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May 31, 2022

Mr. Bradley S. Nave
Principal Project Manager
The Chemours Company, FC, LLC
c/o AECOM
500 West Jefferson Street
Suite 1600
Louisville, KY 40202

Re: Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Bioremediation Pilot Test – 2021 Field Season
Former DuPont Barksdale Works Site
FID No.: 804009140
EPA ID No.: WIR000133447
BRRTS No. 02-04-000156

Dear Mr. Nave:

This letter report provides a summary of ongoing Bioremediation Pilot Test Program (BPTP) work conducted in 2021 at the Former E. I. du Pont de Nemours and Company (DuPont) Barksdale Works site (Site). This letter not only documents work completed during the reporting period, but provides the information required by the Wisconsin Department of Natural Resources (WDNR) to fulfill Condition 7 of the Hazardous Waste Remediation Variance (HWRV) permit for Biodegradation of Contaminants and Removal of Residual Product and Debris.

1.0 BACKGROUND INFORMATION

The Barksdale BPTP is focused on biodegradation of nitroaromatic and nitramine organic compounds (NNOCs) in soil. The BPTP began in 2007 with the construction of four small in-situ till areas (cells) intended to evaluate the effect of water, oxygen, and pH on the rate of in-situ microbial degradation of 2,4- and 2,6-dinitrotoluene (DNT or "primary site-related DNT isomers") in site soil as a possible alternative to conventional remedies. These original cells are identified as cell locations C01 through C04 on Figure 2 and in total encompassed an area approximately 50 feet by 20 feet or 1,000 square feet.

Early results indicated that degradation of the two primary site-related DNT isomers was feasible; however, the presence of various other NNOCs was observed to affect degradation rates. As such, the program was expanded in 2008 to evaluate the range of this observed effect by adding three more cells that contained less complex NNOC mixtures. After initiating tilling, several of the 2008 cells were found to contain solid pieces of residual product that resulted in cell heterogeneity and limited the analysis of the test results. As a result, six additional cells with similar trinitrotoluene (TNT)/DNT ratios were constructed in 2009 at locations where the majority of such solids could be removed manually prior to tilling. Also, in 2009, one of the 2008 cells was expanded to four times its original size with the construction of two contiguous new cells in order to evaluate potential economies of scale in cell operation. The cells constructed in 2008 and 2009 are identified as C05 through C15 on Figure 2.

In 2010, NNOCs were discovered within a sandy soil matrix during investigation of new areas of the site. Because all cells constructed prior to 2010 had been in clayey soil, three additional cells (C16 to C18) were added in 2011 to evaluate degradation in the alternate soil type. All debris and product residues encountered during development of the first 18 cells was collected, containerized, and shipped off-site for incineration.

Prior to issuance of the HWRV permit, there were several limitations with respect to construction, soil and waste handling, and test evaluation for the first 18 cells. These limitations included:

- Having to incinerate soil removed during cell construction, which would have otherwise been amenable to biodegradation.
- Having to remove product either by bulk removal prior to cell construction or by manually removing product solids on a periodic basis from the cell surface after tilling was initiated.
- Not having permission to consolidate disjointed areas for testing.
- Having limitations on the ability to control water content within the cells driven by the fact that all cells had to be constructed in-situ.

To address these constraints on the BPTP, The Chemours Company, FC, LLC (formerly DuPont), at the suggestion of WDNR, requested a hazardous waste remediation variance permit in July 2010. Following Chemours response to several sets of agency comments, WDNR issued the HWRV on May 22, 2012. The HWRV permit specifies that a total of 10,000 cubic yards of soil may be treated during the course of the BPTP.

Since June 2012, 21 additional cells have been constructed within the area of concern (AOC) identified at the site. Cells C19, C20, C21, and C22 were constructed in 2012 to accommodate and evaluate material removed in and around areas investigated.

Cell C23 was constructed in 2013 to support a proof of concept study in conjunction with the United States Army Corp of Engineers (USACE) to evaluate degradation of TNT and other NNOCs by introducing hydrated lime to accelerate waste degradation processes. The study on cell C23 was completed in 2014 and waste soils were subsequently removed from the cell and stored for further study or to await future treatment or incineration. Soils stored from the cell were placed in cells C12, C17, and C22 during the 2017 field season. Cell C23 was dismantled in 2021 to make room for the construction of a structure to support the soil heating test cell (C40) that was approved in the December 2020 HWRV permit modification.

Further site investigation between 2014 and 2021 identified soil that contained varying concentrations of fine grained (i.e., sand sized or smaller) TNT. Cells C24 through C39 were constructed during this time period to store, test, and treat this fine-grained material with methods developed as a direct result of the C23 study.

Table 1 lists the cells currently in place and includes information regarding their volume, status, and contaminant mass. Pilot test activities performed under the HWRV are conducted within the designated AOC. Any debris or product removed from cells is handled in accordance with Resource Conservation and Recovery Act (RCRA) rules, including land disposal restrictions (LDRs) and Best Demonstrated Available Technology (BDAT) requirements.

2.0 REPORTING REQUIRED BY THE VARIANCE

Condition 7 of the HWRV requires that annual progress reports be submitted to the department in accordance with s. NR 724.13(3), Wis. Adm. Code. The annual reports are required until the variance ends on May 18, 2023 and are due on or before June 1st of each year. Progress reports required by Condition 7 must be submitted annually in accordance with s. NR 724.13(3), and must include:

a. *Documentation of the type and amount of product residuals and debris removed from biopilot cells. Documentation of any characterization and container storage of product residuals and debris removed from biopilot cells. Documentation of disposal of any product residuals and debris removed from the biopilot cells including manifest copies.*
b. *Documentation of any management, including consolidation, of discrete areas where impacted soil is located within narrow locations such as former ditches or locations that are contorted by the layout of former building features. Documentation of the location of those areas and the amount of soil that is moved. Documentation of the location of areas where the soil combined from discrete source areas is managed.*
c. *Documentation of any alternative treatment of large debris that facilitates management, including washing and physical resizing of large debris for off-site disposal. Documentation of management of all impacted waste streams generated by these activities, including amounts and volumes of waste treated and generated.*

Certified laboratory analytical testing for effectiveness, waste collection, management, and disposal associated with construction and operation of the BPTP are addressed in this progress report. Laboratory reports for 2021 data referenced in this report are included in Appendix E.

2.1 Progress of the Bioremediation Pilot Test Program

2.1.1 Contaminant Removal

Table 1 includes estimates of contaminant mass removed within the biopilot test program over the calendar year and to date, as well as, estimated contaminant mass remaining for each cell and constituent of potential concern (COPC). The estimated masses indicated in Table 1 are based on averaged values for all samples collected in a given cell at the first sampling of a COPC and in the most recent events that included that COPC (typically multiple locations within a cell to form a composite sample). Observations on contaminant removal during the past pilot test season are provided below.

- Distribution of COPCs in the soil in the cells is heterogeneous. As a result, the concentrations of a few COPCs are shown to have increased over time on Table 1. However, statistical analysis based on data collected across the full duration of the program show overall concentrations are decreasing. Such heterogeneity effects are more apparent in the single season product removal estimates than in the long-term, overall removal values. The apparent mass increases shown on Table 1 are generally on the order of a few micrograms per kilogram (µg/kg) and some of the apparent increases are due to changes in reporting/detection limits within the duration of the project.
- To date, an estimated total of 12,987 pounds of COPCs in soil has been destroyed/removed via on-site mitigation efforts in the entirety of the BPTP (Table 1).
- Approximately ninety percent of the COPCs being tracked have shown decreases over the life of the pilot program.
- Laboratory reporting limits (RLs) were compared to Residual Contaminant Levels (RCLs) for direct contact as shown on Table 4. This comparison shows that the laboratory RLs are below the direct contact RCLs and are considered suitable for making risk management decisions.

2.1.2 Reporting Period Operational Issues

No operational issues were encountered during the reporting period.

2.1.3 Evaluation of System Effectiveness

In general, the analytical results continually show that the reduction approaches being tested show promise for remediation of affected site soil, but the evaluation is on-going to determine if the process will be effective in reaching site-wide remedial goals for the varying COPC mixtures found in site soil.

Because this is a pilot test program, the activities do not address all impacted areas on the site; therefore, discussion of site-wide monitored natural attenuation and case closure are not applicable.

An evaluation of soil concentrations of primary COPCs (TNT, 2,4-DNT, and 2,6-DNT) in cells in comparison to site-specific recreational RCLs for direct contact is included in the summary below:

Cell Status and Summary

Cell	Sampled in 2021	pH Adjustment Cell	Soil Volume in Cell (cubic yards)	TNT Below RCL	2,4-DNT Below RCL	2,6-DNT Below RCL
C01	No	No	13.6	No	No	No
C02	No	No	13.6	Yes	Yes	Yes
C03	No	No	13.6	Yes	Yes	Yes
C04	No	No	13.6	Yes	Yes	Yes
C05	No	No	432.9	Yes	Yes	Yes
C06	No	Yes	68.4	Yes	Yes	Yes
C07	No	No	189.4	Yes	Yes	Yes
C08	No	No	115.4	Yes	Yes	Yes
C09	No	No	229.2	Yes	Yes	Yes
C10	No	No	392.5	Yes	Yes	Yes
C11	No	No	244.4	Yes	Yes	Yes
C12	No	Yes	300.9	No	No	Yes
C13	No	No	369.4	Yes	Yes	Yes
C14	No	No	189.4	Yes	Yes	Yes
C15	No	No	468.5	Yes	Yes	Yes
C16	No	Yes	0.0	Yes	Yes	Yes
C17	No	Yes	136.6	Yes	Yes	Yes
C18	No	No	57.0	Yes	Yes	Yes
C19	No	No	106.5	Yes	Yes	Yes
C20	No	No	76.0	Yes	Yes	Yes
C21	No	Yes	41.1	No	Yes	Yes
C22	No	No	1.5	--	--	--
C23	No	No	0.0	--	--	--
C24	Yes	Yes	263.0	No	Yes	Yes
C25	No	Yes	335.0	Yes	Yes	Yes
C26	No	Yes	307.0	Yes	Yes	Yes
C27	No	Yes	527.0	Yes	Yes	Yes
C28	Yes	Yes	850.0	TBD	Yes	Yes
C29	No	No	0.0	--	--	--
C30	No	No	0.0	--	--	--
C31	Yes	Yes	11.4	TBD	Yes	Yes

Cell	Sampled in 2021	pH Adjustment Cell	Soil Volume in Cell (cubic yards)	TNT Below RCL	2,4-DNT Below RCL	2,6-DNT Below RCL
C32	No	No	0.0	--	--	--
C33	Yes	Yes	292.0	TBD	Yes	Yes
C34	No	No	66.6	NS	NS	NS
C35	Yes	Yes	564.0	TBD	Yes	Yes
C36	Yes	Yes	577.8	TBD	Yes	Yes
C37	Yes	Yes	447.0	No	TBD	TBD
C38	No	Yes	519.0	NS	NS	NS
C39	No	No	0.0	NS	NS	NS

Notes:
RCL: Site-specific recreational direct contact RCL. Soil concentrations are considered to be below the RCL if the calculated 95% upper confidence level for the analyte is below the RCL.
TBD: To be determined. Additional sampling is planned to refine the statistical analysis.
NS: Not sampled

Additional detail regarding the status of the cells during the reporting period is as follows:

- Existing biodegradation test cells C01 to C05, C07 to C11, C13 to C15, C18 to C20, C22, C23, C29, C30, C32, C34, and C39 were not mixed or actively tested in 2021.
  - Control cell C01 was not sampled in 2021 because historical analytical testing has showed that COPC concentrations have generally stabilized.
  - COPC concentrations in cells C02 through C05, C07 through C11, C13 through C15, and C18 through C20, were below site-specific recreational RCLs for direct contact on average. These cells were seeded prior to 2021 and observed for vegetation regrowth, which was successful. Photos of select cells showing examples of vegetation cover are included in Appendix D.
  - Cell C22 has not yet been fully loaded with soil and currently only contains approximately 1 cubic yard of soil. Cell C22 was constructed to evaluate reduction of di- and tri- nitroxylene (DNX and TNX) impacted soil. Loading of additional soil in cell C22 has been postponed pending further bench scale testing to evaluate the methods of degradation for DNX and TNX impacted soil.
  - The soil tested in cell C23 was containerized at the close of the 2013 field season and was unused after. The limited amount of affected residual soil formerly located in C23 was relocated to C22 (1 cubic yard), C12 (0.9 cubic yards), and C17 (0.8 cubic yards) in spring 2017 based on the similarities of the constituents present in each of the destination cells. Cell C23 was fully dismantled in 2021 to make room for the construction of the soil heating test cell (cell C40).
  - Cells C29, C30, C32, and C39 have not yet been loaded with soil. Cell C39 was constructed in 2021.
  - Cell C34 was partially loaded prior to 2021, and it is anticipated that lime addition, mixing and sampling will occur after the cell has been loaded to capacity.
  - Willow trees were planted in cell C09 prior to 2021 to evaluate the ability of the trees to control pore water. COPC concentrations fell below site-specific recreational RCLs for direct contact in 2010.
- Cells C06, C12, C17, C21, C24 to C28, C31, C33 and C35 through C38 are alkaline hydrolysis (AH) cells. These cells have been mixed with hydrated lime to adjust soil pH as allowed under the HWRV to treat elevated NNOC concentrations in soil.
  - Composite soil samples were collected from cells C24, C28, C31, C33, C35, C36 and C37 in 2021.

  - COPC concentrations in cell C06, C17, C26 and C27 were below site-specific RCLs for direct contact on average and therefore not sampled.
  - Soil samples were not collected from cells C12 and C21 in 2021 as the cell contents are planned to be excavated as part of ongoing site investigation work.
  - Soil from cell C16 was excavated and placed in C25 in 2020 to access a former drainage ditch for site investigation work.
  - Approximately 303 cubic yards of soil was added to cell C37 in 2021. With the 144 cubic yards of soil added in 2020, the total volume of soil in cell C37 is 447 cubic yards. The cell was mixed with a mix head attached to an excavator, following the application of lime.
  - Cell C38 was constructed and partially loaded in 2021. Approximately 519 cubic yards of soil was added to cell C38 in 2021. The cell was mixed with a mix head attached to an excavator, following the application of lime.
- Heating cell C40 was constructed, loaded with non-contaminated soil, water, and hydrated lime in 2021. The insulated cell was constructed using poured concrete walls and floor with three removable wood framed roof sections. Cell C40 is an in ground constructed cell. The walls and roof were designed to retain heat. Results of a soil heating pilot test conducted within the cell showed that the soil mixture could effectively be heated to temperatures above the melt temperature of TNT (176 degrees F) while remaining below the TNT self-detonation temperature (approximately 450 degrees F). The mixture was heated to an average temperature of approximately 230 degrees F in 13 days using nine electric resistive heaters.

With the completion of the 2021 field season, the total volume of soil currently loaded into cells is 8,233 cubic yards. Approximately 4,287 cubic yards of the 8,233 cubic yards total of soil referenced above is located in cells that are considered to be below site-specific recreational RCLs for direct contact. The remaining 3,946 cubic yards of soil are considered to be currently under remediation.

See Figure 5 for the general design of cells C1 through C22. See Figure 6 for the general design of cells C24 through C39 (ex-situ, lime addition cells). Figure 7 shows Pilot Heating Cell C40.

2.1.4 System Status and Recommended Future Work

The BPTP has treated approximately 12,987 pounds of site contaminants to date (Table 1). The initial quantity of contaminants placed in all cells was approximated at 14,686 pounds. With the addition of 2021 contaminated soils, the approximated quantity of COPCs in current cells is estimated to be 1,699 pounds. A visual representation of the cell data is provided in Appendix C.

Work proposed for the 2022 field season includes:

- Results of the vegetative regrowth in cells C05, C07, C08, C10, C11, C13 through C15, and C18 through C20 will continue to be evaluated, and re-seeding will be conducted if necessary.
- Alkaline hydrolysis (via pH adjustment) cells C06, C24, C26, C28, C31, C33, C35, C36 and C37 will continue to receive monitoring, if necessary.
- Cells C29, C30, C32 and C39 are currently empty and may be utilized as needed in 2021.
- Cells C34 and C38 will continue to be loaded with soil, as needed, and sampled if cell capacity is reached.

- Soil heating tests will continue using soil impacted with NNOCs at cell C40 to evaluate pilot scale techniques and rates.
- Up to two new cells (C41 and C42) are proposed for construction in 2022. These cells will be built using the general design depicted in Figure 6. The cells will be constructed to hold soil generated during site investigation work. The specific locations of the new cells have not yet been determined.

An additional 100 to 1,500 cubic yards of soil is anticipated to be treated under the HWRV at the end of 2022. With the anticipated additional soil added in 2022, the total amount of soil treated under the HWRV will be within the permitted maximum of 10,000 cubic yards. Considerations will be made to eliminate the soil volume from cells with soil concentrations below site-specific recreational RCLs for direct contact from the 10,000 cubic yard maximum, if needed.

2.2 Site Maps

Site maps are provided in Figures 1 through 4. Figures 2 through 4 provide the locations of the test cells. Figures 5 through 7 provide details of the construction of the existing cells.

2.3 Data Presentation

Table 1 provides data indicating the progress of soil bioremediation. Table 2 lists debris and residuals removed in the reporting period. Table 3 lists the source and quantities of soil moved to cells in the reporting period. Table 4 provides a comparison of RCLs to laboratory reporting limits.

2.4 Data Documentation

Manifests for waste materials removed from site are attached in Appendix B. Scatter plots for contaminant trend monitoring are attached in Appendix C. Laboratory analytical reports are attached in Appendix E.

2.5 Reporting Form

A completed copy of WDNR Form 4400-194: “Remediation Site Operation, Maintenance, Monitoring & Optimization Report” is attached in Appendix A.

2.6 Product Residuals and Debris Removed from Bioremediation Pilot Cells [Condition 7a]

The cited variance condition requires:

- Documentation of the type and amount of product residuals and debris removed from biopilot cells.
- Documentation of any characterization and container storage of product residuals and debris removed from biopilot cells.
- Documentation and disposal of any product residuals and debris removed from the biopilot cells including manifest copies.

No residual solid product was manually removed from cells within the reporting period.

2.7 Product Residuals and Debris Removed

Debris managed and/or removed by site investigation work during the current reporting period included metal, concrete, and residual solid product (RSP) from historical operations within the AOC. Debris was screened in the field using an amplifying fluorescent polymer meter (FIDO®) and/or a colorimetric identification spray (Expray®). Debris removal locations are indicated on

Figures 3 and 4. Table 2 provides a summary of debris handled on-site during the 2021 field season.

2.7.1 Residual Solid Product

RSP was collected during the current reporting period in the Use Area PAD drainage ditch PADD0001 in 2021 (Table 2). Approximately five pounds of RSP was removed from Use Area PAD in 2021. The RSP was containerized, wetted, and shipped to USACE in Vicksburg, Mississippi for use in laboratory tests to support the soil heating evaluation permitted in the last HWRV modification.

The permitted on-site magazine currently contains an estimated 124 pounds RSP, which is contained within a mixture of soil and water. This weight is estimated since recovered RSP is typically found mixed with soil and is not able to be separated. The total weight of the RSP/soil/water mixture present in the magazine is 254 pounds. This material was collected during the 2019 and 2020 field seasons and has been held for possible use in heated alkaline hydrolysis testing and for as needed study at the USACE's laboratory in Vicksburg, MS.

2.7.2 Concrete

Approximately 405 cubic feet of concrete was removed from Use Area PAK in 2021. Field screening of the concrete encountered in 2021 did not indicate the presence of NNOCs. The concrete was managed within the AOC and moved to a concrete stockpile in Use Area PAH.

2.7.3 Metal

Metallic debris, including a culvert, pipe, and banding material, was encountered in Use Areas PAK and PAH in 2021. The culvert and pipe had visible internal channels that allowed for field screening. Metallic debris for which field screening did not indicate the presence of NNOCs was transported to a metal stockpile area (SAK-SP01). Approximately 30 pounds of metal debris screened positive for NNOCs and was moved to cell C28 pending additional accumulation.

2.7.4 Wood

Approximately 3,137 pounds of plywood and wood railroad ties that were placed in cell C23 during historical biopilot testing were removed when the cell was deconstructed in 2021. The wood was placed in a site-designated roll-off container (SAJ-WP01) in 2021. The roll-off container was shipped to Veolia ES Technical Solutions (USEPA ID ILD098642424) in Sauget, Illinois for incineration on October 18, 2021.

2.7.5 Vitrified Clay Pipes (VCP)

Vitrified clay pipe was not encountered in 2021.

2.7.6 Suspect Asbestos Containing Material

Approximately 52 pounds of suspect asbestos containing material was encountered in the area of the soil heating pilot cell in Use Area SAJ. The material was placed in a labeled bag. The bag is currently stored in a drum on-site pending additional accumulation of asbestos for off-site disposal.

2.7.7 Water

As part of site investigation work, approximately 800 gallons of decontamination water (e.g. hand and boot washes and equipment/tool decontamination) and approximately 3,500 gallons of ponded stormwater from Use Area PAJ was applied to test cells. The water was used to hydrate soil in alkaline hydrolysis cells. The on-site wastewater treatment unit was not operated in 2021.

2.7.8 Rubber/Plastic

Approximately 8,043 pounds of rubber/plastic liner and matting that was placed in cell C23 during historical biopilot testing was removed when the cell was deconstructed in 2021. The matting and liner from cell C23 and an approximately 10-pound segment of plastic culvert from ditch PAHD0076 were placed in a designated roll-off container (SAJ-WP01). The roll-off container was shipped to Veolia ES Technical Solutions (USEPA ID ILD098642424) in Sauget, Illinois for incineration on October 18, 2021.

2.7.9 Other

An estimated 50 pounds of debris consisting of used personal protective equipment (PPE), plastic buckets, tarps, and sampling/decon supplies were consolidated into a site-designated roll-off container (SAJ-WP01) in 2021. The roll-off container was shipped to Veolia ES Technical Solutions (USEPA ID ILD098642424) in Sauget, Illinois for incineration on October 18, 2021. An additional 75 pounds of debris consisting of used PPE and sampling/decon supplies generated after October 18, 2021 was containerized and stored on-site pending additional accumulation.

2.8 Movement of Soil into Pilot Cells [Condition 7b]

The cited variance condition requires:

- Documentation of any management, including consolidation, of discrete areas where impacted soil is located within narrow locations such as former ditches or locations that are contorted by the layout of former building features.
- Documentation of the location of those areas and the amount of soil that is moved.
- Documentation of the location of areas where the soil combined from discrete source areas is managed.

A total of 303 cubic yards of soil was placed into cell C37 and 519 cubic yards of soil was placed into cell C38 in 2021. Table 3 lists the source areas and destinations of the soil managed during the current reporting period, and locations are provided on Figure 3.

2.9 Alternative Treatment of Large Debris [Condition 7c]

The cited variance condition requires:

- Documentation of any alternative treatment of large debris that facilitates management, including washing and physical resizing of large debris for off-site disposal.
- Documentation of management of all impacted waste streams generated by these activities, including amounts and volumes of waste treated and generated.

This section describes alternative treatment of debris that potentially contained RCRA hazardous constituents. As detailed in Section 2.7, field screening of some of the debris did not indicate the presence of hazardous constituents and was therefore managed as non-regulated debris. Some non-regulated debris may be stored and resized to facilitate on-site reuse as aggregate or to meet off-site industrial facility acceptance requirements.

No alternative debris treatment or management of metallic debris was conducted in 2021. No impacted concrete debris was encountered in 2021. Management of water is detailed in Section 2.7.7.

3.0 SUMMARY

The information contained within this report will allow Chemours to comply with the reporting requirements of the May 18, 2017 Hazardous Waste Remediation Variance issued for the Former DuPont Barksdale Works site and this report should be included with the filing.

Should you have any questions or comments, please do not hesitate to contact us.

Sincerely,

Eric Schmidt, P.E.
Project Engineer

C. E. "Cary" Pooler, P.G.
Associate Vice President

Attachments:

Table 1: 2021 Contaminant Progress Summary
Table 2: 2021 Debris and Residuals Removed
Table 3: 2021 Soil Moved to Test Cells
Table 4: Comparison of Pace Analytical Reporting Limits to RCLs

Figure 1: Regional Site Location
Figure 2: Site Layout and Bio-Cell Locations
Figure 3: 2021 Impacted Soil Recovery Locations
Figure 4: Debris Removal Locations
Figure 5: Typical Biopilot Sites Operation Stage 2007-2010
Figure 6: General pH Adjustment Cell Configuration
Figure 7: Pilot Heating Cell C40

Appendix A: WDNR Form 4400-194: Remediation Site Operation, Maintenance, Monitoring & Optimization Report

Appendix B: Shipping Documentation/Manifests
State of Wisconsin Annual Hazardous Waste Report

Appendix C: Barksdale Summary Graphs 2021 Year End

Appendix D: Cell Photographs

Appendix E: Biodegradation Evaluation Lab Data
Pace Analytical Reports
A213411 Final 09102021 1359 (August 2021 Cell Soil Sample)
A214013 Final 10212021 1350 (October 2021 Cell Soil Samples)

Tables

Table 1
2021 Contaminant Progress Summary
Waste Management Progress Report No.10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Analyte	Amount remaining as of 2021 (lbs)	Initial Amount (lbs)	Amount Decreased from 2020 to 2021 (lbs)	Amount Decreased to Date for all Cells (lbs)
2,4,6-TNT	1142.8	9754.0	348.3	8611.3
2-A-4,6-DNT	15.7	66.7	(3.7)	51.0
4-A-2,6-DNT	39.3	86.9	(3.1)	47.7
2,3-DNT	0.8	102.4	0.0	101.6
2,4-DNT	7.2	2566.0	0.6	2558.7
2,5-DNT	0.3	0.5	0.0	0.2
2,6-DNT	4.8	908.3	0.0	903.5
3,4-DNT	1.4	136.0	0.0	134.6
3,5-DNT	0.1	2.8	0.0	2.7
Total DNT[1]	14.7	3717.3	0.5	3702.6
1,2-DM-3,4-DNB	39.4	92.8	0.0	53.4
1,2-DM-3,5-DNB	36.3	92.8	0.0	56.5
1,2-DM-3,6-DNB	9.2	23.5	0.0	14.3
1,2-DM-4,5-DNB	12.3	29.1	0.0	16.8
1,3-DM-2,4-DNB	98.8	255.0	0.0	156.3
1,3-DM-2,5-DNB	0.3	0.0	0.0	(0.3)
1,4-DM-2,3-DNB	60.6	145.0	0.0	84.5
1,4-DM-2,5-DNB	11.4	12.3	0.0	1.0
1,4-DM-2,6-DNB	28.7	25.3	0.0	(3.4)
1,5-DM-2,3-DNB	3.3	5.8	0.0	2.6
1,5-DM-2,4-DNB	178.8	349.8	0.0	171.0
Total DNX	478.9	1031.6	0.0	552.7
2,4,6-TNX	6.1	14.2	0.5	8.1
1,3,5-TNB	0.7	5.0	(0.5)	4.3
1,3-DNB	0.3	7.1	0.0	6.8
NB	0.0	0.6	0.0	0.6
3-NT	0.0	1.7	0.0	1.7
4-NT	0.0	0.4	0.0	0.4
2-NT	0.0	1.2	0.0	1.2
NG	0.0	0.0	NA	0.0
HMX	0.0	0.0	NA	0.0
3,5-Dinitroaniline	0.8	0.6	(0.4)	(0.2)
All Analyte Totals	**1,699.2**	**14686.1**	**341.6**	**12986.9**

NOTES:

[1]Total DNT calculated by adding 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT isomers.	
Red Data (#.#)	Denotes an increase over time. Many of the apparent increases are due to changes in detection limits within the duration of the project and heterogeneity effects. 2-A-4,6 DNT and 4-A-2,6 DNT increases may be associated with the anaerobic degradation of TNT.

Data Compilation Summary

If multiple samples were analyzed from a single cell during a single sampling event, the average concentration of the samples was calculated.
Results reported below the reporting limit have been rounded to zero to compare varying/changing limits: over multiple years, using different laboratories, concentration dilutions, etc.

To calculate analyte weights, the following formula was used:

Analyte Concentration (mg/kg)	X	Volume of Soil in Cell (cuyd)	X	Estimated Soil Weight per Cubic Yard of Soil (2,700 lbs / cuyd)	X	Soil Concentration Conversion Factor from Parts Per Million (1 kg / 1,000,000 mg)	=	Recorded Analyte Concentration per Cell in Pounds (lbs)

Table 1
2021 Contaminant Progress Summary
Analytes Remaining in 2021
Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Cell	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16[A] (Original C16)	C25[B] (Former C16)	C17	C18	C19	C20	C21	C22	C23*
Sampled in 2021	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Mixed in 2021	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
pH Adjustment Cell	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No
Hydrated Lime Added in 2021	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Debris Removed 2021 (lbs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,180
Soil Added to Cell 2021 (cuyd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soil Removed from Cell 2021 (cuyd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soil Volume in Cell (cuyd)	13.6	13.6	13.6	13.6	432.9	68.4	189.4	115.4	229.2	392.5	244.4	300.9	369.4	189.4	468.5	0	335.0	136.6	57.0	106.5	76.0	41.1	1.5	0.0

Cell	C24	C25[C] (Original C25)	C26	C27[D] (Original C27)	C27[E] (Original C27 plus Former C25)	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	Total for All Cells
Sampled in 2021	Yes	--	No	--	No	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	No	--
Mixed in 2021	No	--	No	--	No	No	No	No	No	No	No	No	No	No	Yes	No	No	--
pH Adjustment Cell	Yes	--	Yes	--	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	--
Hydrated Lime Added in 2021	No	--	No	--	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	--
Debris Removed 2021 (lbs)	0	--	0	--	0	0	0	0	0	0	0	0	0	0	0	0	0	11180
Soil Added to Cell 2021 (cuyd)	0	--	0	--	0	0	0	0	0	0	0	0	0	0	**303**	**519**	0	822
Soil Removed from Cell 2021 (cuyd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soil Volume in Cell (cuyd)	263.0	--	307.0	--	527.0	850.0	0	0	11.4	0	292.0	66.6	564.0	577.8	447.0	519.0	0	8233.4

Analytes remaining (lbs) 2021 (Averages of subcells)	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16[A] (Original C16)	C25[B] (Former C16)	C17	C18	C19	C20	C21	C22	C23*
2,4,6-TNT	5.0	1.2	0.2	0.3	0.3	2.8	0.7	0.0	0.0	0.2	0.0	146.2	0.2	2.2	2.4	--[A]	0.3	0.2	0.0	0.4	0.0	53.3	NA	NA
2-A-4,6-DNT	0.5	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	1.3	0.0	0.1	0.5	--[A]	0.2	0.1	0.0	0.1	0.0	0.6	NA	NA
4-A-2,6-DNT	0.4	0.1	0.1	0.1	0.3	0.7	0.3	0.0	0.0	0.2	0.0	2.7	0.0	0.6	4.3	--[A]	0.4	0.6	0.0	0.5	0.0	2.7	NA	NA
2,3-DNT	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
2,4-DNT	0.3	0.0	0.1	0.1	0.9	0.1	0.5	0.2	0.0	0.3	0.0	2.7	0.2	0.4	0.3	--[A]	0.0	0.2	0.0	0.1	0.0	0.0	NA	NA
2,5-DNT	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
2,6-DNT	0.4	0.0	0.0	0.1	2.0	0.1	0.4	0.0	0.0	0.2	0.2	0.5	0.3	0.3	0.0	--[A]	0.0	0.1	0.0	0.0	0.0	0.0	NA	NA
3,4-DNT	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
3,5-DNT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
Total DNT[1]	0.7	0.1	0.2	0.3	3.6	0.2	1.5	0.2	0.0	0.6	0.2	3.1	0.5	2.0	0.3	--[A]	0.0	0.3	0.1	0.1	0.0	0.0	NA	NA
1,2-DM-3,4-DNB	19.7	3.9	5.5	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.5	0.0	0.0	0.0	0.0	NA	NA
1,2-DM-3,5-DNB	21.7	3.8	3.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,2-DM-3,6-DNB	4.9	0.8	1.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,2-DM-4,5-DNB	6.0	1.3	1.6	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,3-DM-2,4-DNB	54.3	6.5	11.6	20.9	0.0	0.0	0.0	0.0	0.0	0.5	0.8	0.0	0.9	0.0	0.0	--[A]	0.0	3.3	0.0	0.0	0.0	0.0	NA	NA
1,3-DM-2,5-DNB	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,4-DM-2,3-DNB	30.8	5.5	8.8	14.3	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.5	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,4-DM-2,5-DNB	4.6	0.6	0.7	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	3.4	0.0	0.0	0.0	0.0	NA	NA
1,4-DM-2,6-DNB	14.7	2.0	3.5	6.8	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.3	0.0	0.0	--[A]	0.0	1.0	0.0	0.0	0.0	0.0	NA	NA
1,5-DM-2,3-DNB	1.6	0.3	0.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,5-DM-2,4-DNB	88.6	15.2	24.3	38.5	0.2	0.0	0.0	0.0	0.0	1.0	0.9	0.0	0.8	0.0	0.0	--[A]	0.0	9.2	0.0	0.0	0.0	0.0	NA	NA
Total DNX	247.0	39.9	60.6	106.7	0.3	0.0	0.0	0.0	0.0	2.2	2.3	0.0	2.5	0.0	0.0	--[A]	0.0	17.4	0.0	0.0	0.0	0.0	NA	NA
2,4,6-TNX	2.0	0.4	0.4	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.6	1.5	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,3,5-TNB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
1,3-DNB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
NB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
3-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
4-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
2-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA
NG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	NA	0.0	NA	NA
HMX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	NA	0.0	NA	NA
3,5-Dinitroaniline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.1	NA	NA

Analytes remaining (lbs) 2021 (Averages of subcells)	C24	C25[C] (Original C25)	C26	C27[D] (Original C27)	C27[E] (Original C27 plus Former C25)	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	Total for All Cells
2,4,6-TNT	29.1	--[C]	3.2	--[D]	37.0	0.4	NA	NA	0.5	NA	5.0	NA	18.3	483.6	350.0	NA	NA	1142.8
2-A-4,6-DNT	0.3	--[C]	0.2	--[D]	0.3	0.0	NA	NA	0.0	NA	0.2	NA	0.4	3.6	6.5	NA	NA	15.7
4-A-2,6-DNT	2.5	--[C]	0.9	--[D]	0.5	0.5	NA	NA	0.0	NA	0.2	NA	1.8	3.1	15.7	NA	NA	39.3
2,3-DNT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.8
2,4-DNT	0.1	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.2	0.3	NA	NA	7.2
2,5-DNT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.3
2,6-DNT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.2	NA	NA	4.8
3,4-DNT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1.4
3,5-DNT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.1
Total DNT[1]	0.1	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.3	0.4	NA	NA	14.7
1,2-DM-3,4-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	39.4
1,2-DM-3,5-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	36.3
1,2-DM-3,6-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	9.2
1,2-DM-4,5-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	12.3
1,3-DM-2,4-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	98.8
1,3-DM-2,5-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.3
1,4-DM-2,3-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	60.6
1,4-DM-2,5-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	11.4
1,4-DM-2,6-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	28.7
1,5-DM-2,3-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	3.3
1,5-DM-2,4-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	178.8
Total DNX	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	478.9
2,4,6-TNX	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	6.1
1,3,5-TNB	0.1	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.3	0.2	NA	NA	0.7
1,3-DNB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.2	NA	NA	0.3
NB	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.0
3-NT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.0
4-NT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.0
2-NT	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.0
NG	NA	--[C]	NA	--[D]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
HMX	NA	--[C]	NA	--[D]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
3,5-Dinitroaniline	0.1	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.3	0.3	NA	NA	0.8
																		1699.2

NOTES:

[1]: Total DNT calculated by adding 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT isomers.
0.0 Values: The constituent was not detected above the Reporting Limit (RL) and was rounded down to zero.
NA: Not analyzed/applicable
Gray cells with numbers (#.#): These cells were not sampled in 2020. Most recent data for each cell is shown.
C23*: Cell was emptied in 2014. The remaining contents from the C23 stored soils were placed in cells C12, C17, and C22 in 2017.
C16[A]: Cell was emptied in 2020. Contents of C16 (approximately 177 cubic yards) and portions of the cell base and berm that were in contact with the cell contents (approximately 158 cubic yards) were placed in emptied cell C25 in 2020.
C25[B]: Cell C25 was filled with material from Cell C16 in 2020.
C25[C]: Material originally placed in cell C25 (approximately 250 cubic yards of soil) was added to cell C27 in 2019.
C27[D]: Material originally placed in cell C27 prior to cell C25 contents being added in 2019.
C27[E]: Material originally placed in cell C27 plus material added from cell C25 in 2019.

Table 1
2021 Contaminant Progress Summary
Initial Analyte Concentrations
Waste Management Progress Report No.9 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Analytes, Initial readings starting in 2007 (Averages of subcells)	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16^A (Original C16)	C25^B (Former C16)	C17	C18	C19	C20	C21	C22	C23*	C24	C25^C (Original C25)	C26	C27^D (Original C27)	C27^E (Original C27 plus Former C25)	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	Total for All Cells
2,4,6-TNT	15.8	5.5	0.6	0.6	3.2	991.0	171.0	0.5	0.3	9.0	0.7	1472.7	9.4	144.9	1553.9	--^A	294.6	47.0	0.0	130.4	24.9	1332.4	NA	NA	874.3	119.1	137.8	251.7	370.8	6.7	NA	NA	318.6	NA	135.3	NA	198.0	1154.4	350.0	NA	NA	9754.0
2-A-4,6-DNT	0.2	0.0	0.0	0.0	0.0	1.7	6.2	0.0	0.0	0.5	0.1	0.0	0.9	0.8	5.4	--^A	14.8	1.7	0.0	0.8	0.2	2.7	NA	NA	4.0	3.1	2.2	10.1	13.2	0.6	NA	NA	1.2	NA	0.5	NA	1.0	1.6	6.5	NA	NA	66.7
4-A-2,6-DNT	0.3	0.1	0.0	0.0	0.0	0.4	5.9	0.1	0.0	0.7	0.1	0.0	0.5	0.7	6.4	--^A	11.4	1.1	0.0	2.0	0.3	6.3	NA	NA	6.4	3.0	3.6	10.1	13.1	2.3	NA	NA	1.2	NA	0.7	NA	3.4	4.5	15.7	NA	NA	86.9
2,3-DNT	0.1	0.0	0.0	0.1	50.4	1.4	2.6	0.1	0.0	15.2	0.0	2.7	10.0	7.9	0.2	--^A	0.0	11.6	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	102.4
2,4-DNT	1.0	1.1	0.5	0.5	854.1	129.8	60.4	13.6	0.2	427.8	0.5	789.5	56.3	17.6	39.2	--^A	0.4	132.9	0.2	0.7	5.0	1.1	NA	NA	0.5	29.5	1.5	0.0	29.5	0.0	NA	NA	0.7	NA	0.3	NA	0.3	0.4	0.3	NA	NA	2566.0
2,5-DNT	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	--^A	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.5
2,6-DNT	0.8	1.0	0.6	0.8	447.9	20.9	54.0	1.7	0.0	147.3	0.1	32.3	21.9	79.4	1.5	--^A	0.0	95.7	0.1	0.0	0.0	0.0	NA	NA	0.0	1.9	0.2	0.0	1.9	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.2	NA	NA	908.3
3,4-DNT	0.2	0.1	0.0	0.1	55.3	2.4	4.0	0.1	0.0	21.3	0.0	6.2	14.1	13.8	0.4	--^A	0.0	17.8	0.0	0.0	0.0	0.0	NA	NA	0.0	0.1	0.0	0.0	0.1	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	136.0
3,5-DNT	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.6	1.1	0.1	--^A	0.0	0.0	0.0	0.0	0.2	0.1	NA	NA	0.1	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	2.8
Total DNT	2.1	2.2	1.2	1.5	1407.7	154.6	121.1	15.6	0.3	612.0	0.7	830.7	102.9	120.1	41.4	--^A	0.4	258.1	0.4	0.7	5.2	1.2	NA	NA	0.6	31.5	1.7	0.0	31.5	0.0	NA	NA	0.7	NA	1.0	NA	0.6	0.7	0.4	NA	NA	3717.3
1,2-DM-3,4-DNB	18.3	14.7	6.5	16.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	36.3	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	92.8
1,2-DM-3,5-DNB	17.8	14.2	6.5	16.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	--^A	0.0	37.4	0.1	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	92.8
1,2-DM-3,6-DNB	4.7	2.0	1.9	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	12.5	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	23.5
1,2-DM-4,5-DNB	5.5	4.3	1.9	5.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	12.0	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	29.1
1,3-DM-2,4-DNB	56.5	40.0	17.8	43.8	1.4	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.6	0.0	0.0	--^A	0.0	94.0	0.3	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	255.0
1,3-DM-2,5-DNB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.0
1,4-DM-2,3-DNB	31.0	24.8	11.2	29.7	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	--^A	0.0	47.1	0.2	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	145.0
1,4-DM-2,5-DNB	6.0	1.7	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	2.4	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	12.3
1,4-DM-2,6-DNB	4.9	3.8	1.6	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	10.8	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	25.3
1,5-DM-2,3-DNB	1.2	0.9	0.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	2.6	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	5.8
1,5-DM-2,4-DNB	84.2	58.7	25.1	61.1	1.6	0.1	0.0	0.1	0.0	0.2	0.0	0.6	0.5	0.0	0.0	--^A	0.0	117.3	0.3	0.1	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	349.8
Total DNX	230.1	165.0	75.1	179.6	4.9	0.2	0.1	0.2	0.0	0.5	0.0	1.2	1.5	0.0	0.0	--^A	0.0	372.4	0.9	0.1	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1031.6
2,4,6-TNX	1.0	0.6	0.2	0.8	0.2	0.2	0.0	0.0	0.0	0.0	5.0	2.6	0.1	0.0	0.0	--^A	0.1	1.3	0.0	0.0	0.5	0.4	NA	NA	0.0	0.2	0.0	0.0	0.2	0.0	NA	NA	0.0	NA	0.0	NA	0.9	0.0	0.0	NA	NA	14.2
1,3,5-TNB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.5	0.7	0.9	--^A	0.0	1.2	0.0	0.2	0.0	0.3	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.4	NA	0.0	NA	0.0	0.0	0.2	NA	NA	5.0
1,3-DNB	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.3	0.1	0.3	--^A	0.1	3.2	0.0	0.0	0.0	0.5	NA	NA	0.2	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.2	NA	0.0	0.0	0.2	NA	NA	7.1
NB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.1	0.0	0.1	0.0	0.4	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.6
3-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.0	--^A	0.0	0.9	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1.7
4-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	--^A	0.0	0.1	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.4
2-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.3	0.0	0.0	0.0	--^A	0.0	0.5	0.0	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1.2
NG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	NA	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
HMX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	NA	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
PETN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	NA	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
RDX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	NA	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
Tetryl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	NA	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
3,5-Dinitroaniline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--^A	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.1	0.0	0.0	0.0	0.0	0.0	NA	NA	0.1	NA	0.0	NA	0.0	0.0	0.3	NA	NA	0.6
																																										14686.1

NOTES:

[1]: Total DNT calculated by adding 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT isomers.

Initial analyte concentrations: Not all analytes were initially sampled for each cell. TNX, some DNX & DNT isomers and 3,5-Dinitroaniline were added to the sampling program at later dates. The initial reading for each analyte included on this table are from the earliest recorded data set for each analyte.

0.0 Values: The constituent was not detected above the Reporting Limit (RL) and was rounded down to zero.

NA: Not analyzed/applicable

C23*: Cell was emptied in 2014. The remaining contents from the C23 stored soils were placed in cells C12, C17, and C22 in 2017.

C16^A: Cell was emptied in 2020. Contents of C16 (approximately 177 cubic yards) and portions of the cell base and berm that were in contact with the cell contents (approximately 158 cubic yards) were placed in emptied cell C25 in 2020.

C25^B: Cell C25 was filled with material from Cell C16 in 2020.

C25^C: Material originally placed in cell C25 (approximately 250 cubic yards of soil) was added to cell C27 in 2019. Totals shown in this column not included in "Total for All Cells" column.

C27^D: Material originally placed in cell C27 prior to cell C25 contents being added in 2019. Totals shown in this column not included in "Total for All Cells" column.

C27^E: Material originally placed in cell C27 plus material added from cell C25 in 2019. Totals shown in this column are included in "Total for All Cells" column.

Table 1
2021 Contaminant Progress Summary
Analyte Decrease 2020 to 2021
Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Analytes decrease (lbs) 2020 to 2021 (Averages of subcells)	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16A (Original C16)	C25B (Former C16)	C17	C18	C19	C20	C21	C22	C23*	C24	C25C (Original C25)	C26	C27D (Original C27)	C27[E] (Original C27 plus Former C25)	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	Total for All Cells
2,4,6-TNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(26.3)	NA	NA	NA	NA	11.5	NA	NA	0.0	NA	739.0	NA	3.0	(379.1)	NA	NA	NA	348.3
2-A-4,6-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(0.3)	NA	NA	NA	NA	0.0	NA	NA	(0.0)	NA	0.1	NA	(0.4)	(3.1)	NA	NA	NA	(3.7)
4-A-2,6-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(1.9)	NA	NA	NA	NA	0.8	NA	NA	(0.0)	NA	0.3	NA	(0.8)	(1.6)	NA	NA	NA	(3.1)
2,3-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
2,4-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(0.1)	NA	NA	NA	NA	0.0	NA	NA	(0.0)	NA	0.9	NA	0.0	(0.2)	NA	NA	NA	0.6
2,5-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
2,6-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
3,4-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
3,5-DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
Total DNT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(0.1)	NA	NA	NA	NA	0.0	NA	NA	(0.0)	NA	0.9	NA	0.0	(0.3)	NA	NA	NA	0.5
1,2-DM-3,4-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,2-DM-3,5-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,2-DM-3,6-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,2-DM-4,5-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,3-DM-2,4-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,3-DM-2,5-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,4-DM-2,3-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,4-DM-2,5-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,4-DM-2,6-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,5-DM-2,3-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
1,5-DM-2,4-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
Total DNX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
2,4,6-TNX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.5	0.0	NA	NA	NA	0.5
1,3,5-TNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(0.1)	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	(0.3)	NA	NA	NA	(0.5)
1,3-DNB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
NB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
3-NT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
4-NT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
2-NT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	NA	NA	NA	0.0
NG	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,5-Dinitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(0.1)	NA	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	(0.3)	NA	NA	NA	(0.4)
																																										341.6

NOTES:

[1]: Total DNT calculated by adding 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT isomers.
0.0 Values: The constituent was not detected above the Reporting Limit (RL) and was rounded down to zero.
Red Data (#.#): Denotes an increase over time. Many of the apparent increases are due to changes in detection limits within the duration of the project and heterogeneity effects. 2-A-4,6 DNT and 4-A-2,6 DNT increases may be associated with the anaerobic degradation of TNT.
NA: Not analyzed in 2020 and/or 2021
C23*: Cell was emptied in 2014. The remaining contents from the C23 stored soils were placed in cells C12, C17, and C22 in 2017.
C16[A]: Cell was emptied in 2020. Contents of C16 (approximately 177 cubic yards) and portions of the cell base and berm that were in contact with the cell contents (approximately 158 cubic yards) were placed in emptied cell C25 in 2020.
C25[B]: Cell C25 was filled with material from Cell C16 in 2020.
C25[C]: Material originally placed in cell C25 (approximately 250 cubic yards of soil) was added to cell C27 in 2019.
C27[D]: Material originally placed in cell C27 prior to cell C25 contents being added in 2019.
C27[E]: Material originally placed in cell C27 plus material added from cell C25 in 2019.

