

Addendum to Citizens' Guide Proposed soil cleanup plans for additional Tax Blocks for Lockheed Martin's Middle River Complex

Winter 2013-2014



Lockheed Martin Middle River Complex
2323 Eastern Boulevard
Middle River, Maryland

Lockheed Martin Would Like to Invite the Community to a Public Information Session On Proposed Soil Cleanup Plans at the Middle River Complex

Date: Thursday, January 23, 2014

**Location: Wilson Point Fire Hall
1100 Wilson Point Road**

**Times: 5 to 7 p.m. - Informal poster session with
personalized attention and questions/answers;
7 p.m. - Formal presentation of proposed plans,
followed by a question and answer
and comment period**

Light refreshments will be served.

**The public is invited to make further
comments orally or in writing from January 23
to February 24, 2014.**

**To make comments, please do so by
February 24 to:**

**Lockheed Martin, c/o Kay Armstrong
P. O. Box 2687 Tybee Island, GA 31328
Email: darrylkay@aol.com • Phone: 888-340-2006**

**The Soil Remedial Action Plans can be
downloaded from the Lockheed Martin website at:
<http://www.lockheedmartin.com/middleriver> and
are available in hard copy at the
Essex Public Library, 1110 Eastern Boulevard,
Essex, Maryland, 21221.**

**Library Hours: Monday through
Thursday, 9 a.m. to 9 p.m.
Friday and Saturday, 9 a.m. to 5:30 p.m.**

Introduction

Earlier this fall, Lockheed Martin issued its Citizens' Guide, Proposed soil cleanup plans for Lockheed Martin's Middle River Complex, which provided general information as well as specifically addressed Tax Block F. This addendum to the Citizen's Guide, Proposed soil cleanup plans for Lockheed Martin's Middle River Complex, covers the investigations and proposed soil cleanup for additional tax blocks of the Middle River Complex—Blocks D, D Panhandle, E, G and H. Readers are encouraged to look at the previously published Citizens' Guide, Proposed soil cleanup plans for Lockheed Martin's Middle River Complex, for an introduction to the Soil Remedial Action Plans and for a glossary. This addendum summarizes the objectives, background, alternative selection, and planned remedial action for these additional tax blocks. *See Figure 1 for Tax Blocks map.*

Remedial Action Objectives

The Remedial Action Objectives establish the project's goals for the cleanup of each tax block and vary based on conditions found in each location.

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Tax Blocks D And H

Reduce site-related chemicals of concern in Block D and H soils, in this case polycyclic aromatic hydrocarbons (PAHs), to concentrations that achieve a one in 100,000 human health cancer-risk limit for *industrial* workers exposed via ingestion, skin contact and inhalation.

How is 1 in 100,000 used in environmental risk assessments?

A one in 100,000 human health cancer-risk limit does not mean that one out of a hundred thousand people exposed to a contaminant for a certain length of time will necessarily get cancer in their lifetime; it is a measure of potential risk. A person's total cancer risk depends on many individual factors including genetics, eating and personal habits, etc. Environmental scientists calculate risk to be able to compare and contrast contaminants and help make decisions about clean up. Environmental risk is calculated by multiplying exposure times a contaminant's toxicity. Exposure is a combination of the concentration of a contaminant and the length of time a person is exposed to it. Toxicity is a measure of a chemical's potential adverse health effects.

Tax Block D Panhandle

Reduce site-related organic chemicals of concern in Block D Panhandle soils, in this case, primarily polycyclic aromatic hydrocarbons (PAHs), to concentrations that achieve a one in 100,000 human health cancer-risk limit for *recreational* users exposed via ingestion, skin contact and inhalation; and reduce the metals contaminants of concern, arsenic and hexavalent chromium, to background levels.

Tax Block E

1. Reduce site-related chemicals of concern in Block E soils, primarily polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs), to concentrations that achieve a one in 100,000 human health cancer-risk limit for *industrial* workers exposed via ingestion, skin contact and inhalation.
2. Prevent erosion of polychlorinated biphenyl-impacted soils to Dark Head Cove via overland storm water runoff.

