



Department of Energy

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MAY 26 2010

Ms. Jennifer Tufts
U.S. Environmental Protection Agency, Region 4
Federal Facilities Branch
61 Forsyth Street
Atlanta, Georgia 30303

PPPO-02-463-10

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

Dear Ms. Tufts and Mr. Winner:

TRANSMITTAL OF THE REPLACEMENT PAGES AND COMMENT RESPONSE SUMMARY FOR THE SITE EVALUATION REPORT FOR ADDENDUM 2 SOIL PILES AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY (DOE/LX/07-0188&D2/R1)

Reference: Letter from A. Webb to R. Knerr, "Conditional Concurrence to the Site Evaluation Report for Addendum 2 Soil Piles (DOE/LX/07-0188&D2/R1), dated March 8, 2010

Please find enclosed the certified replacement pages and Comment Response Summary (CRS) for the D2/R1 *Site Evaluation Report for Addendum 2 Soil Piles at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE/LX/07-0188&D2/R1). The replacement pages and CRS were prepared in response to comments received from the Kentucky Department for Environmental Protection on March 8, 2010 (Reference) and during the April 26, 2010 teleconference.

If you have any questions or require additional information, please contact Rob Seifert at (270) 441-6823.

Sincerely,

A handwritten signature in black ink, appearing to read "Reinhard Knerr", is written over the word "Sincerely,".

Reinhard Knerr
Paducah Site Lead
Portsmouth/Paducah Project Office

Enclosures:

1. Certification Page
2. Replacement Pages for D2/R1 SER Addendum 2 Soil Piles
3. CRS

cc w/enclosure:

AR File/Kevil

e-copy w/enclosure:

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CERTIFICATION

Document Identification: *Replacement pages for the Site Evaluation Report for
Addendum 2 Soil Piles at the Paducah Gaseous Diffusion
Plant, Paducah, Kentucky, DOE/LX/07-0188&D2/R1*

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 assure 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.

Paducah Remediation Services, LLC



Dennis Ferrigno, PM, Site Manager

5/26/10

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 assure 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)



Reinhard Knerr, Paducah Site Lead

5/26/10

Date Signed

CHANGES MADE

**Site Evaluation Report
for Addendum 2 Soil Piles
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky
DOE/LX/07-0188&D2/R1, issued January 2010**

The following five changes should be incorporated into the document:

1. Title Page – Added revised date.
2. Executive Summary – Added text “Five uranium-238 results were above background; however, these results likely are below the teen recreational user no-action level.”
3. Section 8 – Removed text “The Addendum 2 piles do not meet the definition of a SWMU or AOC because the constituent concentrations in soil are at or near background levels or do not exceed NALs, and no documentation exists to indicate the presence of wastes.”
4. Appendix B, page B-63 – Removed text “The revised background value, which is derived using two times the log-transformed mean, is 1.9 pCi/g (DOE 2009). Comparing the surface uranium-238 values to the adjusted, revised background value, there are no surface soil samples exceeding background.”
Added text “Although 3 of 54 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64.”
5. Appendix B, page B-67 – Removed text “The revised background value, which is derived using two times the log-transformed mean, is 1.8 pCi/g (DOE 2009). Comparing the subsurface uranium-238 values to the adjusted, revised background value, there are no subsurface soil samples exceeding background.”
Added text “Although 2 of 56 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64.”

Comment Response Summary

KY Conditional Approval for the

**Site Evaluation Report
for Addendum 2 Soil Piles at the
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky
(DOE/LX/07-0188&D2/R1)**



Prepared for
U.S. Department of Energy
Office of Environmental Management

COMMENT RESPONSE SUMMARY
for the
Site Evaluation Report for Addendum 2 Soil Piles at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0188&D2/R1

Comment Number	§/Page/¶	Comment	Response
Kentucky Division of Waste Management and Radiation Health Branch – March 8th, 2010			
		Conditions	
1.		Addendum 2 soil pile samples BC1401, BC1102, BCBNOI, BCBPO4 and BCBN03 were all above the adjusted background level of 0.40 pCi/g Uranium-238. The 2009 revised background value was not an agreed screening value in the Uranium White Paper and should not be used. Note that these values did not survive review of the 2009 Draft Risk Methods Document and will not appear in the present revision. Several results also exceed the child resident No Action Level (NAL) of 0.261 pCi/g. The discussion of this data on pages B-63 and B-67 should continue through a comparison to PGDP NALs and Site Specific NALs and include a discussion of the uncertainty of this data in accordance with the Uranium White Paper.	<p>Consistent with discussions between the KYDEP, EPA and DOE on April 21, 2010, the following changes have been made:</p> <p>The following text was deleted from page B-63: “The revised background value, which is derived using two times the log-transformed mean, is 1.9 pCi/g (DOE 2009). Comparing the surface uranium-238 values to the adjusted, revised background value, there are no surface soil samples exceeding background.”</p> <p>The following text was deleted from page B-67: “The revised background value, which is derived using two times the log-transformed mean, is 1.8 pCi/g (DOE 2009). Comparing the subsurface uranium-238 values to the adjusted, revised background value, there are no subsurface soil samples exceeding background.”</p> <p>The Site Evaluation Report (SER) recognizes the cited piles have U-238 concentrations greater than the adjusted background and discusses the uncertainty in the results. The D1 Risk Methods Document was submitted in July 2009. The values that appear in the SER matched what was being discussed at the time the report was written. These background values were derived in accordance with EPA Region 4 guidance that states, “for naturally occurring inorganics and radionuclides, compare the on-site maximum detected concentration to 2 times the average site-specific background concentration. Eliminate the chemical as a</p>

COMMENT RESPONSE SUMMARY
for the
Site Evaluation Report for Addendum 2 Soil Piles at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0188&D2/R1

Comment Number	§/Page/¶	Comment	Response
			COPC if it is less than 2 times the background levels.” While subsequent draft revisions to the Risk Methods Document have been made, a D2 version of this document has not been submitted. The D1 version was the most current at the time the SER was written.
2.		Figures B.30 and B.32 should be revised so as to be consistent with the language of the Uranium Data White Paper, specifically, the incremental adjustments from the data should be removed and the adjusted background lines should be corrected on the graphs. The draft 2009 background values should not appear on the graphs.	The following text has been added to page B-63: “Although 3 of 54 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64.” The following text has been added to page B-67: “Although 2 of 56 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64.”

