February 9, 2018

Mr. Steven G. Morgan
Air & Solid Waste Permitting Manager
Permitting and Waste Cleanup Program
Florida Department of Environmental Protection
Southwest District Office
13051 North Telecom Parkway
Temple Terrace, FL 33637-0926

Re: Responses to Comments of Cell 17 Draft Substantial Modification Application
Pasco County – Solid Waste
Facility Name: Enterprise Road Class III Recycling and Disposal
Facility Site ID: 87895
DEP Application Nos.: 177982-023-SC/T3 and 177982-024-SO/T3

Dear Mr. Morgan:

Thank you for your review of the above-referenced permit modification draft for the Enterprise Road Class III Recycling and Disposal Facility. The following information is provided in response to the FDEP's draft comments email dated October 17, 2017. Information is provided in the order requested in the referenced correspondence. In each case, the Department's request is stated in italics with the response immediately following in **bold**.

CONTENTS:

Comment 1: For those sections and/or parts remaining unchanged, please identify whether the section/part is from the 2012, 2015, or 2016 permit application.

RESPONSE 1: The sections now reference either the 2012, 2015, or 2016 permit applications.

Comment 2: Based on the scope of the 2015 and 2016 permit modification applications and the proposed modifications with this application, the narrative information previously provided Parts E, F, G, I and O is largely outdated. Therefore, this information *does not appear to be "still valid" as stated in the Introduction Section and these Parts should be updated accordingly.*

RESPONSE 2: Information has been updated where warranted.

Comment 3: Part E-2: The most current topographic survey of the site should be provided.

RESPONSE 3: The most current topographic survey of the entire site was done in 2013 as referenced in the application package. The topography of the proposed Cell 17 area has changed towards the west where there are mining activities and by observation appears to be essentially unchanged in the area of the temporary stormwater pond. Ground surface elevations for each of the Cell 17 geologic borings were measured on August 15, 2017 and January 4, 2018 by Angelo's staff using a total survey station that makes use of the FDOT FPRN network for accuracy. This elevation data allows us to compare the Cell 17 geology with geologic and other data collected across the site. Surveying the current topography of the proposed Cell 17 area beyond the boring locations will not provide data that would be used to evaluate or change the current cell design. Additionally, the topography towards the west side of proposed cell will continue to change with mining operations.

<u>APPLICATION FORM #62-701.320(7), F.A.C.)</u>:

Comment 4: Parts B.23. & B.24: Please see description for treatment and disposal of leachate in the IW permitted percolation pond [i.e. Pond 3] on the 2016 permit application form and revise these parts accordingly.

RESPONSE 4: Parts B.23 & B.24 have been revised accordingly.

Comment 5: Part D.13.: The Notice of Application to be published <u>after</u> application submittal is attached.

RESPONSE 5: Section 2, Part D-2 has been revised with the provided Notice of Application.

Comment 6: Part E.3.b.: Verify changes to borrow areas based on lateral expansion.

RESPONSE 6: Since the proposed Cell 17 expansion area will no longer be used for borrow material once cell construction begins, future borrow material will be excavated from the areas west of Cells 7 and 17 in accordance with the mining permit.

Comment 7: Part G.3: Both permitted Cell 16 and proposed Cell 17 include a leachate collection and removal system. Revise Part G.3 where applicable to reference where information on the system is provided in the application.

RESPONSE 7: Part G.3 has been revised as requested.

Comment 8: Part I.1.g.: It is unclear why Part I.1.g. is not marked when new geotechnical information is provided for proposed Cell 17.

RESPONSE 8: Part I.1.g. has been revised to reference the new geotechnical information.

<u>APPENDIX G-1 – LINER SYSTEM REQUIREMENTS EVALUATION (Rule 62-701.340(2)(b), F.A.C.)</u>:

Comment 9: It appears that duplicate Appendices G-1 were provided in the draft submittal.

RESPONSE 9: The duplicated pages in Appendices G-1 have been removed.

Comment 10: §2.0:

a. It is unclear why the "conceptual closure design" is referred to in this section and was referred to previously for Cell 16. If closure design is appropriate, then previously provided information for closure design is not valid based the proposed vertical expansion of the facility.

b. This section should be modified to clarify that proposed Cell 17 was referred to as Cells 13 & 14 in previous submittals.

c. Include description of leachate collection for Cells 16 and 17.

RESPONSE 10: a. §2.0 has been revised to delete the word "closure."

b. §2.0 has been revised to clarify that proposed Cell 17 was referred to as Cells 13 & 14 in previous submittals.

c. A description of leachate collection for Cells 16 and 17 has been provided.

Comment 11: §6.0:

a. Since the preparation of the hydrological evaluation for the Cell 16 horizontal expansion, monitoring wells MW-18B, MW-19A, and MW-20B have been added for Cell 7 which were not included in the Cell 16 evaluation. An explanation of why these wells *do not need to be considered in the hydrologic evaluation for Cell 17 should be provided. The same explanation should be provided for wells associated with Cells 16 if they are installed and sampled prior to completion of this application.*

b. The evaluation of water quality provided for the hydrological evaluation for the Cell 16 horizontal expansion was based on water quality data collected through September 2015. An explanation of why site water quality data collected since September 2015 does not need to be considered in the hydrologic evaluation for Cell 17 should be provided.

RESPONSE 11: a. Monitoring wells MW-18B, MW-19A, and MW-20B have been added to the hydrological evaluation. Monitoring wells associated with Cell 16 have not been installed as of February 2018.

b. Water quality data collected since September 2015 have been added to the hydrological evaluation.

Comment 12: §7.0:
a. This section concludes the SPT borings collectively characterize the subsurface conditions of Cell 17. However, Section 3.3.2 of the Universal Engineering Report both discusses the variability in subsurface conditions identified in the boring logs results and states that the boring logs and related information "are indicators of subsurface conditions only at the specific locations and times noted" and "Subsurface conditions, including groundwater levels and the presence of deleterious materials, at other locations on the site may differ significantly from conditions which exist at the sampling locations." These conclusions appear contradictory and appear to indicate that the subsurface conditions have not been adequately characterized by the borings conducted, requiring further investigation.

b. Section 3.5 of the Universal Engineering report concludes that the potential for sinkhole occurrence in Cell 17 is "average". Universal's May 31, 2016 geotechnical report concluded that the sinkhole risk in the proposed Cell 16 footprint was "low". This apparent greater potential for sinkhole in Cell 17 than Cell 16 does not appear to be discussed or considered in the liner evaluation report.

RESPONSE 12: a. The language quoted in the Department's comment is standard language included in all geotechnical reports prepared by Universal Engineering Sciences report. This is consistent with standard practices within the geologic and geotechnical industries.

b. The term "average" was intended to refer to "average" or "typical" for the site. The Universal Engineering Sciences report has been revised to make this clearer. The evaluation revealed no data indicating that the sinkhole

potential for the proposed Cell 17 expansion area is any greater than that of Cell 16 or any of the previously constructed cells.

Comment 13: Figure 1 – Site Monitoring Network: This figure should be modified, as appropriate, based on your response to comments on the proposed WQMP.

RESPONSE 13: Figure 1 – Site Monitoring Network has been revised accordingly.

<u>Attachment 1 – Universal Engineering Report</u>:

Comment 14: §1.2: As stated in this section, based your response comments related to the geotechnical information provided to Universal, a revised Universal report will be needed.

RESPONSE 14: The Universal Engineering Sciences report has been revised. Provided in Part I, Appendix I-1.

Comment 15: §3.3.2 & §3.4: An understanding of the shallow water table elevations would appear to be important information in characterizing subsurface condition and conducting a sinkhole evaluation and geotechnical investigation of Cell 17. Please explain why water table elevations were not measured and recorded as part of subsurface boring activities.

RESPONSE 15: A shallow aquifer was not encountered during advancement of the geotechnical borings in the proposed Cell 17 expansion area. This is consistent with the data collected over the past 15 years which has shown an intermittent shallow aquifer system to be present <u>only</u> in the easternmost portions of the site. Please refer to the March 2012 Water Quality Monitoring Plan Evaluation Report (and subsequent revisions) for a detailed analysis of the site hydrogeology.

Comment 16: §3.5:

a. As stated in this section, one of the indicators of sinkhole occurrence is the loss of drilling fluid circulation while advancing a borehole. No discussion about any losses of drilling fluid circulation in the SPT borings was included in the report text, nor were indications from field borings if LOC occurrences were monitored.

b. SPT boring B-101 could be interpreted as having a boring profile exhibiting systematic weakening caused by karst processes (consistent or decreasing N-values with depth and overall low N-values indicating soft to medium stiff clay and clayey soils above the limestone. Limestone was encountered 32 feet and N-values indicate the limestone was weathered (N-values of 20 and 24). Hard limestone wasn't encountered in the boing until a depth of 43.5 feet. Upon review of the boring logs provided, B-101 *had the most extensive sequence of weathered limestone prior to encountering hard (refusal) limestone.*

RESPONSE 16: a. No losses of drilling fluid circulation were observed, which warranted no description. The logs have been revised to indicate that "No LOC observed."

b. The data collected in SPT boring B-101 was included in the geotechnical evaluation performed by Universal Engineering Sciences, as well as in the bearing capacity calculations and report performed by Civil Design Services. Both reports show that the site geology, including that of B-101, meets the geotechnical requirements associated with the proposed Cell 17 expansion.

Comment 17: §4.0:
a. This section states that Universal Engineering's recommendation are unchanged from those presented in their May 5, 2000 geotechnical report. However, the recommendations presented in the May 5, 2000 report were based on the geotechnical work and evaluations conducted by Universal at the time which included evaluations of the stability of the mine cuts and landfill slopes, bearing capacity of the subgrade, and settlement of the subgrade and landfill waste. There does not appear to any indication in the Universal 2017 report that the Civil Design Services Inc.'s September 6, 2017 Slope Stability, Settlement and Bearing Capacity Analysis Report for Cell 17 was provided to or considered by Universal Engineering. Furthermore, the May 2000 geotechnical evaluations conducted by Universal Engineering were based on a final landfill elevation of 170' NGVD and therefore outdated based on the proposed vertical expansion of the facility.

RESPONSE 17: It is our understanding that UES and CDC communicated during the preparation of their respective reports.

<u>*Appendix C – Locklear & Associates Boring Logs & Information*</u>*:*

Comment 18: Boring Field Logs:
a. Please explain the drastically different field boring logs for Boring B-102 were prepared and why one was chosen over the other by Universal in their evaluation.

b. Please explain why borings B-102, B-104 and B-106 were terminated before encountering limestone or refusal.

RESPONSE 18: a. We disagree that the borings are "drastically different."

b. Borings B-102, B-104 and B-106 were terminated in consistently dense sandy soils to depths comparable to the other borings performed in the proposed Cell 17 expansion area. The data collected from borings B-102, B-104 and B-106 were included in the geotechnical evaluation performed by Universal Engineering Sciences, as well as in the bearing capacity calculations and report performed by Civil Design Services. Both reports show that the site geology, including that of B-102, B-104 and B-106, meets the geotechnical requirements associated with the proposed Cell 17 expansion.

Comment 19: Boring Log Cross-Sections:
a. If borings SSA-36, and B-23 are utilized in the evaluation, then the boring logs for these should be provided in the report.

b. There were no elevations provided in either the Universal borings logs or the Locklear field logs. How and when were the elevations obtained and why are they not included on field reports?

c. Cross Section A-A': Please explain how Boring B-3A is comparable to the other borings when data was only collected at depth and not from ground surface.

RESPONSE 19: a. Boring profiles for SSA-36 and B-23 were provided to the Department as part of the Cell 16 permit application.

b. Ground surface elevations were surveyed by Angelo's staff after the borings were performed. The Universal boring logs and Locklear field logs have been revised to include the elevations.

c. Borings B-3 and B-3A were performed as part of previous site investigations. Our understanding is that boring B-3 was performed first. The engineer (or FDEP) wanted additional geologic data from depths below the termination depth of boring B-3. A second boring was advanced next to B-3 to collect the required data. As is commonly done, the driller advanced the B-3A boring to the termination depth of B-3 before starting to collect data. Considering the borings were performed next to one another, it is reasonable to assume that the geology in the upper portion of boring B-3A is comparable to that of boring B-3. Boring profiles for B-3 and B-3A were provided to the Department as part of the Cell 16 permit application.

PART I – GEOTECHNICAL INVESTIGATION REQUIREMENTS – APPENDIX I-2 (Rule 62-70.410, F.A.C.):

__Civil Design Services, Inc. - Slope Stability, Settlement, and Bearing Capacity Analysis Report__:

Comment 20: In the event that additional subsurface investigation is conducted, the slope stability, settlement, and bearing capacity analyses should be modified accordingly to consider new information.

RESPONSE 20: Three additional SPT borings were performed along the north side of the proposed Cell 17 in the location of the toe drain. The Slope Stability, Settlement, and Bearing Capacity report prepared by CDS has been revised. Provided in Part I, Appendix I-2.

§3.10.2.:

Comment 21: It appears that the analyses in this report are limited to the proposed Cell 17 expansion. Sitewide slope stability, settlement, and bearing capacity analyses in support of the proposed vertical expansion need to be conducted.

RESPONSE 21: The CDS report has been revised to include the requested information. Provided in Part I, Appendix I-2.

Comment 22: Slope Stability Model Analysis:

a. Since water table reading were not obtained in conducting the borings, how can a seasonal high groundwater table be assumed in the analysis. Where was this assumed water table elevation obtained?

b. Utilizing borings with similar soil types and SPT N-values without considering outlier boring results does not appear to provide an accurate analysis of the slope stability of the Cell 17 as a whole.

c. What is identified as a North/South (West) Section appear to be more a center section of Cell 17. Since the subsurface of the western portion of Cell 17 is clearly different, a north-south cross-section analysis in that area appear to be warranted.

d. Slope stability analyses of the west slope of Cell 17 should be conducted.

RESPONSE 22: The CDS report has been revised to include the requested information. Provided in Part I, Appendix I-2.

Comment 23: Attachment F:

a. Since no header, floor, or top of boring elevations appear to have been provided on the borings logs, field logs, or permit drawings, it is unclear how these elevations were obtained.

b. Considering the potential variability of the subsurface of Cell 17 identified in the Universal Report, it is unclear how the borings chosen for settlement analysis, which are not located along the leachate collection corridor, can be relied upon to represent subsurface conditions along the corridor.

c. Considering the potential variability of the subsurface of Cell 17 identified in the Universal Report and the variability of the subsurface identified in the boring logs results obtained, please discuss why a settlement analysis of Cell 17 as a whole is not warranted to ensure that under final buildout conditions, leachate will still flow to the leachate collection corridor.

RESPONSE 23: The CDS report has been revised to include the requested information. Provided in Part I, Appendix I-2.

<u>ENGINEERING REPORT, Rule 62-701.320(7)(d), F.A.C.</u>:

Comment 24: The section numbering in the table of contents was omitted throughout the Engineering Report.

RESPONSE 24: Section numbering has been added.

Comment 25: Surrounding Land Uses and Zoning:
a. Referenced Figure 3-2A in Appendix 3-C appears outdated.

b. Referenced revised Figure 5 does not appear to have been provided.

RESPONSE 25:
a. Figure 3-2A in Appendix 3-C has been updated and revised.
b. The potable well inventory was incorrectly referenced as Figure 5 in the Engineering Report. The correctly referenced potable well inventory is Figure S-1. Figure S-1 has been updated and revised.

Comment 26: Topography: No topographic survey appears to have been provided in the 2017 plan set. A topographic survey more current than 2013 should be provided.

RESPONSE 26: The most current topographic survey of the entire site was done in 2013 as referenced in the application package. The topography of the proposed Cell 17 area has changed and continues to change as this is within the active mining operations area. Ground surface elevations for each of the Cell 17 geologic borings

were measured on August 15, 2017 and January 4, 2018 (3 additional borings along the toe drain) by Angelo's staff. This elevation data allows us to accurately compare the Cell 17 geology with geologic and other data collected across the site. Surveying the current topography of the proposed Cell 17 area will not provide data that would be used to evaluate or change the current cell design. Additionally, the topography in portions of proposed Cell 17 will change almost immediately after the survey is completed due to continuing mining operations – rendering the data obsolete.

Drawing C3.00:

Comment 27: 100-year Flood Prone Areas: Please verify that the reference 2006 flood plain map is still valid and provide the current flood plain map, if appropriate.

RESPONSE 27: Figure S-5 has been revised with the most current available data.

Comment 28: Excavation Operations and Cell Construction:
a. Phasing of cell construction and filling operation is also shown on Sheet 2.00 of the 2017 plan set.

RESPONSE 28: Comment is acknowledged.

Comment 29: Method of Cell Sequence:
a. Phasing Sequence 1:
1) Sheets C1.00 and C1.01 show the filling of Cell 16 which is described in Phasing Sequence 2.

2) It is unclear when filling in Cells 1-7 and 15 to fill 4H:1V slopes from 122' to 167' NGVD will occur.

b. Phasing Sequence 2: Sheets C1.10 and C1.11 show the filling of Cell 17 which is described in Phasing Sequence 3.

c. Phasing Sequence 3:
1) Sheets C2.00 and C2.10 show the vertical expansion after Cell 17 filling and not Cell 17 filling as described in this section.

2) Reference to Elevation 217' appear to be a typo.

3) The construction of the bench at elevation 137' NGVD is also described in Phasing Sequence 1.

RESPONSE 29: The method of sequencing has been updated to match the proposed construction sequencing shown on the engineering plan set.

Comment 30: Erosion Control:

a. Need to discuss erosion control on exterior 3H:1V slopes

b. Need to provide revise erosion calculations based on relocation of benches and increased slope of exterior slopes.

RESPONSE 30: The engineering report has been revised to discuss erosion control.

Comment 31: Life Expectancy:

a. It is unclear how September 2017 remaining airspace calculations are obtained using a 2013 topographic survey.

RESPONSE 31: Remaining airspace calculations remain unchanged for 2013 topographic survey data; Airspace calculations will be revised based on landfill tonnages data, which will be submitted under separate cover.

Comment 32: Design of Gas, Leachate and Stormwater Controls:

a. Gas Probe Design: Based on an assumed seasonal high ground water table elevation of 72' NGVD, it would appear that several of the identified probes will intercept the water table.

b. Passive Gas Vents: The passive gas vents are not shown on Sheet C3.00 as indicated. Based on the proposed vertical expansion, Figure 3-16 from 2012 is likely outdated also.

c. Leachate Control:

1) The toe drain design calculations provided for Cell 16 need to be referenced or revised as appropriate for the addition of the Cell 17 system and/or the proposed vertical expansion.

2) Please provide supporting calculations that demonstrate that the toe drain system in Cell 16 can handle all leachate generated at the facility until the Cell 17 toe drain system is constructed and operating.

RESPONSE 32: a. The design of gas probes have been revised where appropriate to ensure they are above the SHGWT.

b. Sheet C3.00 shows 12 passive gas vents and Figure 3-16 has been revised.

c.1 The toe drain design calculations provided for Cell 16 were revised to include the Cell 17 system and the proposed vertical expansion.

c.2 Supporting calculations that demonstrate that the toe drain system in Cell 16 can handle all leachate generated at the facility until the Cell 17 toe drain system is constructed and operating is provided in Attachment 1 of the Engineering Report.

Comment 33: Foundation Analysis: As discussed in Comment #21 above, the bearing capacity analysis provided with this draft application appear to only address Cell 17 and not the proposed site wide vertical expansion.

RESPONSE 33: The CDS report has been revised to include the requested information. Provided in Part I, Appendix I-2.

<u>APPENDIX 3A - OPERATIONS PLAN (Rule 62-701.500(9), F.A.C.)</u>:

Comment 34: The section numbering in the table of contents was omitted throughout the Operations Plan.

RESPONSE 34: The Operations Plan has been revised to include section numbering.

Comment 35: Method of Cell Sequence and Life Expectancy: Please modify consistent with changes in Engineering Report.

RESPONSE 35: The Operations Plan has been revised to be consistent with changes made in the Engineering Report.

Comment 36: Operation of Gas, Leachate and Stormwater Controls:

a. Leachate Control: Please modify consistent with changes in Engineering Report.

b. Leachate pumping will not be vacated after final closure but will continue until leachate is not generated in volumes to be collected in the sump. This section should be revised accordingly.

RESPONSE 36: a. The Operations Plan has been revised to be consistent with changes made in the Engineering Report.

b. The Operations Plan has been revised accordingly.

Comment 37: Attachment 1 – Facility Entrance Sign: This sign is outdated and should be replaced.

RESPONSE 37: The facility entrance sign will be updated. Photographs will be submitted under a separate cover.

Comment 38: Attachment 4 – Gas Monitoring Survey Form: Updated to include proposed installation of Probes 4 and 5.

RESPONSE 38: The Gas Monitoring Survey Form has been updated to include the proposed installation of Probes 4 and 5.

Comment 39: Attachment 7 – SOPF Registration: Please provide most current registration.

RESPONSE 39: The most current SOPF will be submitted to the Department under a separate cover.

<u>APPENDIX 3B - CONTINGENCY PLAN (Rules 62-701.320(7)(e)2. & (16), F.A.C.)</u>:

Comment 40: The section numbering in the table of contents was omitted throughout the Contingency Plan.

RESPONSE 40: The Contingency Plan has been revised to include section numbering.

Comment 41: Emergency and Contingency Operations:

a. Communications & Spills: The FDEP Southwest District phone number has changed to (813) 470-5700. Please verify all the contact phone numbers provided.

b. Landfill Shutdown: Please revise this section to discuss leachate management prior to landfill shutdown.

RESPONSE 41: a. The FDEP phone number has been revised. All other contact phone numbers have been verified.

b. The landfill shutdown section has been revised to include the leachate system management.

<u>SECTION 4 – 2017 PLAN SET (Rule 62-701.320(7)(f), F.A.C.)</u>:

Comment 42: Please revise Plan Set to include most current topographic survey. This includes modification to topographic background and existing grades on all applicable drawings.

RESPONSE 42: See response to Comment 26.

Comment 43: Drawing C0.03: Monitoring Wells MW-20B, MW-19A, and MW-18B are not designated as installed wells on this drawing.

RESPONSE 43: Drawing C0.03 has been revised to show monitoring wells MW-20B, MW-19A and MW-18B as installed wells.

Comment 44: Drawing C0.04:
a. Please explain why the leachate lift station as-built details were removed from this drawing.

b. The Cell 17 temporary diversion berm does not appear to be shown on drawing.

RESPONSE 44: a. The Plan Set has been revised to include leachate lift station details.

b. Drawing C0.04 has been revised to show the Cell 17 temporary diversion berm.

Comment 45: Drawing C1.00: The Cell 17 toe drain trench and pipe details are not shown on drawing.

RESPONSE 45: Drawing C1.00 has been revised to show the Cell 17 toe drain trench and pipe details.

Comment 46: Drawings C1.01, C1.11, C2.10 and C3.10: The "Permitted Kelner Landfill Profile Grade" was modified by Permit Modification #177982-021-SC/IM. Drawings should be updated accordingly.

RESPONSE 46: Drawings C1.01, C1.11, C2.10 and C3.10 have been revised to include the profile grade in accordance with the referenced permit modification.

Comment 47: Drawing C2.00:
a. Please explain where the Cell 7 west conveyance swale will drain to once construction of Cell 17 begins.

b. No west conveyance swale appears to be provided for Cell 17.

RESPONSE 47: The Cell 7 west conveyance swale will discharge to Pond 3. Please see revised drawing C2.00.

SECTION 5 – GROUNDWATER MONITORING PLAN (Rule 62-701.510, F.A.C.):

Comment 48: Table 1:
a. The table identifies MW-21A, MW-21B, MW-22A, MW-22B, MW-23A, MW-23B as "Existing", however also indicates that the wells will be installed in conjunction with Cell 17 construction. Consistent with MW-5AR and MW-5BR these should be designated as Future wells.

b. The table indicates monitoring wells MW-5A, MW-5B & P-4 will be abandoned 60 days prior to placement of waste in Cell 16. Permit #177982-024-SO/T3 indicates these wells will be abandoned at least 30 days prior to the start of construction of Cell 16.

c. This table indicates monitoring wells MW-5AR & MW-5BR will be installed 60 days prior to placement of waste in Cell 16. Permit #177982-024-SO/T3 indicates these wells will be installed at least 30 days prior to disposal of waste into Cell 16.

RESPONSE 48: a. Table 1 of the Groundwater Monitoring Plan has been revised to identify MW-21A, MW-21B, MW-22A, MW-22B, MW-23A, and MW-23B as "future" wells.

b. Table 1 of the Groundwater Monitoring Plan has been revised to state that monitoring wells MW-5A, MW-5B and P-4 will be abandoned at least 30 days prior to the start of construction of Cell 16.

c. Table 1 of the Groundwater Monitoring Plan has been revised to state that monitoring wells MW-5AR and MW-5BR will be installed at least 30 days prior to disposal of waste into Cell 16.

SECTION 7 – CLOSURE AND RECLAMATION PLAN (Rule 62-701.600, F.A.C.):

Comment 49: The section numbering in the table of contents was omitted throughout the Closure and Reclamation Plan.

RESPONSE 49: The Closure and Reclamation Plan has been revised to include section numbering.

APPENDIX 7A – FINANCIAL ASSURANCE COST ESTIMATES (Rule 62-701.630, F.A.C.):

Comment 50: Page 1 of 9: Please complete the "Total disposal unit acreage included in this estimate" for Closure and Long-Term Care.

RESPONSE 50: The FACE has been revised to include the total disposal unit acreage.

Comment 51: The attached 2012 third-party references are outdated. If relying on previous provided unit costs, please utilize the January 2017 inflation-adjusted unit costs.

RESPONSE 51: The FACE has been revised to include the January 2017 inflation-adjusted unit costs.

<u>Closure Costs</u>:

Comment 52: Three-dimensional closure areas should be utilized in the estimates based on the proposed vertical expansion.

RESPONSE 52: Closure areas have been updated with the three-dimensional areas from the proposed vertical expansion.

Comment 53: Vegetative Layer: Please verify whether a swale will be provided along the west side of Cell 17 and revise these estimates accordingly.

RESPONSE 53: Yes, a swale will be provided and estimates updated accordingly.

Comment 54: Stormwater Control System:
a. It is not clear how the unit quantities for piping, ditches, and berms can be unchanged from your January 2017 cost estimates with the additional of Cell 17 and a vertical expansion of the facility.

RESPONSE 54: The FACE has been updated to include revised quantities associated with the lateral and vertical expansions.

Comment 55: Gas Control - Passive:
a. Wells:
1) The passive wells are not shown on Sheet C3.00.

2) It is not clear how the unit quantities for pipe length for passive vents can be unchanged from your January 2017 cost estimates with the proposed vertical expansion of the facility.

b. Monitoring Probes:

l) The landfill monitoring probes are not shown on Sheet C3.00. Please verify the number of probes to be installed in the future.

RESPONSE 55: a1. Sheet C3.00 shows the passive gas wells.

a2. See response to Comment 54.

b. Sheet C3.00 has been revised to show the landfill gas monitoring probes. The FACE has been revised to include the number of future probes.

Long-term Care Costs:

Comment 56: Landscape-Mowing: Three-dimensional closure areas should be utilized in the estimates based on the proposed vertical expansion.

RESPONSE 56: Three-dimensional closure areas will be utilized in the estimates based on the proposed vertical expansion.

Please feel free to call me or John Locklear at (352) 672-6867 with any questions regarding this submittal.

Sincerely,

Lisa Baker

Lisa J. Baker, P.E.
Engineering Division Director

cc: John Arnold, Angelo's Aggregate Materials, Ltd.
John Locklear, Locklear & Associates, Inc.

Attachments
Attachment 1: Revised Permit Modification Application

ATTACHMENT 1

PERMIT MODIFICATION APPLICATION
FOR THE
ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY

WACS Facility ID: 87895
WACS No.: SWD/29/41084
Construction Permit No.: 177982-023-SC/T3
Operation Permit No.: 177982-024-SO/T3

Prepared for:

ANGELO'S AGGREGATE MATERIALS, LTD.
855 28th Street South
St. Petersburg, Florida 33712

Presented to:

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE SECTION
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

Prepared by:

LOCKLEAR AND ASSOCIATES, INC.
4140 NW 37 Place, Suite A
Gainesville, Florida 32606
Certificate of Authorization #30066

Project No.: 02000-217-17

February 2018 ~~September 2017~~

LISA J. BAKER
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STATE OF FLORIDA
PROFESSIONAL ENGINEER

Performed Under the Supervision of

Lisa Baker 2-9-18

Lisa J. Baker, P.E.
Florida PE #74652

Contents

NOTE: Contents page is from the 2012 Permit Renewal Application submitted by Kelner Engineering, Inc., 2015 Permit Modification Application submitted by Locklear & Associates, Inc., and 2016 Permit Modification submitted by Locklear & Associates, Inc. Only items in **BOLD** are provided in the current application package. The remaining items are unchanged.

