



Department of Energy

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May 8, 2026

Mr. Brian Begley
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

PPPO-02-10036656-26

Ms. April Webb
Interim Federal Facility Agreement Manager
Hazardous Waste Branch Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

Dear Mr. Begley and Ms. Webb:

**TRANSMITTAL OF THE LITTLE BAYOU CREEK SOLID WASTE MANAGEMENT
UNIT ASSESSMENT REPORT FOR SOLID WASTE MANAGEMENT UNIT 64,
DOE/LX/07-2530&D1, HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT
NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059**

Please find enclosed the *Little Bayou Creek Solid Waste Management Unit (SWMU) Assessment Report (SAR)* for SWMU 64, DOE/LX/07-2530&D1. As part of the independent verification survey for Parcel 1, the Oak Ridge Institute for Science and Education found elevated concentrations of uranium-238 and uranium-234 in soil samples taken from an area east of Little Bayou Creek. The evidence indicates that the area has been impacted by site operations. The Federal Facility Agreement managers were consulted on December 16, 2025. As a result of the consultation, the SAR for SWMU 64 was updated to expand the SWMU boundary.

If you have any questions or require additional information, please contact me at (270) 217-2029.

Sincerely,

APRIL LADD

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April Ladd
Federal Facility Agreement Manager
Portsmouth/Paducah Project Office

Enclosures:

1. Certification Page
2. *Little Bayou Creek Solid Waste Management Unit (SWMU) Assessment Report (SAR)*, DOE/LX/07-2530&D1

Administrative Record File—Administrative Record Reference

cc w/enclosures:

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CERTIFICATION

Document Identification: *Little Bayou Creek Solid Waste Management Unit (SWMU) Assessment Report for SWMU 64, DOE/LX/07-2530&D1, Hazardous Waste Management Facility Permit Number KY8-890-008-982, Agency Interest Number 3059, dated April 2026*

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those 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.

Four Rivers Nuclear Partnership, LLC

MYRNA REDFIELD
(Affiliate)

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Myrna E. Redfield, Program Manager/Date Signed
Four Rivers Nuclear Partnership, LLC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those 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

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April Ladd, Paducah Site Lead/Date Signed
Portsmouth/Paducah Project Office
U.S. Department of Energy

**Little Bayou Creek
Solid Waste Management Unit (SWMU) Assessment Report (SAR)**

SWMU/Area of Concern (AOC) Number: 64

DATE OF ORIGINAL SAR: 8/24/1987

DATE OF SAR REVISIONS: 4/29/2026

REGULATORY STATUS: Solid Waste Management Unit (SWMU)

LOCATION: Little Bayou Creek is a stream located east of the Paducah Site that flows north toward the Ohio River. It converges with Bayou Creek 3 miles north of the Paducah Site before emptying into the Ohio River (Figure 1).

APPROXIMATE DIMENSION OR CAPACITY: The length of SWMU 64, Little Bayou Creek, runs approximately 7 miles along the main creek channel to the confluence with Bayou Creek. In this revision, the SWMU boundary is being expanded to include an area east of Kentucky Pollutant Discharge Elimination System (KPDES) Outfall 002 ditch, which was found to have elevated surface sample (0–15 cm) results above site-specific background levels for uranium-238 (U-238) and uranium-234 (U-234) in July 2025. Review of historical information determined that the newly discovered area east of KPDES Outfall 002 ditch is within the historical creek channel (Figure 2).

PRESENT FUNCTION: Little Bayou Creek is used to discharge wastewater and storm water from the east side of the plant site to the Ohio River. Permitted discharges to Little Bayou Creek occur through KPDES-permitted Outfalls 002, 010, 011, 012, 013, 019, and 020, and former 003.

BRIEF HISTORY: The Paducah Site is on a local drainage divide and surface water from the east side of the plant flows east-northeast toward Little Bayou Creek. Surface water leaving the Paducah Site includes precipitation runoff from cylinder yards, landfills, and effluent from Paducah Site processes. Signs are posted along Little Bayou Creek to warn members of the public about the possible risks posed by recreational contact with these waters, stream sediments, and fish caught in the creeks. Effluents from the Paducah Site are major sources of flow during low-flow periods and may constitute all of the flow in Little Bayou Creek.

Little Bayou Creek has received effluent from the east side of the Paducah Site since operation of the plant began in the early 1950s. The east side of the plant contained most of the heavily industrialized processes of the plant, which included the main uranium processing buildings and their associated cooling towers and switchyards. Blowdown of recirculating water from the cooling towers served as a primary effluent source to Little Bayou Creek. In 1975, a National Pollutant Discharge Elimination System (NPDES) permit was implemented for surface water sampling at the Paducah Site. Sampling of Little Bayou Creek continued under the NPDES program until October 1987 when the KPDES permit was signed. With the implementation of the 1987 KPDES permit, additional monitoring locations were established at various effluent ditches located along the east side of the plant (e.g., KPDES Outfalls 002, 010, 011, 012, and 013, and former 003), allowing for more detailed monitoring of potential impacts of the effluent discharge on Little Bayou Creek. The KPDES permit has been updated periodically since 1987, allowing for the changes in monitoring parameters, limits, and locations. In 2001, a total maximum daily load (TMDL) was established for Little Bayou Creek promulgated under Section 303(d) of the Clean Water Act, which established allowable loadings of pollutants or other quantifiable parameters related to the protection of

aquatic life and human health. This TMDL was necessitated by the presence of polychlorinated biphenyls (PCBs), which originated from historical operations at the Paducah Site.