Tax Block G

1. Reduce site-related polycyclic aromatic hydrocarbons (PAHs) in Block G soils to concentrations that achieve a one in 100,000 human health cancer-risk limit for *industrial* workers exposed via ingestion, skin contact and inhalation, and reduce site-related arsenic to background levels.
2. Excavate and recycle offsite, or dispose of, underground storage tanks at Recognized Environmental Condition (REC) 11 in accordance with Maryland Oil Control Program Guidance and Code of Maryland Regulations.

Assessing The Tax Blocks

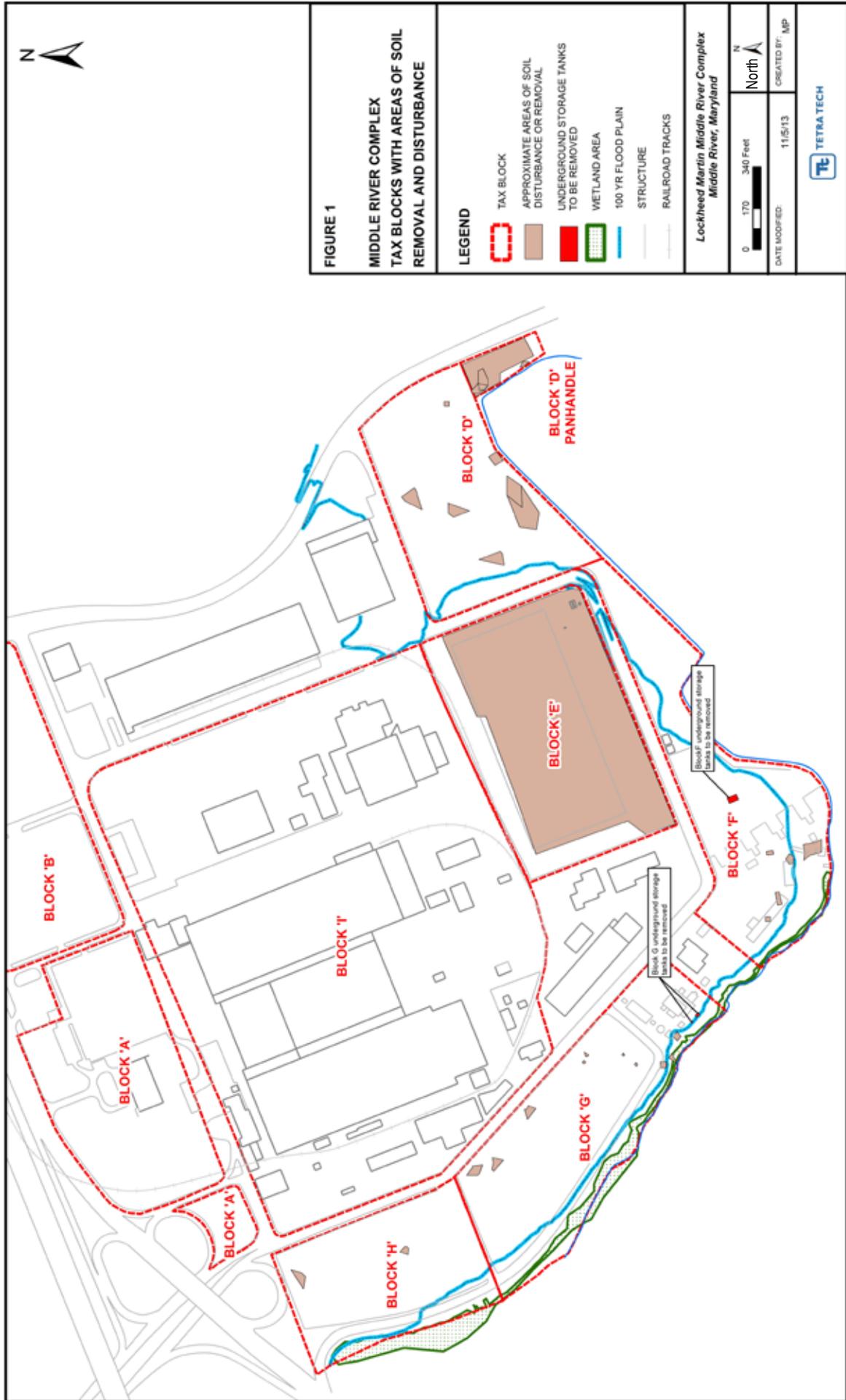
What are the features of the tax blocks?