INTRODUCTION

Locklear & Associates, Inc. (L&A) is submitting one (1) copy of the completed Form 62-701.900(1), F.A.C. and all supporting documentation for the modification of Solid Waste Construction Permit 177982-023-SC/T3 and Solid Waste Operations Permit 177982-024-SO/T3 on behalf of Angelo's Aggregate Materials, LTD (Applicant) for the Enterprise Road Class III Recycling and Disposal Facility (Facility) located in Pasco County, Florida. L&A has been authorized by the Applicant to act on its behalf in the preparation and submittal of this document. A letter of authorization is provided in Section 1 S-1.

In accordance with Rule 62-701.320, F.A.C., facility information that was submitted to the Department to support the current permits, and which is still valid, has not been re-submitted for permit modification. This permit modification application lists and reaffirms the information that was previously provided to the Department that is still valid. Information related to the specific modification requests has been revised/consolidated/updated and is being resubmitted as discussed herein.

The application generally involves modifying the current permits to allow for: (1) the construction and operation of an approximately 14.5 acre lateral expansion referred to as Cell 17; and (2) a vertical expansion of the entire permitted facility (Cells 1-7, 15-17) to a new maximum height of 220 feet with 3H:1V side slopes. Cell 17 is comprised of two previously labeled smaller cells (Cells 13 and 14). Cell 17 is proposed to be constructed with a 3-foot thick clay layer consistent with the previously constructed cells and a toe drain as permitted for the adjacent Cell 16.

SECTION 1

APPLICATION FOR PERMIT TO CONSTRUCT, OPERATE, MODIFY, OR CLOSE A SOLID WASTE MANAGEMENT FACILITY

DEP FORM 62-701.900(1)

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form #: 62-701.900(1), F.A.C.

Form Title: Application to Construct, Operate, Modify, or Close a Solid Waste Management Facility

Effective Date: February 15, 2015

Incorporated in Rule: 62-701.330(3), F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION TO CONSTRUCT, OPERATE, MODIFY, OR CLOSE A SOLID WASTE MANAGEMENT FACILITY

APPLICATION INSTRUCTIONS AND FORMS

INSTRUCTIONS TO APPLY FOR A SOLID WASTE MANAGEMENT FACILITY PERMIT

I. General

Solid Waste Management Facilities shall be permitted pursuant to Section 403.707, Florida Statutes (FS) and in accordance with Florida Administrative Code (FAC) Chapter 62-701. A permit application shall be submitted in accordance with the requirements of Rule 62-701.320(5)(a), F.A.C., to the appropriate Department office having jurisdiction over the facility. The appropriate fee in accordance with Rule 62-701.315, FAC, shall be submitted with the application by check made payable to the Department of Environmental Protection (DEP).

Complete appropriate sections for the type of facility for which application is made. Entries shall be typed or printed in ink. All blanks shall be filled in or marked "Not Applicable" or "No Substantial Change". Information provided in support of the application shall be marked "Submitted" and the location of this information in the application package indicated. The application shall include all information, drawings, and reports necessary to evaluate the facility. Information required to complete the application is listed on the attached pages of this form.

II. Application Parts Required for Construction and Operation Permits

A. Landfills and Ash Monofills - Submit Parts A through S
B. Asbestos Monofills - Submit Parts A, B, C, D, E, F, I, K, M, O through S
C. Industrial Solid Waste Disposal Facilities - Submit Parts A through S

NOTE: Portions of some Parts may not be applicable.

NOTE: For facilities that have been satisfactorily constructed in accordance with their construction permit, the information required for A, B and C type facilities does not have to be resubmitted for an operation permit if the information has not substantially changed during the construction period. The appropriate portion of the form should be marked "no substantial change".

III. Application Parts Required for Closure Permits

A. Landfills and Ash Monofills - Submit Parts A, B, L, N through S
B. Asbestos Monofills - Submit Parts A, B, M, O through S
C. Industrial Solid Waste Disposal Facilities - Submit Parts A, B, L through S

NOTE: Portions of some Parts may not be applicable.

IV. Permit Renewals

The above information shall be submitted at time of permit renewal in support of the new permit. However, facility information that was submitted to the Department to support the expiring permit, and which is still valid, does not need to be re-submitted for permit renewal. Portions of the application not re-submitted shall be marked "no substantial change" on the application form.

V. Application Codes

S	-	Submitted
LOCATION	-	Physical location of information in application
N/A	-	Not Applicable
N/C	-	No Substantial Change

VI. Listing of Application Parts

PART A: GENERAL INFORMATION

PART B: DISPOSAL FACILITY GENERAL INFORMATION

PART C: PROHIBITIONS

PART D: SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL

PART E: LANDFILL PERMIT REQUIREMENTS

PART F: GENERAL CRITERIA FOR LANDFILLS

PART G: LANDFILL CONSTRUCTION REQUIREMENTS

PART H: HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS

PART I: GEOTECHNICAL INVESTIGATION REQUIREMENTS

PART J: VERTICAL EXPANSION OF LANDFILLS

PART K: LANDFILL OPERATION REQUIREMENTS

PART L: WATER QUALITY AND LEACHATE MONITORING REQUIREMENTS

PART M: SPECIAL WASTE HANDLING REQUIREMENTS

PART N: GAS MANAGEMENT SYSTEM REQUIREMENTS

PART O: LANDFILL CLOSURE REQUIREMENTS

PART P: OTHER CLOSURE PROCEDURES

PART Q: LONG-TERM CARE

PART R: FINANCIAL ASSURANCE

PART S: CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
APPLICATION FOR A PERMIT TO CONSTRUCT, OPERATE, MODIFY OR CLOSE A SOLID WASTE MANAGEMENT FACILITY

Please Type or Print

PART A. GENERAL INFORMATION

1. Type of disposal facility (check all that apply):

- ☐ Class I Landfill
- ☑ Class III Landfill
- ☐ Industrial Solid Waste
- ☐ Other (describe):
- ☐ Ash Monofill
- ☐ Asbestos Monofill

____

____

____

NOTE: Waste Processing Facilities should apply on Form 62-701.900(4), FAC;
Yard Trash Disposal Facilities should notify on Form 62-701.900(3), FAC;
Compost Facilities should apply on Form 62-709.901(1), FAC; and
C&D Disposal Facilities should apply on Form 62-701.900(6), FAC

2. Type of application:

- ☐ Construction
- ☐ Operation
- ☑ Construction/Operation
- ☐ Closure
- ☐ Long-term Care Only

3. Classification of application:

- ☐ New
- ☐ Renewal
- ☑ Substantial Modification
- ☐ Intermediate Modification
- ☐ Minor Modification

4. Facility name: Enterprise Road Class III Recycling and Disposal Facility

5. DEP ID number: SWD/51/87895 County: Pasco

6. Facility location (main entrance):
The main entrance gate is on the north side of Enterprise Road, 1.5 miles east
C.R. 35 Alt. The address is 41111 Enterprise Road in Dade City, Florida 33525.

7. Location coordinates:

Section: 5 and 8 Township: 25 S Range: 22 E

Latitude: 28 ° 19 ' 53 " Longitude: 82 ° 08 ' 06 "

Datum: NGVD 29 Coordinate method: State Plane West

Collected by: Professional Land Surveyor Company/Affiliation: Picket Surveying and Photogrammetry

8. Applicant name (operating authority): Angelo's Aggregate Materials, Ltd.

Mailing address: 855 28th St. South | St. Petersburg | FL | 33712
Street or P.O. Box | City | State | Zip

Contact person: John Arnold, P.E. Telephone: (813) 477-1719

Title: Director of Engineering & Facilities

john.phillip.arnold@gmail.com
E-Mail address (if available)

9. Authorized agent/Consultant: Locklear & Associates, Inc.

Mailing address: 4140 NW 37th Place, Suite A | Gainesville | FL | 32606
Street or P.O. Box | City | State | Zip

Contact person: Lisa Baker, P.E. Telephone: (352) 672-6867

Title: Engineering Division Director

lisa@locklearconsulting.com
E-Mail address (if available)

10. Landowner (if different than applicant): Same as Applicant

Mailing address: ______
Street or P.O. Box | City | State | Zip

Contact person: ______ Telephone: (____) ______

______
E-Mail address (if available)

11. Cities, towns, and areas to be served:
Pasco County and surrounding areas

12. Population to be served:
Current: 487,588 (Pasco County 2015 Census Est) Five-Year Projection: 540,367 (Pasco County 2020 Projections)

13. Date site will be ready to be inspected for completion: N/A

14. Expected life of the facility: 10+ years

15. Estimated costs:
Total Construction: $ N/A Closing Costs: $ ______

16. Anticipated construction starting and completion dates:
From: Ongoing To: Ongoing

17. Expected volume or weight of waste to be received:
______ yds^3/day 550 +/- tons/day ______ gallons/day

PART B. DISPOSAL FACILITY GENERAL INFORMATION

1. Provide brief description of disposal facility design and operations planned under this application:
This application is submitted as a modification of construction and operations for an existing, permitted Class III landfill. Please refer to the introduction for details on changes and updates submitted as part of this application.

2. Facility site supervisor: Alfredo "Freddie" Martinez
Title: Landfill Manager Telephone: (352) 567-7676
N/A
E-Mail address (if available)

3. Disposal area: Total acres: 67.0 Used acres: 50.5 Available acres: 16.5

4. Weighing scales used: ☑ Yes ☐ No

5. Security to prevent unauthorized use: ☑ Yes ☐ No

6. Charge for waste received: +/- $9.00 $/yds^3 _____ $/ton

7. Surrounding land use, zoning:
   - ☐ Residential
   - ☑ Agricultural
   - ☐ Commercial
   - ☐ Industrial
   - ☐ None
   - ☐ Other (describe):

   Surrounding zoning is AC (Agricultural Commercial) and AR (Agricultural Residential).

8. Types of waste received:
   - ☐ Household
   - ☐ Commercial
   - ☐ Incinerator/WTE ash
   - ☐ Treated biomedical
   - ☐ Water treatment sludge
   - ☐ Air treatment sludge
   - ☐ Agricultural
   - ☑ Asbestos
   - ☑ C & D debris
   - ☑ Shredded/cut tires
   - ☑ Yard trash
   - ☐ Septic tank
   - ☐ Industrial
   - ☐ Industrial sludge
   - ☐ Domestic sludge
   - ☑ Other (describe):

   Class III waste

9. Salvaging permitted: ☐ Yes ☑ No

10. Attendant: ☑ Yes ☐ No   Trained operator: ☑ Yes ☐ No

11. Trained spotters: ☑ Yes ☐ No   Number of spotters used: 1 - 2

12. Site located in: ☐ Floodplain ☐ Wetlands ☑ Other (describe):

Orange groves

13. Days of operation: Monday through Friday, Saturday

14. Hours of operation: 7 am to 6 pm (M-F); 7 am - 2 pm (Sat)

15. Days working face covered: Once per week

16. Elevation of water table: 55 - 70 ft. Datum Used: NGVD 29

17. Number of monitoring wells: 21

18. Number of surface monitoring points: 0

19. Gas controls used: ☑ Yes ☐ No   Type controls: ☐ Active ☑ Passive

Gas flaring: ☐ Yes ☑ No   Gas recovery: ☐ Yes ☑ No

20. Landfill unit liner type:

- ☐ Natural soils
- ☑ Single clay liner
- ☐ Single geomembrane
- ☐ Single composite
- ☐ Slurry wall
- ☐ Double geomembrane
- ☐ Geomembrane & composite
- ☐ Double composite
- ☐ None
- ☐ Other (describe):

21. Leachate collection method:

- ☐ Collection pipes
- ☐ Geonets
- ☐ Well points
- ☐ Perimeter ditch
- ☑ Other (describe):
- ☐ Double geomembrane
- ☐ Gravel layer
- ☐ Interceptor trench
- ☐ None

Gravity drainage to temporary stormwater pond (Cell 14) and proposed Pond 3.
Pond 3 will be an industrial wastewater pond.

22. Leachate storage method:

☐ Tanks ☐ Surface impoundments

☐ Other (describe):

None

23. Leachate treatment method:

☐ Oxidation ☐ Chemical treatment

☐ Secondary ☐ Settling

☐ Advanced ☐ None

☑ Other (describe):

As described in the IW permit application, the leachate will be treated by dilution and evaporation.

24. Leachate disposal method:

☐ Recirculated ☐ Pumped to WWTP

☐ Transported to WWTP ☐ Discharged to surface water/wetland

☐ Injection well ☑ Percolation ponds

☐ Evaporation ☐ Spray irrigation

☐ Other (describe):

A portion of the leachate will be disposed in a percolation pond.

25. For leachate discharged to surface waters:

Name and Class of receiving water:

N/A

26. Storm Water:

Collected: ☑ Yes ☐ No

Type of treatment:

100 year, 24-hour storm event retained on-site without discharge.

Name and Class of receiving water:

None

27. Environmental Resources Permit (ERP) number or status:

ERP 51-0172489-006

PART C. **PROHIBITIONS** (62-701.300, FAC)

LOCATION

S ☑ Section 4 N/A ☐ N/C ☐ 1. Provide documentation that each of the siting criteria will be satisfied for the facility; (62-701.300(2), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 2. If the facility qualifies for any of the exemptions contained in Rules 62-701.300(12), (13) and (16) through (18), FAC, then document this qualification(s);

S ☐ ____________ N/A ☐ N/C ☑ 3. Provide documentation that the facility will be in compliance with the burning restrictions; (62-701.300(3), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 4. Provide documentation that the facility will be in compliance with the hazardous waste restrictions; (62-701.300(4), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 5. Provide documentation that the facility will be in compliance with the PCB disposal restrictions; (62-701.300(5), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 6. Provide documentation that the facility will be in compliance with the biomedical waste restrictions; (62-701.300(6), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 7. Provide documentation that the facility will be in compliance with the Class I surface water restrictions; (62-701.300(7), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 8. Provide documentation that the facility will be in compliance with the special waste for landfills restrictions; (62-701.300(8), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 9. Provide documentation that the facility will be in compliance with the liquid restrictions; (62-701.300(10), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 10. Provide documentation that the facility will be in compliance with the used oil and oily waste restrictions; (62-701.300(11), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 11. Provide documentation that the facility will be in compliance with the CCA treated wood restrictions; (62-701.300(14), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 12. Provide documentation that the facility will be in compliance with the dust control restrictions; (62-701.300(15), FAC)

PART D. SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL (62-701.320, FAC)

LOCATION

S ☑ Section 1 N/A ☐ N/C ☐ — 1. A minimum of one completed electronic application form, all supporting data and reports; (62-701.320(5)(a), FAC)

S ☑ Sections 1 & 3 N/A ☐ N/C ☐ — 2. Engineering and/or professional certification (signature, date, and seal) provided on the applications and all engineering plans, reports, and supporting information for the application; (62-701.320(6), FAC)

S ☑ Cover Letter N/A ☐ N/C ☐ — 3. A letter of transmittal to the Department; (62-701.320(7)(a), FAC)

S ☑ Section 1 N/A ☐ N/C ☐ — 4. A completed application form dated and signed by the applicant; (62-701.320(7)(b), FAC)

S ☑ Cover Letter N/A ☐ N/C ☐ — 5. Permit fee specified in Rule 62-701.315, FAC in check or money order, payable to the Department; (62-701.320(7)(c), FAC)

S ☑ Section 3 N/A ☐ N/C ☐ — 6. An engineering report addressing the requirements of this rule and with the following format: a cover sheet, text printed on 8 ½ inch by 11 inch consecutively numbered pages, a table of contents or index, the body of the report and all appendices including an operation plan, contingency plan, illustrative charts and graphs, records or logs of tests and investigations, engineering calculations; (62-701.320(7)(d), FAC)

S ☑ Sec. 3, App 3-A & Sec. 7 N/A ☐ N/C ☐ — 7. Operation Plan and Closure Plan; (62-701.320(7)(e)1, FAC)

S ☑ Section 3, App 3-B N/A ☐ N/C ☐ — 8. Contingency Plan; (62-701.320(7)(e)2, FAC)

S ☑ Section 4 N/A ☐ N/C ☐ — 9. Plans or drawings for the solid waste management facilities in appropriate format (including sheet size restrictions, cover sheet, legends, north arrow, horizontal and vertical scales, elevations referenced to NGVD 1929) showing: (62-701.320(7)(f), FAC)

S ☐ ________ N/A ☐ N/C ☑ — a. A regional map or plan with the project location in relation to major roadways and population centers;

S ☑ Section 4 N/A ☐ N/C ☐ — b. A vicinity map or aerial photograph no more than one year old showing the facility site and relevant surface features located within 1000 feet of the facility;

S ☑ Section 4 N/A ☐ N/C ☐ — c. A site plan showing all property boundaries certified by a Florida Licensed Professional Surveyor and Mapper;

S ☑ Section 4 N/A ☐ N/C ☐ — d. Other necessary details to support the engineering report, including referencing elevations to a consistent, nationally recognized datum, and identifying the method used for collecting latitude and longitude data;

LOCATION				PART D CONTINUED
S ☐		N/A ☐	N/C ☑	10. Documentation that the applicant either owns the property or has legal authority from the property owner to use the site; (62-701.320(7)(g), FAC)
S ☐		N/A ☑	N/C ☐	11. For facilities owned or operated by a county, provide a description of how, if any, the facilities covered in this application will contribute to the county's achievement of the waste reduction and recycling goals contained in Section 403.706, FS; (62-701.320(7)(h), FAC)
S ☐		N/A ☐	N/C ☑	12. Provide a history and description of any enforcement actions taken by the Department against the applicant for violations of applicable statutes, rules, orders, or permit conditions relating to the operation of any solid waste management facility in the state; (62-701.320(7)(i), FAC)
S ☑	Section 2, Part D-2	N/A ☐	N/C ☐	13. Proof of publication in a newspaper of general circulation of notice of application for a permit to construct or substantially modify a solid waste management facility; (62-701.320(8), FAC)
S ☑	Section 3, App 3-C	N/A ☐	N/C ☐	14. Provide a description of how the requirements for airport safety will be achieved, including proof of required notices if applicable. If exempt, explain how the exemption applies; (62-701.320(13), FAC)
S ☐		N/A ☐	N/C ☑	15. Explain how the operator and spotter training requirements and special criteria will be satisfied for the facility; (62-701.320(15), FAC)

PART E. LANDFILL PERMIT REQUIREMENTS (62-701.330, FAC)

LOCATION				
S ☑	Section 3, App 3-C	N/A ☐	N/C ☐	1. Regional map or aerial photograph no more than five years old showing all airports that are located within five miles of the proposed landfill; (62-701.330(3)(a), FAC)
S ☑	Section 4	N/A ☐	N/C ☐	2. Plot plan with a scale not greater than 200 feet to the inch showing: (62-701.330(3)(b), FAC)
S ☑	Section 4	N/A ☐	N/C ☐	a. Dimensions;
S ☑	Section 5	N/A ☐	N/C ☐	b. Locations of proposed and existing water quality monitoring wells;
S ☑	Section 2 Part G-1	N/A ☐	N/C ☐	c. Locations of soil borings;
S ☑	Section 4	N/A ☐	N/C ☐	d. Proposed plan of trenching or disposal areas;
S ☑	Section 4	N/A ☐	N/C ☐	e. Cross sections showing original elevations and proposed final contours which shall be included either on the plot plan or on separate sheets;

LOCATION				PART E CONTINUED
S ☑	Section 4	N/A ☐	N/C ☐	f. Any previously filled waste disposal areas;
S ☑	Section 4	N/A ☐	N/C ☐	g. Fencing or other measures to restrict access;
S ☑	Section 4	N/A ☐	N/C ☐	3. Topographic maps with a scale not greater than 200 feet to the inch with five foot contour intervals showing: (62-701.330(3)(c), FAC)
S ☑	Section 4	N/A ☐	N/C ☐	a. Proposed fill areas;
S ☐		N/A ☐	N/C ☑	b. Borrow areas;
S ☑	Section 4	N/A ☐	N/C ☐	c. Access roads;
S ☑	Section 4	N/A ☐	N/C ☐	d. Grades required for proper drainage;
S ☑	Section 4	N/A ☐	N/C ☐	e. Cross sections of lifts;
S ☐		N/A ☑	N/C ☐	f. Special drainage devices if necessary;
S ☑	Section 4	N/A ☐	N/C ☐	g. Fencing;
S ☐		N/A ☐	N/C ☑	h. Equipment facilities;
S ☐		N/A ☐	N/C ☑	4. A report on the landfill describing the following: (62-701.330(3)(d), FAC)
S ☐		N/A ☐	N/C ☑	a. The current and projected population and area to be served by the proposed site;
S ☐		N/A ☐	N/C ☑	b. The anticipated type, annual quantity, and source of solid waste expressed in tons;
S ☑	Section 4	N/A ☐	N/C ☐	c. Planned active life of the facility, the final design height of the facility, and the maximum height of the facility during its operation;
S ☐		N/A ☐	N/C ☑	d. The source and type of cover material used for the landfill;
S ☐		N/A ☐	N/C ☑	5. Provide evidence that an approved laboratory shall conduct water quality monitoring for the facility in accordance with Chapter 62-160, FAC; (62-701.330(3)(g), FAC
S ☐		N/A ☐	N/C ☑	6. Provide a statement of how the applicant will demonstrate financial responsibility for the closing and long-term care of the landfill; (62-701.330(3)(h), FAC)

PART F. GENERAL CRITERIA FOR LANDFILLS (62-701.340, FAC)

LOCATION

S ☑ Section 3, App 3-C N/A ☐ N/C ☐ 1. Describe (and show on a Federal Insurance Administration flood map, if available) how the landfill or solid waste disposal unit shall not be located in the 100 year floodplain where it will restrict the flow of the 100 year flood, reduce the temporary water storage capacity of the floodplain unless compensating storage is provided, or result in a washout of solid waste; (62-701.340(3)(b), FAC)

S ☑ Section 4 N/A ☐ N/C ☐ 2. Describe how the minimum horizontal separation between waste deposits in the landfill and the landfill property boundary shall be 100 feet, measured from the toe of the proposed final cover slope; (62-701.340(3)(c), FAC)

PART G. LANDFILL CONSTRUCTION REQUIREMENTS (62-701.400, FAC)

LOCATION

S ☑ Section 3 N/A ☐ N/C ☐ 1. Describe how the landfill shall be designed so the solid waste disposal units will be constructed and closed at planned intervals throughout the design period of the landfill, and shall be designed to achieve a minimum factor of safety of 1.5 using peak strength values to prevent failures of side slopes and deep-seated failures; (62-701.400(2), FAC)

S ☑ Section 2, part G-1 N/A ☐ N/C ☐ 2. Landfill liner requirements; (62-701.400(3), FAC)

S ☐ ____________ N/A ☑ N/C ☐ a. General construction requirements; (62-701.400(3)(a), FAC)

S ☐ ____________ N/A ☑ N/C ☐ (1) Provide test information and documentation to ensure the liner will be constructed of materials that have appropriate physical, chemical, and mechanical properties to prevent failure;

S ☐ ____________ N/A ☑ N/C ☐ (2) Document foundation is adequate to prevent liner failure;

S ☐ ____________ N/A ☑ N/C ☐ (3) Constructed so bottom liner will not be adversely impacted by fluctuations of the ground water;

S ☐ ____________ N/A ☑ N/C ☐ (4) Designed to resist hydrostatic uplift if bottom liner located below seasonal high ground water table;

S ☐ ____________ N/A ☑ N/C ☐ (5) Installed to cover all surrounding earth which could come into contact with the waste or leachate;

LOCATION		**PART G CONTINUED**
S ☐ ____________ N/A ☑ N/C ☐		b. Composite liners; (62-701.400(3)(b), FAC)
S ☐ ____________ N/A ☑ N/C ☐	(1)	Upper geomembrane thickness and properties;
S ☐ ____________ N/A ☑ N/C ☐	(2)	Design leachate head for primary leachate collection and removal system (LCRS) including leachate recirculation if appropriate;
S ☐ ____________ N/A ☑ N/C ☐	(3)	Design thickness in accordance with Table A and number of lifts planned for lower soil component;
S ☐ ____________ N/A ☑ N/C ☐		c. Double liners; (62-701.400(3)(c), FAC)
S ☐ ____________ N/A ☑ N/C ☐	(1)	Upper and lower geomembrane thickness and properties;
S ☐ ____________ N/A ☑ N/C ☐	(2)	Design leachate head for primary LCRS to limit the head to one foot above the liner;
S ☐ ____________ N/A ☑ N/C ☐	(3)	Lower geomembrane sub-base design;
S ☐ ____________ N/A ☑ N/C ☐	(4)	Leak detection and secondary leachate collection system minimum design criteria (k ≥ 10 cm/sec, head on lower liner ≤ 1 inch, head not to exceed thickness of drainage layer);
S ☐ ____________ N/A ☑ N/C ☐		d. Standards for geosynthetic components; (62-701.400(3)(d), FAC)
S ☐ ____________ N/A ☑ N/C ☐	(1)	Factory and field seam test methods to ensure all geomembrane seams achieve the minimum specifications;
S ☐ ____________ N/A ☑ N/C ☐	(2)	Geomembranes to be used shall pass a continuous spark test by the manufacturer;
S ☐ ____________ N/A ☑ N/C ☐	(3)	Design of 24-inch-thick protective layer above upper geomembrane liner;
S ☐ ____________ N/A ☑ N/C ☐	(4)	Describe operational plans to protect the liner and leachate collection system when placing the first layer of waste above a 24-inch-thick protective layer;
S ☐ ____________ N/A ☑ N/C ☐	(5)	HDPE geomembranes, if used, meet the specifications in GRI GM13, and LLDPE geomembranes, if used, meet the specifications in GRI GM17;
S ☐ ____________ N/A ☑ N/C ☐	(6)	PVC geomembranes, if used, meet the specifications in PGI 1104;

LOCATION	PART G CONTINUED
S ☐ ____________ N/A ☑ N/C ☐	(7) Interface shear strength testing results of the actual components which will be used in the liner system;
S ☐ ____________ N/A ☑ N/C ☐	(8) Transmissivity testing results of geonets if they are used in the liner system;
S ☐ ____________ N/A ☑ N/C ☐	(9) Hydraulic conductivity testing results of geosynthetic clay liners if they are used in the liner system;
S ☐ ____________ N/A ☑ N/C ☐	e. Geosynthetic specification requirements; (62-701.400(3)(e), FAC)
S ☐ ____________ N/A ☑ N/C ☐	(1) Definition and qualifications of the designer, manufacturer, installer, QA consultant and laboratory, and QA program;
S ☐ ____________ N/A ☑ N/C ☐	(2) Material specifications for geomembranes, geocomposites, geotextiles, geogrids, and geonets;
S ☐ ____________ N/A ☑ N/C ☐	(3) Manufacturing and fabrication specifications including geomembrane raw material and roll QA, fabrication personnel qualifications, seaming equipment and procedures, overlaps, trial seams, destructive and non-destructive seam testing, seam testing location, frequency, procedure, sample size, and geomembrane repairs;
S ☐ ____________ N/A ☑ N/C ☐	(4) Geomembrane installation specifications including earthwork, conformance testing, geomembrane placement, installation personnel qualifications, field seaming and testing, overlapping and repairs, materials in contact with geomembranes, and procedures for lining system acceptance;
S ☐ ____________ N/A ☑ N/C ☐	(5) Geotextile and geogrids specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil materials and any overlying materials;
S ☐ ____________ N/A ☑ N/C ☐	(6) Geonet and geocomposites specifications including handling and placement, conformance testing, stacking and joining, repair, and placement of soil materials and any overlying materials;
S ☐ ____________ N/A ☑ N/C ☐	(7) Geosynthetic clay liner specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil materials and any overlying materials;