In July 2025, during the independent verification survey for Parcel 1, the Oak Ridge Institute for Science and Education (ORISE) found elevated concentrations of U-238 and U-234 in one judgmental surface soil sample taken from an area east of KPDES Outfall 002 ditch (Sample ID S0013) (ORAU 2025). The concentrations of U-238 and U-234 were determined to be above site-specific background levels. The elevated uranium results and historical information indicate that the area has been impacted by site operations. Review of historical information determined that the newly discovered area east of KPDES Outfall 002 was within the historical/original creek channel (Figure 2). Historic imagery shows that Little Bayou Creek was rerouted and straightened near KPDES Outfall 002 to the current shape in the 1950s.

PRESENT OPERATIONAL STATUS: Active

DATES OPERATED: 1950s to present

SITE/PROCESS DESCRIPTION: Little Bayou Creek is a surface water stream located east of the Paducah Site that is used to discharge wastewater and storm water from the plant site to the Ohio River. Historical information indicates that most floor drains in the industrial facilities on the east side of the plant were designed to drain to the storm sewer system leading to Little Bayou Creek. Most of the flow in Little Bayou Creek can be attributed to effluent discharges from process buildings, cooling towers, switchyards, and surface drainage from storage yards through KPDES outfalls. Little flow originates in the headwaters of the creek south of the Paducah Site. Nearly 100% of the flow in Little Bayou Creek can be attributed to discharges from plant effluent streams (i.e., outfall ditches and storm water runoff) (DOE 2012). Figures 3.A–3.H show the contours of Little Bayou Creek and any additional SWMUs located near Little Bayou Creek. Figures 4–11 show photographs upstream and downstream at four different locations along Little Bayou Creek.

WASTE DESCRIPTION: Sediments within Little Bayou Creek and surface soils adjacent to Little Bayou Creek are potentially contaminated. The extent of contamination (if any) will be defined during a future investigation.

WASTE QUANTITY: A projected waste volume for Little Bayou Creek is uncertain. The extent of contamination (if any) and waste volume will be defined during a future investigation.

SUMMARY OF ENVIRONMENTAL SAMPLING DATA: In 2012, the Surface Water Operable Unit (SWOU) Remedial Investigation/Feasibility Study (RI/FS) Work Plan assessed previous investigations regarding areas near Little Bayou Creek. The work plan indicated further data was needed to determine the extent of contamination and whether they have an adverse effect on human health or ecological receptors (DOE 2012).

In the ORISE survey of July 2025, one judgmental surface sample (0 to 15 cm) was collected in the subject area. The isotopic abundance ratio between U-238 and U-234 indicates that the sample (S0013) was impacted by depleted uranium.

DESCRIPTION OF RELEASE AND MEDIA AFFECTED: According to the SWOU RI/FS Work Plan, contaminants of potential concern, including PCBs, chromium, organics, inorganics, and radionuclides, have been discharged to Little Bayou Creek.

GROUNDWATER:	No
SURFACE WATER:	Yes
SOIL:	Yes
ECOLOGY AFFECTED (e.g., threatened/endangered species):	Yes

There have been documented historical spills or releases that have been discharged to and impacted Little Bayou Creek. Examples of these releases are the following:

- From 1974 to 1982, cooling tower blowdown and effluent recirculating water discharges resulted in concentrations of Cr^{+6} in Little Bayou Creek more than the Commonwealth of Kentucky aquatic life standard of 0.05 mg/L. In June 1977, a chromate treatment facility was put into operation to reduce chromium concentrations from recirculating cooling water discharges. In 1992, the Paducah Site stopped using chromate additives and, therefore, ceased chromate treatment.
- In April 1980, the C-637 cooling tower basin overflowed to Little Bayou Creek, resulting in an NPDES violation. Further details provided in 1982 indicated that 300,000 gal of recirculating water was released to Little Bayou Creek when the cooling tower basin was overfilled. This quantity of chromium was below the U.S. Environmental Protection Agency reporting limit, but exceeded the NPDES limit. The total quantity of chromium released was approximately 23 lb.
- In 1981, there were six chromium violations in Little Bayou Creek due to windage from cooling towers, which drain to the creek. Windscreens and windage collection aprons were installed during 1979 to minimize windage losses.
- In April 1985, a high-level alarm on the C-637 cooling tower basin did not actuate, resulting in overfeeding. The overfeeding of nonchromated water to the C-637 cooling tower basin allowed a calculated 3,000 gal of water containing Cr^{+6} (9 parts per million) to flow to Little Bayou Creek. The NPDES permit was not violated. Concentrations in Little Bayou Creek were measured at 0.05 mg/L.
- In November 1985, a small pipe broke on a recirculating water header in the C-331 Process Building, which resulted in a spill of chromated water. It was calculated that 5,000 to 5,500 gal of chromated water reached Little Bayou Creek. A 24-hour composite sample indicated a Cr^{+6} level of 0.03 mg/L in Little Bayou Creek. This level did not result in a violation of the 0.08 mg/L NPDES limit.
- In January 1988, a leak in the waste heat utilization system in the basement of the C-360 Toll Transfer and Sampling Building was discovered. An estimated 50,000 gal of water containing approximately 9 mg/L of Cr^{+6} was released. Approximately 25,000 gal was contained within the building and 10,000 gal contained in a plant drainage ditch. An estimated 15,000 gal of water was released to Little Bayou Creek. The contained water was returned to the recirculating water system. No adverse effects on aquatic life in the ditch or Little Bayou Creek were observed.
- In December 1990, approximately 345 gal of non-PCB oil was released when a current transformer failed. The oil spread over a large area of the switchyard gravel. Due to water flow from the fire sprinkler system and heavy precipitation, the oil leached out of the switchyard and into KPDES Outfall 012, which formed a visible sheen in the ditch. On one occasion, the sheen broke through the containment devices and reached Little Bayou Creek, prompting reports to the Kentucky Division of Water and the National Spill Response Center. Approximately 120 55 gal drums of gravel and soil were excavated from the switchyard to remove as much of the free oil as possible.
- In January 2018, a piece of out-of-service electrical equipment in the C-533-2 Switchyard was determined to be the source of an oil sheen at KPDES Outfall 012 leading to Little Bayou Creek. The

equipment was filled with non-PCB mineral oil and was placed out of service in February 2017. The flanges were tightened on the equipment to stop the leaks, the drainage line exiting the switchyard was plugged, and absorbent pads and booms were deployed to prevent further migration of the release. The oil sheen impacted a maximum of 5,000 ft of Little Bayou Creek and the release did not extend beyond the U.S. Department of Energy (DOE) property boundary.

