Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

DEC 20 2017

Ms. Susan B. Fulmer, P. G., Manager
Federal Remediation Section
Division of Site Assessment, Remediation and Revitalization
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Jon Richards
Acting Savannah River Site Remedial Project Manager
Superfund Division
U. S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

SUBJECT: Savannah River Site's Responses to the Regulatory Comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016 (SRNS-RP-2017-00229, Revision 0, June 2017) CERCLIS Number: 31

In accordance with the terms of the Federal Facility Agreement, the U. S. Department of Energy (DOE) is submitting the subject comment responses for your review. The U. S. Environmental Protection Agency's (EPA) and the South Carolina Department of Health and Environmental Control's (SCDHEC) comments were received on September 21, 2017 and September 28, 2017 respectively. This report will not be revised; however, all comment responses will be included in the next EMR, as applicable. Please review these responses and provide your approval within thirty (30) days from receipt. The time and effort that the SCDHEC and the EPA have given on the subject operable unit are greatly appreciated.

Questions from you or your staff may be directed to me at (803) 952-8365, or the DOE Federal Project Director, Ms. Karen Adams, at (803) 952-7871.

Sincerely,

Brian T. Hennessey
SRS Remedial Project Manager
Infrastructure and Area Completion Division

IACD-18-113

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Ms. Susan Fulmer
Mr. Jon Richards 2

Enclosures:
1. SRS Responses to EPA comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Numbers: 31, SRNS-RP-2017-00229, Revision 0, June 2017
2. SRS Responses to South Carolina Department of Health and Environmental Control's Comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U) – January 2015 through December 2016, CERCLIS Number: 31 (SRNS-RP-2017-00229, Revision 0, June 2017)

cc w/o encl:
D. Scaturo, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. D. Wilson, SCDHEC-Columbia
G. K. Taylor, SCDHEC-Columbia
T. Fuss, SCDHEC–Aiken Environmental Affairs Office
R. H. Pope, EPA-Atlanta

cc w/ encl:
J. Tufts, EPA-Atlanta
M. McRae, TechLaw, Inc.

SRS Responses to South Carolina Department of Health and Environmental Control's Comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U) – January 2015 through December 2016, CERCLIS Number: 31 (SRNS-RP-2017-00229, Revision 0, June 2017) received June 8, 2017

Comments Received on 9/28/2017

Specific Comments

1. Executive Summary, page ES-1 and Section 2.2, Land Use Control Boundary and Monitoring Network, page 4. The second paragraph of the Executive Summary and the last paragraph of Section 2.2 both refer to a total of 16 monitoring wells in the CBRP network. This number should be changed to 18 to include wells CRP 8D and CRP 6DR, as well. Please correct.

   Response: Agree.

   The number of monitoring wells in the CBRP OU network will be corrected to 18 wells in the Executive Summary and Section 2.2 in future reports.

   Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

2. Figure 5, CBRP OU Groundwater Model Particle Tracks (WSRC-TR-2001-00298), page 25. This figure should be revised to indicate Fourmile Branch, as referenced on page 12. Please label accordingly.

   Response: Agree.

   Figure 5, or equivalent, will be revised to label Fourmile Branch in the next EMR (See attached revised Figure 5).

   Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

SRS Responses to South Carolina Department of Health and Environmental Control's Comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U) – January 2015 through December 2016, CERCLIS Number: 31 (SRNS-RP-2017-00229, Revision 0, June 2017) received June 8, 2017

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Draft SRS Responses to South Carolina Department of Health and Environmental Control's Comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U) – January 2015 through December 2016, CERCLIS Number: 31 (SRNS-RP-2017-00229, Revision 0, June 2017) received June 8, 2017.

