN Approved X Rating for Packing Groups I, II and III
- Woven polypropylene construction with heavy-duty hardwall inserts
- 3000 lbs. capacity

Item #	Components Include:	DOT/UN Specifications*	Dimensions (inches)
WP106	Bag, Liner, Inserts	11HH2/X/USA/2501/1360	36 x 36 x 36
WP166	Bag, Liner, Inserts	11HH2/Y/USA/2501/1360	42 x 42 x 42

WasteSack™ Cubic Yard Bag

- DOT/UN Approved Y Rating for Packing Groups II and III
- Woven polypropylene construction
- 2200 lbs. capacity

Item #	Components Include:	DOT/UN Specifications*	Dimensions (inches)
WS03	Bag, Liner	13H3/Y/RP/1800/1000	36 x 36 x 36

DrumPack™ Collapsible Container

- DOT/UN Approved Y Rating for Packing Groups II and III
- Woven polypropylene construction with hardwall inserts
- 800 and 255 lbs. capacity

Item #	Components Include:	DOT/UN Specifications*	Dimensions (inches)
DP5503	Bag, Liner, Inserts	13H4/Y/USA/0/364	20 x 20 x 35
DP3003	Bag, Liner, Inserts	13H4/Y/USA/0/116	20 x 20 x 20

*** UN specifications subject to change.**

PORTABLE STORAGE TANKS

MHF-PS Portable Storage Tanks are collapsible, flexible storage tanks that provide temporary as well as long-term liquid storage.

✦ Water ✦ Oil ✦ Chemicals ✦ Fuel

Typical Applications

- Potable water tanks
- Chemical storage
- Oil storage
- Fuel storage

Sizes*

- 8' W x 5' L x 3' H
- 12' W x 8' L x 3' H
- 22' W x 11' L x 3 1/2' H

Valves

- Fill valve is a 2" threaded valve
- Drain is a 2" unthreaded valve

As a safety precaution, to eliminate the chance of these tanks becoming mobile, we highly recommend that each storage tank be secured with some type of berm system, concrete barrier, or that a depression in the ground is used to hold the bag in place.

Fill Valve

Drain

*** Approximate dimensions based on tank when filled**