LOCATION	PART G CONTINUED
S ☐ ____________ N/A ☑ N/C ☐	f. Standards for soil liner components; (62-701.400(3)(f), FAC)
S ☐ ____________ N/A ☑ N/C ☐	(1) Description of construction procedures including over-excavation and backfilling to preclude structural inconsistencies and procedures for placing and compacting soil components in layers;
S ☐ ____________ N/A ☑ N/C ☐	(2) Demonstration of compatibility of the soil component with actual or simulated leachate in accordance with EPA Test Method 9100, or an equivalent test method;
S ☐ ____________ N/A ☑ N/C ☐	(3) Procedures for testing in situ soils to demonstrate they meet the specifications for soil liners;
S ☐ ____________ N/A ☑ N/C ☐	(4) Specifications for soil component of liner including at a minimum:
S ☐ ____________ N/A ☑ N/C ☐	(a) Allowable particle size distribution, and Atterberg limits including shrinkage limit;
S ☐ ____________ N/A ☑ N/C ☐	(b) Placement moisture and dry density criteria;
S ☐ ____________ N/A ☑ N/C ☐	(c) Maximum laboratory-determined saturated hydraulic conductivity using simulated leachate;
S ☐ ____________ N/A ☑ N/C ☐	(d) Minimum thickness of soil liner;
S ☐ ____________ N/A ☑ N/C ☐	(e) Lift thickness;
S ☐ ____________ N/A ☑ N/C ☐	(f) Surface preparation (scarification);
S ☐ ____________ N/A ☑ N/C ☐	(g) Type and percentage of clay mineral within the soil component;
S ☐ ____________ N/A ☑ N/C ☐	(5) Procedures for constructing and using a field test section to document the desired saturated hydraulic conductivity and thickness can be achieved in the field;
S ☐ ____________ N/A ☑ N/C ☐	g. If a Class III landfill is to be constructed with a bottom liner system, provide a description of how the minimum requirements for the liner will be achieved;

LOCATION				PART G CONTINUED
S ☑	Section 3	N/A ☐	N/C ☐	3. Leachate collection and removal system (LCRS); (62-701.400(4), FAC)
S ☑	Section 3	N/A ☐	N/C ☐	a. The primary and secondary LCRS requirements; (62-701.400(4)(a), FAC)
S ☑	Section 3	N/A ☐	N/C ☐	(1) Constructed of materials chemically resistant to the waste and leachate;
S ☑	Section 3	N/A ☐	N/C ☐	(2) Have sufficient mechanical properties to prevent collapse under pressure;
S ☑	Section 3	N/A ☐	N/C ☐	(3) Have granular material or synthetic geotextile to prevent clogging;
S ☑	Section 3	N/A ☐	N/C ☐	(4) Have a method for testing and cleaning clogged pipes or contingent designs for reducing leachate around failed areas;
S ☑	Section 3	N/A ☐	N/C ☐	b. Other LCRS requirements; (62-701.400(4)(b), (c) and (d), FAC
S ☑	Section 3	N/A ☐	N/C ☐	(1) Bottom 12 inches having hydraulic conductivity $\geq 1 \times 10^{-3}$ cm/sec;
S ☑	Section 3	N/A ☐	N/C ☐	(2) Total thickness of 24 inches of material chemically resistant to the waste and leachate;
S ☑	Section 3	N/A ☐	N/C ☐	(3) Bottom slope design to accommodate for predicted settlement and still meet minimum slope requirements;
S ☐		N/A ☑	N/C ☐	(4) Demonstration that synthetic drainage material, if used, is equivalent or better than granular material in chemical compatibility, flow under load, and protection of geomembranes liner;
S ☑	Section 3	N/A ☐	N/C ☐	(5) Schedule provided for routine maintenance of LCRS.
S ☐		N/A ☑	N/C ☐	4. Leachate recirculation; (62-701.400(5), FAC)
S ☐		N/A ☑	N/C ☐	a. Describe general procedures for recirculating leachate;
S ☐		N/A ☑	N/C ☐	b. Describe procedures for controlling leachate runoff and minimizing mixing of leachate runoff with storm water;
S ☐		N/A ☑	N/C ☐	c. Describe procedures for preventing perched water conditions and gas buildup;

LOCATION **PART G CONTINUED**

S ☐ ____________ N/A ☑ N/C ☐ d. Describe alternate methods for leachate management when it cannot be recirculated due to weather or runoff conditions, surface seeps, wind-blown spray, or elevated levels of leachate head on the liner;

S ☐ ____________ N/A ☑ N/C ☐ e. Describe methods of gas management in accordance with Rule 62-701.530, FAC;

S ☐ ____________ N/A ☑ N/C ☐ f. If leachate irrigation is proposed, describe treatment methods and standards for leachate treatment prior to irrigation over final cover, and provide documentation that irrigation does not contribute significantly to leachate generation;

S ☐ ____________ N/A ☑ N/C ☐ 5. Leachate storage tanks and leachate surface impoundments; (62-701.400(6), FAC)

S ☐ ____________ N/A ☑ N/C ☐ a. Surface impoundment requirements; (62-701.400(6)(b), FAC)

S ☐ ____________ N/A ☑ N/C ☐ (1) Documentation that the design of the bottom liner will not be adversely impacted by fluctuations of the ground water;

S ☐ ____________ N/A ☑ N/C ☐ (2) Designed in segments to allow for inspection and repair, as needed, without interruption of service;

S ☐ ____________ N/A ☑ N/C ☐ (3) General design requirements;

S ☐ ____________ N/A ☑ N/C ☐ (a) Double liner system consisting of an upper and lower 60-mil minimum thickness geomembrane;

S ☐ ____________ N/A ☑ N/C ☐ (b) Leak detection and collection system with hydraulic conductivity ≥ 1 cm/sec;

S ☐ ____________ N/A ☑ N/C ☐ (c) Lower geomembrane place on subbase ≥ 6 inches thick with $k \leq 1 \times 10^{-5}$ cm/sec or on an approved geosynthetic clay liner with $k \leq 1 \times 10^{-7}$ cm/sec;

S ☐ ____________ N/A ☑ N/C ☐ (d) Design calculation to predict potential leakage through the upper liner;

S ☐ ____________ N/A ☑ N/C ☐ (e) Daily inspection requirements, and notification and corrective action requirements if leakage rates exceed that predicted by design calculations;

S ☐ ____________ N/A ☑ N/C ☐ (4) Description of procedures to prevent uplift, if applicable;

LOCATION		PART G CONTINUED
S ☐ ____________ N/A ☑ N/C ☐	(5)	Design calculations to demonstrate minimum two feet of freeboard will be maintained;
S ☐ ____________ N/A ☑ N/C ☐	(6)	Procedures for controlling vectors and off-site odors;
S ☐ ____________ N/A ☑ N/C ☐	b. Above-ground leachate storage tanks; (62-701.400(6)(c), FAC)	
S ☐ ____________ N/A ☑ N/C ☐	(1)	Describe tank materials of construction and ensure foundation is sufficient to support tank;
S ☐ ____________ N/A ☑ N/C ☐	(2)	Describe procedures for cathodic protection for the tank, if needed;
S ☐ ____________ N/A ☑ N/C ☐	(3)	Describe exterior painting and interior lining of the tank to protect it from the weather and the leachate stored;
S ☐ ____________ N/A ☑ N/C ☐	(4)	Describe secondary containment design to ensure adequate capacity will be provided and compatibility of materials of construction;
S ☐ ____________ N/A ☑ N/C ☐	(5)	Describe design to remove and dispose of stormwater from the secondary containment system;
S ☐ ____________ N/A ☑ N/C ☐	(6)	Describe an overfill prevention system, such as level sensors, gauges, alarms, and shutoff controls to prevent overfilling;
S ☐ ____________ N/A ☑ N/C ☐	(7)	Inspections, corrective action, and reporting requirements;
S ☐ ____________ N/A ☑ N/C ☐		(a) Weekly inspection of overfill prevention system;
S ☐ ____________ N/A ☑ N/C ☐		(b) Weekly inspection of exposed tank exteriors;
S ☐ ____________ N/A ☑ N/C ☐		(c) Inspection of tank interiors when tank is drained, or at least every three years;
S ☐ ____________ N/A ☑ N/C ☐		(d) Procedures for immediate corrective action if failures detected;
S ☐ ____________ N/A ☑ N/C ☐		(e) Inspection reports available for Department review;
S ☐ ____________ N/A ☑ N/C ☐	c. Underground leachate storage tanks; (62-701.400(6)(d), FAC)	

LOCATION		PART G CONTINUED
S ☐ ____________ N/A ☑ N/C ☐	(1)	Describe materials of construction;
S ☐ ____________ N/A ☑ N/C ☐	(2)	A double-walled tank design system to be used with the following requirements:
S ☐ ____________ N/A ☑ N/C ☐		(a) Interstitial space monitoring at least weekly;
S ☐ ____________ N/A ☑ N/C ☐		(b) Corrosion protection provided for primary tank interior and external surface of outer shell;
S ☐ ____________ N/A ☑ N/C ☐		(c) Interior tank coatings compatible with stored leachate;
S ☐ ____________ N/A ☑ N/C ☐		(d) Cathodic protection inspected weekly and repaired as needed;
S ☐ ____________ N/A ☑ N/C ☐	(3)	Describe an overfill prevention system, such as level sensors, gauges, alarms, and shutoff controls to prevent overfilling, and provide for weekly inspections;
S ☐ ____________ N/A ☑ N/C ☐	(4)	Inspection reports available for Department review;
S ☐ ____________ N/A ☑ N/C ☐	6. Liner systems construction quality assurance (CQA); (62-701.400(7), FAC)	
S ☐ ____________ N/A ☑ N/C ☐	a. Provide CQA Plan including:	
S ☐ ____________ N/A ☑ N/C ☐	(1)	Specifications and construction requirements for liner system;
S ☐ ____________ N/A ☑ N/C ☐	(2)	Detailed description of quality control testing procedures and frequencies;
S ☐ ____________ N/A ☑ N/C ☐	(3)	Identification of supervising professional engineer;
S ☐ ____________ N/A ☑ N/C ☐	(4)	Identify responsibility and authority of all appropriate organizations and key personnel involved in the construction project;
S ☐ ____________ N/A ☑ N/C ☐	(5)	State qualifications of CQA professional engineer and support personnel;

LOCATION **PART G CONTINUED**

S ☐ ____________ N/A ☑ N/C ☐ (6) Description of CQA reporting forms and documents;

S ☐ ____________ N/A ☑ N/C ☐ b. An independent laboratory experienced in the testing of geosynthetics to perform required testing;

S ☐ ____________ N/A ☑ N/C ☐ 7. Soil liner CQA; (62-701.400(8), FAC)

S ☐ ____________ N/A ☑ N/C ☐ a. Documentation that an adequate borrow source has been located with test results, or description of the field exploration and laboratory testing program to define a suitable borrow source;

S ☐ ____________ N/A ☑ N/C ☐ b. Description of field test section construction and test methods to be implemented prior to liner installation;

S ☐ ____________ N/A ☑ N/C ☐ c. Description of field test methods, including rejection criteria and corrective measures to insure proper liner installation;

S ☐ ____________ N/A ☑ N/C ☐ 8. For surface water management systems at aboveground disposal units, provide documentation showing the design of any features intended to convey stormwater to a permitted or exempted treatment system; (62-701.400(9), FAC)

S ☐ ____________ N/A ☑ N/C ☐ 9. Gas control systems; (62-701.400(10), FAC)

S ☐ ____________ N/A ☑ N/C ☐ a. Provide documentation that if the landfill is receiving degradable wastes, it will have a gas control system complying with the requirements of Rule 62-701.530, FAC;

S ☐ ____________ N/A ☑ N/C ☐ 10. For landfills designed in ground water, provide documentation that the landfill will provide a degree of protection equivalent to landfills designed with bottom liners not in contact with ground water; (62-701.400(11), FAC)

PART H. HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS (62-701.410(2), FAC)

LOCATION

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ 1. Submit a hydrogeological investigation and site report including at least the following information:

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ a. Regional and site specific geology and hydrology;

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ b. Direction and rate of ground water and surface water flow including seasonal variations;

LOCATION **PART H CONTINUED**

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ c. Background quality of ground water and surface water;

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ d. Any on-site hydraulic connections between aquifers;

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ e. Site stratigraphy and aquifer characteristics for confining layers, semi-confining layers, and all aquifers below the site that may be affected by the disposal facility;

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ f. Description of topography, soil types, and surface water drainage systems;

S ☑ Section 3 Appendix 3-C N/A ☐ N/C ☐ g. Inventory of all public and private water wells within a one mile radius of the site including, where available, well top of casing and bottom elevations, name of owner, age and usage of each well, stratigraphic unit screened, well construction technique, and static water level;

S ☐ ____________ N/A ☐ N/C ☑ h. Identify and locate any existing contaminated areas on the site;

S ☑ Section 3, App 3-C N/A ☐ N/C ☐ i. Include a map showing the locations of all potable wells within 500 feet of the waste storage and disposal areas;

S ☑ Section 2 Part G-1 N/A ☐ N/C ☐ 2. Report signed, sealed, and dated by P.E. and/or P.G.

PART I. **GEOTECHNICAL INVESTIGATION REQUIREMENTS** (62-701.410(3) and (4), FAC)

LOCATION

S ☑ Section 2 Part I-1 N/A ☐ N/C ☐ 1. Submit a geotechnical site investigation report defining the engineering properties of the site including at least the following:

S ☑ Section 2 Part I-1 N/A ☐ N/C ☐ a. Description of subsurface conditions including soil stratigraphy and ground water table conditions;

S ☑ Section 2 Part I-1 N/A ☐ N/C ☐ b. Investigate for the presence of muck, previously filled areas, soft ground, and lineaments;

S ☑ Section 2 Part I-1 N/A ☐ N/C ☐ c. Estimates of average and maximum high water table across the site;

S ☑ Section 2 Part I-1 N/A ☐ N/C ☐ d. Evaluation of potential for fault areas and seismic impact zones;

S ☑ Section 2 Part I-2 N/A ☐ N/C ☐ e. Foundation analysis including:

LOCATION			**PART I CONTINUED**
S ☑	Section 2 Part I-2	N/A ☐ N/C ☐	(1) Foundation bearing capacity analysis;
S ☑	Section 2 Part I-2	N/A ☐ N/C ☐	(2) Total and differential subgrade settlement analysis;
S ☑	Section 2 Part I-2	N/A ☐ N/C ☐	(3) Slope stability analysis;
S ☑	Section 2 Part I-1	N/A ☐ N/C ☐	f. Evaluation of potential for sinkholes and sinkhole activity at the site that is based upon the investigations required in Rule 62-701.410(3)(f), F.A.C.;
S ☑	Attachment 1	N/A ☐ N/C ☐	g. A geotechnical report providing a description of methods used in the investigation, and includes soil boring logs, laboratory results, analytical calculations, cross sections, interpretations, conclusions, and a description of any engineering measures proposed for the site;
S ☑	Sec. 2 Part G-1 & I-2	N/A ☐ N/C ☐	2. Report signed, sealed, and dated by P.E. and/or P.G.

PART J. VERTICAL EXPANSION OF LANDFILLS (62-701.430, FAC)

LOCATION			
S ☐		N/A ☑ N/C ☐	1. Describe how the vertical expansion shall not cause or contribute to any violations of water quality standards or criteria, shall not cause objectionable odors, or adversely affect the closure design of the existing landfill;
S ☐		N/A ☑ N/C ☐	2. Describe how the vertical expansion over unlined landfills will meet the requirements of Rule 62-701.400, FAC with the exceptions of Rule 62-701.430(1)(c), FAC;
S ☐		N/A ☑ N/C ☐	3. Provide foundation and settlement analysis for the vertical expansion;
S ☐		N/A ☑ N/C ☐	4. Provide total settlement calculations demonstrating that the final elevations of the lining system, gravity drainage, and no other component of the design will be adversely affected;
S ☐		N/A ☑ N/C ☐	5. Minimum stability factor of safety of 1.5 for the lining system component interface stability and for deep stability;
S ☐		N/A ☑ N/C ☐	6. Provide documentation to show the surface water management system will not be adversely affected by the vertical expansion;
S ☐		N/A ☑ N/C ☐	7. Provide gas control designs to prevent accumulation of gas under the new liner for the vertical expansion;

PART K. **LANDFILL OPERATION REQUIREMENTS** (62-701.500, FAC)

LOCATION

S ☐ ____________ N/A ☐ N/C ☑ 1. Provide documentation that the landfill will have at least one trained operator during operation and at least one trained spotter at each working face; (62-701.500(1), FAC)

S ☑ Section 3, App 3-A N/A ☐ N/C ☐ 2. Provide a landfill operation plan including procedures for: (62-701.500(2), FAC)

S ☐ ____________ N/A ☐ N/C ☑ a. Designating responsible operating and maintenance personnel;

S ☐ ____________ N/A ☐ N/C ☑ b. Emergency preparedness and response, as required in subsection 62-701.320(16), FAC;

S ☐ ____________ N/A ☐ N/C ☑ c. Controlling types of waste received at the landfill;

S ☐ ____________ N/A ☐ N/C ☑ d. Weighing incoming waste;

S ☐ ____________ N/A ☐ N/C ☑ e. Vehicle traffic control and unloading;

S ☑ Section 3, App 3-A N/A ☐ N/C ☐ f. Method and sequence of filling waste;

S ☐ ____________ N/A ☐ N/C ☑ g. Waste compaction and application of cover;

S ☑ Section 3, App 3-A N/A ☐ N/C ☐ h. Operations of gas, leachate, and stormwater controls;

S ☑ Section 5 N/A ☐ N/C ☐ i. Water quality monitoring;

S ☐ ____________ N/A ☑ N/C ☐ j. Maintaining and cleaning the leachate collection system;

S ☐ ____________ N/A ☐ N/C ☑ 3. Provide a description of the landfill operation record to be used at the landfill, details as to location of where various operational records will be kept (i.e. DEP permit, engineering drawings, water quality records, etc.); (62-701.500(3), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 4. Describe the waste records that will be compiled monthly and provided to the Department annually; (62-701.500(4), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 5. Describe methods of access control; (62-701.500(5), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 6. Describe load checking program to be implemented at the landfill to discourage disposal of unauthorized waste at the landfill; (62-701.500(6), FAC)

LOCATION **PART K CONTINUED**

S ☐ ______________ N/A ☐ N/C ☑ 7. Describe procedures for spreading and compacting waste at the landfill that include: (62-701.500(7), FAC)

S ☐ ______________ N/A ☐ N/C ☑ a. Waste layer thickness and compaction frequencies;

S ☐ ______________ N/A ☑ N/C ☐ b. Special considerations for first layer of waste placed above the liner and leachate collection system;

S ☐ ______________ N/A ☐ N/C ☑ c. Slopes of cell working face and side grades above land surface, and planned lift depths during operation;

S ☐ ______________ N/A ☐ N/C ☑ d. Maximum width of working face;

S ☐ ______________ N/A ☐ N/C ☑ e. Description of type of initial cover to be used at the facility that controls:

S ☐ ______________ N/A ☐ N/C ☑ (1) Vector breeding/animal attraction;

S ☐ ______________ N/A ☐ N/C ☑ (2) Fires;

S ☐ ______________ N/A ☐ N/C ☑ (3) Odors;

S ☐ ______________ N/A ☐ N/C ☑ (4) Blowing litter;

S ☐ ______________ N/A ☐ N/C ☑ (5) Moisture infiltration;

S ☐ ______________ N/A ☐ N/C ☑ f. Procedures for applying initial cover, including minimum cover frequencies;

S ☐ ______________ N/A ☐ N/C ☑ g. Procedures for applying intermediate cover;

S ☐ ______________ N/A ☐ N/C ☑ h. Time frames for applying final cover;

S ☐ ______________ N/A ☐ N/C ☑ i. Procedures for controlling scavenging and salvaging;

S ☐ ______________ N/A ☐ N/C ☑ j. Description of litter policing methods;

S ☐ ______________ N/A ☐ N/C ☑ k. Erosion control procedures;

LOCATION				PART K CONTINUED
S ☐	____________	N/A ☑	N/C ☐	8. Describe operational procedures for leachate management including: (62-701.500(8), FAC)
S ☐	____________	N/A ☑	N/C ☐	a. Leachate level monitoring;
S ☐	____________	N/A ☑	N/C ☐	b. Operation and maintenance of leachate collection and removal system, and treatment as required;
S ☐	____________	N/A ☑	N/C ☐	c. Procedures for managing leachate if it becomes regulated as a hazardous waste;
S ☐	____________	N/A ☑	N/C ☐	d. Identification of treatment or disposal facilities that may be used for off-site discharge and treatment of leachate;
S ☐	____________	N/A ☑	N/C ☐	e. Contingency plan for managing leachate during emergencies or equipment problems;
S ☐	____________	N/A ☑	N/C ☐	f. Procedures for recording quantities of leachate generated in gal/day and including this in the operating record;
S ☐	____________	N/A ☑	N/C ☐	g. Procedures for comparing precipitation experienced at the landfill with leachate generation rates and including this information in the operating record;
S ☐	____________	N/A ☑	N/C ☐	h. Procedures for water pressure cleaning or video inspecting leachate collection systems;
S ☐	____________	N/A ☑	N/C ☐	9. Describe how the landfill receiving degradable wastes shall implement a gas management system meeting the requirements of Rule 62-701.530, FAC; (62-701.500(9), FAC)
S ☑	Section 3, App 3-A	N/A ☐	N/C ☐	10. Describe procedures for operating and maintaining the landfill stormwater management system to comply with the requirements of Rule 62-701.400(9), FAC; (62-701.500(10), FAC)
S ☐	____________	N/A ☐	N/C ☑	11. Equipment and operation feature requirements; (62-701.500(11), FAC)
S ☐	____________	N/A ☐	N/C ☑	a. Sufficient equipment for excavating, spreading, compacting, and covering waste;
S ☐	____________	N/A ☐	N/C ☑	b. Reserve equipment or arrangements to obtain additional equipment within 24 hours of breakdown;
S ☐	____________	N/A ☐	N/C ☑	c. Communications equipment;

LOCATION **PART K CONTINUED**

S ☐ ______ N/A ☐ N/C ☑ d. Dust control methods;

S ☐ ______ N/A ☐ N/C ☑ e. Fire protection capabilities and procedures for notifying local fire department authorities in emergencies;

S ☐ ______ N/A ☐ N/C ☑ f. Litter control devices;

S ☐ ______ N/A ☐ N/C ☑ g. Signs indicating operating authority, traffic flow, hours of operation, and disposal restrictions;

S ☑ Section 3, App 3-A N/A ☐ N/C ☐ 12. Provide a description of all-weather access road, inside perimeter road, and other on-site roads necessary for access at the landfill; (62-701.500(12), FAC)

S ☐ ______ N/A ☐ N/C ☑ 13. Additional record keeping and reporting requirements; (62-701.500(13), FAC)

S ☐ ______ N/A ☐ N/C ☑ a. Records used for developing permit applications and supplemental information maintained for the design period of the landfill;

S ☐ ______ N/A ☐ N/C ☑ b. Monitoring information, calibration and maintenance records, and copies of reports required by permit maintained for at least 10 years;

S ☐ ______ N/A ☐ N/C ☑ c. Maintain annual estimates of the remaining life of constructed landfills, and of other permitted areas not yet constructed, and submit this estimate annually to the Department;

S ☐ ______ N/A ☐ N/C ☑ d. Procedures for archiving and retrieving records which are more than five years old;

PART L. WATER QUALITY MONITORING REQUIREMENTS (62-701.510, FAC)

LOCATION

S ☑ Section 5 N/A ☐ N/C ☐ 1. A water quality monitoring plan shall be submitted describing the proposed ground water and surface water monitoring systems, and shall meet at least the following requirements:

S ☑ Section 5 N/A ☐ N/C ☐ a. Based on the information obtained in the hydrogeological investigation and signed, dated, and sealed by the P.G. or P.E. who prepared it; (62-701.510(2)(a), FAC)

LOCATION		PART L CONTINUED	
S ☑ Section 5 N/A ☐ N/C ☐	b. All sampling and analysis performed in accordance with Chapter 62-160, FAC; (62-701.510(2)(b), FAC)		
S ☑ Section 5 N/A ☐ N/C ☐	c. Ground water monitoring requirements; (62-701.510(3), FAC)		
S ☑ Section 5 N/A ☐ N/C ☐	(1)	Detection wells located downgradient from and within 50 feet of disposal units;	
S ☑ Section 5 N/A ☐ N/C ☐	(2)	Downgradient compliance wells as required;	
S ☑ Section 5 N/A ☐ N/C ☐	(3)	Background wells screened in all aquifers below the landfill that may be affected by the landfill;	
S ☑ Section 5 N/A ☐ N/C ☐	(4)	Location information for each monitoring well;	
S ☑ Section 5 N/A ☐ N/C ☐	(5)	Well spacing no greater than 500 feet apart for downgradient wells and no greater than 1500 feet apart for upgradient wells, unless site specific conditions justify alternate well spacings;	
S ☑ Section 5 N/A ☐ N/C ☐	(6)	Properly selected well screen locations;	
S ☑ Section 5 N/A ☐ N/C ☐	(7)	Monitoring wells constructed to provide representative ground water samples;	
S ☐ ____ N/A ☐ N/C ☑	(8)	Procedures for properly abandoning monitoring wells;	
S ☐ ____ N/A ☐ N/C ☑	(9)	Detailed description of detection sensors, if proposed;	
S ☐ ____ N/A ☐ N/C ☑	d. Surface water monitoring requirements; (62-701.510(4), FAC)		
S ☐ ____ N/A ☐ N/C ☑	(1)	Location of and justification for all proposed surface water monitoring points;	
S ☐ ____ N/A ☐ N/C ☑	(2)	Each monitoring location to be marked and its position determined by a registered Florida land surveyor;	
S ☑ Section 5 N/A ☐ N/C ☐	e. Initial and routine sampling frequency and requirements; (62-701.510(5), FAC)		
S ☐ ____ N/A ☐ N/C ☑	(1)	Initial background ground water and surface water sampling and analysis requirements;	

LOCATION				PART L CONTINUED
S ☑	Section 5	N/A ☐	N/C ☐	(2) Routine monitoring well sampling and analysis requirements;
S ☐		N/A ☐	N/C ☑	(3) Routine surface water sampling and analysis requirements;
S ☑	Section 5	N/A ☐	N/C ☐	f. Describe procedures for implementing evaluation monitoring, prevention measures, and corrective action as required; (62-701.510(6), FAC)
S ☑	Section 5	N/A ☐	N/C ☐	g. Water quality monitoring report requirements; (62-701.510(8), FAC)
S ☑	Section 5	N/A ☐	N/C ☐	(1) Semi-annual report requirements; (see paragraphs 62-701.510(5)(c) and (d), FAC for sampling frequencies)
S ☑	Section 5	N/A ☐	N/C ☐	(2) Documentation that the water quality data shall be provided to the Department in an electronic format consistent with requirements for importing into Department databases, unless an alternate form of submittal is specified in the permit;
S ☑	Section 5	N/A ☐	N/C ☐	(3) Two and one-half year, or annual, report requirements, or every five years if in long-term care, signed dated, and sealed by P.G. or P.E.;

PART M. SPECIAL WASTE HANDLING REQUIREMENTS (62-701.520, FAC)

LOCATION				
S ☐		N/A ☑	N/C ☐	1. Describe procedures for managing motor vehicles; (62-701.520(1), FAC)
S ☐		N/A ☑	N/C ☐	2. Describe procedures for landfilling shredded waste; (62-701.520(2), FAC)
S ☐		N/A ☐	N/C ☑	3. Describe procedures for asbestos waste disposal; (62-701.520(3), FAC)
S ☐		N/A ☑	N/C ☐	4. Describe procedures for disposal or management of contaminated soil; (62-701.520(4), FAC)
S ☐		N/A ☑	N/C ☐	5. Describe procedures for disposal of biological wastes; (62-701.520(5), FAC)

PART N. **GAS MANAGEMENT SYSTEM REQUIREMENTS** (62-701.530, FAC)

LOCATION

S	LOCATION	N/A	N/C	Requirement
☑	Section 3	☐	☐	1. Provide documentation for a gas management system that will: (62-701.530(1), FAC)
☐		☐	☑	a. Be designed to prevent concentrations of combustible gases from exceeding 25% the LEL in structures and 100% the LEL at the property boundary;
☐		☐	☑	b. Be designed for site specific conditions;
☐		☐	☑	c. Be designed to reduce gas pressure in the interior of the landfill;
☐		☐	☑	d. Be designed to not interfere with the liner, leachate control system, or final cover;
☑	Section 3	☐	☐	2. Provide documentation that will describe locations, construction details, and procedures for monitoring gas at ambient monitoring points and with soil monitoring probes; (62-701.530(2), FAC)
☐		☐	☑	3. Provide documentation describing how the gas remediation plan and odor remediation plan will be implemented; (62-701.530(3), FAC)
☐		☑	☐	4. Landfill gas recovery facilities; (62-701.530(5), FAC)
☐		☑	☐	a. Provide information required in Rules 62-701.320(7) and 62-701.330(3), FAC;
☐		☑	☐	b. Provide information required in Rule 62-701.600(4), FAC, where relevant and practical;
☐		☑	☐	c. Provide estimates of current and expected gas generation rates and description of condensate disposal methods;
☐		☑	☐	d. Provide description of procedures for condensate sampling, analyzing, and data reporting;
☐		☑	☐	e. Provide closure plan describing methods to control gas after recovery facility ceases operation, and any other requirements contained in Rule 62-701.400(10), FAC;