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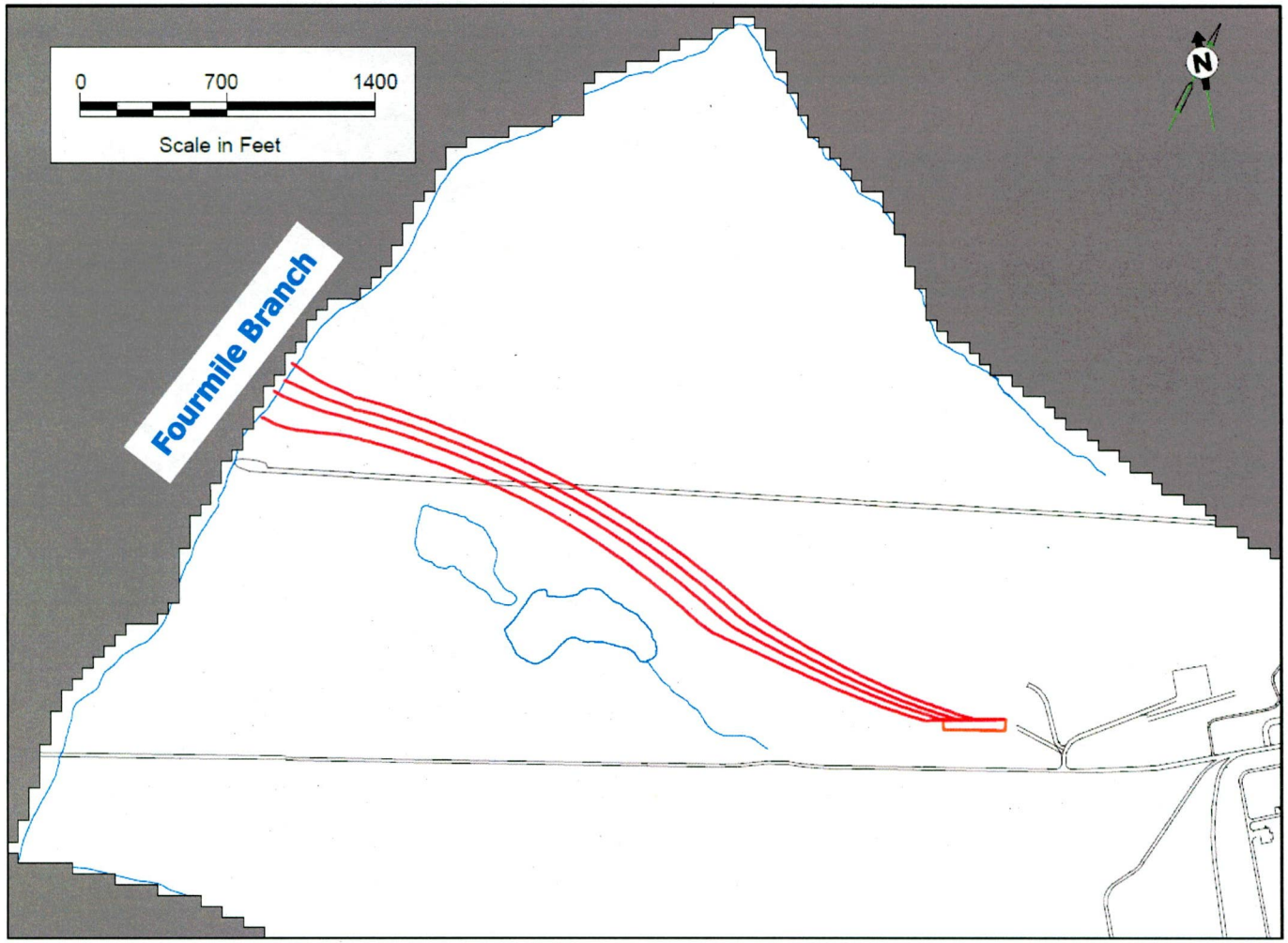

Figure 5. **CBRP OU Groundwater Model Particle Tracks (WSRC-TR-2001-00298)**

Draft SRS Responses to South Carolina Department of Health and Environmental Control's Comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U) – January 2015 through December 2016, CERCLIS Number: 31 (SRNS-RP-2017-00229, Revision 0, June 2017) received June 8, 2017.

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GENERAL COMMENTS

1. The conclusions regarding the effectiveness of the remedy provided in Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Number: 31, SRNS-RP-2017-00229, Revision 0, June 2017 (Biennial Report) are not fully supported. In Section 5.0, Summary, the text on Page 18 of 32 indicates the data yield a time estimate of 38 years for all areas of the volatile organic compound (VOC) plume to be below the respective maximum contaminant levels (MCLs). This estimate is based on the 2016 maximum trichloroethylene (TCE) concentration for the plume of 1,640 micrograms per liter (µg/L). While it is noted the time estimate of 38 years is based upon a simplistic evaluation using the current data, the time-series plots for several wells demonstrate contaminant concentration trends are stable and greater than the respective MCLs, indicating that attainment of MCLs would take longer than 38 years. For example, the TCE detection of 1,640 µg/L was measured in well CRP 20CU in 2016. As seen in the time-series plot presented in Figure C-102, Appendix C, Page C-104-C-116, the trend of TCE concentrations was upward above the MCL from 2000 to 2012 and have remained stable through 2016. The time-series plot in Figure C-102 does not illustrate trending that would indicate MCLs will be achieved within 38 years. A similar issue is noted with CRP 5C where the trend of tetrachloroethylene concentrations has been stable above the MCL since 1996 as seen in Figure C-66, Appendix Page C-68 of C-116. Also, the trend of TCE concentrations in monitoring well CRP 18C have remained relatively stable above the MCL since 2000. Finally, the trend of vinyl chloride concentrations in Monitored Natural Attenuation (MNA) well CRP-50B has been greater than the MCL since 2000 and has been increasing since 2011 as seen in Figure C-27, Page Appendix C-29 of C-116. Figure C-27 also demonstrates a similar vinyl chloride trend noted in well CRP-50A. Currently, it is uncertain whether all areas of the VOC plume will be below their respective MCLs within 38 years, or whether the estimated timeframe will be reasonable based on future monitoring data. As such, revise the Biennial Report to include additional text discussing how the long-term stable and/or increasing contaminant trends impact the reasonableness of the overall cleanup timeframe estimates.

Response: Agree/Clarification.

Prior to the installation of the soil cover in 1999, heavy rains (42.28 inches) from December 1997 to May 1998 transported a large quantity of TCE from the vadose zone into the groundwater as observed in well CRP 3D (Figure C-97). This hot spot has been moving from the CBRP OU source area toward Fourmile Branch (FMB) from 1998 to present (Figures 5 to 9). It is this hot spot which has been impacting TCE concentrations at well CRP 20CU. This TCE hot spot has decreased 96% in

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concentration from 41,700 µg/L in November 2000 at CRP 3D to 1,640 µg/L in November 2016 at well CRP 20CU due to attenuation (i.e., sorption, dilution, dispersion, and diffusion). As this TCE plume continues to transport through the wetland soils adjacent to FMB and Twin Lakes, it will continue to attenuate and undergo biodegradation, which is estimated to yield a 99% reduction in TCE discharging to FMB (WSRC-TR-2001-00298). Both attenuation during plume transport and biodegradation in wetland soils are anticipated to reduce TCE concentrations so that FMB surface water will never exceed the TCE MCL (5 µg/L).