DOCUMENTATION OF NO RELEASE: Examples of spill/release events, as noted in the “Description of Release and Media Affected” section, indicate potential environmental releases to Little Bayou Creek. Based on historical environmental sampling data, releases of PCBs and radionuclides likely have occurred. Historical data and documentation of previous spills and releases support further investigation to verify whether or not any such environmental releases may exist.

IMPACT ON OR BY OTHER SWMUs/AOCs: Little Bayou Creek receives discharges from the following ditches on DOE property: SWMU 58 [North-South Diversion Ditch (NSDD) (Outside) (includes KPDES 003)], SWMU 60 [C-375-E2 Effluent Ditch (KPDES 002)], SWMU 61 [C-375-E5 Effluent Ditch (KPDES 013)], SWMU 66 [C-375-E3 Effluent Ditch (KPDES 010)], SWMU 67 [C-375-E4 Effluent Ditch (C-340 Ditch) (KPDES 011)], and SWMU 168 (KPDES Outfall Ditch 012). SWMUs 93 (Concrete Disposal Area East of Plant Security Area), 108 [Concrete Rubble Pile (6)], 109 [Concrete Rubble Pile (7)], and 113 [Concrete Rubble Pile (11)] are rubble piles located within outfall ditches or the creek, which have had potential impacts on Little Bayou Creek. SWMU 201 (Northwest Groundwater Plume) impacts Little Bayou Creek in the seep areas. Storm water runoff from the following soil piles flow to Little Bayou Creek: SWMU 561 (Soil Pile I), SWMU 562 (Soil Piles C, D, E, F, G, H, J, K, and P in subunit 1 north of Soil Pile I on the west bank of Little Bayou Creek), and SWMU 563 (Soil Piles 20, CC, and BW in subunit 4 north of Outfall 012 west of Little Bayou Creek). SWMU 492 (Contaminated Soil Area Near Outfall 010) and SWMU 541 (Contaminated Soil Area South of Outfall 011) also have storm water runoff that flows to Little Bayou Creek. SWMU 64 combines with SWMU 65, Bayou Creek, north of the plant site near the Ohio River.

PRELIMINARY REMEDIATION GOAL COMPARISON: The ORISE survey found elevated U-238 and U-234 concentrations of 64 pCi/g and 7.2 pCi/g, respectively, at S0013. These concentrations exceeded both the industrial worker and the teen recreational user NAL concentrations, as well as site-specific background concentrations for surface soil for U-238 and U-234. NALs and site-specific background concentrations were taken from the *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 1. Human Health* (DOE 2024). See the Summary of Environmental Sampling Data section for information regarding historical data.

RCRA FACILITY INVESTIGATION NECESSARY: Yes

OPERABLE UNIT ASSIGNMENT: Environmental Media Sitewide Operable Unit

REFERENCES:

DOE (U.S. Department of Energy) 2012. *Work Plan for the Surface Water Operable Unit Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0361&D2/R1, U.S. Department of Energy, Paducah, KY, June.

DOE 2024. *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 1. Human Health*, DOE/LX/07-0107&D2/R15/V1, U.S. Department of Energy, Paducah, KY, June.

ORAU (Oak Ridge Associated Universities) 2025. *Independent Verification Survey Report for Parcel 1 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DCN 5385-SR-01-0, Oak Ridge Associated Universities, Oak Ridge, TN, July.