Table 1
2021 Contaminant Progress Summary
Analyte Decrease Initial to 2021
Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Analytes decrease (lbs) Initial to 2021 (Averages of subcells)	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16[A] (Original C16)	C25[B] (Former C16)	C17	C18	C19	C20	C21
2,4,6-TNT	10.8	4.3	0.5	0.3	2.9	988.2	170.3	0.5	0.3	8.8	0.7	1326.5	9.2	142.7	1551.5	--[A]	294.3	46.8	0.0	130.0	24.9	1279.1
2-A-4,6-DNT	(0.3)	(0.1)	(0.1)	(0.1)	0.0	1.6	6.0	0.0	0.0	0.5	0.1	(1.3)	0.9	0.7	4.9	--[A]	14.6	1.6	0.0	0.6	0.2	2.1
4-A-2,6-DNT	(0.1)	(0.0)	(0.1)	(0.1)	(0.3)	(0.4)	5.6	0.1	0.0	0.5	0.1	(2.7)	0.5	0.2	2.1	--[A]	11.0	0.5	0.0	1.4	0.3	3.7
2,3-DNT	0.1	0.0	0.0	0.0	50.2	1.4	2.4	0.1	0.0	15.2	0.0	2.7	10.0	7.7	0.2	--[A]	0.0	11.6	0.0	0.0	0.0	0.0
2,4-DNT	0.7	1.0	0.4	0.3	853.1	129.7	59.9	13.4	0.2	427.5	0.5	786.8	56.1	17.1	39.0	--[A]	0.4	132.7	0.2	0.6	5.0	1.1
2,5-DNT	0.0	0.0	(0.0)	0.0	(0.2)	0.0	(0.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0
2,6-DNT	0.4	0.9	0.5	0.7	446.0	20.8	53.5	1.7	0.0	147.1	(0.0)	31.8	21.7	79.0	1.5	--[A]	0.0	95.7	0.1	0.0	0.0	0.0
3,4-DNT	0.2	0.1	0.0	0.1	55.0	2.4	3.8	0.1	0.0	21.3	0.0	6.2	14.1	12.9	0.4	--[A]	0.0	17.8	0.0	0.0	0.0	0.0
3,5-DNT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.6	1.0	0.1	--[A]	0.0	0.0	0.0	0.0	0.2	0.1
Total DNT	1.4	2.1	1.0	1.2	1404.1	154.3	119.6	15.4	0.3	611.4	0.5	827.5	102.4	118.2	41.1	--[A]	0.4	257.8	0.3	0.7	5.2	1.2
1,2-DM-3,4-DNB	(1.5)	10.7	1.0	6.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	35.8	0.0	0.0	0.0	0.0
1,2-DM-3,5-DNB	(3.9)	10.3	3.5	8.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	--[A]	0.0	37.4	0.1	0.0	0.0	0.0
1,2-DM-3,6-DNB	(0.2)	1.2	0.8	(0.2)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	12.5	0.0	0.0	0.0	0.0
1,2-DM-4,5-DNB	(0.5)	3.0	0.3	1.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	12.0	0.0	0.0	0.0	0.0
1,3-DM-2,4-DNB	2.2	33.5	6.2	22.9	1.4	0.0	0.0	0.0	0.0	(0.4)	(0.8)	0.4	(0.3)	0.0	0.0	--[A]	0.0	90.7	0.3	0.0	0.0	0.0
1,3-DM-2,5-DNB	(0.1)	(0.0)	(0.0)	(0.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	0.0
1,4-DM-2,3-DNB	0.2	19.4	2.5	15.4	0.6	0.0	0.0	0.0	0.0	(0.3)	(0.4)	0.3	(0.5)	0.0	0.0	--[A]	0.0	47.1	0.2	0.0	0.0	0.0
1,4-DM-2,5-DNB	1.4	1.1	1.5	(2.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	(1.0)	0.0	0.0	0.0	0.0
1,4-DM-2,6-DNB	(9.8)	1.8	(1.9)	(3.0)	0.3	0.0	0.0	0.0	0.0	(0.2)	(0.2)	0.0	(0.3)	0.0	0.0	--[A]	0.0	9.8	0.0	0.0	0.0	0.0
1,5-DM-2,3-DNB	(0.4)	0.6	(0.1)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	2.6	0.0	0.0	0.0	0.0
1,5-DM-2,4-DNB	(4.3)	43.5	0.7	22.7	1.4	0.1	0.0	0.1	0.0	(0.9)	(0.9)	0.6	(0.3)	(0.0)	0.0	--[A]	0.0	108.1	0.3	0.1	0.0	0.0
Total DNX	(16.9)	125.1	14.5	72.9	4.6	0.2	0.1	0.2	0.0	(1.7)	(2.3)	1.2	(1.1)	(0.0)	0.0	--[A]	0.0	355.0	0.9	0.1	0.0	0.0
2,4,6-TNX	(1.0)	0.2	(0.2)	(0.1)	0.1	0.2	0.0	0.0	0.0	0.0	4.5	1.0	0.1	0.0	0.0	--[A]	0.1	1.3	0.0	0.0	0.5	0.4
1,3,5-TNB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.5	0.7	0.9	--[A]	0.0	1.2	0.0	0.2	0.0	0.3
1,3-DNB	0.0	(0.0)	(0.0)	(0.0)	1.3	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.3	0.1	0.3	--[A]	0.1	3.2	0.0	0.0	0.0	0.5
NB	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.1	0.0	0.1	0.0	0.4
3-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.0	--[A]	0.0	0.9	0.0	0.0	0.0	0.0
4-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	--[A]	0.0	0.1	0.0	0.0	0.0	0.0
2-NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.3	0.0	0.0	0.0	--[A]	0.0	0.5	0.0	0.0	0.0	0.0
NG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	NA	0.0
HMX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	NA	0.0
3,5-Dinitroaniline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--[A]	0.0	0.0	0.0	0.0	0.0	(0.1)

Analytes decrease (lbs) Initial to 2021 (Averages of subcells)	C22	C23*	C24	C25[C] (Original C25)	C26	C27[D] (Original C27)	C27[E] (Original C27 plus Former C25)	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	Total for All Cells
2,4,6-TNT	NA	NA	845.2	--[C]	134.6	--[D]	333.8	6.3	NA	NA	318.1	NA	130.3	NA	179.7	670.8	0.0	NA	NA	8611.3
2-A-4,6-DNT	NA	NA	3.6	--[C]	2.0	--[D]	12.9	0.6	NA	NA	1.2	NA	0.3	NA	0.5	(2.0)	0.0	NA	NA	51.0
4-A-2,6-DNT	NA	NA	3.9	--[C]	2.7	--[D]	12.6	1.8	NA	NA	1.1	NA	0.5	NA	1.5	1.4	0.0	NA	NA	47.7
2,3-DNT	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	101.6
2,4-DNT	NA	NA	0.4	--[C]	1.5	--[D]	29.5	0.0	NA	NA	0.7	NA	0.3	NA	0.3	0.2	0.0	NA	NA	2558.7
2,5-DNT	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.2
2,6-DNT	NA	NA	0.0	--[C]	0.2	--[D]	1.9	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	903.5
3,4-DNT	NA	NA	0.0	--[C]	0.0	--[D]	0.1	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	134.6
3,5-DNT	NA	NA	0.1	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	2.7
Total DNT	NA	NA	0.5	--[C]	1.7	--[D]	31.5	0.0	NA	NA	0.7	NA	1.0	NA	0.6	0.4	0.0	NA	NA	3702.6
1,2-DM-3,4-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	53.4
1,2-DM-3,5-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	56.5
1,2-DM-3,6-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	14.3
1,2-DM-4,5-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	16.8
1,3-DM-2,4-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	156.3
1,3-DM-2,5-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	(0.3)
1,4-DM-2,3-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	84.5
1,4-DM-2,5-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1.0
1,4-DM-2,6-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	(3.4)
1,5-DM-2,3-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	2.6
1,5-DM-2,4-DNB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	171.0
Total DNX	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	552.7
2,4,6-TNX	NA	NA	0.0	--[C]	0.0	--[D]	0.2	0.0	NA	NA	0.0	NA	0.0	NA	0.9	0.0	0.0	NA	NA	8.1
1,3,5-TNB	NA	NA	(0.1)	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.4	NA	0.0	NA	0.0	(0.3)	0.0	NA	NA	4.3
1,3-DNB	NA	NA	0.2	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.2	NA	0.0	0.0	0.0	NA	NA	6.8
NB	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.6
3-NT	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1.7
4-NT	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	0.4
2-NT	NA	NA	0.0	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.0	NA	0.0	NA	0.0	0.0	0.0	NA	NA	1.2
NG	NA	NA	NA	--[C]	NA	--[D]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
HMX	NA	NA	NA	--[C]	NA	--[D]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
3,5-Dinitroaniline	NA	NA	(0.1)	--[C]	0.0	--[D]	0.0	0.0	NA	NA	0.1	NA	0.0	NA	0.0	(0.3)	0.0	NA	NA	(0.2)
																				12986.9

NOTES:

[1]: Total DNT calculated by adding 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT isomers.
0.0 Values: The constituent was not detected above the Reporting Limit (RL) and was rounded down to zero.
Red Data (#.#): Denotes an increase over time. Many of the apparent increases are due to changes in detection limits within the duration of the project and heterogeneity effects. 2-A-4,6 DNT and 4-A-2,6 DNT increases may be associated with the anaerobic degradation of TNT.
NA: Not analyzed/applicable
Gray cells with numbers (#.#): These cells were not sampled in 2021. Decreases shown are from initial reading to the most recent data available for each cell.
C23*: Cell was emptied in 2014. The remaining contents from the C23 stored soils were placed in cells C12, C17, and C22 in 2017.
C16[A]: Cell was emptied in 2020. Contents of C16 (approximately 177 cubic yards) and portions of the cell base and berm that were in contact with the cell contents (approximately 158 cubic yards) were placed in emptied cell C25 in 2020.
C25[B]: Cell C25 was filled with material from Cell C16 in 2020.
C25[C]: Material originally placed in cell C25 (approximately 250 cubic yards of soil) was added to cell C27 in 2019.
C27[D]: Material originally placed in cell C27 prior to cell C25 contents being added in 2019.
C27[E]: Material originally placed in cell C27 plus material added from cell C25 in 2019.

Table 2
2021 Debris and Residuals Removed
Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Debris and Residuals Removed						
Source	**Material Description**	**Approximate Quantity (cf)**	**Approximate Weight (lbs)**	**On-Site Holding Location**	**Off-Site Destination**	**Shipping Number/Manifest**
RSP						
PADD0001	TNT	<1	5 (shipment weight including added water and containers = 9 lbs)	NA	US Army Corps of Engineers, Vicksburg, MS	Bill of Lading Number 2021-011
Pipe, Metal						
SAJ storage shed	Miscellaneous scrap metal	--	200	SAK-SP01	NA (currently stored onsite)	--
PAKB0001	Miscellaneous scrap metal	--	250			
PAHD0076	Metal culvert	--	500			
PAHD0160	Metal banding	--	100			
PAHD00145	Metal pipe	--	30			
PAHD0160	Metal banding		30	Cell C28	NA (currently stored onsite)	--
Other						
Introduced materials from 2021	Sampling/decon supplies, used PPE (e.g. gloves, coveralls), tarps, 5-gallon buckets	--	50	Lined and covered roll-off container (SAJ-WP01)	Veolia, Sauget, IL	Manifest Tracking Number 001997384
PAHD0076	Plastic culvert segment	--	10			
Cell C23	Formerly introduced material within former Cell C23 (plywood, wood railroad ties)	--	3,137			
	Formerly introduced material within former Cell C23 (rubber liner and rubber matting)	--	8,043			
Materials placed in roll-off container from 2018 through 2020	Sampling/decon supplies, used PPE (e.g. gloves, coveralls), tarps, 5-gallon buckets, wood	--	1,380			
Introduced materials from 2021 (late season)	Sampling/decon supplies, used PPE (e.g. gloves, coveralls)	--	75	Inside shed (SAJ-WP01)	NA (currently stored onsite)	--
West of Cell C23	Suspect asbestos containing material	--	52	Drum stored inside shed (SAJ-WP01)	NA (currently stored onsite)	--

Items Not Requiring Off-Site Disposal						
Source	**Material Description**	**Approximate Quantity (cf)**	**Approximate Weight (lbs.)**	**On-Site Holding Location**	**Off-Site Destination**	**Manifest**
Concrete						
PAKB0001 (East of Cell C23)	non-contaminated concrete (screened below background)	405	--	Stockpile in PAH	NA	--

Notes:

--: not applicable or not measured
cf: cubic feet
ft: feet
lbs: pounds
NA: Not applicable
PAH: Use Area PAH
RSP: Residual Solid Product
TNT: trinitrotoluene

Table 3
2021 Soil Moved to Test Cells

Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

Source	Destination Cell	Volume (CY)	Date
Use Area PAH Ditch PAHD0146	C37	120	6/15/2021 - 6/24/2021
Use Area PAH Ditch PAHD0076	C37	6	6/24/2021
Use Area PAJ Refined Triton Ditch 5 (PAJD0005)	C37	60	7/13/2021 - 7/19/2021
Use Area PAJ Refined Triton Ditches 3 and 4 (PAJD0003 and PAJD0004)	C37	117	7/14/2021 - 7/22//2021
Total for C37	**C37**	**303**	
Use Area PAJ Refined Triton Ditch 4 (PAJD0004)	C38	369	8/12/2021 - 9/13/2021
Use Area PAJ Refined Triton Ditch 5 (PAJD0005)	C38	30	8/12/2021
Portions of cell C23 base and berm that were in contact with the cell material	C38	120	8/20/2021
Total for C38	**C38**	**519**	
Total for 2021		**822**	

Notes:

CY: cubic yards

C: Cell

Table 4
Comparison of Pace Analytical Reporting Limits to RCLs

Waste Management Progress Report No. 10
For Period May 19, 2021 to May 18, 2022
Hazardous Waste Remediation Variance Approval of May 22, 2012
Hazardous Waste Remediation Variance Renewal Approval of May 18, 2017
Former Barksdale Works
Bayfield County, Wisconsin

CAS Number	Chemical Constituent	Non-Industrial RCL (mg/kg)	Industrial RCL (mg/kg)	Site-Specific Recreational RCL (mg/kg)	2021 Pace Analytical Laboratory Reporting Limit (mg/kg)[1]
99-35-4	1,3,5-Trinitrobenzene	2,250	32,400	**13,100**	0.2
99-65-0	1,3-Dinitrobenzene	6.32	82.1	**36.9**	0.2
118-96-7	2,4,6-Trinitrotoluene	21.3	96	**124**	0.2
121-14-2	2,4-Dinitrotoluene	1.21	5.11	**7.03**	0.2
606-20-2	2,6-Dinitrotoluene	1.21	5.11	**7.03**	0.2
35572-78-2	2-Amino-4,6-Dinitrotoluene	7.71	114	**45**	0.2
88-72-2	2-Nitrotoluene	3.16	14.9	**18.4**	0.2
99-08-1	3-Nitrotoluene	6.32	82.1	**36.9**	0.2
19406-51-0	4-Amino-2,6-Dinitrotoluene	7.66	113	**44.7**	0.2
99-99-0	4-Nitrotoluene	33.9	144	**198**	0.2
98-95-3	Nitrobenzene	7.41	32.4	**43.2**	0.2
2691-41-0	HMX	3,860	57,000	**22,500**	Not analyzed
78-11-5	PETN	126	534	**736**	Not analyzed
121-82-4	RDX	8.34	38.4	**48.6**	Not analyzed
479-45-8	Tetryl	156	2,330	**911**	Not analyzed
55-63-0	Nitroglycerin	6.32	82.1	**36.9**	Not analyzed
602-01-7	2,3-Dinitrotoluene	1.21	5.11	**7.03**	0.2
618-85-9	3,5-Dinitrotoluene	1.21	5.11	**7.03**	0.2
610-39-9	3,4-Dinitrotoluene	1.21	5.11	**7.03**	0.2
619-15-8	2,5-Dinitrotoluene	1.21	5.11	**7.03**	0.2
632-92-8	2,4,6-Trinitro-3-Xylene	21.3	96	**124**	0.2
616-69-3	1,2-Dimethyl-3,5-Dinitrobenzene	19	247	**111**	0.2
603-02-1	1,3-Dimethyl-2,4-Dinitrobenzene	19	247	**111**	0.2
711-41-1	1,4-Dimethyl-2,6-Dinitrobenzene	19	247	**111**	0.2
65151-56-6	1,5-Dimethyl-2,3-Dinitrobenzene	19	247	**111**	0.2
616-72-8	1,5-Dimethyl-2,4-Dinitrobenzene	19	247	**111**	0.2
EVS0672	1,2-Dimethyl-3,4-Dinitrobenzene	19	247	**111**	0.2
EVS0709	1,2-Dimethyl-3,6-Dinitrobenzene	19	247	**111**	0.2
EVS0670	1,2-Dimethyl-4,5-Dinitrobenzene	19	247	**111**	0.2
EVS0708	1,3-Dimethyl-2,5-Dinitrobenzene	19	247	**111**	0.2
EVS0671	1,4-Dimethyl-2,3-Dinitrobenzene	19	247	**111**	0.2

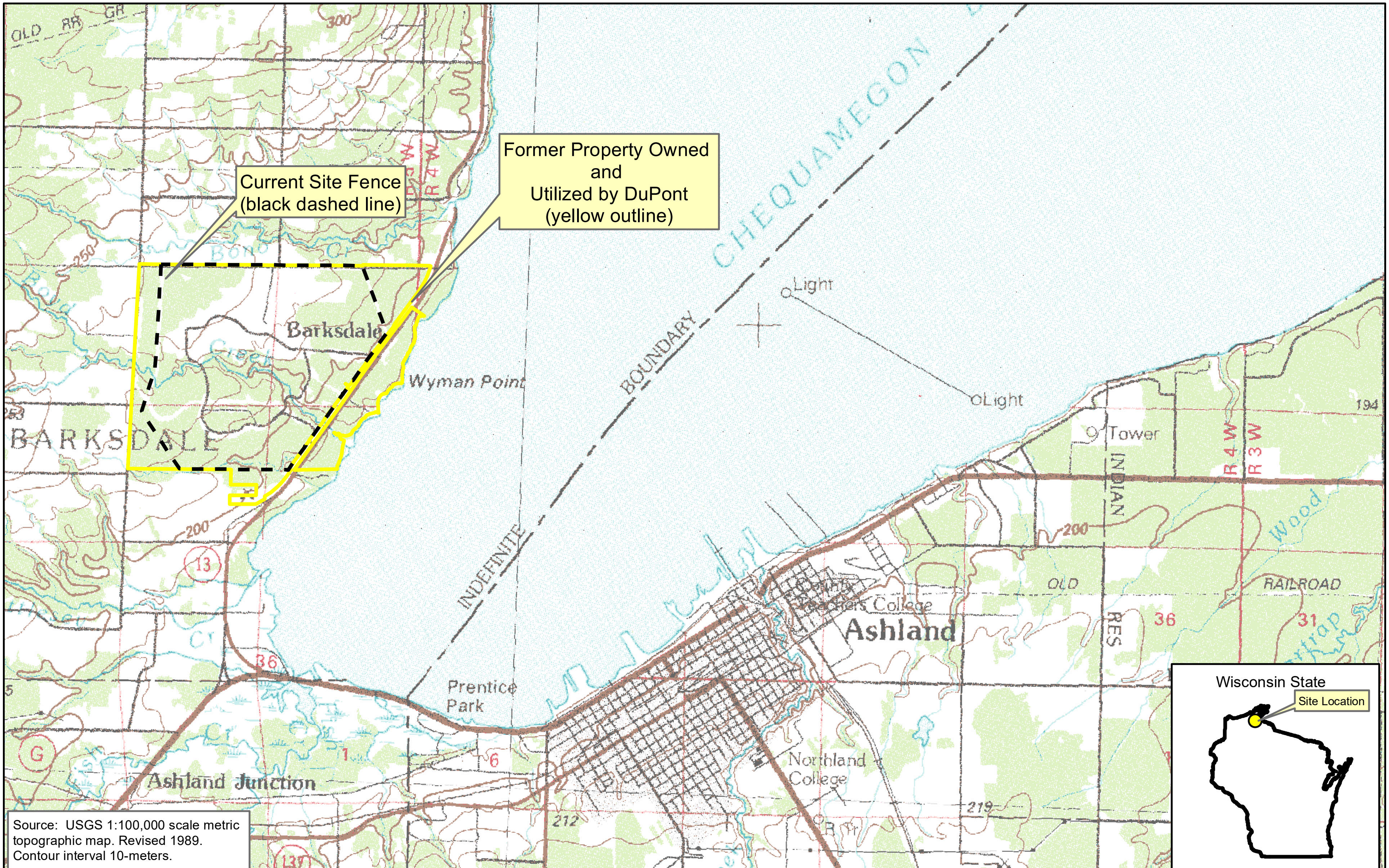
Notes:

[1]: Reporting limits ranged from 0.20 to 0.21 mg/kg when laboratory dilution was equal to 1. Reporting limits were higher where dilution was required.

Not analyzed = With the exception of nitroglycerin, the compounds listed as not analyzed were not used or manufactured on-site. This is supported by historical analytical sampling for these compounds. Nitroglycerin was manufactured on-site; however, the manufacturing operation was located in the Boyd Creek valley and not associated with the bio-pilot test cells.

RCL = Residual Contaminant Level for direct contact

Figures



Area Map (Optional)

0 0.5 1 2
Miles
1:63,000

MAP FORMATTED FOR "A" (8.5" X 11") SIZE SHEET.
SCALE NOT VALID FOR DIFFERENT PAGE SIZE.

FILE NUMBER:	
DESIGNED BY:	DJN
DRAWN BY:	DJN
DATA QUALITY CHECK BY:	ECS

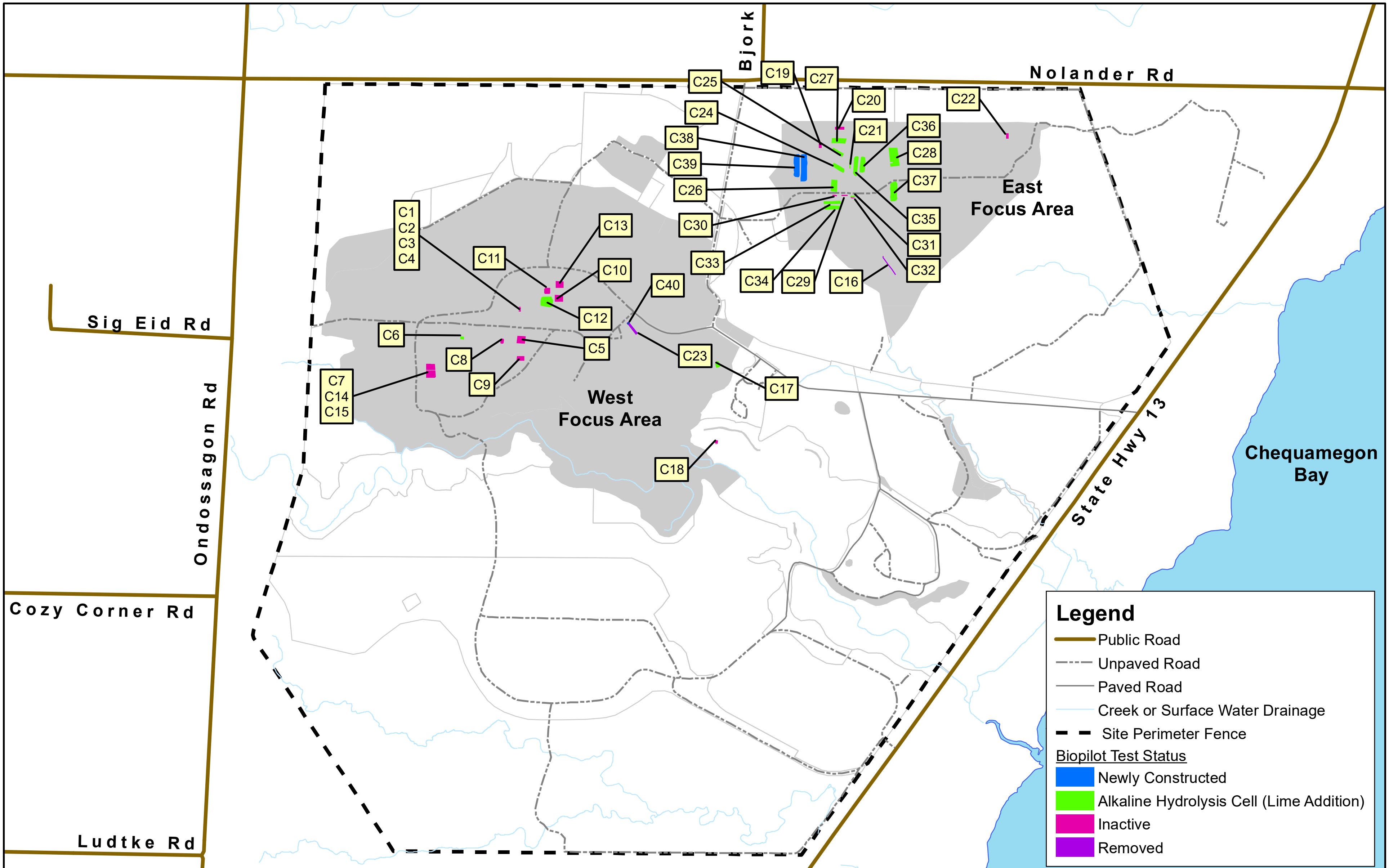
AECOM
500 West Jefferson Street
Suite 1600
Louisville, Kentucky 40202

Regional Site Location

Waste Management Progress Report No.10
2021 Field Season
Former DuPont Barksdale Works
Barksdale, Wisconsin 54806

PROJECT NUMBER: 60663958
DATE: May 2022
FIGURE NUMBER: 1

C:\Users\desmond.nielsen\Desktop\Barksdale\GIS data\GIS Pioneer Files 1.14.2021\Maps\Maps 2022_DN\WM Progress Report 2021 Field Season\Fig 1_Site_Loc.mxd



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Area Map (Optional)

1:16,800

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FILE NUMBER:

DESIGNED BY: DJN

DRAWN BY: DJN

DATA QUALITY CHECK BY: ECS

AECOM

AECOM
500 West Jefferson Street
Suite 1600
Louisville, Kentucky 40202

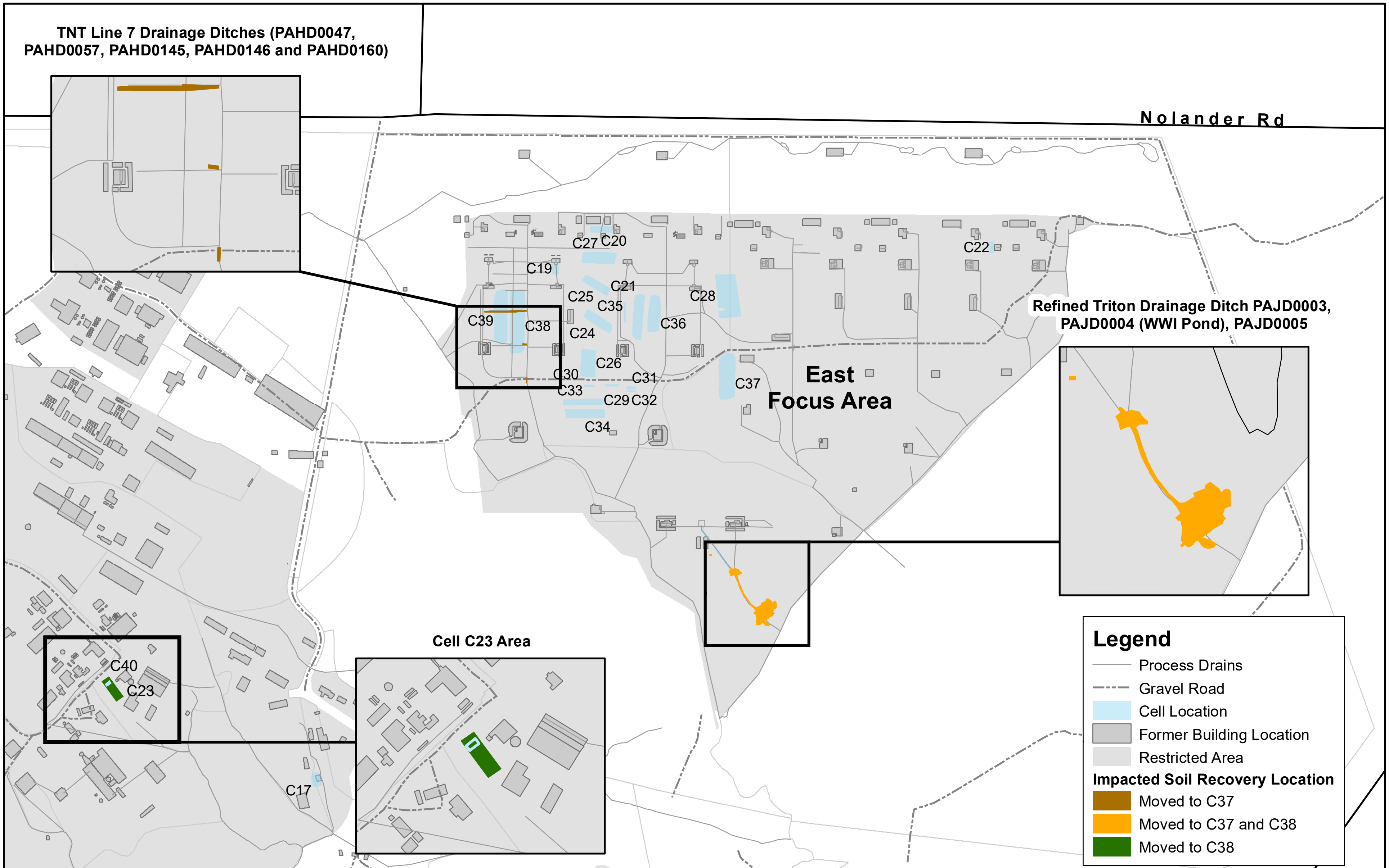
Site Layout and Cell Locations

Waste Management Progress Report No. 10
2021 Field Season
Former DUPont Barksdale Works
Barksdale, Wisconsin 54806

PROJECT NUMBER: 60663958

DATE: May 2022

FIGURE NUMBER: 2



Area Map (Optional)

N W E S

0 125 250 500 750 1,000 1,250

Feet

1:7,200

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SCALE NOT VALID FOR DIFFERENT PAGE SIZE.

FILE NUMBER:

DESIGNED BY: DJN

DRAWN BY: DJN

DATA QUALITY CHECK BY: ECS

AECOM

AECOM
500 West Jefferson Street
Suite 1600
Louisville, Kentucky 40202

2021 Impacted Soil Recovery Locations

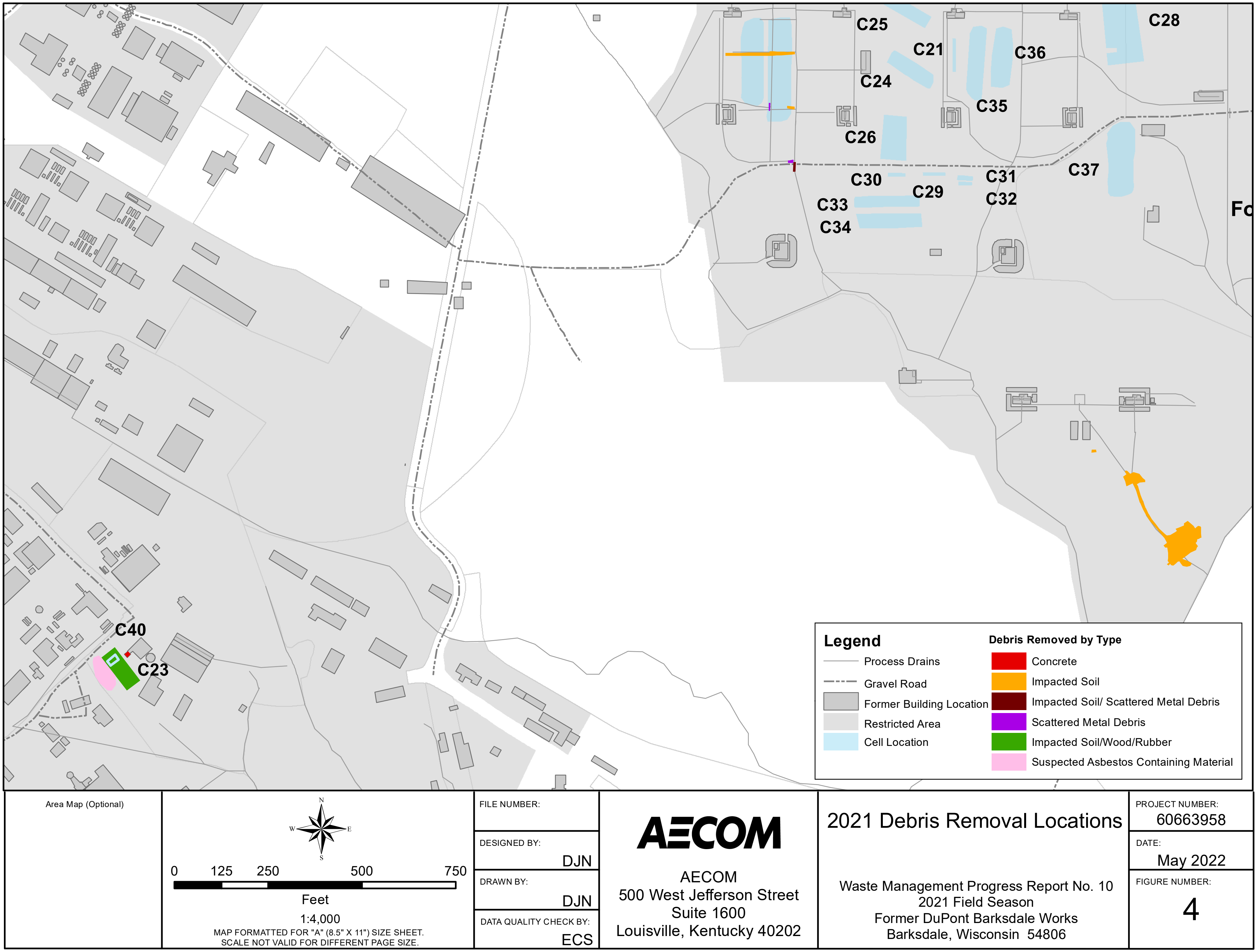
Waste Management Progress Report No. 10
2021 Field Season
Former DuPont Barksdale Works
Barksdale, Wisconsin 54806

PROJECT NUMBER: 60663958

DATE: May 2022

FIGURE NUMBER: 3

C:\Users\desmond.nielsen\Desktop\Barksdale\GIS data\GIS Pioneer Files 1.14.2021\Maps\Maps 2022_DNWM Progress Report 2021 Field Season\Fig 3_Impacted-Soil.mxd



C:\Users\desmond.nielsen\Desktop\Barksdale\GIS data\GIS Pioneer Files 1.14.2021\Maps\Maps 2022_DNWM Progress Report 2021 Field Season\Fig04_Debris_Recovery.mxd

Area Map (Optional)

1:4,000

MAP FORMATTED FOR "A" (8.5" X 11") SIZE SHEET.
SCALE NOT VALID FOR DIFFERENT PAGE SIZE.

FILE NUMBER:

DESIGNED BY: DJN

DRAWN BY: DJN

DATA QUALITY CHECK BY: ECS

AECOM

AECOM
500 West Jefferson Street
Suite 1600
Louisville, Kentucky 40202

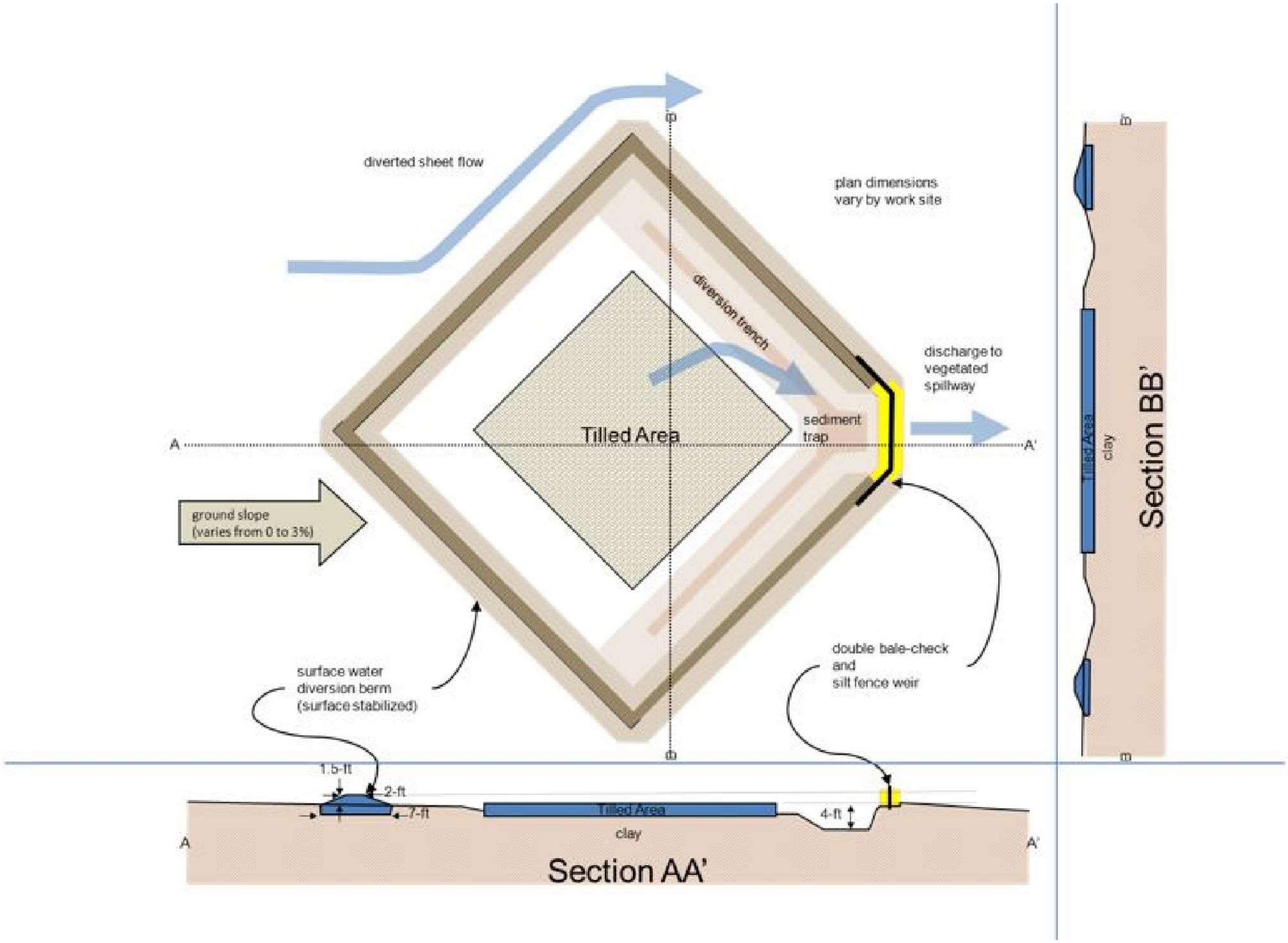
2021 Debris Removal Locations

Waste Management Progress Report No. 10
2021 Field Season
Former DuPont Barksdale Works
Barksdale, Wisconsin 54806

PROJECT NUMBER: 60663958

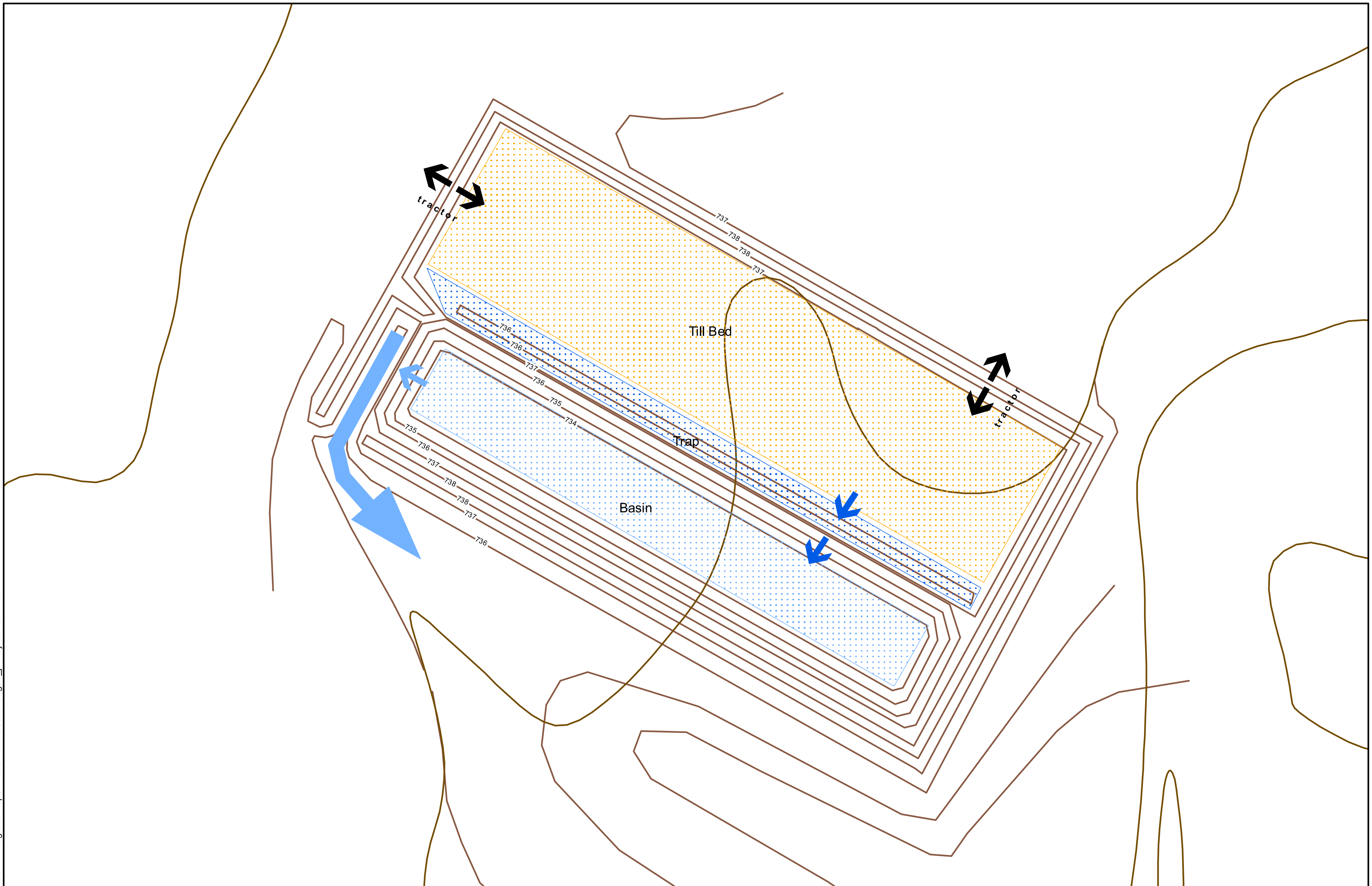
DATE: May 2022

FIGURE NUMBER: 4



G:\Projects\Barksdale\GIS\Maps\Maps 2020\WM Progress Report 2019 Field Season\Fig05_Typical_Cells.mxd

Area Map (Optional)	FILE NUMBER:	AECOM AECOM 500 West Jefferson Street Suite 1600 Louisville, Kentucky 40202	Typical Biopilot Sites Operational Stage 2007-2010 Waste Management Progress Report No.10 2021 Field Season Former DuPont Barksdale Works Barksdale, Wisconsin 54806	PROJECT NUMBER: 60663958
	DESIGNED BY: DJN			DATE: May 2022
	DRAWN BY: DJN			FIGURE NUMBER: 5
	DATA QUALITY CHECK BY: ECS			



Area Map (Optional)

FILE NUMBER:

DESIGNED BY: DJN

DRAWN BY: DJN

DATA QUALITY CHECK BY: ECS

AECOM
500 West Jefferson Street
Suite 1600
Louisville, Kentucky 40202

General pH Adjustment Cell Configuration

Waste Management Progress Report No.10
2021 Field Season
Former DuPont Barksdale Works
Barksdale, Wisconsin 54806

PROJECT NUMBER: 60663958

DATE: May 2022

FIGURE NUMBER: 6

G:\Projects\Barksdale\GIS\Maps\Maps 2020\WM Progress Report 2019 Field Season\Fig06_phAdjustment.mxd

C:\Users\desmond.nielsen\Desktop\Barksdale\GIS data\GIS Pioneer Files 1.14.2021\Maps\Maps 2022_DNIWM Progress Report 2021 Field Season\Fig05_Heating Cell.mxd

Area Map (Optional)	N W E S 0 2.5 5 Feet 1:60 MAP FORMATTED FOR "A" (8.5" X 11") SIZE SHEET. SCALE NOT VALID FOR DIFFERENT PAGE SIZE.	FILE NUMBER: DESIGNED BY: DJN DRAWN BY: DJN DATA QUALITY CHECK BY: ECS	AECOM AECOM 500 West Jefferson Street Suite 1600 Louisville, Kentucky 40202	Pilot Heating Cell C40 Waste Management Progress Report No. 10 2021 Field Season Former DuPont Barksdale Works Barksdale, Wisconsin 54806	PROJECT NUMBER: 60663958 DATE: May 2022 FIGURE NUMBER: 7

Appendix A

WDNR Form 4400-194:
Remediation Site Operation, Maintenance, Monitoring & Optimization Report

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Remediation Site Operation, Maintenance, Monitoring & Optimization Report

Form 4400-194 (R 06/20)

GENERAL INSTRUCTIONS, PURPOSE AND APPLICABILITY OF THIS FORM:

Completion of the applicable portions of this form is required under Wis. Admin. Code § NR 724.13(3). Failure to submit this form as required is a violation of that rule section and is subject to the penalties in Wis. Stats. § 292.99. This form must be submitted every six months for remediation projects that report operation and maintenance progress, in accordance with Wis. Admin. Code §. NR 724.13(3). A narrative report or letter containing the equivalent information required in this form may be submitted in lieu of the actual form. Submittal of this form is not a substitute for reporting required by department programs such as Waste Water or Air Management.

Notes:

1. Long-term monitoring results submitted in accordance with Wis. Admin. Code § NR 724.17(3) are required to be submitted within 10 business days of receiving sampling results and are not required to be submitted using this form. However, portions of this form require monitoring data summary information that may be based on information previously submitted in accordance with that section of code.
2. Responsible parties should check with the department Project Manager assigned to the site to determine if this form is required to be submitted at sites responded to under the Federal Comprehensive Environmental Response and Compensation Act (commonly known as Superfund) or an equivalent state-lead response.
3. Responsible parties should check with the department Project Manager assigned to the site to determine if any of the information required in this form may be omitted or changed and should obtain prior written approval for any omissions or changes.
4. Responsible parties are required to report separately on a semi-annual basis under Wis. Admin. Code § NR 700.11(1). Reporting under that provision is through an internet-based form. More information can be found at: http://dnr.wi.gov/topic/Brownfields/documents/regs/NR700progreport.pdf.
5. Personally identifiable information on this form is not intended to be used for any other purpose than tracking progress of the remediation by Remediation and Redevelopment Program. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Public Records Law (Wis. Stats. §§ 19.31–19.39).

Section GI - General Site Information

A. General Information

1. Site name
Former DuPont Barksdale Works

2. Reporting period from: 05/19/2021 To: 05/18/2022 Days in period: 365

3. Regulatory agency (enter DNR, DATCP and/or other)
WDNR

4. BRRTS ID No. (2 digit program-2 digit county-6 digit site specific)
02-04-000156

5. Site location

Region	County	Address
Northern Region	Bayfield	72315 Highway 13

Municipality name (○ City ◉ Town ○ Village)	Township	Range (○ E ◉ W)	Section	¼	¼ ¼
Barksdale	48 N	5 W	24	NW	

6. Responsible party

Name
Mr. Bradley S. Nave, Project Director, Chemours

Mailing address
1007 Market St, PO Box 2047, Wilmington, DE 19899

Phone number
(812) 923-1136

7. Consultant

☐ Select if the following information has changed since the last submittal

Company name
AECOM - Attention: Cary Pooler

Mailing address
500 W Jefferson, Louisville KY 40202

Phone number
(502) 252-5878

8. Contaminants
Nitramine and Nitroaromatic Organic Compounds (NNOCs) including TNT, DNT, DNX, TNX, NT

9. Soil types (USCS or USDA)
CL / SM-ML / SC

10. Hydraulic conductivity(cm/sec):
NA

11. Average linear velocity of groundwater (ft/yr)
NA

12. If soil is treated ex situ, is the treatment location off site? ○ Yes ◉ No

If yes, give location: Region				County		
Municipality name ○ City ○ Town ○ Village	Township N	Range ○ E ○ W	Section	¼	¼ ¼	

B. Remediation Method

Only submit sections that apply to an individual site. Check all that apply:

- ☐ Landspreading/thinspreading of petroleum contaminated soil (submit a completed Section ES-2).
- ☐ Other ex situ remediation method (submit a completed Section ES-3).
- ☐ Site is a landfill (submit a completed Section LF-1).
- ☐ Biopiles (submit a completed Section ES-1).
- ☐ Other in situ soil remediation method (submit a completed Section IS-3).
- ☐ Soil natural attenuation (submit a completed Section IS-2).
- ☐ Soil venting (including soil vapor extraction building venting and bioventing submit a completed Section IS-1).
- ☐ Other groundwater remediation method (submit a completed Section GW-4).
- ☐ Groundwater natural attenuation (submit a completed Section GW-3).
- ☐ In situ air sparging (submit a completed Section GW-2).
- ☐ Free product recovery (submit a completed Section GW-1).
- ☐ Groundwater extraction (submit a completed Section GW-1).

C. General Effectiveness Evaluation for All Active Systems

If the remediation is active (not natural attentuation), complete this subsection.

1. Is the system operating at design rates and specifications? ○ Yes ◉ No
   If the answer is no, explain whether or not modifications are necessary to achieve the goal that was previously established in design.

2. Are modifications to the system warranted to improve effectiveness ◉ Yes ○ No
   If yes, explain:
   Results of prior seasons' testing are used to improve system performance in subsequent test cells. Current data indicate that elevated (above ground) cells and adjustments to pH are likely to accelerate remediation; however, data are still being acquired to support this finding.

3. Is natural attenuation an effective low cost option at this time? ○ Yes ◉ No
4. Is closure sampling warranted at this time? ○ Yes ◉ No
5. Are there any modifications that can be made to the remediation to improve cost effectiveness? ○ Yes ◉ No
   If yes, explain:

Site name: Former DuPont Barksdale Works

Reporting period from: 05/19/2021 To: 05/18/2022

Days in period: 365

Remediation Site Operation, Maintenance, Monitoring & Optimization Report

Form 4400-194 (R 06/20)

D. Economic and Cost Data to Date

1. Total investigation cost: ______
2. Implementation costs (design, capital and installation costs, excluding investigation costs: ______
3. Total costs during the previous reporting period: ______
4. Total costs during this reporting period: ______
5. Total anticipated costs for the next reporting period: ______
6. Are any unusual or one-time costs listed in the reporting periods covered by D.3., D.4. or D.5. above? (●) Yes ( ) No

   If yes, explain:
   System is a pilot test. Economic and cost data is not applicable.

7. If closure is anticipated within 12 months, estimated costs for project closeout: ______

E. Name(s), Signature(s) and Date of Person(s) Submitting Form

Legibly print name, date and sign. Only persons qualified to submit reports under ch. NR 712 Wis. Adm. Code are to sign this form for sites with any ongoing active remediation, monitoring or an investigation. Other persons may sign this form for sites with no response activities during the six month reporting period.

Registered Professional Engineers:

I hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Print name Eric C. Schmidt	Title Project Engineer, P.E. 38842-6
Signature	Date May 31, 2022

Hydrogeologists:

I hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03(1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Print name Carroll E. Pooler, III	Title Project Manager, P.G. 1265
Signature	Date May 31, 2022

Scientists:

I hereby certify that I am a scientist as that term is defined in s. NR 712.03(3), Wis. Adm. Code, and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Print name	Title
Signature	Date

Other Persons:

Print name	Title
Signature	Date

Site name: Former DuPont Barksdale Works

Reporting period from: 05/19/2021 To: 05/18/2022

Days in period: 365

Professional Seal(s), if applicable:

Section GW-1, Groundwater Pump and Treat Systems and Free Product Recovery Systems

A. Groundwater Extraction System Operation:

1. Total number of groundwater extraction wells or trenches available: ________ and the number in use during period: ________
2. Number of days of operation (only list the number of days the system actually operated, if unknown explain:
3. System utilization in percent (days of operation divided by reporting time period multiplied by 100). If < 80%, explain:
4. Quantity of groundwater extracted during this time period: ________ gallons
5. Average groundwater extraction rate: ________ gpm
6. Quantity of dissolved phase contaminants removed during this time period in pounds: ________ lbs

B. Free Product Recovery System Operation

1. Is free product (nonaqueous phase liquid) being recovered at this site? ◯ Yes ◯ No
   If yes, explain:
2. Quantity of free product extracted during this time period (enter none if none): ________ gallons
3. Average free product extraction rate: ________ gpm

C. System Effectiveness Evaluation

1. Is a contaminated groundwater plume fully contained in the capture zone? ◯ Yes ◯ No
   If no, explain:
2. If free product is present, is the free product fully contained in capture zone? ◯ Yes ◯ No
   If no, explain:
3. If free product is present in any wells at the site, but free product was not recovered during reporting period, explain:
4. If free product is not present, determine the single contaminant that requires the greatest percent reduction to achieve ch. NR 140 ES and PAL. Perform this calculation for all contaminants that were present at the site that have ch. NR 140 standards. Use the highest contaminant concentration measured in any sampling points during reporting period. If free product is present, write "FREE PRODUCT" in C.4.a.
   a. Contaminant: ________
   b. Percent reduction necessary to reach ch. NR 140 ES and PAL: ________ %
   c. Maximum contaminant concentration level in any monitoring well of that contaminant: ________ µg/L
   d. Maximum contaminant concentration level in any extraction well of that contaminant: ________ µg/L

NOT APPLICABLE

e. If the maximum concentration in a monitoring well is more that one order of magnitude above the concentration measured in an extraction well, explain why the extracted groundwater contamination levels are significantly less than the levels at other locations within the aquifer.

D. Additional Attachments

Attach the following to this form:

- Most recent report to the DNR Wastewater Program, if applicable.
- Groundwater contour map with capture zone indicated.
- Groundwater contaminant distribution map (may be combined with contour map).
- Graph of cumulative contaminant removal, if both free product recovery and ground water extraction are used, provide separate graphs.
- Time versus groundwater contaminant concentration graphs for the contaminant listed in C.4.a. (above), as follows:
  - -- Graph of contaminant concentrations versus time for each extraction well in use during the period.
  - -- Graph of contaminant concentrations versus time for the monitoring well with the greatest level of contamination.
- Groundwater contaminant chemistry table.
- Groundwater elevations table.
- System operational data table.

Site name: Former DuPont Barksdale Works

Reporting period from: 05/19/2021 To: 05/18/2022

Days in period: 365

Remediation Site Operation, Maintenance, Monitoring & Optimization Report

Form 4400-194 (R 06/20)

Section GW-2, In Situ Air Sparging Systems

A. In Situ Air Sparging System Operation

1. Number of air injection wells at the site and the number actually in use during the period: ______
2. Number of days of operation (only list the number of days the system actually operated, if unknown explain):
3. System utilization in percent (days of operation divided by reporting time period multiplied by 100). If < 80%, explain:

B. System Effectiveness Evaluation

1. If free product is not present, determine the single contaminant that requires the greatest percent reduction to achieve ch. NR 140 ES and PAL. Perform this calculation for all contaminants that were present at the site that have ch. NR 140 standards. Use the highest contaminant concentration measured in any sampling points during reporting period. If free product is present, write "FREE PRODUCT" in B.1.a.

   a. Contaminant: ______

   b. Percent reduction necessary to reach ch. NR 140 ES and PAL: ______ %

   c. Maximum contaminant concentration level in any monitoring well: ______ µg/L
2. Is there any evidence that air is short circuiting through natural or man-made pathways? ○ Yes ○ No

   If yes, explain:
3. Is the size of the plume: ○ Increasing ○ Stabalized ○ Decreasing ?