BLOCK D consists of approximately 13 acres and one Recognized Environmental Condition (REC), REC 6, which is the waterfront lot between parking lot No. 6 and Dark Head Cove. The Block D Soil Remedial Action Plan (RAP) concerns only the main area of Block D. It does not include the panhandle. Lockheed Martin proposes that the Block D main area soil be cleaned up to standards for *industrial* use. See Figure 2.

The BLOCK D PANHANDLE is a 1.4 acre narrow strip of land at the southeast end of Block D. Most of the panhandle is an asphalt-paved extension of parking lot No. 6. The parking lot is bordered by a chain-link fence. Outside the parking lot a wood rail fence separates a grassy area from Dark Head Cove. Lockheed Martin proposes that the Block D Panhandle soil be cleaned up to standards for *recreational* use, in case this block should become a community resource, such as a park. See Figure 3.

BLOCK E consists of approximately 16 acres and includes three Recognized Environmental Conditions (RECs): the area around former Building D (REC 1); an abandoned 1,815-foot long, two-inch-diameter pipe (REC 2) that runs underground from a former 500,000-gallon above-ground fuel storage tank (REC 3) to the Middle River Complex power plant in Block I. The tank and associated other tanks were located on a grassy shoulder in the southeastern part of Block E. Lockheed Martin proposes that Block E soil be cleaned up to standards for *industrial* use. See Figure 4.

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BLOCK G consists of approximately 13 acres and two Recognized Environmental Conditions (RECs): REC 11, which was where a former sewage treatment plant and wind tunnel and vibration test buildings were located; and REC 12, which is the southern portion of Parking Lot No. 3. The rest of Parking Lot No. 3 is also included in Block G. Lockheed Martin proposes that Block G soil be cleaned up to standards for *industrial* use. See *Figures 5-1 and 5-2*.

BLOCK H consists of nearly 8 acres. The block is now and has been historically used as an employee parking lot. Lockheed Martin proposes that Block H soil be cleaned up to standards for *industrial* use. See *Figure 6*.

What is the nature and extent of soil contamination in the tax blocks?

The soils in the tax blocks at the Middle River Complex are contaminated mainly with polycyclic aromatic hydrocarbons (PAHs). The PAHs are found in varying concentrations throughout the soil. The source of the contaminated soil appears to be fill used for grading when the Middle River Complex expanded in the 1930s and 1940s. (Fill is soil and other materials used to create or build-up land areas.) Some metals are scattered throughout the Complex; their concentrations are above Maryland Department of the Environment screening levels in only a few places.

What are polycyclic aromatic hydrocarbons?

Polycyclic aromatic hydrocarbons (PAHs) are semi-volatile organic chemicals that originate from both man-made and natural sources. (A semi-volatile organic compound has a boiling point higher than water but may still vaporize when exposed to temperatures above room temperature.) PAHs are created when products like coal, oil, gas, wood and garbage are burned incompletely, and are found in the resulting residue. Asphalt pavement is a common source of PAHs, among many other petroleum product-related sources. PAHs can break down over time and some PAHs are considered carcinogenic.

Where are polycyclic aromatic hydrocarbons (PAHs) located in the tax blocks?

Because PAHs were introduced to the blocks primarily in fill, they are found throughout the Middle River Complex. Other possible sources include deposition from air and residue from brush burning when the land was cleared. The tax block maps note the areas to be cleaned up.

Do I need to be concerned about the polycyclic aromatic hydrocarbons (PAHs) affecting me?