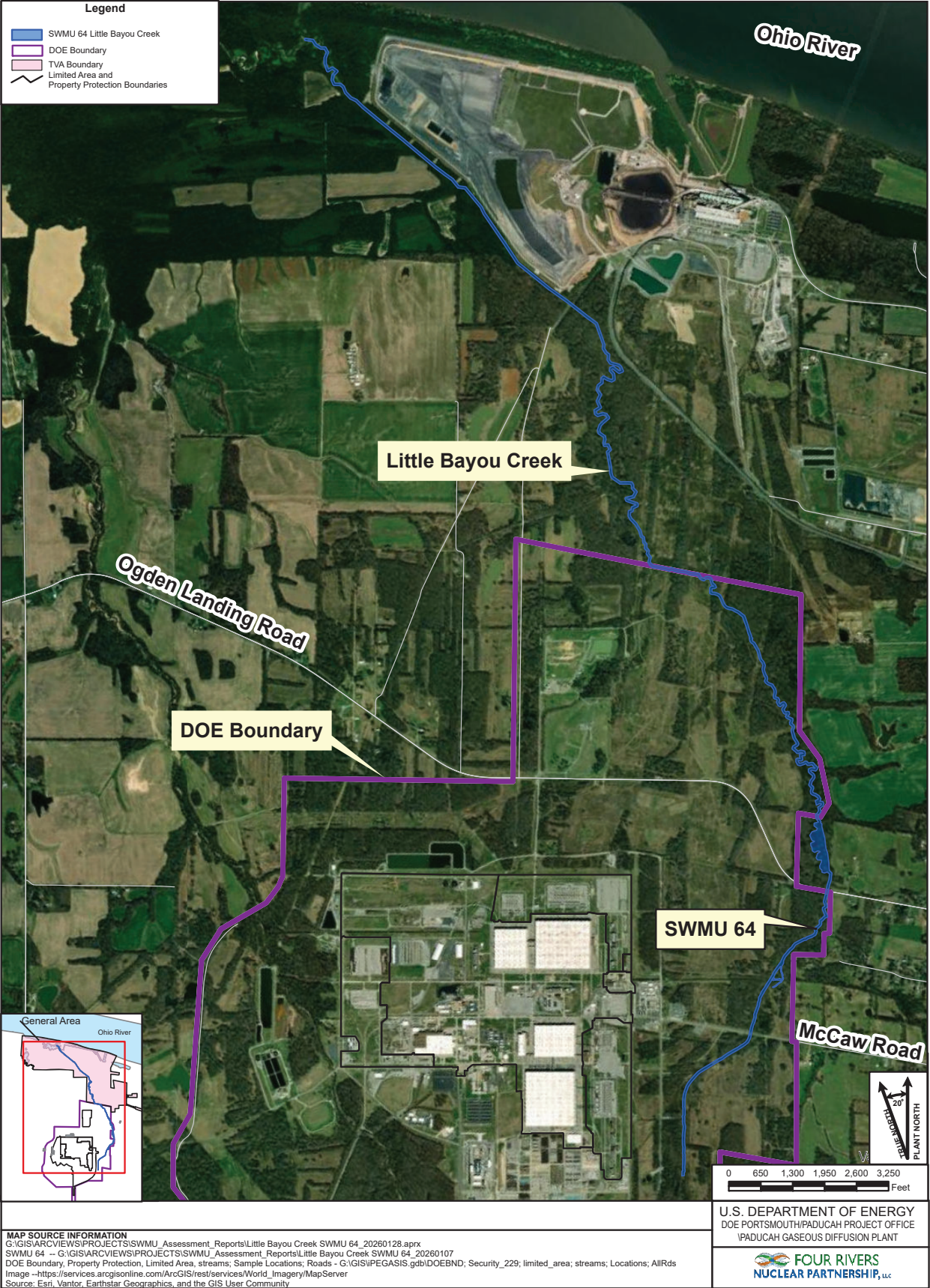


Figure 1. SWMU 64

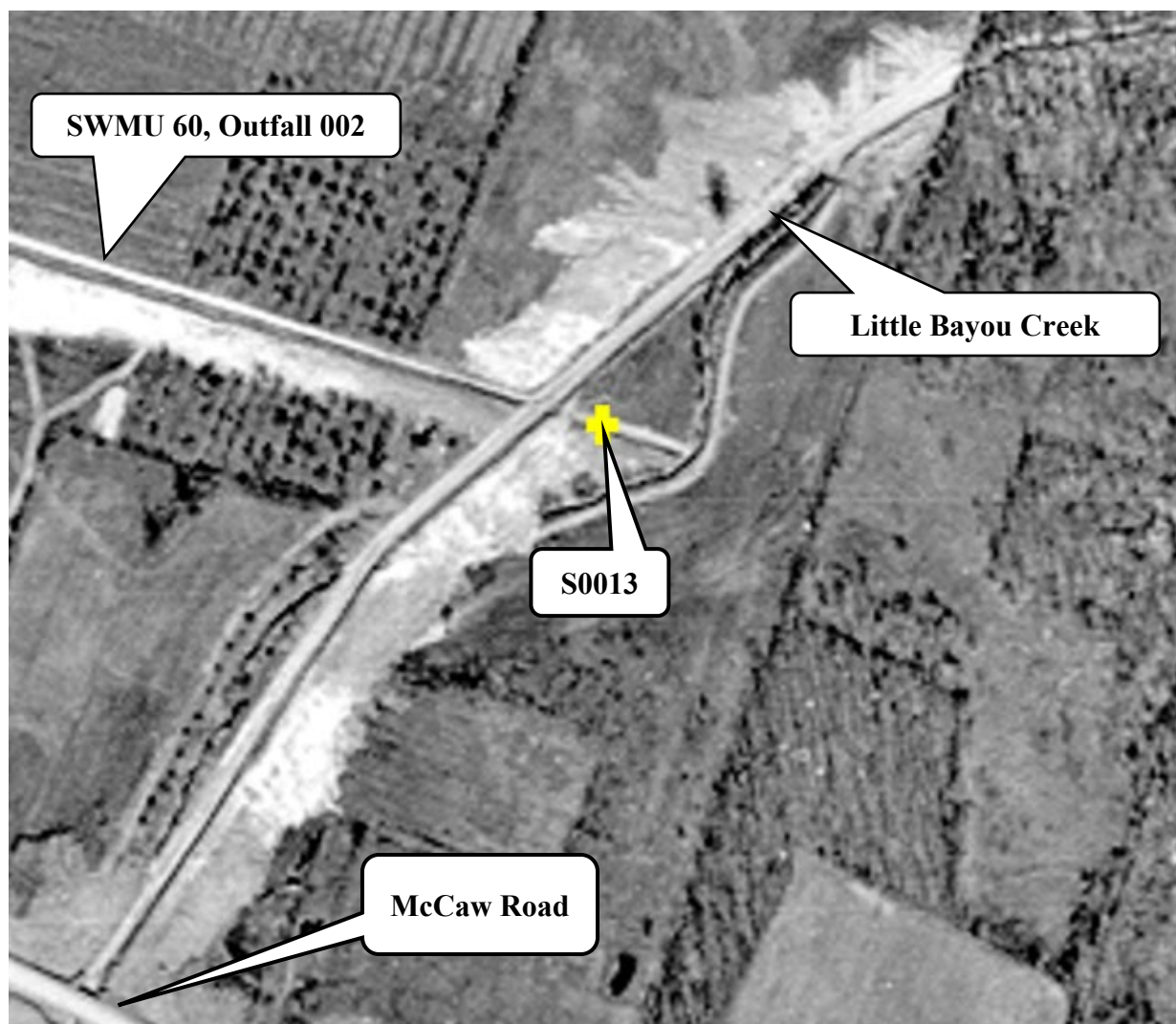


Figure 2. Zoomed in 1952 Aerial of Outfall 002 with Approximate Location of S0013