The 2003 TCE concentrations at well CRP 20CL are an indication that attenuation and biodegradation will decrease TCE concentrations in groundwater sufficiently to not cause FMB surface water to exceed the TCE MCL (5 µg/L). The current TCE concentration (1,640 µg/L) at well CRP 20CU is much lower than the 8/28/03 TCE concentration (8,330 µg/L) at co-located well CRP 20CL, and none of the FMB surface water stations have ever exceeded the TCE MCL. TCE concentrations at well CRP 20CL have since declined to 136 µg/L, and it is expected that well CRP20CU will follow a similar trend.

Fluctuations in TCE concentrations at the downgradient wells are expected until the residual contamination from the hotspot has completely discharged to FMB and the Twin Lakes. Fluctuations in TCE degradation compounds are also expected at the MNA wells in the FMB and Twin Lakes wetland areas. The hot spot TCE concentrations, transport time, and attenuation mechanisms are incorporated into the 2003 CBRP OU groundwater model, which estimates the entire TCE plume will be below MCLs in 70 years. In the CBRP OU EMR the simplistic estimate of 38 years until the entire TCE plume is below the MCL is intended to indicate that the current data still supports the 2003 groundwater model estimate.

Additional discussion will be added to future Biennial Reports to explain the impact of stable and/or increasing contaminants on the overall cleanup timeframe estimate.

Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

2. The Biennial Report presents cross-sections A-A' prepared for the TCE plume from monitoring data collected in 2000, 2012, 2014 and 2016. However, the line of cross-section A-A' is not illustrated on any of the plan maps presented in the Biennial Report. For clarity and completeness revise the Biennial Report to address this issue.

Response: Agree.

The cross-section line will be added to Figure 3 and the maps in Appendix D (See attached revised Figure 3 and Figures D-1 through D-5) in the next EMR.

Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

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3. Potentiometric surface maps were only prepared for the 2016 monitoring event and not for the 2015 sampling event. For example, in Figure E-1, 2015 Water Elevations for the Upper Aquifer Zone of the Upper Three Runs Aquifer, Appendix E, Page E-3 of E-8, no contour lines were drawn illustrating the potentiometric surface of the Upper Aquifer Zone (UAZ) 2015 water elevations. A similar issue was identified in Figure E-2, 2015 Water Elevations for the Middle/Lower Aquifer Zone of the Upper Three Runs Aquifer, Appendix E, Page E-4 of E-8. Additionally, while the potentiometric surface is depicted for the 2016 water levels recorded for the relative aquifer zones, the maps do not depict flow lines indicating the relative flow direction based on the potentiometric surface. Potentiometric surface maps and corresponding flow direction should be prepared for all biennial sampling events and presented in the biennial report to be used for comparative purposes. For clarity and completeness, revise the Biennial Report to addresses this issue.

   Response: Agree/Clarification.

   In odd years, only the MNA wells are sampled and have water elevations measured; therefore, there is not enough information in the odd years to draw contour lines. Groundwater flow lines will be added to potentiometric surface maps in the next EMR.

   Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

4. In Figure E-4, Water Elevations for the Middle/Lower Aquifer Zone of the Upper Three Runs Aquifer, Appendix E, Page E-6 of E-8, the water elevations are depicted for the well locations shown on the figure. However, the figure does not include the corresponding monitoring well designation or identification. For clarity and completeness, revise the Biennial Report addresses this issue.

   Response: Agree.

   The station names will be included on all potentiometric surface maps in the next EMR (See attached revised Figure E-4).

   Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

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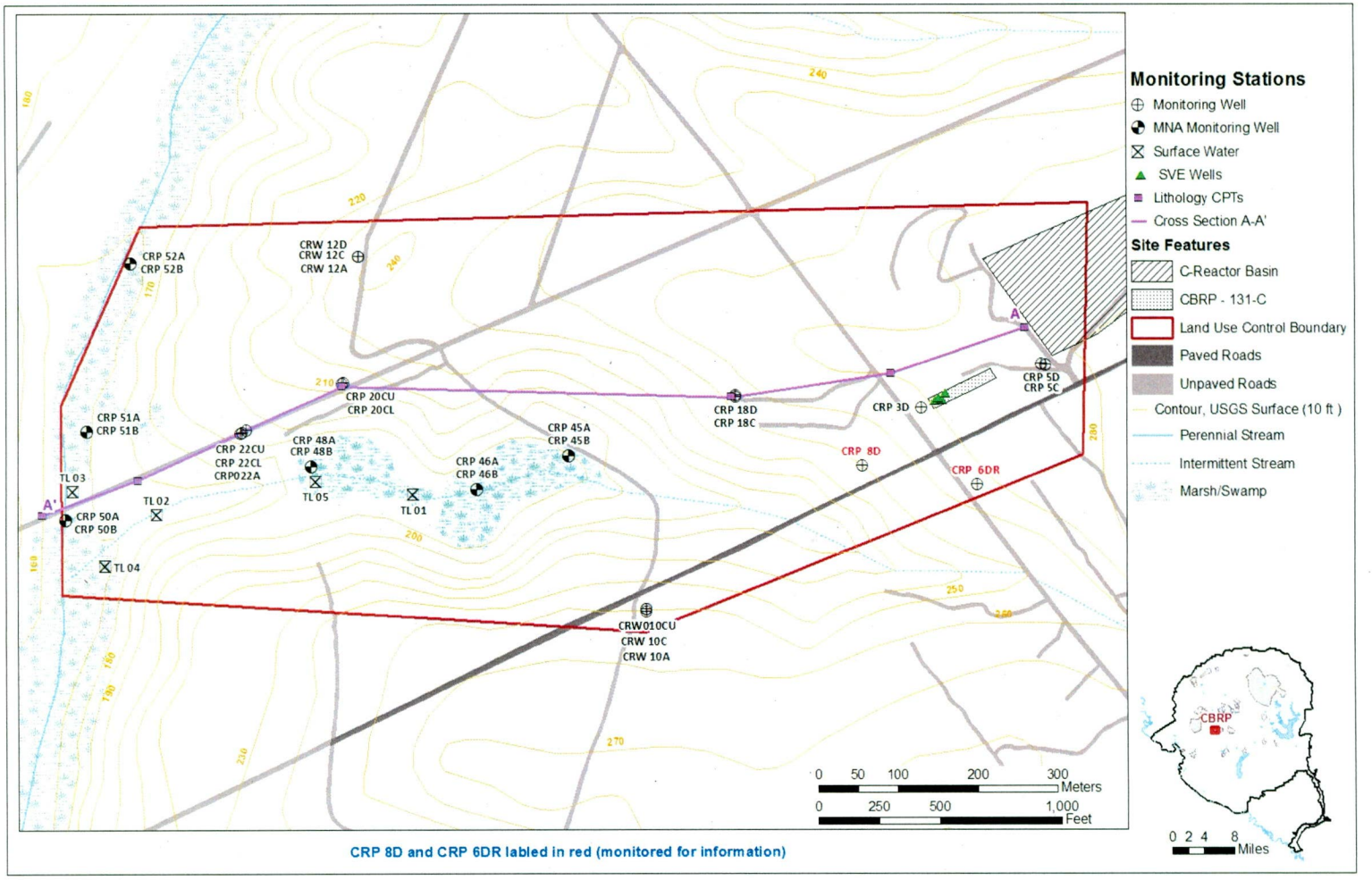

Figure 3. CBRP OU LUC Boundary

Draft SRS Responses to EPA comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Numbers: 31, SRNS-RP-2017-00229, Revision 0, June 2017,
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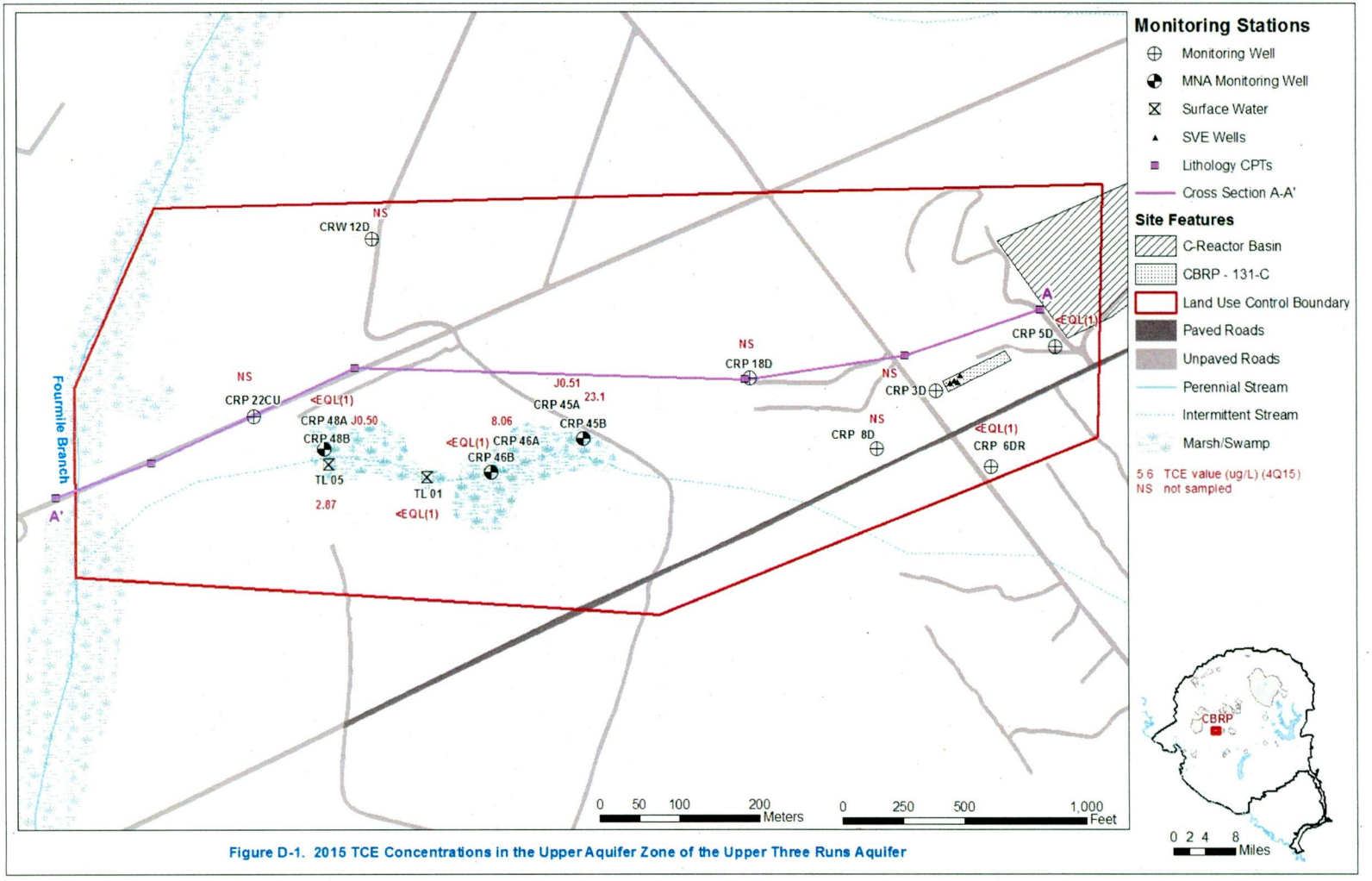

