PORTABLE DOCUMENT FORMAT CERTIFICATION

The electronic copy of the Voluntary Remediation Program Status Report No. 2 for the former Swift & Company Meat Processing Plant, Moultrie, Colquitt County, Georgia, HSI No 10509 as provided on this CD is complete and identical to the paper copy and free of viruses to the best of our knowledge.

Amec Foster Wheeler Environment & Infrastructure, Inc.

David E. Smoak
Project Manager

Voluntary Remediation Program Semi-Annual Progress Report No. 2

Former Swift & Company Meat Processing Plant
Moultrie, Colquitt County, Georgia
HSI Site No. 10509

Submitted to:

Georgia Department of Natural Resources
Environmental Protection Division
Hazardous Sites Response and Remediation Program
Suite 1054, East Tower
2 Martin Luther King Jr. Drive SE
Atlanta, Georgia 30334

Prepared for:	ConAgra Foods, Inc. 1 ConAgra Drive, Omaha, Nebraska 68102
Date:	May 29, 2016
Prepared by:	Amec Foster Wheeler Environment & Infrastructure, Inc. 1075 Big Shanty Road NW, Suite 100, Kennesaw, Georgia 30144
Project No.:	6122140220.07.01

May 29, 2016

Mr. Allan Nix
Unit Coordinator
Georgia Department of Natural Resources
Response and Remediation Program
Suite 1054 East
2 Martin Luther King Jr. Drive SE
Atlanta, Georgia 30334

Subject: **Voluntary Remediation Program Semiannual Progress Report No. 2**
Former Swift & Company Meat Processing Plant
1189 North Main Street
Moultrie, Colquitt County, Georgia
HSI Site No. 10509

Dear Mr. Nix:

On behalf of ConAgra Foods, Inc. and Swift & Company, Inc., Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) respectfully submits the attached Voluntary Remediation Program (VRP) Progress Report No. 2 for the above-referenced site. This progress report is required by the VRP statute and requested by the Georgia Environmental Protection Division (EPD) approval/comment letter dated May 29, 2015.

Please note that the ConAgra Foods (Swift & Company successor) contact and office location will be changing as of July 1, 2016. The corporate office of ConAgra will be relocating from Omaha, Nebraska to:

Trevor Foster (Vice President, Chief Counsel / Legal & Government Affairs)
ConAgra Foods, Inc.
222 W. Merchandise Mart Plaze, Suite 1300
Chicago, IL 60654

This report is for the exclusive use of ConAgra (successor to Swift & Company), the City of Moultrie, the Rennie A. Tumlin Estate and The Joint Development Authority of Brooks, Colquitt, Grady, Mitchell, and Thomas Counties, and for regulatory submittal. Please contact us at 770-421-3400 with any questions you may have regarding this submittal. Thank you for your assistance with this project.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure, Inc.

John M. Quinn, P.G.
Senior Geologist

David E. Smoak, P.G.
Associate Geologist/Project Manager

cc: Mr. Chris Aupperle, ConAgra Foods
Ella Fast, City of Moultrie
Mr. Billy Fallin

Attachments: VRP Progress Report No. 2

Correspondence:
Amec Foster Wheeler Environment & Infrastructure, Inc.
1075 Big Shanty Road NW, Suite 100
Kennesaw, Georgia 30144
Tel: (770) 421-3400
www.amecFW.com

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1.0 PG CERTIFICATION

"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.

Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division.

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."

David E. Smoak / Georgia P.G. #1314
Printed Name and GA PG Number

5/26/16
Date

Signature and Stamp

2.0 INTRODUCTION AND BACKGROUND

This Voluntary Remediation Program Semi-Annual Status Report No. 1 (Status Report) was prepared in accordance with the Voluntary Remediation Program (VRP) for the former Swift & Company former meat processing facility site, Hazardous Site Inventory (HSI) No.10509. The site is comprised of three qualifying properties located at 1189 North Main Street (U.S. Highway 319 Business, Georgia Highway 33) the northern part of Moultrie, Georgia, in Colquitt County. A site location map is shown on Figure 1. The qualifying properties include:

- A 2.53 acre tract currently owned by the City of Moultrie (Tax ID Parcel M022A 005), which represents the southernmost portion of the former 14-acre Swift & Company meat processing facility property.
- A 2.52 acre parcel owned by the Rennie A. Tumlin Estate (Tax ID Parcel M022A 004).
- The easternmost portion of an adjoining 50.23 acre tract (Tax ID Parcel M022A 002) which formerly contained the Former Boiler and Engine House. This tract is owned by the Joint Development Authority (JDA) of Brooks, Colquitt, Grady, Mitchell, and Thomas Counties

A site plan is provided in Figure 2. The western and southern boundaries of the site are bordered by an active railroad right of way owned by Georgia & Florida RailNet, Inc. North Main Street borders the subject properties on the east. The northern boundary of the subject properties are bounded by property that was part of the former Swift facility. Railroad tracks and retention ponds used by Farmland National Beef are located to the west.

While operational, the Swift & Company plant was a stockyard and meat-processing facility where hogs, cattle, and sheep were slaughtered, butchered, and packaged for the consumer market. The meat-processing plant was originally constructed in 1914, and operated until 1970. After 1970, Swift & Company constructed a new facility to the west now referred to as Farmland National Beef.

After meat processing operations ceased, the buildings remained on the property for about 30 years and were believed to have been used for storage by other property owners, among other things. The buildings on the 2.53-acre City of Moultrie tract were demolished in 2001, and the surface was subsequently graded and grassed. Information contained in a CSR prepared by Advanced Environmental Technologies, LLC (AET), and information provided by City of Moultrie representatives report the demolition debris was removed and properly disposed offsite. The Former Boiler and Engine House were demolished in 2011. There are no activities currently conducted on the subject properties, and the subject properties are currently located on an open tract.

Previous investigations of the property detected volatile organic compounds (VOCs), and metals in groundwater. A few of the constituents exceeded the Hazardous Site Response Act (HSRA) notification concentrations. The environmental history of the site is summarized as follows:

- Assessments including soil and groundwater sampling were conducted in 1997.
- The site was listed on the Hazardous Site Inventory (HSI) on June 6, 1998 as Site No. 10509.

- A a HSRA Compliance Status Report (CSR) Assessment was conducted in 2001-2002 that included soil and groundwater sampling and submittal of a CSR. Buildings on the property were demolished in 2001 before the HSRA CSR investigations.
- Further CSR assessment was performed in 2003 (including submittal of a Revised CSR).
- Additional field investigation was conducted in 2004-2005.
- The available 2004-2005 data were included in the September 30, 2008, Revised CSR, which also included details for the 2007 and 2008 investigations conducted by MACTEC.
- The January 29, 2010 Revised CSR responded to the subsequent EPD comments on the September 30, 2008, Revised CSR, and included information from 2009 field investigations by MACTEC.
- A Corrective Action Plan (CAP) was submitted on May 13, 2011. The proposed remedy in the CAP for the former Swift site was monitored natural attenuation (MNA).
- EPD gave Conditional Approval of the CAP In a letter dated December 12, 2011.
- The First Semiannual Corrective Action Effectiveness Report (CAER) was submitted to EPD on June 12, 2012.
- The Second Semiannual CAER was submitted to EPD on December 11, 2012.
- The Third Semiannual CAER was submitted to EPD on May 24, 2013.
- The Fourth Semiannual CAER was submitted to EPD on December 11, 2013.
- The First Annual CAER (ACAER) was submitted to EPD on February 27, 2015 as Appendix B to the Voluntary Remediation Program Application and Plan. Based on the results of the monitoring and the updated SourceDK models presented in the ACAER, and after discussions with EPD, Swift had made the decision to proceed with entering the site into the VRP.
- The EPD letter dated May 29, 2015 accepted the site into the VRP and requested submittal of semi-annual VRP status reports.
- The EPD letter dated June 4, 2015 provided comments that were addressed in a response letter dated August 31, 2015. EPD issued additional comments in a letter dated January 25, 2016 that addressed the August 31, 2015 response letter.
- The VRP Status Report No. 1 was submitted to EPD on December 8, 2015 as a semiannual progress report. The first Status Report covered the activities conducted subsequent to the EPD's May 29, 2015 VRP acceptance letter. The first Status Report was submitted under a extension request communicated to EPD via telephone and electronic mail on November 17, 2015.

3.0 WORK PERFORMED DURING REPORTING PERIOD

This section reports activities completed during the current six month reporting period (December 2015 through May 2016). There were no field activities completed during this period with the exception of removal of drummed purgewater from the sampling event conducted during prior reporting period. Groundwater monitoring under the approved VRP is conducted on an annual basis in the fall of each year, and groundwater sampling is planned for September 2016.

During this reporting period, ConAgra has continued working with property owners on finalizing property affadavits required under the VRP approval. This work is described further in Section 3.1 of this Progress Report. Additionally, during this reporting period ConAgra addressed comments contained in an EPD letter dated January 25, 2016, which was a response to to ConAgra's letter dated August 31, 2015. These responses are provided in Section 3.2 of this Progress Report.

3.1 PROPERTY AFFIDAVITS UPDATE

ConAgra continues to work with site property owner's to complete the property affidavits required under the VRP approval. The site properties are owned by multiple parties (the City of Moultrie, the Rennie A. Tumlin Estate and the JDA of Brooks, Colquitt, Grady, Mitchell, and Thomas Counties). Draft Affidavits and Uniform Environmental Covenants have been circulated and reviewed by all parties, and there is general agreement amongst the parties on the need to deed restrict the property, but not a specific response from the land owner's attorney on the wording of affidavits. As soon as the affidavits are filed with the County, copies will be submitted to EPD as required.