Figure 3.A. SWMUs and Contours Near SWMU 64



Figure 3.B. SWMUs and Contours Near SWMU 64

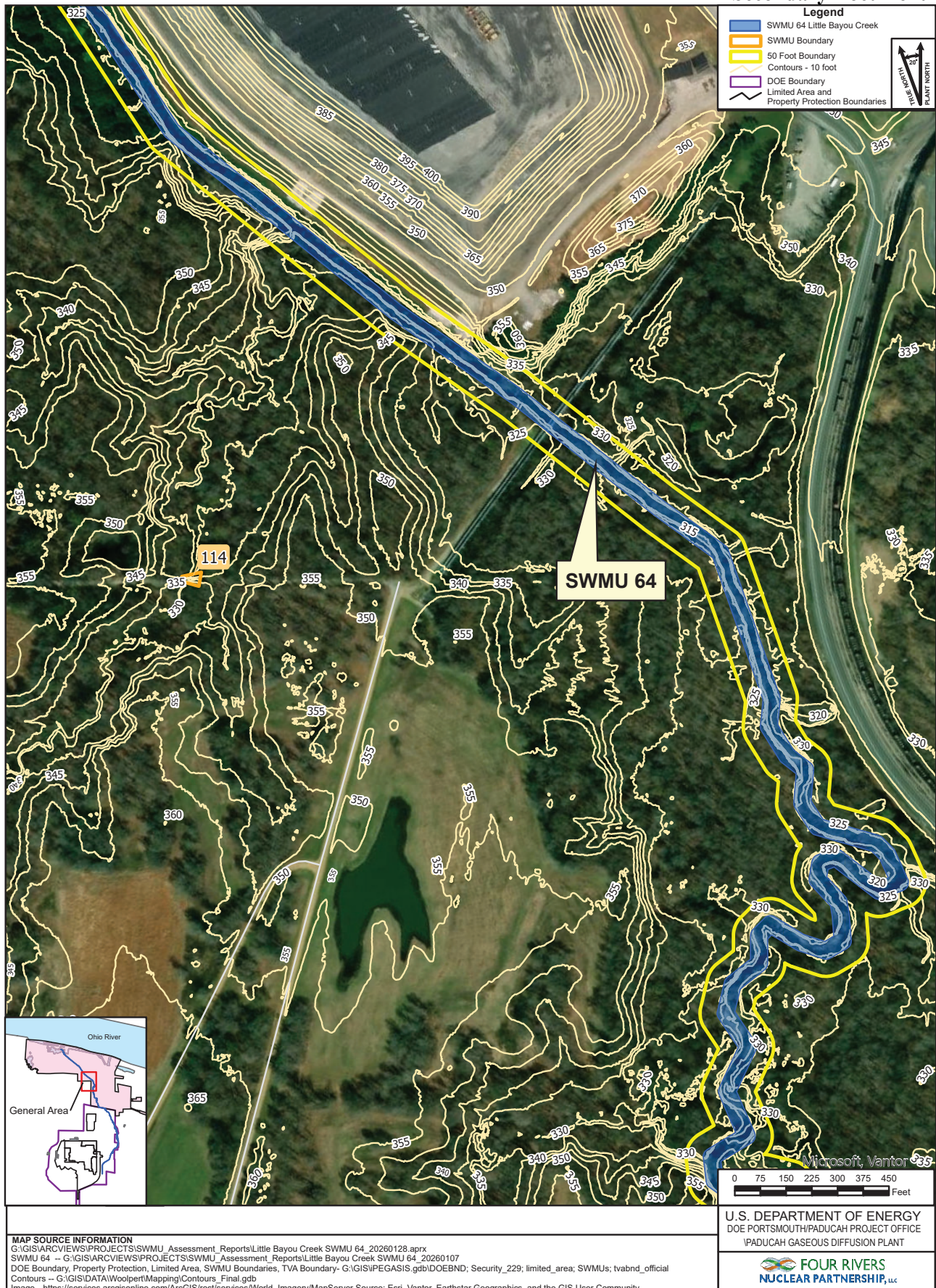


Figure 3.C. SWMUs and Contours Near SWMU 64

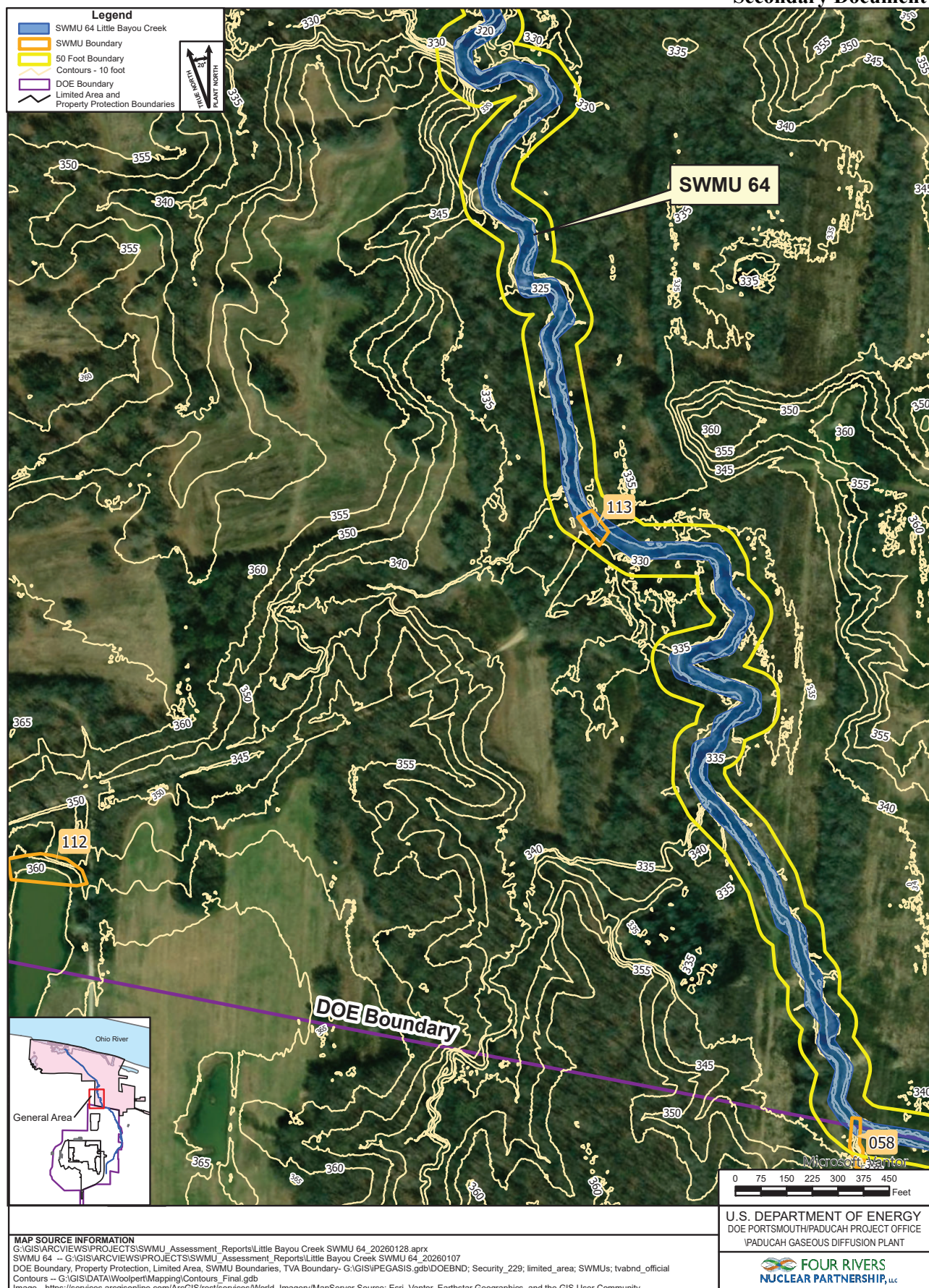


Figure 3.D. SWMUs and Contours Near SWMU 64

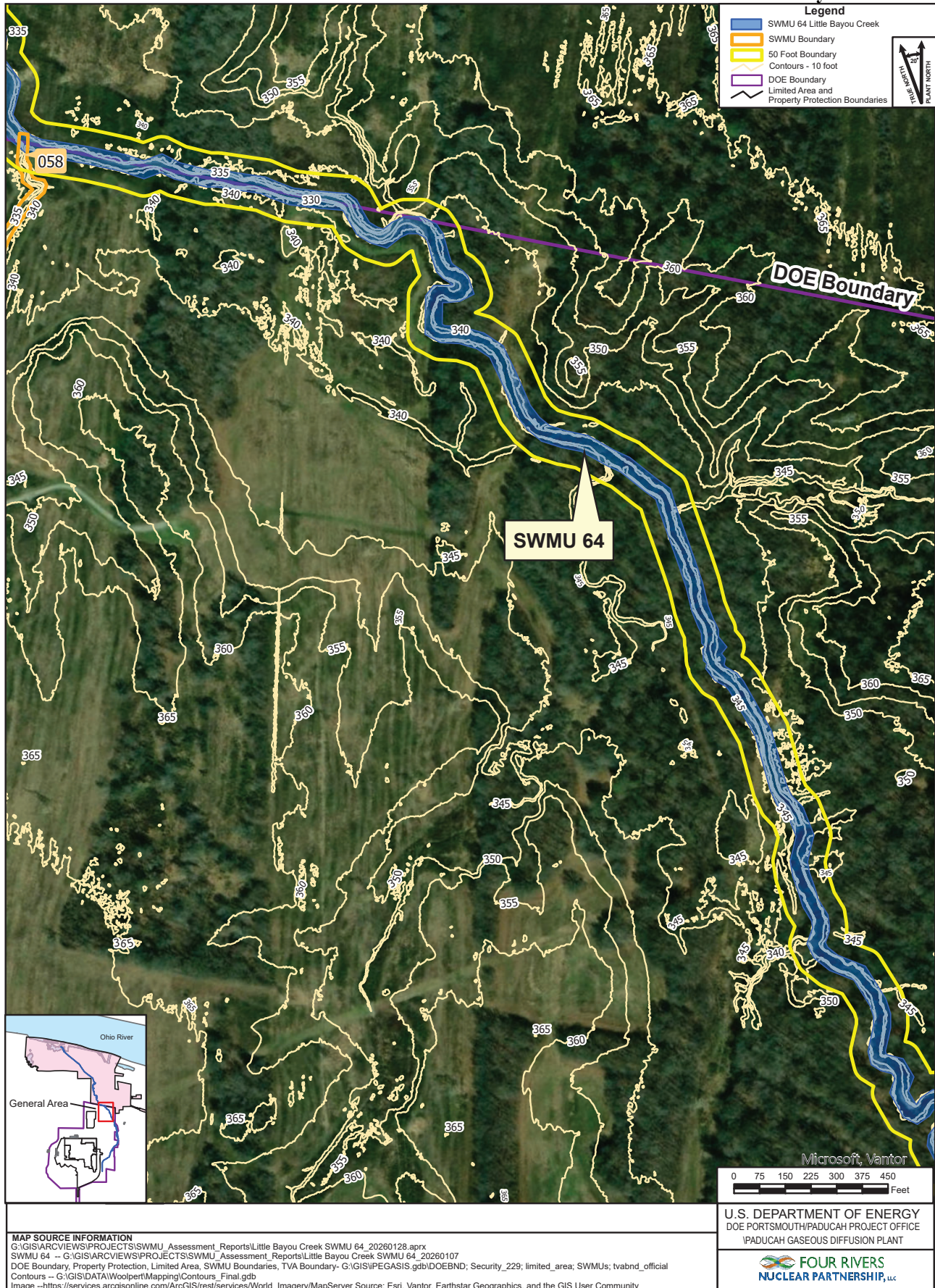