   If increasing, explain:

C. Additional Attachments

Attach the following to this form:

- Groundwater contour map.
- Groundwater contaminant distribution map (may be combined with contour map).
- When contaminants are aerobically biodegradable, attach a dissolved oxygen in groundwater map (dissolved oxygen may be combined with the contaminant data on a single map).
- Site map with all air injection wells and groundwater monitoring points.
- Graph of contaminant concentrations versus time for the contaminant listed in B.1.a. (above) for the monitoring point with the greatest level of contamination.
- Groundwater contaminant chemistry table.
- Groundwater elevations table.
- System operational data table.

Section GW-3, Natural Attenuation (Passive Bioremediation) in Groundwater

A. Effectiveness Evaluation

1. If free product is not present, determine the single contaminant that requires the greatest percent reduction to achieve ch. NR 140 ES and PAL. Perform this calculation for all contaminants that were present at the site that have ch. NR 140 standards. Use the highest contaminant concentration measured in any sampling points during reporting period. If free product is present, write "FREE PRODUCT" in A.1.a
   a. Contaminant: ____
   b. Percent reduction necessary to reach ch. NR 140 ES and PAL: ____ %
   c. Maximum contaminant concentration level in any monitoring well of that contaminant: ____ µg/L
2. Aquifer parameters:
   a. Hydraulic conductivity: ____ cm/sec
   b. Groundwater average linear velocity: ____ ft/yr
3. Is there a downgradient monitoring well that meets ch. NR 140 standards? ◯ Yes ◯ No
4. Based on water chemistry results, is the plume: ◯ Expanding ◯ Stabalized ◯ Contracting ?
5. If the answer in 4. (above) is "expanding," is natural attenuation still the best option? ◯ Yes ◯ No
   If yes, explain:
6. Biodegradation parameters:
   a. Upgradient (or other site specific background) DO level: ____ µg/L
   b. DO levels in the part of the plume that is most heavily contaminated ____ µg/L
7. Is site closure a viable option within 12 months from the date of this form? ◯ Yes ◯ No
8. Are there any modifications that can improve cost effectiveness? ◯ Yes ◯ No
   If yes, explain:
9. Have groundwater table fluctuations changed the contaminant level trends over time? ◯ Yes ◯ No
   If yes, explain:
10. Has the direction of groundwater flow changed during the reporting period? ◯ Yes ◯ No
    If yes, approximate change in degrees: ____

B. Additional Attachments

Attach the following:

- Groundwater contour map.
- Groundwater contaminant distribution map (may be combined with contour map).
- When contaminants are aerobically biodegradable, attach a dissolved oxygen in groundwater map (dissolved oxygen may be combined with the contaminant data on a single map).
- Graph of contaminant concentrations versus time for the contaminant listed in A.1.a. (above) for the monitoring point with the greatest level of contamination.
  Note: This is the minimum required graph; however, it is recommended that multiple time versus contamination concentration graphs as described in the instructions on page 24 for Natural Attenuation of Groundwater be submitted.
- Graph of contaminant concentrations versus distance.
- Groundwater contaminant chemistry table.
- Groundwater biological parameters.
- Groundwater elevations table.

NOT APPLICABLE

Section GW-4, Other Groundwater Remediation Methods

A. Effectiveness Evaluation

1. If free product is not present, determine the single contaminant that requires the greatest percent reduction to achieve ch. NR 140 ES and PAL. Perform this calculation for all contaminants that were present at the site that have ch. NR 140 standards. Use the highest contaminant concentration measured in any sampling points during reporting period. If free product is present, write "FREE PRODUCT" in A.1.a.

   a. Contaminant: ________

   b. Percent reduction necessary: ________ %

   c. Maximum contaminant concentration level in any monitoring well: ________ µg/L

2. Is the size of the plume: ◯ Increasing ◯ Stabalized ◯ Decreasing ?

3. Describe the method used to remediate groundwater at the site:

4. List any additional information required by the DNR for this method for this site:

NOT APPLICABLE

B. Additional Attachments

Attach the following:

- Groundwater contour map.
- Groundwater contaminant distribution map (may be combined with contour map).
- When contaminants are aerobically biodegradable, attach a dissolved oxygen in groundwater map (dissolved oxygen may be combined with the contaminant data on a single map).
- Graph of contaminant concentrations versus time for the contaminant listed in A.1.a. (above) for the monitoring point with the greatest level of contamination.
- Groundwater contaminant chemistry table.
- Groundwater elevations table.
- Any other attachments required by the DNR for this remediation method.

Site name: Former DuPont Barksdale Works

Reporting period from: 05/19/2021 To: 05/18/2022

Days in period: 365

Remediation Site Operation, Maintenance, Monitoring & Optimization Report

Form 4400-194 (R 06/20)

Section IS-1, Soil Venting (Including Soil Vapor Extraction, Building Venting and Bioventing)

A. Soil Venting Operation

Note: This form is not required for building vapor mitigation systems that are installed proactively to protect building occupants/users and are not considered part of ongoing active soil remediation.

1. Number of air extraction wells available and number of wells actually in use during the period: ______

2. Number of days of operation (only list the number of days the system actually operated, if unknown explain):

______

3. System utilization in percent (days of operation divided by reporting time period multiplied by 100). If < 80%, explain:

______

4. Average depth to groundwater: ______ gpm

B. Building Basement/Subslab Venting System Operation

1. Number of venting points available and number of points actually in use during the period: ______

2. Number of days of operation (only list the number of days the system actually operated, if unknown explain):

______

3. System utilization in percent (days of operation divided by reporting time period multiplied by 100). If < 80%, explain:

C. Effectiveness Evaluation

1. Average contaminant removal rate for the entire system: ______ pounds per day

2. Average contaminant removal rate per well or venting point: ______ pounds per day

3. If the average contaminant removal rate is less than one pound per day for the entire system, or if the average contaminant removal rate per well is less than one tenth of a pound per day, evaluate the following:

   a. If contaminants are aerobically biodegradable and confirmation borings have not been drilled in the past year:

      i. Oxygen levels in extracted air: ______ percent

      ii. Methane levels in extracted air (ppm_V) If over 10 ppm_V, explain:

      ______

      iii. If methane is not present above 10 ppm_V and if oxygen is greater than 20 percent in extracted air, you should either:

      - Drill confirmation borings during the next reporting period, if the entire site should be considered for closure.
      - Or, perform an in situ respirometry test in a zone of high contamination. Do not perform the test in an air extraction well, use a gas probe or water table well. If a zero order rate of decay based on oxygen depletion is less than 2 mg/kg per day, then you should drill confirmation borings, if the entire site should be considered for closure. If the rate of decay is between 2 and 10 mg/kg, operate for one more reporting period before evaluating further. If the zero order rate of decay is greater than 10 mg/kg total hydrocarbons, continue operating the system in a manner than maximizes aerobic biodegradation.

   b. If contaminants are not aerobically biodegradable and confirmation borings have not been recently drilled during the past year, you should drill confirmation borings during the next reporting period if the entire site should be considered for closure.

   c. If soil borings were drilled during the past year and soil contamination remains above acceptable levels, explain if the system effectiveness can be increased and/or if other options need to be considered to achieve cleanup criteria.

D. Additional Attachments

Attach the following to this form:

- Well and soil sample location map indicating all air extraction wells. If forced air injection wells are also in use, identify those wells.
- If water table monitoring wells are present at the site, a map of well locations.
- Time versus vapor phase contaminant concentration graph.
- Time versus cumulative contaminant removal graph.
- Groundwater elevations table, if water table wells are present at the site; also list screen lengths and elevations.
- Table of soil contaminant chemistry data.
- Soil gas data, if gas probes are used to monitor subsurface conditions in locations other than where air is extracted.
- System operational data table.

NOT APPLICABLE

Section IS-2, Natural Attenuation (Passive Bioremediation) in Soil

A. Effectiveness Evaluation

1. Soil gas information in the soil that is most contaminated from a permanently installed gas probe(s) or water table monitoring well(s).
   a. Hydrocarbon levels: ______ ppm, with an FID
   b. Oxygen levels: ______ percent
   c. Carbon dioxide levels(specify ppm or percent): ______
   d. Methane levels: ______ ppm
2. Soil gas information in background (uncontaminated soil) from permanently installed gas probe(s)or water table monitoring well(s):
   a. Hydrocarbon levels: ______ ppm, with an FID
   b. Oxygen levels: ______ percent
   c. Carbon dioxide levels(specify ppm or percent): ______
   d. Methane levels: ______ ppm
3. List the results of the single boring that had the highest levels of soil contamination during the last round of soil sampling, and the date those samples were collected. Since soil borings are only drilled periodically, list the most recent data even if the data is prior to this reporting period. Since this data is used to assess progress based on the most recent soil sampling event, do not list data from prior sampling events.
   a. Total hydrocarbons (Specify if GRO and/or DRO): ______ µg/kg
   b. Specific compounds (µg/kg):
      i. Benzene: ______ µg/kg
      ii. 1,2 Dichloroethane: ______ µg/kg
      iii. Ethylbenzene: ______ µg/kg
      iv. Toluene: ______ µg/kg
      v. Total xylenes: ______ µg/kg
4. Is there any evidence that contaminants are leaching into groundwater? ◯ Yes ◯ No
   If the answer is yes and if groundwater quality is not being monitored, explain:
5. Is site closure a viable option within 12 months from the date of this form? ◯ Yes ◯ No
6. Are there any modifications that can be made to the remediation to improve cost effectiveness? ◯ Yes ◯ No
   If yes, explain:

NOT APPLICABLE

B. Additional Attachments

Attach the following to this form:

- Well and soil sample location map.
- Cross sections showing the water table, soil sampling locations, screened intervals for gas probes or water table wells, geologic contacts, and any former excavation boundaries.
- Graphs of contaminant concentrations, oxygen, carbon dioxide and methane levels over time.
- Groundwater elevations table, if water table wells are present at the site.
- Table of soil contaminant chemistry.
- Table of soil gas readings.

Section IS-3, Other In Situ Soil Remediation Methods

A. Effectiveness Evaluation

1. Describe the method used to remediate soil at the site:

The Bioremediation Pilot Test program is a preliminary evaluation of the efficacy of enhanced attenuation of NNOCs using periodic soil mixing with moisture and pH adjustment. The test program, initiated June 16, 2007, is currently evaluating alternate till bed configurations, mixing frequencies, and cell construction methods. Analytical data is currently being collected to evaluate the effects of soil moisture, pH and various NNOC mixtures on degradation pathways and is anticipated to provide information needed to implement a full scale program within several years.

2. List all information required by the DNR for this remediation method for this site:

This form is attached to a Waste Management Progress Report, which required to support the Remediation Variance issued by WDNR for the Bioremediation PilotTest program. Methods to achieve remediation are currently not fully evaluated and will not be available until the test program is completed. Until such time, annual progress reports \will provide waste tracking data requested by the Remediation Variance for the following topics:

Product Residuals and Debris Removed from Bioremediation Pilot Cells
Movement of Impacted Soils into Bioremediation Pilot Cells
Alternative Treatment of Large Debris

Multiple pilot cells have been constructed at the site. Detailed information regarding the cells is included in the annual Waste Management Progress Report.

B. Additional Attachments

Attach the following to this form:

- Any other attachments required by the DNR for this remediation method.

Section ES-1, Ex Situ Soil Treatment Using Biopiles

A. Effectiveness Evaluation

1. Volume of soil in the biopile (if multiple biopiles, list number of piles and total volume): ______

2. Monitoring used to assess progress and verify optimal conditions for biodegradation.
   a. Vapor phase measurements of gases (average of all readings from most recent sampling event):
      i. VOCs by FID: ______ ppm
      ii. Oxygen: ______ percent
      iii. Carbon dioxide: ______ percent
      iv. Methane: ______ ppm
   b. Soil temperature: ______ °F
   c. Soil moisture sensors, if used: ______ percent

3. Treatment amendments added to the soil during construction:
   a. Artificial nutrients, excluding manure.
      i. Types and total pounds added: ______
      ii. Nitrogen and phosphorous content of the added amendment: ______ percent
   b. Manure: ______ total pounds
   c. Natural organic materials (straw, wood chips, etc.)(type and total pounds): ______

4. Forced air biopiles only answer the following:
   a. Total air flow rate of the ventilation system: ______ scfm
   b. Average contaminant removal rate: ______ pounds per day
   c. Average biodegradation rate based on oxygen utilization: ______ pounds per day

5. If soil samples have been taken to monitor progress, list results. Only list the most recent results. If none collected enter NA.
   a. Total hydrocarbons. Specify if GRO and/or DRO: ______ µg/kg
   b. Specific compounds (µg/kg):
      i. Benzene: ______ µg/kg
      ii. 1,2 Dichloroethane: ______ µg/kg
      iii. Ethylbenzene: ______ µg/kg
      iv. Toluene: ______ µg/kg
      v. Total xylenes: ______ µg/kg

B. Additional Attachments

Attach the following to this form:

- Figure showing the construction details of the biopile and any sampling locations within the biopile.
- Table of soil contaminant chemistry data.
- Table of operational data.

NOT APPLICABLE

Section ES-2, Ex Situ Soil Treatment Using Landspreading/Thinspreading

A. Effectiveness Evaluation

1. Method used: ◯ landspreading ◯ thinspreading

Note: For purposes of this form, "landspreading" is the placement of contaminated soil on native topsoil, incorporation of that soil into the native soil and planting crops or other plants on it. The term "thinspreading" refers to placing contaminated soil on an impervious base for aeration.

2. Was any progress monitoring using field screening on soil conducted during this reporting period? ◯ Yes ◯ No

3. If the answer to A.2. (above) is yes:

   i. List monitoring method:

   ii. List monitoring results:

4. Is there any evidence of soil erosion at the landspreading/thinspreading location? ◯ Yes ◯ No

5. Spreading thickness: ______ inches

6. Type of crop planted (if thinspreading with no crop planted, so state):

7. Confirmation sampling date: ______ Anticipated confirmation sampling date: ______

8. Most recent soil sample results, if soil samples for laboratory analysis have been collected to monitor progress. Only list the highest result of the most recent sampling round. If no samples have been collected, enter NA.

   a. Total hydrocarbons. Specify if GRO and/or DRO: ______ μg/kg

   b. Specific compounds (μg/kg):

      i. Benzene: ______ μg/kg

      ii. 1,2 Dichloroethane: ______ μg/kg

      iii. Ethylbenzene: ______ μg/kg

      iv. Toluene: ______ μg/kg

      v. Total xylenes: ______ μg/kg

B. Additional Attachments

Attach the following to this form:

- Map of the landspreading/thinspreading area. If soil samples have been collected, specify locations of samples and dates of sampling.
- Table of soil contaminant chemistry data.
- Table of any field screening results with dates of sample collection.

NOT APPLICABLE

Site name: Former DuPont Barksdale Works

Reporting period from: 05/19/2021 To: 05/19/2022

Days in period: 365

Remediation Site Operation, Maintenance, Monitoring & Optimization Report

Form 4400-194 (R 06/20)

Section ES-3, Landfills

Note: Reporting forms or reporting requirements in a Department approved Operation and Maintenance Plan for a landfill may take the place of this form.

Specific Inspection Items	Potential Problem Areas	Status	Notes
Perimeter Security Fencing	Broken or missing wood slats, torn chain link fabric, barbed wire, other - list		
Entrance Gate and Locking Mechanism	Lock broken/missing, mechanism inoperative.		
Monitoring Wells and Wellhead Covers	Signs of tampering, casing damaged, lock missing.		
Final Cover Vegetation	Bare spots, stressed vegetation, deep rooted vegetation.		
Final Cover Slope (explain below)	Gullies, lack of vegetation, subsidence, ponding.		
Evidence of Burrowing Animals	Damage to final cover, evidence of waste.		
Stormwater Drainage Channels	Gullies, erosion, debris, culvert blocked.		
Passive Landfill Gas Venting System	Damaged or blocked vent risers, stressed vegetation.		
Active Landfill Gas Extraction System	Damaged or blocked piping, cleanouts, other blower flare, knockouts, etc.		
Leachate Collection System	Pumps, connection piping, collection system piping, extraction wells, collectiontanks, tanker truck loadingsystem or sanitary sewer discharge piping.		
Access Road Cover Mowing; Tall Vegetation Removal	Ponding, rutting, erosion, cracked or damaged pavement. Mowing and tallvegetation removal done tospecified vegetation.		

Summary of Deficiencies and/or Corrective Actions:

NOT APPLICABLE

B. Additional Attachments

Attach the following to this form:

- Any photographs documenting problems and maintenance activities.
- Maps, drawings showing site features requiring maintenance.
- Records for leachate pumping/discharge/hauling.
- Records for active gas extraction volumes.

NOT APPLICABLE

Section INS- 1, Section by Section Instructions and Information

Specific Section by Section Instructions for This Form. The site name and reporting period is listed on every page. Then if the pages are inadvertently separated, that information can be used to determine which pages form the report.

General Site Information

-- A.1. List the name as it appears on the DNR tracking system. If the person filling out the form does not know what the name on the tracking system is, use the name that the DNR used in the most recent correspondence.

-- A.2. The reporting period should be either from January 1 to June 30 or July 1 to December 31 for active systems. For passive systems, use a calendar year basis. If however the report covers a newly installed system, list the actual startup date instead of January 1 or July 1. For new passive systems, use the first date that monitoring data is available as the date of startup.

-- A.3. Enter all regulatory agencies that regulate the site.

-- A.4. This form is a DNR form. For that reason, list the DNR site number. If there are other agencies regulating the site, listing identification numbers for other agencies is also recommended, but not mandatory, unless specified by those other agencies.

-- A.5. If the information listed for the site location is not sufficient information for a person to use to drive to a site (example: no street address in a rural area), also include a map that is sufficient for a person to use to drive to the site. A U.S.G.S. topographic map that shows the site location may be used.

-- A.8. List the contaminants that have at one time exceeded the PALs or Table Values in ch. NR 720. If GRO and/or DRO exceed the ch. NR 720 standards, also list GRO and/or DRO. Do not list other contaminants that have never exceeded state standards at the site. If more room is necessary, write "SEE ATTACHED SHEETS" and list all contaminants on a separate sheet.

-- A.9. List the predominant soil types that are contaminated. If there is both contaminated soil and groundwater at the site, list soil types both above and below the water table. If only some soil is contaminated, do not list the soil types that are uncontaminated. If the site soils meet soil cleanup criteria, but groundwater is contaminated, so state that. Specify if the USCS or USDA system is used for soil descriptions. This line specifies soil because the vast majority of contaminated sites do not have contaminated bedrock. If bedrock is contaminated, also list that bedrock type.

-- A.10. If the groundwater meets ch. NR 140 standards, enter "NA - NO NR 140 EXCEEDANCES". Otherwise, list the estimated hydraulic conductivity and the method used to estimate it (bail-down tests, calculations based on grain size, pumping test, etc.) If the hydraulic conductivity has not been determined, state when the tests are to be conducted. When a number of test results are available, list the range of results and the geometric mean. If however some results have a low level of accuracy and some results have a high level of accuracy, you should only list the most accurate results. See the Section on aquifer testing in the *Guidance on Design, Installation and Operation of Ground Water Extraction and Product Recovery Systems* for more information.

-- A.11. If the groundwater meets ch. NR 140 standards, enter "NA - NO NR 140 EXCEEDANCES". Otherwise, enter groundwater average linear velocity as a function of hydraulic conductivity, effective porosity and the groundwater gradient. You should use the geometric mean from A.11. (above) and the most representative value for the gradient at the site. Estimate the effective porosity based on soil types and geologic origin of the soil. If there are reasons to believe that the average liner velocity estimate is less than the actual rate at the site, so state that reason. Secondary porosity effects, flow through submerged utility trenches, widespread contaminant distribution in low permeability soils, etc., are reasons to assume that the actual migration rate is much greater than the predicted average linear velocity. In such cases, you should explain the reasoning for doubting the predicted average linear velocity.

-- A.12. If the information listed for the soil treatment location is not sufficient information for a person to use to drive to a site, also include a map that is sufficient for a person to use to drive to the site. A U.S.G.S. topographic map or a plat map that shows the site location may be used.

NOT APPLICABLE

-- B. Check all methods used at a site. For example, if groundwater extraction, free product recovery and soil venting are used, check all three methods and submit the additional pages for those methods. If dual-phase or bioslurping are used, these methods extract both air and groundwater, check boxes for and attach additional pages for both soil venting and pump and treat.

-- C. Remediation systems that use any form of enhancement are considered "active" and sites where there are no enhancements of any kind are considered "passive" forms of remediation. For purposes of these forms, natural attenuation (also called naturally occurring bioremediation) is "passive" and all other remediation methods are "active" methods.

-- C.1. Design flow rates refers to flow rates such as gallons per minute extracted by a ground water extraction system, standard cubic feet per minute extracted by a soil venting system, standard cubic feet per minute injected by an in situ air sparging system, etc. If the actual flow rate is within 80 percent of the rate predicted in the design, consider that as meeting the design specification.

-- D. The cost data in this section is used by DNR staff to evaluate whether or not the selected remedy is the most cost effective remedy and whether or not system modifications may be warranted to improve efficiency and/or cost effectiveness. Responsible parties and consultants are encouraged to submit cost information so that DNR staff may assist responsible parties and consultants accomplish environmental cleanups in the most cost effective manner.

Total costs for past costs are all costs to date. This information is for all costs that were incurred to investigate and/or remediate the site. These costs include but are not limited to: consulting labor and supplies, laboratory testing, transportation, equipment, etc. If the consultant does not pass all costs through the consulting firm, the consultant will need to contact their client for other non-consulting costs to determine total costs. Exceptions include costs for attorney fees, accounting, claim assistance in preparing claims to state reimbursement funds, or other indirect expenses that are not essential to remediating the site.

-- D.2. The initial implementation costs are all costs that are incurred to start implementing a remedy at a site. Costs for the investigation however are excluded because those costs are incurred prior to remedy selection. Since costs for treatability and/or pilot testing are used to procure data for remedial design and are specific to different remediation methods, these costs should be included in implementation costs and not investigation costs. Startup or shakedown costs are also considered implementation costs and should not be considered operation and maintenance costs.

-- D.3. Costs for implementation or investigation should not be repeated here or they will be double counted.

-- D.4. Costs for implementation or investigation should not be repeated here or they will be double counted.

-- D.5. Costs for implementation or investigation should not be repeated here or they will be double counted.

-- D.6. Examples of one-time or unusual costs include the following:
- Replacing a burned out motor on a pump.
- Replacement of a well that was destroyed by a snowplow.
- Confirmation sampling to determine if the site meets closeout criteria. This type of cost is considered an unusual cost because this type of sampling is not conducted during most reporting periods.

-- D.7. This estimate of costs is for all costs to close out a site minus the salvage value of any remediation equipment. Pertinent costs include items such as well abandonment, equipment removal from the site, consulting costs associated with these items, etc. Do not include any costs that will not be paid by a state reimbursement fund, such as repaving.

NOT APPLICABLE

NOT APPLICABLE

Section GW-1, Groundwater Extraction and Product Recovery

-- A.1. List two numbers, the total number of extraction wells at the site and the number that were in actual use during the period. If all wells were in use, state that on the form.

-- A.2. The number of days of operation are the number of days that the system was actually operated. If the system was shut down for reasons such as: repairs were necessary, piping froze, shut down to provide time for subsurface conditions to equilibrate before sampling, etc., do not list those days as being in operation.

-- A.3. System utilization is a measure of the amount of time that the system operated relative to the amount of time that it could have operated.

-- A.5. The average is for the entire site, not per well or trench. For purposes of determining the average ground water extraction rate, calculate the average based on the total volume of groundwater extracted divided by the time of the reporting period. For example, if the system operated at 10 gallons per minute for one month, the amount of water extracted would be approximately 432,000 gallons. If the reporting period was six months long, then the time period is approximately 260,000 minutes. Therefore, the average flow rate over six months is 432,000 divided by 260,000 minutes for an average flow rate of 1.67 gallons per minute (gpm).

-- A.6. Calculate the total dissolved contaminants removed in pounds. If the estimate is a sum of BTEX and not based on a total hydrocarbon test (GRO and/or DRO), so state that on the form.

-- B.3. The average should be based on the entire site over the entire reporting period. See instructions above for A.5. List the free product recovery rate as gallons per day (gpd), not gallons per minute (gpm).

-- C.1. To answer this question, a thorough evaluation of water levels and chemical analyses in all monitoring points at the site is necessary.

-- C.2. If the capture zone has not been determined mathematically, it will need to be determined to answer this question. See the *Guidance on Design, Installation and Operation of Ground Water Extraction and Product Recovery Systems* for and any recent update or errata sheets for more information on plume capture.

-- C.4. When free product is present, line C.4.a. should state "FREE PRODUCT" and lines C.4.b. through C.4.d. are left blank. Otherwise, complete the following calculations.
There typically are several compounds at most contaminated sites that exceed the standards in ch. NR 140. The purpose of this question is to focus on the single contaminant that requires the most treatment to achieve groundwater quality standards on a percent reduction basis. For example, the most recent round of sampling at an example site demonstrated the highest levels of contaminants were 1,000 µg/L benzene and 1,000 µg/L toluene in the most heavily contaminated monitoring well. The ES and PAL for benzene is 5 µg/L and 0.5 µg/L (respectively) and for toluene the ES and PAL is 343 µg/L and 68.6 µg/L (ES and PAL data as of August 1995). Therefore the percent reduction to meet the ES and PAL for benzene is 99.5 and 99.95 percent and for toluene it is 65.7 and 93.14 percent. For that reason, the single contaminant that is most critical to reaching state groundwater standards is benzene. Therefore benzene is entered on line a. In this example, 99.5 and 99.95 percent is entered on line b. In this example, 1,000 µg/L is entered on line c. In this example, benzene is the driving factor, therefore enter the maximum benzene level in the single most heavily contaminated extraction well during the most recent sampling period on line d.

-- D. See the generic discussion at the end of the instructions (below) for figures, graphs and tables, starting on page INS-2.

Section GW-2, In Situ Air Sparging

-- B.1. See instructions for Section GW-1, Item C.4.

-- C. See the generic discussion at the end of the instructions (below) for figures, graphs and tables, starting on page INS-2.

Section GW-3, Natural Attenuation in Groundwater

-- A.1. See instructions for Section GW-1, Item C.4.

-- A.2.a. List the estimated hydraulic conductivity that was listed on line A.11 in Section GI-1.

-- A.2.b. List the groundwater average linear velocity that was listed on line A.12 in Section GI-1.

-- A.3. Assess the monitoring well network to determine if there is a down gradient well that has not been impacted by the contaminants. Consider the possibility of a submerged (or diving) plume in that assessment. If all evidence indicates that the plume does not extend to the farthest "clean" downgradient well, indicate "YES" on the form. Otherwise indicate "NO" on the form. If there are not plans to install such a well, explain.

-- A.4. Based on the contaminant distribution, evaluate whether or not the plume is expanding, stabilized, or contracting. When making this determination, consider the contaminant that requires the greatest percent reduction to achieve ch. NR 140 standards.

-- A.5. If the plume is expanding and a justification is necessary, add additional sheets justifying why natural attenuation is still the appropriate remedy. If it is not, further describe in the explanation the plans to use a different remedy.

-- A.6.a. Enter the upgradient dissolved oxygen (DO) level(s). If however there are contaminants measured in the upgradient well, it is not a true background measurement. In that case enter "UNKNOWN" on the form.

-- A.6.b. Enter the range of DO values measured in wells within the plume.

-- B. See the generic discussion at the end of the instructions (below) for figures, graphs and tables, starting on page INS-2.

Section GW-4, Other Groundwater Remediation Methods

-- A.1. See instructions for Section GW-1, Item C.4.
-- A.2. Self explanatory.
-- A.3-4. Enter the information specified by the DNR for this method at this site.

Section IS-1, Soil Venting (Including both Soil Vapor Extraction and Bioventing)

-- B.3. This subsection is used as a trigger for determining if the system requires an evaluation for future activities, such as improvements, converting the site to monitoring for natural attenuation, closure, etc. If an in situ respiration test must be performed, see Hinchee, R.E. and Ong, S.K. 1992. A Rapid In Situ Respiration Test for Measuring Aerobic Biodegradation Rates of Hydrocarbons in Soil. *Journal of the Air and Waste Management Association.* Volume 42, Number 10. Pages 1305 to 1312 for general procedures. For a discussion of methane monitoring, see the instructions for Section IS-2, item A.1.d., below. If the contaminant extraction rate in B.3. is greater than the trigger levels, leave lines B.3.a.i. and B.3.a.ii. blank.

-- C. See the generic discussion at the end of the instructions (below) for figures, graphs and tables, starting on page INS-2.

NOT APPLICABLE

Section IS-2, Natural Attenuation in Soil

-- A.1. This data is used to assess subsurface conditions based on soil gas data. Whenever possible, a permanently installed gas probe should be used. If at all possible, the gas probe should be located in the part of the site that is most heavily contaminated, since that is the part of the site that is likely to take the longest amount of time to meet ch. NR 720 standards. Water table wells that have screen exposed above the water table are also good measuring points. When installing permanent gas probes, you should install the screen deep enough that a true measure of the most heavily contaminated soil is possible, but install the screen shallow enough to assure that it is not submerged by groundwater table fluctuations. In some situations where the depth of contamination is variable, consideration should be given to using nested gas probes instead of only using probes at a single depth. Measuring points that should not be used include temporary gas probes because these points are less repeatable from one monitoring event to the next. Also, if there has been an active soil venting system in use at the site, the air extraction wells should not be used because these wells are in locations that have had much more aggressive treatment than the rest of the site.

-- A.1.a. A flame ionization detector (FID) is specified instead of a photo ionization detector (PID) because PIDs often read inaccurately in moist oxygen deficient/carbon dioxide rich atmospheres. Also, PIDs do not detect some petroleum compounds.

-- A.1.d. Methane readings are used to measure for anaerobic conditions. When the original product that is lost is a refined petroleum product (not crude oil), there should not be any methane within the product. Methane however may be produced under very anaerobic conditions. Any method may be used for measuring methane provided that the detection limit is less than a few ppm_V. One convenient method is to use an FID that is equipped with a granular activated carbon filter to filter out non-methane components. Some instrument manufacturers make these filters available as options. In some cases an FID will flame out due to an oxygen deficiency. Some instrument manufacturers offer a dilution device as an accessory that is designed to prevent flameouts and also raises the upper limit of measurement to 10,000 ppm_V or higher. If the meter "pegs" at 10,000 ppm_V (or one percent), enter ">10,000 ppm_V."

-- A.2. The background monitoring point is predominantly used to measure natural oxygen and carbon dioxide levels in soil over time. For this reason, the background monitoring point should be reasonably close to the site, but not so close that the conditions are no longer representative. Considerable variations over time can occur, this background point should be measured during every sample event. Considerations for determining if a background point is representative include:

- If an on-site background point has minor levels of VOCs in it due to gas phase diffusion, that is acceptable, but if the levels are high, it may not be representative of true background conditions.
- Background oxygen and carbon dioxide levels vary with soil type and natural organic carbon content. For this reason, if at all possible, the soil types should be identical within the screened interval of all gas probes.
- The same depths should be used for all gas probes to allow comparison from one location to the next. If the depth to water varies greatly across the site, a certain amount of confusion in the data is likely. In this case, use professional judgement to provide the best data possible at a reasonable cost.

-- A.3. Enter this data for petroleum fuel sites. For other sites, provide the data that is most appropriate for the situation.

-- B. Cross sections are self explanatory, see the generic discussion at the end of the instructions (below) for other attachments.

Section IS-3, Other In Situ Soil Treatment Methods

-- A.2. Enter the information specified by the DNR for this method at this site.

NOT APPLICABLE

Section ES-1, Ex Situ Soil Treatment Using Biopiles

-- A.3.a. The term "artificial nutrients" essentially means agricultural fertilizers or any other fertilizer products.

-- A.3.a.i. The types of fertilizers that are added should be listed here by chemical names, not by vendor trade names.

-- A.3.a.ii. List nitrogen content as N, list phosphorous content as phosphoric acid (P_2O_5). Note: Fertilizer ratings are based not on actual content of N, P and K, but on nitrogen (as N), phosphorous (as P_2O_5) and potassium (as K_2O).

-- A.4.c. See example calculations at the end of this set of instructions.

-- A.5. Enter this data for petroleum fuel sites. For other sites, provide the data that is most appropriate for the situation.

-- B. The figure is self explanatory. See the generic discussion at the end of the instructions (below) for instructions for the tables.

Section ES-2, Ex Situ Soil Treatment Using Landspreading/Thinspreading

-- B. A map to scale of the landspreading location including and landmarks or benchmarks. When samples have been collected, the distances to any landmarks or benchmarks should be indicated.

Section ES-3, Other Ex Situ Soil Treatment Methods

-- A.2. Enter the information specified by the DNR for this method at this site.

NOT APPLICABLE

Section INS- 2, Figures, Graphs and Tables

When figures and graphs are specified, they should at a minimum contain the following information, or an explanation as to why the information is not necessary.

Maps. All maps should include the applicable information specified in s. NR 724.11(6), Wis. Adm. Code. In most cases, all information can be combined into a single map. There are times that a single map will have so much data that it is essentially unreadable. The consultant should use professional judgement when determining if a single map or multiple maps best portray the information necessary.

- Groundwater Contour Map Guidelines.

  -- List groundwater elevations for each measuring point on the map.
  -- Use the most recent data available.
  -- For water table maps, do not use data from deeper piezometers. If piezometer data is shown, use a different symbol for the piezometers than used for water table wells.
  -- If any wells are dry, indicate that on the map.
  -- If free product is present at site, shade the area where free product is estimated to be present.
  -- If groundwater is extracted with a pump and treat system, also denote plume capture zone.
  -- If in situ air sparging or soil venting is in use, specify on the map if the system was operating or shut down during the water level measurements. See the Subsection on water table maps in the *Guidance on Design, Installation and Operation of Ground Water Extraction and Product Recovery Systems* for more information on this topic.

- Groundwater Contaminant Distribution Map Guidelines.

  -- Only contaminants that exceed the ch. NR 140 ES or PAL should be shown on the map. When contaminants are above the PAL or ES at some data points and below the PAL or ES at other data points, list the data for all locations to portray which areas of the site meet ch. NR 140 groundwater quality standards.
  -- If a well is not sampled due to the presence of free product indicate "FREE PRODUCT" at those data points.
  -- If more than five contaminants exceed ch. NR 140 ES, only the five contaminants that require the greatest percent reduction to achieve ch. NR 140 ES or PAL should be shown on the map.
  -- Drawing isoconcentration lines is optional, unless specified for the site on a site specific basis.
  -- If the contamination has crossed the property line, that property line should be clearly denoted on the map.
  -- If in situ air sparging is used, water samples from ch. NR 141 type monitoring wells may not represent aquifer water quality as a whole. For that reason, groundwater data should be obtained from driven probes with no filter pack. If there are no driven probes and conventional ch. NR 141 monitoring wells are used, shut down the air injection system at least two weeks prior to collecting groundwater samples. See the *Guidance on Design, Installation and Operation of In Situ Air Sparging Systems* and the August 1995 update sheets for more information on this topic.

- Dissolved Oxygen Map Guidelines.

  -- Dissolved oxygen data may be shown on the contaminant concentration graphs or on a separate graph.
  -- Dissolved oxygen maps are optional for ground water extraction and product recovery systems.
  -- When in situ air sparging is used, monitoring points may not represent aquifer water quality as a whole. For that reason, groundwater data should be obtained from driven probes with no filter pack. If there are no driven probes and conventional ch. NR 141 monitoring wells are used, shut down the air injection system at least two weeks prior to collecting groundwater samples for DO. See the *Guidance on Design, Installation and Operation of In Situ Air Sparging Systems* and the August 1995 update sheets for more information on this topic.

- Well and Soil Sample Location Map Guidelines. Well and sample location maps for all methods should clearly indicate the location(s) of the release or the area where soil contamination historically has been highest. Also, if part of the contamination has been excavated, the pit boundaries.

  The recommended documentation for each remedial method is as follows:

  -- Groundwater Extraction and Product Recovery - separate well location maps should not be provided, instead the wells should be indicated on the groundwater contour and contaminant distribution maps.
  -- In Situ Air Sparging - the map should indicate all air injection wells, soil venting extraction wells, and all groundwater monitoring points.

NOT APPLICABLE

Maps (Continued).

- -- Natural Attenuation in Groundwater - separate well location maps should not be provided, instead the wells should be indicated on the groundwater contour maps.
- -- Soil Venting - indicate all air extraction wells. If any gas probes are used to assess subsurface conditions in either contaminated zones or background locations, also indicate those data points with a different symbol. If soil samples have been collected recently to track progress, indicate those locations with the date of sampling noted on the map.
- -- Natural Attenuation in Soil - show all monitoring points. Indicate which data points are background measuring points. If soil samples have been collected recently to track progress, indicate those locations with the date of sampling noted on the map. If the site was previously treated by soil venting, the locations of former air extraction wells should also be shown since these are areas where aggressive treatment has been applied. Also show area(s) of paved and unpaved ground surface. If pavement is significantly broken to allow significant water infiltration and air diffusion, map that area as broken pavement.

Graphs. All graphs that show time versus contaminant concentration or cumulative contaminant removal should be based on total time, not only operation time. All graphs that denote cumulative removal should use pounds of contaminant removed. Graphs should accurately show the time period(s) when the system was not operating. Plot time on the X axis, concentration or cumulative removal data on the Y axis.

• Time Versus Cumulative Removal. The recommended documentation for each remedial method is as follows:

- -- Groundwater Extraction and Product Recovery - separate graphs should be used for free product recovery and dissolved phase recovery. A single graph for each phase is adequate, per well graphs are only necessary when specified by the Department on a site specific basis.
- -- In Situ Air Sparging - no graph is necessary (removal data is shown on the graphs for the soil venting system).
- -- Natural Attenuation in Groundwater - no graph is necessary.
- -- Soil Venting - provide a graph of cumulative removal for total VOCs for the total system.
- -- Natural Attenuation in Soil - no graph is necessary.
- -- Ex Situ Soil Treatment Using Biopiles - Provide two graphs, one showing cumulative removal of total VOCs and a second graph showing total contaminant biodegradation over time.
- -- Ex Situ Soil Treatment Using Landspreading/Thinspreading - no graphs are needed.

• Time Versus Contamination Concentration Graphs. Create graphs with contamination level on the y axis (semilog scale) and time on the x axis (linear scale). If free product is present, time versus contamination concentration graphs are not necessary.

The recommended documentation for each remedial method is as follows:

- -- Groundwater Extraction and Product Recovery - graph the contaminant level over time for the groundwater that is extracted by the extraction system. List all compounds that exceed ch. NR 140 ES or PAL. If over five contaminants exceed ch. NR 140 ES or PAL, only list the five contaminants that exceed ch. NR 140 standards by the greatest percent.
- -- In Situ Air Sparging - provide a graph for the single monitoring well that is most heavily contaminated. If over five contaminants exceed ch. NR 140 ES or PAL, only list the five contaminants that exceed ch. NR 140 standards by the greatest percent.
- -- Natural Attenuation in Groundwater - provide a graph for all monitoring wells that contain any compounds that exceed ch. NR 140 standards. If over five contaminants exceed ch. NR 140 ES or PAL, only list the five contaminants that exceed ch. NR 140 standards by the greatest percent.
- -- Soil Venting - provide a graph of contaminant concentration over time for the entire system for total VOCs. If any gas probes are used to assess subsurface conditions in either contaminated zones, also provide a graph with the data from the most heavily contaminated gas probe.
- -- Natural Attenuation in Soil - provide a graph of contaminant concentration over time for total vapor phase VOCs as measured with an FID, oxygen, carbon dioxide and methane in an gas probe.
- -- Ex Situ Soil Treatment Using Biopiles - no graph is necessary.
- -- Ex Situ Soil Treatment Using Landspreading/Thinspreading - no graphs are needed.

Graphs (Continued).

- <u>Graph of Contaminant Concentrations Versus Distance.</u> If free product is present, a graph of contaminant concentrations versus distance is not necessary.

  The recommended documentation for each remedial method is as follows:

  -- Groundwater Extraction and Product Recovery - no graph is necessary.
  -- In Situ Air Sparging and Natural Attenuation in Groundwater - plot a graph with distance (on the x axis, linear scale) and contaminant concentrations (y axis, log scale) from the upgradient measurement point to the farthest downgradient data point along the centerline of the plume. List the same contaminants as shown on the Time Versus Contaminant Concentration Graphs. Clearly show the source area on the graph. If free product has been present, label the data points that previously contained free product. For in situ air sparging, see comments above about samples collected from conventional monitoring wells with filter packs versus driven probes.

Tables. Whenever possible, data over the life of the project should be listed.

The recommended documentation for each type of table is as follows:

- <u>Groundwater Contaminant Chemistry Data.</u>

  List:
  -- Contamination levels for all contaminants that exceed ch. NR 140 standards.
  -- Dissolved oxygen levels if applicable.
  -- Other biological parameters, if applicable (nitrogen, phosphorous, manganese, sulphate, iron, dissolved methane, redox potential, pH, microbial population size, etc.). See instructions for page GW-3 for more information on these parameters. Also, list the dates the samples were collected and the standard methods used to analyze the samples.

- <u>Groundwater Biological Parameters.</u>

  For natural attenuation in groundwater only, these measurements should be listed (if known) to provide information on biodegradation. This table is not necessary for free product extraction, groundwater extraction or in situ air sparging.

  Provide a table that includes any results of tests conducted for dissolved oxygen, nitrate, manganese, iron, sulphate, methane, redox potential, heterotrophic and/or hydrocarbon degrading microorganism populations. Identify on the table if the monitoring locations are upgradient, side gradient, downgradient, or within the plume, dates of sampling, and the analytical methods used for those parameters. Include all data for the life of the project. Since some of these tests are only conducted once, or periodically - enter "NS" in the table for not sampled for any parameters that were not sampled during a particular round of sampling.

  When asked to list the standard methods, list the method if a standard method exists. There are however some tests (for example dissolved methane) where there are no official standard laboratory or field methods. In this case the laboratory will have to create their own standard procedures. In these cases list the name of the laboratory and that laboratory's name for that test.

  Specific considerations for each parameter are as follows:

  -- Dissolved oxygen (mg/L). The most efficient mechanism for natural or enhanced biodegradation of petroleum compounds is aerobic biodegradation.
  -- Nitrate (mg/L as N). Nitrate (NO_3^{-1}) is a potential electron acceptor for denitrification and also serves as a nutrient for heterotrophic microbial populations to enhance aerobic biodegradation. Decreasing nitrate levels from background wells to wells within the plume are an indication of either aerobic or anaerobic biodegradation.
  -- Manganese as Mn^{+2} (mg/L). Manganese as Mn^{+4} is converted to soluble manganese as Mn^{+2} under anaerobic biodegradation. For this reason, total manganese analysis is not appropriate, only soluble manganese as Mn^{+2}. When the levels of soluble manganese are higher in wells within the plume than in background wells, that is an indication of anaerobic biodegradation.
  -- Iron as Fe^{+2} (mg/L). Iron as Fe^{+3} is converted to soluble iron as Fe^{+2} under anaerobic biodegradation. For this reason, total iron analysis is not appropriate, only soluble iron as Fe^{+2}. When the levels of soluble iron are higher in wells within the plume than in background wells, that is an indication of anaerobic biodegradation.

Tables (Continued).

- -- Dissolved sulphate (SO_4^{-2}, mg/L). Sulphate (SO_4^{-2}) is a potential electron acceptor. Decreasing sulphate levels from background wells to wells within the plume are an indication of anaerobic biodegradation.
- -- Dissolved methane (mg/L). Methane is produced under anaerobic conditions. Since background methane levels can usually be assumed to be zero, in most cases only measurements within the plume are used. Exceptions are when the natural soils have very high levels of TOC (for example peat), background methane levels are also warranted. When the contaminant is crude oil instead of a refined petroleum product, methane measurements may however cause erratic results. Significant amounts of methane may be created when other electron acceptors (NO_3^{-1}, Mn^{+4}, Fe^{+3} and SO_4^{-2}) are exhausted. For this reason, significant levels of methane are indicative of very very anaerobic conditions.
- -- Redox potential (millivolts, include + or - sign). Redox potential is another measure of the level of aerobic/anaerobic conditions, however it is a much more sensitive measurement than DO at very low levels of DO.
- -- Heterotrophic and hydrocarbon degrading microorganism populations (CFU/mL). Heterotrophic and specific hydrocarbon degrader population sizes should be listed for both background locations and locations within the plume, if there is information available. There is disagreement by many of the experts within the field as to the merits of sampling for this parameter. Refer to other DNR guidance documents on natural attenuation (or passive bioremediation) for more information on this topic.

- <u>Soil Gas Data.</u>

The recommended documentation for each remedial method is as follows:

- -- When natural attenuation in soil is used, provide a graph of all soil gas readings over time for every data point.
- -- When soil venting is used, if a gas probe is used to assess subsurface conditions over time in a location where air is not extracted, provide that data in a table.

- <u>System Operational Data.</u>

The recommended documentation for each remedial method is as follows:

-- Groundwater Extraction and Product Recovery:

- Well by well flow rates in gpm for each extraction well. If a well is off line, list flow rate as "ZERO." Clearly denote on the table periods of system shutdown.

-- In Situ Air Sparging:

- Air pressure and injection flow rates in scfm for each well. If a well is off line, list flow rate as "ZERO." Clearly denote on the table periods of system shutdown.

-- Natural Attenuation in Groundwater - no table needed.

-- Soil Venting:

- Vacuum readings and extraction rates in scfm for each well. If a well is off line, list flow rate as "ZERO." Clearly denote on the table periods of system shutdown.
- Air concentrations in ppm_V or in mg/L for total VOCs.
- Total system contaminants removed in pounds and the pounds per day removal rate.

-- Natural Attenuation in Soil - no table needed.

Tables (Continued).

-- Ex Situ Soil Treatment Using Biopiles:

- If forced air ventilation is used:
  - System extraction rates in scfm.
  - Air concentrations in ppm_V for total VOCs.
  - Total system contaminants removed in pounds and the pounds per day removal rate.
  - Temperature.
- If passive ventilation is used, a table of temperatures.

-- Ex Situ Soil Treatment Using Landspreading/Thinspreading - no table is needed.

Acronyms and Abbreviations:

CFU/mL	colony forming units per milliliter
cm/sec	centimeters per second
DATCP	Department of Agriculture, Trade and Consumer Protection
DCOM	Department of Commerce
DNR	Department of Natural Resources
DO	Dissolved Oxygen
DRO	Diesel Range Organics
ES	Enforcement Standards in NR 140
FID	Flame Ionization Detector
ft/yr	feet per year
gpd	gallons per day
gpm	gallons per minute
GRO	Gasoline Rage Organics
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NR	prefix for rules established by the DNR
P.E.	Registered Professional Engineer
P.G.	Registered Professional Geologist
PAL	Preventative Action Limit in NR 140
PECFA	the state sponsored cleanup fund for certain petroleum contaminated sites
ppm_V	parts per million by volume (vapor phase only)
scfm	standard cubic feet per minute
TOC	Total Organic Carbon
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
µg/kg	micrograms per kilogram
µg/mL	micrograms per milliliter
VOC	Volatile Organic Compounds
Y/N	Yes or No

Section INS-3, Example Calculations for Determining the Biodegradation Rate on Forced Air Biopiles

Important Note: This page uses a nonproportional font and characters that are unique to WordPerfect. If the user received this document electronically, this page may need to be converted to a different font for the formulas to print correctly. The original font used for this page was prestige elite with 16.67 characters per inch.

Assumptions:

- The measurements at the stack are as follows:

  -- Average flow rate is 20 scfm.
  -- Average oxygen level extracted from biopile is 14.0 percent by volume.
  -- Average carbon dioxide level extracted from biopile is 3.5 percent by volume or 35,000 ppm_v.

- Atmospheric air contains 21 percent oxygen by volume and 400 ppm_v (or 0.04 percent) carbon dioxide. (Note: On each site visit, the consultant should check atmospheric air to assure that the instrument is spanned correctly.)

- Atmospheric air weight 0.0763 pounds per cubic foot at standard temperature and pressure (Gibbs, 1971).

- Average molecular weight of air is 28.97 (Gibbs, 1971) which is rounded off to 29, molecular weight of O_2 is 32, molecular weight of CO_2 is 44.

- For every pound of contaminants biodegraded, 3.3 pounds of oxygen is utilized and up to 3.2 pounds of carbon dioxide is generated.

  -- The stoichiometry of aerobic benzene biodegradation can be described as follows:

  $$C_6H_6 + 7.5\ O_2 \text{ -- -- --> } 6\ CO_2 + 3\ H_2O$$

  Based on this, benzene biodegradation requires that 3.07 pounds of oxygen are utilized to fully oxidize one pound of benzene, assuming no electron acceptors other than oxygen are used. Assuming no biomass is produced and no geochemical reactions consume carbon dioxide, 3.38 pounds of carbon dioxide is generated from one pound of benzene.

  -- The stoichiometry of aerobic hexane biodegradation can be described as follows:

  $$C_6H_{14} + 9.5\ O_2 \text{ -- -- --> } 6\ CO_2 + 7\ H_2O$$

  Based on the above assumptions, hexane biodegradation requires 3.52 pounds of oxygen and generates up to 3.06 pounds of carbon dioxide.

  Other hydrocarbons also require a similar ratio of oxygen for aerobic biodegradation. For purposes of this guidance it is assumed that a pound of petroleum contamination requires 3.3 pounds of oxygen and generates up to 3.2 pounds of carbon dioxide and 1.1 pounds of water in the biodegradation reaction.

Calculations:

Oxygen utilization rate:

$$(0.21 - 0.14) * \frac{32}{29} * 0.0763 \frac{\text{pounds}}{\text{ft}^3} * 20 \frac{\text{ft}^3}{\text{min}} * 60 \frac{\text{min}}{\text{hour}} \frac{\text{pounds}}{\text{hour}} = 7.07$$

Carbon dioxide production rate:

$$(0.035 - 0.0004) * \frac{44}{29} * 0.0763 \frac{\text{pounds}}{\text{ft}^3} * 20 \frac{\text{ft}^3}{\text{min}} * 60 \frac{\text{min}}{\text{hour}} \frac{\text{pounds}}{\text{hour}} = 4.81 \text{ -- -- -- -- -- -- -- --}$$

Calculations (Continued):

Biodegradation rate based on oxygen:

7.07 / 3.3 = 2.1 pounds per hour

Biodegradation rate based on carbon dioxide:

4.81 / 3.2 = 1.5 pounds per hour

Since the biodegradation rate is based on oxygen utilization and/or carbon dioxide generation, it is a measure of the overall biodegradation rate of all carbon sources, including natural organic carbon and any organic materials that were added. For this reason, the biodegradation rate is not specific to hydrocarbons and it is likely that the measured biodegradation rate will overestimate the rate of contaminant reduction.

Commonly the measured biodegradation rate based on carbon dioxide generation is less than the rate estimated with oxygen. Because of geochemical interferences and biomass formation, estimates based on carbon dioxide measurements are often low. If however the biodegradation rate estimate based on carbon dioxide is significantly greater than the estimate based on oxygen, it is likely that there is a measurement or calculation error. In this way, the carbon dioxide measurements can be used to double check the oxygen measurements and calculations.

NOT APPLICABLE

Appendix B

Shipping Documentation/Manifests
State of Wisconsin Annual Hazardous Waste Report

Please print or type.