PART O. **LANDFILL FINAL CLOSURE REQUIREMENTS** (62-701.600, FAC)

LOCATION			
S ☑	Section 7	N/A ☐ N/C ☐	1. Closure permit requirements; (62-701.600(2), FAC)
S ☑	Section 7	N/A ☐ N/C ☐	a. Application submitted to the Department at least 90 days prior to final receipt of wastes;
S ☑	Section 7	N/A ☐ N/C ☐	b. Closure plan shall include the following:
S ☑	Section 7	N/A ☐ N/C ☐	(1) Closure design plan;
S ☑	Section 7	N/A ☐ N/C ☐	(2) Closure operation plan;
S ☑	Section 7	N/A ☐ N/C ☐	(3) Plan for long-term care;
S ☑	Section 7, App. 7-A	N/A ☐ N/C ☐	(4) A demonstration that proof of financial assurance for long-term care will be provided;
S ☑	Section 4	N/A ☐ N/C ☐	2. Closure design plan including the following requirements: (62-701.600(3), FAC)
S ☑	Section 4	N/A ☐ N/C ☐	a. Plan sheet showing phases of site closing;
S ☑	Section 4	N/A ☐ N/C ☐	b. Drawings showing existing topography and proposed final grades;
S ☑	Section 4	N/A ☐ N/C ☐	c. Provisions to close units when they reach approved design dimensions;
S ☑	Section 4	N/A ☐ N/C ☐	d. Final elevations before settlement;
S ☑	Section 4	N/A ☐ N/C ☐	e. Side slope design including benches, terraces, down slope drainage ways, energy dissipaters, and description of expected precipitation effects;
S ☐		N/A ☐ N/C ☑	f. Final cover installation plans including:
S ☐		N/A ☐ N/C ☑	(1) CQA plan for installing and testing final cover;
S ☐		N/A ☐ N/C ☑	(2) Schedule for installing final cover after final receipt of waste;
S ☐		N/A ☐ N/C ☑	(3) Description of drought resistant species to be used in the vegetative cover;

LOCATION				PART O CONTINUED
S ☑	Section 4	N/A ☐	N/C ☐	(4) Top gradient design to maximize runoff and minimize erosion;
S ☐		N/A ☐	N/C ☑	(5) Provisions for cover material to be used for final cover maintenance;
S ☑	Section 4	N/A ☐	N/C ☐	g. Final cover design requirements;
S ☑	Section 4	N/A ☐	N/C ☐	(1) Protective soil layer design;
S ☑	Section 4	N/A ☐	N/C ☐	(2) Barrier soil layer design;
S ☑	Section 4	N/A ☐	N/C ☐	(3) Erosion control vegetation;
S ☐		N/A ☑	N/C ☐	(4) Geomembrane barrier layer design;
S ☐		N/A ☑	N/C ☐	(5) Geosynthetic clay liner design, if used;
S ☑	Section 2 Part I-2	N/A ☐	N/C ☐	(6) Stability analysis of the cover system and the disposed waste;
S ☑	Section 3, App 3-A	N/A ☐	N/C ☐	h. Proposed method of stormwater control;
S ☐		N/A ☐	N/C ☑	i. Proposed method of access control;
S ☐		N/A ☐	N/C ☑	j. Description of the proposed or existing gas management system which complies with Rule 62-701.530, FAC;
S ☐		N/A ☐	N/C ☑	3. Closure operation plan shall include: (62-701.600(4), FAC)
S ☐		N/A ☐	N/C ☑	a. Detailed description of actions which will be taken to close the landfill;
S ☐		N/A ☐	N/C ☑	b. Time schedule for completion of closing and long-term care;
S ☐		N/A ☐	N/C ☑	c. Describe proposed method for demonstrating financial assurance for long-term care;
S ☐		N/A ☐	N/C ☑	d. Operation of the water quality monitoring plan required in Rule 62-701.510, FAC;
S ☐		N/A ☐	N/C ☑	e. Development and implementation of gas management system required in Rule 62-701.530, FAC;

LOCATION **PART O CONTINUED**

S ☐ _____________ N/A ☐ N/C ☑ 4. Certification of closure construction completion and final reports including: (62-701.600(6), FAC)

S ☐ _____________ N/A ☐ N/C ☑ a. Survey monuments; (62-701.600(6)(a), FAC)

S ☐ _____________ N/A ☐ N/C ☑ b. Final survey report; (62-701.600(6)(b), FAC)

S ☐ _____________ N/A ☐ N/C ☑ c. Closure construction quality assurance report; (62-701.400(7), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 5. Declaration to the public; (62-701.600(7), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 6. Official date of closing; (62-701.600(8), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 7. Justification for and detailed description of procedures to be followed for temporary closure of the landfill, if desired; (62-701.600(9), FAC)

PART P. OTHER CLOSURE PROCEDURES (62-701.610, FAC)

LOCATION

S ☐ _____________ N/A ☐ N/C ☑ 1. Describe how the requirements for use of closed solid waste disposal areas will be achieved; (62-701.610(1), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 2. Describe how the requirements for relocation of wastes will be achieved; (62-701.610(2), FAC)

PART Q. LONG-TERM CARE (62-701.620, FAC)

LOCATION

S ☐ _____________ N/A ☐ N/C ☑ 1. Maintaining the gas collection and monitoring system; (62-701.620(5), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 2. Stabilization report requirements; (62-701.620(6), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 3. Right of access; (62-701.620(7), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 4. Requirements for replacement of monitoring devices; (62-701.620(8), FAC)

S ☐ _____________ N/A ☐ N/C ☑ 5. Completion of long-term care signed and sealed by professional engineer; (62-701.620(9), FAC)

PART R. FINANCIAL ASSURANCE (62-701.630, FAC)

LOCATION

S ☑ Section 7, App 7-A N/A ☐ N/C ☐ 1. Provide cost estimates for closing, long-term care, and corrective action costs estimated by a P.E. for a third party performing the work, on a per unit basis, with the source of estimates indicated; (62-701.630(3) & (7), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 2. Describe procedures for providing annual cost adjustments to the Department based on inflation and changes in the closing, long-term care, and corrective action plans; (62-701.630(4) & (8), FAC)

S ☐ ____________ N/A ☐ N/C ☑ 3. Describe funding mechanisms for providing proof of financial assurance and include appropriate financial assurance forms. (62-701.630(5), (6), & (9), FAC)

PART S. CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

1. Applicant:

The undersigned applicant or authorized representative of Angelos Aggregate Materials, LTD
______________________ is aware that statements made in this form and attached information are an application for a modification permit from the Florida Department of Environmental Protection, and certifies that the information in this application is true, correct, and complete to the best of his/her knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403, Florida Statutes, and all rules and regulations of the Department. It is understood that the Permit is not transferable, and the Department will be notified prior to the sale or legal transfer of the permitted facility.

Signature of Applicant or Agent	855 28th Street South Mailing Address
John Arnold, P.E., Director of Engineering & Facilities Name and Title (please type)	St. Petersburg, FL 33712 City, State, Zip Code
John.Phillip.Arnold@gmail.com E-Mail Address (if available)	(813) 477-1719 Telephone Number
	Date: 2/9/18

Attach letter of authorization if agent is not a government official, owner, or corporate officer.

2. Professional Engineer registered in Florida (or Public Officer if authorized under Sections 403.707 and 403.7075, Florida Statutes):

This is to certify that the engineering features of this solid waste management facility have been designed/examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, this facility, when properly maintained and operated, will comply with all applicable statutes of the State of Florida and rules of the Department. It is agreed that the undersigned will provide the applicant with a set of instructions of proper maintenance and operation of the facility.

Signature	4140 NW 37th Place, Suite A Mailing Address
Lisa Baker, P.E., Engineering Division Director Name and Title (please type)	Gainesville, FL 32606 City, State, Zip Code
	lisa@locklearconsulting.com E-Mail Address (if available)
74652 Florida Registration Number (please affix seal)	(352) 672-6867 Telephone Number
	Date: 2-9-18

LISA B. BAKER LICENSE No. 74652 STATE OF FLORIDA PROFESSIONAL ENGINEER

PERMIT APPLICATION
APPENDIX S-1

LETTER OF AUTHORIZATION

June 19, 2013

Dominic Iafrate, Vice President
Angelo's Aggregate Materials, LLC
855 28th Street South
St. Petersburg, FL 33712

RE: Angelo's Aggregate Materials, LLC (d/b/a Angelo's Recycled Materials)
Agent Authorization

To Whom It May Concern,

Mr. John Arnold, P.E. is authorized by Angelo's Aggregate Materials, LLC to act on its behalf for all matters related to our existing and contemplated facilities in the state of Florida. Such authorization includes permitting, construction, operations, closure activities, and dealings as may be necessary in the pursuit of Angelo's Aggregate Materials, LLC interests. This authorization shall remain in effect until rescinded in writing by an authorized agent of Angelo's Aggregate Materials, LLC.

Sincerely,

Dominic Iafrate, Vice President
Angelo's Aggregate Materials, LLC

Witness Signature:

Witness Name (printed): NEIRO DE RUBEIS

Date: 6/20/2013

July 25, 2014

Angelo's Aggregate Materials, LLC
John Arnold, P.E.
41111 Enterprise Road
Dade City, FL 33525

RE: Engineer of Record Authorization

To Whom It May Concern,

Locklear and Associates, Inc. is authorized to act as the engineer of record on behalf of Angelo's Aggregate Materials, LLC for solid waste facilities located at 41111 Enterprise Road, Dade City, FL 33525. This authorization shall remain in effect until rescinded in writing by an authorized agent of Angelo's Aggregate Materials, LLC.

Sincerely,

John Arnold, P.E.
Manager
Angelo's Aggregate Materials, LLC

Witness Signature:

Witness Name (printed): John Lockler

Date: 7/25/14

SECTION 2

FDEP FORM 62-701.900(1)
CHECKLIST SUPPORT

FDEP FORM 62-701.900(1) CHECKLIST SUPPORT

PART D
SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL
APPENDIX D-2

NOTICE OF APPLICATION
TO BE ADVERTISED
FOLLOWING APPLICATION SUBMITTAL

State of Florida
Department of Environmental Protection
Notice of Application

The Department announces receipt of applications for construction and operation permit modifications from Angelo's Aggregate Materials, Ltd. for vertical and lateral expansion of a Class III landfill, subject to Department rules, at the Enterprise Class III Recycling and Disposal Facility, located at 41111 Enterprise Road, Dade City, Pasco County, Florida.

This application is being processed and is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the Department of Environmental Protection, Southwest District Office, 13051 North Telecom Parkway, Suite 101 Temple Terrace, Florida 33637-0926.

FDEP FORM 62-701.900(1) CHECKLIST SUPPORT

PART G
LANDFILL CONSTRUCTION REQUIREMENTS
APPENDIX G-1

LINER SYSTEM REQUIREMENTS EVALUATION

ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY LINER SYSTEM REQUIREMENTS STUDY REPORT

Prepared for:

ANGELO'S AGGREGATE MATERIALS, LTD.
855 28th Street South
St. Petersburg, Florida 33712

Presented to:

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHWEST DISTRICT – SOLID WASTE DIVISION
13051 N. Telecom Parkway
Temple Terrace, Florida 33637

Prepared by:

LOCKLEAR AND ASSOCIATES, INC.
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Certificate of Authorization #30066

Project No.: 02000-217-17

~~NOVEMBER 2017~~ ~~SEPTEMBER 2017~~
FEBRUARY 2018

2/9/18

John D. Locklear, P.G.
Florida License Number 2467

TABLE OF CONTENTS

1.0 INTRODUCTION

Angelo's Aggregate Materials, Ltd. (Applicant) operates the Enterprise Road Class III Landfill in accordance with Florida Department of Environmental Protection (FDEP) operation permit 177982-024-SO/T3 and construction permit 177982-023-SC/T3. The Applicant desires to expand the disposal footprint laterally to the north of the existing disposal cells and is seeking a determination from FDEP regarding specific construction requirements. The currently proposed lateral expansion will be limited to Cell 17 as shown in Figure 1.

Rule 62-701.400(3)(g) of the Florida Administrative Code (F.A.C.) reads as follows:

> *A Class III landfill shall be constructed with a bottom liner consisting of a single 60-mil minimum average thickness HDPE geomembrane. In the sumps located inside the landfill footprint and in the leachate collection trenches, the geomembrane shall be placed on a GCL with a hydraulic conductivity of less than or equal to 1 x 10^{-7} cm/sec, or on a compacted clay liner which is a minimum six inches thick with a saturated hydraulic conductivity of less than or equal to 1 x 10^{-7} cm/sec. The liner shall be placed on a prepared subgrade that will not damage the geomembrane liner or the GCL. A primary leachate collection and removal system and a drainage layer shall be installed above the geomembrane liner. Except in sumps and leachate collection trenches, the system shall be designed to limit leachate head above the liner during routine landfill operation after placement of initial cover to no greater than 12 inches. An applicant may request exemption from the requirements of this paragraph in accordance with paragraph 62-701.340(2)(b), F.A.C.*

Rule 62-701.340(2)(b), F.A.C. reads as follows:

> *Class III landfills are those which receive only Class III waste. The Department shall exempt Class III landfills from some or all of the requirements for liners, leachate controls, and water quality monitoring in subsections 62-701.400(3) and (4), and Rule 62-701.510, F.A.C., if the applicant demonstrates that no significant threat to the environment will result from the exemption based upon the types of waste received, methods for controlling types of waste disposed of, and the results of the hydrogeological and geotechnical investigations required in Rule 62-701.410, F.A.C. Such a demonstration must include a CCA treated wood management plan as described in subsection 62-701.730(20), F.A.C., if the landfill will not have a constructed liner system.*

The applicant is seeking a partial exemption from the bottom liner and leachate collection requirements of Rule 62- 701.400(3)(g), F.A.C. as allowed by Rule 62-701.340(2)(b), F.A.C. for the proposed lateral expansion referred to as Cell 17. Specifically, in lieu of the single HDPE geomembrane and leachate collection system, the applicant proposes to construct a compacted clay layer with a minimum thickness of three feet and a saturated hydraulic conductivity of less than or equal to 1 x 10^{-8} cm/sec (note that this is the average value of the existing clay layer which ranges from 1 x 10^{-7} cm/sec to 1 x 10^{-9} cm/sec). Leachate that reaches the clay layer will be conveyed to Pond 3, which is an industrial wastewater pond permitted with the FDEP.

The requested partial exemption is consistent with the existing approved and constructed system at the facility. Therefore, it is contingent upon the applicant to demonstrate the in-place infrastructure and operating procedures have not resulted in environmental impacts and, as such, extending the same infrastructure and operating procedures to the proposed Cell 17 expansion would not be expected to be a significant threat to the environment.

The information provided herein will demonstrate that no significant threat to the environment will result from the partial exemption based on: the types of waste received; methods for controlling types of waste disposed; the results of hydrogeological and geotechnical investigations.

2.0 CELL 17 DESIGN CONCEPT

The conceptual ~~closure~~ design for Cell 17 (referred to as Cells 13 & 14 in previous submittals) is shown in the 2018 Plan Set ~~Appendix A of the March 2016 Major Permit Modification Application~~. The cell will be constructed with a compacted clay layer with a minimum thickness of three feet and a saturated hydraulic conductivity of less than or equal to 1 x 10^{-8} cm/sec, consistent with the existing cells. The clay layer will tie into the existing clay layer on the northern boundary of Cells 5, 6B and 7, and slope to the north and northeast towards Pond 3.

Any leachate that may be produced at the landfill will be controlled with the use of a continuous 3-foot thick clay layer (1x10-8 cm/s) that will be placed on the bottom of the cells. The clay layer beneath each individual cell will form a continuous barrier layer that will be graded to direct leachate to the remaining portion of the temporary stormwater pond in proposed Cell 17 (formerly Cell 14) during construction of Cell 16 and/or a toe drain extending east to west along the northern perimeter of Cells 16 and 17. The toe drain will slope from west to east and terminate in a manhole between Cell 16 and Pond 3. The toe drain will "daylight" approximately 3 feet above the bottom of the manhole. A dedicated pump with float control system will be used to transfer leachate from the manhole to Pond 3. During Cell 16 construction, leachate will continue to flow along the continuous bottom barrier layer towards the northern landfill boundary, and into the existing stormwater pond in proposed Cell 17 (formerly Cell 14). During excavation of permitted Cell 16, a temporary stormwater and leachate diversion swale shall be constructed along the southern perimeter of Cell 16 to divert leachate generated in Cells 1-7 and 15 to flow west to the temporary stormwater pond. During excavation of proposed Cell 17, a temporary stormwater and leachate diversion swale shall be constructed along the southern perimeter of Cell 17 to divert leachate generated in Cell 17 to flow towards the Cell 16 toe drain.

Under no circumstances will waste be placed in water. In the event that water is present above the clay barrier layer at the time waste is to be placed, the operator will utilize pumps to remove the water to Pond 3. Once Cell 16 and any future Cells that would connect to the leachate collection system have been filled to their final design grades and closed, the pumping of leachate into Pond 3 will be vacated shall continue until leachate is not generated in volumes to be collected in the sump.

The controlled method of screening waste also supplements the leachate control. Because the

Applicant privately owns the Enterprise Class III Landfill facility, most of the haulers, waste generators, and sources of waste are known to Angelo's and the scale house attendants. For those haulers that are unfamiliar to the Applicant, the scale house attendants question the haulers more intensely to determine the contents of their loads. The spotters and operators add additional monitoring at the active disposal location. The addition of video surveillance to the monitoring process of incoming wastes helps to identify fires or smoking loads. Combined methods of screening waste is an effective method to reduce any possible threat to public health or the environment.

3.0 TYPES OF WASTE RECEIVED

Class III waste is defined by Section 62-701.200 (14), F.A.C. as "yard trash, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, furniture other than appliances, or other materials approved by the Department, that are not expected to produce leachate that poses a threat to public health or the environment."

4.0 METHODS FOR CONTROLLING TYPES OF WASTE DISPOSED

The facility is operated in accordance with the Operations Plan which is incorporated by reference in operations permit 177982-024-SO/T3. The following items summarize the key components of the operations plan which directly address controlling the types of waste disposed at the facility:

- The site is protected from unauthorized disposal by a fence and a locked gate during non-operating hours; a trained operator is on site and trained spotters are at the working face whenever waste is being accepted;
- All waste is inspected prior to placement for final disposal;
- All customers must enter through the scalehouse and are questioned about the type of waste to be disposed;
- Any customer having unauthorized waste is refused entry to the facility;
- Signs are posted notifying customers that hazardous and household wastes are not accepted at the facility;
- Unauthorized waste detected by a spotter is removed from the waste stream and placed in a separate container for transport to an authorized facility;
- No other loads are tipped in the vicinity of detected non-Class III waste until the authorized waste has been removed;
- CCA-treated wood is not accepted for disposal and is removed from the waste stream and stored in a container until it can be transported to a lined disposal facility.

5.0 GEOTECHNICAL INVESTIGATION

A geotechnical site investigation as required by Section 62-701.410(3), F.A.C. was performed for the entire facility by Universal Engineering Sciences, Inc. (UES) in 1999 and 2000 (report dated May 5, 2000). An update to the site geotechnical investigation was performed by UES in

2005 (report dated January 25, 2006). Substantial geotechnical data has been collected across the site including in the proposed Cell 17 lateral expansion area. UES has prepared a third update to the original geotechnical investigation report which focuses on the proposed Cell 17 footprint. A copy of the UES report is provided in Attachment 1.

6.0 HYDROGEOLOGIC EVALUATION

An extensive hydrogeologic evaluation was conducted as part of the Cell 16 horizontal expansion in 2016/2017. Conclusions and recommendations made in the Cell 16 report are directly applicable to Cell 17.

7.0 CONCLUSIONS AND RECOMMENDATIONS

<u>Conclusions</u>

We offer the following conclusions based upon our review of the information as discussed herein:

- The types of waste received, as defined by the Department, are not expected to produce leachate that poses a threat to public health or the environment.
- The applicant has implemented methods as required by Chapter 62-701, F.A.C. to control the types of waste disposed at the facility.
- Collectively, the SPT borings show dense to very dense sediments and indicate no significant signs of active sinkholes, such as raveling soils, voids, and large areas of soft soils.
- No other subsidence features have been observed at the facility despite the removal of substantial clay overburden as part of mining operations.
- Groundwater quality for samples collected from the site monitoring network between July 2003 and June 2017 has shown only minor exceedances of secondary drinking water standards, with the exception of low levels of Mercury in a single well which have decreased well below the primary drinking water standard.
- There are no potential downgradient receptors within ½ mile of the facility based on potable well surveys. The elevated secondary parameters do not represent a significant environmental impact.
- The groundwater quality data, including a lack of elevated leachate indicator parameters, demonstrates that the current clay layer and facility operational procedures have resulted in minimal groundwater impacts in 15 years.
- The proposed clay layer, combined with the existing subgrade geology, provide reasonable assurances that the system will not result in a significant threat to the environment.

<u>Recommendations</u>

Based on the data reviewed herein, we offer the following recommendations regarding Cell 17:

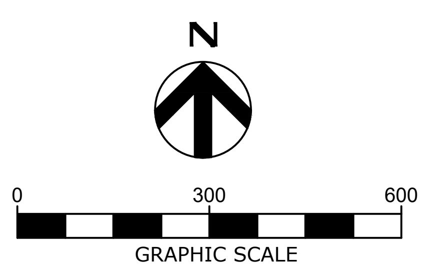
- Cell 17 should be designed with a compacted clay layer with a minimum thickness of three feet and a saturated hydraulic conductivity of less than or equal to 1 x 10^{-8} cm/sec.
- The clay layer should tie into the existing clay layer beneath Cells 5, 6B and 7 and slope to the north and northeast towards Pond 3.

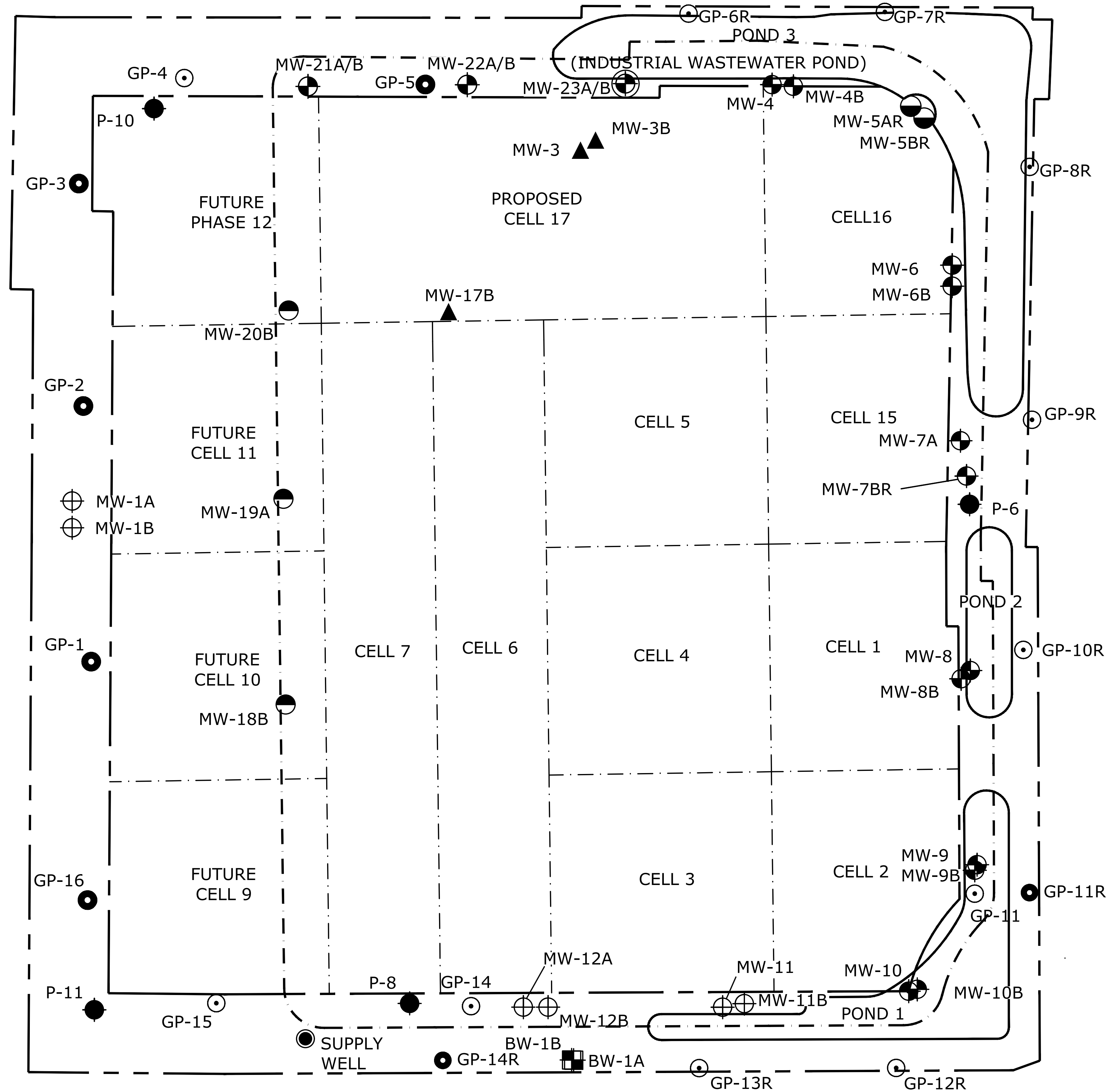
FIGURE 1

SITE MONITORING NETWORK

LEGEND

	BW-1B	BACKGROUND MONITORING WELL LOCATION
	MW-7A	DETECTION MONITORING WELL LOCATION
	MW-21A	PROPOSED DETECTION MONITORING WELL LOCATION
		SUPPLY WELL LOCATION
	P-11	SOLID WASTE PIEZOMETER WELL LOCATION
	MW-5AR	SCHEDULED COMPLIANCE MONITORING WELL LOCATION
	MW-12A	WATER LEVEL ONLY WELL LOCATION
	MW-3	PROPOSED TO BE ABANDONED
	MW-5B	SCHEDULED TO BE ABANDONED
	MW-19A	COMPLIANCE MONITORING WELL LOCATION
	MW-23B	PROPOSED COMPLIANCE MONITORING WELL LOCATION
	GP–1	GAS PROBE LOCATION
	GP–8R	FUTURE GAS PROBE LOCATION
		PROPERTY BOUNDARY
		LANDFILL LIMITS
		CELL BOUNDARY
		ZONE OF DISCHARGE





NO.	DATE	REVISION DESCRIPTION	BY

Locklear & Associates

4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:

ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY DADE CITY, FLORIDA

LISA J. BAKER

FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	LJB
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