Figure D-1. 2015 TCE Concentrations in the Upper Aquifer Zone of the Upper Three Runs Aquifer

Draft SRS Responses to EPA comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Numbers: 31, SRNS-RP-2017-00229, Revision 0, June 2017,
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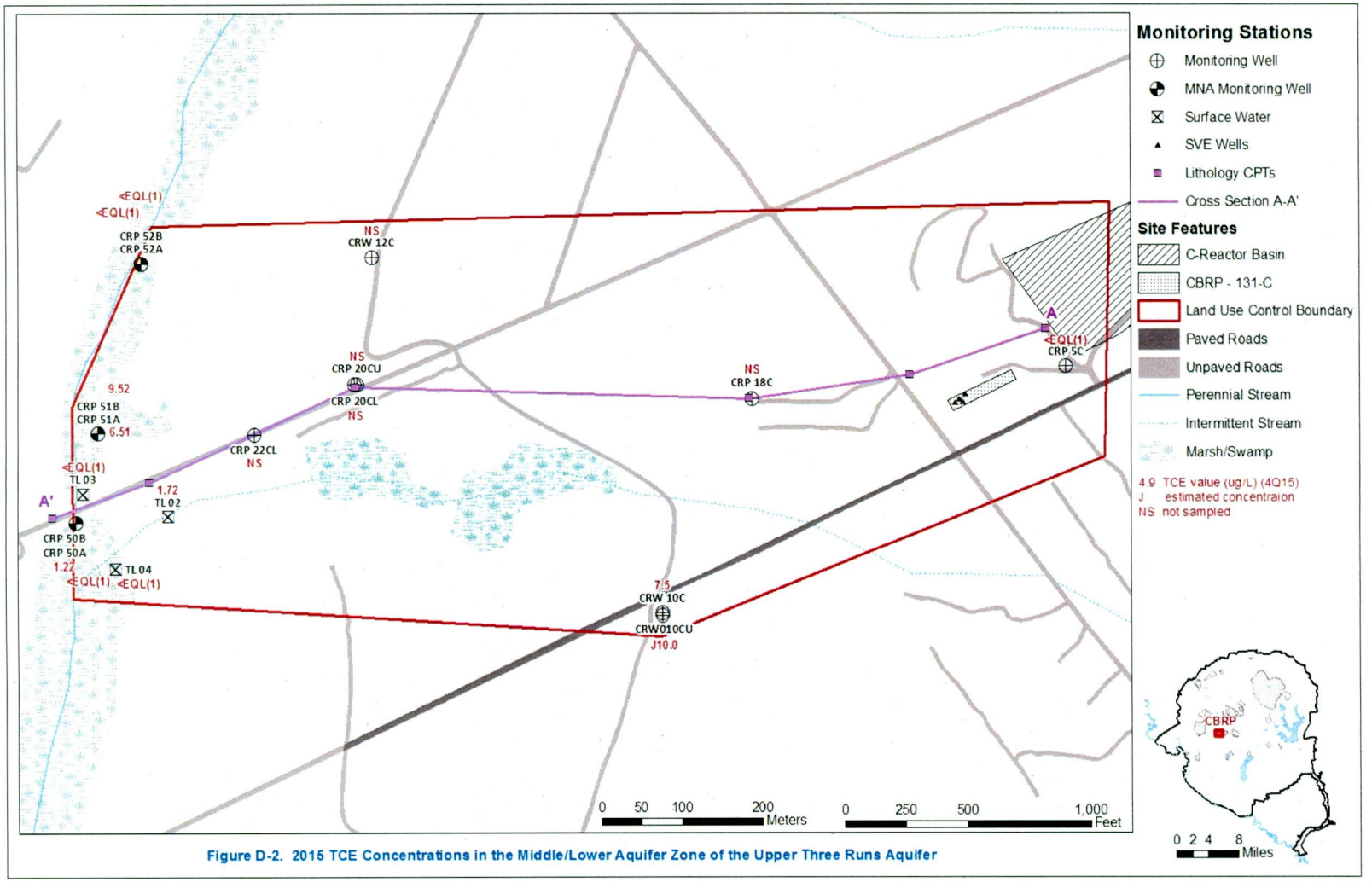

Figure D-2. 2015 TCE Concentrations in the Middle/Lower Aquifer Zone of the Upper Three Runs Aquifer