ELECTRONIC IMAGE EMAILED TO GENERATOR ✓

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: WIR000133447
2. Page 1 of 1
3. Emergency Response Phone: (877) 818-0087
4. Manifest Tracking Number: 001997384 VES

5. Generator's Name and Mailing Address:
BETSY BISHOP, BETSY BISHOP
CHEMOURS BARKSDALE WORKS
17221 W 17TH PL
GOLDEN, CO 80401-2508

Generator's Phone: 303 216 2558

Generator's Site Address (if different than mailing address):
72315 STATE HIGHWAY 13
WASHBURN, WI 54891

6. Transporter 1 Company Name: VEOLIA ES TECHNICAL SOLUTIONS — U.S. EPA ID Number: NJD080631369

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address:
VEOLIA ES TECHNICAL SOLUTIONS
7 MOBILE AVENUE
SAUGET, IL 62201-1069

U.S. EPA ID Number: ILD098642424

Facility's Phone: 618 271-2804

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. NA3077, HAZARDOUS WASTE, SOLID, n.o.s., (DINITROTOLUENE (TRACE) IN SOIL, LEAD), 9, III, RQ (D030, D008) 60-4084	1	CM	~~5.5~~ 6 10/18/21	T	D007	D030	
						D008		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
ER Service Contracted by VESTS -|- OU36190WY -|- Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf. -|- 1) ERG:171 W:781462 A:TWI374340

CRG 508001 PO # 9900296962 Box VE 3017

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Elizabeth Bishop — Signature: [signature] (On behalf of Chemours) — Month 10 Day 18 Year 21

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: TOM MONDLOCH — Signature: [signature] — Month 10 Day 18 Year 21
Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H040			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Cynthia Williams — Signature: [signature] — Month 10 Day 19 Year 21

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

Date: 11-29-2021

BILL OF LADING

SHIP FROM

Name: Chemours Barksdale Works
Address: 72315 Highway 13
City/State/Zip: Ashland, WI 54806
SID#: FOB: ☐

Bill of Lading Number: 2021-011

BAR CODE SPACE

SHIP TO

Name: US Army Corps of Eng. - S. Larson Location #:
Address: 3909 Halls Ferry Road
City/State/Zip: Vicksburg, MS 39180
CID#: 601-262-1909 FOB: ☐

CARRIER NAME: XPO 6
Trailer number:
Seal number(s):

SCAC:
Pro number: 77201000-WH06-507987

BAR CODE SPACE

THIRD PARTY FREIGHT CHARGES BILL TO:

Name: Chemours- c/o Cass Information Systems
Address: PO Box 17628
City/State/Zip: St. Louis, MO 63178

Freight Charge Terms:
Prepaid ______ Collect ______ 3rd Party X

☐ (check box) Master Bill of Lading: with attached underlying Bills of Lading

SPECIAL INSTRUCTIONS:
Pay against Chemours sourcing & logistics, special services .
Chemours charge code: 507987

CUSTOMER ORDER INFORMATION

CUSTOMER ORDER NUMBER	# PKGS	WEIGHT	PALLET/SLIP Y	PALLET/SLIP N	ADDITIONAL SHIPPER INFO
					24 hour emergency contact #
					800-424-9300
GRAND TOTAL					

CARRIER INFORMATION

HANDLING UNIT QTY	HANDLING UNIT TYPE	PACKAGE QTY	PACKAGE TYPE	WEIGHT	H.M. (X)	COMMODITY DESCRIPTION Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation with ordinary care. *See Section 2(e) of NMFC Item 360*	LTL ONLY NMFC #	LTL ONLY CLASS
1	8 g	01	4G	9 p	X	UN1354 Trinitrotoluene, wetted,		4.1
						(with not less than 30%water),4.1,I		
							RECEIVING	
							STAMP SPACE	
				9 p				
1		1				GRAND TOTAL		

Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows:

"The agreed or declared value of the property is specifically stated by the shipper to be not exceeding ______ per ______."

COD Amount: $ ______

Fee Terms: Collect: ☐ Prepaid: ☐
Customer check acceptable: ☐

NOTE Liability Limitation for loss or damage in this shipment may be applicable. See 49 U.S.C. - 14706(c)(1)(A) and (B).

RECEIVED, subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and shipper, if applicable, otherwise to the rates, classifications and rules that have been established by the carrier and are available to the shipper, on request, and to all applicable state and federal regulations.

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

______ Shipper Signature

SHIPPER SIGNATURE / DATE
This is to certify that the above named materials are properly classified, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT. All cargo tendered for transportation is subject to inspection. By tendering ...

[signature] 11-29-21

Trailer Loaded:
☐ By Shipper
☑ By Driver

Freight Counted:
☑ By Shipper
☐ By Driver/pallets said to contain
☐ By Driver/Pieces

CARRIER SIGNATURE / PICKUP DATE
Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has the DOT emergency response guidebook or equivalent documentation in the vehicle.

[signature] 11-30-21

11/30/21 DN

Hazardous Waste Annual Report 2021

Facility Name	FORMER DUPONT BARKSDALE WORKS	DNR Contact	DNR Waste and Materials Management
Facility ID	804009140	e-mail	DNRHazardousWasteReporting@wisconsin.gov
EPA ID	WIR000133447	Telephone	

Site Details

Site Name	FORMER DUPONT BARKSDALE WORKS
Site Land Type	Private
Location Address	72315 STH 13 BARKSDALE WI,54806
Mailing Address	500 W JEFFERSON ST STE 1600 LOUISVILLE KY,40202
Owner	BRETTING DEVELOPMENT CORP 3401 LAKE PARK RD ASHLAND, WI 54806 715-682-5231
Operator	THE CHEMOURS COMPANY FC LLC 500 WEST JEFFERSON STREET, SUITE 1600 LOUISVILLE, KY 40202 Bradley.S.Nave@chemours.com 715-373-2100
HW Contact	BRADLEY NAVE 500 W JEFFERSON ST STE 1600 LOUISVILLE, KY 40202 BRADLEY.S.NAVE@CHEMOURS.COM 812-923-1136

This information has been retrieved from the Federal EPA's RCRAInfo System. If any of this information is incorrect, please update it at the RCRAInfo site or submit a RCRA 8700-12 Form. The completed RCRA 8700-12 Form should be emailed to the DNR contact listed at the top of this report.

Generator Status

Please identify the generator status of your facility at the time of this report submittal. This information will be used to update your information with US EPA via RCRAInfo and will be used to meet the notification or re-notification requirements.

- ○ Large Quantity Generator - Generates in any calendar month 1,000 kg (2,205 lbs) or more of hazardous waste. Generates in any calendar month, or accumulates at any time 1 kg (2.2 lbs) or more of acute hazardous waste. Generates in any calender month, or accumulates at any time, 100kg (220lbs) or more of acute hazardous waste spill cleanup material.
- ● Small Quantity Generator - Generates in every calendar month less than 1,000 kg (2,205 lbs) of hazardous waste. Generates in every calender month no more than 1 Kg (2.2 lbs) of acute hazardous wastes: and no more than 100kg (220lbs) of acute hazardous waste spill cleanup material. Accumulates no more than 6,000kg (13.320 lbs) of hazardous waste. Accumulates no more than 1 Kg (2.2 Lbs) of acute hazardous waste or 100kg (220 lbs) of acute hazardous waste spill clean up material.
- ○ Very Small Quantity Generator - Generates in every calendar month no more than 100 kg (220 lbs) of hazardous waste. Generate in every calender month no more than 1 kg (2.2 lbs) of acute hazardous waste and no more than 100kg (220lbs) of acute hazardous waste spill cleanup material. Accumulates at all times no more than 1,000kg(2,205 lbs) of hazardous waste. Accumulates at all times no more than 1 kg (2.2 lbs) of acute hazardous waste or 100 kg(220 lbs) of acute hazardous waste spill cleanup material.
- ○ Non Generator - No longer generates hazardous waste. Note: Select this option if this facility did not generate, and does not plan to generate, any hazardous waste this year.

Environmental Management System (EMS)

An EMS is a tool to help your organization understand its environmental impacts and systematically operate more efficiently by reducing energy usage, minimizing waste and reducing pollution. Proactively addressing environmental impacts helps your organization protect public health and Wisconsin's natural resources, find and utilize the most cost effective corrective measures and avoid costly noncompliance fees.
DNR website for more EMS info: dnr.wi.gov/topic/greentier/ems.html
US EPA for more EMS info: www.epa.gov/ems

Do you have a formal environmental management system (EMS)? ○ Yes ● No

North American Industry Classification System (NAICS)

Enter all NAICS codes that describe your facility business processes (One code must be designated as primary)
Introduction to NAICS

NAICS Code	Name	Primary
325920	EXPLOSIVES MANUFACTURING	True

Submittal Contact

A facility may have several users with reporting roles who can open, fill, save, and validate this form. The Signatory is the only person who can open, fill, save, validate, submit and sign this report.

To complete the Annual Hazardous Waste Reporting process the Signatory must be current and correct for this facility.

Your facility's current Signatory for this report:
ELIZABETH BISHOP 17221 W. 17TH PLACE GOLDEN, CO elizabeth.bishop@aecom.com 303-216-2558

Signatory contact updates are requested through the DNR Switchboard System. The system will show all the people who have reporting roles for this facility (including secondary contacts who can also open, update, and save data to the report).
Updates to contact information and requests for these roles must be done by the person for whom the request is being made (individuals can request roles for themselves, and request updates to their own contact information). Any person with Switchboard access to a facility can request removal of people who are no longer associated with the facility.

Type of Regulated Waste Activity (WA)

The DNR database indicates you were a Small Quantity Generator in the report year.

Did FORMER DUPONT BARKSDALE WORKS generate hazardous waste? (●) Yes ( ) No

Please identify your facility generator status based on the amount your facility generated during the reporting year OR the higher generator status your facility chose to operate under for the reporting year. This information will ensure you report the correct information and is used to determine Federal reporting requirements and your state hazardous waste generator fee.

(●) Large Quantity Generator - Generates in any calendar month 1,000 kg (2,205 lbs) or more of hazardous waste. Generates in any calendar month, or accumulates at any time 1 kg (2.2 lbs) or more of acute hazardous waste. Generates in any calender month, or accumulates at any time, 100kg (220lbs) or more of acute hazardous waste spill cleanup material.

( ) Small Quantity Generator - Generates in every calendar month less than 1,000 kg (2,205 lbs) of hazardous waste. Generates in every calender month no more than 1 Kg (2.2 lbs) of acute hazardous wastes: and no more than 100kg (220lbs) of acute hazardous waste spill cleanup material. Accumulates no more than 6,000kg (13.320 lbs) of hazardous waste. Accumulates no more than 1 Kg (2.2 Lbs) of acute hazardous waste or 100kg (220 lbs) of acute hazardous waste spill clean up material.

( ) Very Small Quantity Generator - Generates in every calendar month no more than 100 kg (220 lbs) of hazardous waste. Generate in every calender month no more than 1 kg (2.2 lbs) of acute hazardous waste and no more than 100kg (220lbs) of acute hazardous waste spill cleanup material. Accumulates at all times no more than 1,000kg(2,205 lbs) of hazardous waste. Accumulates at all times no more than 1 kg (2.2 lbs) of acute hazardous waste or 100 kg(220 lbs) of acute hazardous waste spill cleanup material.

Short Term Generator. If "Yes", provide a detailed description of the short-term generation event in the Short Term Comment. If the event has ended, provide the end date. No

Short Term Comment

Treat, Store or Dispose of Hazardous Waste: No

When did the facility last file closure cost and long term cost estimates?

Receives Hazardous Waste from Off-site ( ) Yes (●) No

Recycler of Hazardous Waste ( ) Yes (●) No

Exempt Boiler and/or Industrial Furnace ( ) Yes (●) No

Publicly Owned (Wastewater) Treatment Works (POTW) that accepts hazardous waste (via truck, rail, or dedicated pipe) for treatment, and complies with s. NR 670.001(3)(b)9. ( ) Yes (●) No

Permanent "Household and Very Small Quantity Generator Hazardous Waste Collection Facility" that ships hazardous waste off-site to a licensed or permitted hazardous waste treatment, storage or disposal facility, or to a recycling facility ( ) Yes (●) No

Waste Codes for Regulated Hazardous Wastes

Please list the waste codes for all hazardous wastes handled at your site.

D030, D007, D008

Additional Regulated Waste Activities

Other Waste Activities

	Yes	No
Transporter of Hazardous Waste	○ Yes	● No
Under Ground Injection Control	○ Yes	● No
United States Importer of Hazardous Waste	○ Yes	● No
Recognized Trader	○ Yes	● No
Importer/Exporter of Spent Lead□Acid Batteries (SLABs) under 40 CFR 266 Subpart G	○ Yes	● No

Universal Waste Activities

	Yes	No
Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more)	○ Yes	● No
Destination Facility for Universal Waste	○ Yes	● No

Used Oil Activities

	Yes	No
Used Oil Transporter	○ Yes	● No
Used Oil Processor and/or Re-refiner	○ Yes	● No
Off-specification Used Oil Burner	○ Yes	● No
Used Oil Fuel Marketer	○ Yes	● No

Pharmaceutical Activities

	Yes	No
Operating under NR 666, Subchapter P for the management of hazardous waste pharmaceuticals	○ Yes	● No
Withdrawing from operating pharmaceutical Activities NR 666, Subchapter P	○ Yes	● No

Eligible Academic Entities with Laboratories: Notification for opting into or withdrawing from managing laboratory hazardous wastes per NR 662 Subchapter K

	Yes	No
Opting into or currently operating under NR 662 Subchapter K for the management of hazardous wastes in laboratories	○ Yes	● No
Withdrawing from NR 662 Subchapter K for the management of hazardous wastes in laboratories	○ Yes	● No

LQG Consolidation of VSQG Hazardous Waste

	Yes	No
Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)?	○ Yes	● No

Notification of LQG Site Closure for CAA or Site

	Yes	No
LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility	○ Yes	● No

Notification of Hazardous Secondary Material (HSM) Activity

Have you notified under 40 CFR 260.42 that you are managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), (25), or (27)?* *IF you must notify that facility will begin managing excluded HSM or failed to notify prior to starting, facility must submit an 8700-12 form with the HSM addendum separately from this report.	No

Reason for Notification

◯ Facility will begin managing excluded HSM (I)

◯ Facility is still managing excluded HSM/renotifying as required (R)

◯ Facility has stopped managing excluded HSM(S)

Description of Excluded HSM Activity. Please list the appropriate codes and quantities, in short tons, to describe your excluded HSM activity ONLY (do not include any information regarding your hazardous wastes). Use the Add Button to add additional lines."

Facility Code	Waste Codes for HSM	Estimate Short Tons of excluded HSM to be managed annual	Actual Short Tons of excluded HSM that was managed during the most recent odd-numbered year	Land-based Unit Code

Electronic Manifest Broker

Are you notifying as a person, as defined in s. NR 660.10(90) Wis. Admin. Code, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?
Find out more at US EPA e-Manifest data system

◯ Yes ◉ No

Regulated Waste Activity Comments

Comment

Short-term generator due to ongoing remediation pilot scale testing under a WDNR-approved Hazardous Waste Variance. Short -term event from August 18, 2021 to October 18, 2021. (1) roll-off box of hazardous soil & debris from treatment cell construction.

Waste Generation and Management (GM)

Waste Description

Bulk soil and debris with trace Dinitrotoluene

Waste Codes
D030 - 2,4-DINITROTOLUENE
D007 - CHROMIUM
D008 - LEAD

Source Code	Management Method (only for Source Code G25)	Country Code (only for Source Code G62)
G44 - State program or voluntary cleanup		

Form Code	Waste Minimization Code	Radioactive Mixed
W301 - Contaminated soil	A - Continued initiatives to reduce quantity and/or toxicity of this waste	No

Quantity	Unit of Measure (UOM)	Density (only for UOM gallon, liter, or cubic yard)	Unit (only for UOM gallon, liter, or cubic yard)
12620	Pounds		lbs/gal

On-site Generation and Management

Was any of this waste that was generated at this facility treated, disposed, and/or recycled on-site?

No

	Management Method	Quantity
Process System 1		
Process System 2		

Off-site Shipment of Hazardous Waste

Was any of this waste shipped off-site in the reporting year for treatment, disposal, or recycling?

Yes

	EPA ID	Management Method	Total Quantity Shipped
Site 1	ILD098642424	H040 - Incineration - thermal destruction other than use as a fuel (includes any preparation prior to burning)	12,620.00
Site 2			
Site 3			
Site 4			

Comments

Disposal of contaminated soil and debris from ongoing remediation pilot testing of nitrotoluene residuals

Fee Worksheet (FW)

A. Identified Generator Status During Report Year: Large Quantity

Base Fee for reported generator status: 470.00

B. Amounts generated and tonnage fee exempted

1. Total amount of hazardous waste generated at your site during the reporting year (in lbs.): 12,620.00

2. Amount(s) of waste exempted from tonnage fee. Please answer the following:

2a: Was any of the generated hazardous waste recovered for recycling or reuse (including hazardous wastes burned for the purpose of energy recovery)? ○ Yes ● No

2b: Was any of the generated hazardous waste a leachate that was transported to a wastewater treatment plant or discharged directly to a sewer pipe? ○ Yes ● No

2c: Was any of the generated hazardous waste removed from the site to repair environmental pollution? ● Yes ○ No

Amount Removed (in lbs): 12,620.00

2d: Was any of the generated hazardous waste collected by a municipality under its household hazardous waste collection program or by a county under its agricultural chemical waste collection program? ○ Yes ● No

Total Exemptions: 12,620.00

Net Waste (Generated minus Exemptions) (in lbs.): 0.00

Tonnage Fee Estimate: 0.00

Total Fee Estimate (Base plus Tonnage): 470.00

Digital Signature Receipt

This is the electronic signature receipt. This receipt contains information about the document submitted, who signed it, when it was signed, and other technical information that may be used by the Department of Natural Resources to prove the authenticity of the document. This receipt is securely stored in the electronic signature system with the submitted document and neither the document nor this receipt can be altered. Electronic signatures are authorized under Wis. Stat. ch. 137 and have the same legal recognition as ink signatures on paper.

Document ID:	2SUYB
Document Description:	Test Signature File
File Name:	HazardousWaste_Annual_29691.pdf
File Size [KB]:	85
Wisconsin User ID (WAMS):	Barksdale
User Name:	Elizabeth Bishop
User Verified Status:	
Temporary PIN Sent To:	elizabeth.bishop@aecom.com
Signature ID:	2SUVJ
Signature Date/Time:	2/10/2022 10:21:13 AM
Certification Statement:	I certify, under penalty of law, that the information provided in this document is, to the best of my knowledge and belief, true, accurate, and complete. I understand that there are significant civil and criminal penalties, including fines, imprisonment, or both, for submitting false, inaccurate, or incomplete information.

For DNR Use Only:

User IP Address:	71.56.197.25	Public Key Type:	RSA-2048	Hash Type:	SHA-512

Temporary PIN Hash Value:	D548C45AF7901B4E6548FCA10CF4064EEF634971D8EABE41CE9F929016BD85A7783E8F32AA9FF58B1CF6B90545CB4E77328DC5267203725424AFA7E13D9835A7
Public Key Value:	0602000000A40000525341310008000001000100 5FF938AEB69BD9066AAFF840CEA04AEBFB6713381607552 5827FED3B75F70FABAEB64C1B149D83B9B367C10303B612F305CB0058719AF178210C3B23FB29F8A985523A2295E86821BC8BA53F025223091927B68634578A786DB87534459D5FBDAB788871E9D4C4E1331483533D4D1BD576B6AAF168EB495C8EF4A57A720D133A86B46BADA6668CBFD8459599A2813E6AB1A04A37DBAB1D1CB39C81CD51C567AAA9EC8D8B41DEDF6207F909DA9D84925A6C6DE4FB00B875B641DF97898B0963F12DA2DFAC0D1147119B48DAEF1514778105A64409A01F47028CE541F4D168969BE3B2B9157EB85BC20BBE6119687189E752170F4381CF5CEFDD2C551A44DB73CA
Document Hash Value:	6B55101F30215265B50EAF83F255313A6729BE2D068FB6FC07C4AEF070D3D010590289277303F97272116B96F0842BED1AE4FDBE93D29B3846268CA75CBC0059
Document Signature Value:	9BE84AAC3522E7216A936B19DBE24EA62F73DB293015736C5538CBBD4F89C4657651DCE426FBF0F048BDEC9F320A23677D57E64E480751B003D7F97D0ED2CB829A0FDEF58C7AE6A7F7E9699EF3A6B0617DE2ADE5B182032DF3C40AF7E644675D87D3F191F4BB34F7D568DF0EA4D476B63B97F379279FD2FD1CA721D9D3127710558913D98D25A742976F337A39628C6BD1090C1293BFC93DDC35BD4D969ED8C18CF9EFB7400AB203EDCA7B287BDDE4386ED7375DCDD4E66BEC90B76E5FDC6C1C90262C573E8F93E0954030CE9D07166363E7671536188BBED67F1644954F5D0B7D3D845246AFE6308AB53A8E40DEC718DADB597D439027BF174D08439864107F

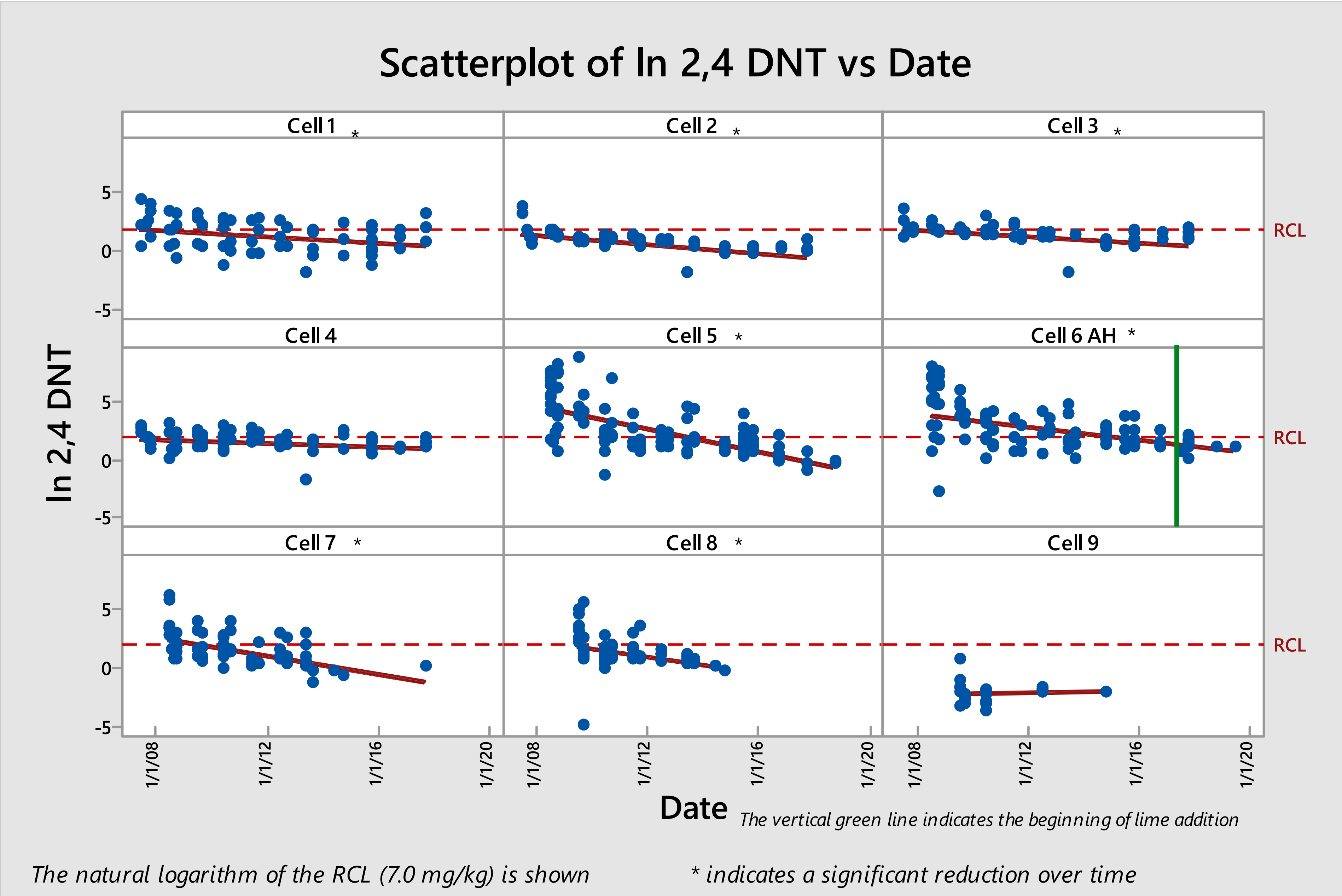
Appendix C

Barksdale Summary Graphs
2021 Year End

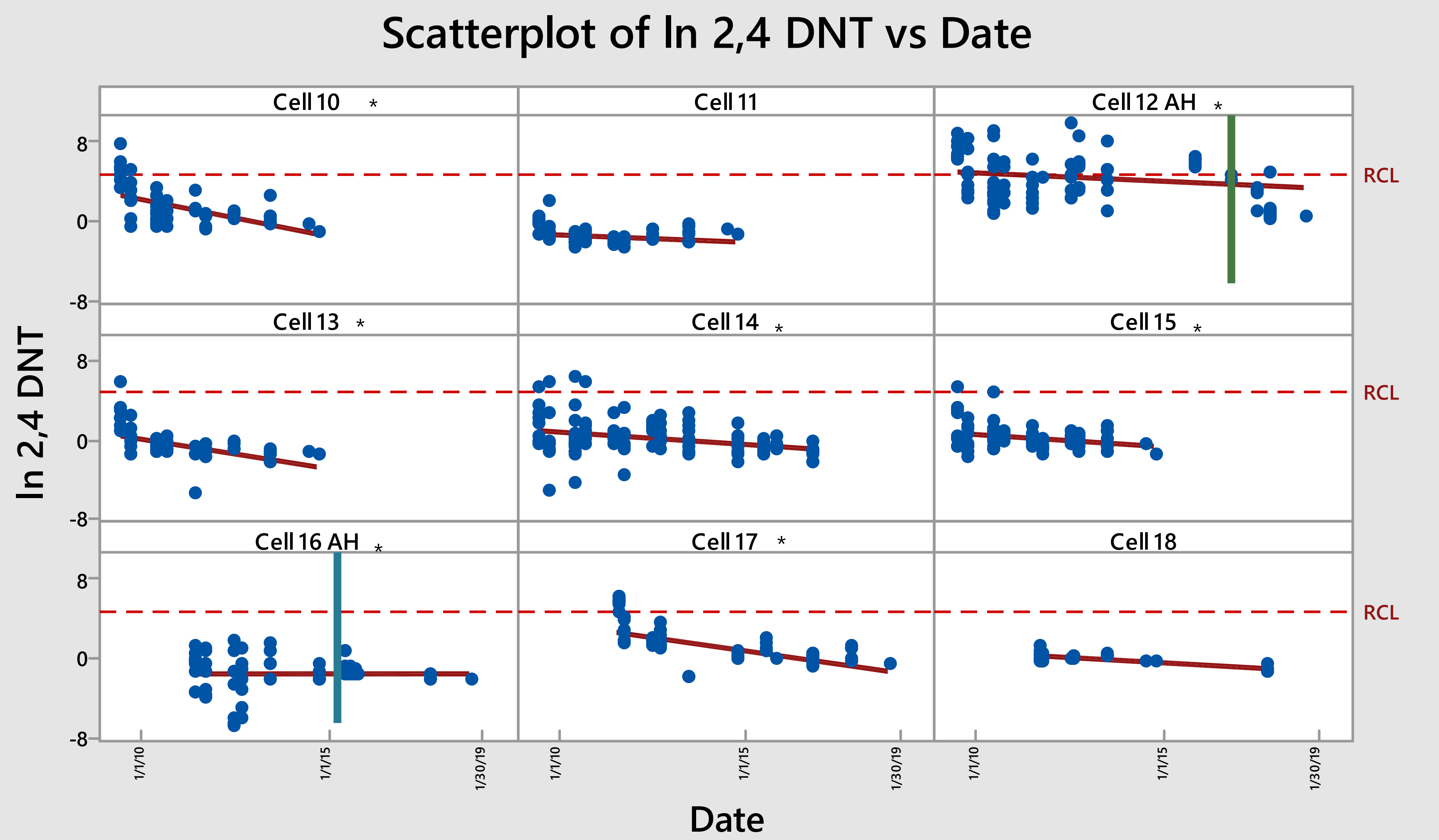
Barksdale Summary Graphs 2021Year End

DNT, TNT, DNX, TNX,

NB, Amino DNT



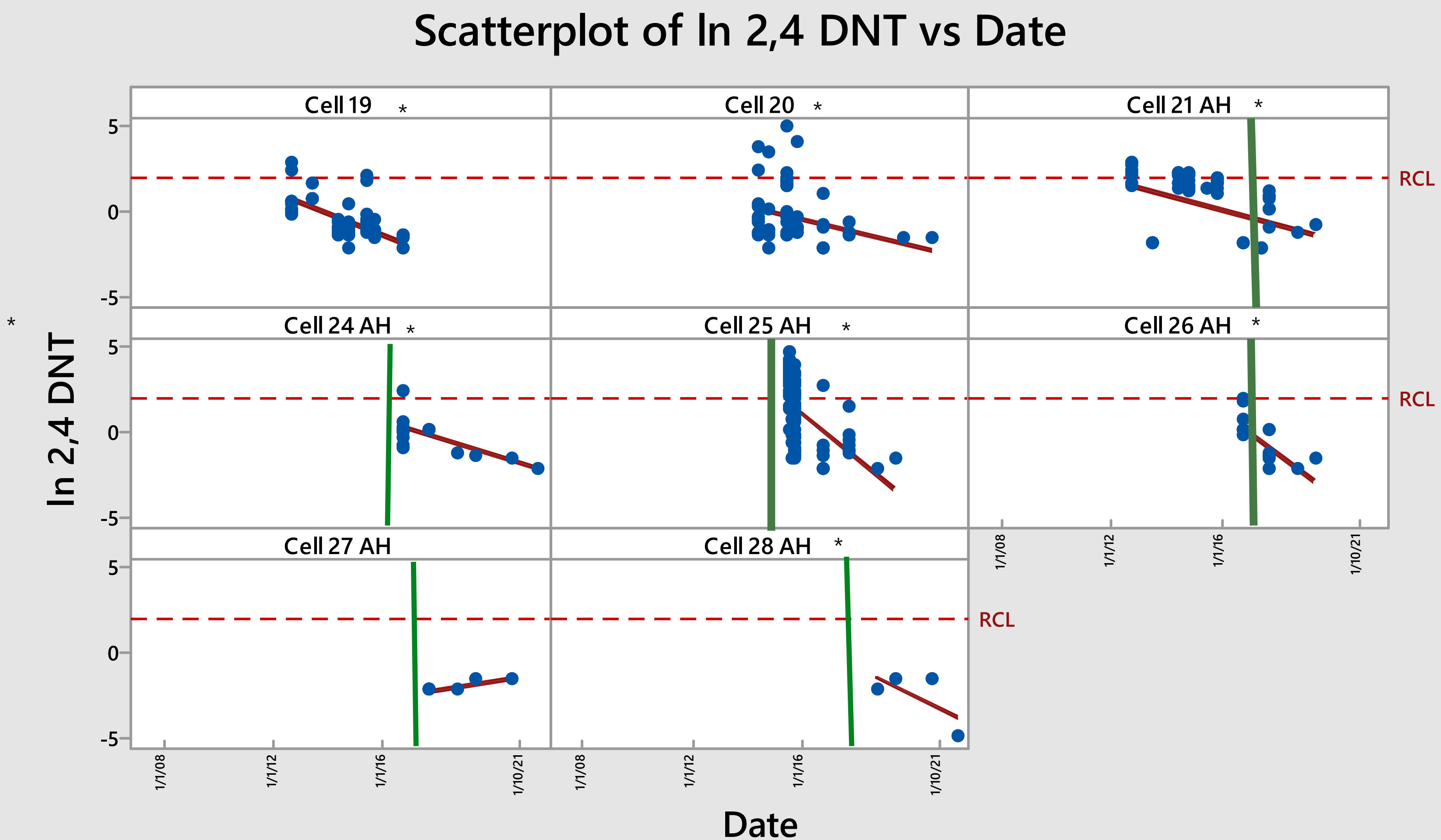
Scatterplot of ln 2,4 DNT vs Date
Cell 1 *
Cell 2 *
Cell 3 *
Cell 4
Cell 5 *
Cell 6 AH *
Cell 7 *
Cell 8 *
Cell 9
RCL
RCL
RCL
5
0
-5
ln 2,4 DNT
1/1/08
1/1/12
1/1/16
1/1/20
Date
The vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* indicates a significant reduction over time



Vertical green line indicates the beginning of lime addition

The natural logarithm of the RCL (7.0 g/kg) is shown

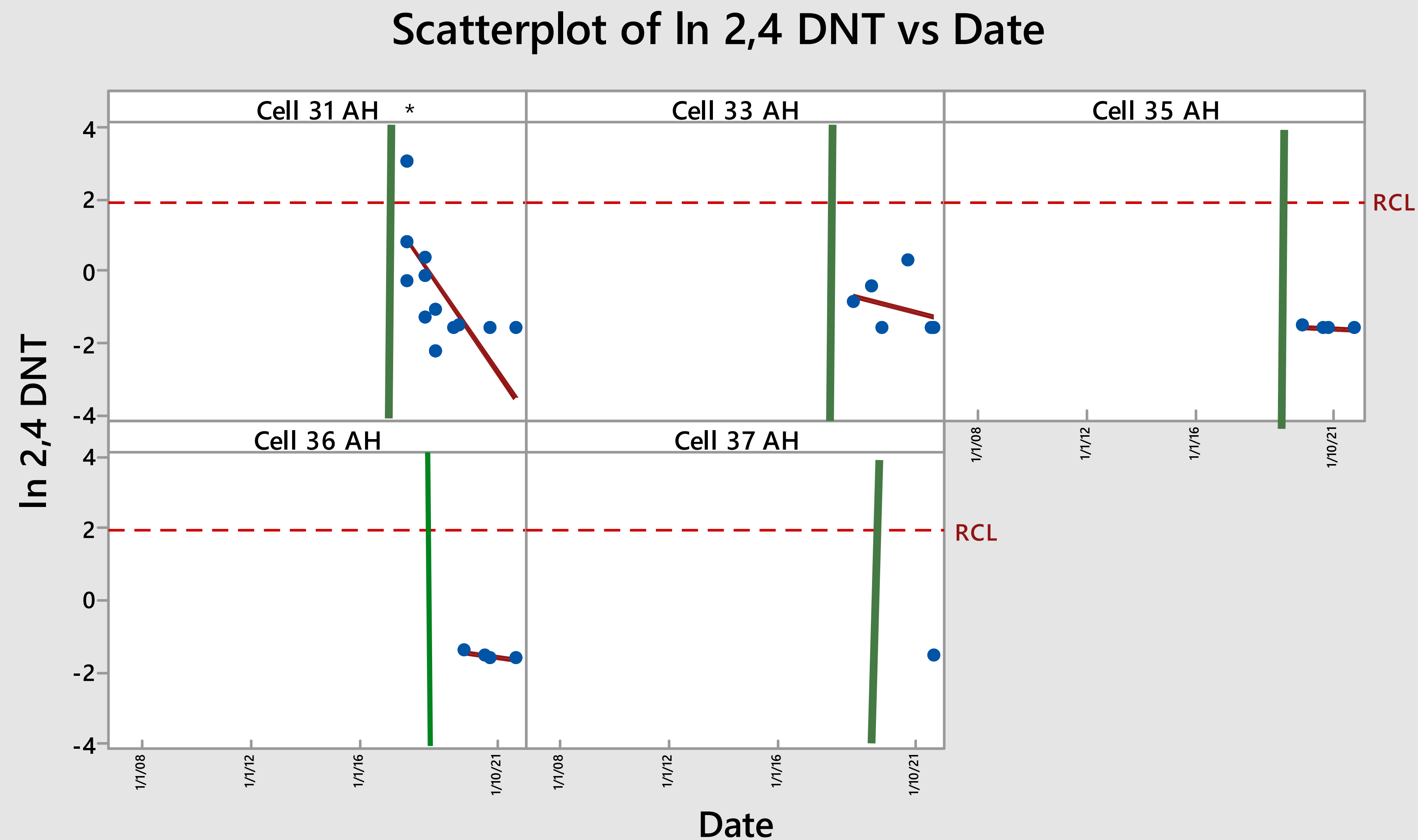
** Indicates a significant reduction over time*



Vertical green line indicates beginning of lime addition

The natural logarithm of the RCL (7.0 mg/kg) is shown.

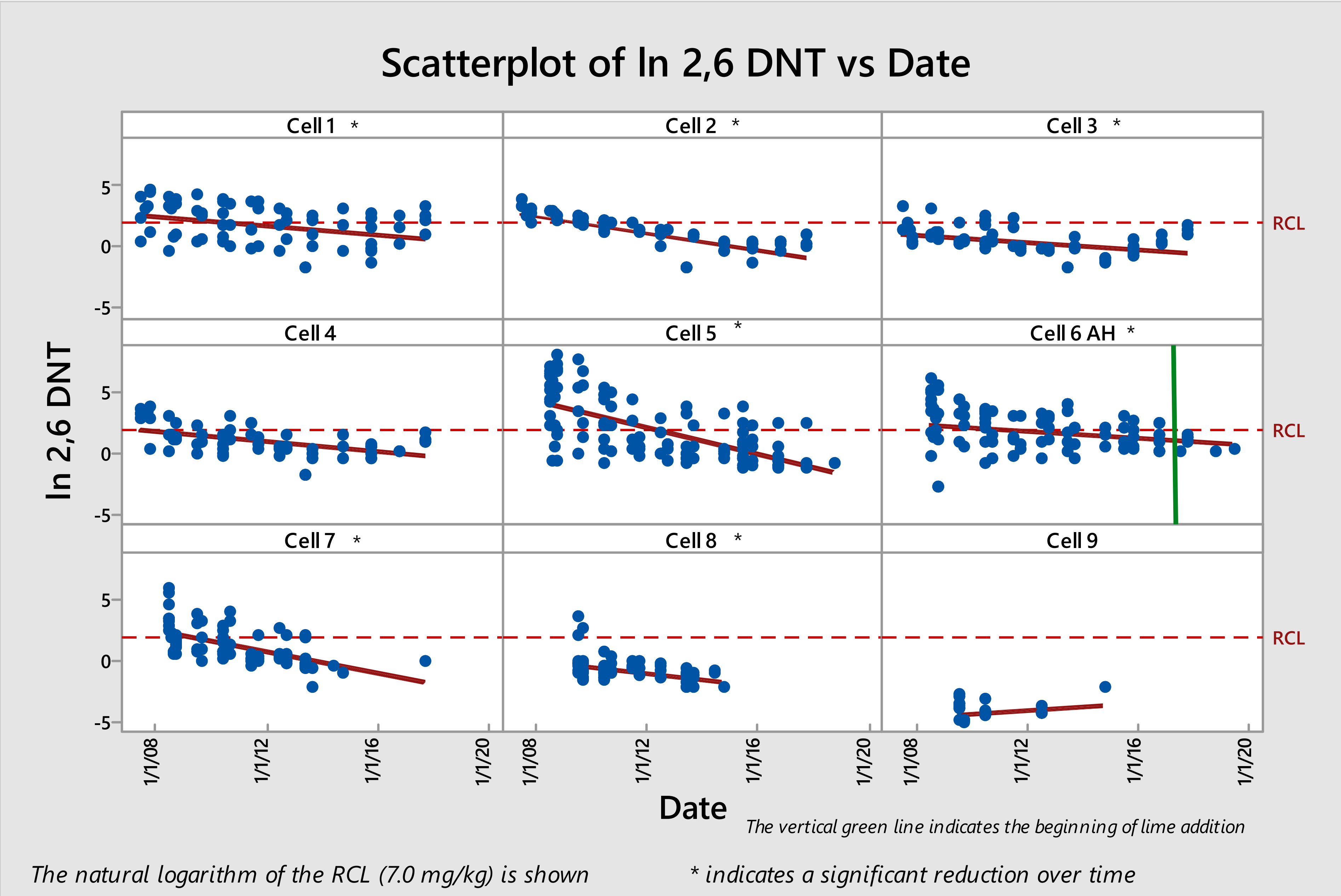
** Indicates a significant reduction over time*

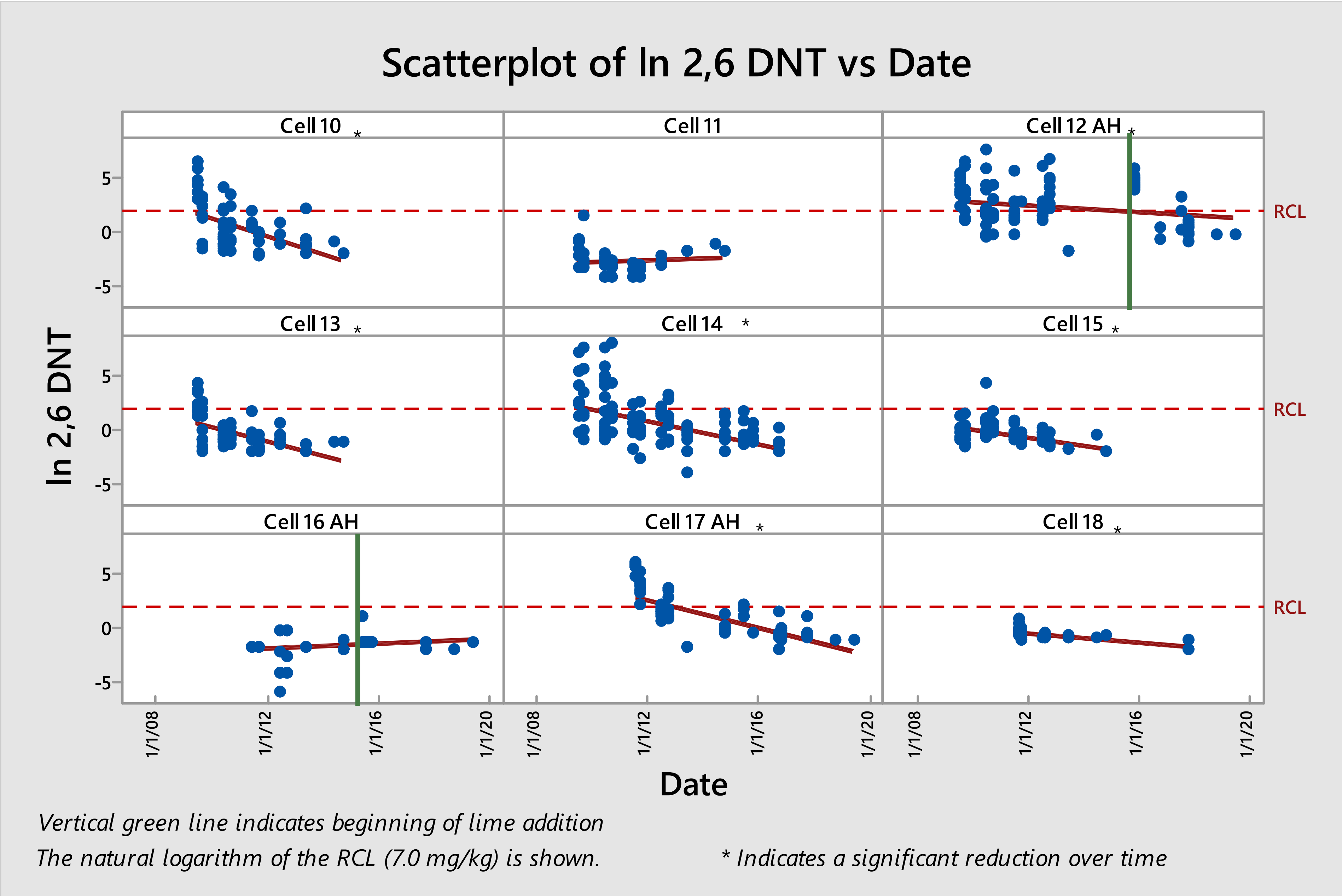


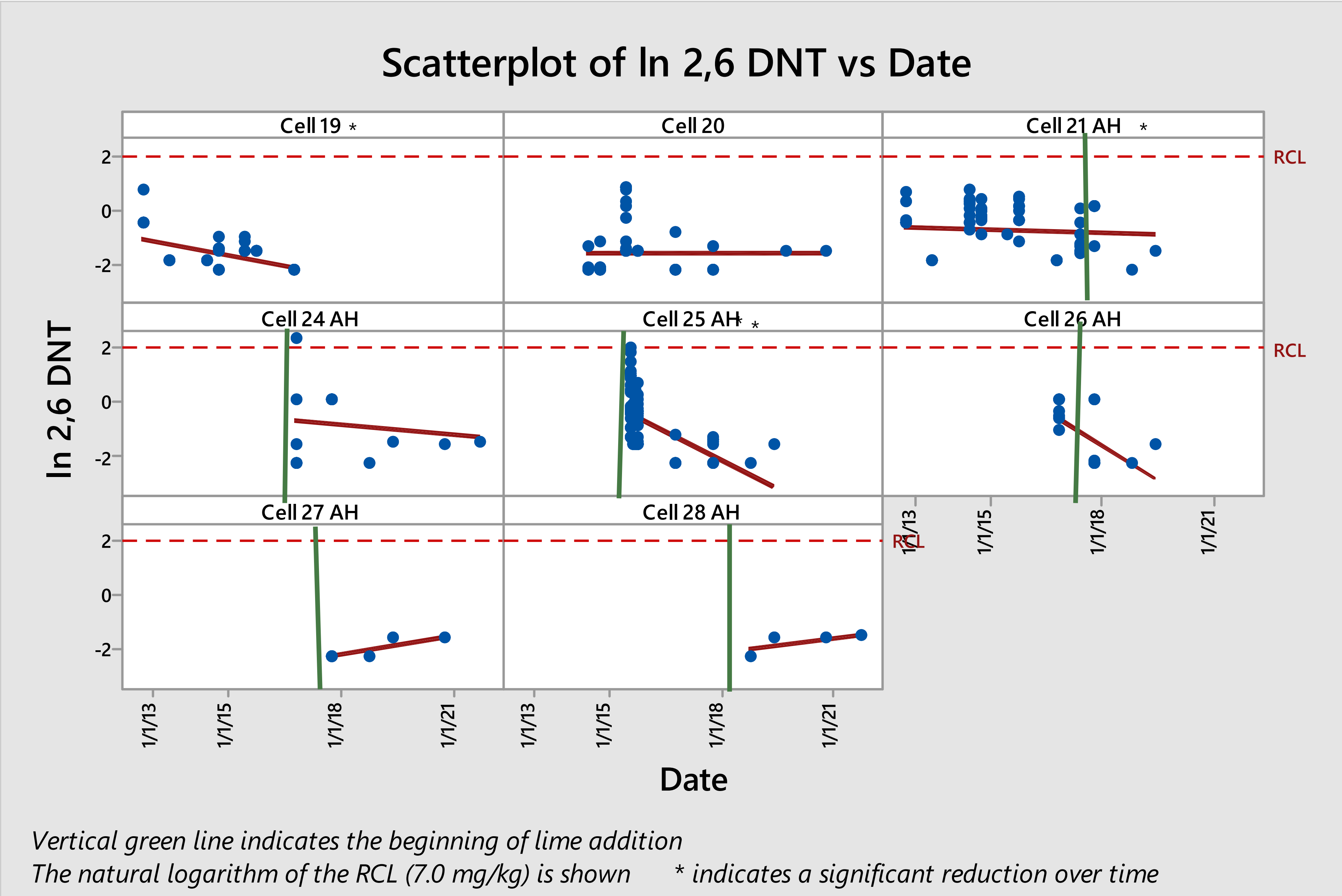
Vertical green line indicates beginning of lime addition

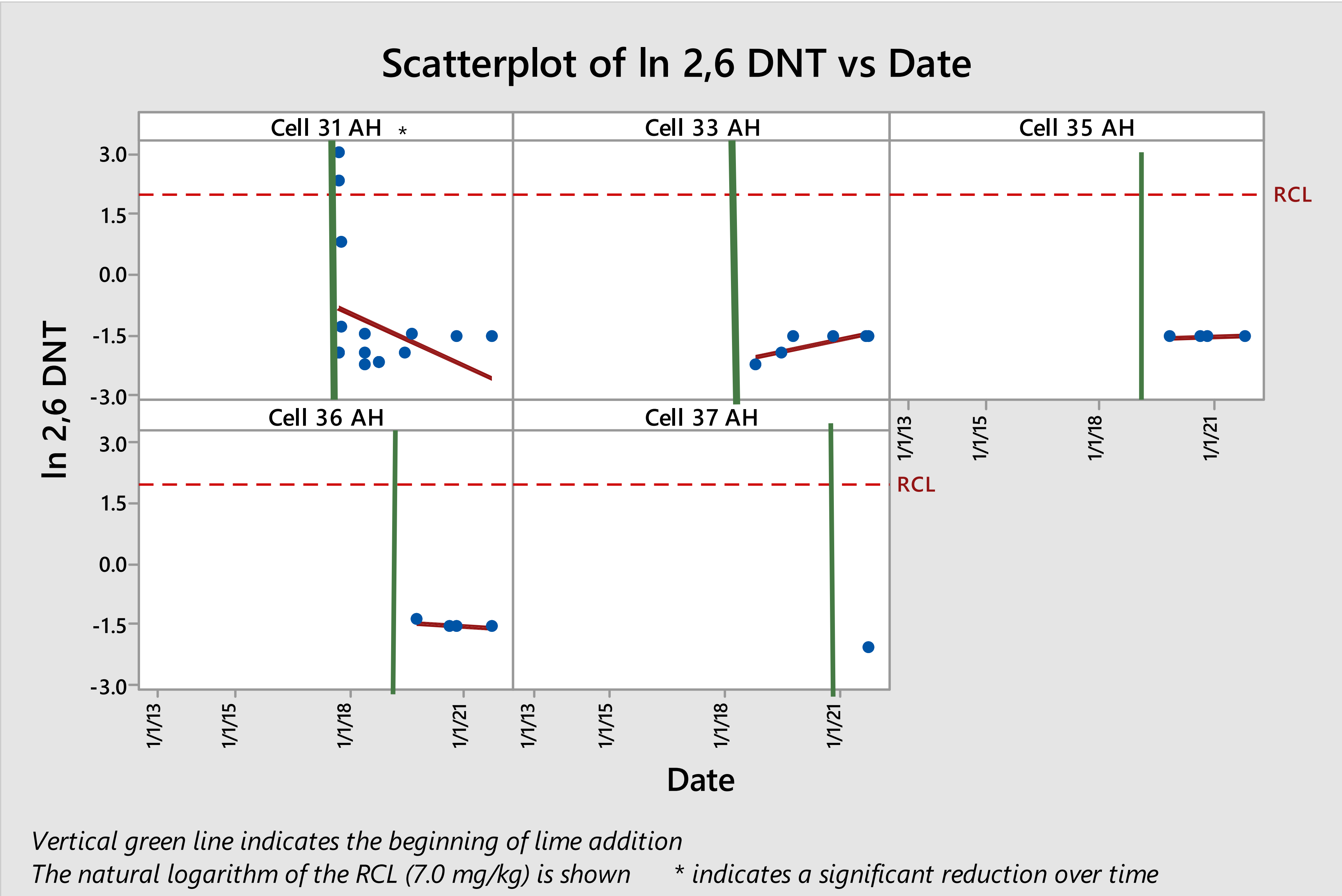
The natural logarithm of the RCL (7.0 mg/kg) is shown.