SITE MONITORING NETWORK

PROJECT NO.: 02000-144-14
SCALE: AS SHOWN
DATE: JANUARY 2018
DRAWING: **FIGURE 1**

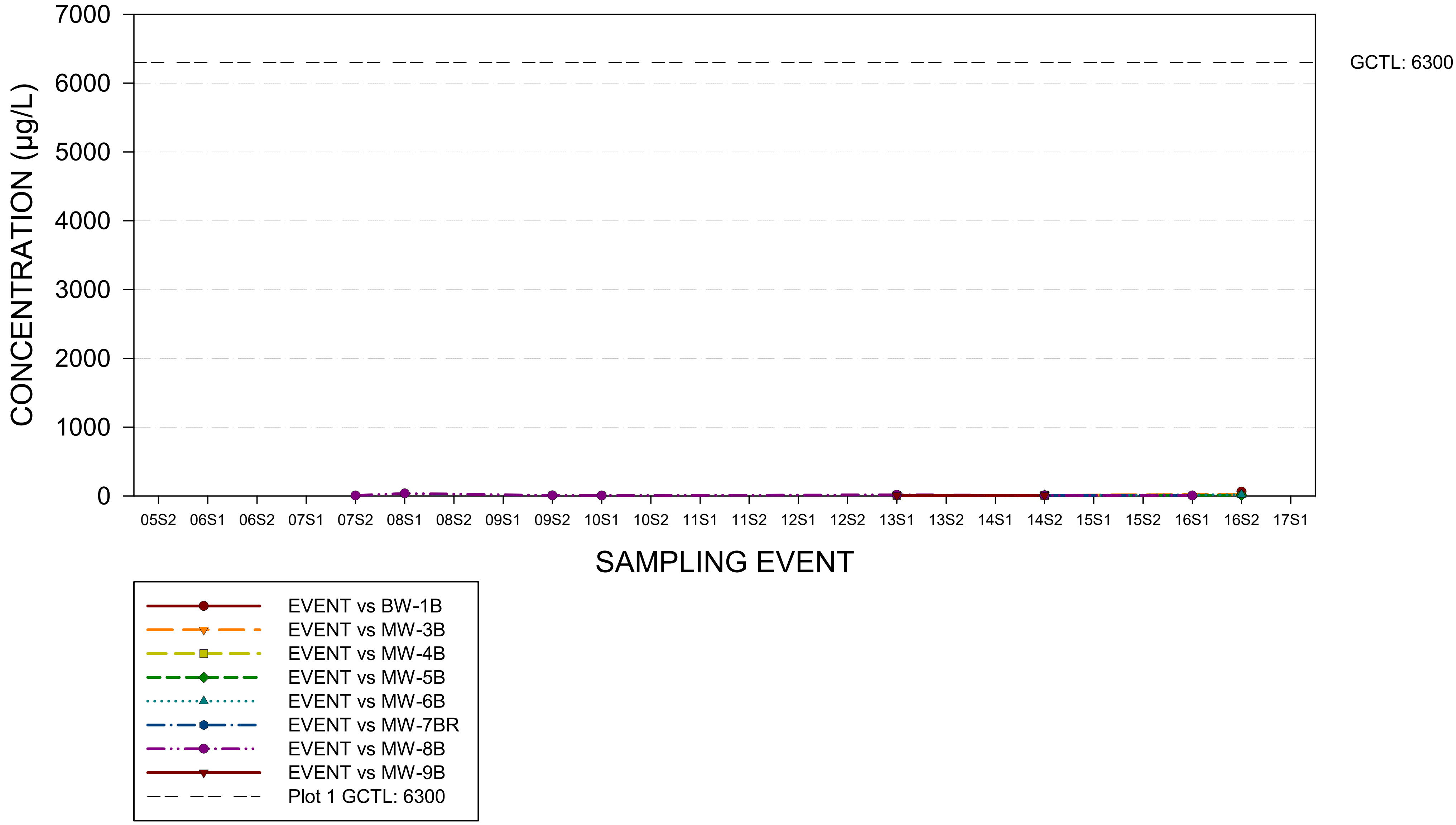
P:\P Drive Files\ANGELOS (FLORIDA)\Enterprise Class III\COMPLIANCE MONITORING\Permit Renewal\2017 Major Permit Mod Cell 17\RAI 1\Section 5 - Groundwater Monitoring Plan\Monitoring Network.dwg PLOT DATE 1/12/2018 2:17 PM BY LJB

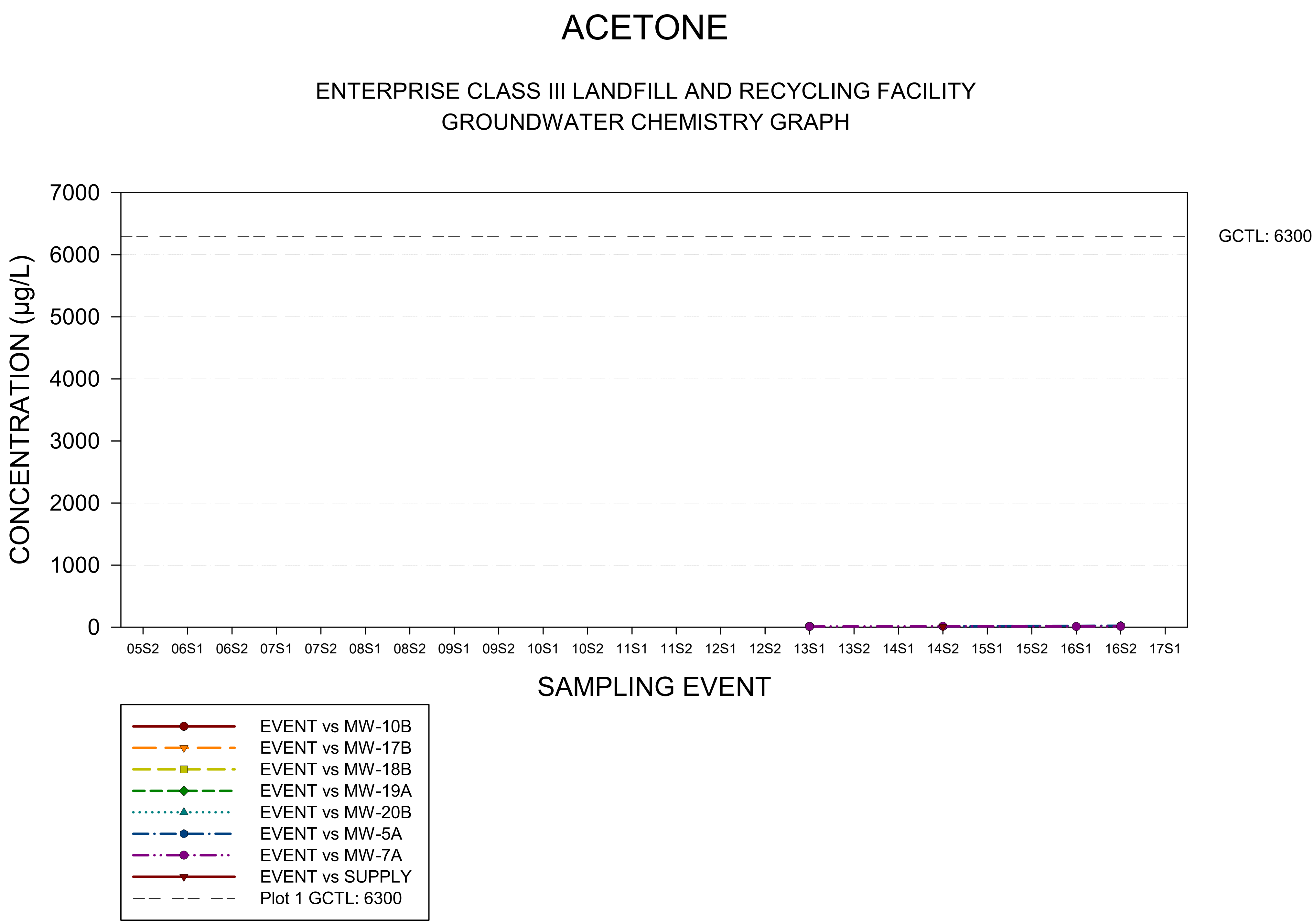
ATTACHMENT

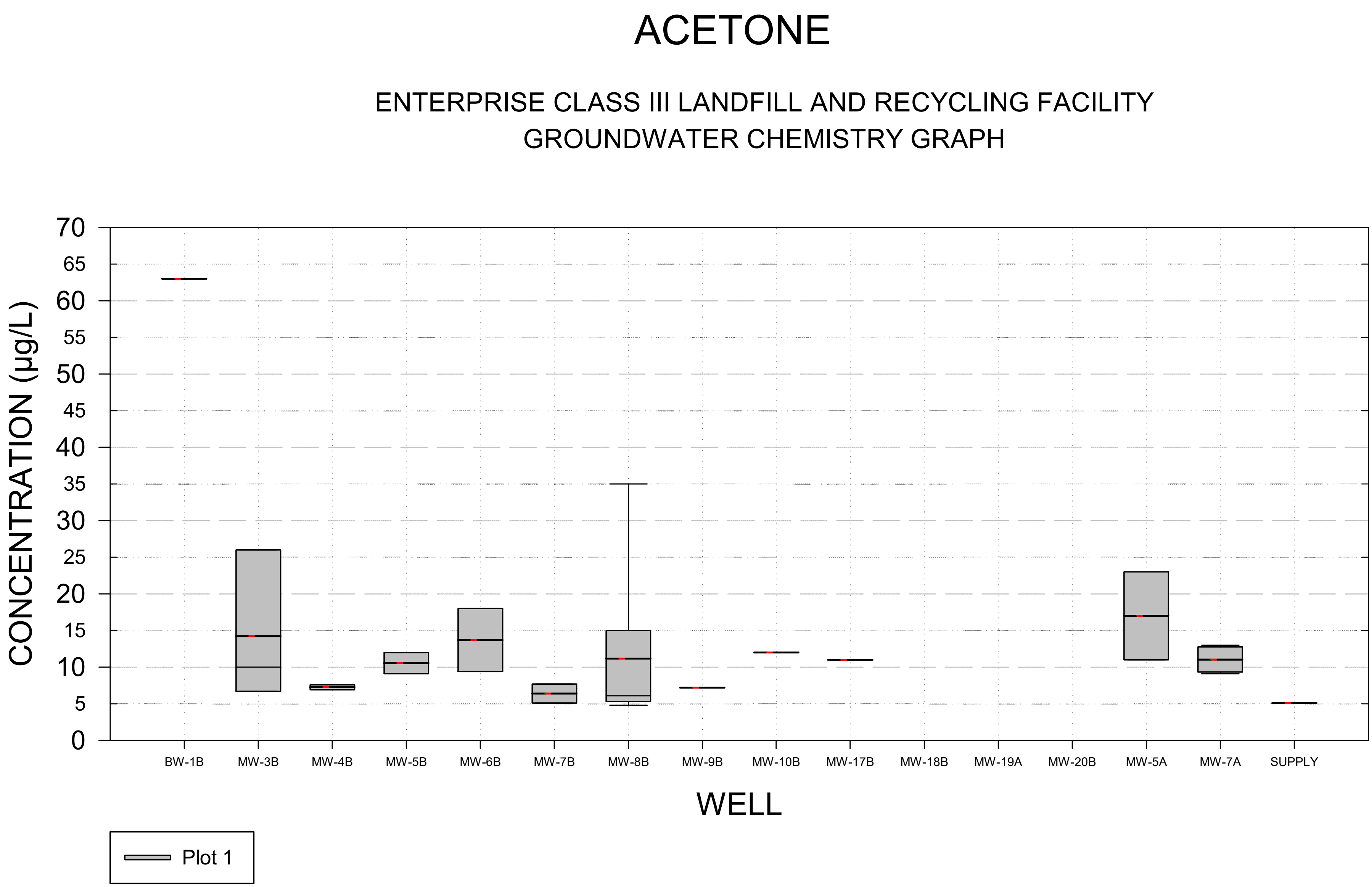
GROUNDWATER QUALITY GRAPHS

ACETONE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

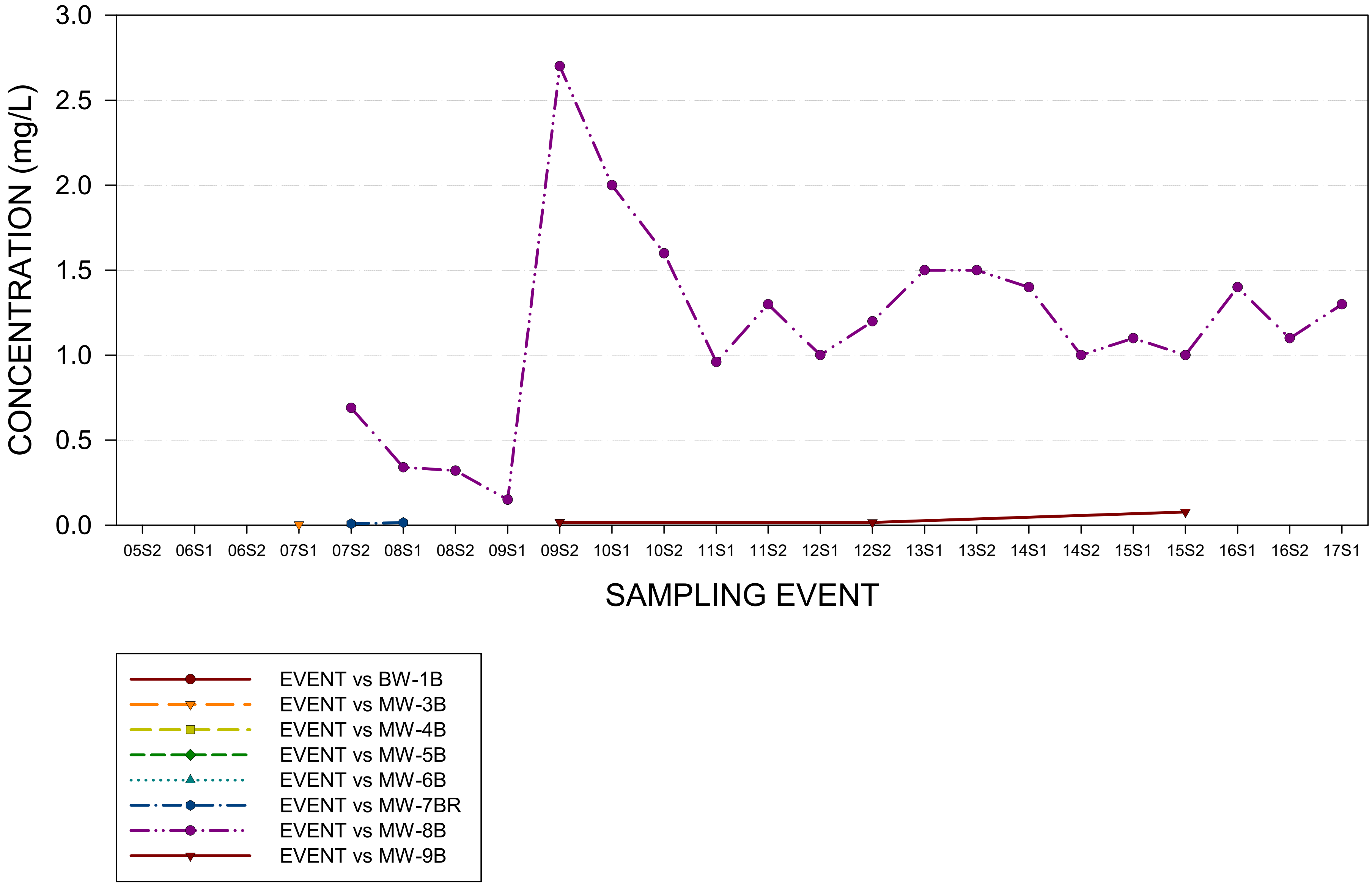



ACETONE
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
0
1000
2000
3000
4000
5000
6000
7000
GCTL: 6300
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 GCTL: 6300


ACETONE
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1

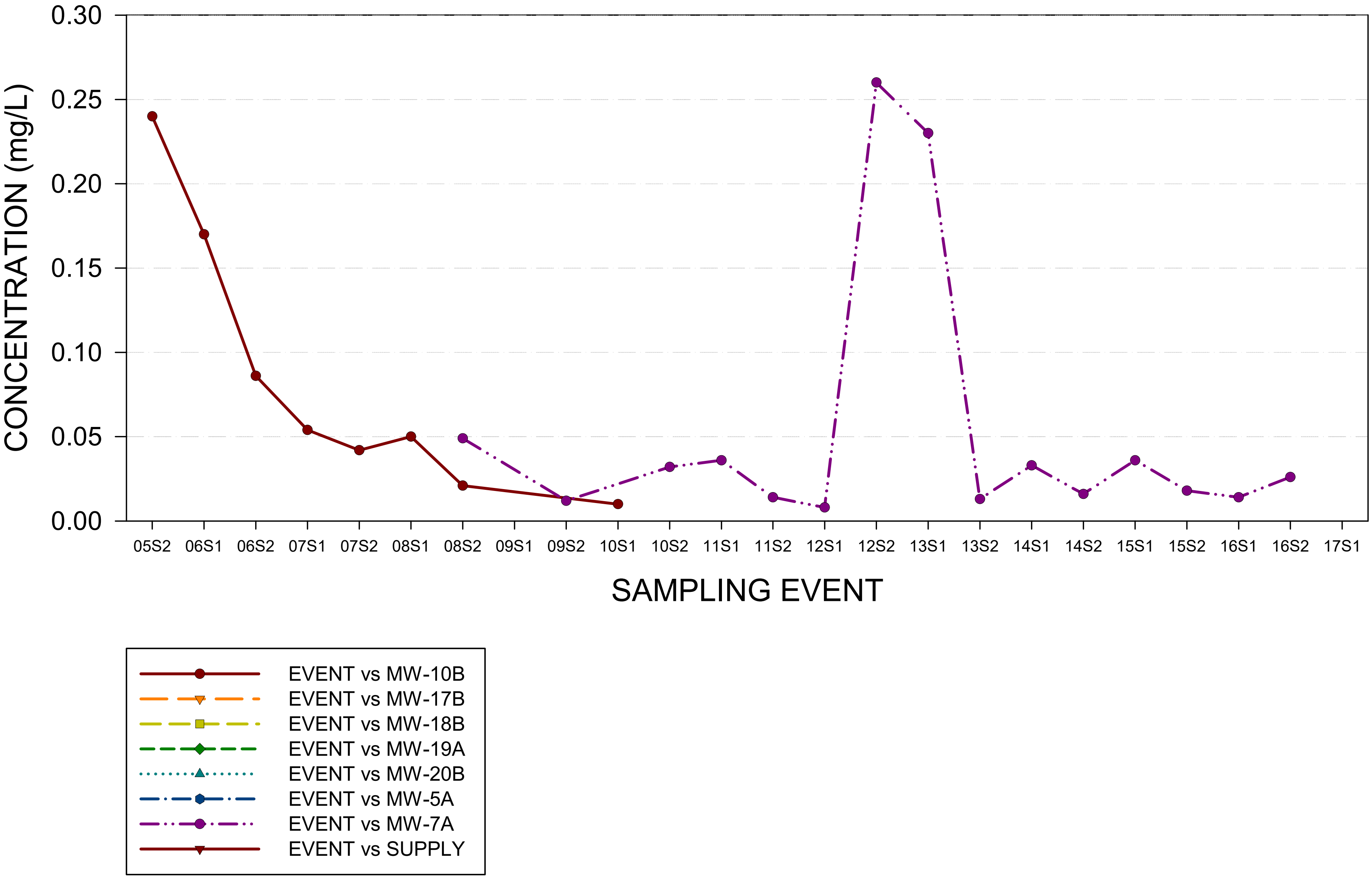
AMMONIA AS NITROGEN

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



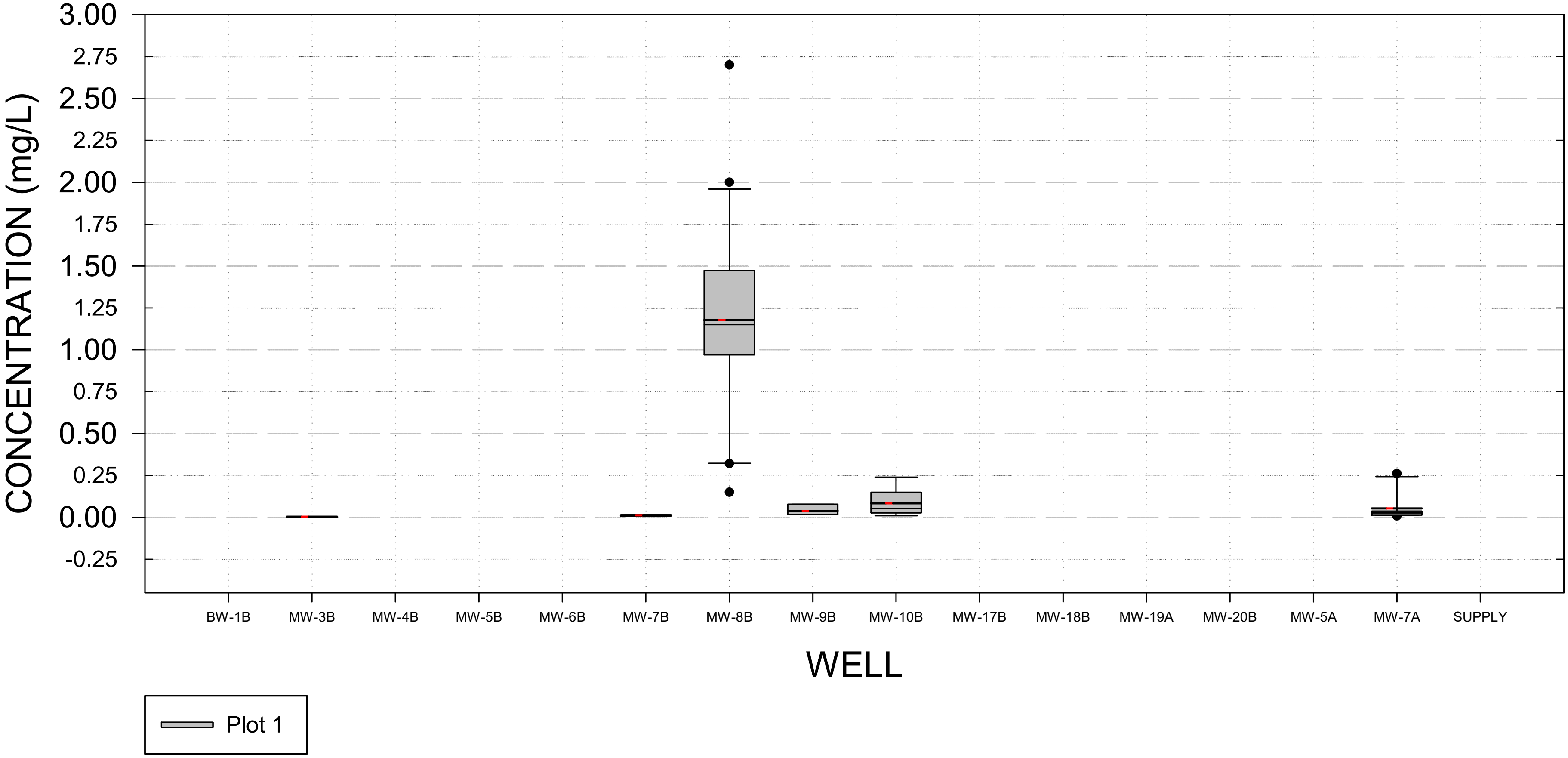
AMMONIA AS NITROGEN

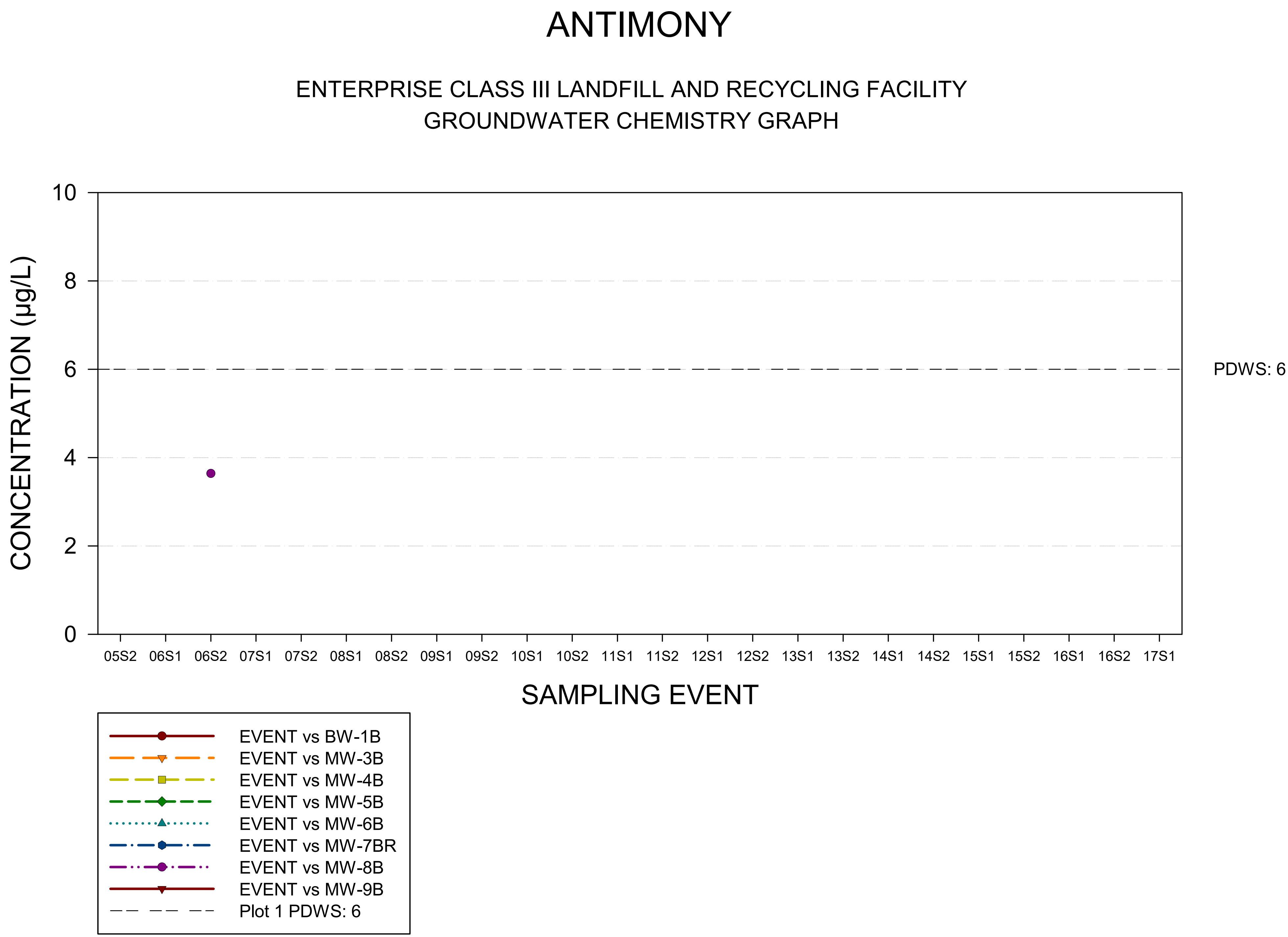
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