The PAHs in the different blocks are found mainly just below the surface of the ground. Grass and such surface covers as pavement and concrete help prevent exposure to surface contamination. Removing the top two feet of PAH-contaminated soil will lower the concentrations of contaminants to average levels considered safe by the Maryland Department of the Environment. Blocks D, E, G and H will be cleaned to *industrial* standards for workers who occasionally disturb the soil. The public is not routinely allowed in those blocks. The Block D Panhandle will be cleaned to a level of concentration that permits *recreational* use.

What about the polychlorinated biphenyls found in Block E?

Three areas in Block E are contaminated with polychlorinated biphenyls (PCBs):

The first place where high levels of PCBs were found was in the first four feet of soil in the southeastern area of Block E, near a 500,000-gallon water tank used by the Middle River Complex as backup for fighting fires. The second place where PCBs were detected was in the south-central part of where Building D was located, in an area that once housed cleaning, plating, and finishing rooms, an electrical transformer room and an electrical substation outside the building. The third place was in the western and southwestern portion of Block E, where the nuclear laboratory, an electrical transformer room and a waste collection area were located. Elevated PCBs concentrations were detected up to twelve feet below the surface of the ground in one area.

The contamination of Block E with PCBs is likely the result of industrial operations that took place in Building D; from a possible release during demolition of Building D; or from use of the Building D basement for storage of PCBs-containing materials.

What are Polychlorinated Biphenyls (PCBs)?

Polychlorinated biphenyls (PCBs) are organic chemicals manufactured for construction materials and electrical products before 1979, since they have very appealing physical and chemical properties - they are chemically inert, and have a very high flash point, and were used in transformers as insulating fluids and coolants. They have a range of toxicity, depending on the type, product, manufacturer, and differing percents of chlorine, and, in some experiments, have caused cancer in animals.

The PCBs found in Block E are Aroclor-1254 and Aroclor-1260. No one is exposed at this time, since the public is restricted from access and there is no current industrial worker exposure. Such an exposure would result in unacceptable risk.

Do I need to be concerned about other contaminants identified in the tax blocks?

Mercury, arsenic and hexavalent chromium were found in the soil in Block D at levels that are considered safe for a site limited to industrial use.

Arsenic and hexavalent chromium were detected in the Block D panhandle. These contaminants will be removed to a lower level of concentration, which will permit safe recreational use.

Arsenic was also found in Block G, mainly near REC 11, the location of the former sewage treatment plant, wind tunnel and vibration test buildings, and will be removed.

Concentrations of trichlorobenzene (1,2,4-TCB) were found more than two feet below the surface of the ground near two soil borings in Block E. Trichlorobenzene is a solvent and is typically associated with PCBs used in electrical equipment. Because it is located more than two feet below the ground surface it does not contribute significantly to a risk for direct contact for typical industrial workers.

All these contaminants are below the surface of the soil and are not carried off site by wind or water runoff. While average remaining concentrations will be considered safe for industrial workers, any future use or redevelopment of Blocks D, E, G, and H may require further cleanup.

Selecting The Best Clean Up Alternative

How did Lockheed Martin come up with cleanup alternatives?

Lockheed Martin first developed alternatives alone or in combination in broad categories: take no action (this was considered only for purposes of comparison); remove contaminated soil; implement land use controls to limit access to contaminants; contain the contaminants in place; and treat the contaminants in place. Multiple alternatives were considered for each block, and are spelled out in the Soil Remedial Action Plans. These are available on line at <http://www.lockheedmartin.com/middleriver> and in hard copy at the Essex Public Library,

1110 Eastern Boulevard, Essex, Maryland, 21221.

How were the alternatives compared?

First, cleanup technologies and process options were screened for effectiveness, implementability and relative cost using two threshold requirements:

- each alternative had to protect human health and the environment, and
- each had to comply with government requirements.

Retained technologies and processes were combined into remediation programs, and then screened in detail against these six criteria:

- the long-term effectiveness and permanence of the alternative;
- the short-term effectiveness of the alternative;
- how well the alternative reduced the toxicity, mobility, or volume of the contaminant;
- how easily the alternative could be implemented;
- would the alternative impact the environment, and if so, how; and
- what would it cost.