Draft SRS Responses to EPA comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Numbers: 31, SRNS-RP-2017-00229, Revision 0, June 2017,
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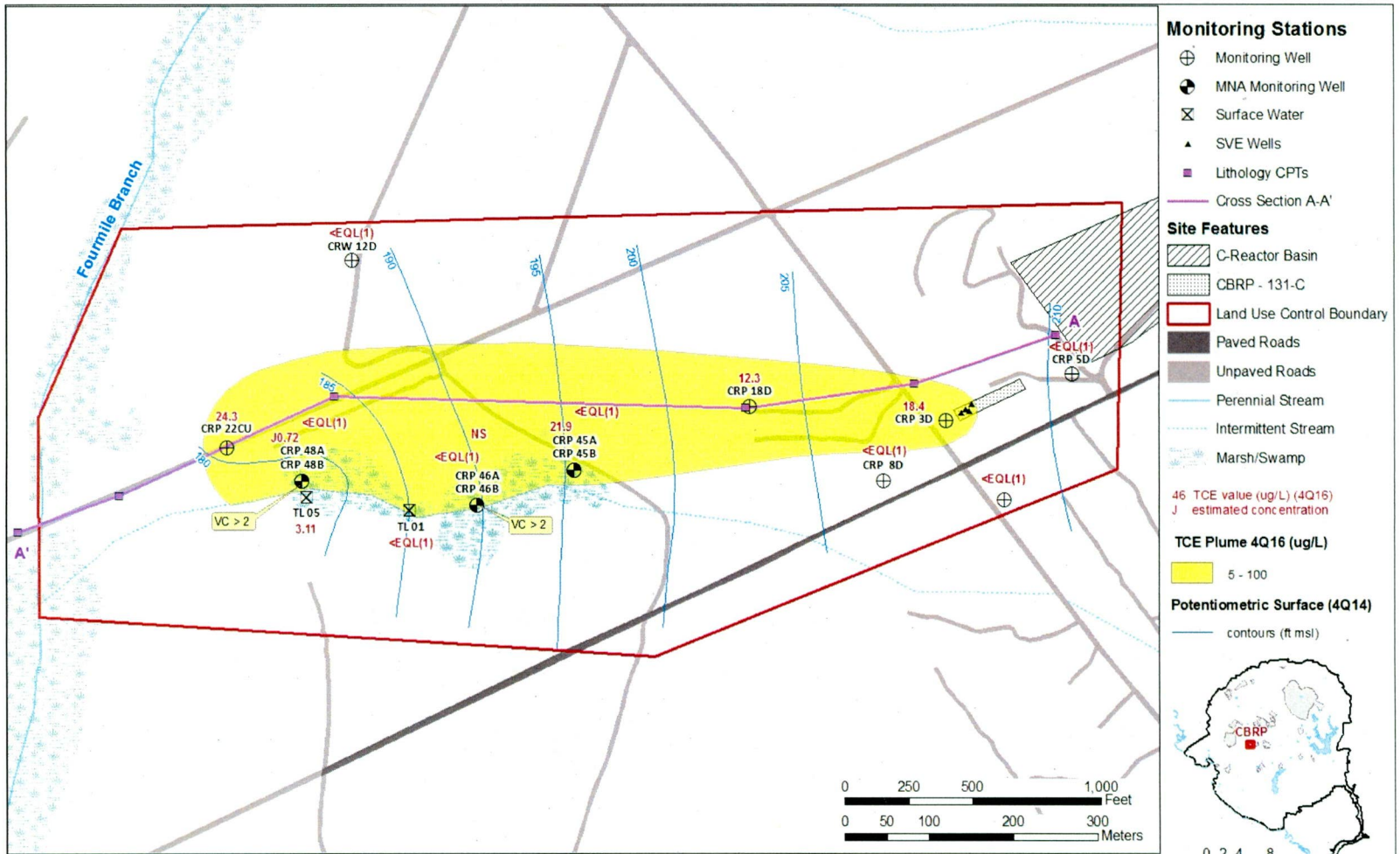

Figure D-3. 2016 TCE Concentration in the Upper Aquifer Zone of the Upper Three Runs Aquifer