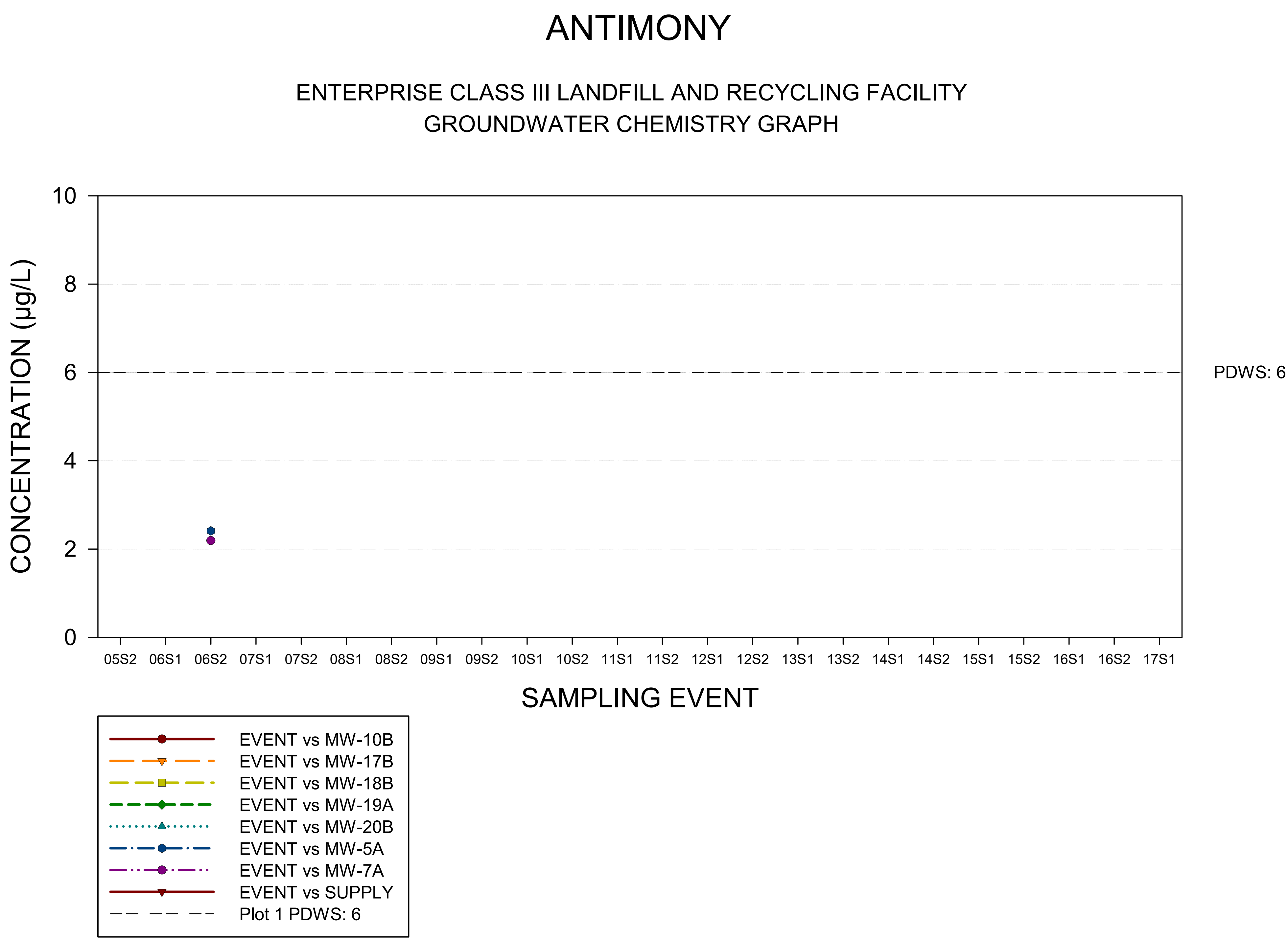


AMMONIA AS NITROGEN

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

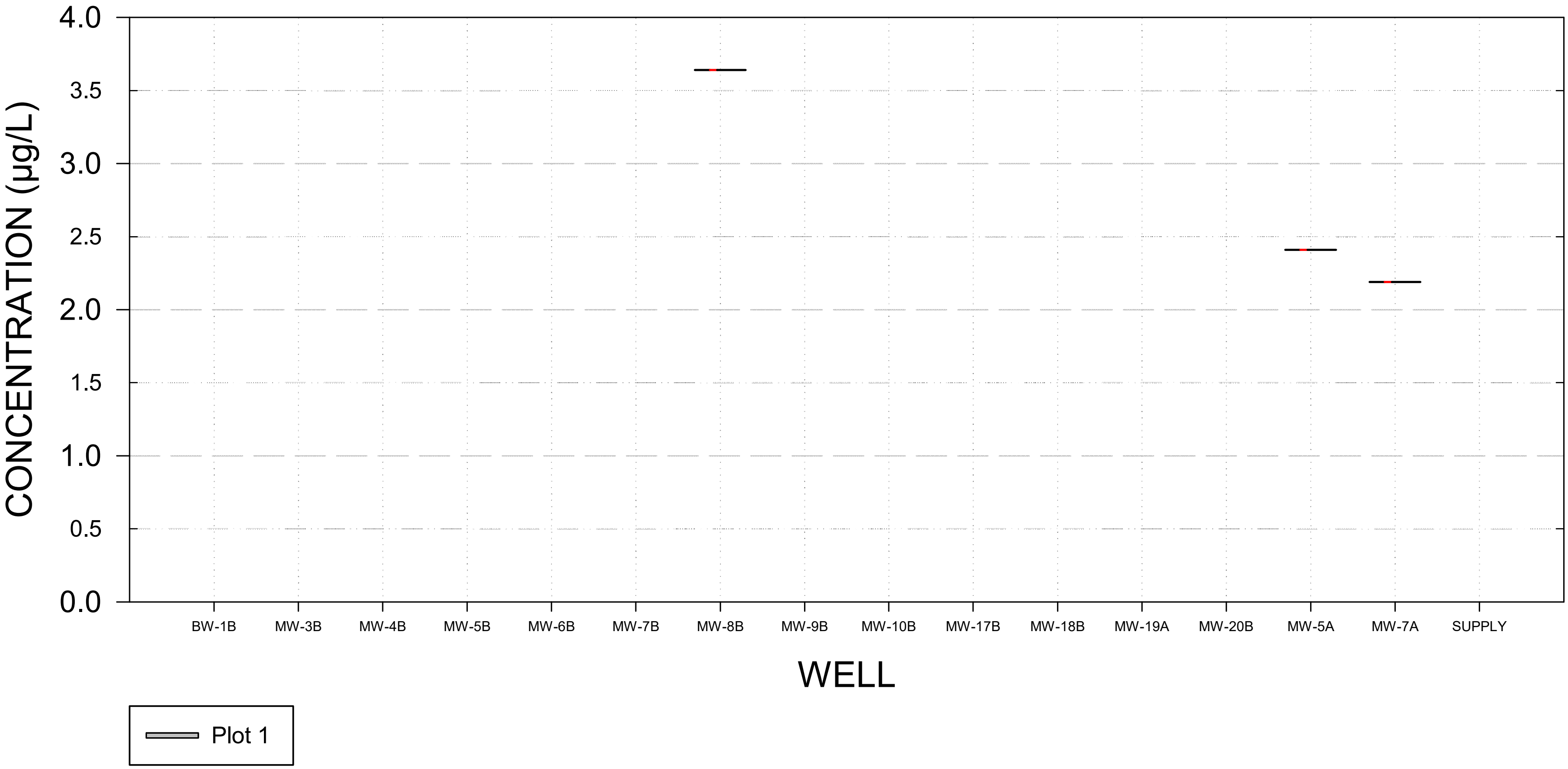


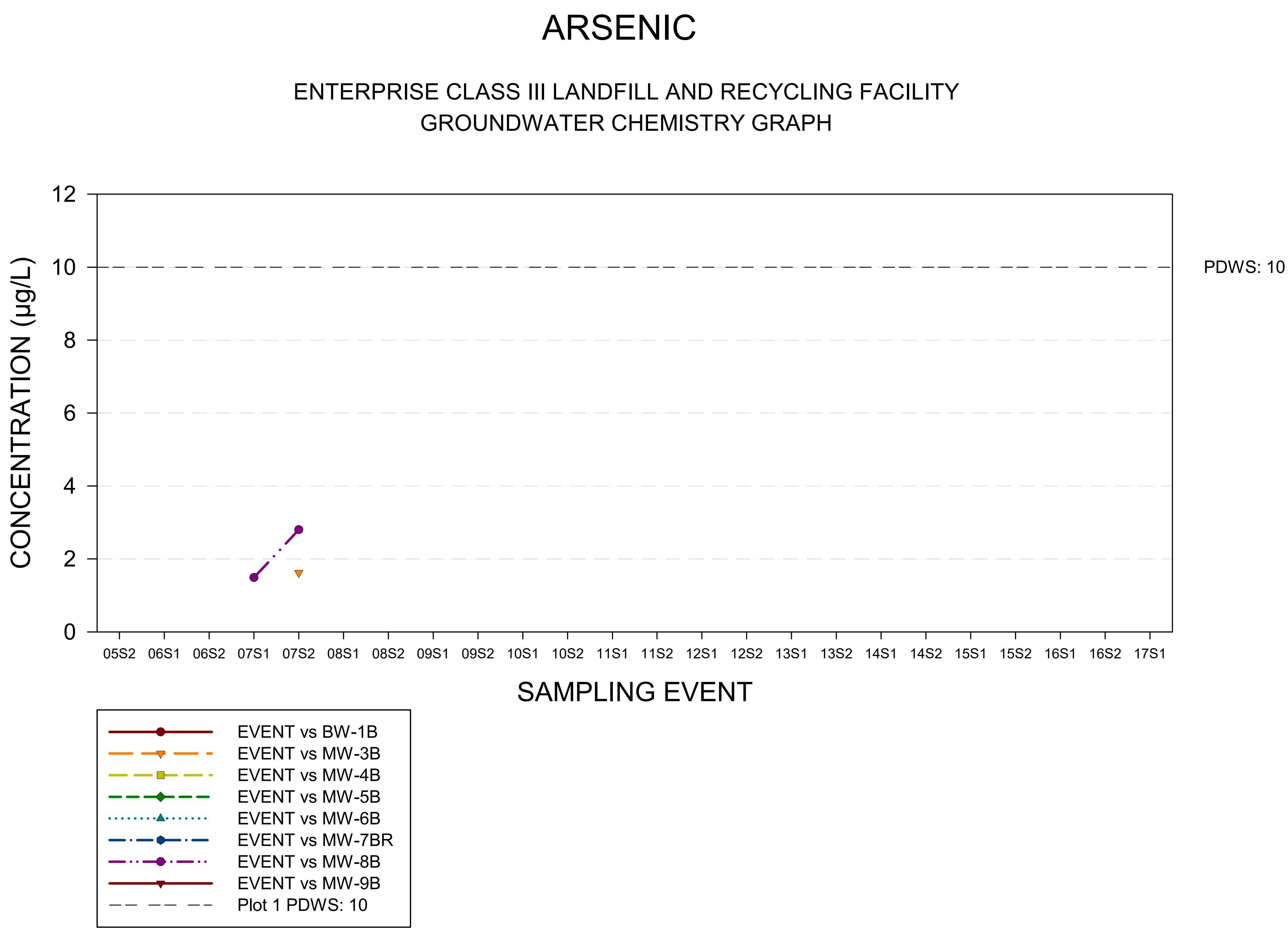

ANTIMONY
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
10
8
6
4
2
0
PDWS: 6
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 PDWS: 6


ANTIMONY
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
0
2
4
6
8
10
PDWS: 6
05S2 06S1 06S2 07S1 07S2 08S1 08S2 09S1 09S2 10S1 10S2 11S1 11S2 12S1 12S2 13S1 13S2 14S1 14S2 15S1 15S2 16S1 16S2 17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 PDWS: 6

ANTIMONY

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

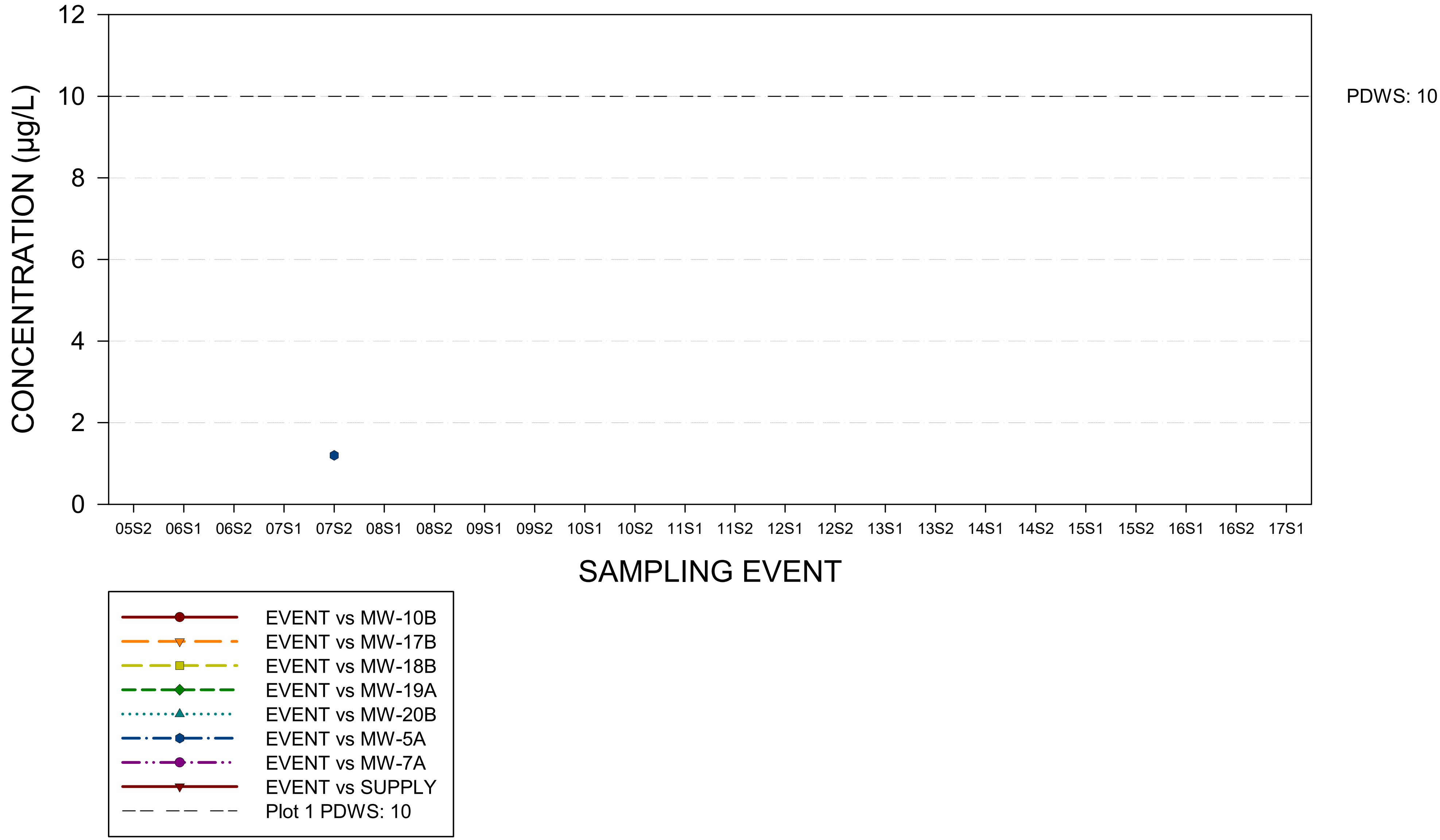




ARSENIC
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
0
2
4
6
8
10
12
PDWS: 10
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 PDWS: 10

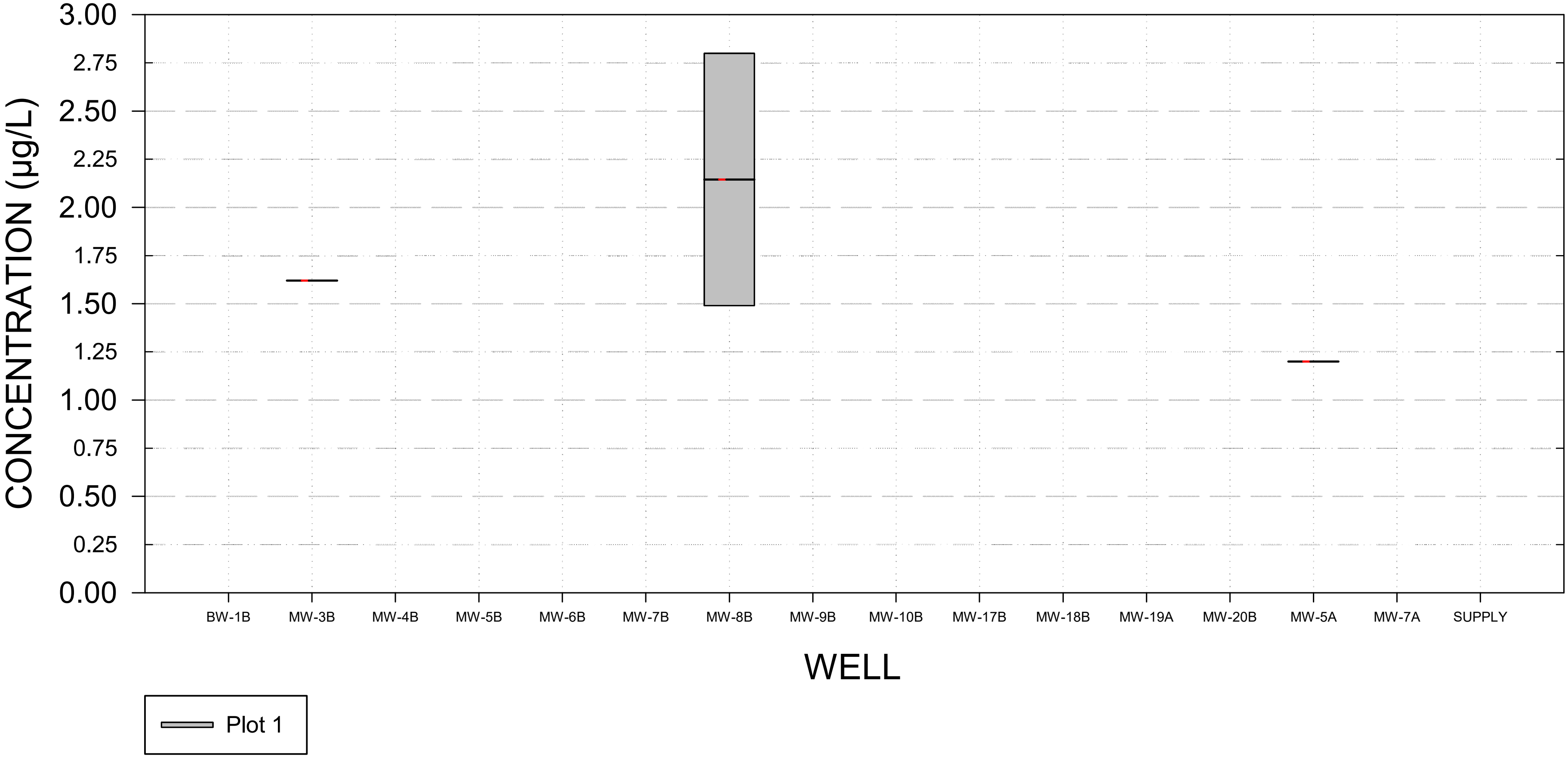
ARSENIC

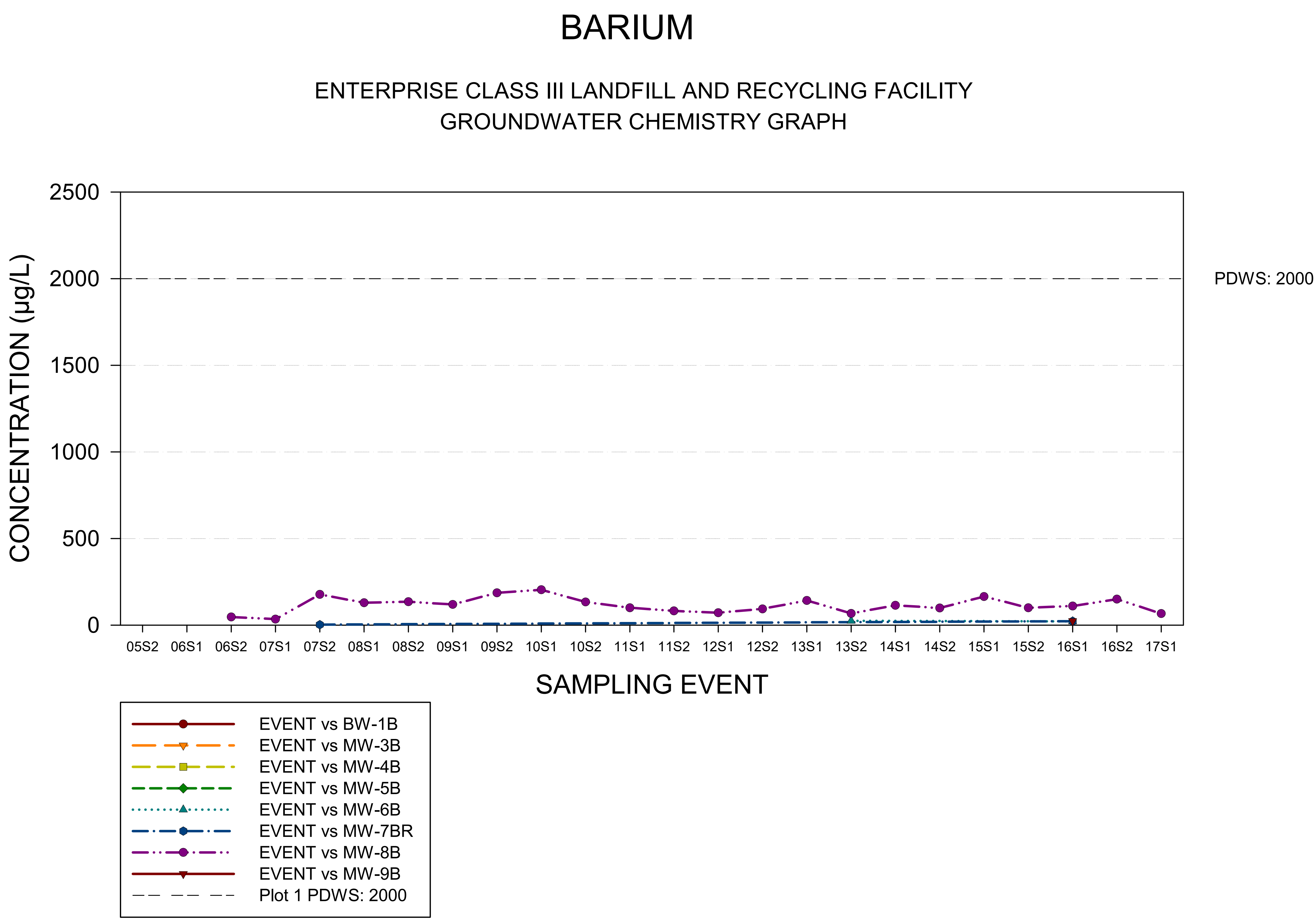
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



ARSENIC

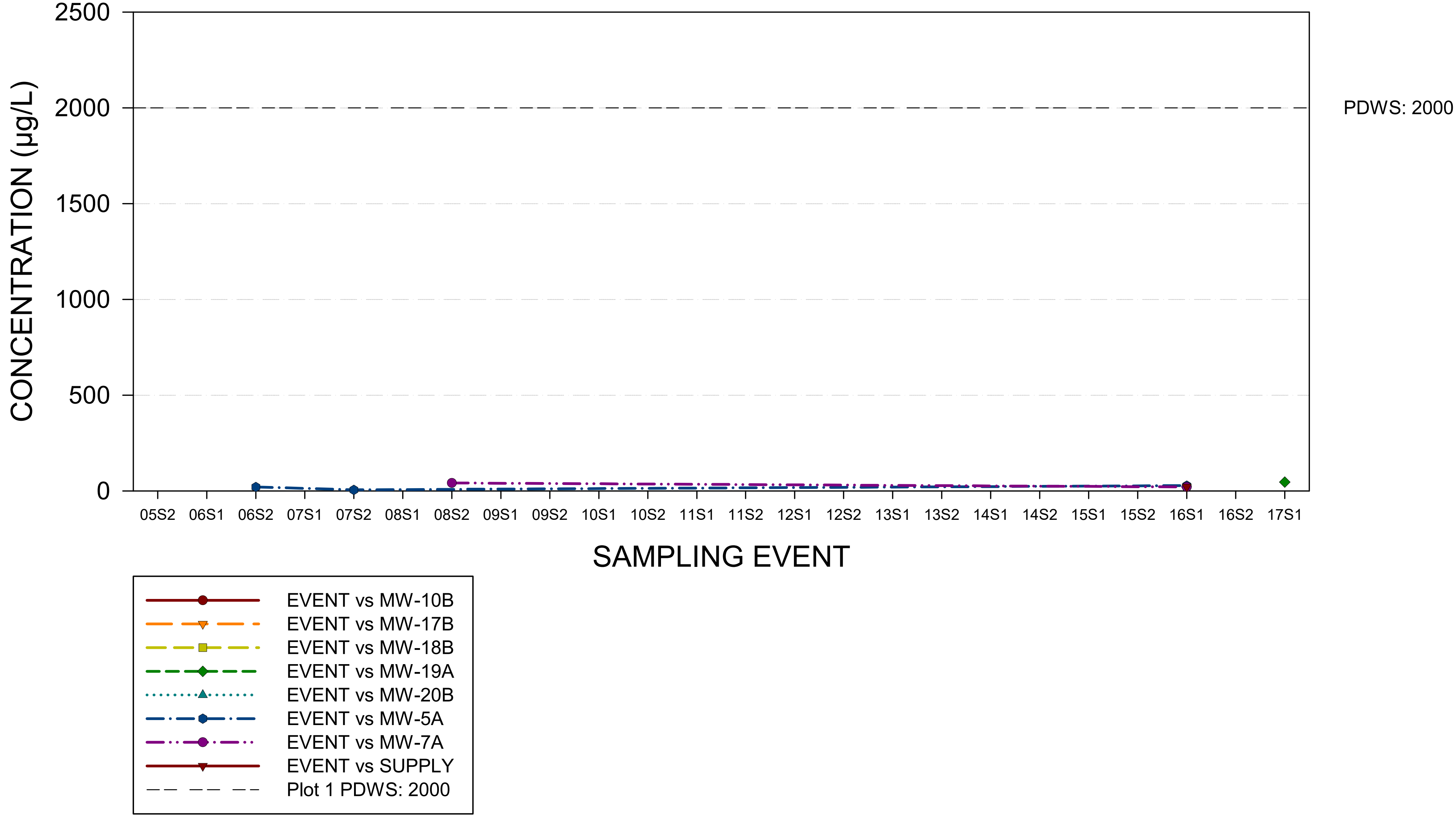
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH




BARIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
2500
2000
1500
1000
500
0
PDWS: 2000
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 PDWS: 2000

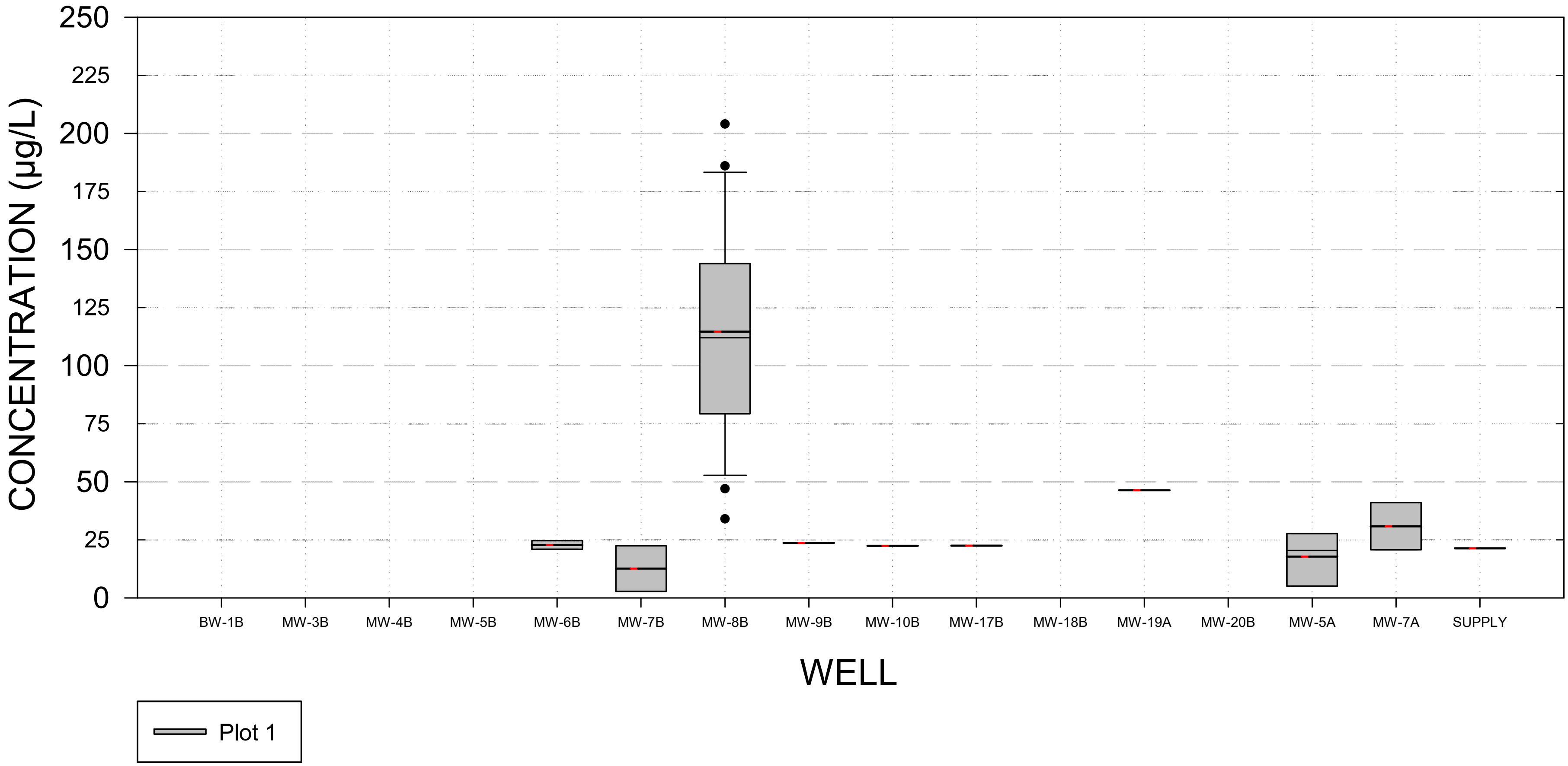
BARIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