3.2 RESPONSE TO COMMENTS – EPD LETTER DATED JANUARY 25, 2016

Following are the EPD comments in bold, followed by ConAgra's responses

1) **Based upon historical potentiometric data, the direction of groundwater flow off site is unclear. The topographically downgradient directions on site are to the north and east, and impact to groundwater has historically been detected to both the north and east of the source areas. Accordingly, EPD has determined that both the north and east should be considered hydraulically downgradient directions**:

    - **Potentiometric maps constructed from current groundwater-elevation data should still be included in each semiannual report**.

Response No. 1 (a) - Potentiometric maps were prepared using the September 21, 2015 groundwater elevation data and were provided in VRP Status Report No. 1. The September 21, 2015 data are still the most current groundwater elevation data. Historically, potentiometric maps have been prepared for Shallow Zone A and Shallow Zone B. Shallow Zone A is a perched water table zone and recharges directly to Shallow Zone B through a thin leaky semiconfining sandy clay. Shallow Zone B has consistently displayed the same gradient flow pattern, converging from the north and south and then transitioning to an eastward flow. The September 21, 2015 potentiometric maps are provided for reference in Appendix A-1

- **A groundwater fate-and-transport model will have to be run in each direction to determine that each point-of demonstration (POD) is protective of its respective point-of exposure (POE).**

Response No. 1 (b) – An update of the fate and transport modeling (BioScreen-AT) submitted in the VRP Application and Plan was prepared using the results of the September 2015 annual sampling event and provided in VRP Status Report No. 1. This updated model is provided for reference in Appendix A-2.

Potentiometric data from the delineation wells proposed for installation (one replacement for MW-28 and on new) east of MW-9 and MW-15 (described below) will possibly clarify direction of groundwater flow, as mentioned in EPD's Comment 5 of June 4, 2015. Based on this additional clarification, ConAgra will modify the groundwater fate-and-transport model to determine that each POD is protective of its respective POE.

2) **Section 12-8-102(b)(11)(C) of the Act defines a point of exposure as "The hypothetical point of drinking water exposure located at a distance of 1,000 feet downgradient from the delineated site contamination under this part," if no existing potable wells or likely future locations of potable wells are closer. Groundwater contamination has not yet been delineated to the east, so no POE can be established in that direction**.

Response No. 2 – ConAgra continues to pursue the installation of additional groundwater delineation wells east of MW-15, across U.S. Highway 319, as described in Status Report No. 1, and east of MW-9 (as described in EPD Comment 3 [below]). Contingent on receiving access permission from the property owners, the proposed wells will be installed and included in the groundwater monitoring plan. Additional details are also provided in the response to EPD Comment 3 (below).

3) **At least two delineation wells will be required east of MW-9 and MW-15. Accordingly**:

- **A delineation well is needed at or east of the former location of MW-28 (east of MW-9). EPD will not accept data from the 2004 and 2007 sampling events as proof of delineation. Recent groundwater data will be required.**
- **If owners of properties immediately east of the site deny access, locations should be sought farther to the east. Property owners who deny access may be required to submit a Compliance Status Report, or to otherwise enter into an environmental covenant restricting groundwater use on their properties.**

Response No. 3 – On behalf of ConAgra, Amec Foster Wheeler is initiating contact with offsite owners and will move ahead with obtaining access permission and performing installation of two offsite monitoring wells as follows: 1) a replacement offsite well for former monitoring well MW-28 (east of onsite well MW-9), and 2) a second offsite well east of MW-15. Contact with the offsite property owners and/or other parties (e.g. DOT), if required, will be made to secure appropriate access agreements. It is anticipated that these monitoring wells will be installed prior to, and sampled during, the next annual monitoring event scheduled for September 2016. The proposed locations of the monitoring wells are provided on Figure 3.

A hypothetical POE was identified in Status Report No. 1 based on previous delineation data from former monitoring well MW-28. Revision of this POE based on sampling of the two proposed offsite wells will be addressed in Status Report No. 3 (November 29, 2016).

4) **EPD questions the choice of MW-9 as a point-of-demonstration (POD) well, given that the lead concentration in MW-9 has historically been above the Type 1 RRS for that substance. The purpose of a POD well is to demonstrate that groundwater concentrations are protective of the downgradient POE. One of the required delineation wells east of MW-9 and MW-15 could possibly serve as a POD well, if delineation is achieved**.

Response No. 4 - ConAgra agrees that one of the proposed delineation wells east of MW-9 and MW-15 could possibly serve as a POD well, if delineation is achieved.

5) **Pursuant to Comment 1 above, please specify a POE in the northern downgradient direction. A POD well will also be required in the northern downgradient direction. Existing impacted wells on the northern portion of the site may be evaluated for selection of a possible POD. If no existing well is deemed suitable for a POD to the north, installation of one or more additional wells will be required.**

Response No. 5 - Potentiometric data from the proposed delineation wells east of MW-9 and MW-15 will possibly clarify direction of groundwater flow, as mentioned in EPD's Comment 5 of June 4, 2015. Based on this additional clarification, ConAgra will specify a POE and a POD well in the northern downgradient direction, if required.

6) **On the Monitoring Well Location Map provided with the response letter, the northern boundary of the 2.52-acre Tumlin property is cut off. In future submittals, please expand the depicted area on the ground to include the entirety of the City of Moultrie and Tumlin parcels (those two parcels comprise the portion of the site currently listed on the State of Georgia Hazardous Site Inventory).**

Response No. 6 - A revised Figure showing the full extent of the Tumlin property is provided as Figure 2. The full extent of the property has not been shown historically as the northermost portion was outside the delineated area of impact. This figure will be utilized in future reports.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Annual groundwater sampling will continue (unless an alternative frequency is subsequently approved by EPD) until the data demonstrate that human health and the environment are adequately protected and EPD concurs. If the data demonstrates that a change in monitoring frequency is warranted, modifications will be proposed in subsequent status reports. As stated in Section 3.2 and 3.3, ConAgra will continue to to proceed with completing the property affidavits required under the VRP approval, and will continue to pursue installation of the additional proposed delineation wells east of MW-9 and MW-15.

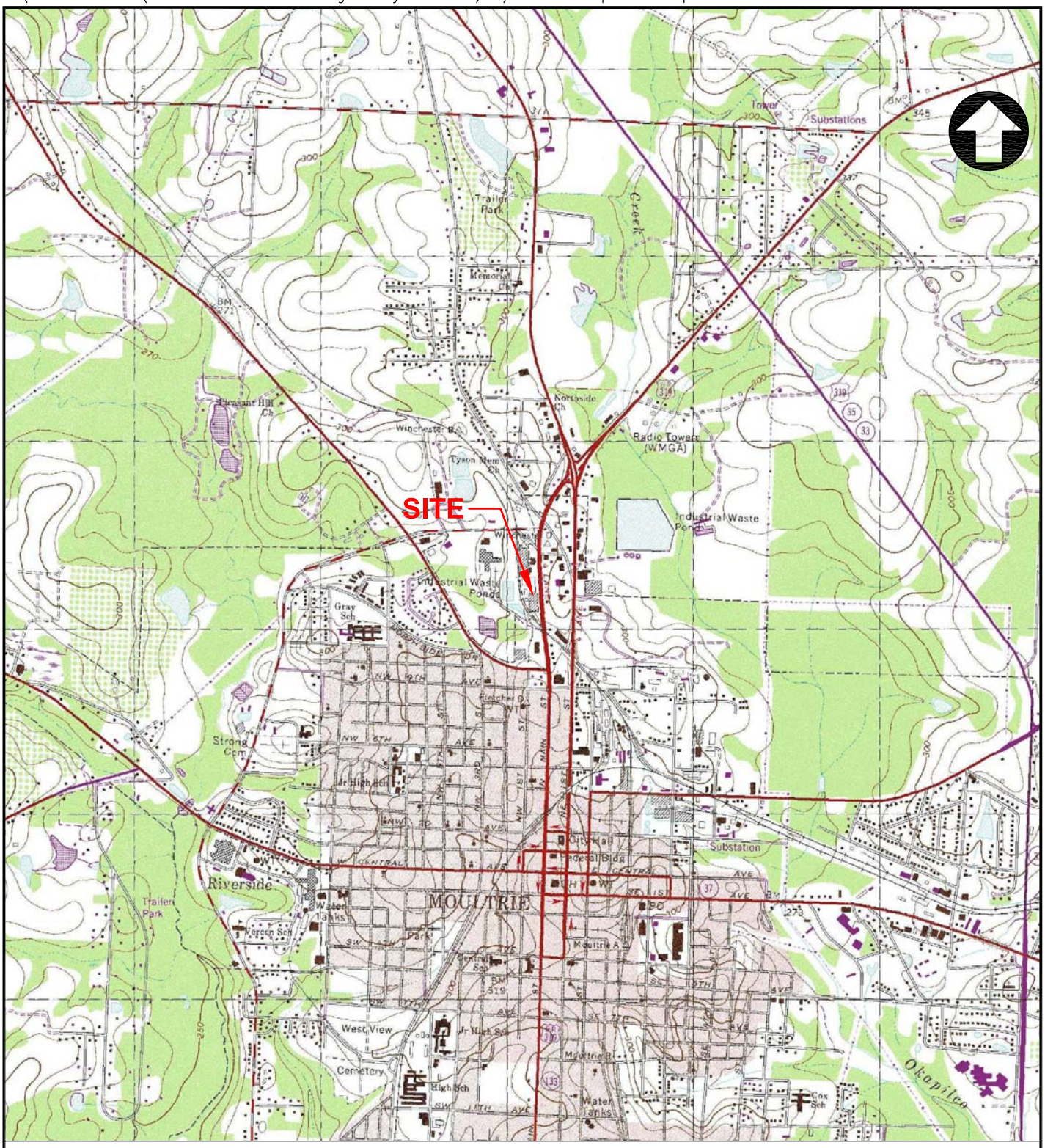
5.0 NEXT SUBMITTAL

As required by EPD's letter dated May 29, 2015, semiannual progress reports are to submitted to EPD November 29th and May 29th annually, beginning November 2015 and ending in 2020, unless a CSR is submitted and approved prior to 2020. A report for the third semiannual period is planned to be submitted by November 29th, 2016, and is planned to include discussion of the following activities:

- Installation and sampling of two offsite monitoring wells
- Annual monitoring event (September 2016)
- Updated Source DK analysis and Bioscreen AT modeling
- Any additional activity, as required, related to pending EPD comments on Progress Report No. 1 (December 9, 2015).