Draft SRS Responses to EPA comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Numbers: 31, SRNS-RP-2017-00229, Revision 0, June 2017,
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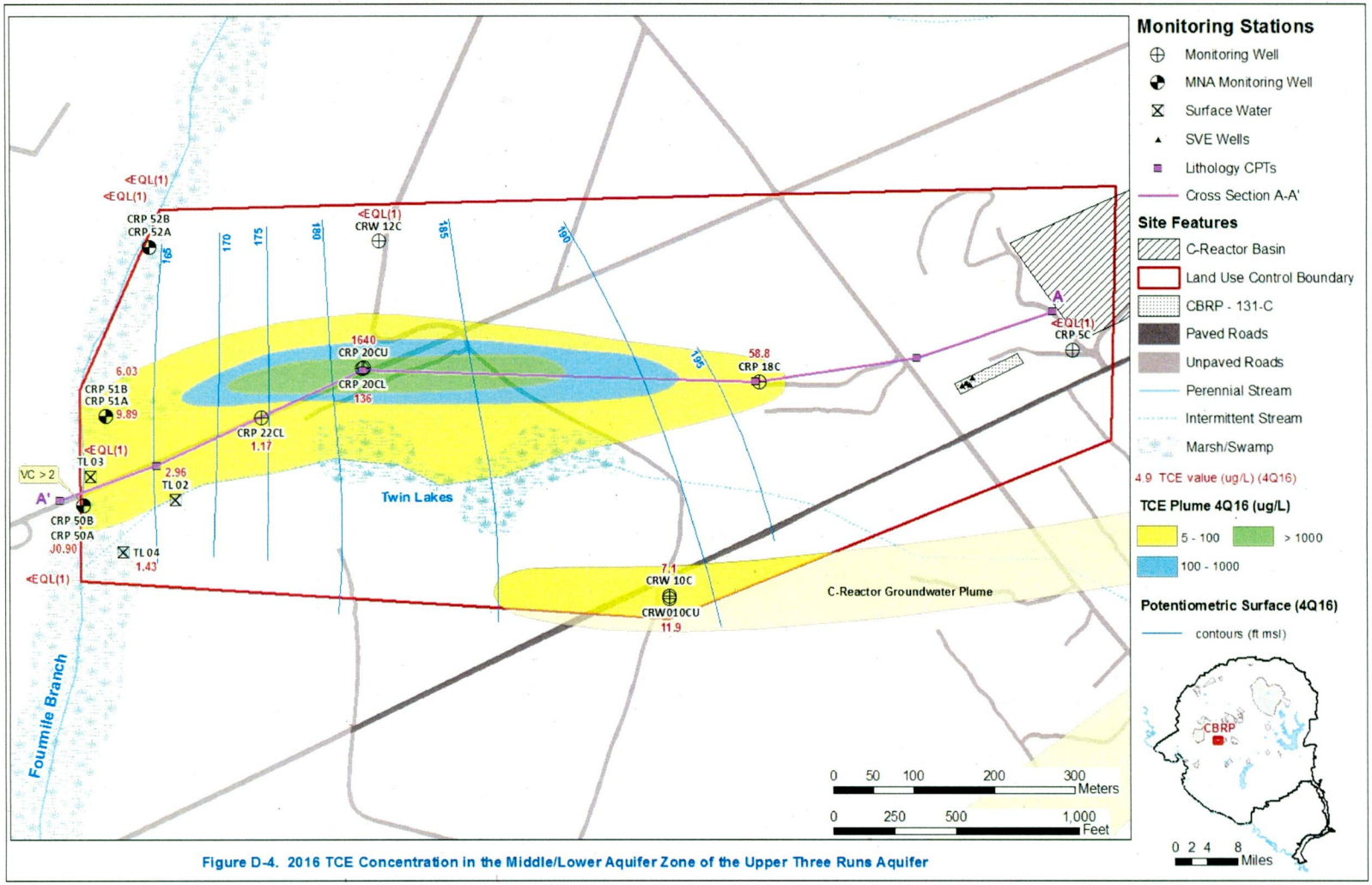

Figure D-4. 2016 TCE Concentration in the Middle/Lower Aquifer Zone of the Upper Three Runs Aquifer

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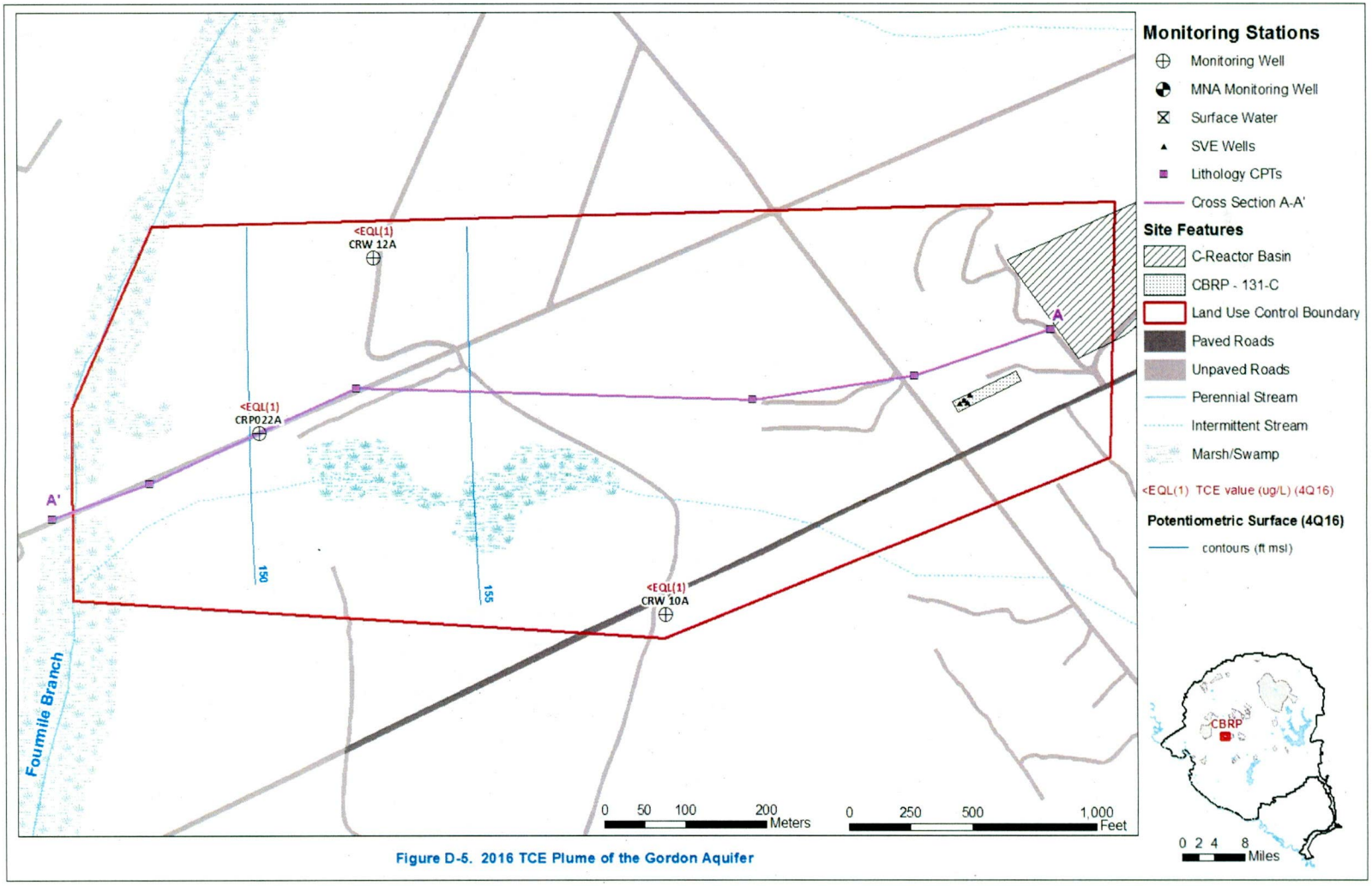