Figure 3.E. SWMUs and Contours Near SWMU 64

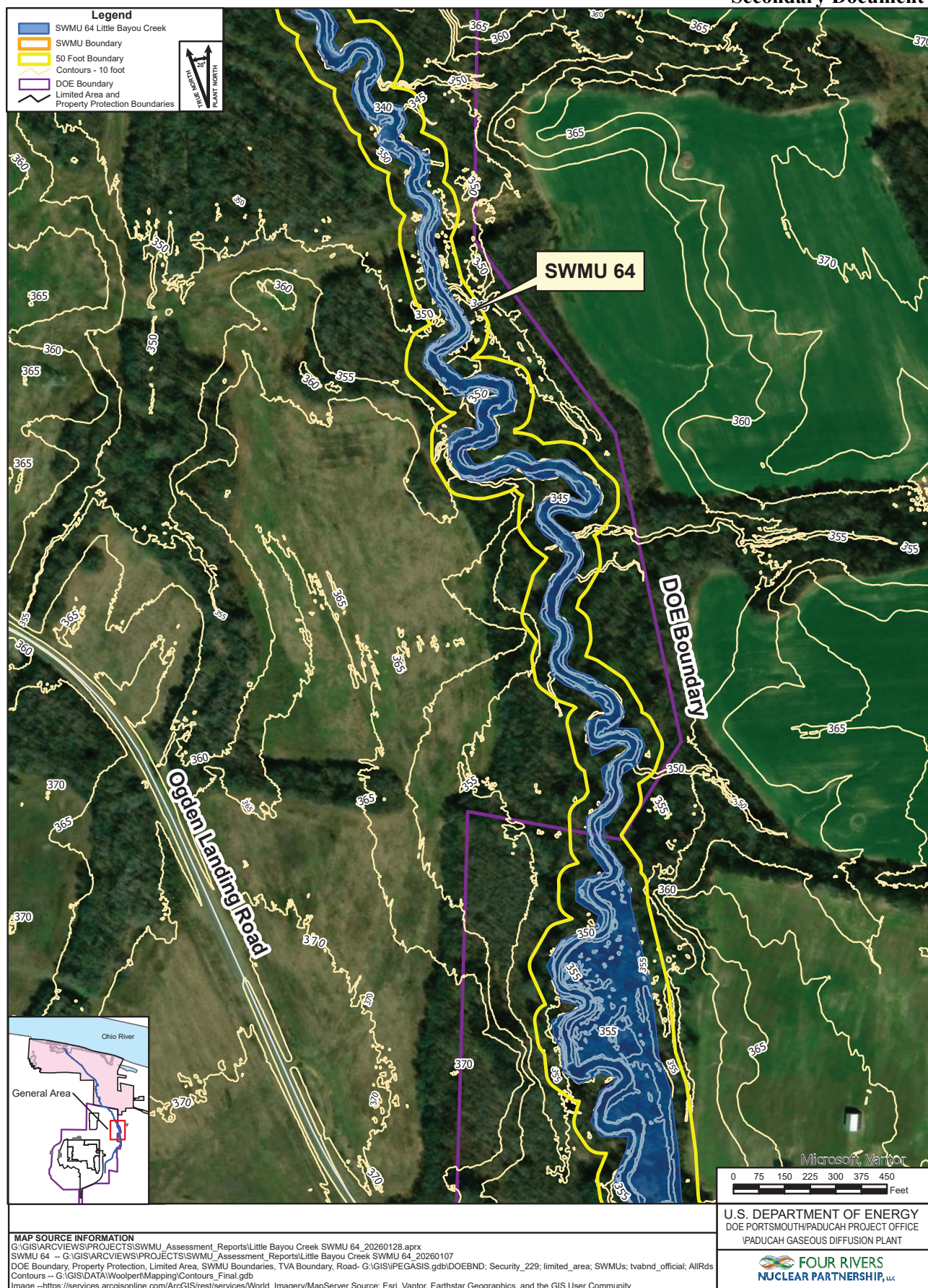


Figure 3.F. SWMUs and Contours Near SWMU 64

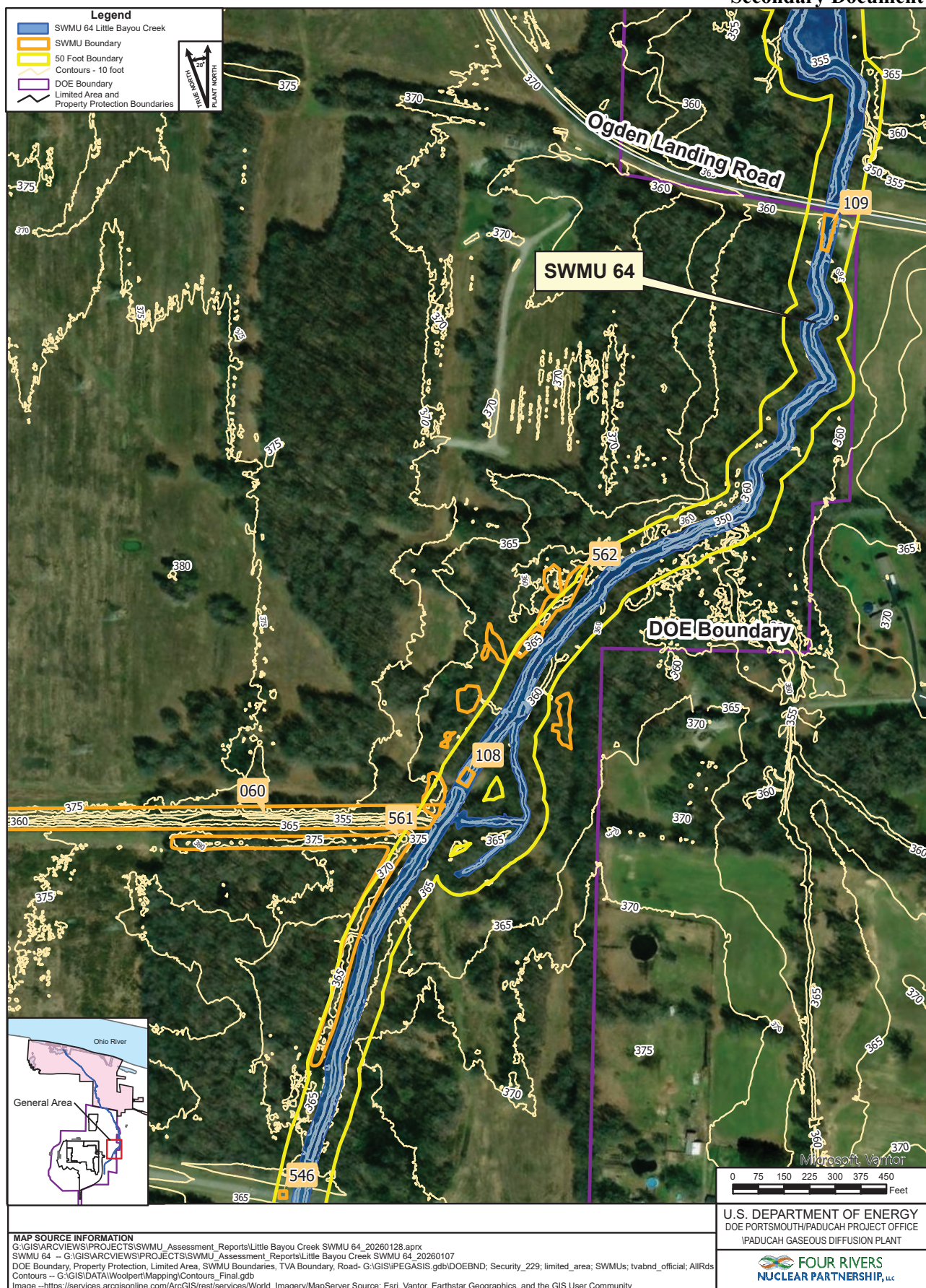


Figure 3.G. SWMUs and Contours Near SWMU 64



Figure 3.H. SWMUs and Contours Near SWMU 64