COMMENT RESPONSE SUMMARY
for the
Site Evaluation Report for Addendum 2 Soil Piles at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0188&D2/R1

Comment Number	§/Page/¶	Comment	Response
3.		The rad walkover surveys were not used to inform sampling on these soil pile projects. Because of this concern, CHFS-RHB has requested and received copies of the gamma walkover data. This data has been reviewed and seems to support the need to reevaluate some of the soil piles. The newly collected data may indicate the need for reevaluating the conclusions in the SER.	<p>Sampling for the soil piles was performed in accordance with the approved Sampling and Analysis Plan. The concentration of radionuclides present in the piles does not result in unacceptable dose. The maximum level of U-238 measured in grab samples was less than 2 pCi/g. The acceptable concentrations under a teen recreational scenario at 1 mrem/yr using default exposure assumptions (inconsistent with expected rates of exposure) are 105 pCi/g (2001 RMD) and 80 pCi/g (2009 RMD). The values for the industrial worker scenario at 1 mrem/yr and using exposure assumptions (inconsistent with expected rates of exposure) are 35 and 28 pCi/g, respectively. (At realistic rates of exposure, these benchmarks could be up to an order of magnitude greater.)</p> <p>Consistent with discussions between the KYDEP, EPA and DOE on April 21, 2010, the conclusions of the SER will not change. The CHFS-RHB will provide the collected data to the FFA Managers which will be evaluated for further consideration.</p> <p>No change to the document was made.</p>
4.		Concerning Cs-137, the data from earlier monitoring studies at PGDP was evaluated in the past. The single background point of 4000 pCi/kg was investigated and found to be a problematic. For example, that data point was associated with coordinates outside the PGDP site. Comment noted is a sufficient response.	Please note that the document states the data point associated with the 4000 pCi/kg background value is 13 km south of the plant.
5.		In the Executive Summary, Page xii, Summary of Investigation Conclusions, the second sentence should be modified because five Uranium-238 samples exceeded background. It should not say the samples were "...less than or similar to background" without acknowledging that five samples were above background.	The following text has been added to the Executive Summary: "Five uranium-238 results were above background; however, these results likely are below the teen recreational user no-action level."

COMMENT RESPONSE SUMMARY
for the
Site Evaluation Report for Addendum 2 Soil Piles at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/LX/07-0188&D2/R1

Comment Number	§/Page/¶	Comment	Response
6.		The 2009 Draft Background values were not referenced in the flow chart in Figure 5 (page 34) and should not be used for screening. The screening was only applied to chromium in surface soils and for U-238 (which has already been discussed). It should be noted that while these screening levels were in the draft Risk Methods Document, these values were removed from the present 2010 Draft. Please revise the discussion for chromium in surface soils on page B-32 to screen against NALs instead.	While the background values presented in the 2009 D1 Risk Methods Document are not specifically referenced in Figure 5, DOE sees no reason why these values cannot be considered “other background criteria.” Whether these values are retained for the 2010 D2 Risk Methods Document or not, the values are still “2 times the average site-specific background concentration.” Please see the previous discussion regarding the use of the 2009 background values in responses to Comment #1. No change to the document was made.
7.		In section 8.1, Future Activities, page 41, bullet one should be revised because background levels and child resident NALs were exceeded for five U-238 samples. Additionally, because the U-238 samples were obtained using a nitric acid only dissolution, an uncertainty discussion is necessary when comparing the data to the teen recreator NAL.	Bullet one now reads as follows: “The soil piles do not pose a current or potential threat to human health or the environment. As a result, no further investigation is recommended for the 54 soil piles along Bayou Creek (Addendum 2 Soil Piles).”

**Site Evaluation Report
for Addendum 2 Soil Piles
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—January 2010

Revised Date—May 2010

Prepared for the
U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
PADUCAH REMEDIATION SERVICES, LLC
managing the
Environmental Remediation Activities at the
Paducah Gaseous Diffusion Plant
under contract DE-AC30-06EW05001

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- Two hundred ten subsurface samples (31 small pile locations, 179 large pile locations) to undergo field measurements only
- A number of contingency samples (no more than 40), if contamination was identified

During execution of Addendum 2, the total number of soil samples collected was as follows:

- Fifty-four surface samples underwent field measurements and fixed laboratory analysis
- Fifty-five surface samples underwent field measurements only
- Fifty-six subsurface samples underwent field measurements and fixed laboratory analysis
- One hundred eleven subsurface samples underwent field measurements only
- No contingency samples were collected

The differences between planned and actual sample numbers resulted from three factors.

First, the observed differences in subsurface samples result entirely from variations in soil pile height. Because the soil pile height, on average, was less than 5 ft, a fewer number of samples than that estimated in the Addendum 2 to the SAP were required to reach the natural grade.

Second, many of the large soil piles were smaller than planned in the Addendum 2 SAP, resulting in less area to be sampled.

Third, the concentration of analytes (i.e., chemicals of potential concern) in samples was at or near background or less than the screening criteria in the Addendum 2 SAP; therefore, no contingency samples were required.