Figure D-5. 2016 TCE Plume of the Gordon Aquifer

Draft SRS Responses to EPA comments on the Biennial Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) Operable Unit (U), January 2015 through December 2016, CERCLIS Numbers: 31, SRNS-RP-2017-00229, Revision 0, June 2017,
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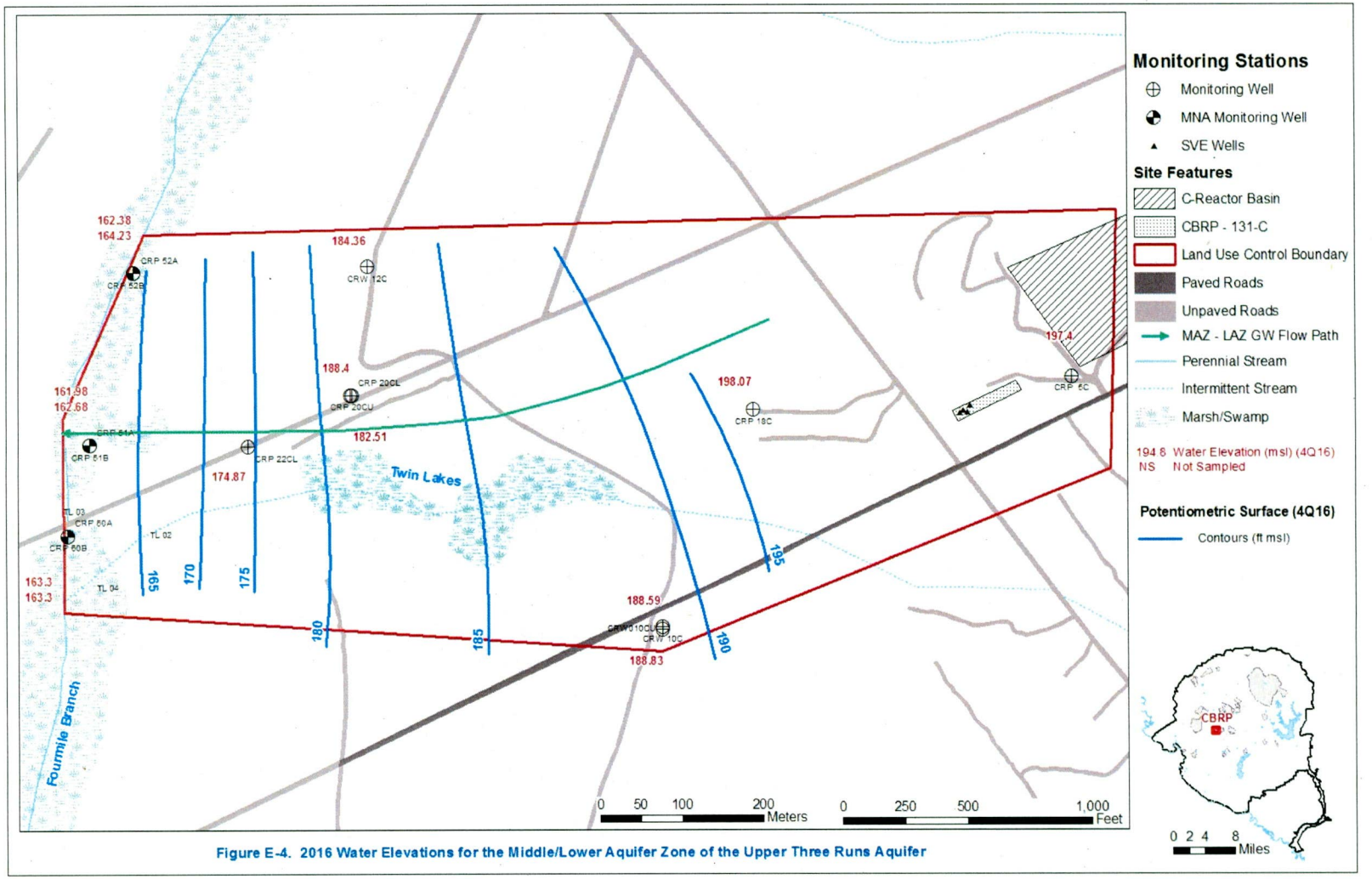

Figure E-4. 2016 Water Elevations for the Middle/Lower Aquifer Zone of the Upper Three Runs Aquifer

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