** Indicates a significant reduction over time*

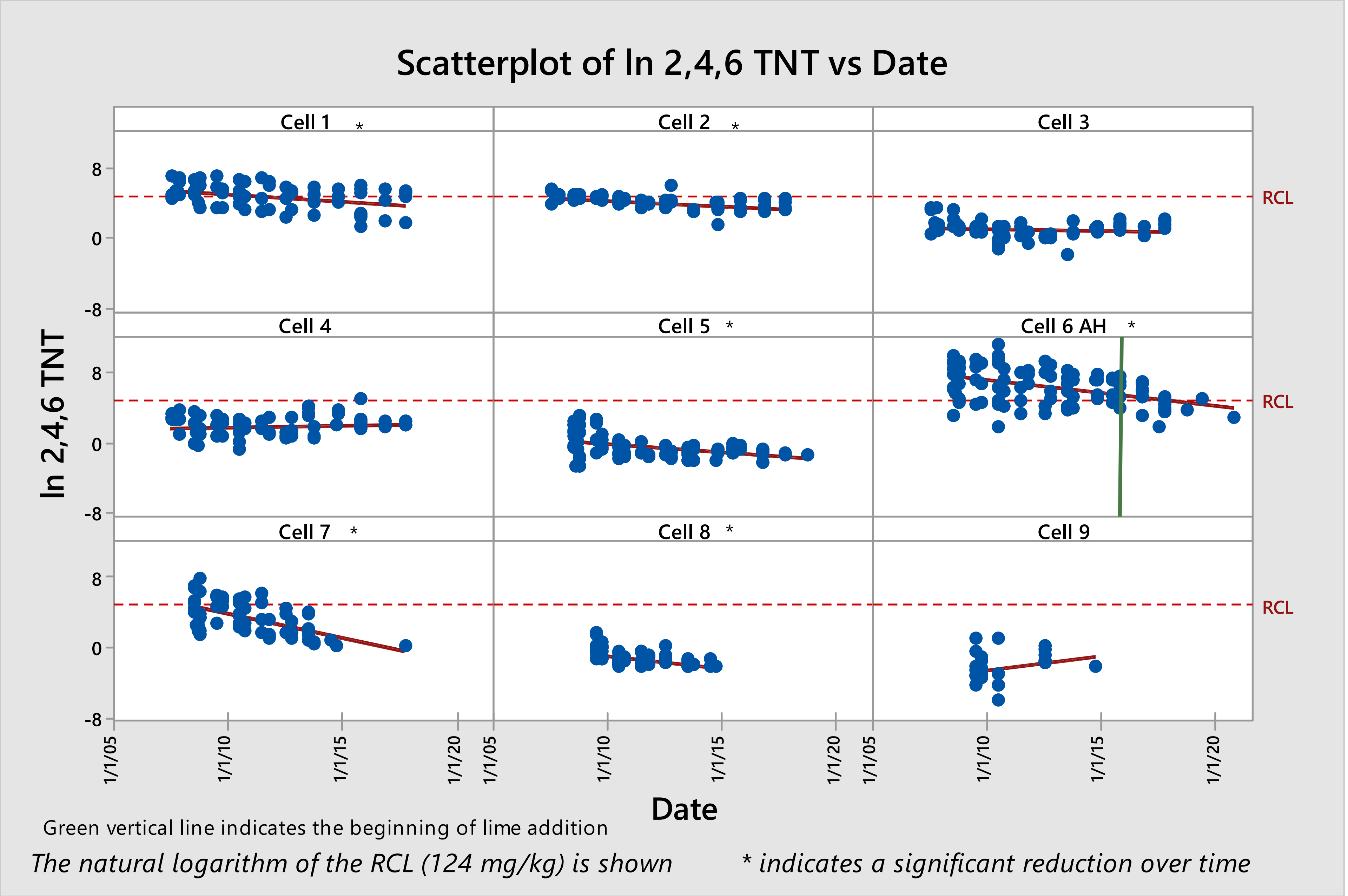

Scatterplot of ln 2,6 DNT vs Date
Cell 1 *
Cell 2 *
Cell 3 *
Cell 4
Cell 5 *
Cell 6 AH *
Cell 7 *
Cell 8 *
Cell 9
5
0
-5
RCL
ln 2,6 DNT
1/1/08
1/1/12
1/1/16
1/1/20
Date
The vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* indicates a significant reduction over time


Scatterplot of ln 2,6 DNT vs Date
Cell 10 *
Cell 11
Cell 12 AH *
Cell 13 *
Cell 14 *
Cell 15 *
Cell 16 AH
Cell 17 AH *
Cell 18 *
RCL
RCL
RCL
5
0
-5
ln 2,6 DNT
1/1/08
1/1/12
1/1/16
1/1/20
Date
Vertical green line indicates beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown.
* Indicates a significant reduction over time

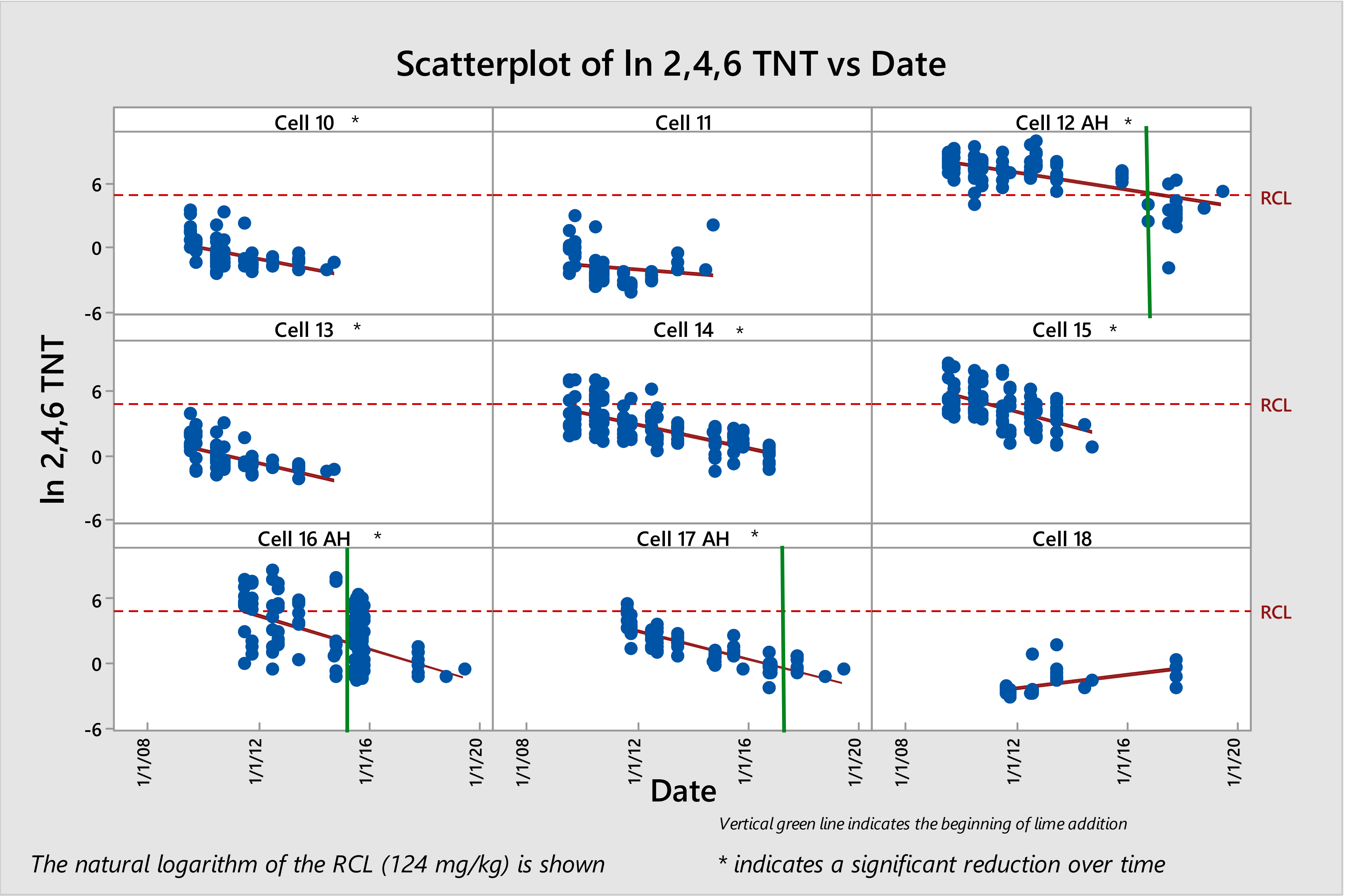

Scatterplot of ln 2,6 DNT vs Date
Cell 19 *
Cell 20
Cell 21 AH *
Cell 24 AH
Cell 25 AH *
Cell 26 AH
Cell 27 AH
Cell 28 AH
RCL
2
0
-2
1/1/13
1/1/15
1/1/18
1/1/21
ln 2,6 DNT
Date
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* indicates a significant reduction over time



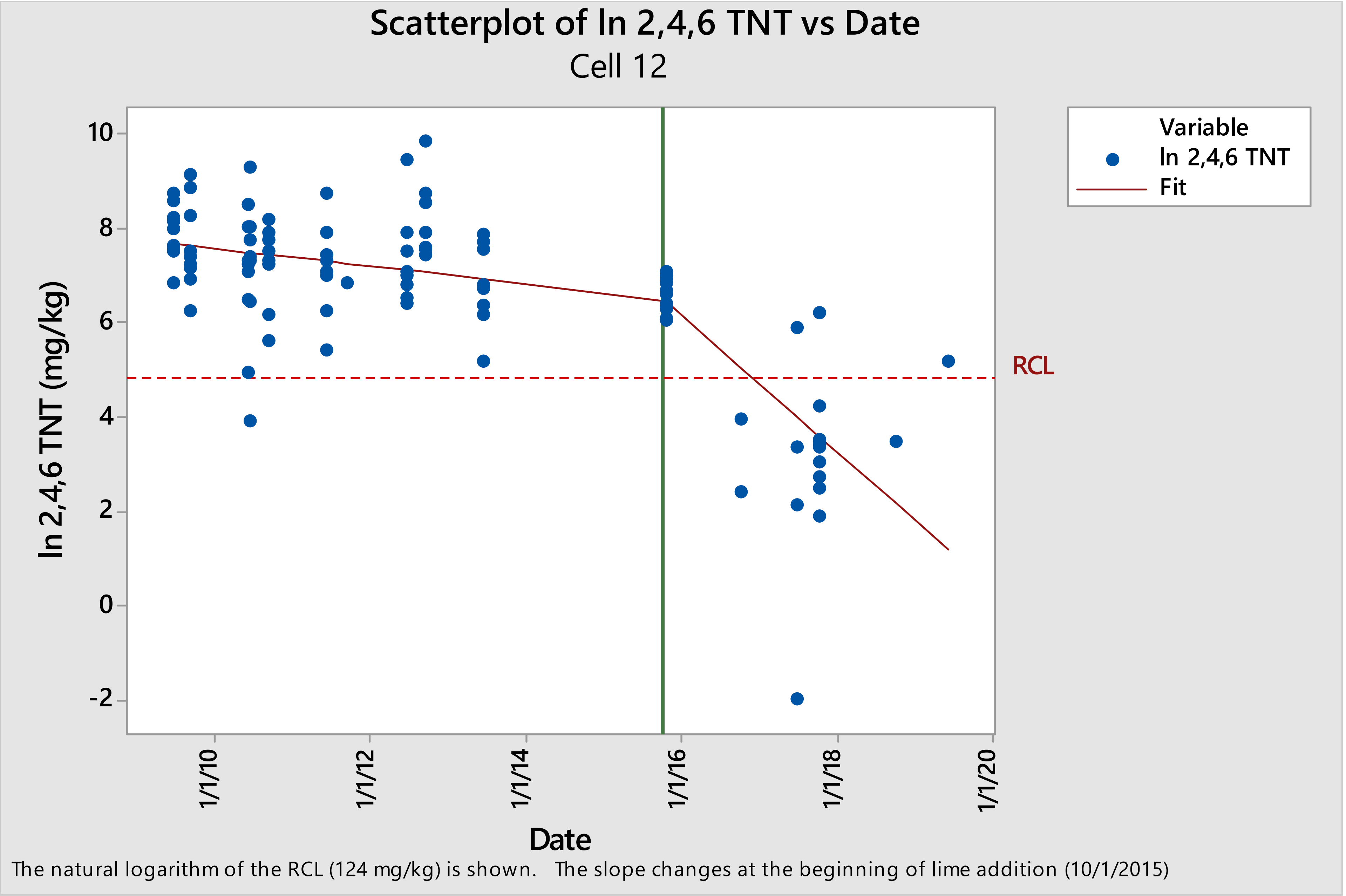
Scatterplot of ln 2,6 DNT vs Date
Cell 31 AH *
Cell 33 AH
Cell 35 AH
Cell 36 AH
Cell 37 AH
RCL
RCL
3.0
1.5
0.0
-1.5
-3.0
ln 2,6 DNT
1/1/13
1/1/15
1/1/18
1/1/21
Date
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* indicates a significant reduction over time



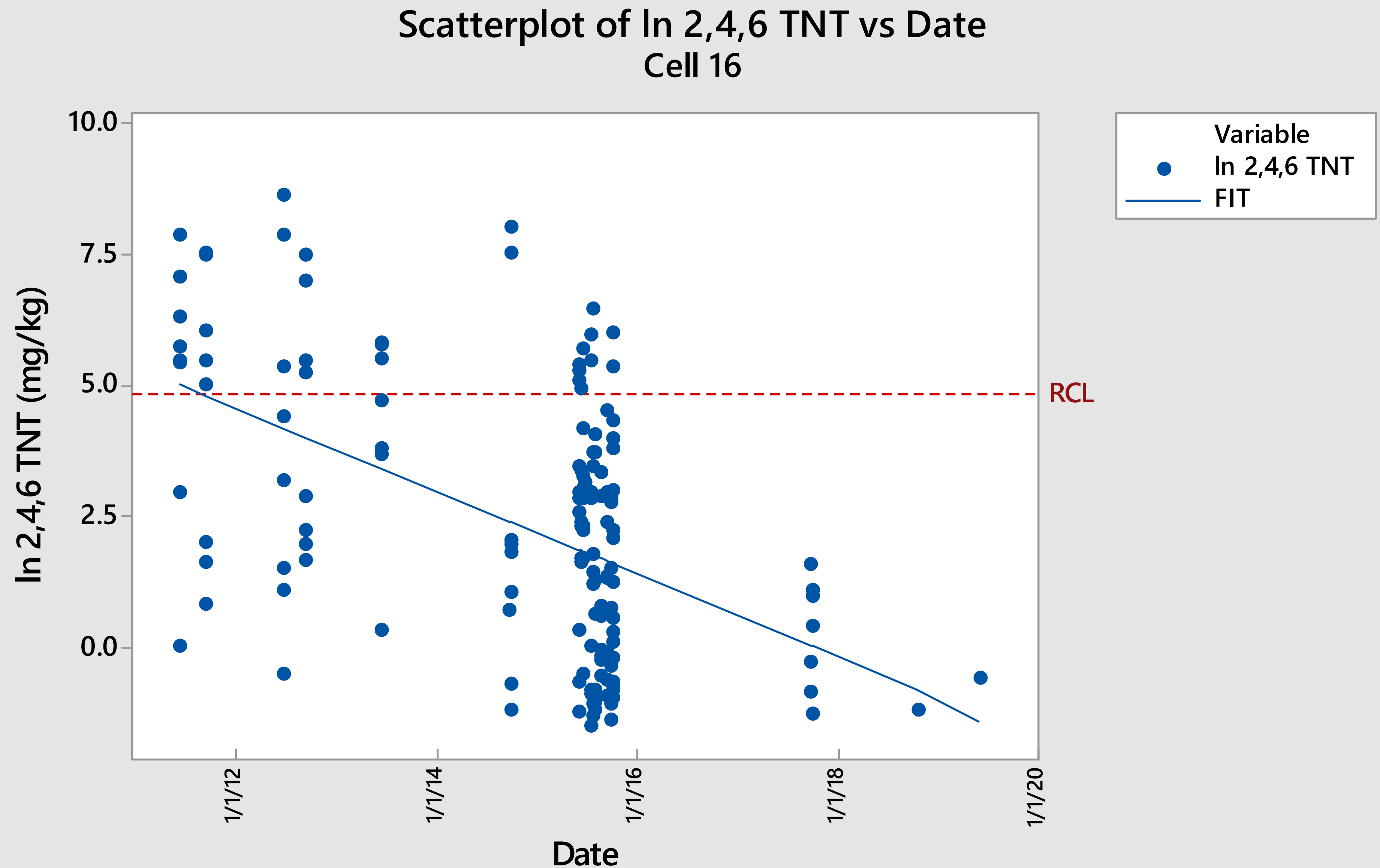
Scatterplot of ln 2,4,6 TNT vs Date
Cell 1 *
Cell 2 *
Cell 3
Cell 4
Cell 5 *
Cell 6 AH *
Cell 7 *
Cell 8 *
Cell 9
RCL
8
0
-8
ln 2,4,6 TNT
1/1/05
1/1/10
1/1/15
1/1/20
Date
Green vertical line indicates the beginning of lime addition
The natural logarithm of the RCL (124 mg/kg) is shown
* indicates a significant reduction over time



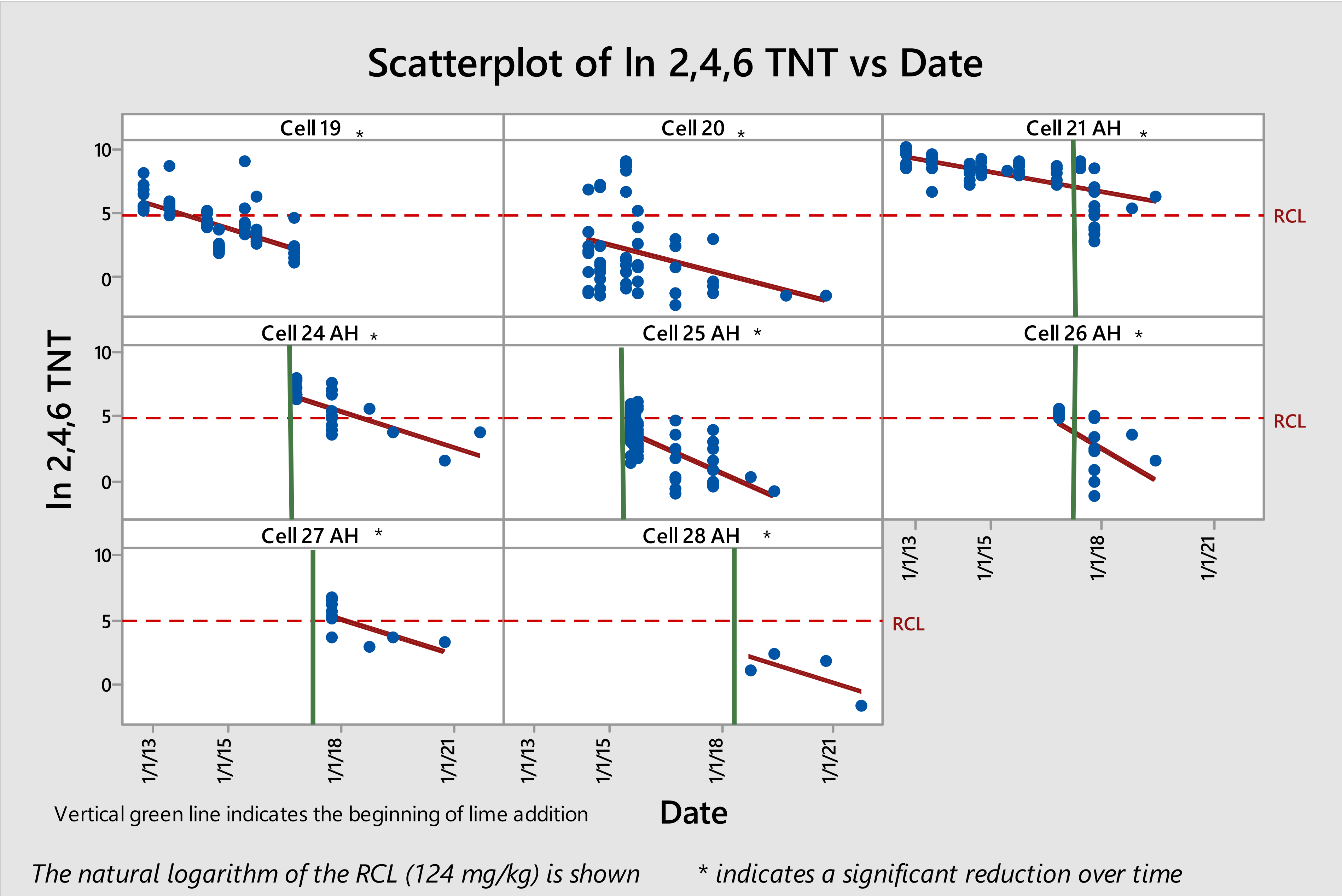
Scatterplot of ln 2,4,6 TNT vs Date
Cell 10 *
Cell 11
Cell 12 AH *
Cell 13 *
Cell 14 *
Cell 15 *
Cell 16 AH *
Cell 17 AH *
Cell 18
RCL
6
0
-6
ln 2,4,6 TNT
1/1/08
1/1/12
1/1/16
1/1/20
Date
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (124 mg/kg) is shown
* indicates a significant reduction over time

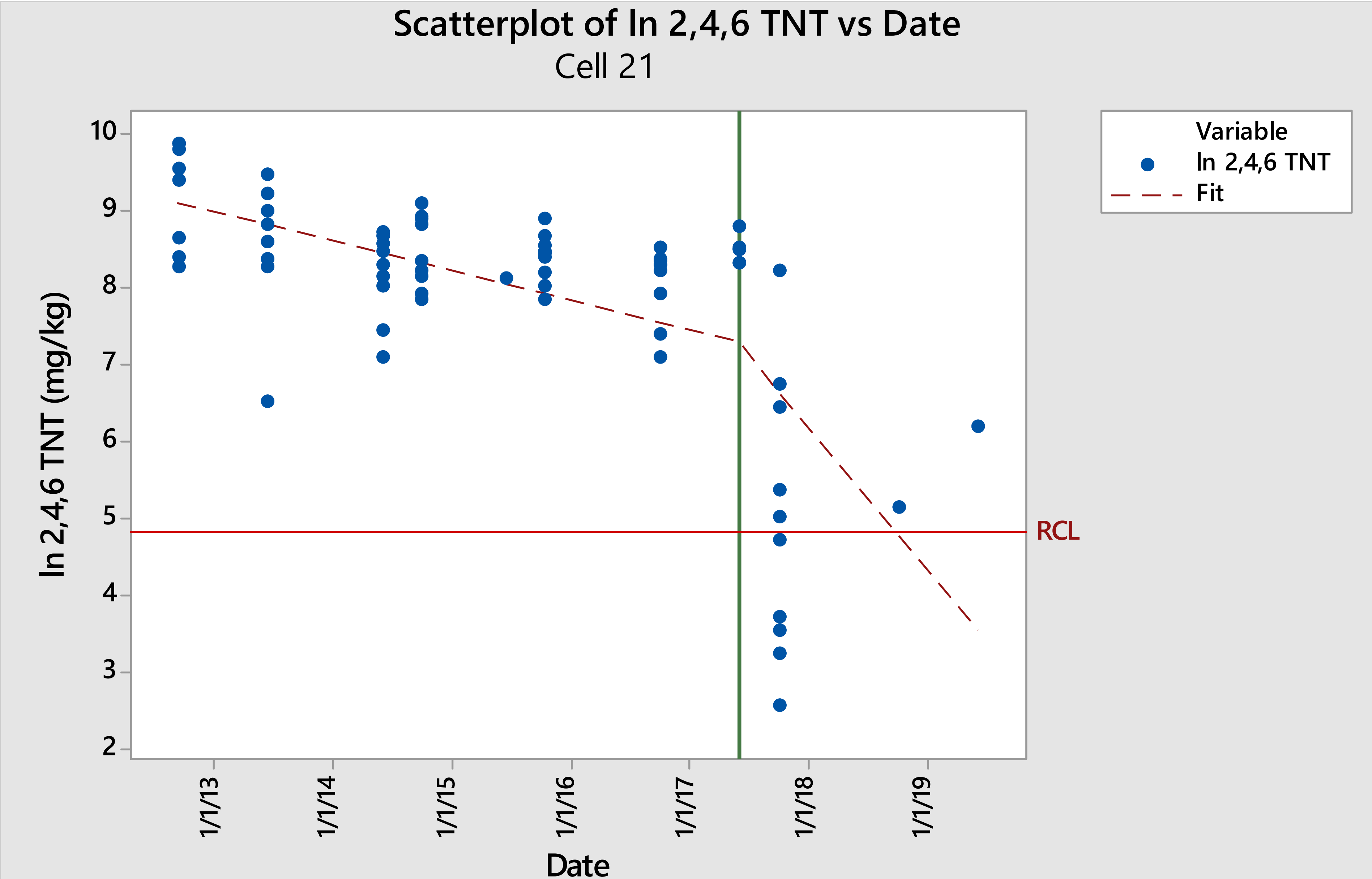


Scatterplot of ln 2,4,6 TNT vs Date
Cell 12
ln 2,4,6 TNT (mg/kg)
10
8
6
4
2
0
-2
RCL
Variable
ln 2,4,6 TNT
Fit
1/1/10
1/1/12
1/1/14
1/1/16
1/1/18
1/1/20
Date
The natural logarithm of the RCL (124 mg/kg) is shown. The slope changes at the beginning of lime addition (10/1/2015)

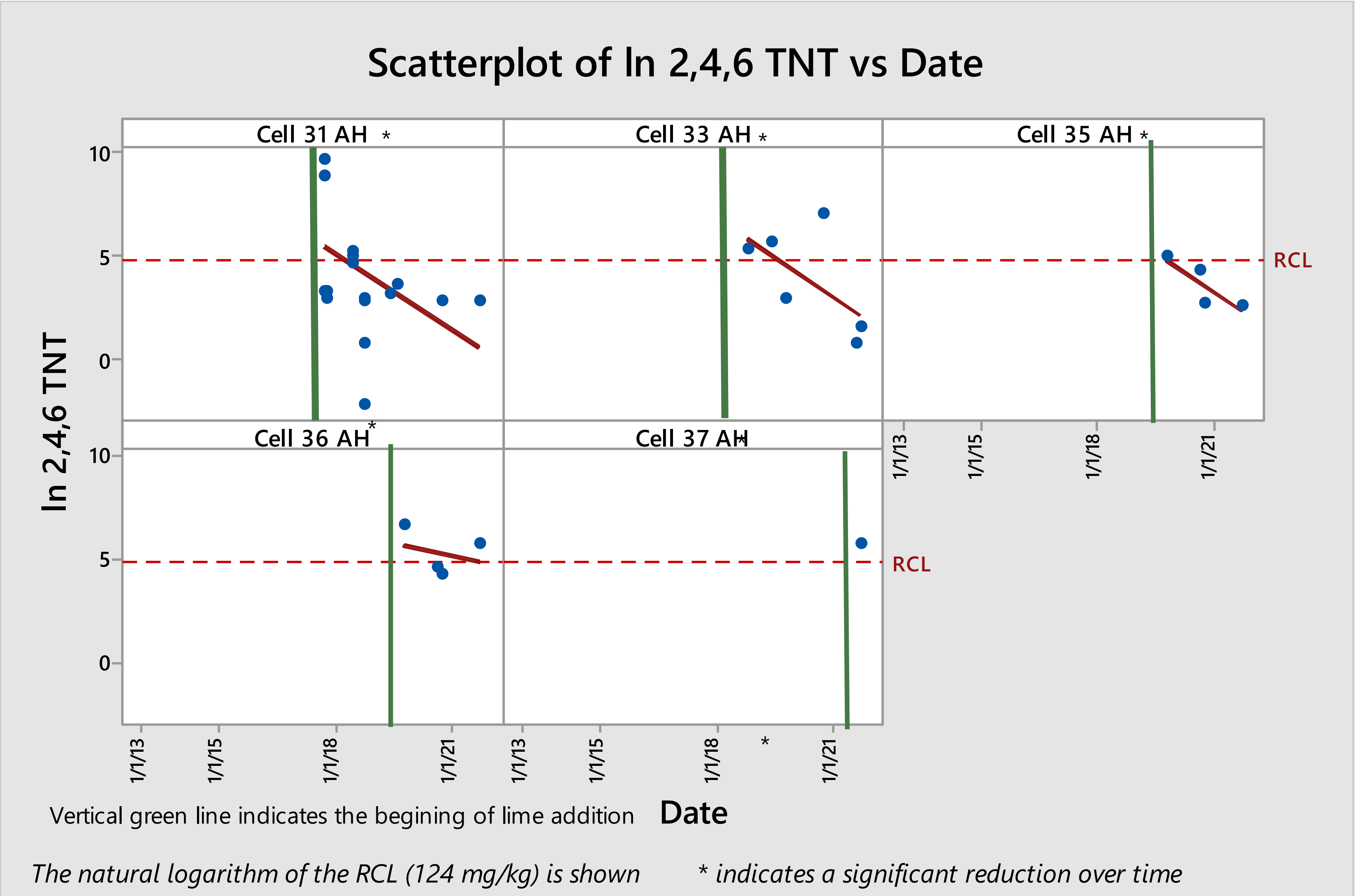


The natural logarithm of the RCL (124 mg/kg) is shown   No change in slope was seen after lime addition (June 2015)

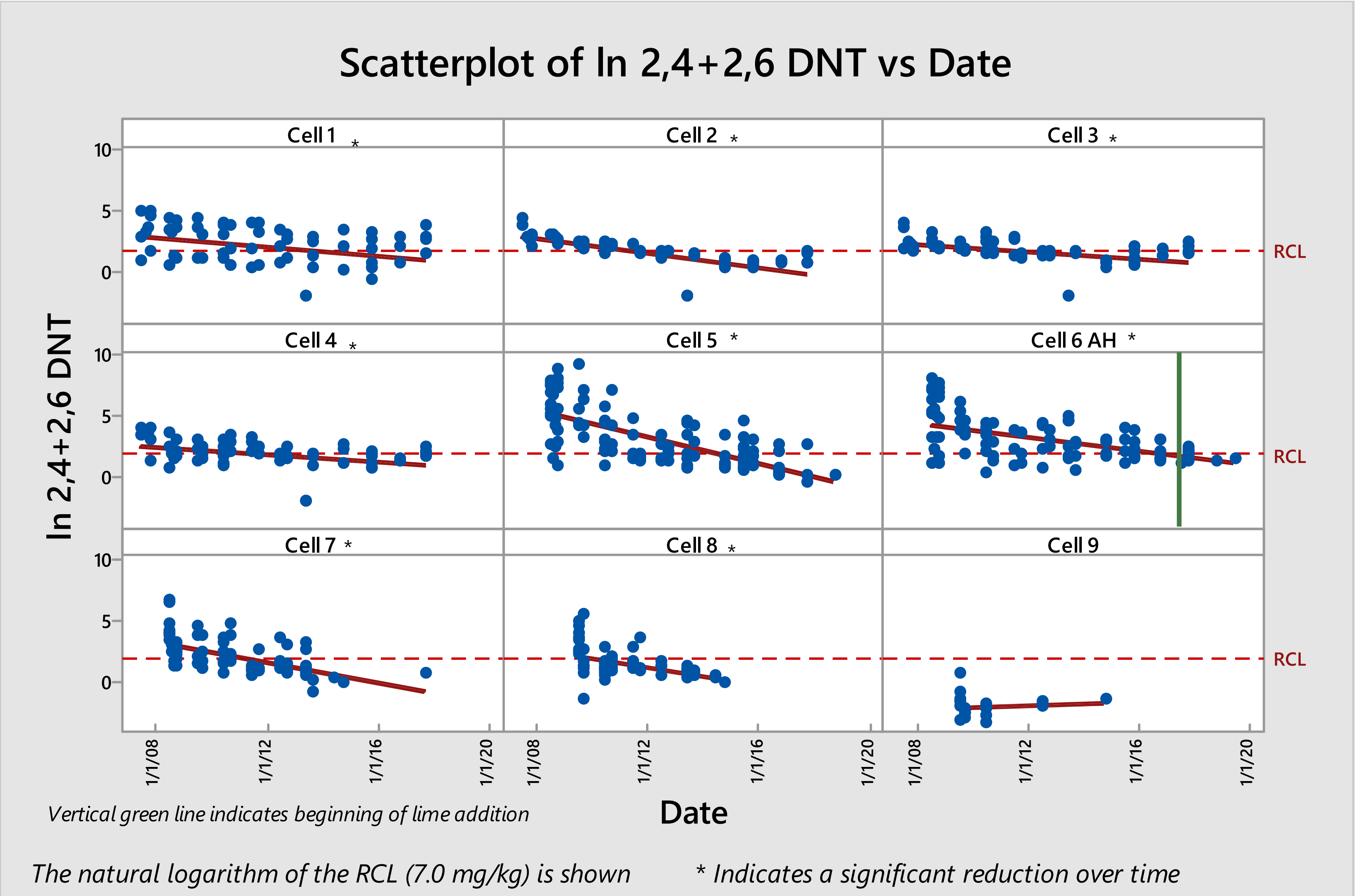

Scatterplot of ln 2,4,6 TNT vs Date
Cell 19 *
Cell 20 *
Cell 21 AH *
Cell 24 AH *
Cell 25 AH *
Cell 26 AH *
Cell 27 AH *
Cell 28 AH *
RCL
10
5
0
ln 2,4,6 TNT
1/1/13
1/1/15
1/1/18
1/1/21
Date
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (124 mg/kg) is shown
* indicates a significant reduction over time



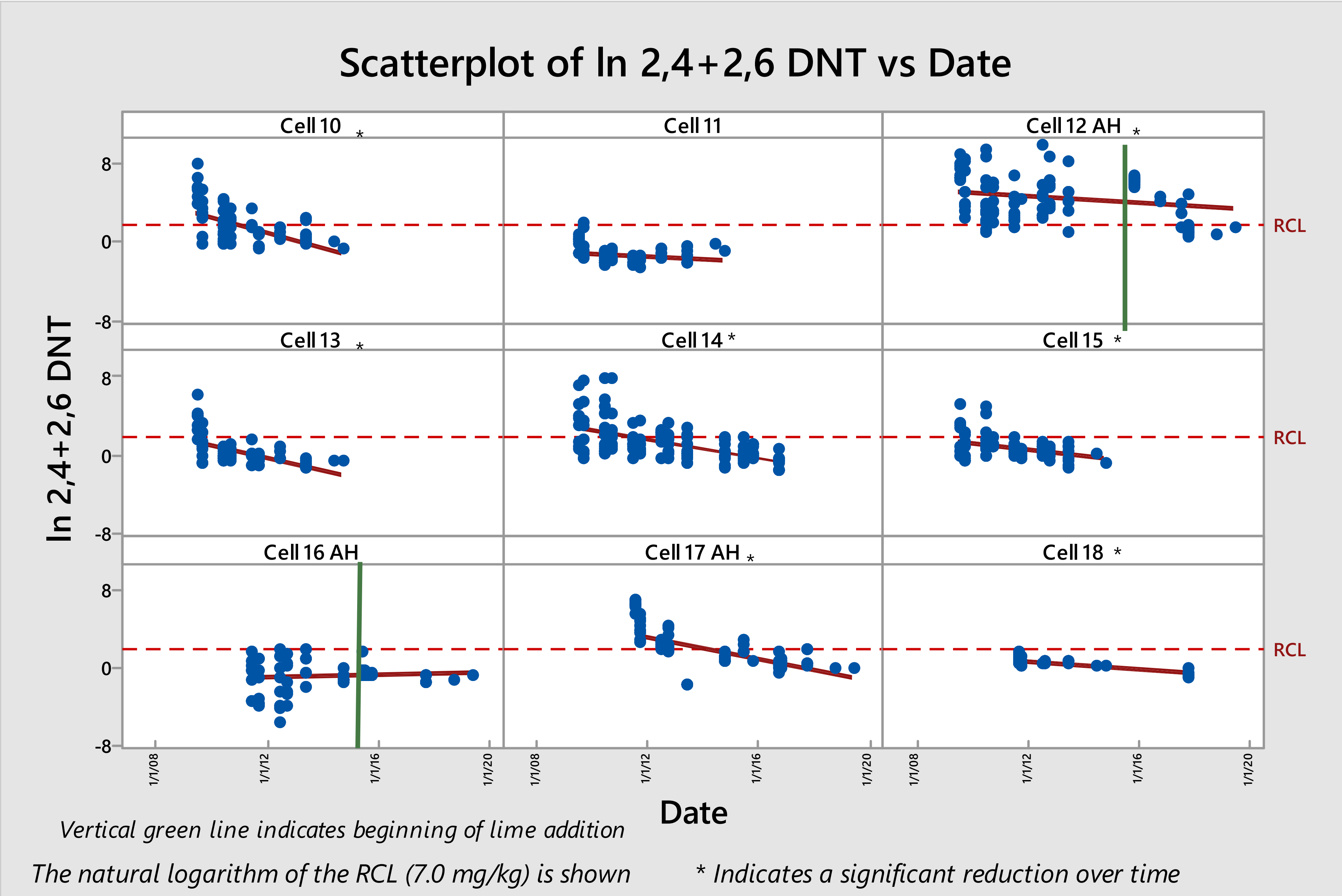
The natural logarithm of the RCL (124 mg/kg) is shown. The slope changes at the beginning of lime addition (6/1/2017)



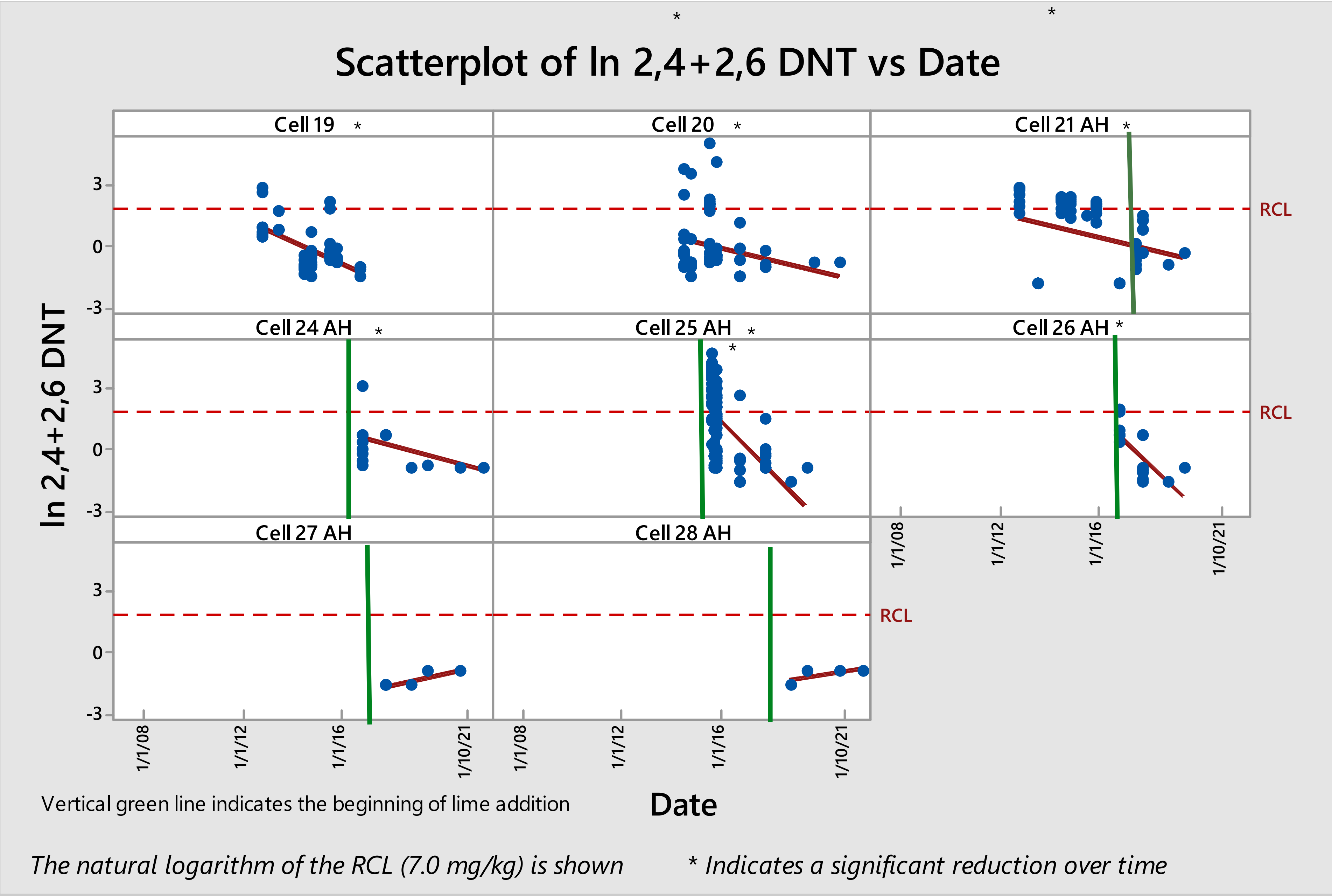
Scatterplot of ln 2,4,6 TNT vs Date
Cell 31 AH *
Cell 33 AH *
Cell 35 AH *
Cell 36 AH *
Cell 37 AH *
10
5
0
ln 2,4,6 TNT
RCL
1/1/13
1/1/15
1/1/18
1/1/21
Date
Vertical green line indicates the begining of lime addition
The natural logarithm of the RCL (124 mg/kg) is shown
* indicates a significant reduction over time



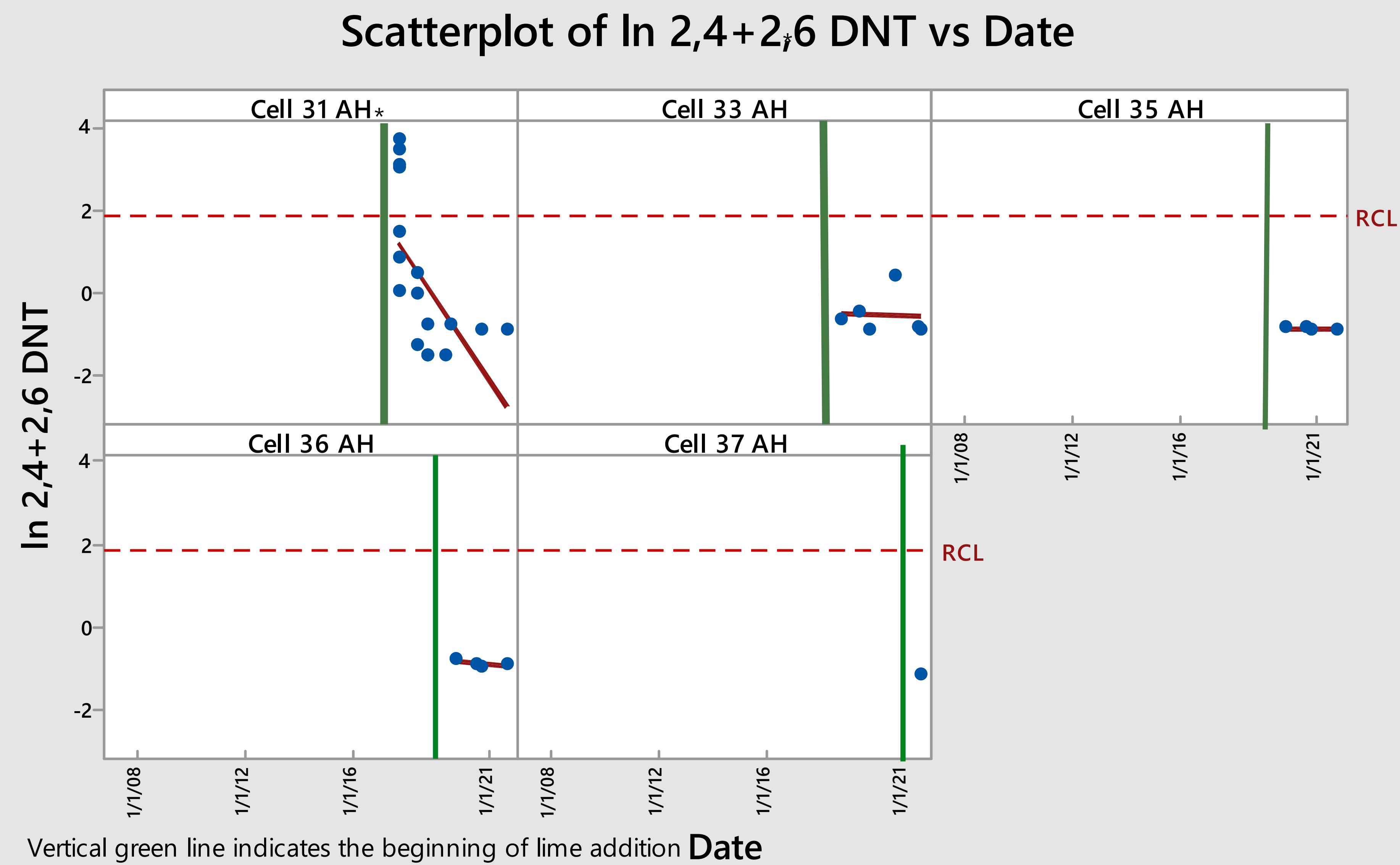
Scatterplot of ln 2,4+2,6 DNT vs Date
Cell 1 *
Cell 2 *
Cell 3 *
Cell 4 *
Cell 5 *
Cell 6 AH *
Cell 7 *
Cell 8 *
Cell 9
10
5
0
RCL
ln 2,4+2,6 DNT
1/1/08
1/1/12
1/1/16
1/1/20
Date
Vertical green line indicates beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* Indicates a significant reduction over time



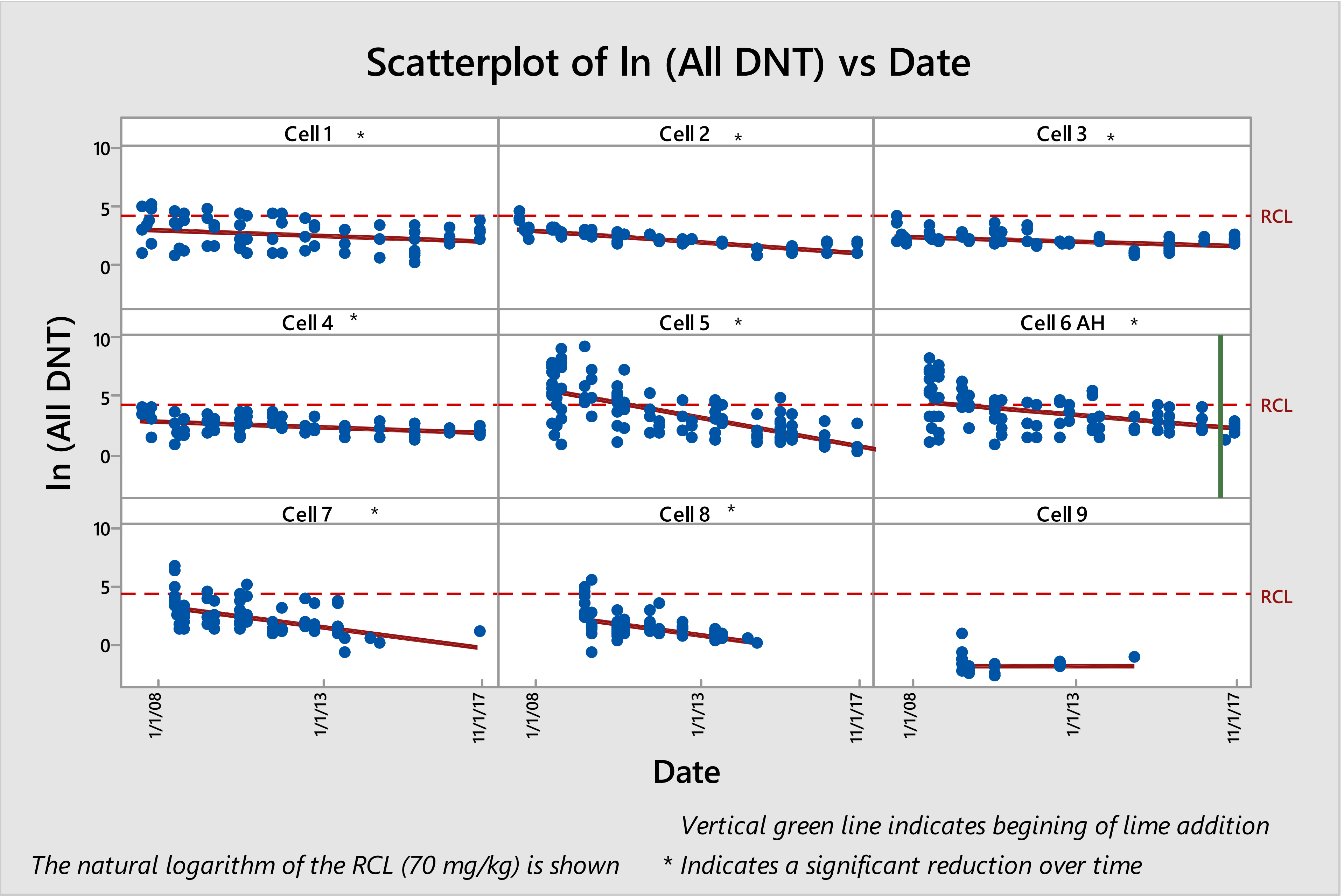
Scatterplot of ln 2,4+2,6 DNT vs Date
Cell 10 *
Cell 11
Cell 12 AH *
Cell 13 *
Cell 14 *
Cell 15 *
Cell 16 AH
Cell 17 AH *
Cell 18 *
ln 2,4+2,6 DNT
8
0
-8
RCL
1/1/08
1/1/12
1/1/16
1/1/20
Date
Vertical green line indicates beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* Indicates a significant reduction over time



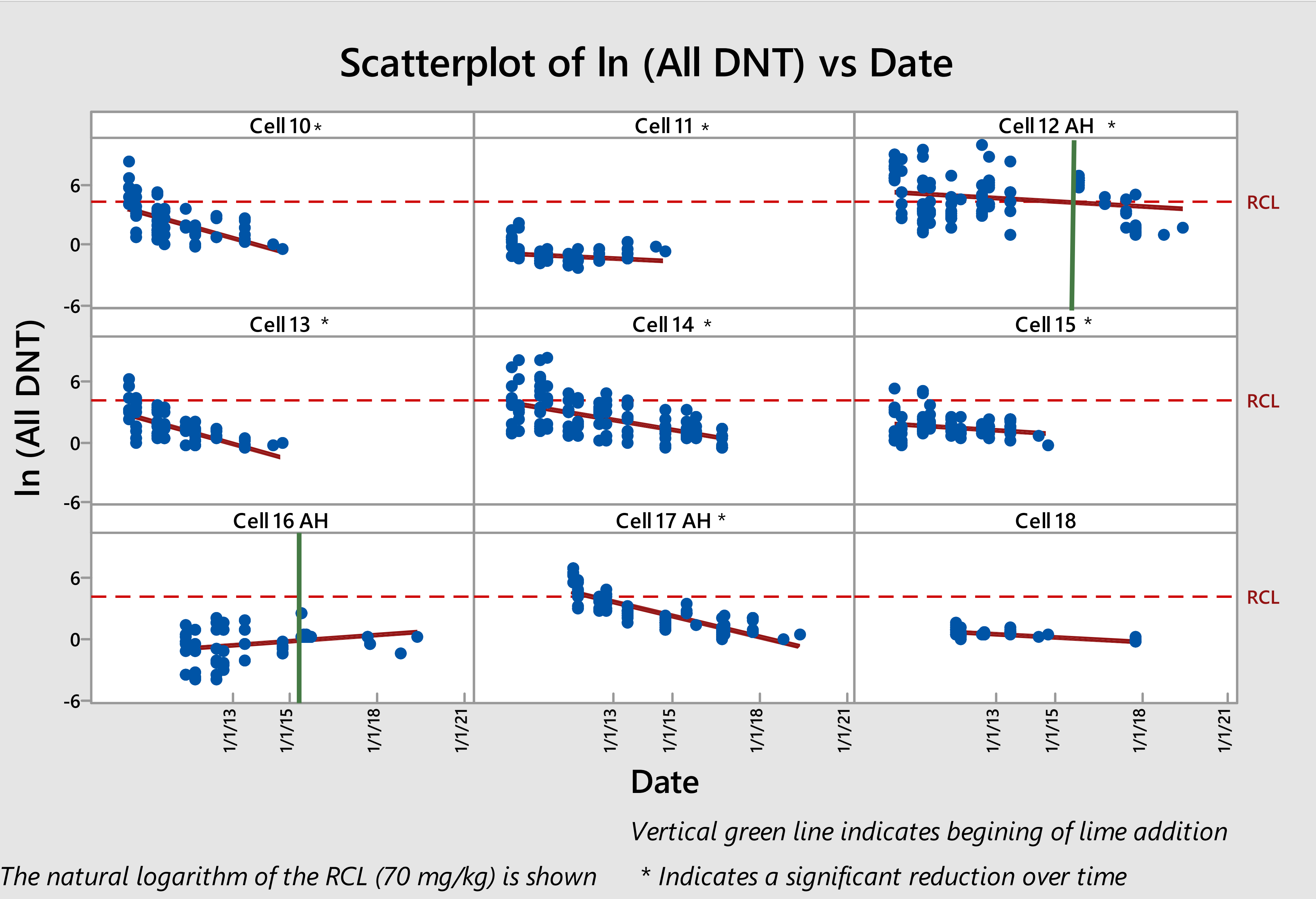
*
*
Scatterplot of ln 2,4+2,6 DNT vs Date
Cell 19 *
Cell 20 *
Cell 21 AH *
Cell 24 AH *
Cell 25 AH *
*
Cell 26 AH *
Cell 27 AH
Cell 28 AH
RCL
RCL
RCL
3
0
-3
ln 2,4+2,6 DNT
1/1/08
1/1/12
1/1/16
1/10/21
Date
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (7.0 mg/kg) is shown
* Indicates a significant reduction over time