INVESTIGATION FINDINGS

Sample results indicate no PCBs detected. Generally, metals results were statistically the same as background, based upon the results being below the 95th percentile of the generic statewide ambient background values (with the mean of the results being below the 95 upper confidence limit of the mean generic statewide ambient background and at least half of the results less than the 60th percentile). Polycyclic aromatic hydrocarbons (PAHs) were detected (benzoanthracene, pyrene, anthracene, chrysene, and fluoranthene between 0.72 and 2.1 ppm) in two samples collected from the 54 Addendum 2 soil piles. The PAHs detected are considered outliers and not indicative of contamination. Cesium-137 and plutonium-239/240 radionuclides were detected at or near background and are considered the result of fallout. Cesium-137 was detected in several piles; however, most are located upstream of PGDP. As a result, these chemicals are not considered site-related contaminants.

SUMMARY OF INVESTIGATION CONCLUSIONS

Nature and Extent of Contamination

Data of known quality were acquired in sufficient quantities to allow decision makers to formulate an informed decision as to the need for an action at any of the Addendum 2 Soil Piles, if warranted. Samples were collected from 54 soil piles and, as noted, was less than or similar to background. Five uranium-238 results were above background; however, these results likely are below the teen recreational user no-action level. No documentation was found as a result of the historical document review to demonstrate the

8. RECOMMENDATIONS

The following provides recommendations for future activities at Addendum 2 Soil Piles. The recommendations are based on the findings of the investigation and lessons learned during the planning and execution of study efforts at Addendum 2 Soil Piles.

8.1 FUTURE ACTIVITIES

The following are recommendations and future actions to be taken based on the findings of the Addendum 2 Soil Piles:

- ~~The soil piles do not pose a current or potential threat to human health or the environment. As a result, no further investigation is recommended for the 54 soil piles along Bayou Creek (Addendum 2 Soil Piles).~~
- The PAH test kit evaluation will be completed in the Addendum 1-B SER because most all results for Addendum 2 Soil Piles were below the detection limit for both field and fixed laboratory results.

Deleted: The Addendum 2 piles do not meet the definition of a SWMU or AOC because the constituent concentrations in soil are at or near background levels or do not exceed NALs, and no documentation exists to indicate the presence of wastes.

Uranium-238–Surface. Due to the method by which uranium isotopes were analyzed by the laboratory,² an incremental adjustment was applied in order to compare these results with screening values.² Incrementally adjusted uranium-238 values in surface soil samples exceed the background value of 1.2 pCi/g (1.205, 1.282, and 1.493) in three of the 54 samples. The exceeding values are the following: 0.405, 0.482, and 0.693 pCi/g. Prior to the incremental adjustment, uranium-238 values in surface soil samples did not exceed background. Although 3 of 54 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64,

Deleted: The revised background value, which is derived using two times the log-transformed mean, is 1.9 pCi/g (DOE 2009). Comparing the surface uranium-238 values to the adjusted, revised background value, there are no surface soil samples exceeding background.

Figure B.30 graphically shows the results with the background value and other comparison values. Figure B.31 illustrates the spatial distribution of the sampling locations in which the background value was exceeded.

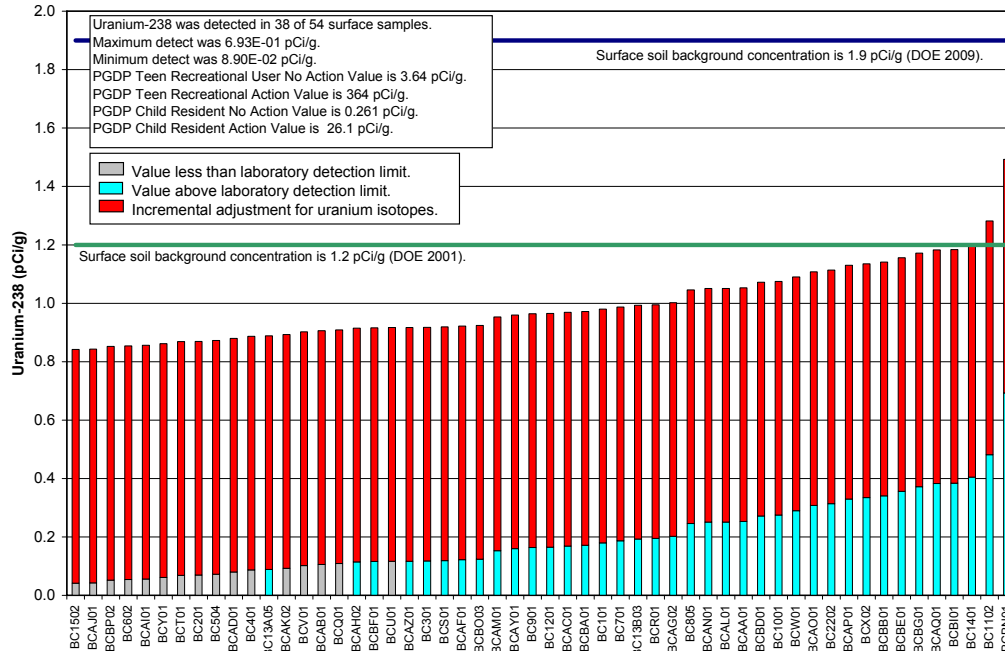


Figure B.30. Comparison between Uranium-238 Concentrations in Samples from Soil Piles Addendum 2 and Surface Soil Background Concentrations

² The laboratory reported results for uranium isotopes near background values may be low based on the laboratory’s extraction method. Due to this method, an incremental adjustment is necessary prior to comparison of the data to screening values. To simplify the comparison, the adjustment was made to the data results and not the screening values themselves. The incremental adjustments (0.77 pCi/g, 0.04 pCi/g, and 0.8 pCi/g for uranium-234, uranium-235, and uranium-238, respectively) were applied to results less than 10 pCi/g within the dataset. Screening is conducted upon detected values only; thus, the incremental adjustment did not affect results qualified by the laboratory as not detected.