Lastly, two modifying criteria—regulatory and local acceptance—were considered. The Maryland Department of the Environment must accept the Remedial Action Plan (RAP) for each block. In Block E the U.S. Environmental Protection Agency (EPA) also has regulatory authority because of the presence of PCBs. Lockheed Martin, through its community outreach and public engagement program, provides the public an opportunity to comment on each RAP before final approval and implementation. These criteria are considered in the final remedy selection.

What cleanup alternatives does Lockheed Martin recommend for each of the tax blocks, and why?

BLOCK D

Alternative 4. Excavate impacted soils to the water table and dispose of the excavated material off site at an approved landfill; replace with clean soil. Put land-use controls in place.

Why Alternative 4:

- By removing all soils identified for cleanup, this solution effectively reduces risk to human health and the environment.

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- This solution adversely impacts the environment only during construction, and these impacts are easily reduced.
- This solution costs about the same as the other alternatives.
- Very doable: The people and equipment necessary to design and implement the proposed solution are readily available.

BLOCK D PANHANDLE

Alternative 4. Excavate impacted soils to the water table and dispose of the excavated material off site at an approved land fill; replace with clean soil. Put land-use controls in place.

Why Alternative 4:

- By removing all soils identified for cleanup, this solution effectively reduces risk to human health and the environment.
- Very doable: The people and equipment necessary to design and implement the proposed solution are readily available.
- This solution adversely impacts the environment only during construction, and these impacts are easily reduced.
- This solution costs about the same as the other alternatives.

BLOCK E

Alternative 2. Excavate and dispose of all impacted soils to a depth of two feet below the surface of the soil. Excavate and dispose of soil with polychlorinated biphenyl concentrations greater than 25 milligrams per kilogram to a depth of two feet below soil surface. Dispose of excavated soils at an approved landfill. Put land use controls into place.

Why Alternative 2:

- This solution effectively reduces risk to human health and the environment. The PCBs in deeper soil are contained and not being transported via groundwater to cove sediments.
- Removing all soils identified for cleanup in a relatively short time is an advantage for this alternative.
- Very doable: The people and equipment necessary to design and implement the proposed solution are readily available.

- This solution has fewer environmental impacts than the other alternatives and is easier to construct.
- The alternative adversely impacts the environment only during construction, and these impacts are easily reduced.
- This solution costs less than other alternatives.

A number of other actions will be implemented as part of the cleanup of Block E:

- The Building D foundation and concrete slab, concrete, and asphalt paving will be demolished and the area restored to grass.
- Since the building at one time was used for radiological research and production, radiological surveys will be performed during the proposed remedial action to ensure that radiological materials or residual radiological contamination, if encountered, are remediated properly.
- The current storm water system will be demolished and disposed of and replaced by a new storm water management system.
- The REC 2 pipeline will be removed and disposed of, or recycled.

BLOCK G

Alternative 4. Excavate the top two feet of impacted soils plus any deeper soils above the groundwater table identified by state regulations as contaminant hot spots. Recycle or dispose of the excavated soils offsite at a permitted landfill.

Why Alternative 4:

- By removing impacted soils, this solution effectively reduces risk to human health and the environment.
- Very doable: The people and equipment necessary to design and implement the proposed solution are readily available.
- This solution adversely impacts the environment only during construction, and these impacts are easily reduced.
- While this solution costs more than other solutions, it provides additional risk reduction at only a modest increase in cost.

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BLOCK H

Alternative 3. Excavate the top two feet of contaminated soil in two impacted areas and dispose of the excavated material off site; replace with clean soil and restore the parking lot to active use. Put land-use controls in place.

Why Alternative 3:

- By removing all soils identified for cleanup, this solution effectively reduces risk to human health and the environment.
- Very doable: The people and equipment necessary to design and implement the proposed solution are readily available.
- This solution adversely impacts the environment only during construction, and these impacts are easily reduced.
- This solution costs about the same as the other alternatives.