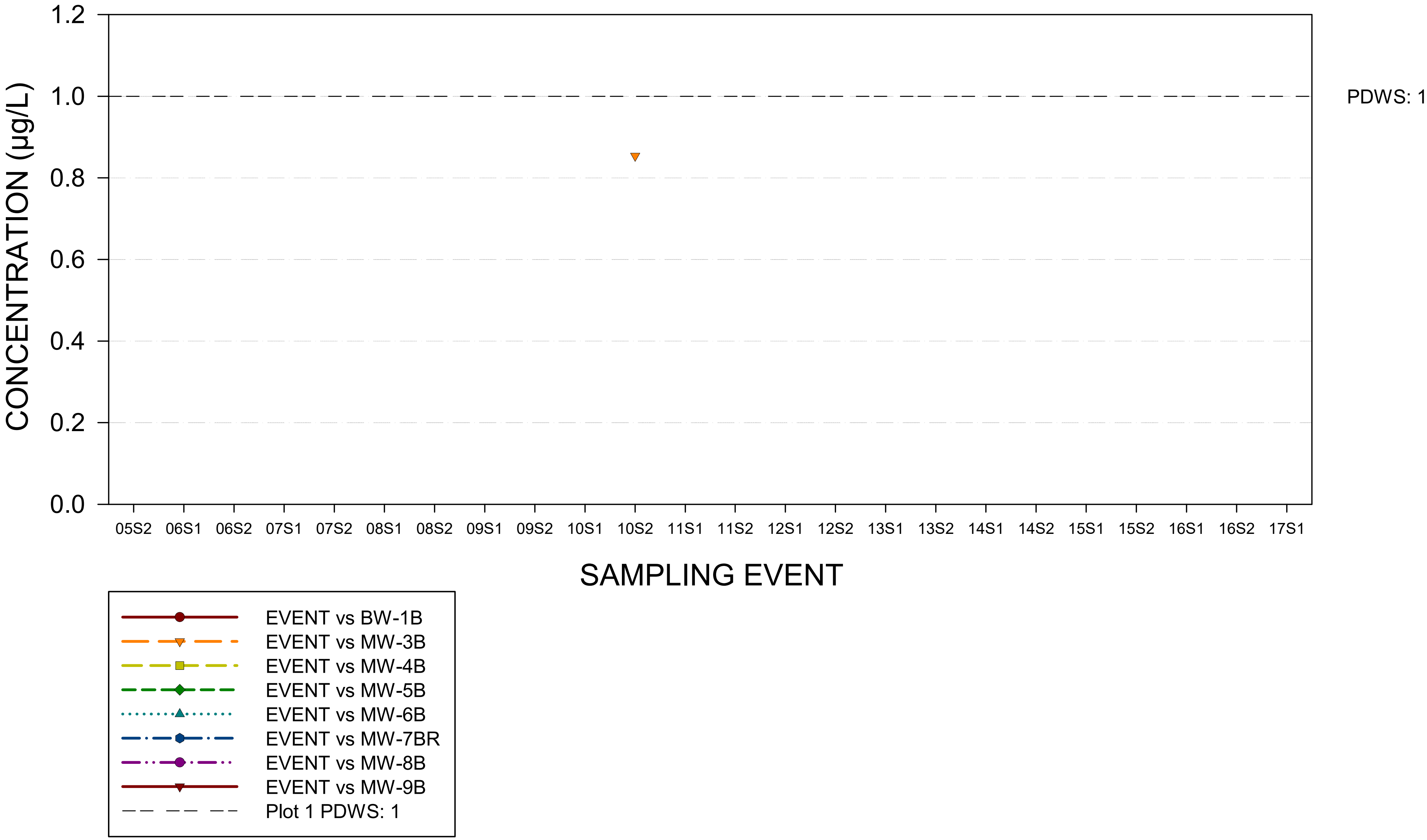
BARIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



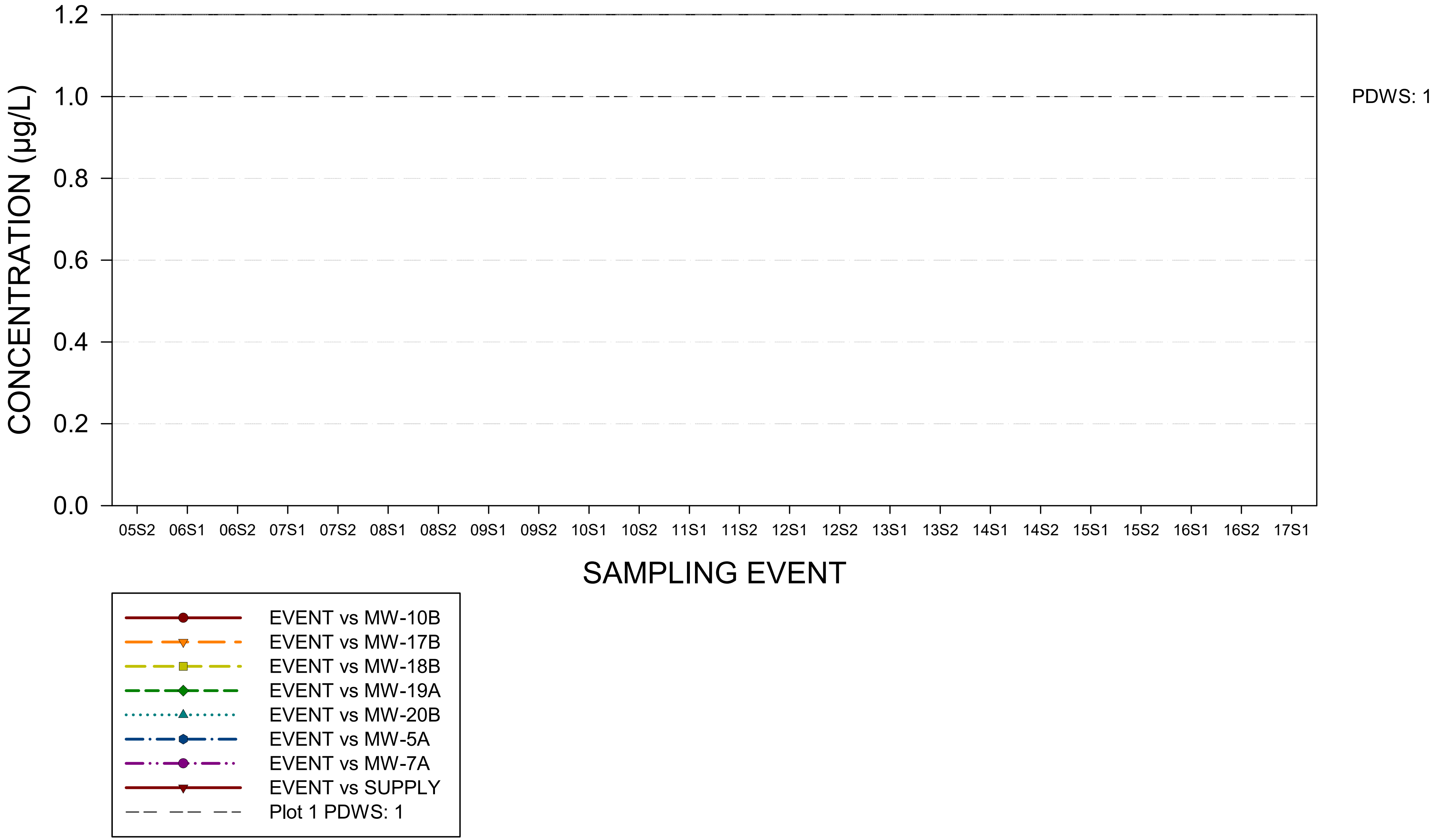
BERYLLIUM

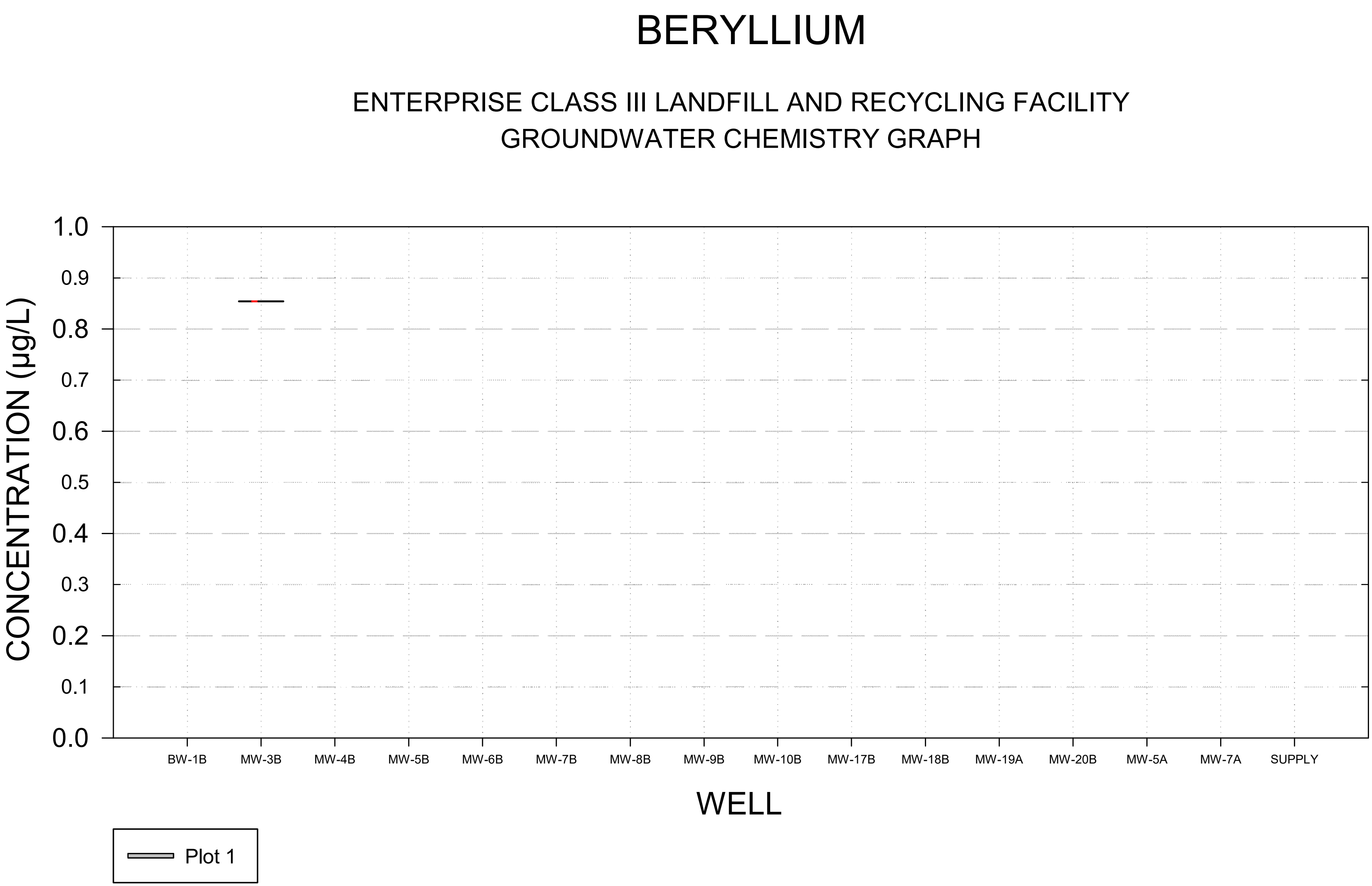
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



BERYLLIUM

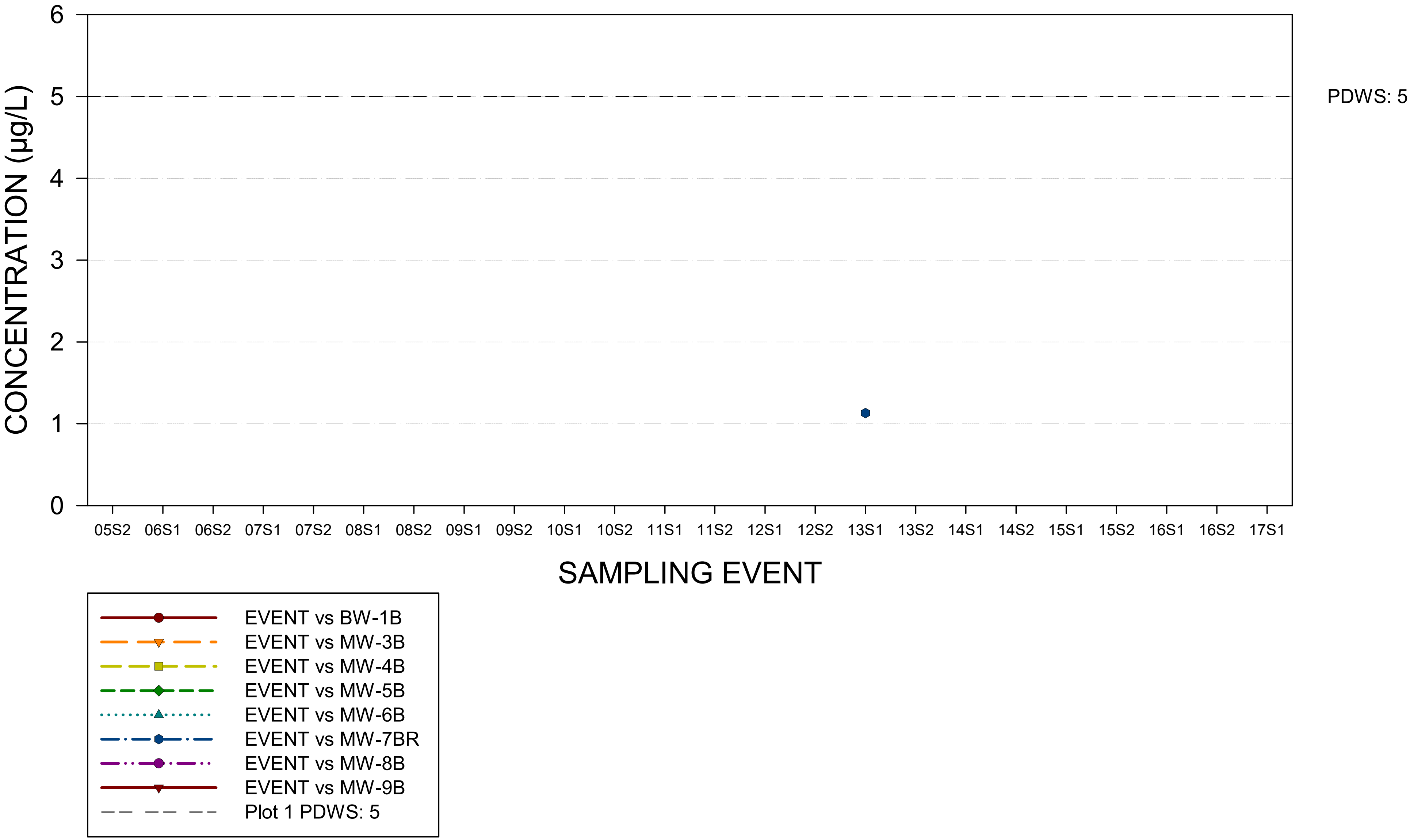
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

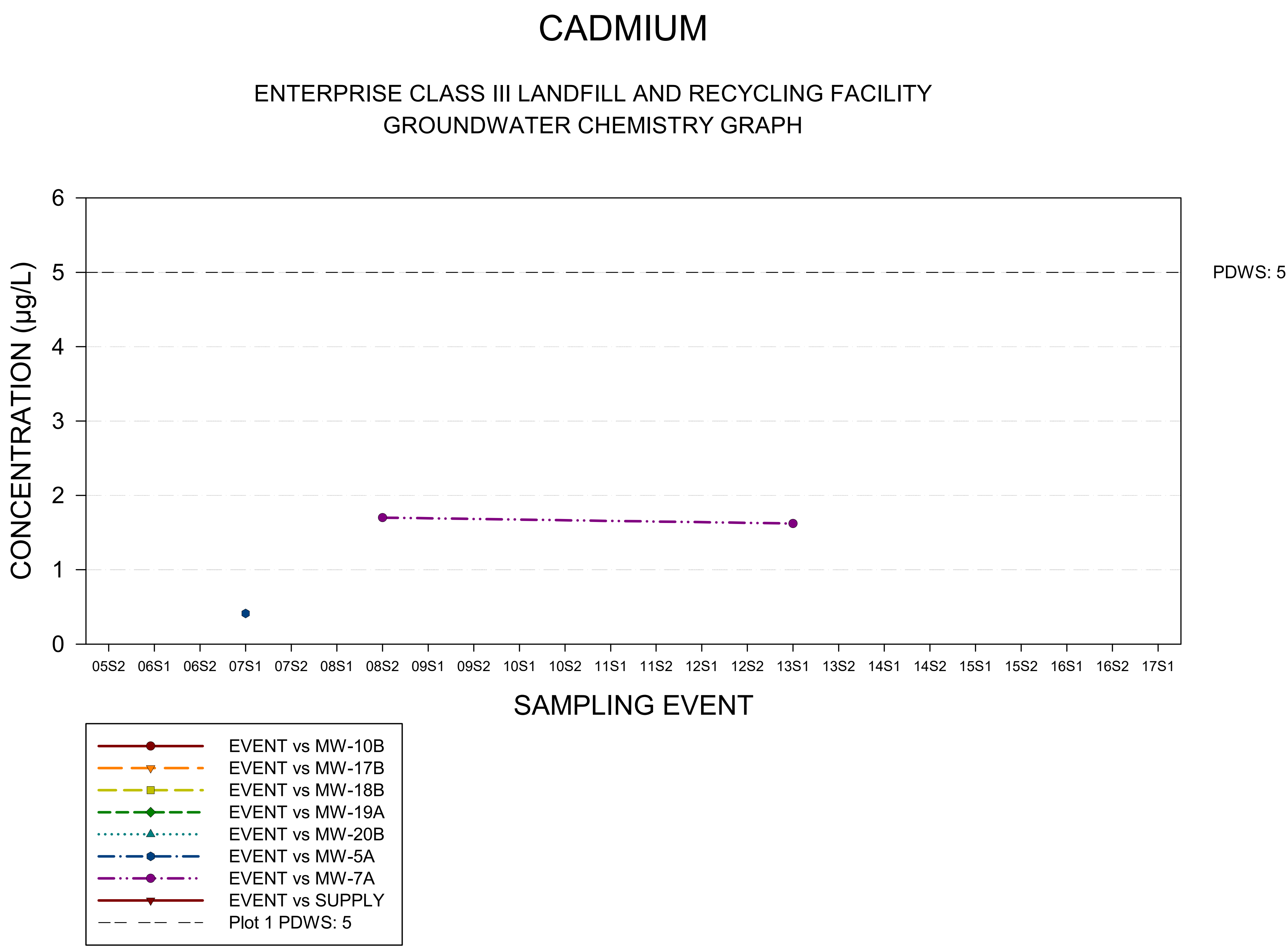



BERYLLIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1

CADMIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

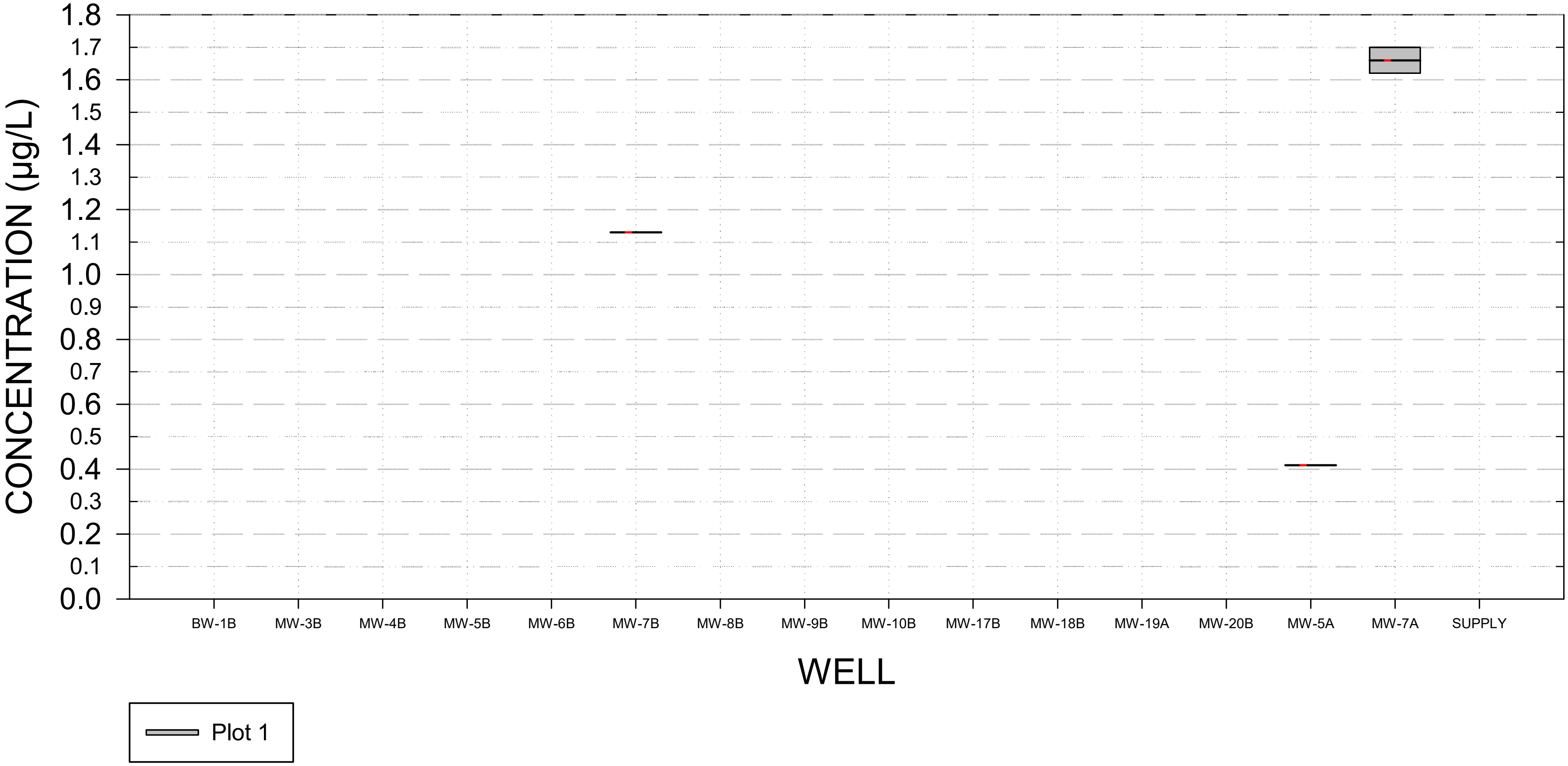




CADMIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
6
5
4
3
2
1
0
PDWS: 5
05S2 06S1 06S2 07S1 07S2 08S1 08S2 09S1 09S2 10S1 10S2 11S1 11S2 12S1 12S2 13S1 13S2 14S1 14S2 15S1 15S2 16S1 16S2 17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 PDWS: 5

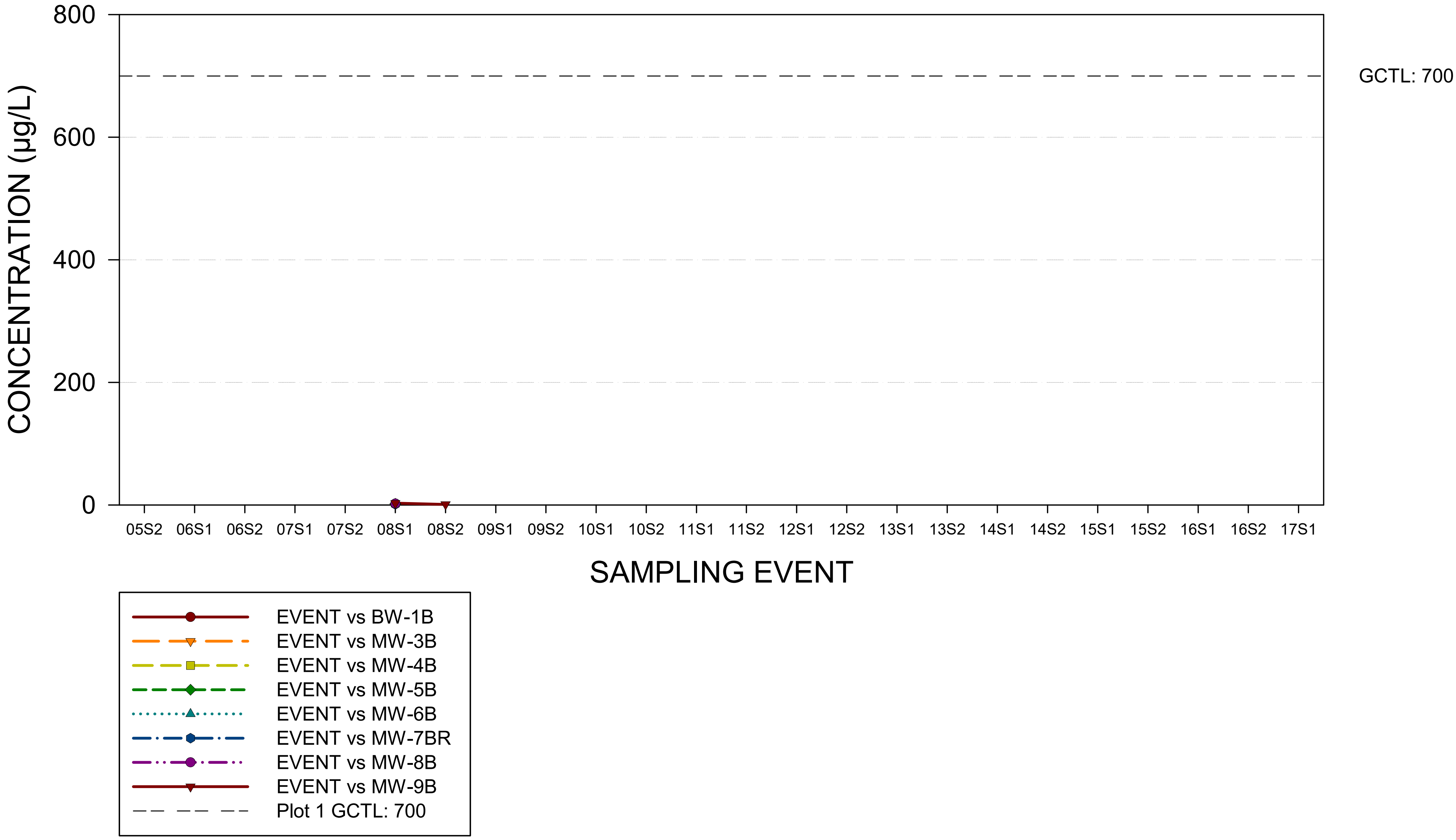
CADMIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



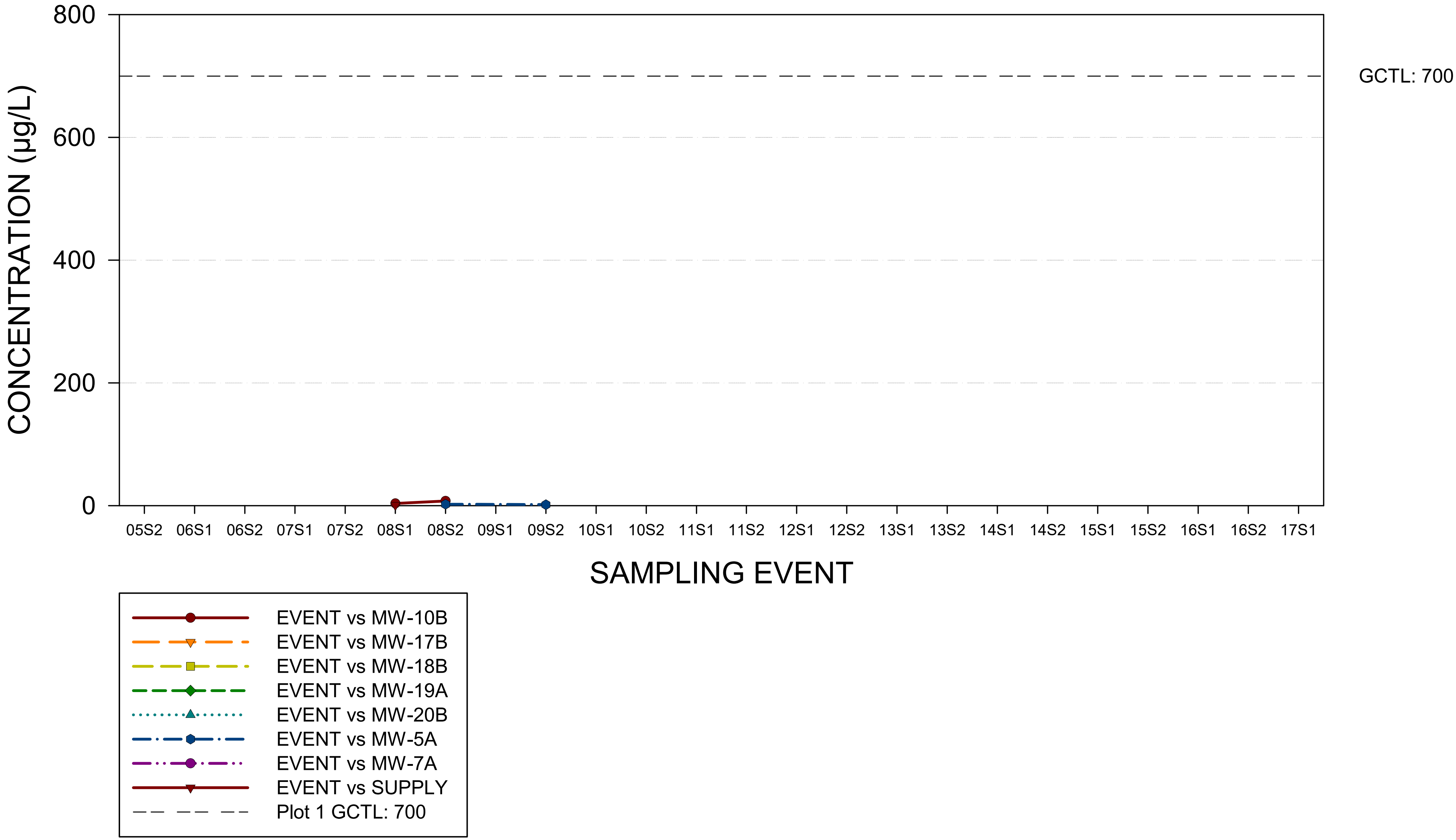
CARBON DISULFIDE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