Uranium-238–Subsurface. Due to the method by which uranium isotopes were analyzed by the laboratory, an incremental adjustment was applied in order to compare these results with screening values.³ Incrementally adjusted uranium-238 values in subsurface soil samples exceed the background value of 1.2 pCi/g (1.31 and 1.756) in 2 of the 56 samples. The exceeding values are the following: 0.51 and 0.956 pCi/g. Prior to the incremental adjustment, uranium-238 values in subsurface soil samples did not exceed background. Although 2 of 56 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64,

Deleted: The revised background value, which is derived using two times the log-transformed mean, is 1.8 pCi/g (DOE 2009). Comparing the subsurface uranium-238 values to the adjusted, revised background value, there are no subsurface soil samples exceeding background.

Figure B.32 graphically shows the results with the background value and other comparison values. Figure B.33 illustrates the spatial distribution of the sampling locations in which the background value was exceeded.

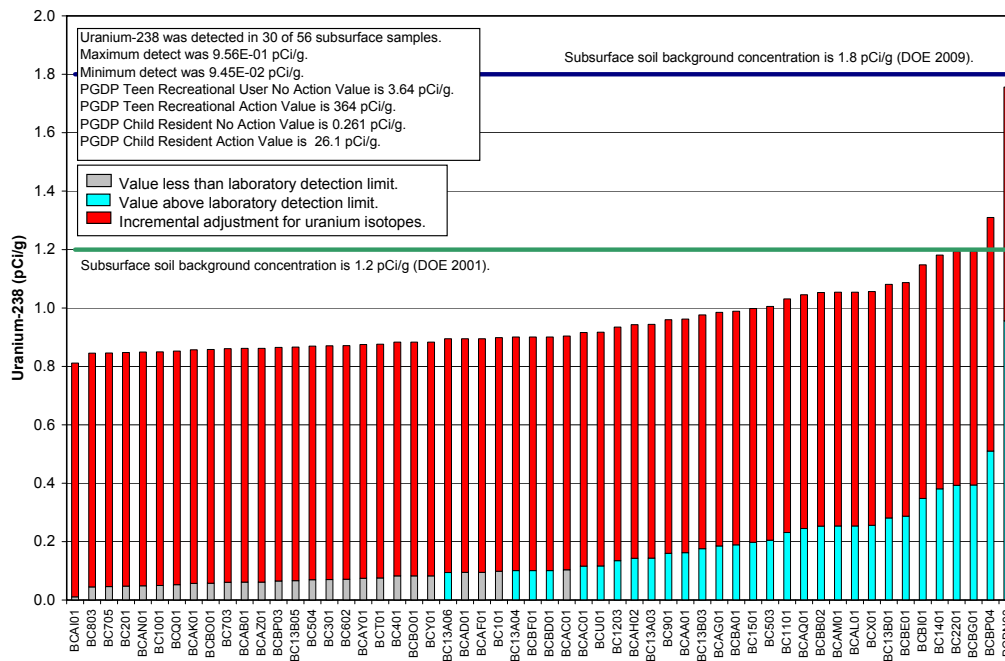


Figure B.32. Comparison between Uranium-238 Concentrations in Samples from Soil Piles Addendum 2 and Subsurface Soil Background Concentrations

³ The laboratory reported results for uranium isotopes near background values may be low based on the laboratory’s extraction method. Due to this method, an incremental adjustment is necessary prior to comparison of the data to screening values. To simplify the comparison, the adjustment was made to the data results and not the screening values themselves. The incremental adjustments (0.77 pCi/g, 0.04 pCi/g, and 0.8 pCi/g for uranium-234, uranium-235, and uranium-238, respectively) were applied to results less than 10 pCi/g within the dataset. Screening is conducted upon detected values only; thus, the incremental adjustment did not affect results qualified by the laboratory as not detected.

**Site Evaluation Report
for Addendum 2 Soil Piles
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—January 2010

Revised Date—May 2010

Prepared for the
U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
PADUCAH REMEDIATION SERVICES, LLC
managing the
Environmental Remediation Activities at the
Paducah Gaseous Diffusion Plant
under contract DE-AC30-06EW05001

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EXECUTIVE SUMMARY

This Site Evaluation Report (SER) presents the results of the comprehensive sampling effort completed for Addendum 2 Soil Piles along Bayou Creek. Sampling and analysis were completed in accordance with the following agency-approved secondary documents:

- *Sampling and Analysis Plan for Soil Piles at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0015&D2/R1, (SAP) 2007; and
- *Addendum 2 to the Sampling and Analysis Plan at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0015/A2/&D2, 2008.

In December 2006, soil sampling was completed at Addendum 2 Soil Piles 14 and 15, which are located off U.S. Department of Energy (DOE) property, to assess further site conditions. The sampling effort indicated results below action levels and at or near background levels for radionuclides, metals, and polychlorinated biphenyls (PCBs). Addendum 2 Soil Piles, distributed across approximately 88 acres, represents over one-half of the total number of soil piles identified in the February 2007 notification letter. The 54 piles that comprise the Addendum 2 soil piles are located along Bayou Creek west of the Paducah Gaseous Diffusion Plant (PGDP) vary in size and shape, ranging from approximately 3 to 450 ft in length and from 2 to 8 ft in height. The field investigation was conducted between August and September 2008.