What are land-use controls?

Land-use, or institutional controls, include such things as requiring that the soil-cover over an excavation be maintained; notifying Baltimore County and the state of Maryland before any future excavations; restricting the reuse of soil; and limits on the future use of property. Depending on the controls, the Maryland Department of the Environment often requires that these controls be noted on property deeds.

What kinds of land-use controls would be required for a site devoted to recreational use?

Examples of the kind of controls required for a recreational site include restrictions from future residential use; also, prohibitions on the use of groundwater from beneath the site; and a requirement for sub-soil vapor mitigation for any building constructed where potential for soil vapor intrusion exists. Similar controls would be required for a site devoted to industrial use.

Could the land use designations be changed?

The Maryland Department of the Environment (MDE) regards all land use controls as existing in perpetuity unless the related environmental covenants are eliminated or modified by mutual consent of the stakeholders, for example the public, property owners and local government, etc. In the future, tax blocks

could be developed for other uses if they were cleaned up enough to meet the standards of a proposed new land use.

Remedial Actions

How will Lockheed Martin handle the cleanup of the blocks?

Removed soil will be recycled, that is, treated and reused at an offsite location, or disposed of properly in approved permitted landfills. Exposed soil on the sidewalls of removal areas will be sampled and analyzed to confirm that concentrations of contaminants in the soil are less than the cleanup goal. Excavated soil will be loaded directly onto trucks for offsite recycling, or disposal. Lockheed Martin anticipates that most of the removed soil will be non-hazardous and can be recycled or disposed of at a Lockheed Martin-approved, nonhazardous waste disposal facility. Block E soils with PCBs above specific levels will be disposed of in special landfills designated for this material.

Lockheed Martin anticipates that approximately 22,826 tons (approximately one and a half tons per cubic yard) of soil and 20,564 tons of asphalt pavement, concrete and other construction materials, will be removed.

	Total Soil (tons)	Total Asphalt/Concrete (tons) ¹	Number of Truck Loads ²
Block D	4,807	234	337
Block D Panhandle	896	1,073	132
Block E	3,236	18,932	1,478
Block E-PCBs	9,553	--	637
Block F	1,368	--	92
Block G	2,468	238	181
Block H	498	87	39
Total	22,826	20,564	2,896

Notes:

1-assumes 1.4 cy/ton for asphalt (Blocks D, D Panhandle, G, and H), 1.5 cy/ton for concrete (Block E only)

2-assumes 15 tons/truck load

How will the land in the blocks be restored?

All disturbed areas will be restored and permanently stabilized. Vegetative restoration will consist of surface preparation, fertilizing, seeding, and mulching. Pavement or concrete slab areas disturbed by

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remedial activities will be restored with asphalt, gravel, or stabilizing vegetation. Restoration procedures will be detailed in remedial design documents that will be prepared prior to implementation.

Will soil excavation require permits?

Yes. Lockheed Martin's grading plan and erosion and sediment control plans must be approved by Baltimore County prior to implementation of each of the Remedial Action Plans.

How will groundwater be handled?

Excavations reaching groundwater may need to be dewatered. How will Lockheed Martin handle this? Water

will be contained and analyzed and disposed of at an off site permitted treatment, storage and disposal facility.

What is the schedule for cleanup?

The public presentation for Soil Remedial Action Plans for Blocks D, D Panhandle, E, G and H will be Thursday, January 23, 2014 at the Wilson Point Fire Hall, 1100 Wilson Point Road, followed by a 30-day review and comment period ending February 24. The final Remedial Action Plans for these blocks will be submitted to the Maryland Department of the Environment in fall 2014. Cleanup is expected to begin in spring 2015, with completion by the fall of 2016.

For More Information

Questions may be addressed to the following individuals at Lockheed Martin:

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All documents are available at the Essex Library, 410-887-0295, or on Lockheed Martin's Web site at: www.lockheedmartin/middleriver

To be added to the mailing list for future updates, please notify Kay Armstrong at 1-888-340-2006 or darrylkay@aol.com.

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