FIGURES

J:\FORMER SWIFT\MOULTRIE-TOPO-MAP.dwg – Layout1 12/01/2015 2:46pm huan.pham



SCALE

0 1 2 MILE

CONTOUR INTERVAL 10 FEET

BASE MAP FROM MOUTRIE QUADRANGLE, 7.5 MINUTE SERIES (TOPOGRAPHIC), 1978, PHOTO REVISED 1988

GEORGIA
QUADRANGLE LOCATION

FORMER SWIFT & COMPANY–
MEAT PROCESSING PLANT
1189 NORTH MAIN STREET
MOULTRIE, GEORGIA COLQUITT
COUNTY

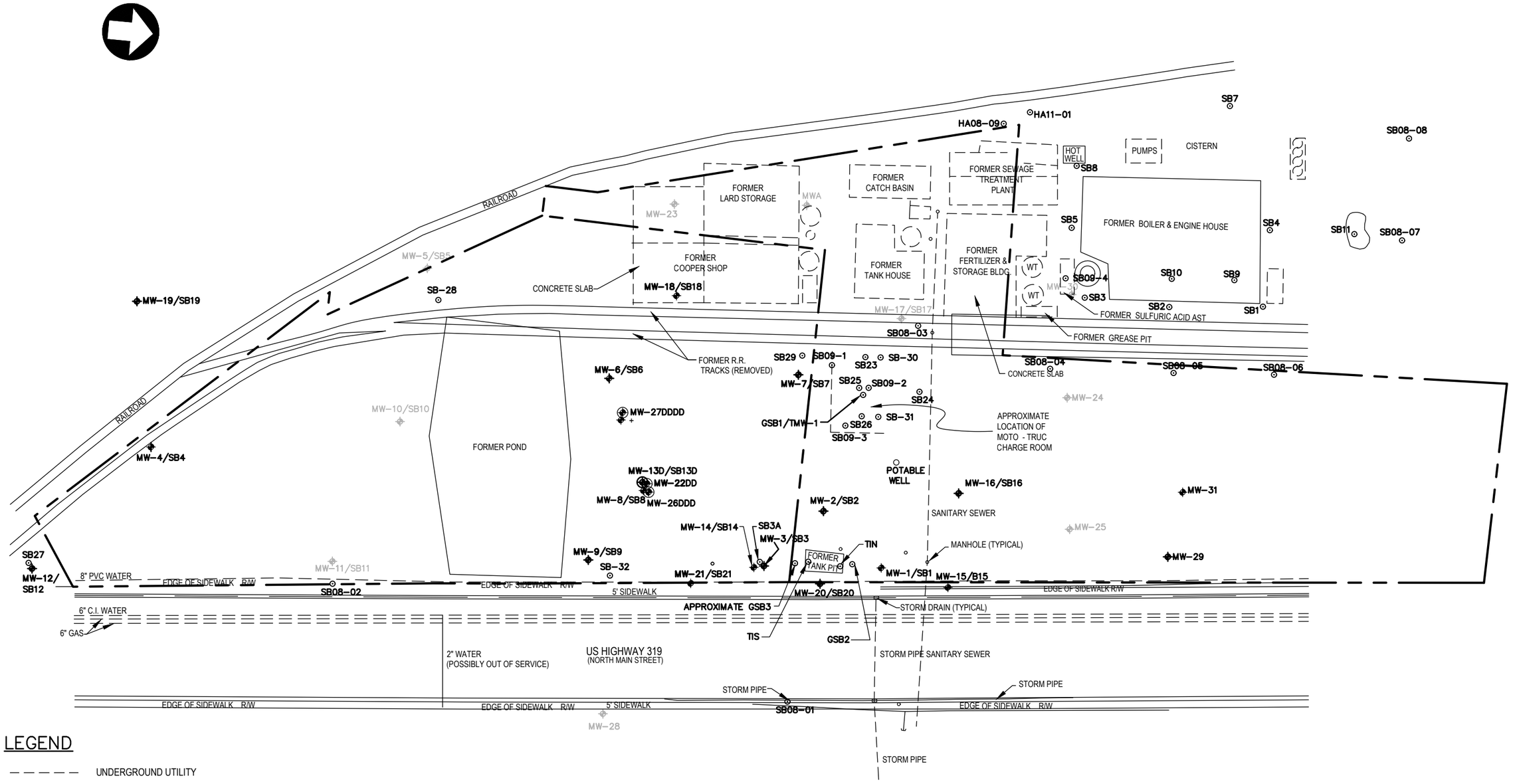
amec foster wheeler

Environment & Infrastructure, Inc.
3200 TOWN POINT DRIVE, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

SITE LOCATION MAP

JOB NO. 6122-14-0220 FIGURE 1

PREPARED BY/DATE TG 11/16/2015
CHECKED BY/DATE RNQ 11/16/2015



LEGEND

- UNDERGROUND UTILITY
- APPROXIMATE PROPERTY BOUNDARY
- MONITORING WELL LOCATION
- UNIDENTIFIED WELL
- DEEP MONITORING WELL LOCATION
- SOIL BORING LOCATION
- WELL CANNOT BE LOCATED, PRESUMED DESTROYED DURING SITE DEMOLITION/ GRADING ACTIVITIES

SOURCES: SITE MAP PREPARED BY ADVANCED ENVIRONMENTAL TECHNOLOGIES, LLC (AET) AND COLQUITT COUNTY TAX ASSESSOR PARCEL MAPS

SCALE IN FEET

0 70 140

FORMER SWIFT & COMPANY
MEAT PROCESSING PLANT
MOULTRIE, GEORGIA COLQUITT COUNTY

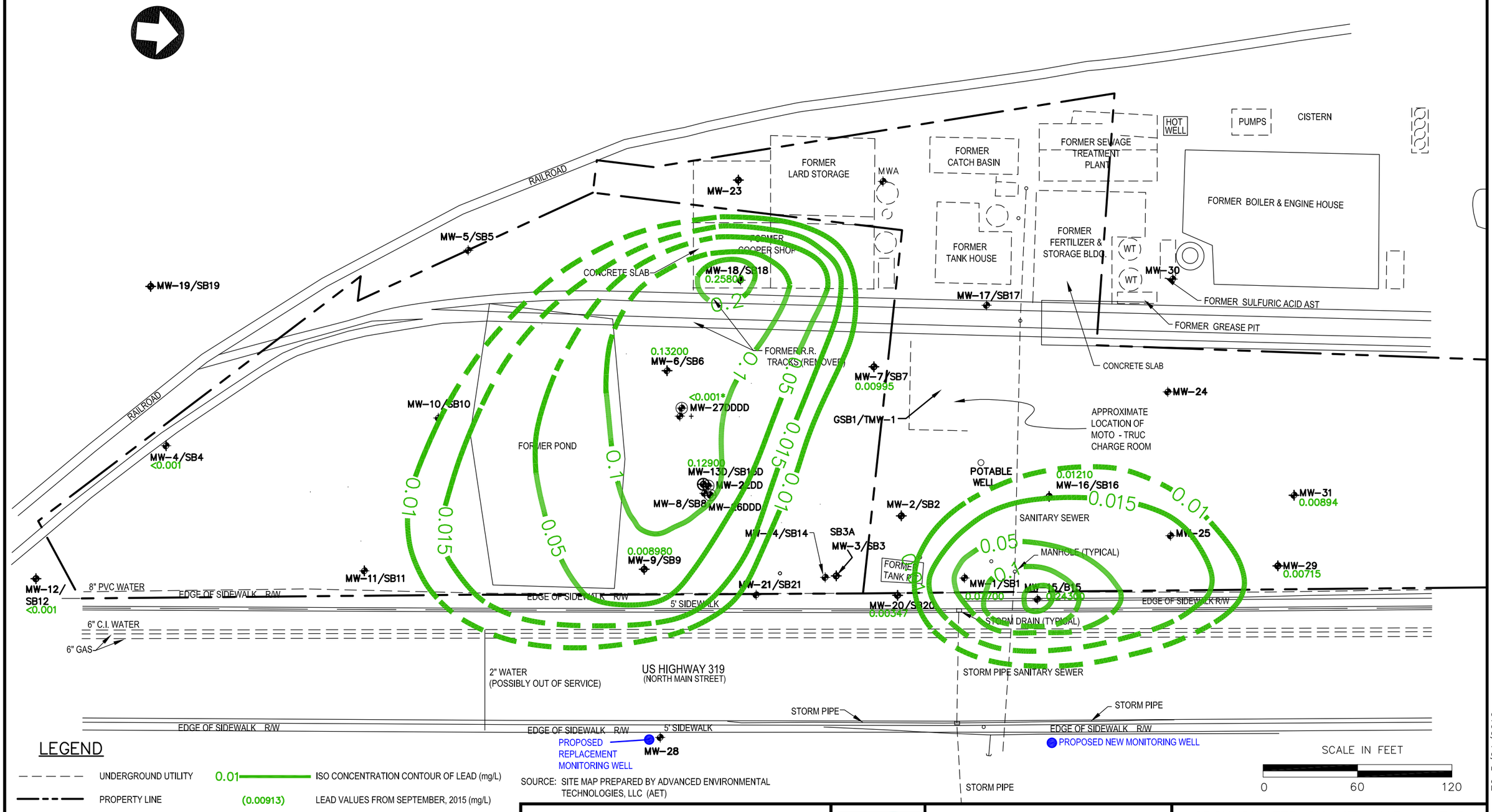
Amec Foster Wheeler
Environment & Infrastructure, Inc.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