PROJECT OBJECTIVES

The study was designed to obtain sufficient data of known quality to support the following objectives:

- Establish the nature and extent of contamination of soils in Addendum 2 Soil Piles and adjacent soils.
- Establish the mean concentrations of contaminants in soils.
- Determine if soils pose imminent risks to human health.
- Determine if soils contamination exceeds regulatory thresholds.

INVESTIGATION SUMMARY

The following provides the planned sampling activities for Addendum 2 Soil Piles and an accounting of the actual number and types of samples collected. Addendum 2 to the PGDP Soil Piles SAP specified the collection and analysis of these samples:

- Fifty-four surface samples (24 small piles, 30 large piles) to undergo field measurements and fixed laboratory analysis
- One hundred seven surface samples (24 small pile locations, 83 large pile locations) to undergo field measurements only
- Sixty subsurface samples (25 small pile locations, 35 large pile locations), where subsurface is defined as soil taken at a depth below 1 ft, to undergo field measurements and fixed laboratory analysis

- Two hundred ten subsurface samples (31 small pile locations, 179 large pile locations) to undergo field measurements only
- A number of contingency samples (no more than 40), if contamination was identified

During execution of Addendum 2, the total number of soil samples collected was as follows:

- Fifty-four surface samples underwent field measurements and fixed laboratory analysis
- Fifty-five surface samples underwent field measurements only
- Fifty-six subsurface samples underwent field measurements and fixed laboratory analysis
- One hundred eleven subsurface samples underwent field measurements only
- No contingency samples were collected

The differences between planned and actual sample numbers resulted from three factors.

First, the observed differences in subsurface samples result entirely from variations in soil pile height. Because the soil pile height, on average, was less than 5 ft, a fewer number of samples than that estimated in the Addendum 2 to the SAP were required to reach the natural grade.

Second, many of the large soil piles were smaller than planned in the Addendum 2 SAP, resulting in less area to be sampled.

Third, the concentration of analytes (i.e., chemicals of potential concern) in samples was at or near background or less than the screening criteria in the Addendum 2 SAP; therefore, no contingency samples were required.

INVESTIGATION FINDINGS

Sample results indicate no PCBs detected. Generally, metals results were statistically the same as background, based upon the results being below the 95th percentile of the generic statewide ambient background values (with the mean of the results being below the 95 upper confidence limit of the mean generic statewide ambient background and at least half of the results less than the 60th percentile). Polyaromatic hydrocarbons (PAHs) were detected (benzoanthracene, pyrene, anthracene, chrysene, and fluoranthene between 0.72 and 2.1 ppm) in two samples collected from the 54 Addendum 2 soil piles. The PAHs detected are considered outliers and not indicative of contamination. Cesium-137 and plutonium-239/240 radionuclides were detected at or near background and are considered the result of fallout. Cesium-137 was detected in several piles; however, most are located upstream of PGDP. As a result, these chemicals are not considered site-related contaminants.

SUMMARY OF INVESTIGATION CONCLUSIONS

Nature and Extent of Contamination

Data of known quality were acquired in sufficient quantities to allow decision makers to formulate an informed decision as to the need for an action at any of the Addendum 2 Soil Piles, if warranted. Samples were collected from 54 soil piles and, as noted, was less than or similar to background. Five uranium-238 results were above background; however, these results likely are below the teen recreational user no-action level. No documentation was found as a result of the historical document review to demonstrate the

presence of wastes. Accordingly, the available information indicates that the piles do not meet the regulatory definition of a solid waste management unit (SWMU) or area of concern (AOC). As defined in the Federal Facility Agreement, a SWMU “means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which routine and systematic releases of hazardous wastes or hazardous constituents has occurred.” AOCs “shall include any area having a probable or known release of a hazardous waste, hazardous constituent or hazardous substance which is not from a solid waste management unit and which poses a current or potential threat to human health or the environment.”

It should be noted that the February 16, 2007, notification letter indicated that 102 of the 122 soil and rubble areas (including Addendum 2 54 soil piles) are being designated as a SWMU and/or AOC (DOE 2007b). It also states that DOE will be “evaluating whether the areas are SWMUs or AOCs...” The Addendum 2 SER is the second of four SERs being provided as part of the evaluation and, as stated and detailed within the document, provides documentation to support the conclusion that Addendum 2 piles do not meet the definition of a SWMU or AOC.

Assessment of Human Health Risks

The results of the background screening for metals indicate concentrations used to quantify risks and hazards were at or near background levels for all 54 soil piles. No PCBs were detected. For uranium, the fixed-base laboratory concentrations are below the individual recreational user screening level for a 1 mrem/year dose and, therefore, below the “walk away” level in the PGDP Risk Methods Document.

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8. RECOMMENDATIONS

The following provides recommendations for future activities at Addendum 2 Soil Piles. The recommendations are based on the findings of the investigation and lessons learned during the planning and execution of study efforts at Addendum 2 Soil Piles.

8.1 FUTURE ACTIVITIES

The following are recommendations and future actions to be taken based on the findings of the Addendum 2 Soil Piles:

- The soil piles do not pose a current or potential threat to human health or the environment. As a result, no further investigation is recommended for the 54 soil piles along Bayou Creek (Addendum 2 Soil Piles).
- The PAH test kit evaluation will be completed in the Addendum 1-B SER because most all results for Addendum 2 Soil Piles were below the detection limit for both field and fixed laboratory results.

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Uranium-238–Surface. Due to the method by which uranium isotopes were analyzed by the laboratory,² an incremental adjustment was applied in order to compare these results with screening values.² Incrementally adjusted uranium-238 values in surface soil samples exceed the background value of 1.2 pCi/g (1.205, 1.282, and 1.493) in three of the 54 samples. The exceeding values are the following: 0.405, 0.482, and 0.693 pCi/g. Prior to the incremental adjustment, uranium-238 values in surface soil samples did not exceed background. Although 3 of 54 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64.