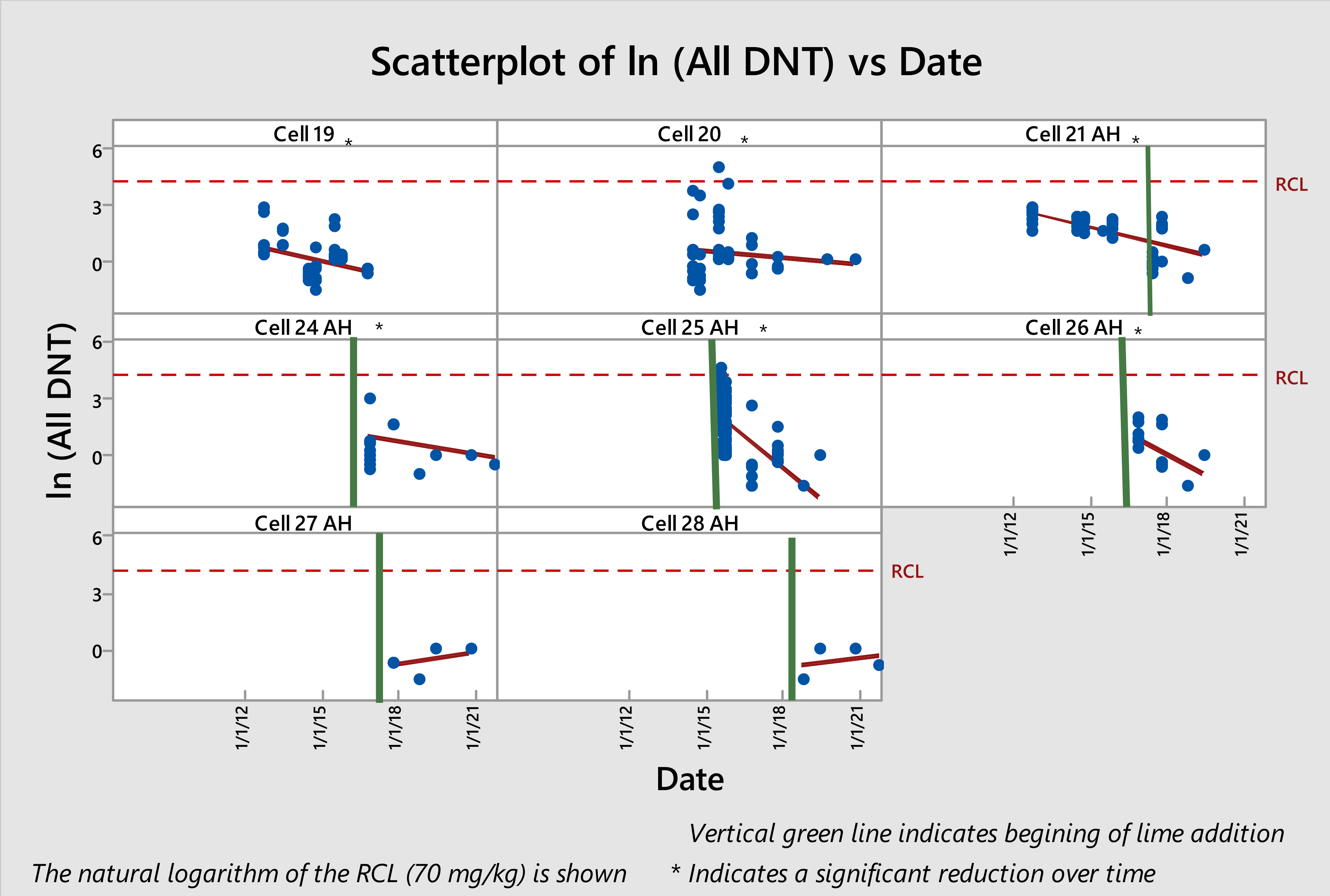
The natural logarithm of the RCL (7.0 mg/kg) is shown *   * ** Indicates a significant reduction over time*



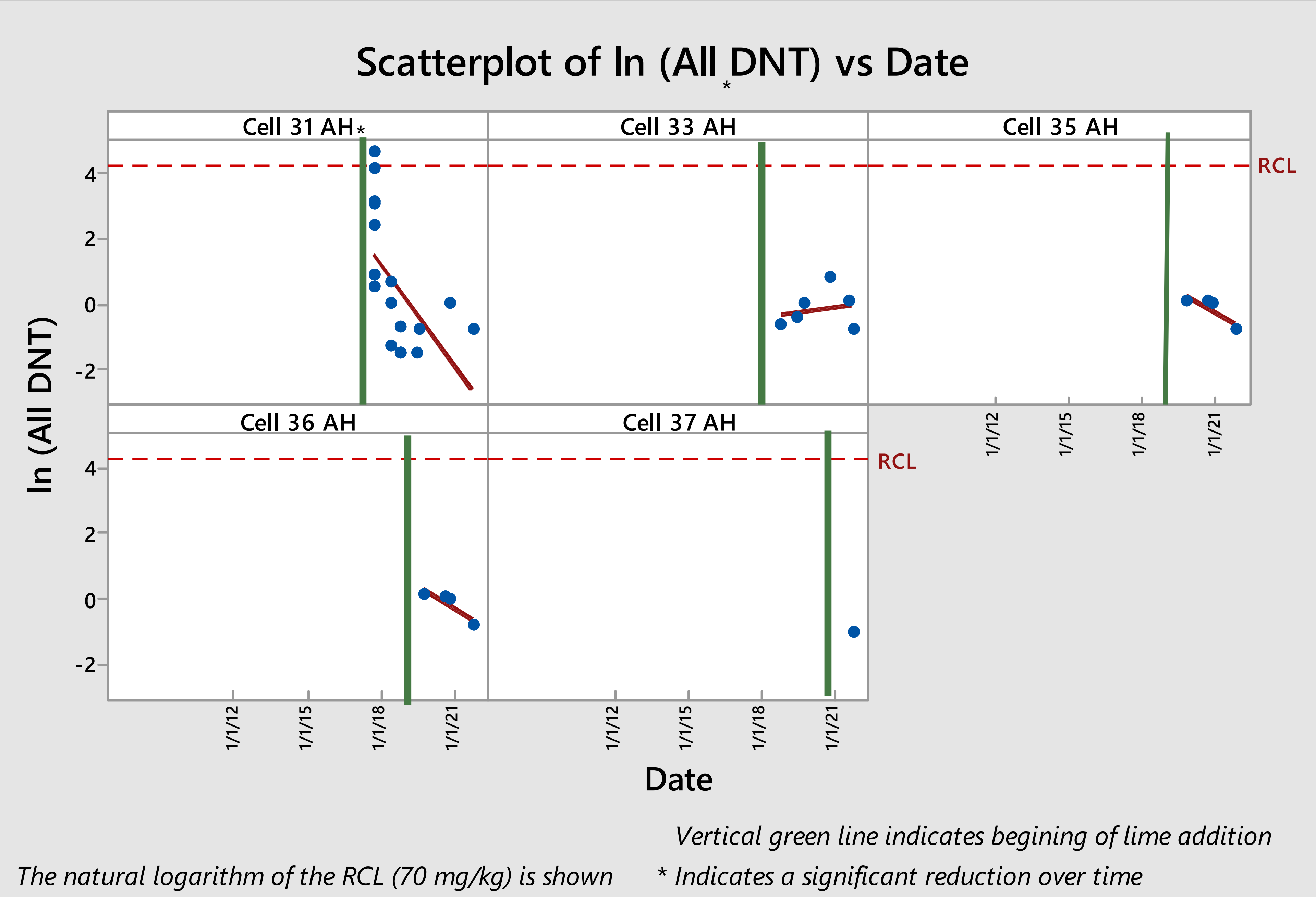
Scatterplot of ln (All DNT) vs Date
Cell 1 *
Cell 2 *
Cell 3 *
Cell 4 *
Cell 5 *
Cell 6 AH *
Cell 7 *
Cell 8 *
Cell 9
RCL
RCL
RCL
10
5
0
ln (All DNT)
1/1/08
1/1/13
11/1/17
Date
Vertical green line indicates begining of lime addition
The natural logarithm of the RCL (70 mg/kg) is shown
* Indicates a significant reduction over time



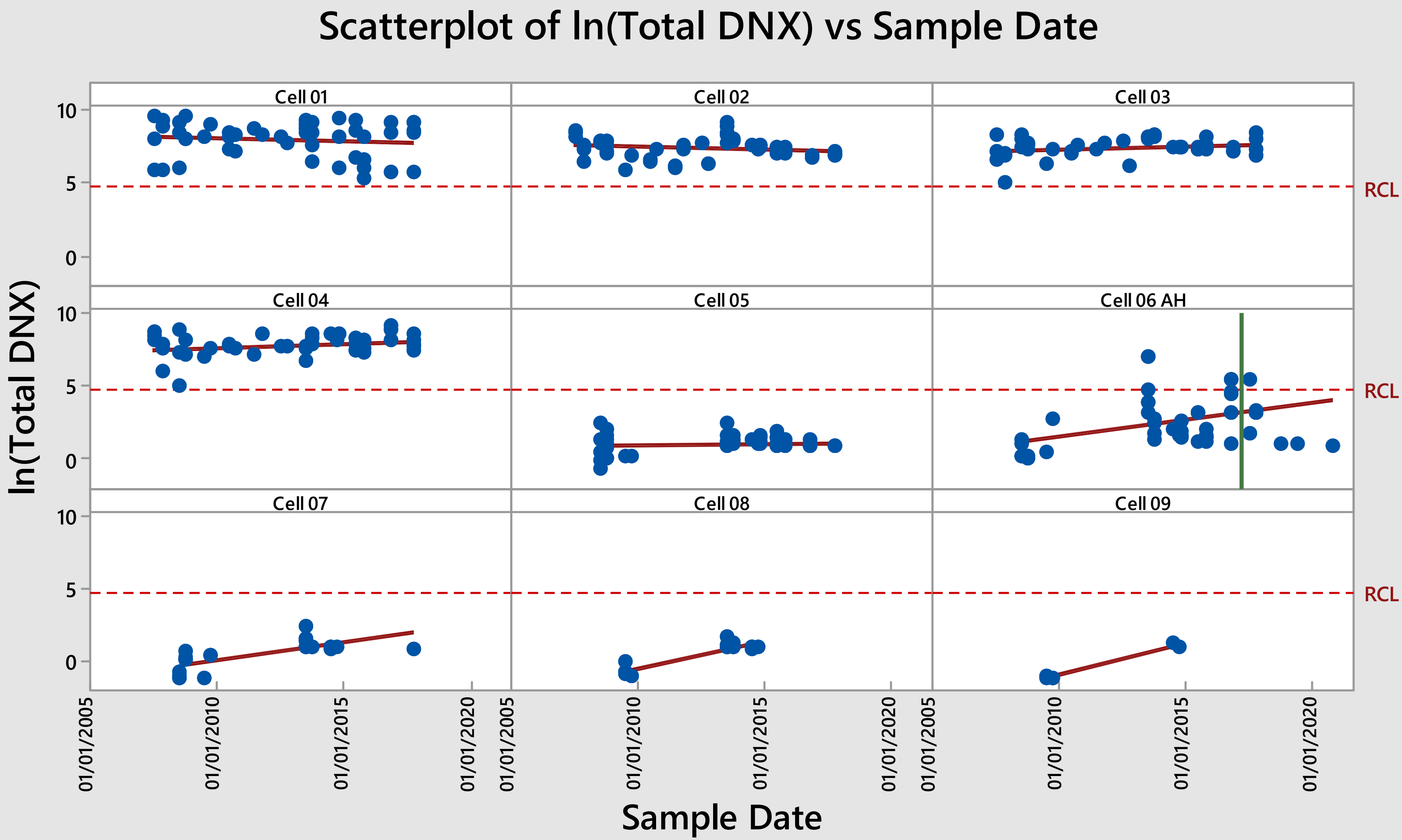
Scatterplot of ln (All DNT) vs Date
Cell 10 *
Cell 11 *
Cell 12 AH *
Cell 13 *
Cell 14 *
Cell 15 *
Cell 16 AH
Cell 17 AH *
Cell 18
RCL
RCL
RCL
6
0
-6
1/1/13
1/1/15
1/1/18
1/1/21
ln (All DNT)
Date
Vertical green line indicates begining of lime addition
The natural logarithm of the RCL (70 mg/kg) is shown
* Indicates a significant reduction over time



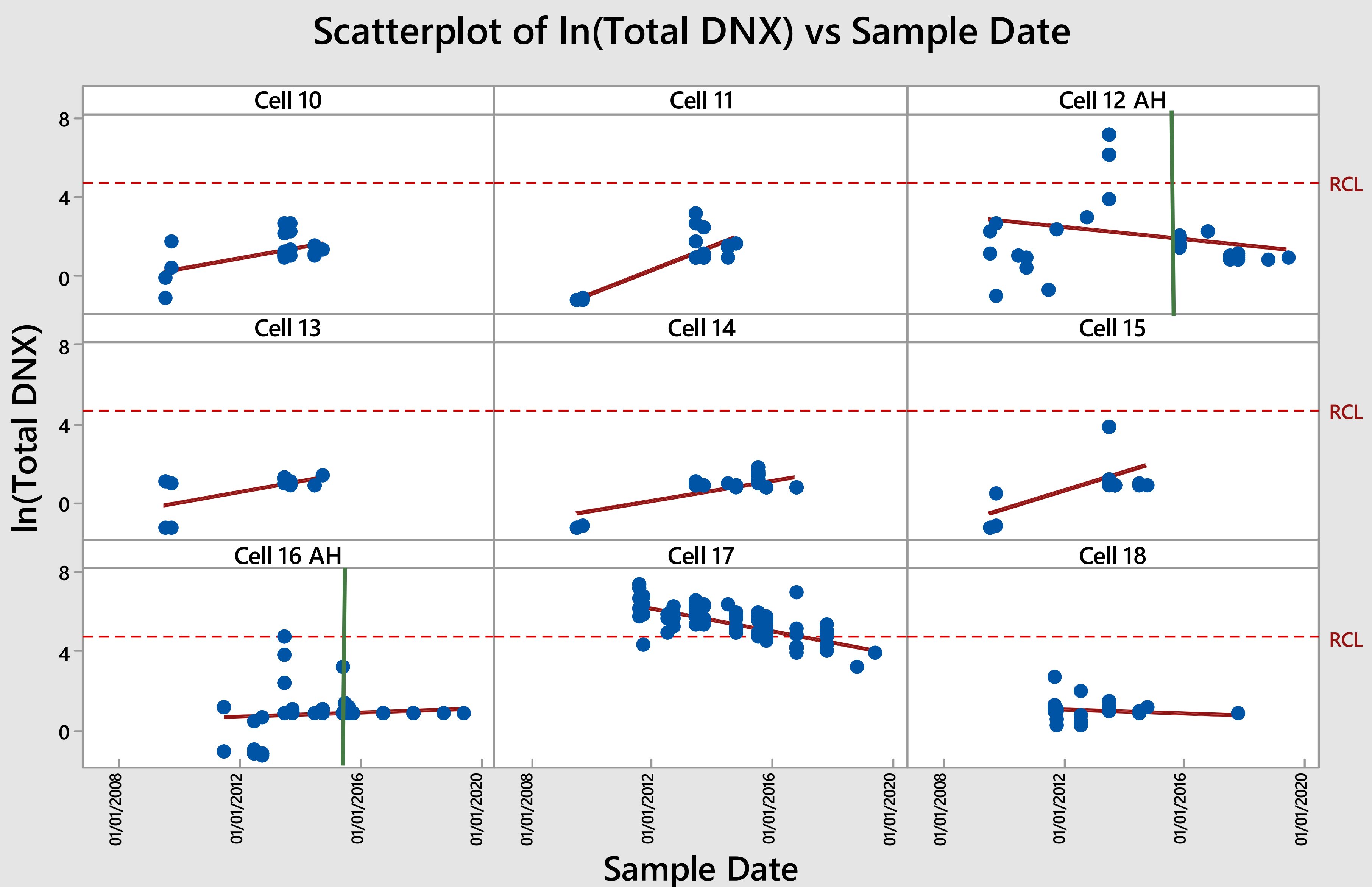
Scatterplot of ln (All DNT) vs Date
Cell 19 *
Cell 20 *
Cell 21 AH *
Cell 24 AH *
Cell 25 AH *
Cell 26 AH *
Cell 27 AH
Cell 28 AH
RCL
RCL
RCL
6
3
0
ln (All DNT)
1/1/12
1/1/15
1/1/18
1/1/21
Date
Vertical green line indicates begining of lime addition
The natural logarithm of the RCL (70 mg/kg) is shown
* Indicates a significant reduction over time



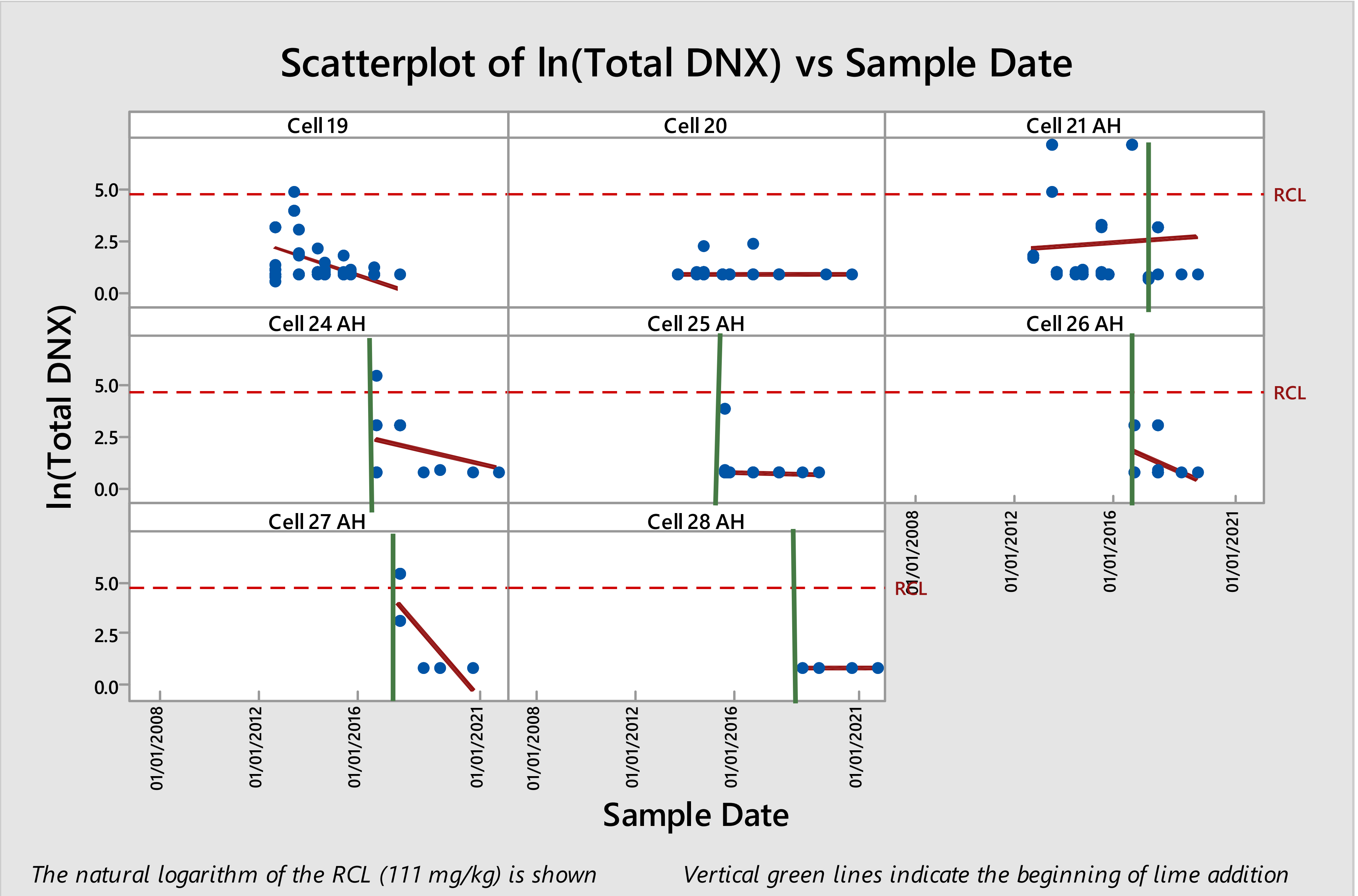
Scatterplot of ln (All DNT) vs Date
*
Cell 31 AH*
Cell 33 AH
Cell 35 AH
Cell 36 AH
Cell 37 AH
RCL
RCL
ln (All DNT)
4
2
0
-2
1/1/12
1/1/15
1/1/18
1/1/21
Date
Vertical green line indicates begining of lime addition
The natural logarithm of the RCL (70 mg/kg) is shown
* Indicates a significant reduction over time



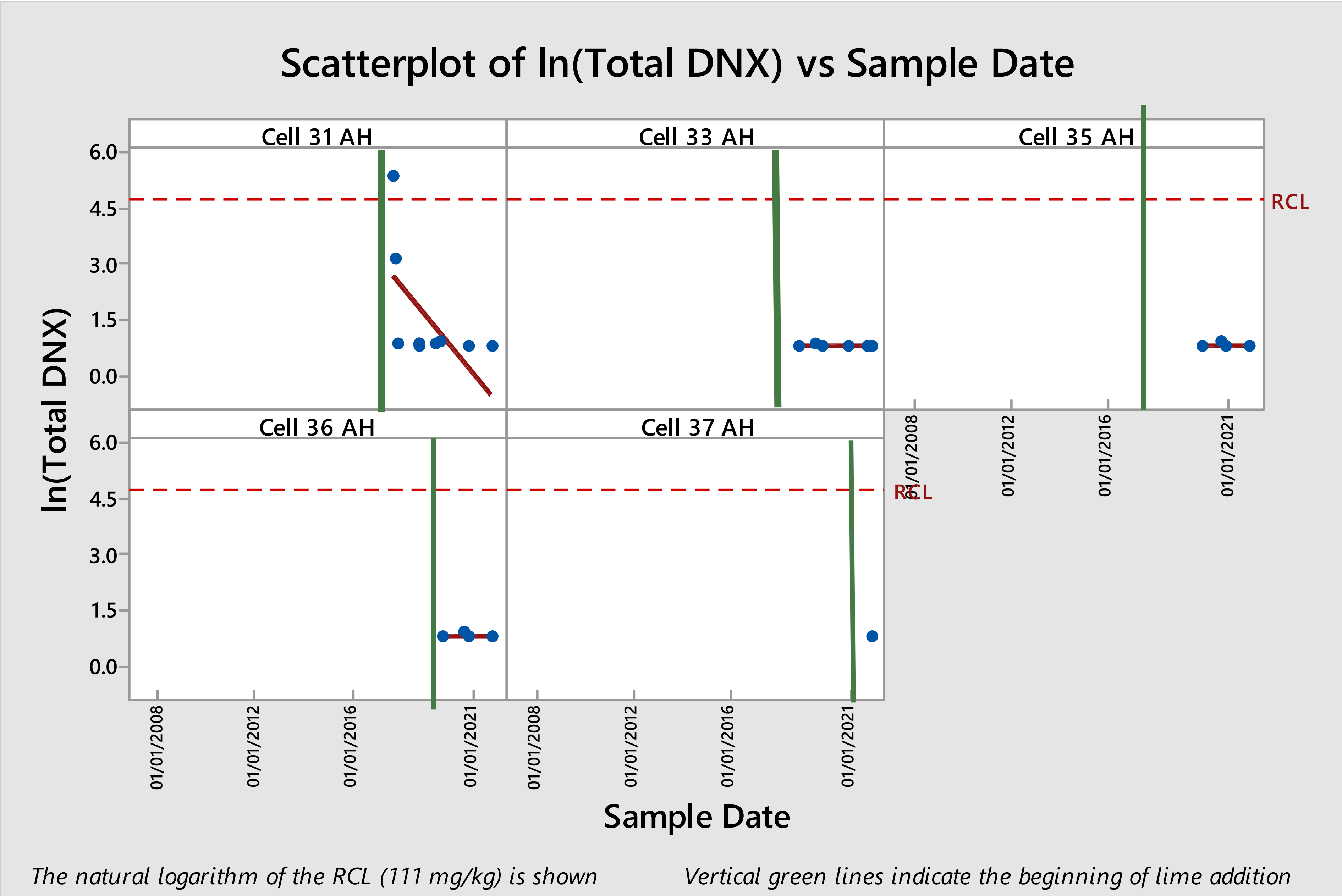
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (111 mg/kg) is shown

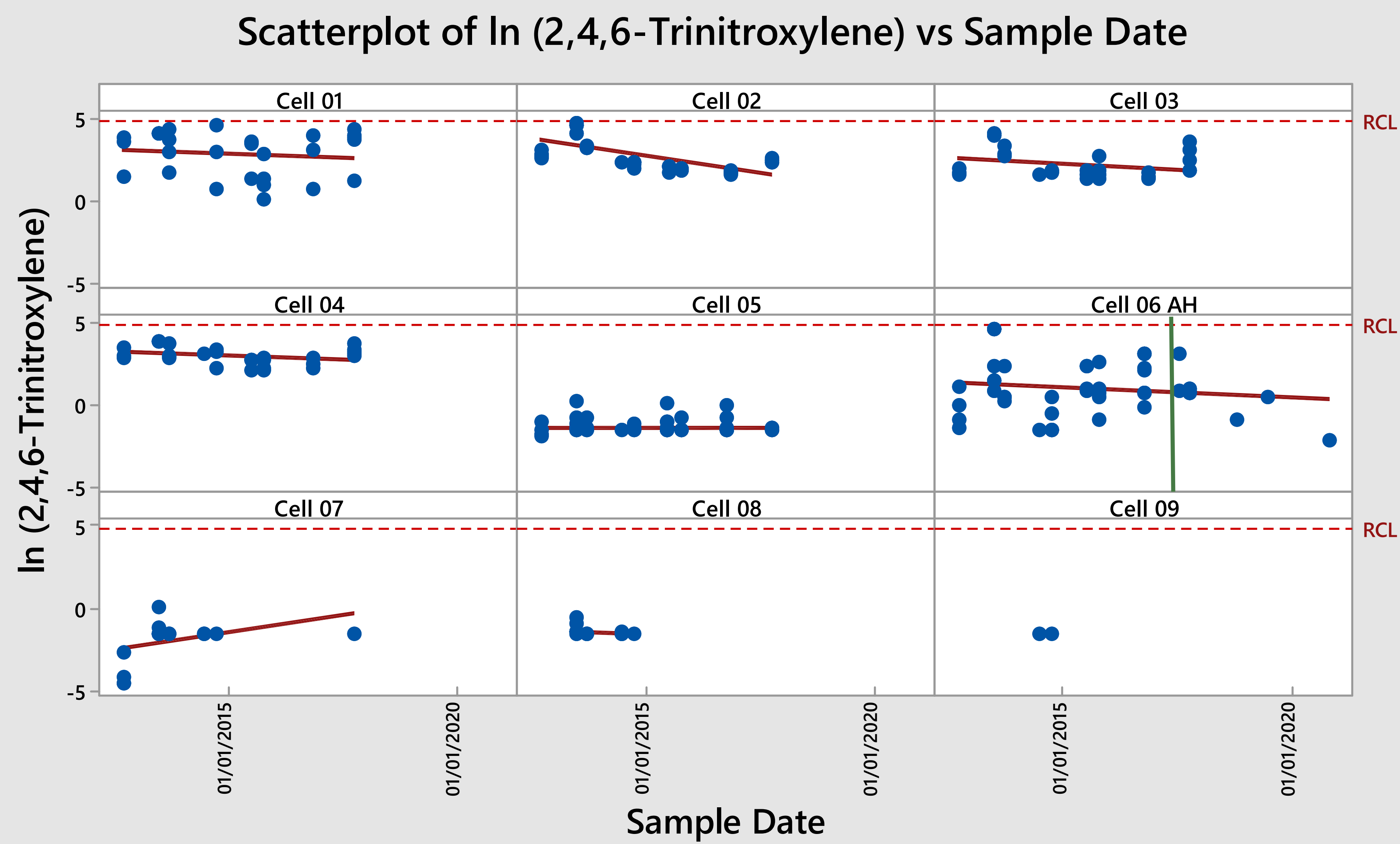


The natural logarithm of the RCL (111 mg/kg) is shown *Vertical green lines indicate the beginning of lime addition*

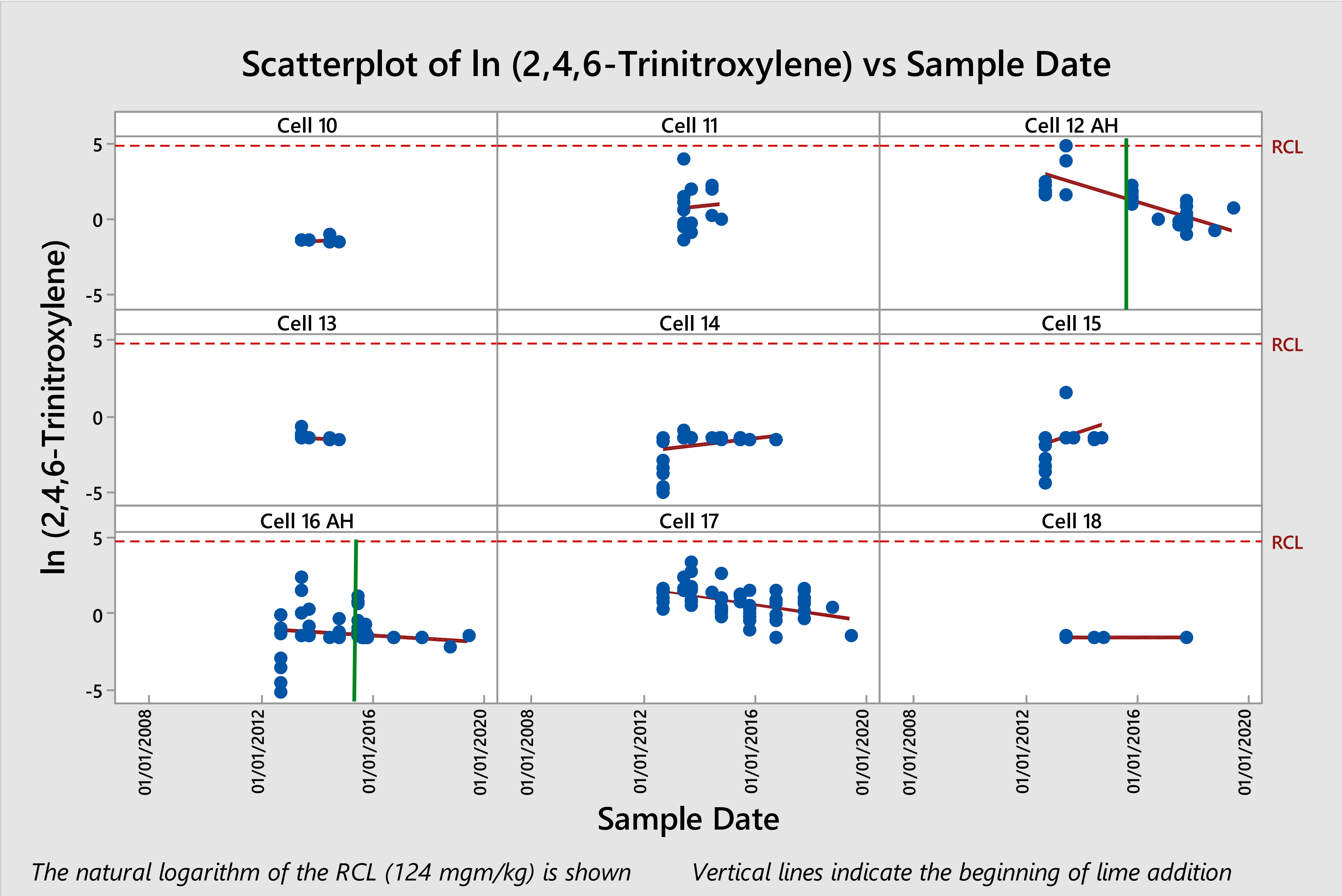


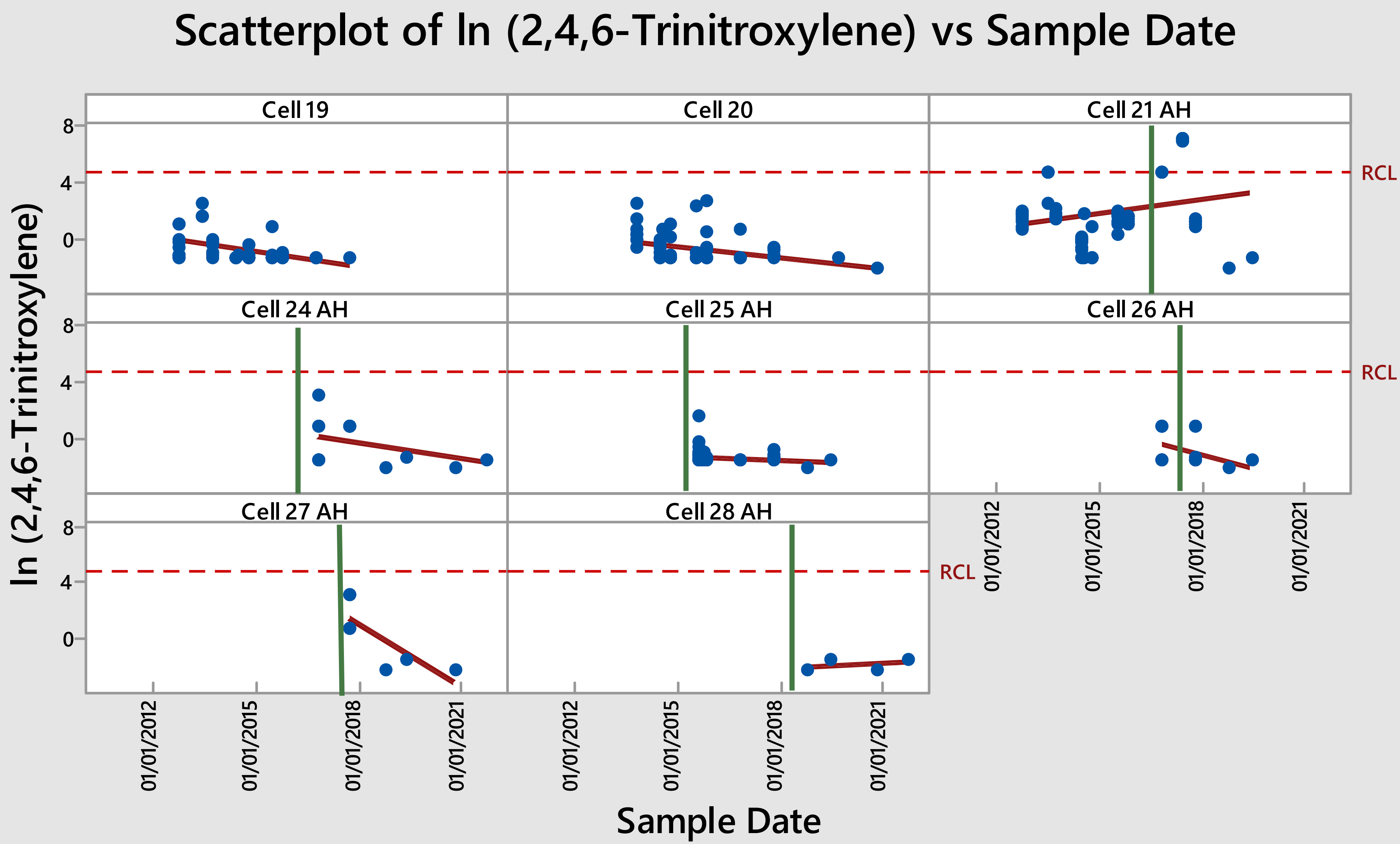
Scatterplot of ln(Total DNX) vs Sample Date
Cell 19
Cell 20
Cell 21 AH
Cell 24 AH
Cell 25 AH
Cell 26 AH
Cell 27 AH
Cell 28 AH
RCL
RCL
RCL
ln(Total DNX)
0.0
2.5
5.0
01/01/2008
01/01/2012
01/01/2016
01/01/2021
Sample Date
The natural logarithm of the RCL (111 mg/kg) is shown
Vertical green lines indicate the beginning of lime addition


Scatterplot of ln(Total DNX) vs Sample Date
Cell 31 AH
Cell 33 AH
Cell 35 AH
Cell 36 AH
Cell 37 AH
6.0
4.5
3.0
1.5
0.0
RCL
01/01/2008
01/01/2012
01/01/2016
01/01/2021
ln(Total DNX)
Sample Date
The natural logarithm of the RCL (111 mg/kg) is shown
Vertical green lines indicate the beginning of lime addition

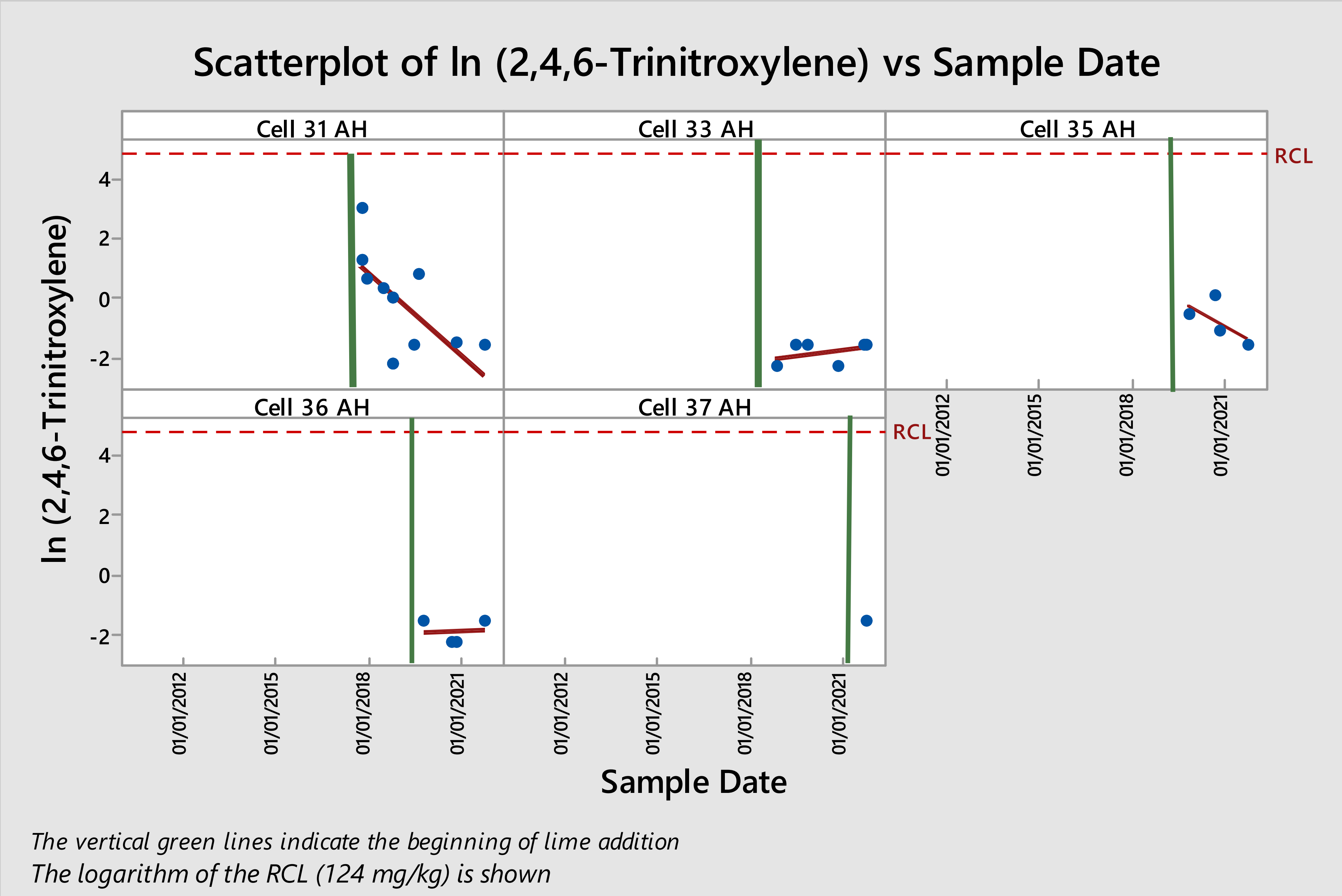


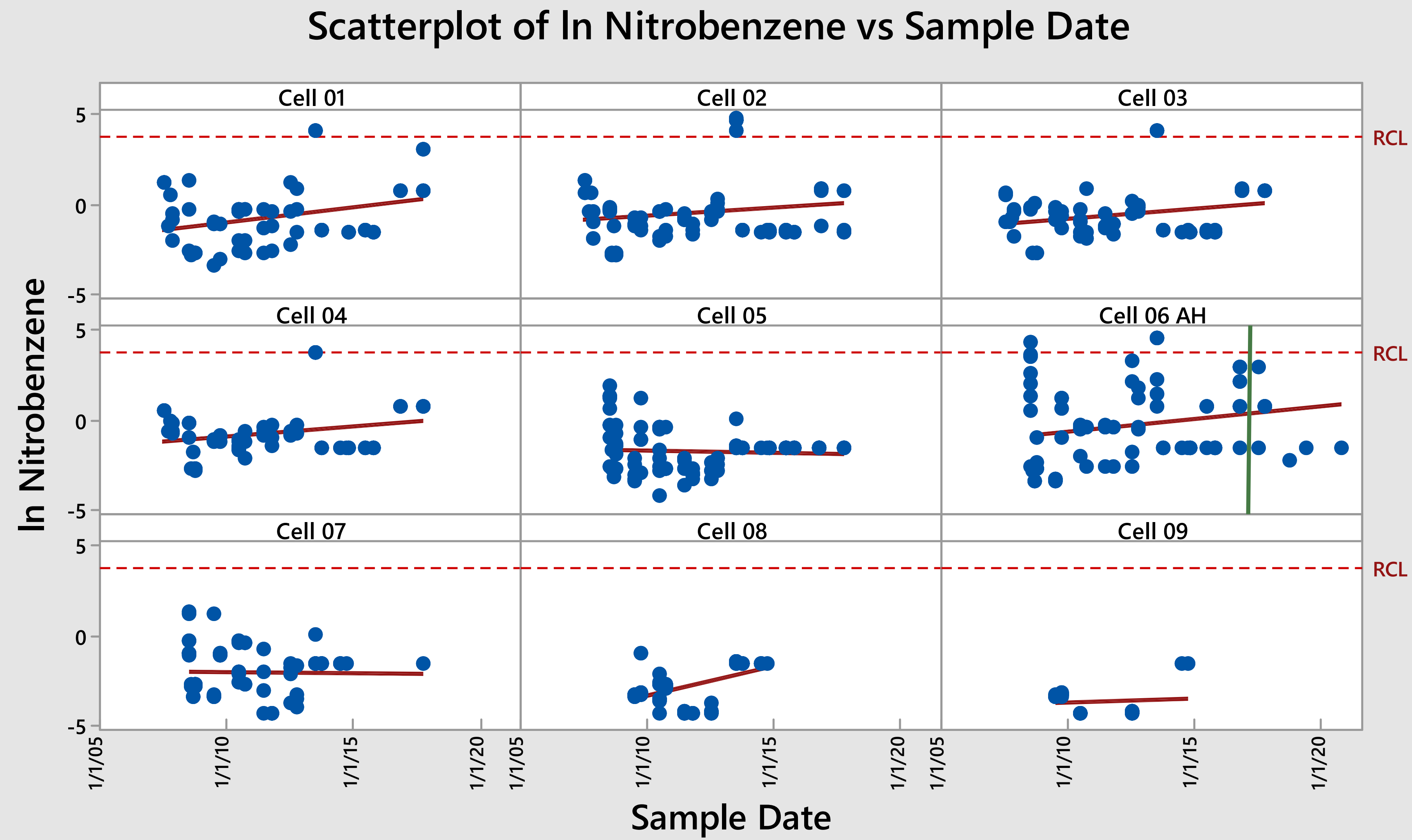
The vertical green line indidates the beginning of lime addition
The natural logarithm of the RCL (124 mg/kg/) is shown


Scatterplot of ln (2,4,6-Trinitroxylene) vs Sample Date
Cell 10
Cell 11
Cell 12 AH
Cell 13
Cell 14
Cell 15
Cell 16 AH
Cell 17
Cell 18
RCL
5
0
-5
ln (2,4,6-Trinitroxylene)
01/01/2008
01/01/2012
01/01/2016
01/01/2020
Sample Date
The natural logarithm of the RCL (124 mgm/kg) is shown
Vertical lines indicate the beginning of lime addition

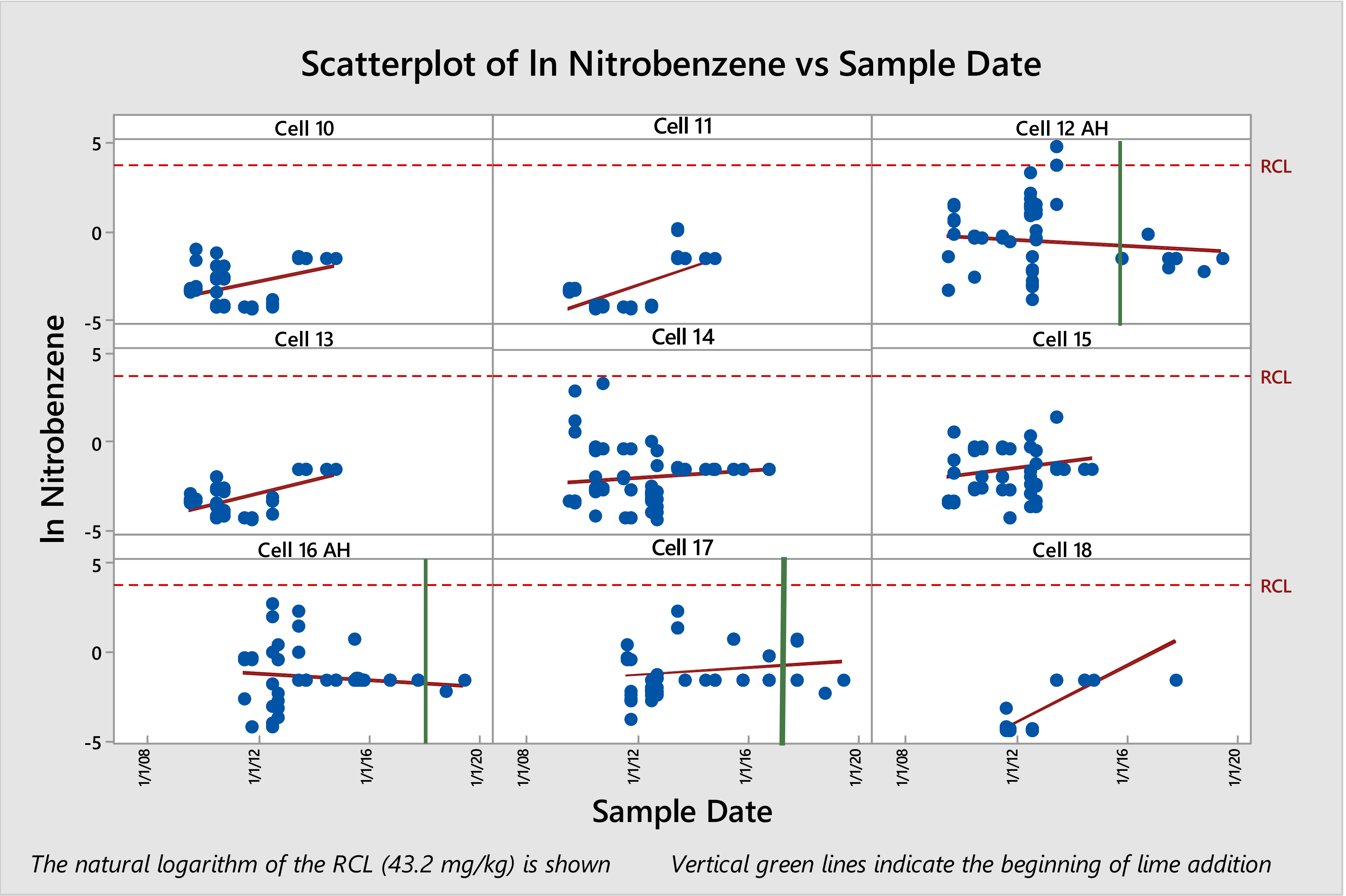


The vertical green lines indicate the beginning of lime addition
The logarithm of the RCL (124 mg/kg) is shown

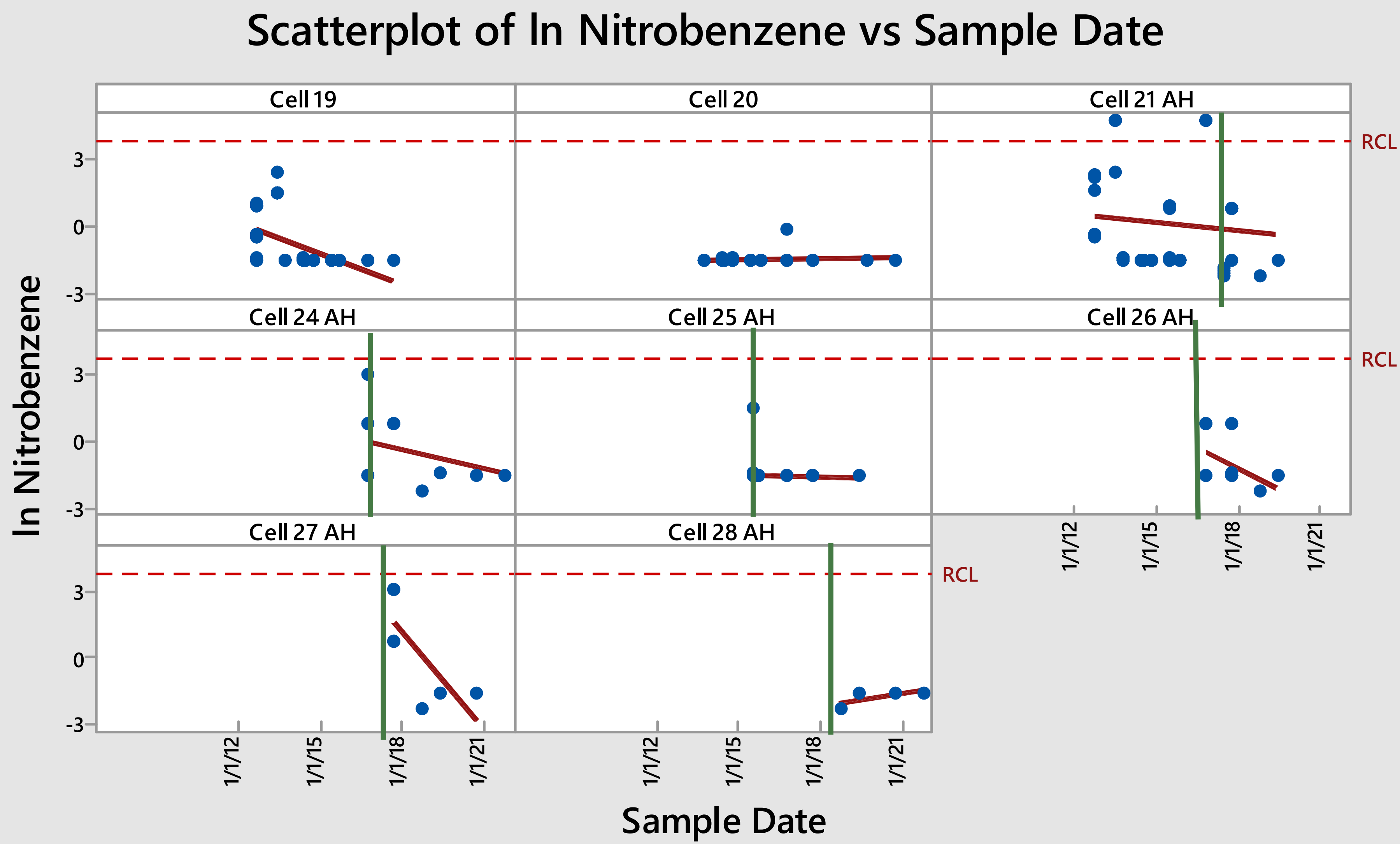

Scatterplot of ln (2,4,6-Trinitroxylene) vs Sample Date
Cell 31 AH
Cell 33 AH
Cell 35 AH
Cell 36 AH
Cell 37 AH
RCL
RCL
4
2
0
-2
ln (2,4,6-Trinitroxylene)
01/01/2012
01/01/2015
01/01/2018
01/01/2021
Sample Date
The vertical green lines indicate the beginning of lime addition
The logarithm of the RCL (124 mg/kg) is shown