SITE PLAN

JOB NO. 6122-14-0220 FIGURE 2

PREPARED BY/DATE JMQ 5/23/2016
CHECKED BY/DATE DS 5/23/2016

J:\FORMER SWIFT\MAY 2016\POTMAP 3RD QUAR 2015 LEAD.-LOC PROP.dwg - Layout1 05/26/2016 7:48am Tonya.Gladstone



LEGEND

- UNDERGROUND UTILITY
- PROPERTY LINE
- MONITORING WELL LOCATION
- UNIDENTIFIED WELL
- DEEP MONITORING WELL LOCATION
- SOIL BORING LOCATION
- 0.01 ISO CONCENTRATION CONTOUR OF LEAD (mg/L)
- (0.00913) LEAD VALUES FROM SEPTEMBER, 2015 (mg/L)
- * LEAD VALUES NOT USED IN CONTOURING

SOURCE: SITE MAP PREPARED BY ADVANCED ENVIRONMENTAL TECHNOLOGIES, LLC (AET)

FORMER SWIFT & COMPANY
MEAT PROCESSING PLANT
MOULTRIE, GEORGIA COLQUITT COUNTY

Amec Foster Wheeler
Environment & Infrastructure, Inc.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

GROUNDWATER QUALITY MAP - LEAD SEPTEMBER, 2015 AND LOCATION OF PROPOSED MONITORING WELLS

JOB NO. 6122-14-0220 FIGURE 3

PREPARED BY/DATE TG 5/24/2016
CHECKED BY/DATE DS 5/24/2016

APPENDIX A

APPENDIX A-1
September 21, 2015 Potentiometric Surface Maps

J:\FORMER SWIFT\SEP 2015\POTMAP SHALLOW A ZONE 3RD QUAR 2015 PH.dwg – Layout1 12/01/2015 4:48pm huan.pham

RAILROAD

MW–19/SB19

MW–5/SB5

MW–23

FORMER LARD STORAGE

MWA

FORMER COOPER SHOP

MW–18/SB18

CONCRETE SLAB

FORMER CATCH BASIN

FORMER TANK HOUSE

FORMER SEWAGE TREATMENT PLANT

HOT WELL

PUMPS

CISTERN

FORMER BOILER & ENGINE HOUSE

FORMER FERTILIZER & STORAGE BLDG.

WT

WT

MW–30

MW–17/SB17

FORMER SULFURIC ACID AST

FORMER GREASE PIT

CONCRETE SLAB

FORMER R.R. TRACKS (REMOVED)

MW–6/SB6
301.70

MW–7/SB7

MW–24

MW–10/SB10

MW–27DDDD

GSB1/TMW–1

APPROXIMATE LOCATION OF MOTO - TRUC CHARGE ROOM

RAILROAD

MW–4/SB4
305.38

305

304

303

302

FORMER POND

MW–13D/SB13D

MW–22DD

301.02

MW–8/SB8

MW–26DDD

POTABLE WELL

MW–16/SB16

MW–31

MW–2/SB2

SANITARY SEWER

MW–14/SB14
302.75

SB3A

MW–3/SB3

MW–25

MANHOLE (TYPICAL)

MW–9/SB9

FORMER TANK PIT

MW–29

MW–12/SB12
304.39

8" PVC WATER

MW–11/SB11

EDGE OF SIDEWALK R/W

EDGE OF SIDEWALK R/W

5' SIDEWALK

MW–21/SB21

MW–1/SB1

MW–15/B15

MW–20/SB20

EDGE OF SIDEWALK R/W

STORM DRAIN (TYPICAL)

6" C.I. WATER

6" GAS

2" WATER
(POSSIBLY OUT OF SERVICE)

US HIGHWAY 319
(NORTH MAIN STREET)

STORM PIPE SANITARY SEWER

STORM PIPE

STORM PIPE

EDGE OF SIDEWALK R/W

EDGE OF SIDEWALK R/W

5' SIDEWALK

MW–28

EDGE OF SIDEWALK R/W

STORM PIPE

LEGEND

- UNDERGROUND UTILITY
- PROPERTY LINE
- MONITORING WELL LOCATION
- UNIDENTIFIED WELL
- DEEP MONITORING WELL LOCATION
- SOIL BORING LOCATION
- 307 — POTENTIOMETRIC SURFACE CONTOUR
- 308.93 — POTENTIOMETRIC SURFACE ELEVATION (FEET, NAVD)
- DIRECTION OF GROUNDWATER FLOW
- -- NOT LOCATED

SOURCE: SITE MAP PREPARED BY ADVANCED ENVIRONMENTAL TECHNOLOGIES, LLC (AET)

SCALE IN FEET

0 60 120

FORMER SWIFT & COMPANY
MEAT PROCESSING PLANT
MOULTRIE, GEORGIA COLQUITT COUNTY

Amec Foster Wheeler
Environment & Infrastructure, Inc.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421–3400

POTENTIOMETRIC SURFACE
SHALLOW ZONE A
SEPTEMBER 21, 2015

JOB NO. 6122–14–0220 FIGURE 3

PREPARED BY/DATE HVP 11/16/2015
CHECKED BY/DATE JMQ 11/16/2015

J:\FORMER SWIFT\SEP 2015\POTMAP SHALLOW B ZONE 3RD QUAR 2015 PH.dwg – Layout1 12/01/2015 5:17pm huan.pham

RAILROAD

MW-19/SB19
297.69

MW-5/SB5

MW-23

FORMER LARD STORAGE

MWA

FORMER COOPER SHOP

293.12
MW-18/SB18

CONCRETE SLAB

FORMER CATCH BASIN

FORMER TANK HOUSE

FORMER SEWAGE TREATMENT PLANT

HOT WELL

PUMPS

CISTERN

FORMER BOILER & ENGINE HOUSE

FORMER FERTILIZER & STORAGE BLDG.

WT

WT

MW-30

MW-17/SB17

FORMER SULFURIC ACID AST

FORMER GREASE PIT

CONCRETE SLAB

FORMER R.R. TRACKS (REMOVED)

MW-6/SB6

MW-7/SB7
293.36

MW-24

GSB1/TMW-1

APPROXIMATE LOCATION OF MOTO - TRUC CHARGE ROOM

296

295

294

293

MW-10/SB10

FORMER POND

MW-27DDDD

292.70
MW-13D/SB13D
MW-22DD
288.11*
MW-8/SB8
MW-26DDD

MW-4/SB4

POTABLE WELL

293.4
MW-16/SB16

MW-31
294.09

MW-2/SB2
Dry

SANITARY SEWER

MW-14/SB14

SB3A
MW-3/SB3
293.00

FORMER TANK PIT

MW-25

MANHOLE (TYPICAL)

MW-9/SB9
292.69

MW-11/SB11

299.84*
MW-21/SB21

296.31*
MW-20/SB20

295.56*
MW-1/SB1

297.48*
MW-15/B15

MW-29
294.26

MW-12/SB12

8" PVC WATER

EDGE OF SIDEWALK R/W

5' SIDEWALK

EDGE OF SIDEWALK R/W

STORM DRAIN (TYPICAL)

6" C.I. WATER

6" GAS

2" WATER
(POSSIBLY OUT OF SERVICE)

US HIGHWAY 319
(NORTH MAIN STREET)

STORM PIPE SANITARY SEWER

STORM PIPE

STORM PIPE

EDGE OF SIDEWALK R/W

EDGE OF SIDEWALK R/W

5' SIDEWALK

EDGE OF SIDEWALK R/W

MW-28

STORM PIPE

SCALE IN FEET

0 60 120

LEGEND

- 301 — POTENTIOMETRIC SURFACE CONTOUR
- 299 — EXTRAPOLATED CONTOUR
- 302.34 — POTENTIOMETRIC SURFACE ELEVATION (FEET, NAVD)
- 304.43* — ANOMALOUS VALUE. ELEVATION NOT USED IN CONTOURING.
- DIRECTION OF GROUNDWATER FLOW
- -- — NOT LOCATED
- UNDERGROUND UTILITY
- PROPERTY LINE
- MONITORING WELL LOCATION
- + UNIDENTIFIED WELL
- DEEP MONITORING WELL LOCATION
- SOIL BORING LOCATION

SOURCE: SITE MAP PREPARED BY ADVANCED ENVIRONMENTAL TECHNOLOGIES, LLC (AET)

FORMER SWIFT & COMPANY
MEAT PROCESSING PLANT
MOULTRIE, GEORGIA COLQUITT COUNTY

amec foster wheeler

Amec Foster Wheeler
Environment & Infrastructure, Inc.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

POTENTIOMETRIC SURFACE
SHALLOW ZONE B
SEPTEMBER 21, 2015

JOB NO. 6122-14-0220 FIGURE 4

PREPARED BY/DATE HVP 11/16/2015
CHECKED BY/DATE JMQ 11/16/2015

APPENDIX A-2
Updated Fate And Transport Modeling Results

BIOSCREEN-AT Model Results
Former Swift Site, Moultrie, Georgia
Fate and Transport of Lead

This section presents the modeled fate and transport for lead at the former Swift site, which was found above the screening level for groundwater in one or more wells. The screening level is based on the Groundwater Protection Standard (GWPS) of 0.015 mg/L. This section will focus on lead concentrations in groundwater since this form is subject to migration. The purpose of the following assessment is to evaluate the potential for lead detected above the screening levels to migrate beyond the current monitoring well network.

The maximum lead concentration detected in groundwater samples taken in September 2015 was at MW-18 (0.258 mg/L). Additonally, the lead concentration at MW-15 (0.243 mg/L), located on the eastern perimeter of the site, was also modeled using BIOSCREEN-AT.