Figure B.30 graphically shows the results with the background value and other comparison values. Figure B.31 illustrates the spatial distribution of the sampling locations in which the background value was exceeded.

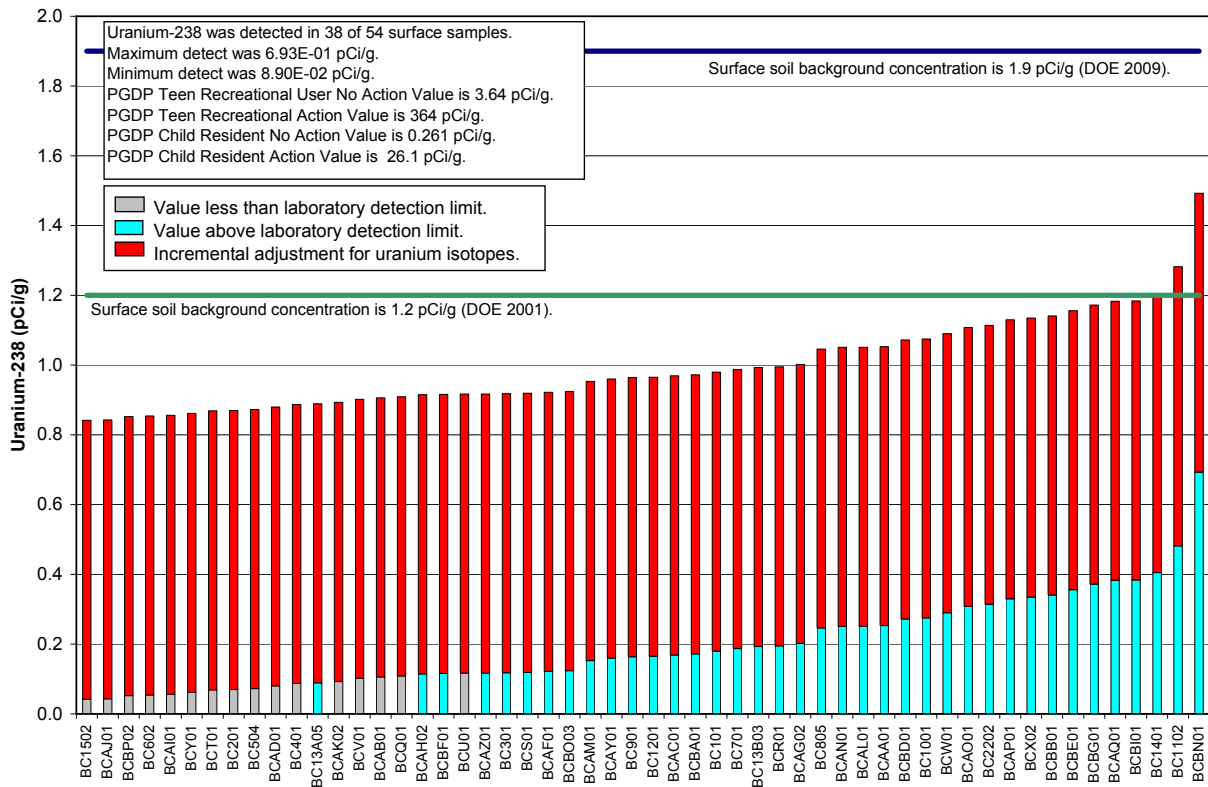


Figure B.30. Comparison between Uranium-238 Concentrations in Samples from Soil Piles Addendum 2 and Surface Soil Background Concentrations

² The laboratory reported results for uranium isotopes near background values may be low based on the laboratory’s extraction method. Due to this method, an incremental adjustment is necessary prior to comparison of the data to screening values. To simplify the comparison, the adjustment was made to the data results and not the screening values themselves. The incremental adjustments (0.77 pCi/g, 0.04 pCi/g, and 0.8 pCi/g for uranium-234, uranium-235, and uranium-238, respectively) were applied to results less than 10 pCi/g within the dataset. Screening is conducted upon detected values only; thus, the incremental adjustment did not affect results qualified by the laboratory as not detected.