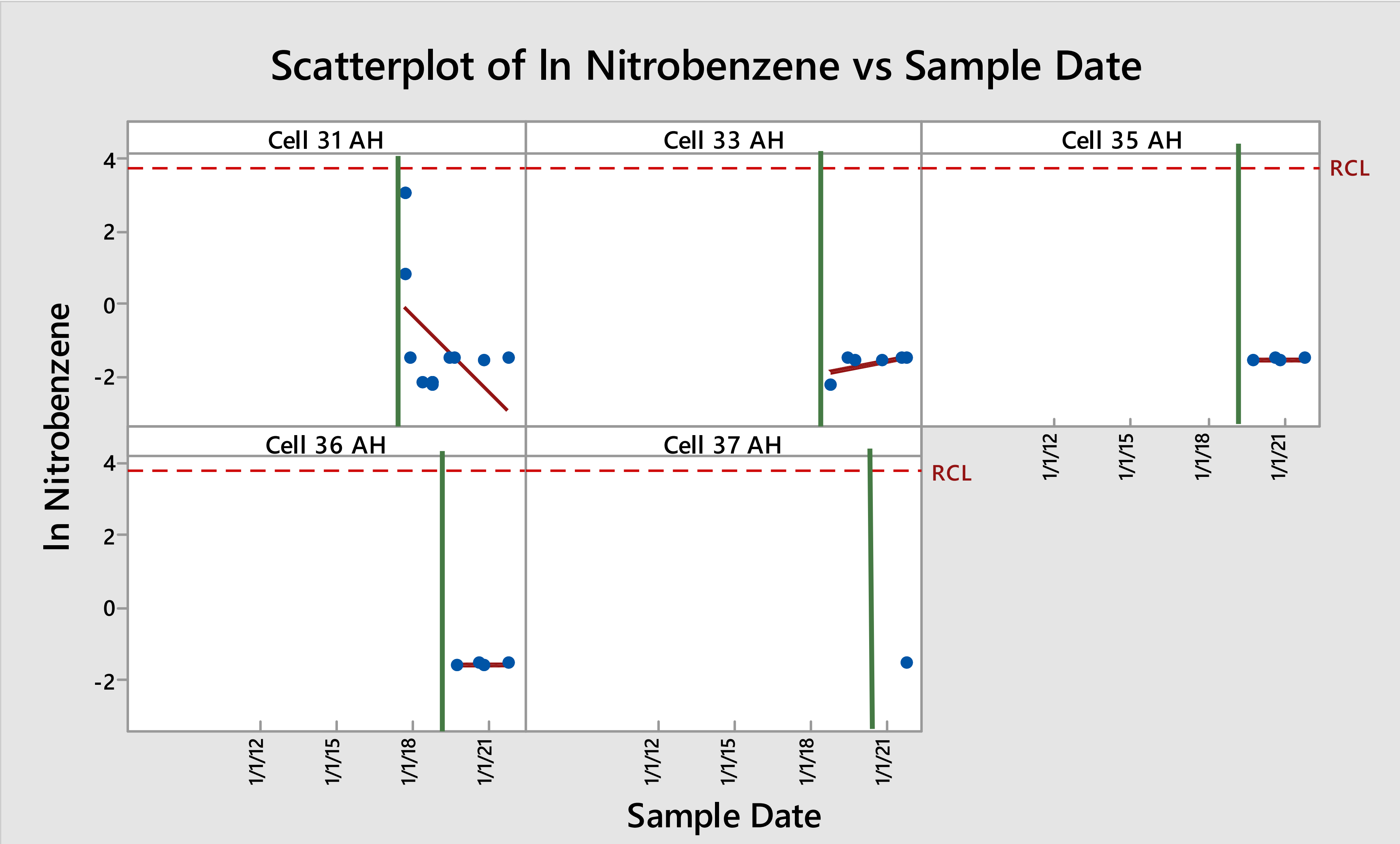
The vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL (43.2 mg/kg) is shown



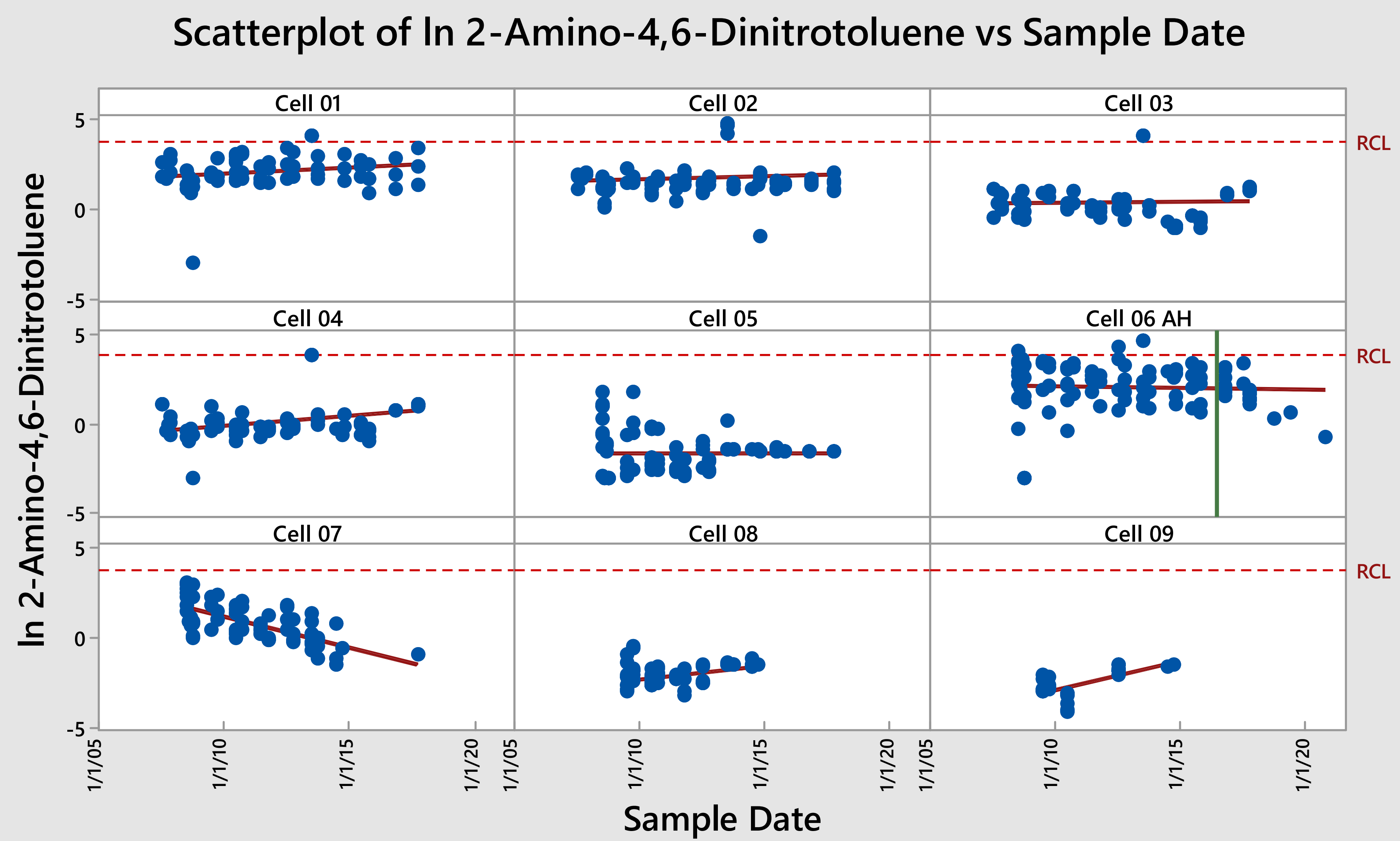
Scatterplot of ln Nitrobenzene vs Sample Date
Cell 10
Cell 11
Cell 12 AH
Cell 13
Cell 14
Cell 15
Cell 16 AH
Cell 17
Cell 18
RCL
RCL
RCL
5
0
-5
ln Nitrobenzene
1/1/08
1/1/12
1/1/16
1/1/20
Sample Date
The natural logarithm of the RCL (43.2 mg/kg) is shown
Vertical green lines indicate the beginning of lime addition



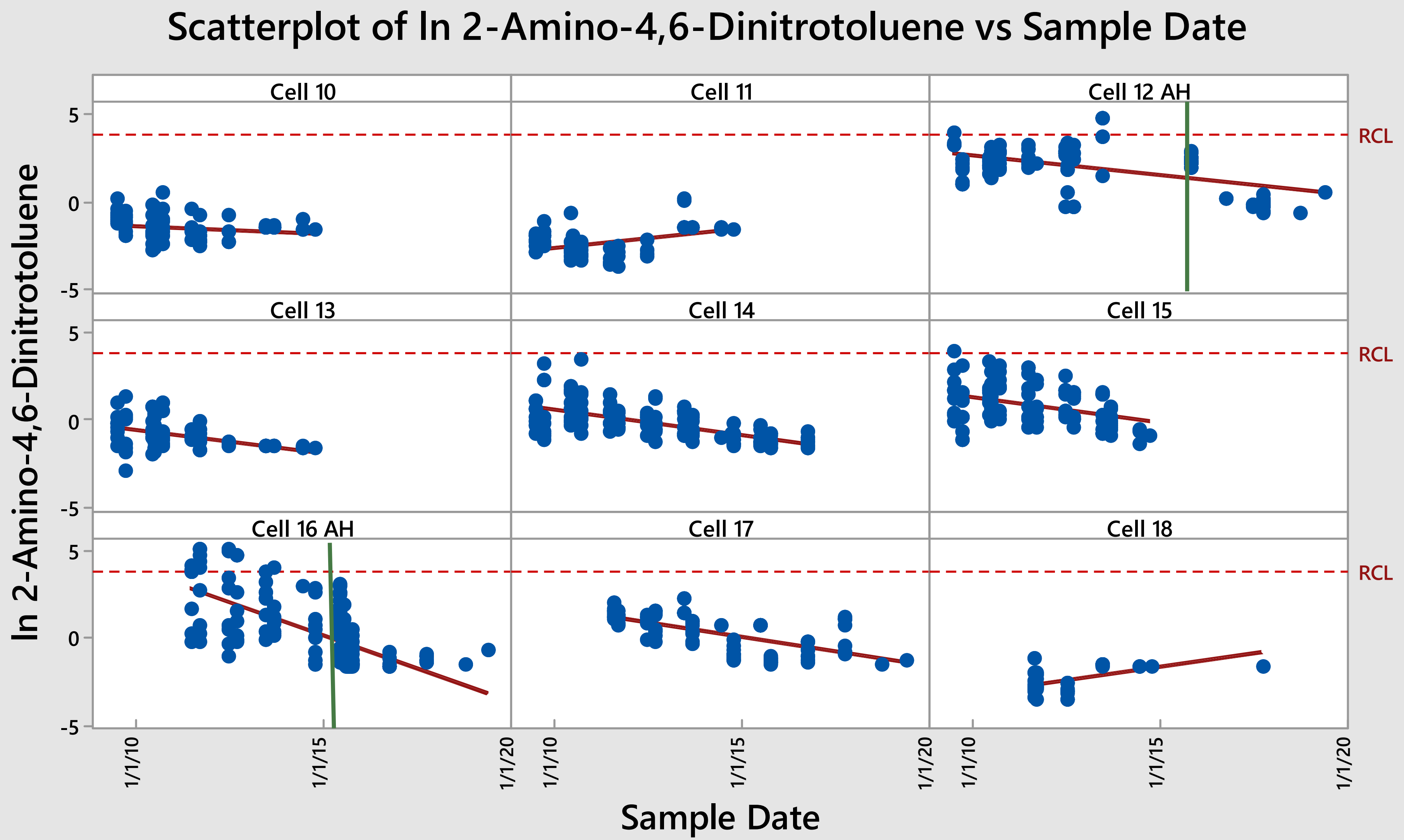
Vertical green lines indicate the beginning of lime addition
The natural logarithm of the RCL (43.2 mg/kg) is shown



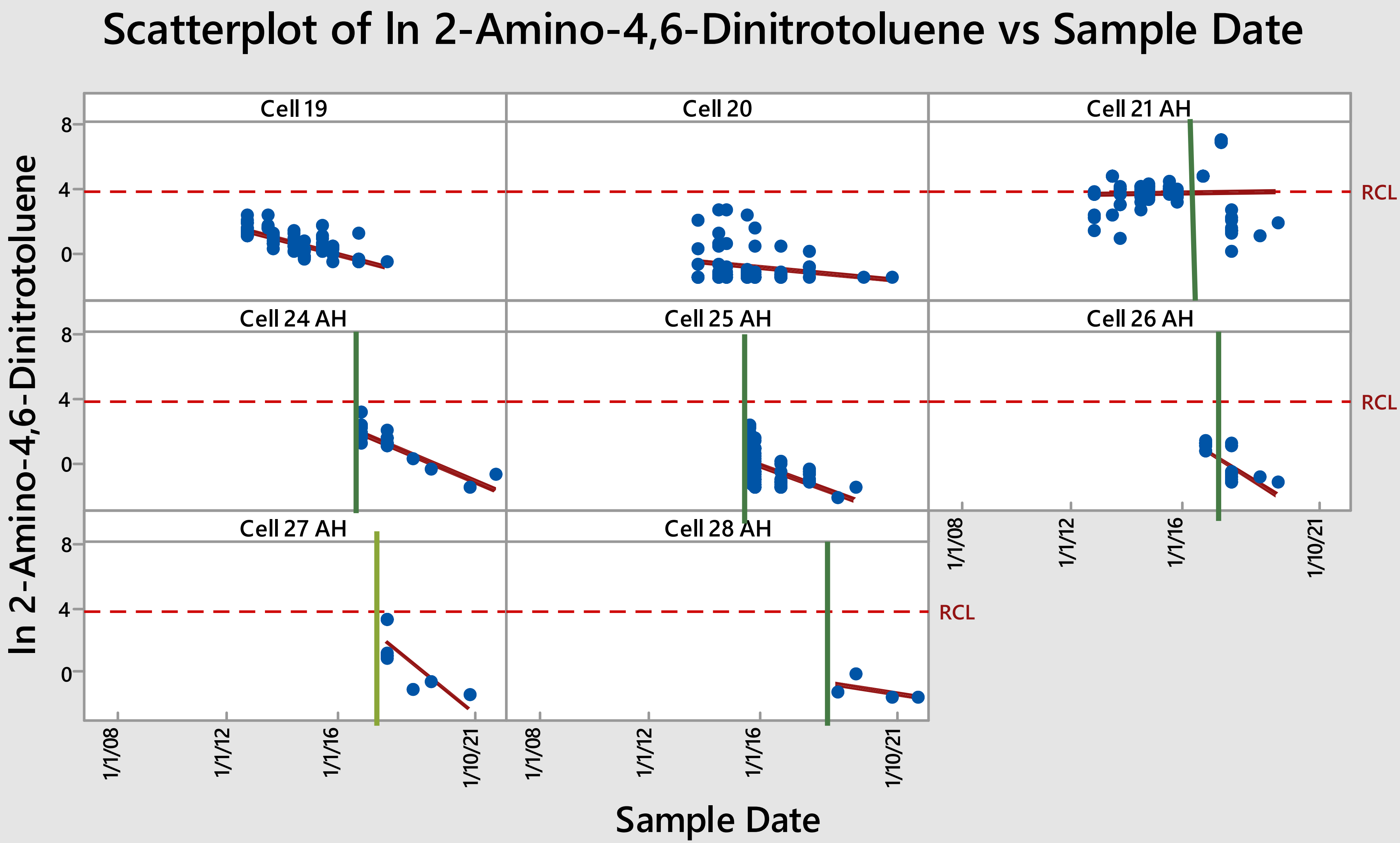
Vertical green lines indicate the beginning of lime addition
The natural logarithm of the RCL (43.2 mg/kg) is shown



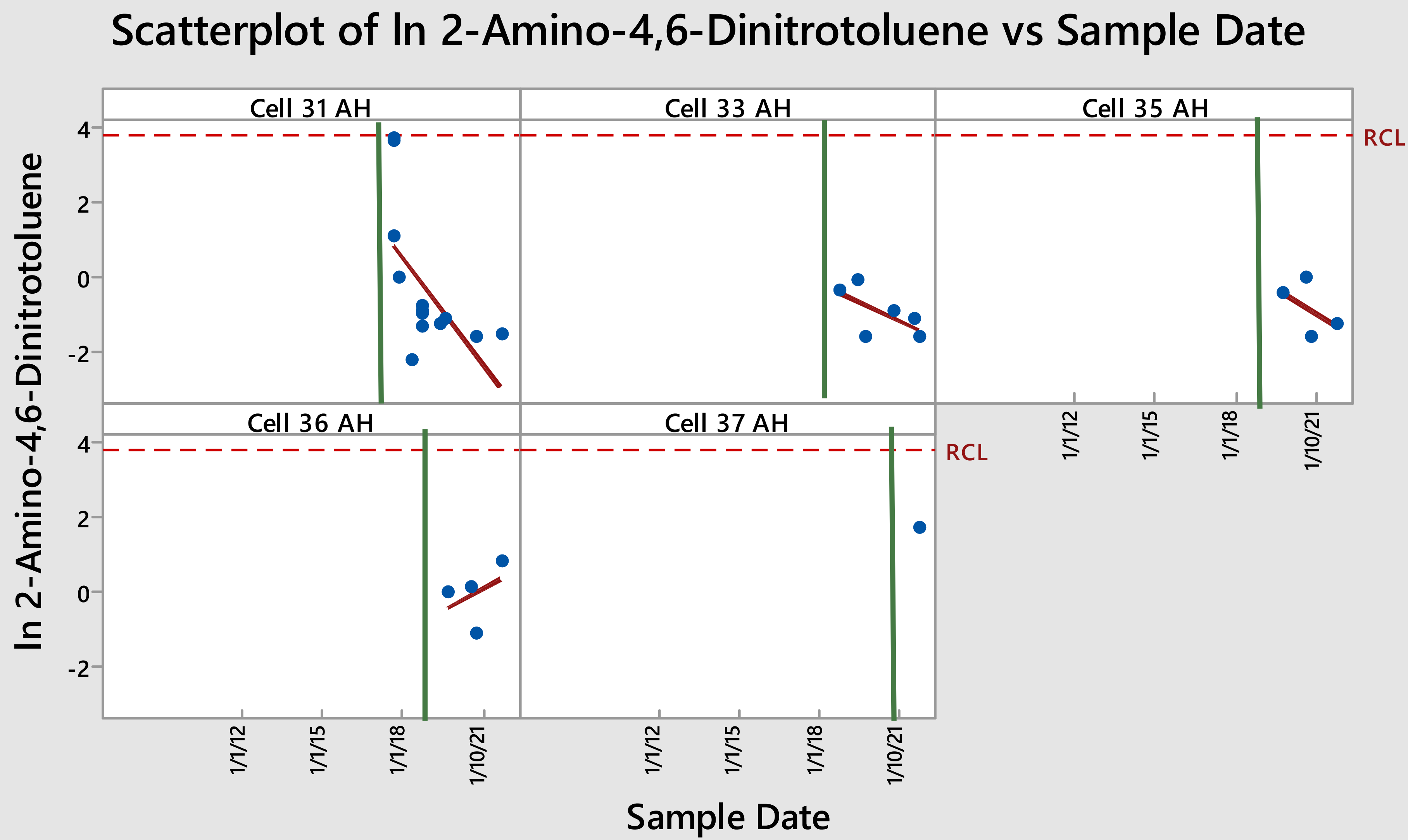
Vertical green line indicates the beginning of lime addition
The natural logarithm of the RCL(45 mg/kg) is shown



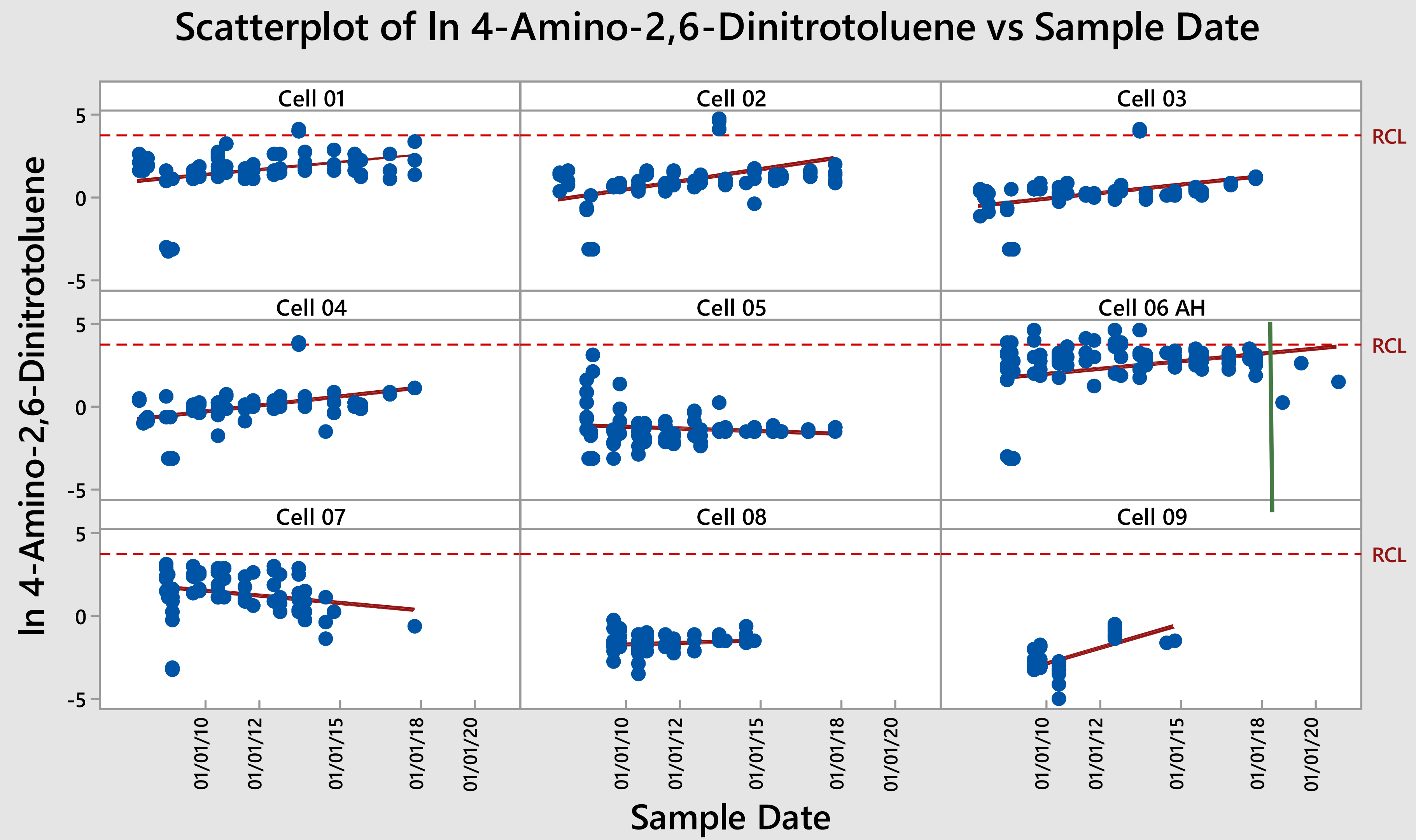
Vertical green lines indicate the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown



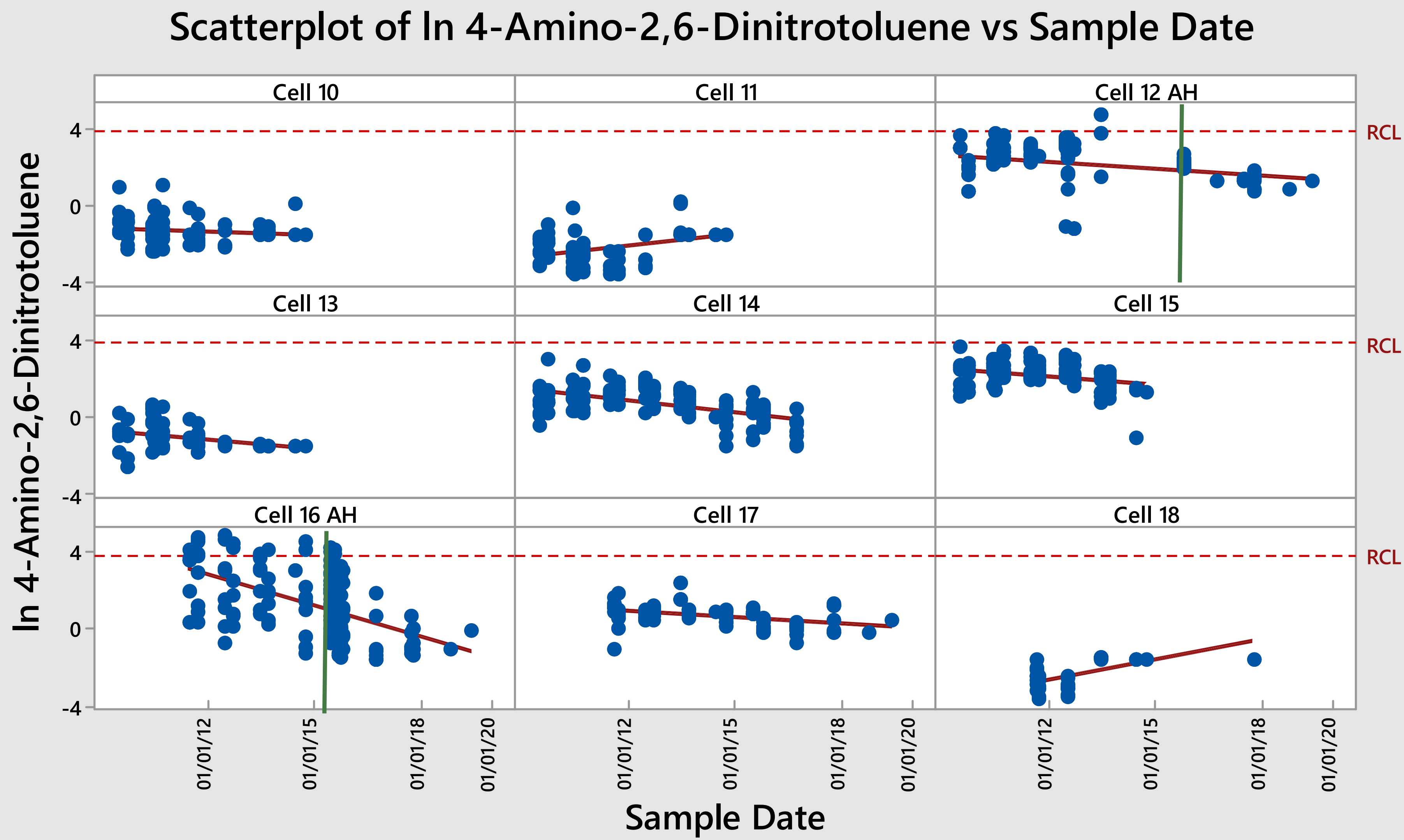
Vertical green lines indicate the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown



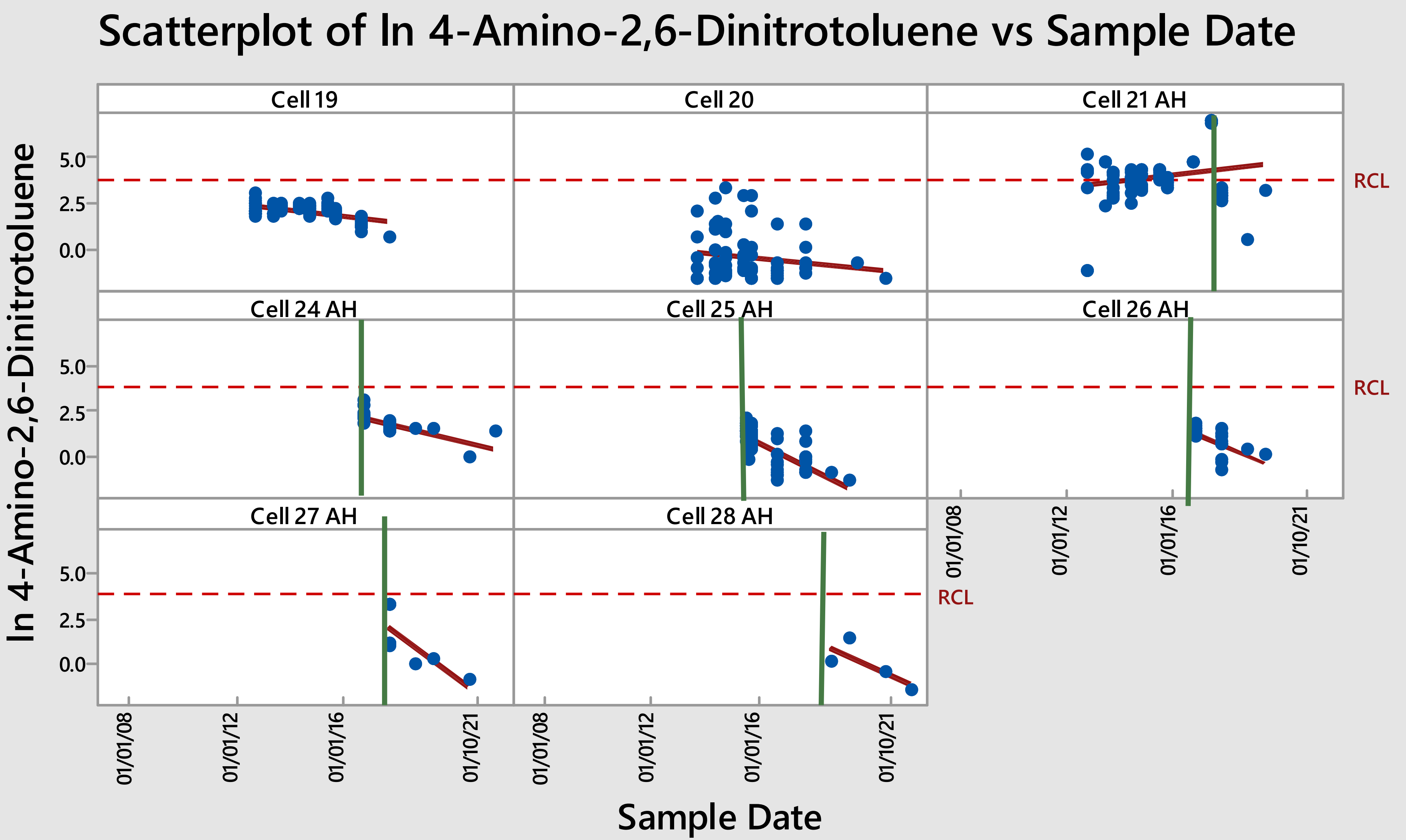
Vertical green lines indicate the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown



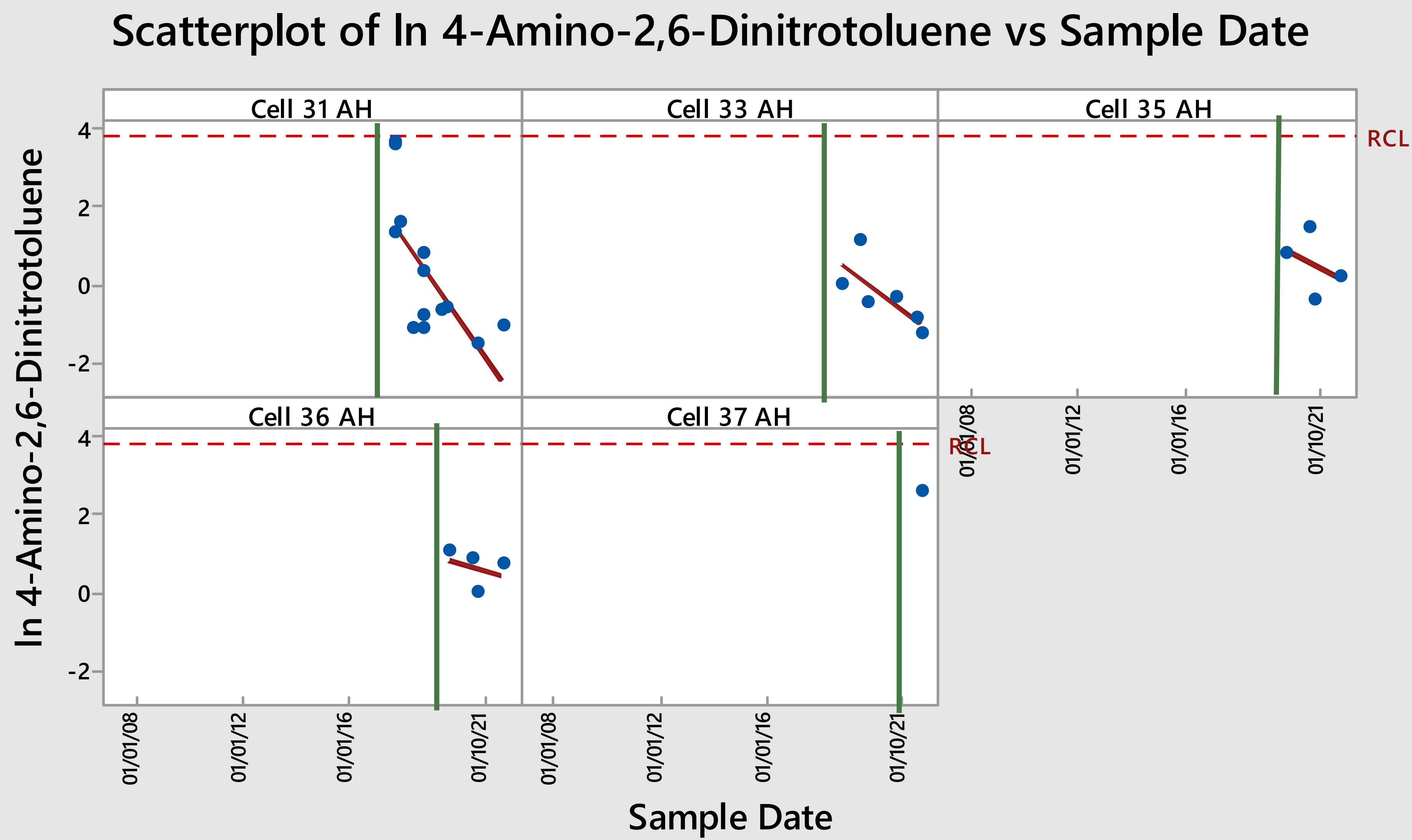
Vertical green line represents the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown



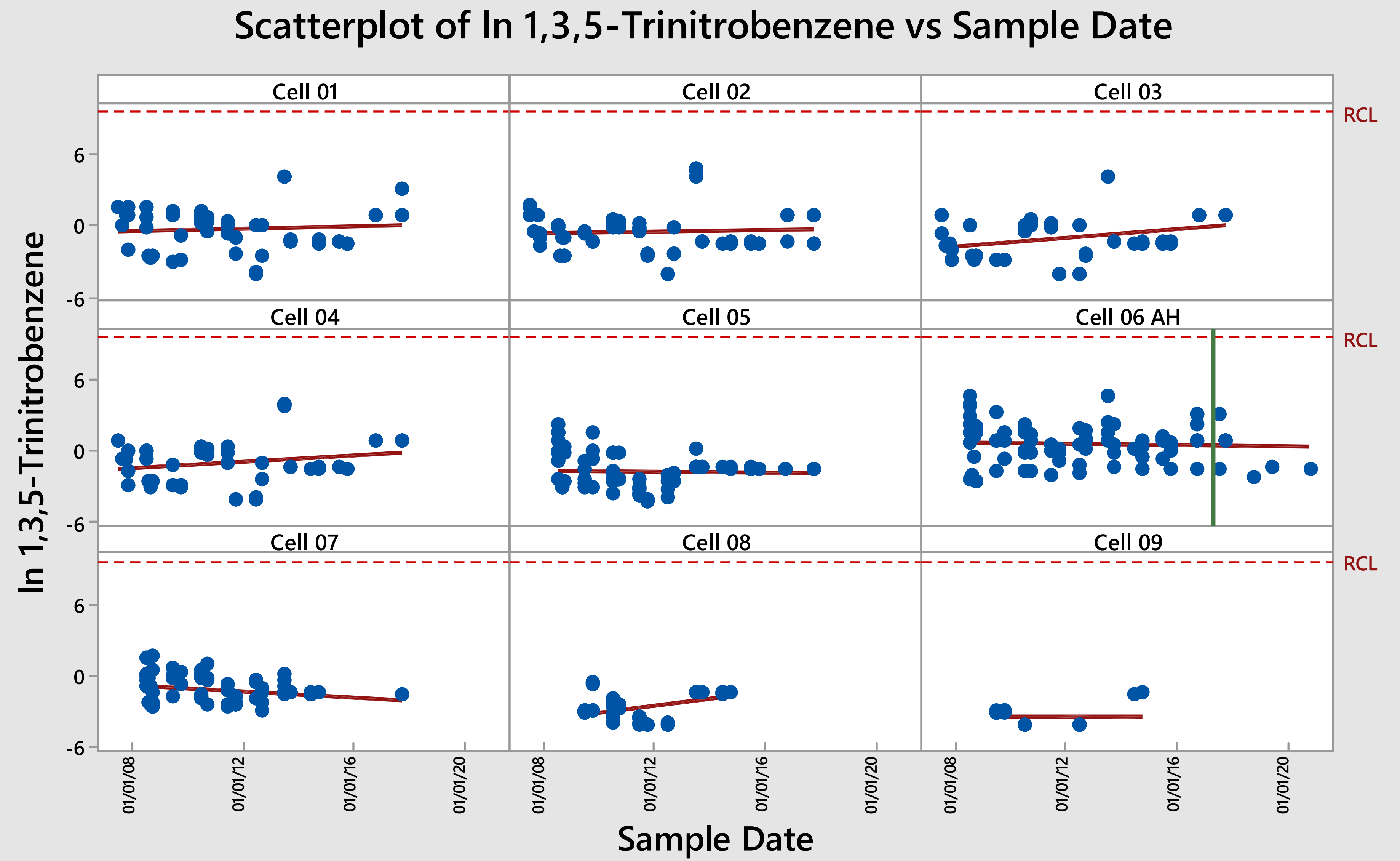
Vertical green lines represent the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown



Vertical green lines represent the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown

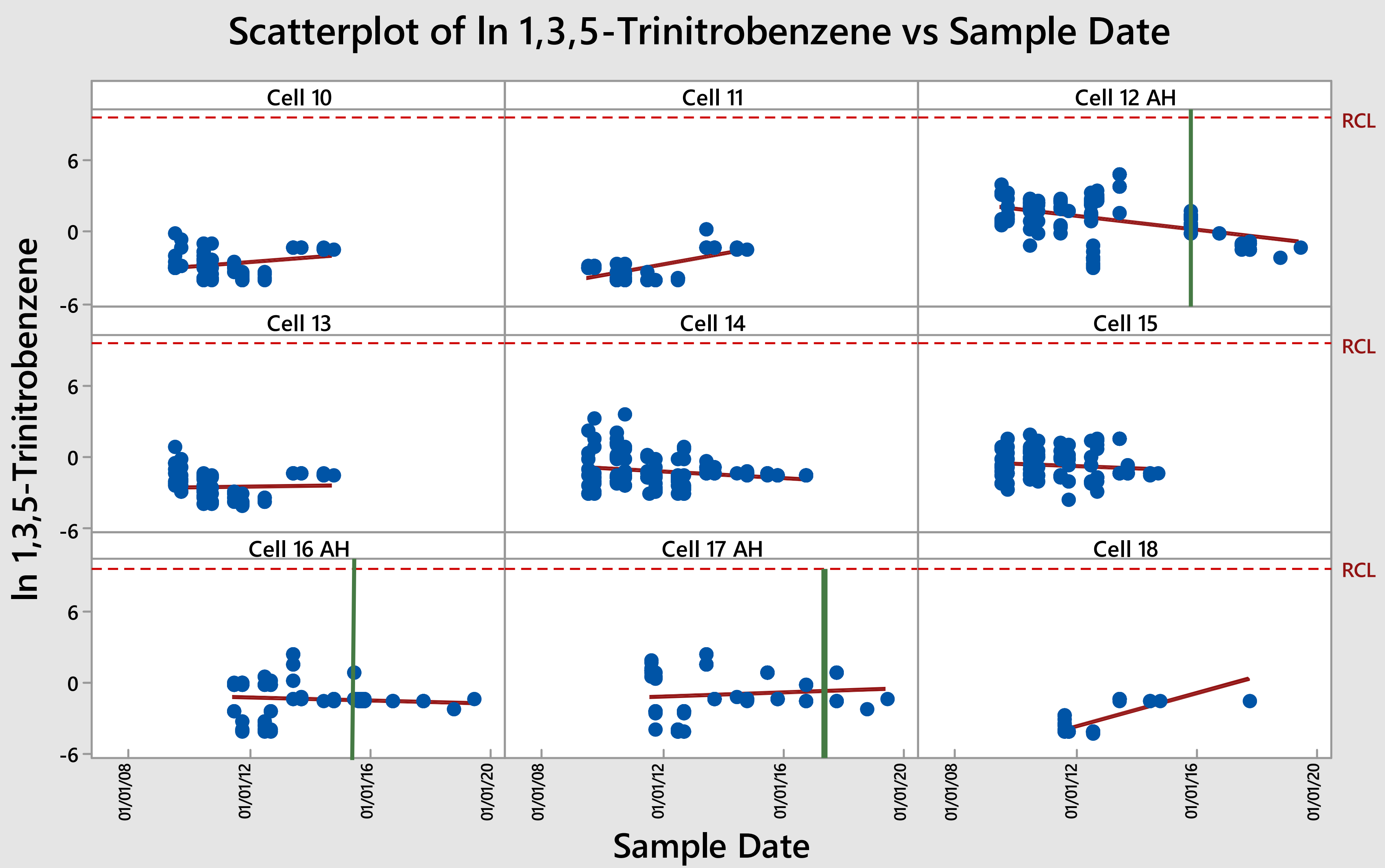


Vertical green lines represent the beginning of lime addition
The natural logarithm of the RCL (45 mg/kg) is shown



The natural logarithm of the RCL (13100 mg/kg) is shown

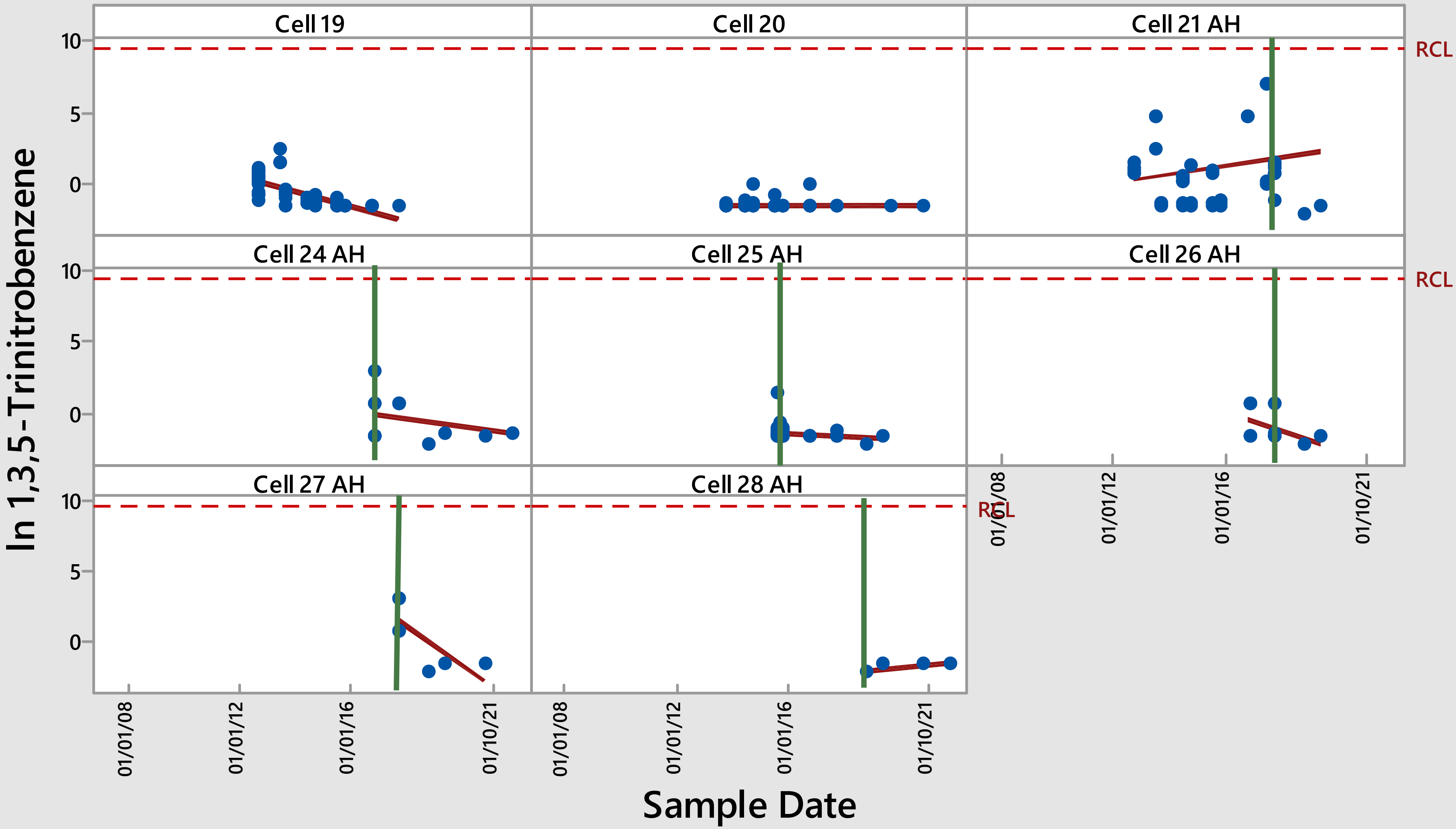
Vertical green line indicates the beginning of lime addition



The natural logarithm of the RCL (13100 mg/kg) is shown

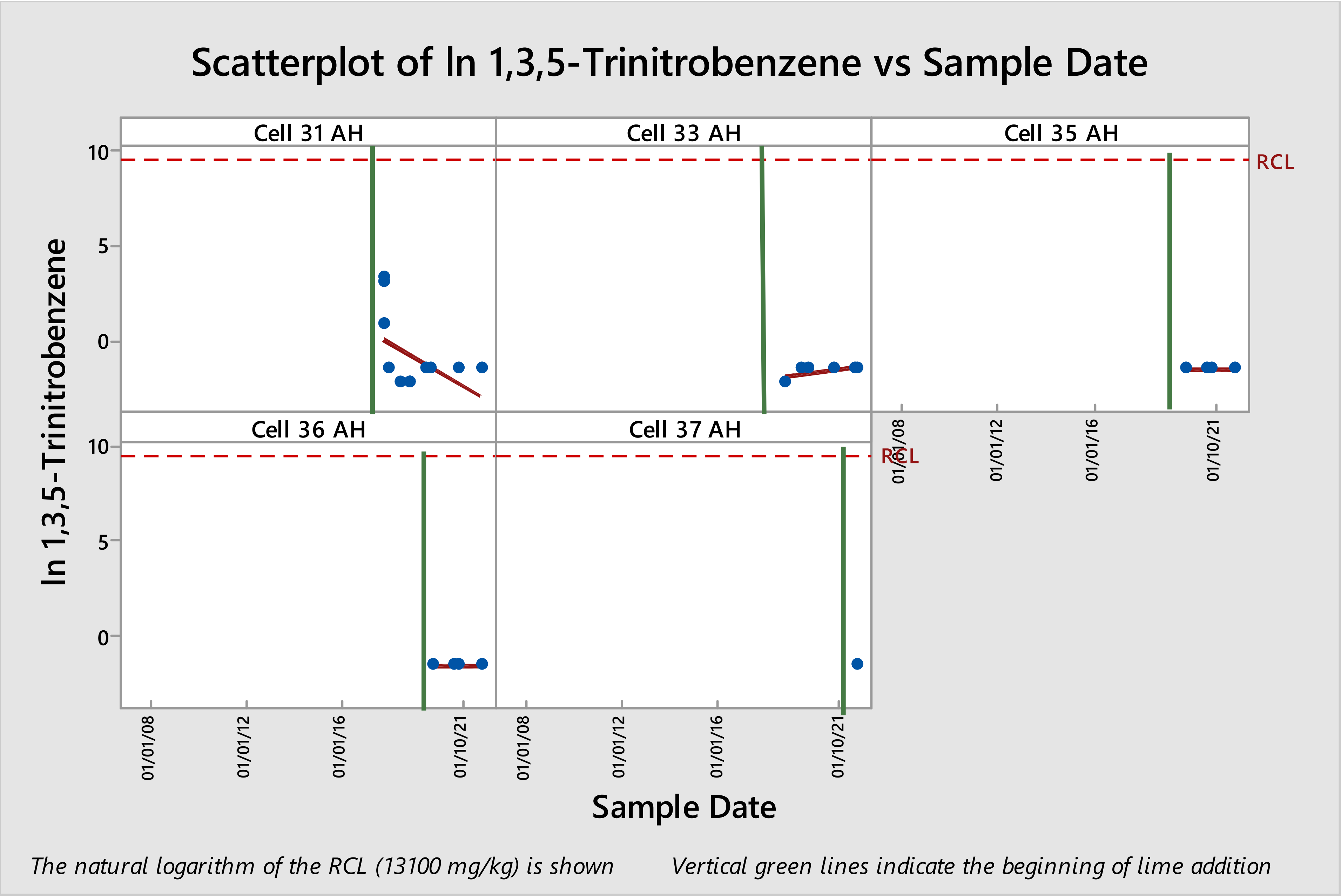
Vertical green lines indicate the beginning of lime addition

Scatterplot of ln 1,3,5-Trinitrobenzene vs Sample Date



The natural logarithm of the RCL (13100 mg/kg) is shown

Vertical green lines indicate the beginning of lime addition



Scatterplot of ln 1,3,5-Trinitrobenzene vs Sample Date
Cell 31 AH
Cell 33 AH
Cell 35 AH
Cell 36 AH
Cell 37 AH
RCL
RCL
10
5
0
ln 1,3,5-Trinitrobenzene
01/01/08
01/01/12
01/01/16
01/10/21
Sample Date
The natural logarithm of the RCL (13100 mg/kg) is shown
Vertical green lines indicate the beginning of lime addition

Appendix D

Cell Photographs

SITE PHOTOGRAPHS Former Barksdale Works	
Date: 05/27/2021 Direction: Down Description: View of cell C19 showing vegetation cover.	
Date: 12/03/2021 Direction: West Description: View of cell C09 showing vegetation cover at the end of summer growing season.	

Appendix E

Pace Analytical Reports

2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

September 10, 2021

Sharon Nordstrom
AECOM
4051 Ogletown Road
Newark, DE 19713

RE: Bio Pilot - Barksdale, WI

Enclosed are the analytical results for the samples received by the laboratory on 08/27/2021.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2022
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2022
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2022
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2022
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2022
NYDOH	New York Department of Health	12110	04/01/2022
TCEQ	Texas Secondary NELAP Accreditation	T104704504-20-11	11/30/2021
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2022

2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BPSB-210825-C33-0-1.5	A213411-01	Soil	08/25/2021	08/27/2021

CASE NARRATIVE

Sample Receipt Information:
One sample was received on 08/27/2021. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):
The E1 footnote on sample A213411-01 indicates that there were quality control sample exceedances for 2,4,6-trinitrotoluene. The LCS recovery was above acceptable limits. Please see the quality control section of the report for more information.