Lead Transport

The potential for lead in groundwater to migrate from current locations to beyond the current monitoring well network was evaluated using the one-dimensional fate and transport model BIOSCREEN-AT. BIOSCREEN-AT is an enhanced version of BIOSCREEN (Newell et al., 1996) with an exact analytical solution for the transport of a contaminant (Karanovic et al., 2007). This model is based on Microsoft Excel software that solves the widely-used analytical Domenico equation (Karanovic et al, 2007). This equation describes transport of solute in groundwater (inorganic or organic, decaying or non-decaying). Features within the model designed to account for processes specific to natural attenuation of organic constituents were not used. The model simulates advection, adsorption and three dimensional dispersion of any dissolved constituent (inorganic or organic), and has the ability to simulate constant or decaying sources, and contaminant degradation using degradation constants. The use of BIOSCREEN AT was limited for this site-specific application to model only advection, dispersion, and adsorption onto porous media since lead is an elemental contaminant that does not naturally degrade. Processes such as degradation or other chemical/biological processes were not included in this model. The use of this model as described above is consistent with USEPA guidance (Ford et al, 2007), where the USEPA's Center for Subsurface Modeling Support states that the Domenico-basedmodels (such as BIOCHLOR, BIOSCREEN, FOOTPRINT, and REMChlor) in their current forms are reasonable for screening level tools.

Lead is modeled as being transported from the source area with the following assumptions.

- The modeled flow path is depicted from MW-18 through MW-09 and beyond.
- The highest detected lead concentration in MW-18 is representative of lead concentrations in the source area and is constant in concentration.
- An alternate scenario using MW-15 as a source area is also modeled.

The parameters selected for use in the model are presented in the following subsections.

Source Zone Width

The source zone is defined as the two-dimensional cross sectional area that is perpendicular to the direction of groundwater flow and of known constituent concentration. Downgradient of this

zone, the groundwater concentration is calculated by the model based on the dispersion, decay, adsorption, etc. that would occur in the flow field based on the value of the parameters used in the model. The modeled source is MW-18, with MW-15 also modeled as an alternate scenario. The planar two-dimensional source is represented by the highest detected lead concentration (MW-18 or MW-15). The cross section of the source is assumed to be approximately 100 feet wide around MW-18, or MW-15 in the alternate scenario.

Source Zone Thickness

The source zone thickness was assumed to be 50 feet based on the boring log and potentiometric surface measurements of MW-26DDD (near the central portion of the site).

Seepage velocity

There are two ways to input seepage velocity in this model – either as a final seepage velocity or as hydraulic conductivity, groundwater gradient, and effective porosity. The final seepage velocity method was used in this model exercise.

There are two water-bearing zones in the area of this model (Zone A and B). For this model, they are considered as one unit. The seepage velocity in Zone A has been calculated to be 65 ft/yr based on a horizontal gradient of 0.0086 ft/ft. Seepage velocities in Zone B have been calculated to be 32 – 91 ft/yr; based on a horizontal gradient of 0.0063 – 0.0178 ft/ft. Since the model requires a single seepage velocity, 65 ft/y was used. This value is consistent with reported values for both zones.

Dispersivity

The dispersivities were calculated by the model based on an estimated plume length of 280 feet. The resulting values are longitudinal dispersivity (13.3 feet), the transverse dispersivity (1.3 feet), and vertical dispersivity of 0.13 feet. The model estimates these based on published guidelines for dispersivity (Newell et al., 1996).

Partitioning Coefficient

BIOSCREEN is designed to use an organic Kd partitioning coefficient. This value is dependent on the fraction of organic carbon (foc) in the aquifer matrix, which is used to multiply the entered organic carbon partitioning coefficient (Koc) to get the organic Kd. It can also be used to model an inorganic metal constituent by entering a foc = 1.0 and an actual Kd for the Koc. With this adjustment, the appropriate actual metal Kd value is used in the adsorption formula. The Kd value for lead is dependent on pH. Both H+ (which determines pH) and Pb2+ are cations so there can be competition between them for adsorption sites on grain surfaces. This means the effective Kd depends on actual groundwater pH. Literature values report a range of Kd values from 5 L/kg to 100,000 L/kg (USEPA, 1996). Because the groundwater pH is below neutral, the median of literature values (15,849L/kg) was used as an initial input value and adjusted to calibrate the model to historic plume length and actual groundwater concentrations. Final Kd was dependent on length of time assumed since initial release.

Source Concentration and Strength

For the initial calibration, the lead concentration used in the MW-18 area was 0.258 mg/L, based on the September 2015 total metals sampling result at MW-18. At MW-18, both total and dissolved metals samples were collected, as turbidity could not be reduced below 17.9 NTU. The dissolved metals result at MW-18 was 0.176 mg/L. The source was assumed to be constant over time. The lead concentration in the MW-15 area is 0.243 mg/L based on the September 2015 sampling result.

Degradation and Chemical Transformations

No degradation of lead or chemical reactions was assumed in the model.

Simulation Time

For calibration, the estimated earliest and latest possible times of release (based on the years of operation of the former Swift facility) were modeled. The actual first release date is unknown but should lie somewhere between these endpoints. The estimated earliest possible release date gives the plume 100 years to develop and results in a slower moving plume with a higher retardation factor for the aquifer. Use of these parameters would lead to predictions of slower future growth and more limited extent. The estimated latest possible release date gives the plume 44 years to develop and results in a faster moving plume with a lower retardation factor for the aquifer. Use of these parameters would lead to predictions of faster future growth and more extensive plume development. Since neither of these scenarios takes into account source area attenuation (both use a continuing source), both will generate very conservative (higher concentrations and greater extent) estimates of future plume development.

Calibration Values

The following September 2015 concentrations were used to calibrate the Kd values for the 100 and 44 year historic plume development:

Well	Distance (Feet from Source Area)	September 2015 Lead Concentration (mg/L)
MW-18	0	0.258 (total)
MW-18	0	0.176 (dissolved)
MW-6	74	0.132
MW-13D	132	0.129
MW-9	194	0.0898
MW-20	224	0.00347

Screen captures of final input and output values for the 44 and 100 year historic plumes are attached.

The calibration using the MW-18 total metals value of 0.258 mg/L yielded unsatisfactory predicted values as compared to existing site values. Therefore, the calibration was performed again using the MW-18 dissolved metals value of 0.176 mg/L, which yielded a more satisfactory calibration when compared to site values. As mentioned above, the BIOSCREEN input pages for both the MW-18 total and dissolved metals values, and associated model output pages showing predicted values, are attached.

For the MW-15 scenario, the source used was the MW-15 September 2015 lead concentration of 0.243 mg/L. Modeled travel times of 50 and 100 years were used for this scenario. The set-up for the MW-18 scenario was otherwise used, as there are no downgradient wells from MW-15 to use for calibration of the Kd values.

CONCLUSIONS

Lead Model Results

The results of this model of lead fate and transport from MW-18 toward MW-9 show that (for the modeled travel time of 100 additional years) the lead concentration would not exceed the GWPS of 0.015 mg/l between approximately 425 to 590 feet from MW-18 (44 year historic plume or 100 year historic plume, respectively). This distance would extend beyond the eastern property boundary approximately 220 to 380 feet for the two time periods. For the MW-15 source scenario, the lead concentration (for the modeled travel time of 100 additional years) would not exceed the GWPS of 0.015 mg/l between approximately 450 to 620 feet from MW-15, or approximately 270 to 320 feet beyond the eastern boundary along the prevalent groundwater flow direction.

The models represent a very conservative estimate and actual conditions will be lower, as the highest detected groundwater concentration was maintained as a constant source over the entire model timeframe, and because the Kd values used are very low when compared to guidance document values. Most importantly, as pH becomes more neutral over time and distance from the source, the mobility of lead will be diminished and corresponding Kd values would increase. Screen captures of model inputs and results are attached.

Initial Set-up and Calibration Using MW-18 Total Metals Value

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Swift- Lead - total Pb / *Moultrie, GA* — *Run Name*

Data Input Instructions:

115 → 1. Enter value directly....or
or
0.02 → 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* → Data used directly in model.
20 → Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	65.0	*(ft/yr)*
or		*or*	
Hydraulic Conductivity	*K*	1.1E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.003	*(ft/ft)*
Porosity	*n*	0.3	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	13.3	*(ft)*
Transverse Dispersivity*	*alpha y*	1.3	*(ft)*
Vertical Dispersivity*	*alpha z*	0.1	*(ft)*
or		*or*	
Estimated Plume Length	*Lp*	280	*(ft)*

3. ADSORPTION

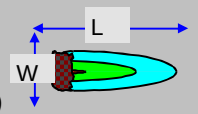
Retardation Factor*	*R*	20.9	*(-)*
or		*or*	
Soil Bulk Density	*rho*	1.5	*(kg/l)*
Partition Coefficient	*Koc*	3.98	*(L/kg)*
FractionOrganicCarbon	*foc*	1.0E+0	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	0.0E+0	*(per yr)*
or		*or*	
Solute Half-Life	*t-half*	0.15	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	1.65	*(mg/L)*
Delta Nitrate*	*NO3*	0.7	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	22.4	*(mg/L)*
Observed Methane*	*CH4*	6.6	*(mg/L)*

5. GENERAL

Modeled Area Length*	250	*(ft)*
Modeled Area Width*	200	*(ft)*
Simulation Time*	44	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 50 *(ft)*

Source Zones:

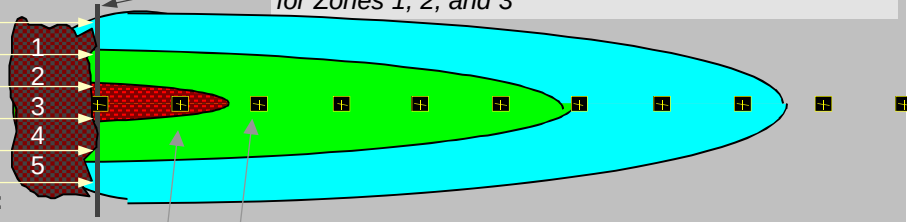
Width* (ft)	Conc. (mg/L)*	
10	0	1
20	0	2
100	0.258	3
20	0	4
10	0	5