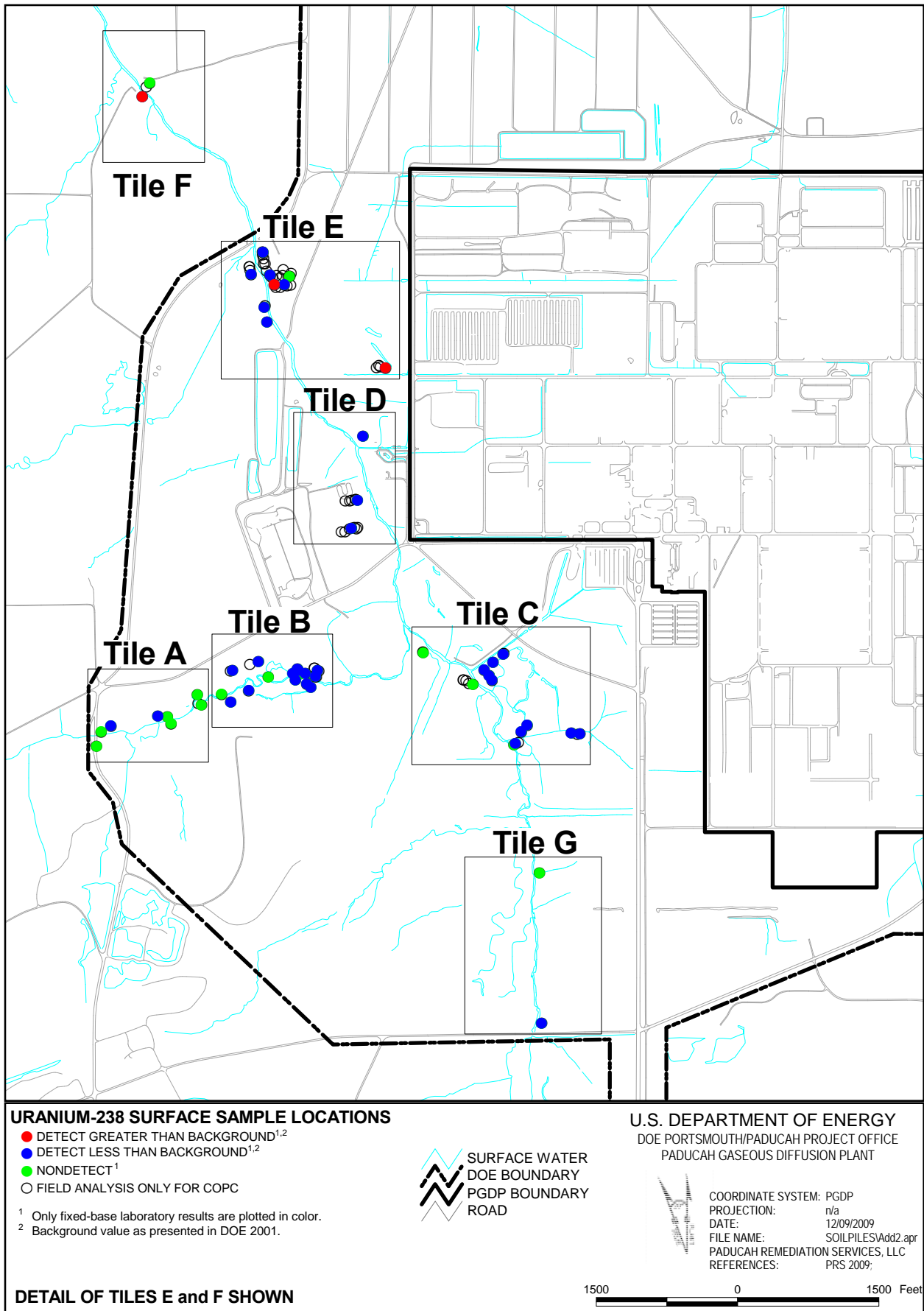


Figure B.31. Location of Sample Stations in Addendum 2 Soil Pile Sampling for Uranium-238 on the Surface
 B-64

Uranium-238–Subsurface. Due to the method by which uranium isotopes were analyzed by the laboratory, an incremental adjustment was applied in order to compare these results with screening values.³ Incrementally adjusted uranium-238 values in subsurface soil samples exceeded the background value of 1.2 pCi/g (1.31 and 1.756) in 2 of the 56 samples. The exceeding values are the following: 0.51 and 0.956 pCi/g. Prior to the incremental adjustment, uranium-238 values in subsurface soil samples did not exceed background. Although 2 of 56 results exceed background of 1.2 pCi/g, these results, although uncertain, are well below the recreational no-action level of 3.64.

Figure B.32 graphically shows the results with the background value and other comparison values. Figure B.33 illustrates the spatial distribution of the sampling locations in which the background value was exceeded.