Continuing Calibration Verification (CCV):
The HC footnote on sample A213411-01 indicates that there were high CCV recoveries for 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene. The upper control limit is 130% and the highest recoveries were 131%, 134% and 139%, respectively.

Pace Analytical
ENVIRONMENTAL SCIENCES
MOBILE LAB SERVICES

2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

BPSB-210825-C33-0-1.5

A213411-01 (Soil)

Date Sampled
08/25/2021 14:00

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
Explosive Compounds by EPA Method 8270						**Preparation Batch: A108171**			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	3.9	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.0	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,3,5-Trinitrobenzene	ND	5.7	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.2	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,3-Dinitrobenzene	ND	34	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.4	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.6	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
2,3-Dinitrotoluene	ND	7.4	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
2,4,6-Trinitrotoluene	**1900**	3.2	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	E1, HC
2,4-Dinitrotoluene	ND	6.5	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
2,5-Dinitrotoluene	ND	6.9	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
2,6-Dinitrotoluene	ND	4.6	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**310**	3.8	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	HC
2-Nitrotoluene	ND	4.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
3,4-Dinitrotoluene	ND	4.5	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
3,5-Dinitroaniline	ND	2.6	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
3,5-Dinitrotoluene	ND	4.8	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
3-Nitrotoluene	ND	5.3	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**420**	2.8	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	HC
4-Nitrotoluene	ND	5.6	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
Nitrobenzene	ND	10	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	08/31/2021	09/03/2021 01:57	EPA 8270D	
Surrogate: 2,2´-Dinitrobiphenyl			*97.5 %*	*10-116*		*08/31/2021*	*09/03/2021 01:57*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*95.3 %*	*67.8-100*		*08/31/2021*	*09/03/2021 01:57*	*EPA 8270D*	
Classical Chemistry Parameters						**Preparation Batch: A108173**			
% Solids	**97.4**		0.00	% by Weight	1	08/31/2021	09/01/2021 08:45	ASTM D2974-87	

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Explosive Compounds by EPA Method 8270 - Quality Control

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Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A108171 - EPA 3570										
Blank (A108171-BLK1)				Prepared: 08/31/2021 Analyzed: 09/02/2021 12:06						
1,2-Dimethyl-3,4-Dinitrobenzene	ND	200	ug/kg wet							
1,2-Dimethyl-3,5-Dinitrobenzene	ND	200	ug/kg wet							
1,2-Dimethyl-3,6-Dinitrobenzene	ND	200	ug/kg wet							
1,2-Dimethyl-4,5-Dinitrobenzene	ND	200	ug/kg wet							
1,3,5-Trinitrobenzene	ND	200	ug/kg wet							
1,3-Dimethyl-2,4-Dinitrobenzene	ND	200	ug/kg wet							
1,3-Dimethyl-2,5-Dinitrobenzene	ND	200	ug/kg wet							
1,3-Dinitrobenzene	ND	200	ug/kg wet							
1,4-Dimethyl-2,3-Dinitrobenzene	ND	200	ug/kg wet							
1,4-Dimethyl-2,5-Dinitrobenzene	ND	200	ug/kg wet							
1,4-Dimethyl-2,6-Dinitrobenzene	ND	200	ug/kg wet							
1,5-Dimethyl-2,3-Dinitrobenzene	ND	200	ug/kg wet							
1,5-Dimethyl-2,4-Dinitrobenzene	ND	200	ug/kg wet							
2,3-Dinitrotoluene	ND	200	ug/kg wet							
2,4,6-Trinitrotoluene	ND	200	ug/kg wet							
2,4-Dinitrotoluene	ND	200	ug/kg wet							
2,5-Dinitrotoluene	ND	200	ug/kg wet							
2,6-Dinitrotoluene	ND	200	ug/kg wet							
2-Amino-4,6-dinitrotoluene	ND	200	ug/kg wet							
2-Nitrotoluene	ND	200	ug/kg wet							
3,4-Dinitrotoluene	ND	200	ug/kg wet							
3,5-Dinitroaniline	ND	200	ug/kg wet							
3,5-Dinitrotoluene	ND	200	ug/kg wet							
3-Nitrotoluene	ND	200	ug/kg wet							
4-Amino-2,6-dinitrotoluene	ND	200	ug/kg wet							
4-Nitrotoluene	ND	200	ug/kg wet							
Nitrobenzene	ND	200	ug/kg wet							
1,3,5-Trinitro-2,4-dimethylbenzene	ND	200	ug/kg wet							
Surrogate: 2,2´-Dinitrobiphenyl	*1290*		*ug/kg wet*	*1943*		*66.5*	*10-116*			
Surrogate: Nitrobenzene-d5	*1900*		*ug/kg wet*	*2000*		*94.9*	*67.8-100*			
LCS (A108171-BS1)				Prepared: 08/31/2021 Analyzed: 09/02/2021 10:31						
1,2-Dimethyl-3,4-Dinitrobenzene	2080	200	ug/kg wet	1996		104	78.3-107			
1,2-Dimethyl-3,5-Dinitrobenzene	2120	200	ug/kg wet	2020		105	74.3-103			
1,2-Dimethyl-3,6-Dinitrobenzene	2040	200	ug/kg wet	1999		102	79.8-108			
1,2-Dimethyl-4,5-Dinitrobenzene	2100	200	ug/kg wet	2026		103	74.3-108			
1,3,5-Trinitrobenzene	2110	200	ug/kg wet	2000		106	45.5-107			
1,3-Dimethyl-2,4-Dinitrobenzene	2050	200	ug/kg wet	2020		101	75-106			
1,3-Dimethyl-2,5-Dinitrobenzene	2030	200	ug/kg wet	2002		101	78.9-108			
1,3-Dinitrobenzene	2150	200	ug/kg wet	2000		107	55.8-108			
1,4-Dimethyl-2,3-Dinitrobenzene	1990	200	ug/kg wet	2006		99.2	77-107			
1,4-Dimethyl-2,5-Dinitrobenzene	2020	200	ug/kg wet	2026		99.7	75.6-108			
1,4-Dimethyl-2,6-Dinitrobenzene	2030	200	ug/kg wet	1996		102	77.8-107			
1,5-Dimethyl-2,3-Dinitrobenzene	2100	200	ug/kg wet	2012		104	75.4-107			
1,5-Dimethyl-2,4-Dinitrobenzene	2080	200	ug/kg wet	1966		106	75-108			
2,3-Dinitrotoluene	2050	200	ug/kg wet	2000		103	69.8-112			
2,4,6-Trinitrotoluene	2350	200	ug/kg wet	2000		118	63.4-111			

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Explosive Compounds by EPA Method 8270 - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A108171 - EPA 3570										
LCS (A108171-BS1)				Prepared: 08/31/2021 Analyzed: 09/02/2021 10:31						
2,4-Dinitrotoluene	2060	200	ug/kg wet	2000		103	69.4-113			
2,5-Dinitrotoluene	2120	200	ug/kg wet	2000		106	67-107			
2,6-Dinitrotoluene	2080	200	ug/kg wet	2000		104	75.3-108			
2-Amino-4,6-dinitrotoluene	2100	200	ug/kg wet	2000		105	61.9-106			
2-Nitrotoluene	1970	200	ug/kg wet	2000		98.6	75.3-111			
3,4-Dinitrotoluene	2050	200	ug/kg wet	2000		103	72.4-108			
3,5-Dinitroaniline	1970	200	ug/kg wet	2000		98.4	61-107			
3,5-Dinitrotoluene	2080	200	ug/kg wet	2000		104	72.2-111			
3-Nitrotoluene	2000	200	ug/kg wet	2000		99.8	77.4-107			
4-Amino-2,6-dinitrotoluene	2180	200	ug/kg wet	2000		109	51.7-110			
4-Nitrotoluene	1960	200	ug/kg wet	2000		97.8	79.1-108			
Nitrobenzene	1960	200	ug/kg wet	2000		98.0	80.5-109			
Surrogate: 2,2´-Dinitrobiphenyl	*2270*		*ug/kg wet*	*1943*		*117*	*10-116*			*S*
Surrogate: Nitrobenzene-d5	*1980*		*ug/kg wet*	*2000*		*99.1*	*67.8-100*			
Matrix Spike (A108171-MS1)	**Source: A213320-17**			Prepared: 08/31/2021 Analyzed: 09/02/2021 11:03						
1,2-Dimethyl-3,4-Dinitrobenzene	1170	200	ug/kg dry	2024	ND	57.9	70.9-106			M
1,2-Dimethyl-3,5-Dinitrobenzene	1370	200	ug/kg dry	2048	ND	66.9	68.2-104			M
1,2-Dimethyl-3,6-Dinitrobenzene	1330	200	ug/kg dry	2027	ND	65.6	75.9-109			M
1,2-Dimethyl-4,5-Dinitrobenzene	1190	200	ug/kg dry	2054	ND	57.8	65-112			M
1,3,5-Trinitrobenzene	1200	200	ug/kg dry	2028	209	48.8	37.4-108			
1,3-Dimethyl-2,4-Dinitrobenzene	1450	200	ug/kg dry	2048	ND	70.9	69.5-109			
1,3-Dimethyl-2,5-Dinitrobenzene	1460	200	ug/kg dry	2030	ND	72.1	76.2-108			M
1,3-Dinitrobenzene	1250	200	ug/kg dry	2028	ND	61.6	50.2-106			
1,4-Dimethyl-2,3-Dinitrobenzene	1210	200	ug/kg dry	2034	ND	59.3	72.3-106			M
1,4-Dimethyl-2,5-Dinitrobenzene	1450	200	ug/kg dry	2054	ND	70.4	71.6-108			M
1,4-Dimethyl-2,6-Dinitrobenzene	1440	200	ug/kg dry	2024	ND	71.0	74-108			M
1,5-Dimethyl-2,3-Dinitrobenzene	1380	200	ug/kg dry	2040	ND	67.5	67.9-106			M
1,5-Dimethyl-2,4-Dinitrobenzene	1380	200	ug/kg dry	1993	ND	69.0	69.2-109			M
2,3-Dinitrotoluene	1110	200	ug/kg dry	2028	ND	54.9	66.9-107			M
2,4,6-Trinitrotoluene	4830	200	ug/kg dry	2028	4120	35.2	20.9-161			
2,4-Dinitrotoluene	1360	200	ug/kg dry	2028	ND	66.9	63.6-113			
2,5-Dinitrotoluene	1360	200	ug/kg dry	2028	ND	67.1	61.4-109			
2,6-Dinitrotoluene	1360	200	ug/kg dry	2028	139	60.3	68-110			M
2-Amino-4,6-dinitrotoluene	1880	200	ug/kg dry	2028	1530	17.0	31-124			M
2-Nitrotoluene	1590	200	ug/kg dry	2028	ND	78.3	70.7-115			
3,4-Dinitrotoluene	1140	200	ug/kg dry	2028	ND	56.0	70-104			M
3,5-Dinitroaniline	789	200	ug/kg dry	2028	ND	38.9	41.8-112			M
3,5-Dinitrotoluene	1380	200	ug/kg dry	2028	ND	67.8	68.4-110			M
3-Nitrotoluene	1630	200	ug/kg dry	2028	ND	80.2	74.4-110			
4-Amino-2,6-dinitrotoluene	1570	200	ug/kg dry	2028	969	29.8	27.9-131			
4-Nitrotoluene	1580	200	ug/kg dry	2028	ND	77.7	75.5-110			
Nitrobenzene	1500	200	ug/kg dry	2028	ND	73.8	76.1-111			M
Surrogate: 2,2´-Dinitrobiphenyl	*924*		*ug/kg dry*	*1970*		*46.9*	*10-116*			
Surrogate: Nitrobenzene-d5	*1500*		*ug/kg dry*	*2028*		*74.0*	*67.8-100*			

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Explosive Compounds by EPA Method 8270 - Quality Control

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Batch A108171 - EPA 3570

Matrix Spike Dup (A108171-MSD1) **Source: A213320-17** Prepared: 08/31/2021 Analyzed: 09/02/2021 11:34

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dimethyl-3,4-Dinitrobenzene	1190	200	ug/kg dry	2020	ND	58.9	70.9-106	1.48	20	M
1,2-Dimethyl-3,5-Dinitrobenzene	1400	200	ug/kg dry	2044	ND	68.4	68.2-104	2.05	20	
1,2-Dimethyl-3,6-Dinitrobenzene	1360	200	ug/kg dry	2023	ND	67.0	75.9-109	1.96	20	M
1,2-Dimethyl-4,5-Dinitrobenzene	1210	200	ug/kg dry	2050	ND	59.1	65-112	1.96	20	M
1,3,5-Trinitrobenzene	1180	200	ug/kg dry	2024	209	47.9	37.4-108	1.68	20	
1,3-Dimethyl-2,4-Dinitrobenzene	1510	200	ug/kg dry	2044	ND	74.0	69.5-109	4.14	20	
1,3-Dimethyl-2,5-Dinitrobenzene	1520	200	ug/kg dry	2026	ND	75.3	76.2-108	4.12	20	M
1,3-Dinitrobenzene	1230	200	ug/kg dry	2024	ND	60.9	50.2-106	1.36	20	
1,4-Dimethyl-2,3-Dinitrobenzene	1260	200	ug/kg dry	2030	ND	62.0	72.3-106	4.30	20	M
1,4-Dimethyl-2,5-Dinitrobenzene	1480	200	ug/kg dry	2050	ND	72.4	71.6-108	2.57	20	
1,4-Dimethyl-2,6-Dinitrobenzene	1490	200	ug/kg dry	2020	ND	73.6	74-108	3.37	20	M
1,5-Dimethyl-2,3-Dinitrobenzene	1420	200	ug/kg dry	2036	ND	69.6	67.9-106	2.82	20	
1,5-Dimethyl-2,4-Dinitrobenzene	1410	200	ug/kg dry	1989	ND	71.0	69.2-109	2.65	20	
2,3-Dinitrotoluene	1130	200	ug/kg dry	2024	ND	56.0	66.9-107	1.76	20	M
2,4,6-Trinitrotoluene	4870	200	ug/kg dry	2024	4120	36.9	20.9-161	0.692	20	
2,4-Dinitrotoluene	1370	200	ug/kg dry	2024	ND	67.8	63.6-113	1.14	20	
2,5-Dinitrotoluene	1400	200	ug/kg dry	2024	ND	69.0	61.4-109	2.63	20	
2,6-Dinitrotoluene	1380	200	ug/kg dry	2024	139	61.2	68-110	1.12	20	M
2-Amino-4,6-dinitrotoluene	1800	200	ug/kg dry	2024	1530	13.2	31-124	4.24	20	M
2-Nitrotoluene	1680	200	ug/kg dry	2024	ND	82.8	70.7-115	5.32	20	
3,4-Dinitrotoluene	1110	200	ug/kg dry	2024	ND	55.1	70-104	1.85	20	M
3,5-Dinitroaniline	769	200	ug/kg dry	2024	ND	38.0	41.8-112	2.62	20	M
3,5-Dinitrotoluene	1440	200	ug/kg dry	2024	ND	71.2	68.4-110	4.66	20	
3-Nitrotoluene	1720	200	ug/kg dry	2024	ND	84.9	74.4-110	5.54	20	
4-Amino-2,6-dinitrotoluene	1510	200	ug/kg dry	2024	969	26.9	27.9-131	3.87	20	M
4-Nitrotoluene	1650	200	ug/kg dry	2024	ND	81.6	75.5-110	4.77	20	
Nitrobenzene	1590	200	ug/kg dry	2024	ND	78.3	76.1-111	5.74	20	
Surrogate: 2,2′-Dinitrobiphenyl	*906*		*ug/kg dry*	*1966*		*46.1*	*10-116*			
Surrogate: Nitrobenzene-d5	*1560*		*ug/kg dry*	*2024*		*76.9*	*67.8-100*			

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A108173 - % Solids										
Duplicate (A108173-DUP1)	**Source: A213320-17**		Prepared: 08/31/2021 Analyzed: 09/01/2021 08:45							
% Solids	97.4	0.00	% by Weight		97.5			0.0467	20	

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4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Notes and Definitions

S	Surrogate recovery was outside of laboratory control limits.
M	The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
HC	Results may be biased high because of high continuing calibration verification (CCV).
E1	Estimated value because of quality control sample exceedances.
ND	Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
NR	Not Reported
dry	Sample results reported on a dry weight basis. Detection limits (if listed) and reporting limits have been adjusted for the solids content. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
RPD	Relative Percent Difference

Detection limits (if listed) and reporting limits have been adjusted for dilutions, if reported.

Environmental Chemistry Consulting Services, Inc.
2525 Advance Road
Madison, WI 53718
608-221-8700 (phone)
608-221-4889 (fax)

CHAIN OF CUSTODY

A213411

Lab Work Order #: ~~A213410~~ (initials) 8/27/21

Mail Report To:	Sharon Nordstrom
Company:	AECOM
Address:	4051 Ogletown Rd Newark, DE 19713
E-mail Address:	sharon.nordstrom@aecom.com
Invoice To:	
Company:	AECOM
Address:	

Project Number:	60663958
Project Name:	Barksdale
Project Location:	Barksdale, WI
Turn Around (check one):	☒ Normal ☐ 5 BDs ☐ 3 BDs ☐ 2 BDs ☐ 24 hrs
If Rush, Report Due Date:	
Sampled By (Print):	Desmond Nielsen

Preservation Codes: (blank)
Analyses Requested: A

Sample Description	Collection Date	Collection Time	Matrix	Total # of Containers	NNOCs	PH					Comments	Lab ID	Lab Receipt Time
BPSB-210825-C33(0-1.5)	8/25/2021	14:00	S	2	☒	☐	☐	☐	☐	☐	Possible elevated NNOCs	01	
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			
			S		☒	☐	☐	☐	☐	☐			

Preservation Codes
A=None B=HCL C=H_2SO_4
D=HNO_3 E=EnCore F=Methanol
G=NaOH O=Other (Indicate)

Matrix Codes
A=Air S=Soil W=Water O=Other

Rush TAT Multipliers
5 Business Days = 1.5x
3 Business Days = 2x
2 Business Days = 2.25x
24 Hours = 2.5x
must be pre-arranged

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Desmond Nielsen	8/26/21	12:00	(signature)	8/27/21	1033

Custody Seal: ☑ Present ☐ Absent ☑ Intact ☐ Not Intact
Seal #s: 1375832/33
Shipped Via: Fed Ex
Receipt Temp: 2.2°C SINLU0142274 Exp 12/17/21
Temp Blank: ☑ Y ☐ N

Download this form at www.eccsmobilelab.com

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774642156709

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October 21, 2021

Sharon Nordstrom
AECOM
4051 Ogletown Road
Newark, DE 19713

RE: Bio Pilot - Barksdale, WI

Enclosed are the analytical results for the samples received by the laboratory on 10/07/2021.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2022
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2022
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2022
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2022
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2022
NYDOH	New York Department of Health	12110	04/01/2022
TCEQ	Texas Secondary NELAP Accreditation	T104704504-20-11	11/30/2021
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2022

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BPSB-211004-C24-0-1.5	A214013-01	Soil	10/04/2021	10/07/2021
BPSB-211004-C28-0-1.5	A214013-02	Soil	10/04/2021	10/07/2021
BPSB-211004-C31-0-1	A214013-03	Soil	10/04/2021	10/07/2021
BPSB-211004-C33-0-1.5	A214013-04	Soil	10/04/2021	10/07/2021
BPSB-211004-C33-0-1.5-D	A214013-05	Soil	10/04/2021	10/07/2021
BPSB-211004-C35-0-2	A214013-06	Soil	10/04/2021	10/07/2021
BPSB-211004-C36-0-2	A214013-07	Soil	10/04/2021	10/07/2021
BPSB-211004-C37-0-3	A214013-08	Soil	10/04/2021	10/07/2021

CASE NARRATIVE

Sample Receipt Information:
Eight samples were received on 10/07/2021. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

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AECOM	Project: Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number: 60663958
Newark DE, 19713	Project Manager: Sharon Nordstrom

BPSB-211004-C24-0-1.5

A214013-01 (Soil)

Date Sampled
10/04/2021 09:40

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045						Preparation Batch: A110126			
Lab pH	**11.6**			pH Units	1	10/08/2021	10/08/2021 14:08	EPA 9045D	
Explosive Compounds by EPA Method 8270						Preparation Batch: A110132			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.3	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	3.8	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	5.8	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,3,5-Trinitrobenzene	**210**	5.6	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.1	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,3-Dinitrobenzene	ND	33	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.5	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
2,3-Dinitrotoluene	ND	7.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
2,4,6-Trinitrotoluene	**41000**	62	4000	ug/kg dry	20	10/11/2021	10/12/2021 00:40	EPA 8270D	M1, D
2,4-Dinitrotoluene	**110**	6.3	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	J
2,5-Dinitrotoluene	ND	6.7	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
2,6-Dinitrotoluene	ND	4.5	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**460**	3.7	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
2-Nitrotoluene	ND	4.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
3,4-Dinitrotoluene	ND	4.4	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
3,5-Dinitroaniline	**190**	2.5	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	J
3,5-Dinitrotoluene	ND	4.7	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
3-Nitrotoluene	ND	5.2	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**3500**	2.7	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
4-Nitrotoluene	ND	5.5	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
Nitrobenzene	ND	10	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.7	200	ug/kg dry	1	10/11/2021	10/12/2021 00:09	EPA 8270D	
Surrogate: 2,2′-Dinitrobiphenyl			*93.1 %*	*10-116*		*10/11/2021*	*10/12/2021 00:09*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*96.5 %*	*67.8-100*		*10/11/2021*	*10/12/2021 00:09*	*EPA 8270D*	
Classical Chemistry Parameters						Preparation Batch: A110131			
% Solids	**97.0**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

BPSB-211004-C28-0-1.5

A214013-02 (Soil)

Date Sampled
10/04/2021 10:00

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045						**Preparation Batch: A110126**			
Lab pH	**12.1**			pH Units	1	10/08/2021	10/08/2021 14:12	EPA 9045D	
Explosive Compounds by EPA Method 8270						**Preparation Batch: A110132**			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.4	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	3.9	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	5.9	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,3,5-Trinitrobenzene	ND	5.7	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.2	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,3-Dinitrobenzene	ND	34	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.6	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
2,3-Dinitrotoluene	ND	7.4	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
2,4,6-Trinitrotoluene	**170**	3.2	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	J
2,4-Dinitrotoluene	ND	6.5	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
2,5-Dinitrotoluene	ND	6.9	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
2,6-Dinitrotoluene	ND	4.6	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
2-Amino-4,6-dinitrotoluene	ND	3.8	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
2-Nitrotoluene	ND	4.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
3,4-Dinitrotoluene	ND	4.5	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
3,5-Dinitroaniline	ND	2.6	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
3,5-Dinitrotoluene	ND	4.8	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
3-Nitrotoluene	ND	5.3	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**230**	2.8	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
4-Nitrotoluene	ND	5.6	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
Nitrobenzene	ND	10	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	200	ug/kg dry	1	10/11/2021	10/12/2021 01:12	EPA 8270D	
Surrogate: 2,2´-Dinitrobiphenyl			*83.8 %*	*10-116*		*10/11/2021*	*10/12/2021 01:12*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*94.7 %*	*67.8-100*		*10/11/2021*	*10/12/2021 01:12*	*EPA 8270D*	
Classical Chemistry Parameters						**Preparation Batch: A110131**			
% Solids	**96.3**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

BPSB-211004-C31-0-1

A214013-03 (Soil)

Date Sampled
10/04/2021 10:20

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Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045						**Preparation Batch: A110126**			
Lab pH	**12.4**			pH Units	1	10/08/2021	10/08/2021 14:15	EPA 9045D	
Explosive Compounds by EPA Method 8270						**Preparation Batch: A110132**			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.6	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	4.0	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.1	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,3,5-Trinitrobenzene	ND	5.9	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,3-Dinitrobenzene	ND	35	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.5	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.7	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.5	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.4	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
2,3-Dinitrotoluene	ND	7.6	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
2,4,6-Trinitrotoluene	**15000**	3.3	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
2,4-Dinitrotoluene	**120**	6.6	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	J
2,5-Dinitrotoluene	ND	7.1	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
2,6-Dinitrotoluene	ND	4.7	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**210**	3.9	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
2-Nitrotoluene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
3,4-Dinitrotoluene	ND	4.6	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
3,5-Dinitroaniline	ND	2.6	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
3,5-Dinitrotoluene	ND	5.0	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
3-Nitrotoluene	ND	5.5	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**340**	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
4-Nitrotoluene	ND	5.8	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
Nitrobenzene	ND	11	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 02:15	EPA 8270D	
Surrogate: 2,2´-Dinitrobiphenyl			*72.4 %*	*10-116*		*10/11/2021*	*10/12/2021 02:15*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*90.3 %*	*67.8-100*		*10/11/2021*	*10/12/2021 02:15*	*EPA 8270D*	
Classical Chemistry Parameters						**Preparation Batch: A110131**			
% Solids	**93.7**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

BPSB-211004-C33-0-1.5

A214013-04 (Soil)

Date Sampled
10/04/2021 10:40

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045							**Preparation Batch: A110126**		
Lab pH	**11.0**			pH Units	1	10/08/2021	10/08/2021 14:16	EPA 9045D	
Explosive Compounds by EPA Method 8270							**Preparation Batch: A110132**		
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.5	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	3.9	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.0	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,3,5-Trinitrobenzene	ND	5.8	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.3	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,3-Dinitrobenzene	ND	34	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.4	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.6	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
2,3-Dinitrotoluene	ND	7.4	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
2,4,6-Trinitrotoluene	**2600**	3.2	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
2,4-Dinitrotoluene	ND	6.5	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
2,5-Dinitrotoluene	ND	6.9	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
2,6-Dinitrotoluene	ND	4.6	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**190**	3.8	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	J
2-Nitrotoluene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
3,4-Dinitrotoluene	ND	4.5	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
3,5-Dinitroaniline	ND	2.6	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
3,5-Dinitrotoluene	ND	4.9	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
3-Nitrotoluene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**260**	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
4-Nitrotoluene	ND	5.7	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
Nitrobenzene	ND	10	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 04:22	EPA 8270D	
Surrogate: 2,2´-Dinitrobiphenyl			*74.8 %*	*10-116*		*10/11/2021*	*10/12/2021 04:22*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*97.4 %*	*67.8-100*		*10/11/2021*	*10/12/2021 04:22*	*EPA 8270D*	
Classical Chemistry Parameters							**Preparation Batch: A110131**		
% Solids	**96.8**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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AECOM		Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road		Project Number:	60663958
Newark DE, 19713		Project Manager:	Sharon Nordstrom

BPSB-211004-C33-0-1.5-D

A214013-05 (Soil)

Date Sampled
10/04/2021 10:40

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045						**Preparation Batch: A110126**			
Lab pH	**11.1**			pH Units	1	10/08/2021	10/08/2021 14:20	EPA 9045D	
Explosive Compounds by EPA Method 8270						**Preparation Batch: A110132**			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.5	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	3.9	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.0	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,3,5-Trinitrobenzene	ND	5.8	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.3	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,3-Dinitrobenzene	ND	34	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.6	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
2,3-Dinitrotoluene	ND	7.5	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
2,4,6-Trinitrotoluene	**6300**	3.2	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
2,4-Dinitrotoluene	ND	6.5	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
2,5-Dinitrotoluene	ND	7.0	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
2,6-Dinitrotoluene	ND	4.7	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**200**	3.8	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	J
2-Nitrotoluene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
3,4-Dinitrotoluene	ND	4.6	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
3,5-Dinitroaniline	ND	2.6	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
3,5-Dinitrotoluene	ND	4.9	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
3-Nitrotoluene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**280**	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
4-Nitrotoluene	ND	5.7	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
Nitrobenzene	ND	10	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 05:25	EPA 8270D	
Surrogate: 2,2´-Dinitrobiphenyl			*76.3 %*	*10-116*		*10/11/2021*	*10/12/2021 05:25*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*94.2 %*	*67.8-100*		*10/11/2021*	*10/12/2021 05:25*	*EPA 8270D*	
Classical Chemistry Parameters						**Preparation Batch: A110131**			
% Solids	**96.3**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

BPSB-211004-C35-0-2

A214013-06 (Soil)

Date Sampled
10/04/2021 11:00

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
				Pace Analytical - Madison					
pH by EPA Method 9045						**Preparation Batch: A110126**			
Lab pH	**11.8**			pH Units	1	10/08/2021	10/08/2021 14:25	EPA 9045D	
Explosive Compounds by EPA Method 8270						**Preparation Batch: A110132**			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.5	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	4.0	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.0	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,3,5-Trinitrobenzene	ND	5.8	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.3	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,3-Dinitrobenzene	ND	34	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.5	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.6	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2,3-Dinitrotoluene	ND	7.5	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2,4,6-Trinitrotoluene	**12000**	3.2	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2,4-Dinitrotoluene	ND	6.6	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2,5-Dinitrotoluene	ND	7.0	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2,6-Dinitrotoluene	ND	4.7	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**280**	3.9	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
2-Nitrotoluene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
3,4-Dinitrotoluene	ND	4.6	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
3,5-Dinitroaniline	ND	2.6	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
3,5-Dinitrotoluene	ND	4.9	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
3-Nitrotoluene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**1200**	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
4-Nitrotoluene	ND	5.7	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
Nitrobenzene	ND	10	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 06:29	EPA 8270D	
Surrogate: 2,2´-Dinitrobiphenyl			*81.3 %*	*10-116*		*10/11/2021*	*10/12/2021 06:29*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*92.5 %*	*67.8-100*		*10/11/2021*	*10/12/2021 06:29*	*EPA 8270D*	
Classical Chemistry Parameters						**Preparation Batch: A110131**			
% Solids	**94.0**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

BPSB-211004-C36-0-2

A214013-07 (Soil)

Date Sampled
10/04/2021 11:20

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045						**Preparation Batch: A110126**			
Lab pH	**11.7**			pH Units	1	10/08/2021	10/08/2021 14:27	EPA 9045D	
Explosive Compounds by EPA Method 8270						**Preparation Batch: A110132**			
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.5	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	4.0	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.1	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,3,5-Trinitrobenzene	**200**	5.9	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	J
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.3	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,3-Dinitrobenzene	ND	35	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.5	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.7	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
2,3-Dinitrotoluene	ND	7.5	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
2,4,6-Trinitrotoluene	**310000**	65	4200	ug/kg dry	20	10/11/2021	10/12/2021 08:03	EPA 8270D	D
2,4-Dinitrotoluene	**140**	6.6	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	J
2,5-Dinitrotoluene	ND	7.0	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
2,6-Dinitrotoluene	ND	4.7	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
2-Amino-4,6-dinitrotoluene	**2300**	3.9	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
2-Nitrotoluene	ND	4.4	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
3,4-Dinitrotoluene	ND	4.6	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
3,5-Dinitroaniline	**190**	2.6	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	J
3,5-Dinitrotoluene	ND	4.9	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
3-Nitrotoluene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**2000**	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
4-Nitrotoluene	ND	5.8	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
Nitrobenzene	ND	10	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 07:32	EPA 8270D	
Surrogate: 2,2′-Dinitrobiphenyl			*90.8 %*	*10-116*		*10/11/2021*	*10/12/2021 07:32*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*93.8 %*	*67.8-100*		*10/11/2021*	*10/12/2021 07:32*	*EPA 8270D*	
Classical Chemistry Parameters						**Preparation Batch: A110131**			
% Solids	**95.5**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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Newark DE, 19713

Project: Bio Pilot - Barksdale, WI
Project Number: 60663958
Project Manager: Sharon Nordstrom

BPSB-211004-C37-0-3

A214013-08 (Soil)

Date Sampled
10/04/2021 11:45

Pace Analytical - Madison

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
pH by EPA Method 9045							**Preparation Batch: A110126**		
Lab pH	**12.5**			pH Units	1	10/08/2021	10/08/2021 14:29	EPA 9045D	
Explosive Compounds by EPA Method 8270							**Preparation Batch: A110132**		
1,2-Dimethyl-3,4-Dinitrobenzene	ND	5.4	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,2-Dimethyl-3,5-Dinitrobenzene	ND	3.9	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,2-Dimethyl-3,6-Dinitrobenzene	ND	6.0	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,2-Dimethyl-4,5-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,3,5-Trinitrobenzene	**200**	5.7	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	J
1,3-Dimethyl-2,4-Dinitrobenzene	ND	5.2	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,3-Dimethyl-2,5-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,3-Dinitrobenzene	**170**	34	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	J
1,4-Dimethyl-2,3-Dinitrobenzene	ND	6.4	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,4-Dimethyl-2,5-Dinitrobenzene	ND	3.6	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,4-Dimethyl-2,6-Dinitrobenzene	ND	5.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,5-Dimethyl-2,3-Dinitrobenzene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,5-Dimethyl-2,4-Dinitrobenzene	ND	3.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
2,3-Dinitrotoluene	ND	7.4	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
2,4,6-Trinitrotoluene	**290000**	64	4100	ug/kg dry	20	10/11/2021	10/12/2021 09:07	EPA 8270D	D
2,4-Dinitrotoluene	**210**	6.5	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
2,5-Dinitrotoluene	ND	6.9	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
2,6-Dinitrotoluene	**130**	4.6	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	J
2-Amino-4,6-dinitrotoluene	**5400**	3.8	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
2-Nitrotoluene	ND	4.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
3,4-Dinitrotoluene	ND	4.5	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
3,5-Dinitroaniline	**270**	2.6	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
3,5-Dinitrotoluene	ND	4.8	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
3-Nitrotoluene	ND	5.3	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
4-Amino-2,6-dinitrotoluene	**13000**	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
4-Nitrotoluene	ND	5.6	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
Nitrobenzene	ND	10	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
1,3,5-Trinitro-2,4-dimethylbenzene	ND	2.8	210	ug/kg dry	1	10/11/2021	10/12/2021 08:35	EPA 8270D	
Surrogate: 2,2′-Dinitrobiphenyl			*102 %*	*10-116*		*10/11/2021*	*10/12/2021 08:35*	*EPA 8270D*	
Surrogate: Nitrobenzene-d5			*93.7 %*	*67.8-100*		*10/11/2021*	*10/12/2021 08:35*	*EPA 8270D*	
Classical Chemistry Parameters							**Preparation Batch: A110131**		
% Solids	**96.3**		0.00	% by Weight	1	10/11/2021	10/12/2021 11:45	ASTM D2974-87	

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

pH by EPA Method 9045 - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A110126 - Default Prep GenChem										
Duplicate (A110126-DUP1)	**Source: A214013-01**		Prepared: 10/08/2021 Analyzed: 10/08/2021 14:10							
Lab pH	11.6		pH Units		11.6			0.345	0.5	

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AECOM	Project: Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number: 60663958
Newark DE, 19713	Project Manager: Sharon Nordstrom

Explosive Compounds by EPA Method 8270 - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A110132 - EPA 3570										
Blank (A110132-BLK1)				Prepared: 10/11/2021 Analyzed: 10/11/2021 21:30						
1,2-Dimethyl-3,4-Dinitrobenzene	ND	200	ug/kg wet							
1,2-Dimethyl-3,5-Dinitrobenzene	ND	200	ug/kg wet							
1,2-Dimethyl-3,6-Dinitrobenzene	ND	200	ug/kg wet							
1,2-Dimethyl-4,5-Dinitrobenzene	ND	200	ug/kg wet							
1,3,5-Trinitrobenzene	ND	200	ug/kg wet							
1,3-Dimethyl-2,4-Dinitrobenzene	ND	200	ug/kg wet							
1,3-Dimethyl-2,5-Dinitrobenzene	ND	200	ug/kg wet							
1,3-Dinitrobenzene	ND	200	ug/kg wet							
1,4-Dimethyl-2,3-Dinitrobenzene	ND	200	ug/kg wet							
1,4-Dimethyl-2,5-Dinitrobenzene	ND	200	ug/kg wet							
1,4-Dimethyl-2,6-Dinitrobenzene	ND	200	ug/kg wet							
1,5-Dimethyl-2,3-Dinitrobenzene	ND	200	ug/kg wet							
1,5-Dimethyl-2,4-Dinitrobenzene	ND	200	ug/kg wet							
2,3-Dinitrotoluene	ND	200	ug/kg wet							
2,4,6-Trinitrotoluene	ND	200	ug/kg wet							
2,4-Dinitrotoluene	ND	200	ug/kg wet							
2,5-Dinitrotoluene	ND	200	ug/kg wet							
2,6-Dinitrotoluene	ND	200	ug/kg wet							
2-Amino-4,6-dinitrotoluene	ND	200	ug/kg wet							
2-Nitrotoluene	ND	200	ug/kg wet							
3,4-Dinitrotoluene	ND	200	ug/kg wet							
3,5-Dinitroaniline	ND	200	ug/kg wet							
3,5-Dinitrotoluene	ND	200	ug/kg wet							
3-Nitrotoluene	ND	200	ug/kg wet							
4-Amino-2,6-dinitrotoluene	ND	200	ug/kg wet							
4-Nitrotoluene	ND	200	ug/kg wet							
Nitrobenzene	ND	200	ug/kg wet							
1,3,5-Trinitro-2,4-dimethylbenzene	ND	200	ug/kg wet							
Surrogate: 2,2´-Dinitrobiphenyl	*928*		*ug/kg wet*	*1943*		*47.7*	*10-116*			
Surrogate: Nitrobenzene-d5	*1860*		*ug/kg wet*	*2000*		*93.2*	*67.8-100*			
LCS (A110132-BS1)				Prepared: 10/11/2021 Analyzed: 10/11/2021 20:58						
1,2-Dimethyl-3,4-Dinitrobenzene	1870	200	ug/kg wet	1996		93.7	78.3-107			
1,2-Dimethyl-3,5-Dinitrobenzene	1770	200	ug/kg wet	2020		87.5	74.3-103			
1,2-Dimethyl-3,6-Dinitrobenzene	1930	200	ug/kg wet	1999		96.8	79.8-108			
1,2-Dimethyl-4,5-Dinitrobenzene	1850	200	ug/kg wet	2026		91.6	74.3-108			
1,3,5-Trinitrobenzene	1650	200	ug/kg wet	2000		82.3	45.5-107			
1,3-Dimethyl-2,4-Dinitrobenzene	1870	200	ug/kg wet	2020		92.6	75-106			
1,3-Dimethyl-2,5-Dinitrobenzene	1970	200	ug/kg wet	2002		98.5	78.9-108			
1,3-Dinitrobenzene	1690	200	ug/kg wet	2000		84.3	55.8-108			
1,4-Dimethyl-2,3-Dinitrobenzene	1940	200	ug/kg wet	2006		96.6	77-107			
1,4-Dimethyl-2,5-Dinitrobenzene	1900	200	ug/kg wet	2026		93.7	75.6-108			
1,4-Dimethyl-2,6-Dinitrobenzene	1900	200	ug/kg wet	1996		94.9	77.8-107			
1,5-Dimethyl-2,3-Dinitrobenzene	1780	200	ug/kg wet	2012		88.4	75.4-107			
1,5-Dimethyl-2,4-Dinitrobenzene	1820	200	ug/kg wet	1966		92.6	75-108			
2,3-Dinitrotoluene	1880	200	ug/kg wet	2000		94.0	69.8-112			
2,4,6-Trinitrotoluene	1740	200	ug/kg wet	2000		87.0	63.4-111			

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AECOM
4051 Ogletown Road
Newark DE, 19713

Project: Bio Pilot - Barksdale, WI
Project Number: 60663958
Project Manager: Sharon Nordstrom

Explosive Compounds by EPA Method 8270 - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A110132 - EPA 3570										
LCS (A110132-BS1)				Prepared: 10/11/2021 Analyzed: 10/11/2021 20:58						
2,4-Dinitrotoluene	1820	200	ug/kg wet	2000		91.1	69.4-113			
2,5-Dinitrotoluene	1760	200	ug/kg wet	2000		88.1	67-107			
2,6-Dinitrotoluene	1900	200	ug/kg wet	2000		95.1	75.3-108			
2-Amino-4,6-dinitrotoluene	1490	200	ug/kg wet	2000		74.6	61.9-106			
2-Nitrotoluene	1900	200	ug/kg wet	2000		94.9	75.3-111			
3,4-Dinitrotoluene	1830	200	ug/kg wet	2000		91.7	72.4-108			
3,5-Dinitroaniline	1480	200	ug/kg wet	2000		74.2	61-107			
3,5-Dinitrotoluene	1830	200	ug/kg wet	2000		91.3	72.2-111			
3-Nitrotoluene	1860	200	ug/kg wet	2000		93.0	77.4-107			
4-Amino-2,6-dinitrotoluene	1410	200	ug/kg wet	2000		70.5	51.7-110			
4-Nitrotoluene	1870	200	ug/kg wet	2000		93.7	79.1-108			
Nitrobenzene	1930	200	ug/kg wet	2000		96.4	80.5-109			
Surrogate: 2,2´-Dinitrobiphenyl	*1690*		*ug/kg wet*	*1943*		*87.1*	*10-116*			
Surrogate: Nitrobenzene-d5	*1870*		*ug/kg wet*	*2000*		*93.5*	*67.8-100*			
Matrix Spike (A110132-MS1)	**Source: A214013-01**			Prepared: 10/11/2021 Analyzed: 10/11/2021 22:02						
1,2-Dimethyl-3,4-Dinitrobenzene	1930	210	ug/kg dry	2058	ND	93.6	70.9-106			
1,2-Dimethyl-3,5-Dinitrobenzene	1840	210	ug/kg dry	2082	ND	88.4	68.2-104			
1,2-Dimethyl-3,6-Dinitrobenzene	2000	210	ug/kg dry	2061	ND	97.0	75.9-109			
1,2-Dimethyl-4,5-Dinitrobenzene	2040	210	ug/kg dry	2089	ND	97.7	65-112			
1,3,5-Trinitrobenzene	2020	210	ug/kg dry	2062	206	88.2	37.4-108			
1,3-Dimethyl-2,4-Dinitrobenzene	1940	210	ug/kg dry	2082	ND	93.3	69.5-109			
1,3-Dimethyl-2,5-Dinitrobenzene	2040	210	ug/kg dry	2064	ND	98.8	76.2-108			
1,3-Dinitrobenzene	1750	210	ug/kg dry	2062	ND	84.8	50.2-106			
1,4-Dimethyl-2,3-Dinitrobenzene	1970	210	ug/kg dry	2068	ND	95.4	72.3-106			
1,4-Dimethyl-2,5-Dinitrobenzene	1980	210	ug/kg dry	2089	ND	94.6	71.6-108			
1,4-Dimethyl-2,6-Dinitrobenzene	1960	210	ug/kg dry	2058	ND	95.4	74-108			
1,5-Dimethyl-2,3-Dinitrobenzene	1860	210	ug/kg dry	2074	ND	89.6	67.9-106			
1,5-Dimethyl-2,4-Dinitrobenzene	1880	210	ug/kg dry	2027	ND	92.8	69.2-109			
2,3-Dinitrotoluene	1800	210	ug/kg dry	2062	ND	87.4	66.9-107			
2,4,6-Trinitrotoluene	48700	4100	ug/kg dry	2062	41500	351	20.9-161			M1, D
2,4-Dinitrotoluene	1970	210	ug/kg dry	2062	110	90.1	63.6-113			
2,5-Dinitrotoluene	1840	210	ug/kg dry	2062	ND	89.5	61.4-109			
2,6-Dinitrotoluene	1930	210	ug/kg dry	2062	ND	93.6	68-110			
2-Amino-4,6-dinitrotoluene	2020	210	ug/kg dry	2062	460	75.8	31-124			
2-Nitrotoluene	1970	210	ug/kg dry	2062	ND	95.6	70.7-115			
3,4-Dinitrotoluene	1840	210	ug/kg dry	2062	ND	89.4	70-104			
3,5-Dinitroaniline	1760	210	ug/kg dry	2062	193	75.9	41.8-112			
3,5-Dinitrotoluene	1910	210	ug/kg dry	2062	ND	92.6	68.4-110			
3-Nitrotoluene	1940	210	ug/kg dry	2062	ND	94.1	74.4-110			
4-Amino-2,6-dinitrotoluene	5340	210	ug/kg dry	2062	3460	91.1	27.9-131			
4-Nitrotoluene	1930	210	ug/kg dry	2062	ND	93.4	75.5-110			
Nitrobenzene	1970	210	ug/kg dry	2062	ND	95.7	76.1-111			
Surrogate: 2,2´-Dinitrobiphenyl	*1800*		*ug/kg dry*	*2003*		*89.9*	*10-116*			
Surrogate: Nitrobenzene-d5	*1950*		*ug/kg dry*	*2062*		*94.4*	*67.8-100*			

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Explosive Compounds by EPA Method 8270 - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A110132 - EPA 3570										
Matrix Spike Dup (A110132-MSD1)	**Source: A214013-01**		Prepared: 10/11/2021 Analyzed: 10/11/2021 23:05							
1,2-Dimethyl-3,4-Dinitrobenzene	1920	210	ug/kg dry	2050	ND	93.8	70.9-106	0.138	20	
1,2-Dimethyl-3,5-Dinitrobenzene	1870	210	ug/kg dry	2074	ND	90.3	68.2-104	1.76	20	
1,2-Dimethyl-3,6-Dinitrobenzene	1960	210	ug/kg dry	2053	ND	95.5	75.9-109	1.93	20	
1,2-Dimethyl-4,5-Dinitrobenzene	1980	210	ug/kg dry	2080	ND	95.0	65-112	3.14	20	
1,3,5-Trinitrobenzene	2090	210	ug/kg dry	2054	206	91.6	37.4-108	3.07	20	
1,3-Dimethyl-2,4-Dinitrobenzene	1940	210	ug/kg dry	2074	ND	93.4	69.5-109	0.248	20	
1,3-Dimethyl-2,5-Dinitrobenzene	2000	210	ug/kg dry	2056	ND	97.3	76.2-108	1.94	20	
1,3-Dinitrobenzene	1820	210	ug/kg dry	2054	ND	88.6	50.2-106	4.03	20	
1,4-Dimethyl-2,3-Dinitrobenzene	1930	210	ug/kg dry	2060	ND	93.7	72.3-106	2.24	20	
1,4-Dimethyl-2,5-Dinitrobenzene	1930	210	ug/kg dry	2080	ND	92.9	71.6-108	2.18	20	
1,4-Dimethyl-2,6-Dinitrobenzene	1950	210	ug/kg dry	2050	ND	95.1	74-108	0.734	20	
1,5-Dimethyl-2,3-Dinitrobenzene	1880	210	ug/kg dry	2066	ND	91.1	67.9-106	1.26	20	
1,5-Dimethyl-2,4-Dinitrobenzene	1880	210	ug/kg dry	2019	ND	93.2	69.2-109	0.116	20	
2,3-Dinitrotoluene	1810	210	ug/kg dry	2054	ND	88.0	66.9-107	0.278	20	
2,4,6-Trinitrotoluene	51000	4100	ug/kg dry	2054	41500	464	20.9-161	4.60	20	M1, D
2,4-Dinitrotoluene	2010	210	ug/kg dry	2054	110	92.5	63.6-113	2.03	20	
2,5-Dinitrotoluene	1870	210	ug/kg dry	2054	ND	90.8	61.4-109	1.12	20	
2,6-Dinitrotoluene	1970	210	ug/kg dry	2054	ND	96.0	68-110	2.11	20	
2-Amino-4,6-dinitrotoluene	2080	210	ug/kg dry	2054	460	79.1	31-124	2.99	20	
2-Nitrotoluene	2000	210	ug/kg dry	2054	ND	97.3	70.7-115	1.35	20	
3,4-Dinitrotoluene	1860	210	ug/kg dry	2054	ND	90.4	70-104	0.710	20	
3,5-Dinitroaniline	1760	210	ug/kg dry	2054	193	76.2	41.8-112	0.0173	20	
3,5-Dinitrotoluene	1910	210	ug/kg dry	2054	ND	93.0	68.4-110	0.0155	20	
3-Nitrotoluene	1980	210	ug/kg dry	2054	ND	96.2	74.4-110	1.85	20	
4-Amino-2,6-dinitrotoluene	5490	210	ug/kg dry	2054	3460	98.9	27.9-131	2.81	20	
4-Nitrotoluene	1980	210	ug/kg dry	2054	ND	96.4	75.5-110	2.76	20	
Nitrobenzene	2000	210	ug/kg dry	2054	ND	97.2	76.1-111	1.16	20	
Surrogate: 2,2´-Dinitrobiphenyl	*1830*		*ug/kg dry*	*1995*		*91.6*	*10-116*			
Surrogate: Nitrobenzene-d5	*1970*		*ug/kg dry*	*2054*		*95.9*	*67.8-100*			

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AECOM	Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road	Project Number:	60663958
Newark DE, 19713	Project Manager:	Sharon Nordstrom

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A110131 - % Solids										
Duplicate (A110131-DUP1)	**Source: A214013-01**		Prepared: 10/11/2021 Analyzed: 10/12/2021 11:45							
% Solids	97.0	0.00	% by Weight		97.0			0.0169	20	

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AECOM		Project:	Bio Pilot - Barksdale, WI
4051 Ogletown Road		Project Number:	60663958
Newark DE, 19713		Project Manager:	Sharon Nordstrom

Notes and Definitions

M1	Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
J	Analyte was detected but is below the reporting limit. The concentration is estimated.
D	Data reported from a dilution
ND	Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
NR	Not Reported
dry	Sample results reported on a dry weight basis. Detection limits (if listed) and reporting limits have been adjusted for the solids content. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
RPD	Relative Percent Difference

Detection limits (if listed) and reporting limits have been adjusted for dilutions, if reported.

Environmental Chemistry Consulting Services, Inc.
2525 Advance Road
Madison, WI 53718
608-221-8700 (phone)
608-221-4889 (fax)

CHAIN OF CUSTODY

TRK# 774873823550

Lab Work Order #: A214013

Project Number:	60663958	Mail Report To:	Sharon Nordstrom
Project Name:	Barksdale	Company:	AECOM
Project Location:	Barksdale, WI	Address:	4051 Ogletown Rd, Newark, DE 19713
Turn Around (check one):	[X] Normal [ ] 5 BDs [ ] 3 BDs [ ] 2 BDs [ ] 24 hrs	E-mail Address:	sharon.nordstrom@aecom.com
If Rush, Report Due Date:		Invoice To:	
Sampled By (Print):	Desmond Nielsen	Company:	AECOM
		Address:	

Preservation Codes: A
Analyses Requested

Sample Description	Collection Date	Collection Time	Matrix	Total # of Containers	NNOCs	PH					Comments	Lab ID	Lab Receipt Time
BPSB-211004-C24 (0-1.5)	10/4/2021	09:40	S	2	X	X					Froze after collection	01	
BPSB-211004-C28 (0-1.5)	10/4/2021	10:00	S	2	X	X						02	
BPSB-211004-C31 (0-1)	10/4/2021	10:20	S	2	X	X						03	
BPSB-211004-C33 (0-1.5)	10/4/2021	10:40	S	2	X	X						04	
BPSB-211004-C33 (0-1.5)-D	10/4/2021	10:40	S	2	X	X						05	
BPSB-211004-C35 (0-2)	10/4/2021	11:00	S	2	X	X						06	
BPSB-211004-C36 (0-2)	10/4/2021	11:20	S	2	X	X						07	
BPSB-211004-C37 (0-3)	10/4/2021	11:45	S	2	X	X						08	
			S										
			S										

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Desmond Nielsen	10/6/21	1200	Jessica Gorres	10-07-21	1115

Custody Seal: [X] Present [ ] Absent [X] Intact [ ] Not Intact
Seal #s:
Shipped Via: FedEx
Receipt Temp: 2.4°C
Temp Blank: [X] Y [ ] N

Preservation Codes
A=None B=HCL C=H_2SO_4
D=HNO_3 E=EnCore F=Methanol
G=NaOH O=Other (Indicate)

Matrix Codes
A=Air S=Soil W=Water O=Other

Rush TAT Multipliers
5 Business Days = 1.5x
3 Business Days = 2x
2 Business Days = 2.25x
24 Hours = 2.5x
must be pre-arranged