Source Halflife (see Help):

20	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	.258			.132		.129			.09	.003	
Dist. from Source (ft)	0	25	50	75	100	125	150	175	200	225	250

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help | Recalculate This

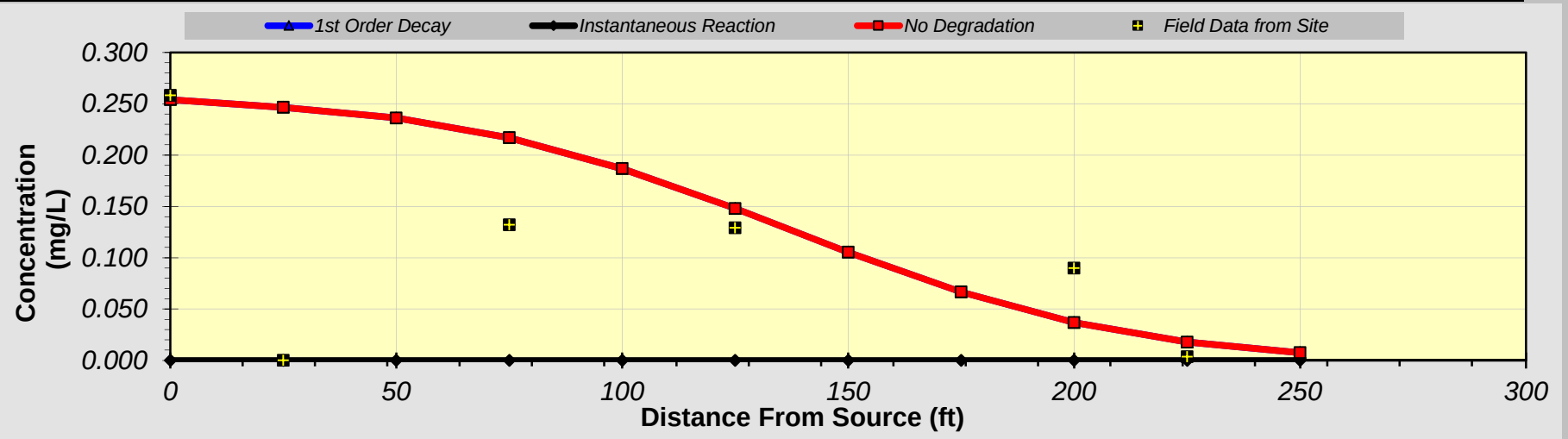
Paste Example Dataset

Restore Formulas for Vs,

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	25	50	75	100	125	150	175	200	225	250
No Degradation	0.254	0.247	0.236	0.217	0.187	0.148	0.105	0.067	0.037	0.018	0.007
1st Order Decay	0.254	0.247	0.236	0.217	0.187	0.148	0.105	0.067	0.037	0.018	0.007
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.258			0.132		0.129			0.090	0.003	



Calculate Animation

Time: 44 Years

Return to

Recalculate This

Final Set-up, Calibration and Predicted Values Using MW-18 Dissolved Metals Value

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Swift- Lead
Moultrie, GA
Run Name

Data Input Instructions:

115 → *1. Enter value directly....or*
↑ or
0.02 → *2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* → *Data used directly in model.*
20 → *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	65.0	*(ft/yr)*
or		↑ or	
Hydraulic Conductivity	*K*	1.1E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.003	*(ft/ft)*
Porosity	*n*	0.3	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	13.3	*(ft)*
Transverse Dispersivity*	*alpha y*	1.3	*(ft)*
Vertical Dispersivity*	*alpha z*	0.1	*(ft)*
or		↑ or	
Estimated Plume Length	*Lp*	280	*(ft)*

3. ADSORPTION

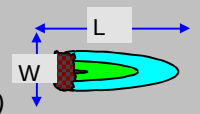
Retardation Factor*	*R*	20.9	*(-)*
or		↑ or	
Soil Bulk Density	*rho*	1.5	*(kg/l)*
Partition Coefficient	*Koc*	3.98	*(L/kg)*
FractionOrganicCarbon	*foc*	1.0E+0	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	0.0E+0	*(per yr)*
or		↑ or	
Solute Half-Life	*t-half*	0.15	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	1.65	*(mg/L)*
Delta Nitrate*	*NO3*	0.7	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	22.4	*(mg/L)*
Observed Methane*	*CH4*	6.6	*(mg/L)*

5. GENERAL

Modeled Area Length*	250	*(ft)*
Modeled Area Width*	200	*(ft)*
Simulation Time*	44	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 50 *(ft)*

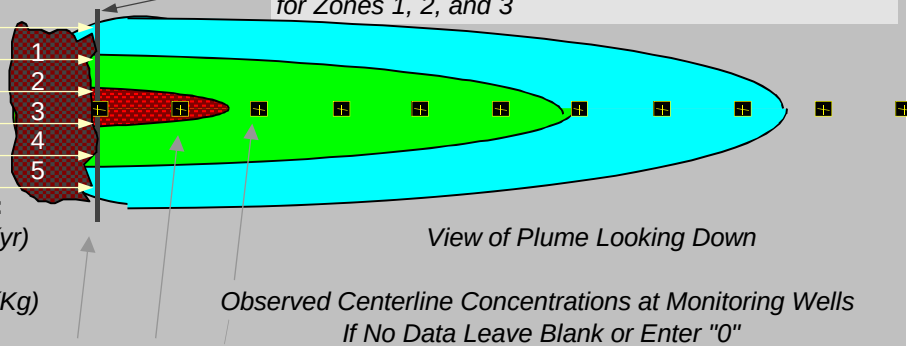
Source Zones:

Width* (ft)	Conc. (mg/L)*	
10	0	1
20	0	2
100	0.176	3
20	0	4
10	0	5

Source Halflife (see Help):

20	>1000	*(yr)*
Inst. React. ↑	↑ 1st Order	
Soluble Mass	2000	*(Kg)*
In Source NAPL, Soil		

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	0	25	50	75	100	125	150	175	200	225	250
Concentration (mg/L)	.258			.132		.129			.09	.003	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

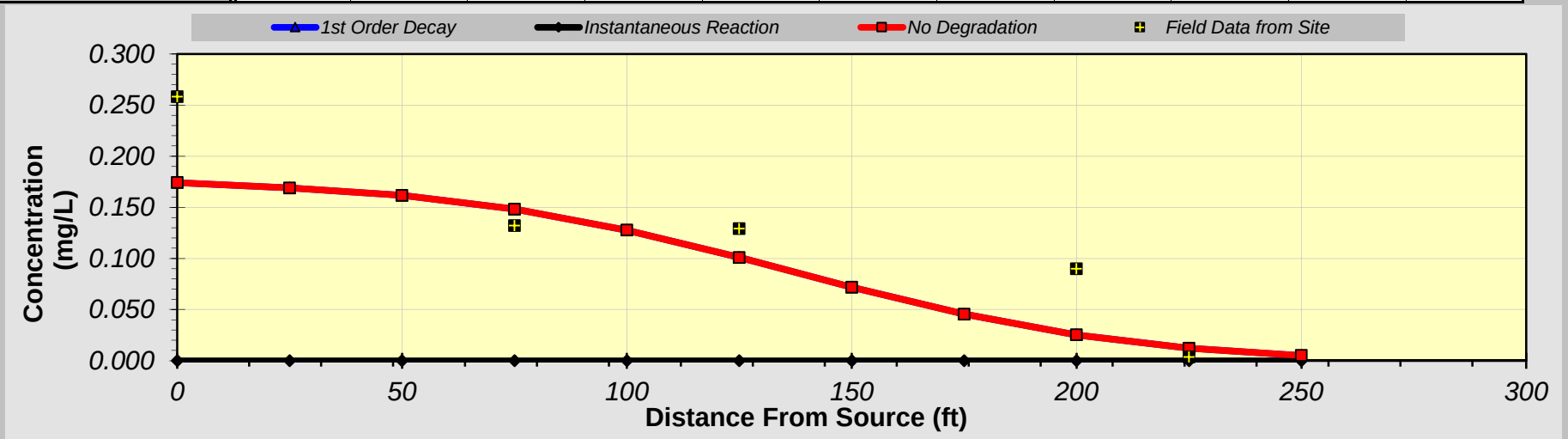
Help — Recalculate This

Paste Example Dataset

Restore Formulas for Vs,

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	25	50	75	100	125	150	175	200	225	250
No Degradation	0.174	0.169	0.162	0.148	0.128	0.101	0.072	0.045	0.025	0.012	0.005
1st Order Decay	0.174	0.169	0.162	0.148	0.128	0.101	0.072	0.045	0.025	0.012	0.005
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.258			0.132		0.129			0.090	0.003	