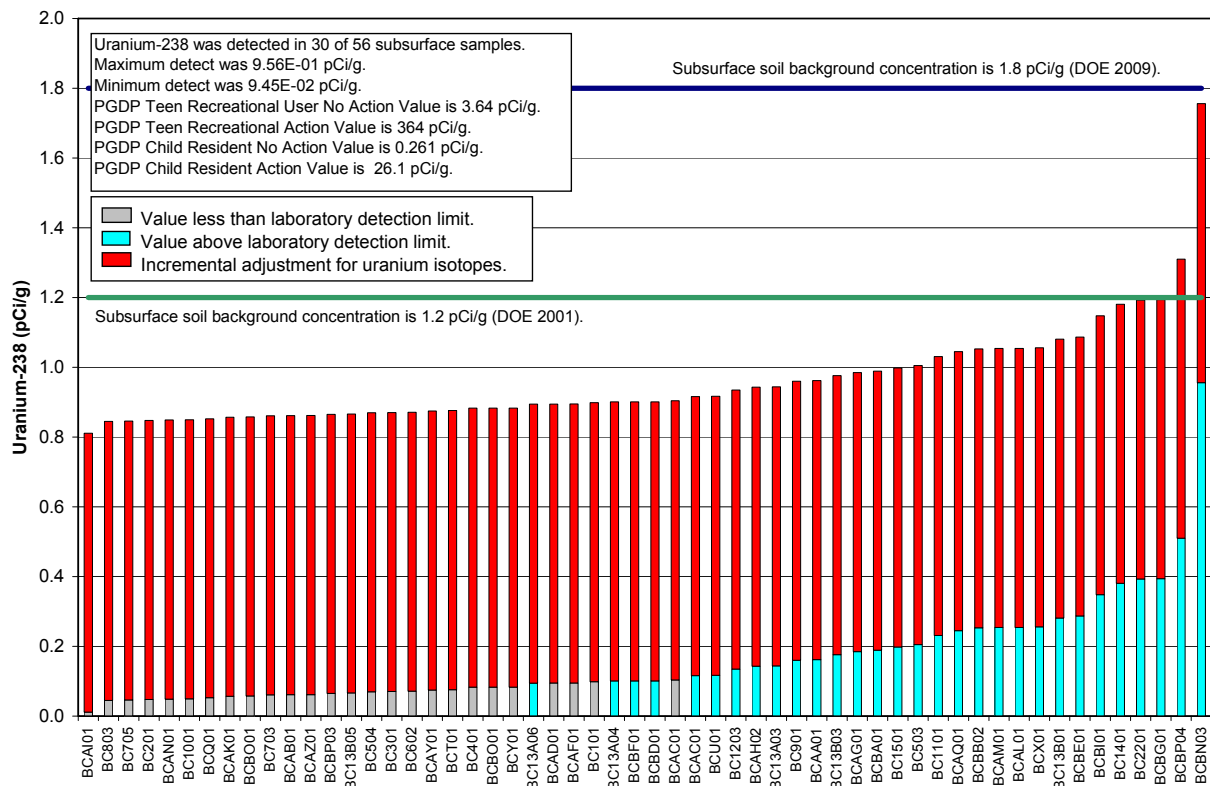


Figure B.32. Comparison between Uranium-238 Concentrations in Samples from Soil Piles Addendum 2 and Subsurface Soil Background Concentrations

³ The laboratory reported results for uranium isotopes near background values may be low based on the laboratory’s extraction method. Due to this method, an incremental adjustment is necessary prior to comparison of the data to screening values. To simplify the comparison, the adjustment was made to the data results and not the screening values themselves. The incremental adjustments (0.77 pCi/g, 0.04 pCi/g, and 0.8 pCi/g for uranium-234, uranium-235, and uranium-238, respectively) were applied to results less than 10 pCi/g within the dataset. Screening is conducted upon detected values only; thus, the incremental adjustment did not affect results qualified by the laboratory as not detected.

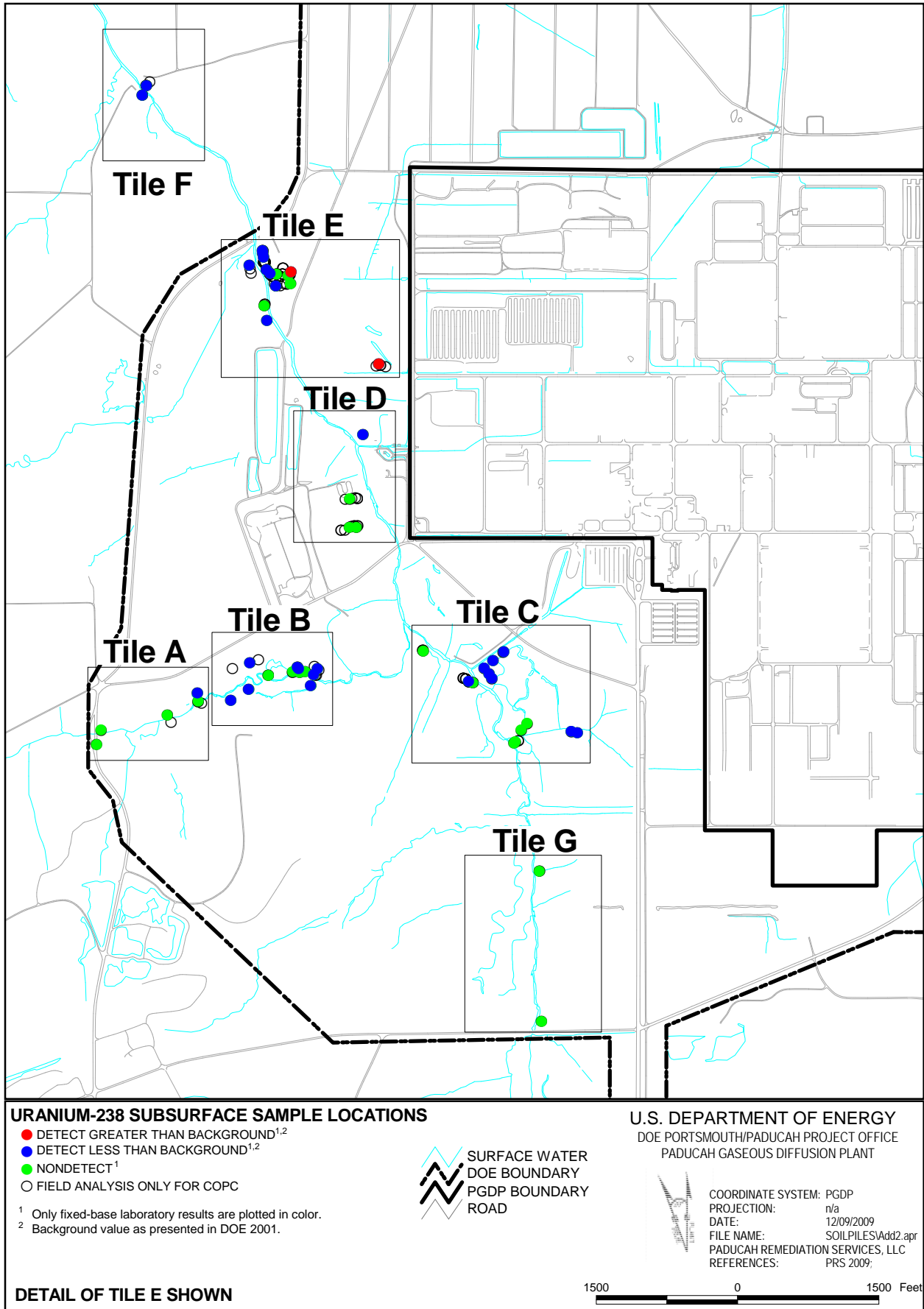


Figure B.33. Location of Sample Stations in Addendum 2 Soil Pile Sampling for Uranium-238 in the Subsurface
 B-68