**Figure 4. Looking North at Little Bayou Creek—
Raw Water Line Crossing on Tennessee Valley Authority (TVA)**



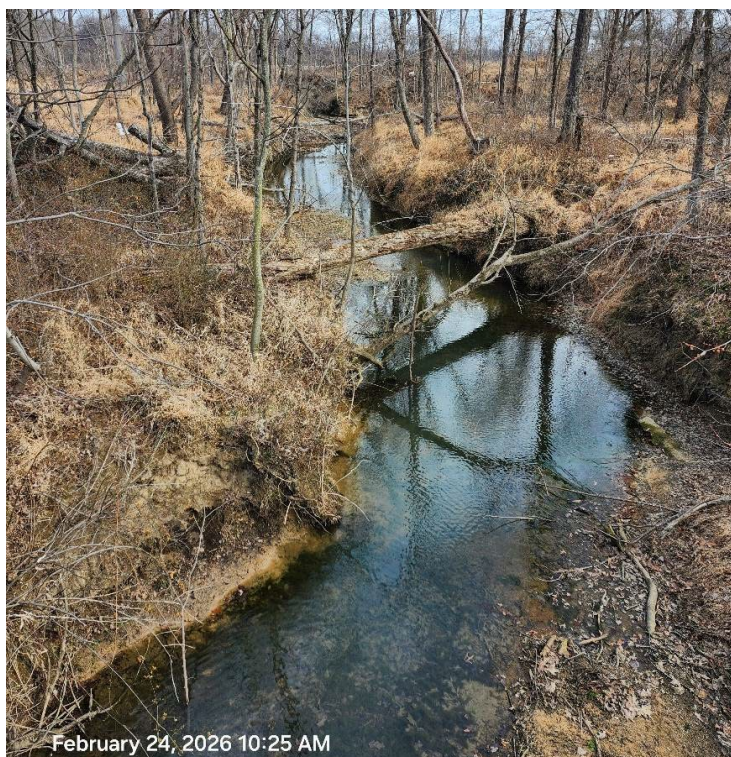
**Figure 5. Looking South at Little Bayou Creek—
Raw Water Line Crossing on TVA**



Figure 6. Looking North at Little Bayou Creek—Anderson Road



Figure 7. Looking South at Little Bayou Creek—Anderson Road



**Figure 8. Looking North at Little Bayou Creek—
Ogden Landing Road**



**Figure 9. Looking South at Little Bayou Creek—
Ogden Landing Road**



Figure 10. Looking North at Little Bayou Creek—McCaw Road



Figure 11. Looking South at Little Bayou Creek—McCaw Road