Calculate Animation

Time: 44 Years

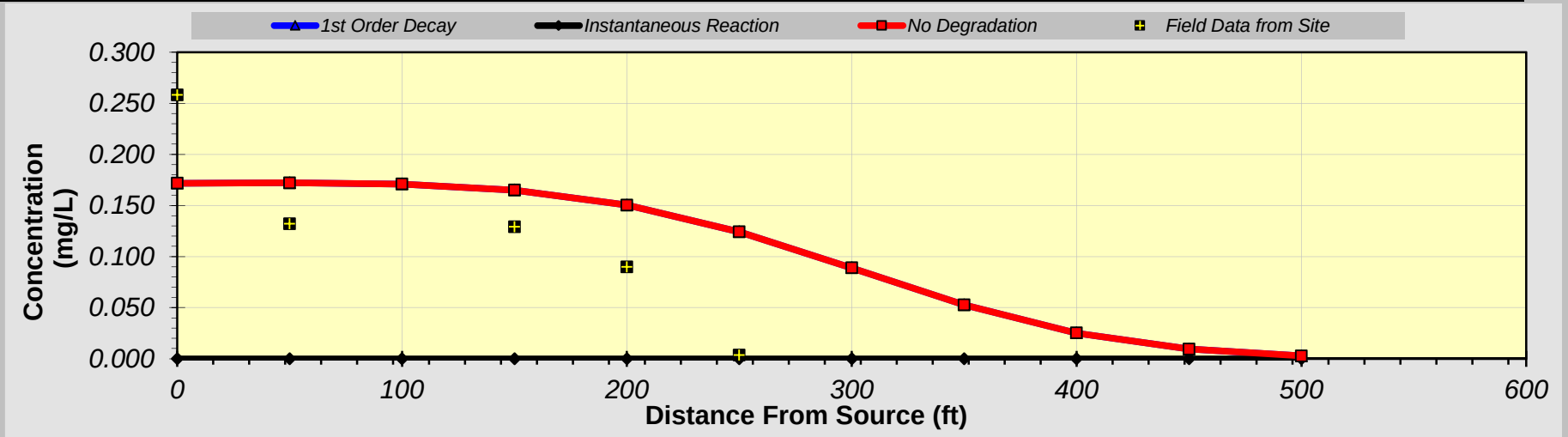
Return to

Recalculate This

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	50	100	150	200	250	300	350	400	450	500
No Degradation	0.172	0.172	0.171	0.165	0.150	0.124	0.089	0.053	0.025	0.009	0.003
1st Order Decay	0.172	0.172	0.171	0.165	0.150	0.124	0.089	0.053	0.025	0.009	0.003
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.258	0.132		0.129	0.090	0.003					



Calculate Animation

Time: 100 Years

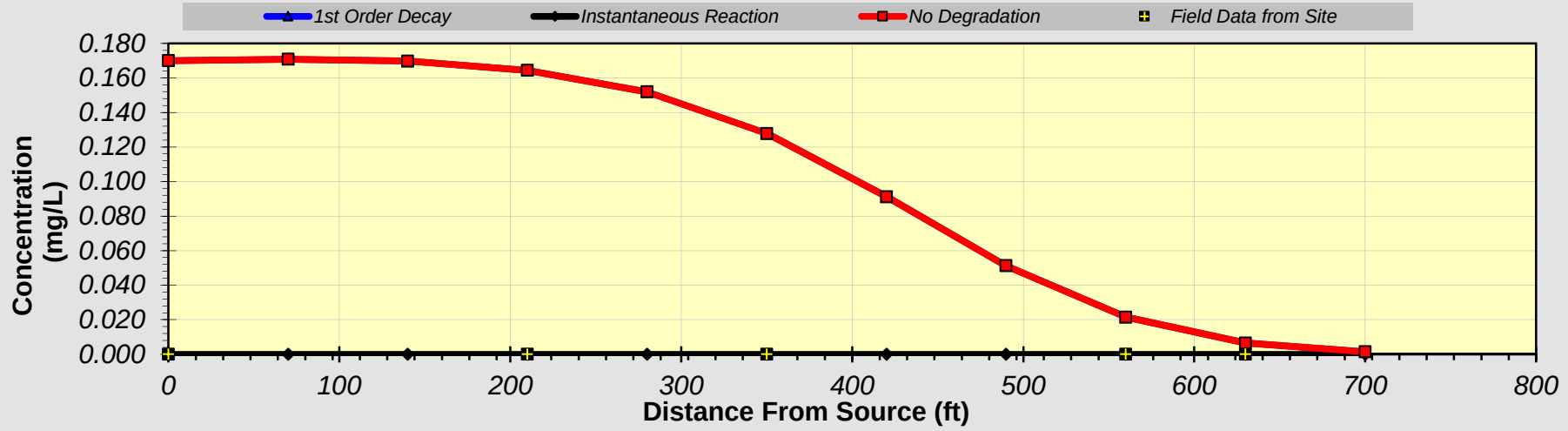
Return to

Recalculate This

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	70	140	210	280	350	420	490	560	630	700
No Degradation	0.170	0.171	0.170	0.164	0.152	0.128	0.091	0.051	0.022	0.007	0.001
1st Order Decay	0.170	0.171	0.170	0.164	0.152	0.128	0.091	0.051	0.022	0.007	0.001
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time: 144 Years

Return to

Recalculate This

Set-up and Predicted Values of MW-15 Scenario

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Swift- Lead MW-15
Moultrie, GA
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
or
0.02 → 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* → *Data used directly in model.*
20 → *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	65.0	*(ft/yr)*
or		*or*	
Hydraulic Conductivity	*K*	1.1E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.003	*(ft/ft)*
Porosity	*n*	0.3	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	13.3	*(ft)*
Transverse Dispersivity*	*alpha y*	1.3	*(ft)*
Vertical Dispersivity*	*alpha z*	0.1	*(ft)*
or		*or*	
Estimated Plume Length	*Lp*	280	*(ft)*

3. ADSORPTION

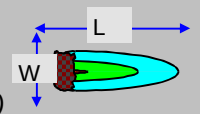
Retardation Factor*	*R*	20.9	*(-)*
or		*or*	
Soil Bulk Density	*rho*	1.5	*(kg/l)*
Partition Coefficient	*Koc*	3.98	*(L/kg)*
FractionOrganicCarbon	*foc*	1.0E+0	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	0.0E+0	*(per yr)*
or		*or*	
Solute Half-Life	*t-half*	0.15	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	1.65	*(mg/L)*
Delta Nitrate*	*NO3*	0.7	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	22.4	*(mg/L)*
Observed Methane*	*CH4*	6.6	*(mg/L)*

5. GENERAL

Modeled Area Length*	500	*(ft)*
Modeled Area Width*	200	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 50 *(ft)*

Source Zones:

Width* (ft)	Conc. (mg/L)*	
10	0	1
20	0	2
100	0.243	3
20	0	4
10	0	5

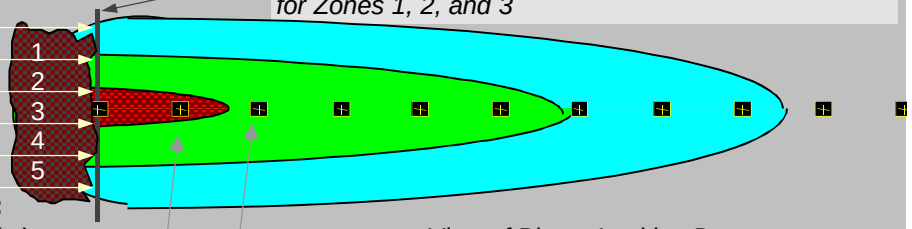
Source Halflife (see Help):

20 | >1000 *(yr)*

Inst. React. ↑ ↑ 1st Order

Soluble Mass 2000 *(Kg)*
In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	.243										
Dist. from Source (ft)	0	50	100	150	200	250	300	350	400	450	500

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help | Recalculate This

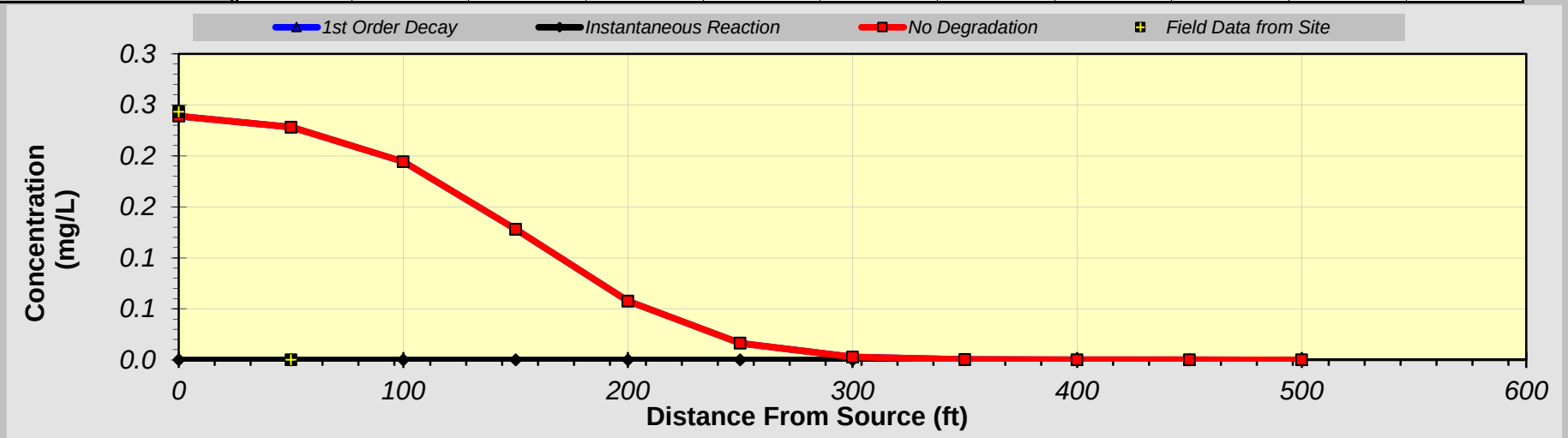
Paste Example Dataset

Restore Formulas for Vs,

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	50	100	150	200	250	300	350	400	450	500
No Degradation	0.239	0.228	0.194	0.128	0.058	0.016	0.003	0.000	0.000	0.000	0.000
1st Order Decay	0.239	0.228	0.194	0.128	0.058	0.016	0.003	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.243										



Replay Animation

Next Timestep

Prev Timestep

Time:

50 Years

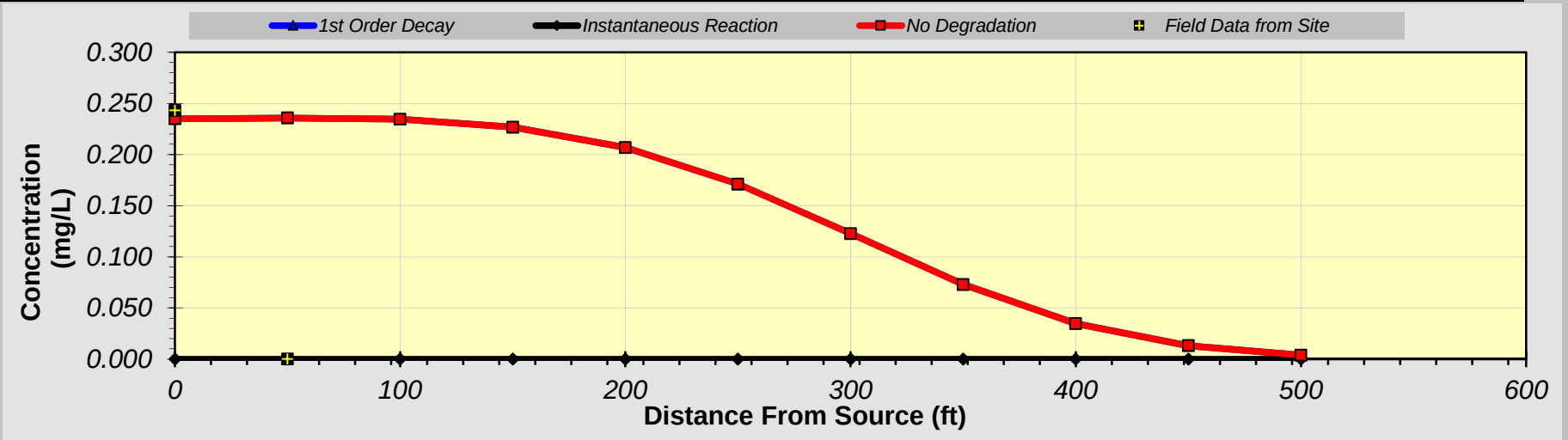
Return to

Recalculate This

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	50	100	150	200	250	300	350	400	450	500
No Degradation	0.235	0.236	0.235	0.227	0.207	0.171	0.123	0.073	0.035	0.013	0.004
1st Order Decay	0.235	0.236	0.235	0.227	0.207	0.171	0.123	0.073	0.035	0.013	0.004
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.243										



Replay Animation

Next Timestep

Prev Timestep

Time:

100 Years

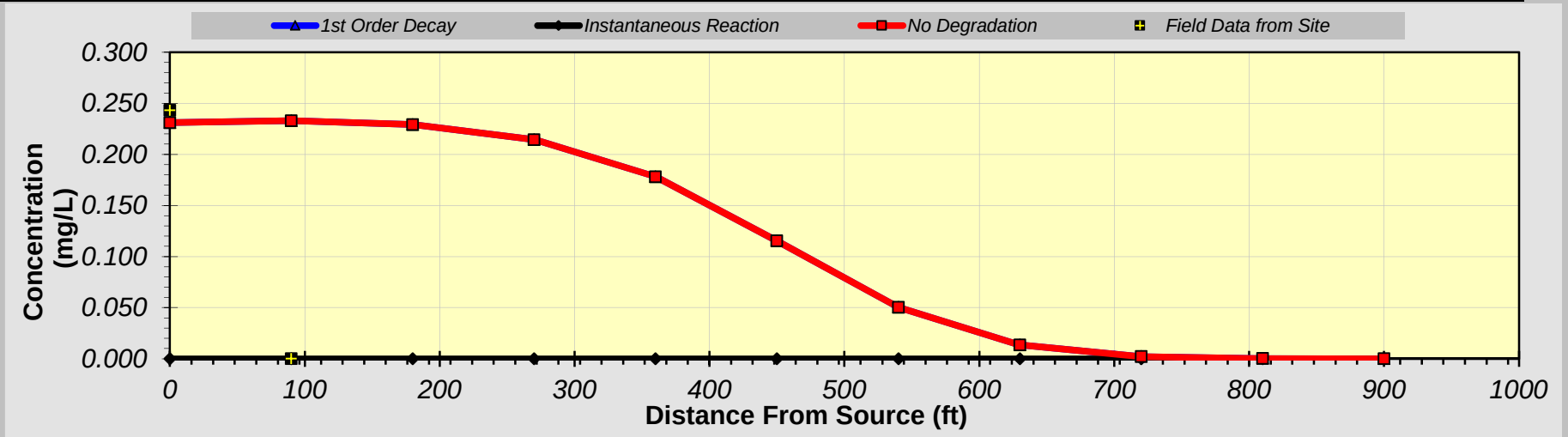
Return to

Recalculate This

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	90	180	270	360	450	540	630	720	810	900
No Degradation	0.231	0.233	0.229	0.214	0.178	0.115	0.050	0.013	0.002	0.000	0.000
1st Order Decay	0.231	0.233	0.229	0.214	0.178	0.115	0.050	0.013	0.002	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.243										

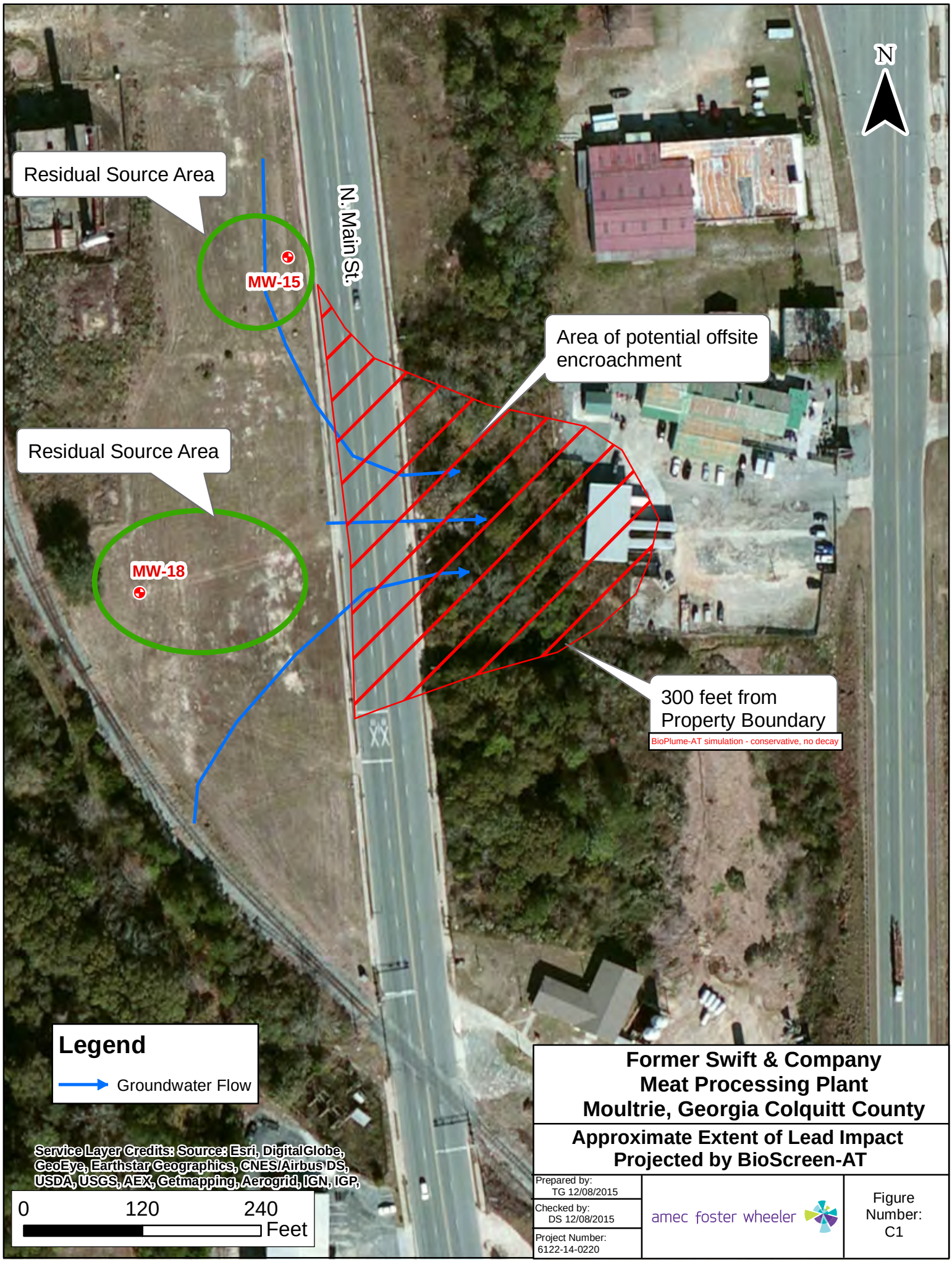


Calculate Animation

Time: 150 Years

Return to

Recalculate This



Former Swift & Company
Meat Processing Plant
Moultrie, Georgia Colquitt County

Approximate Extent of Lead Impact Projected by BioScreen-AT

Prepared by: TG 12/08/2015	amec foster wheeler	Figure Number: C1
Checked by: DS 12/08/2015		
Project Number: 6122-14-0220		

Document Path: G:\Former Swift Moultrie\mxd\Site Map-r1.mxd

APPENDIX B
REGISTERED PROFESSIONAL SUPPORTING DOCUMENTATION

Summary of Hours and Services

Former SWIFT & Company Meat Processing Plant
HSI Site No. 10509
Amec Project No. 6122-14-0220

Submittal to EPD dated May 29, 2016

David E. Smoak, P.G.
Preparation of submittal and review
28 hours charged December 11 through May 29, 2016

John Quinn, P.G
Preparation of submittal
22 hours charged December 11 through May 29, 2016