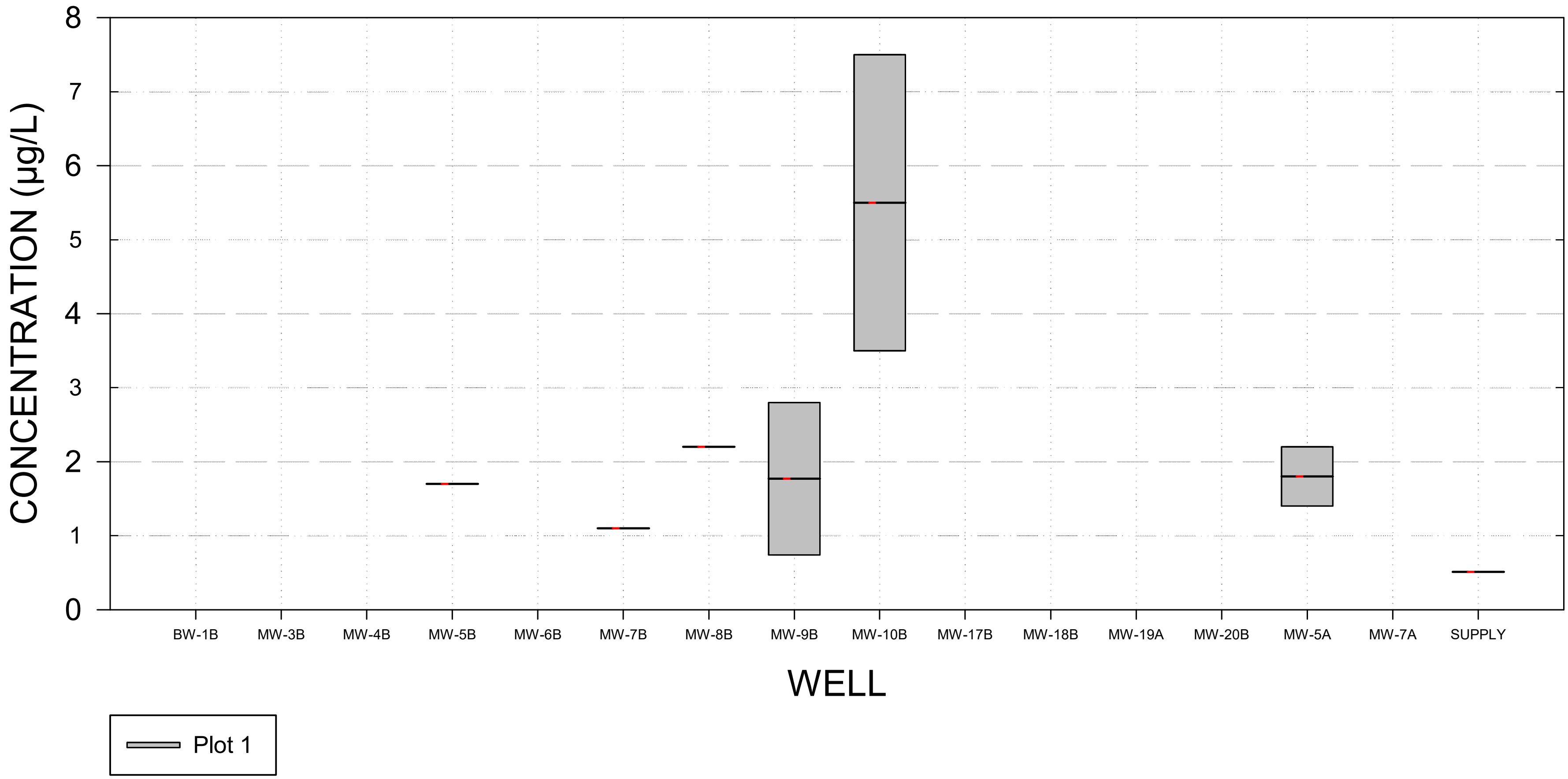
CARBON DISULFIDE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



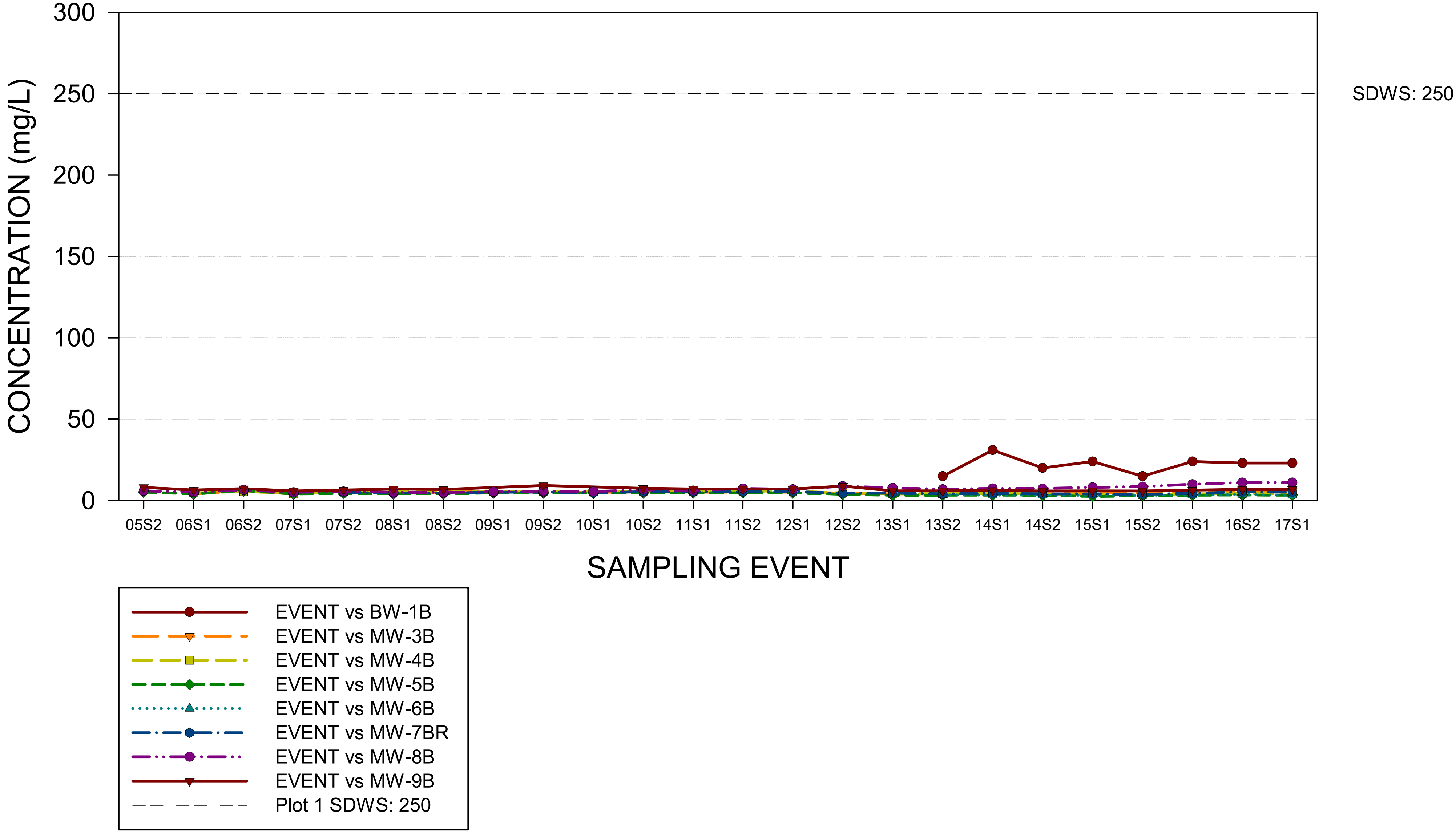
CARBON DISULFIDE

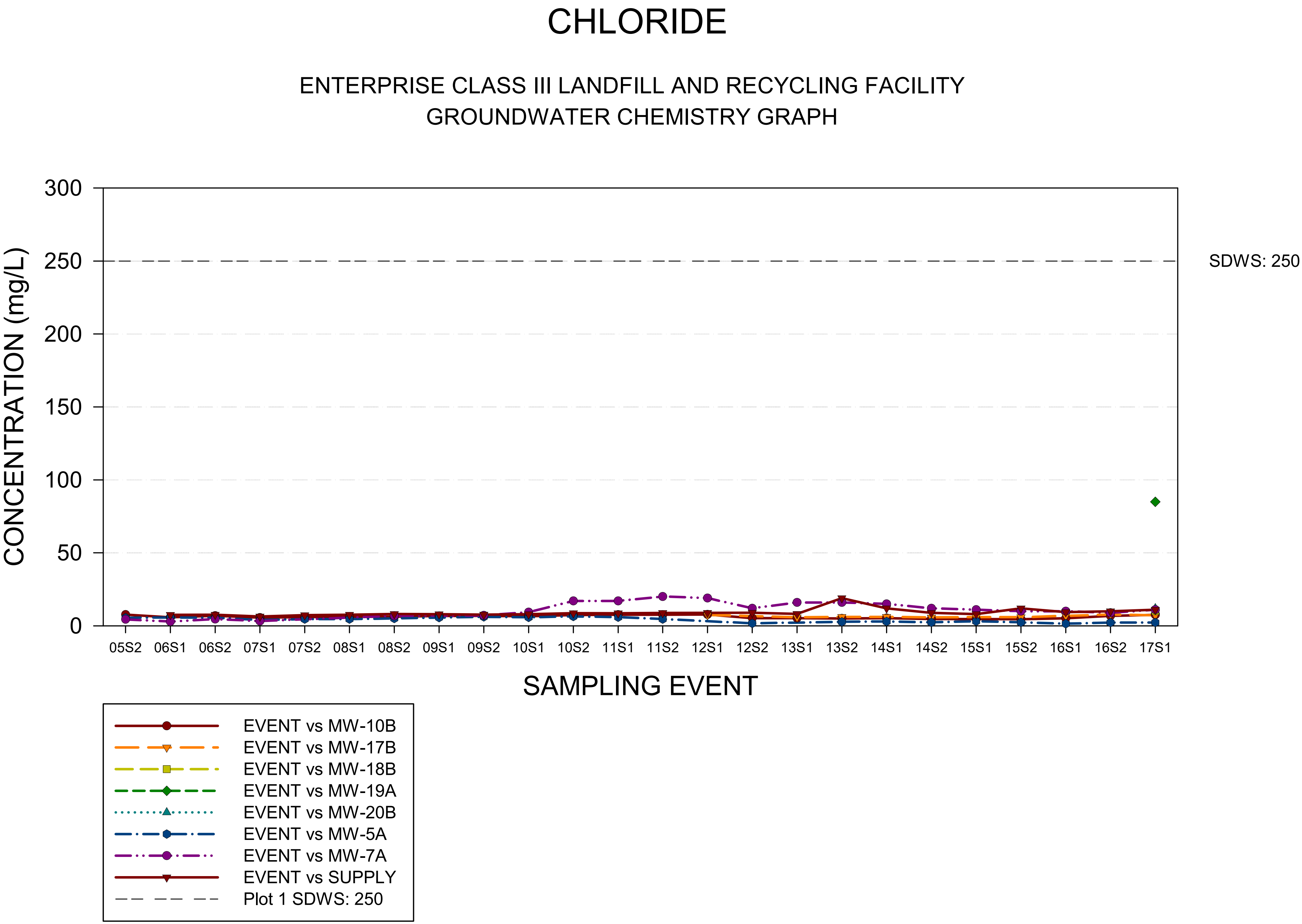
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



CHLORIDE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

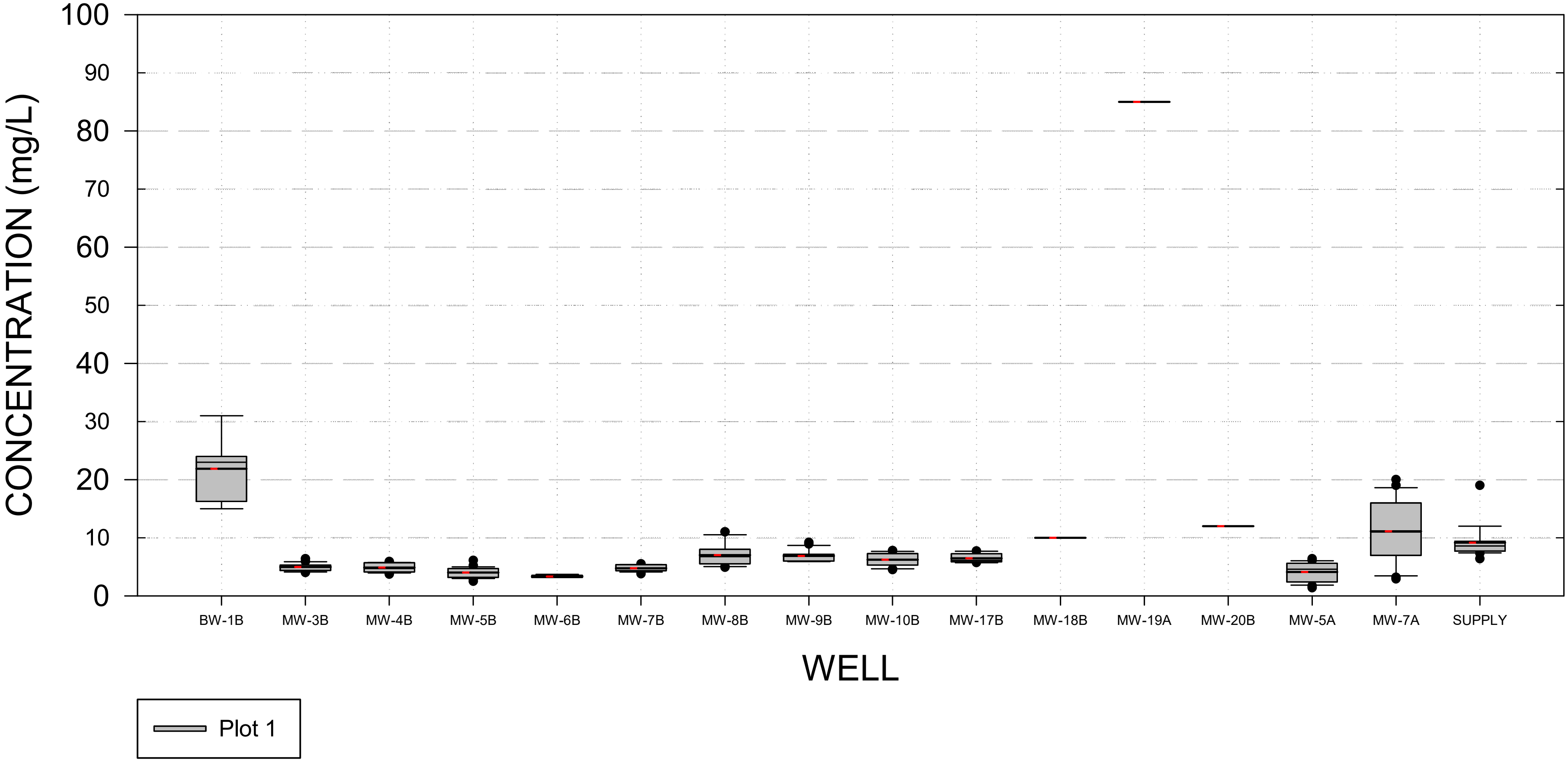


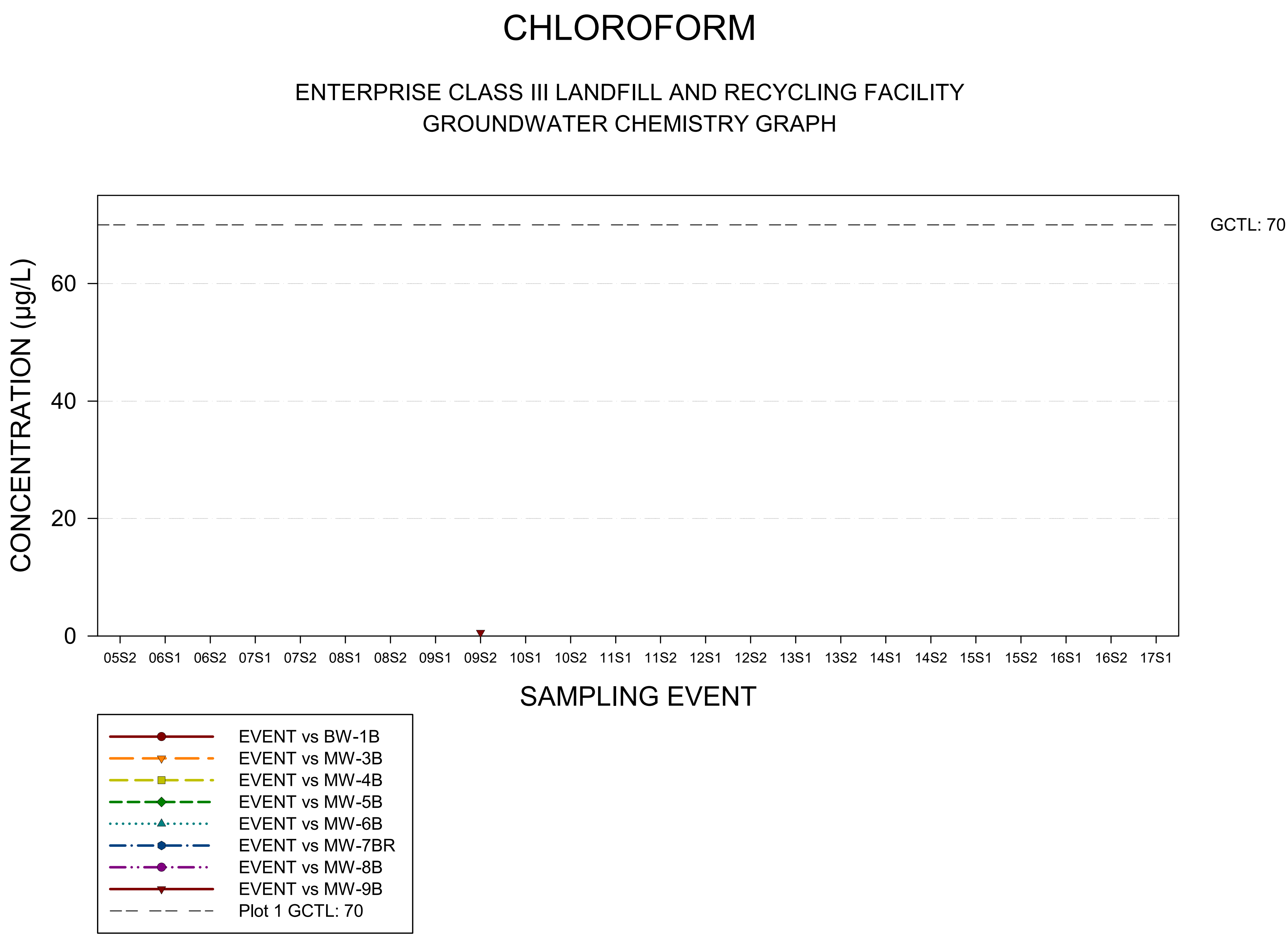


CHLORIDE
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (mg/L)
300
250
200
150
100
50
0
SDWS: 250
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 SDWS: 250

CHLORIDE

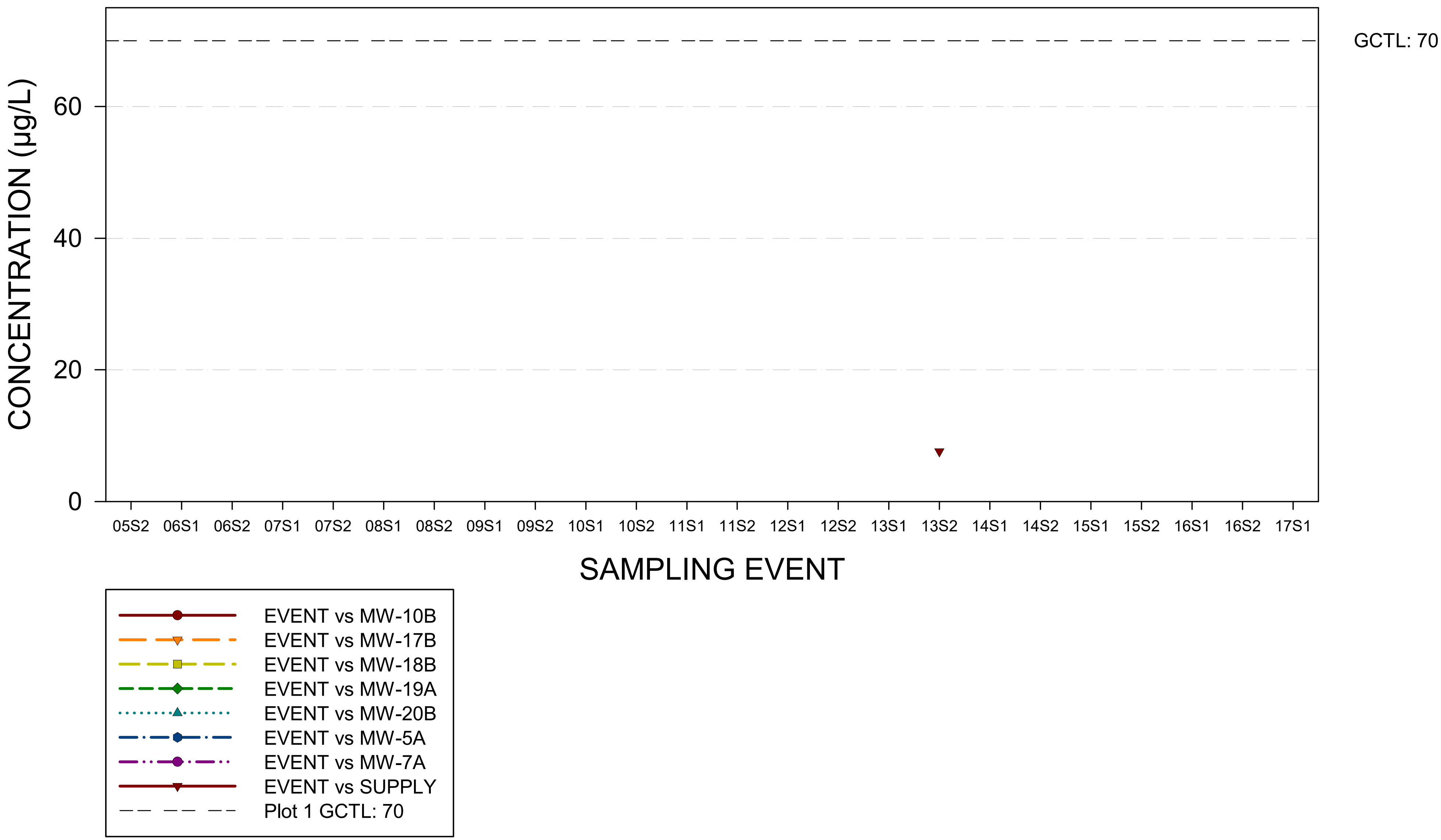
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

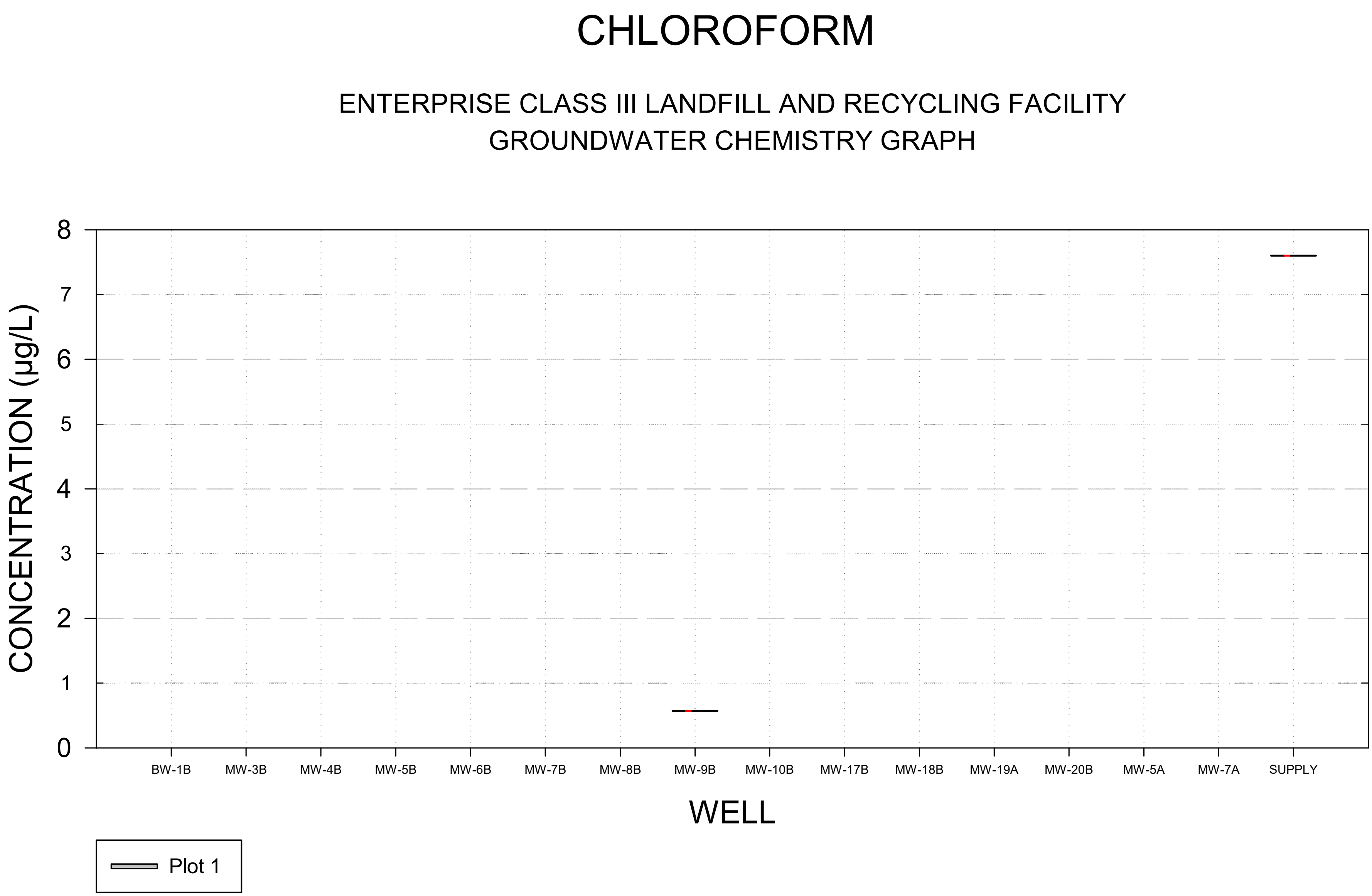



CHLOROFORM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
GCTL: 70
CONCENTRATION (µg/L)
0
20
40
60
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 GCTL: 70

CHLOROFORM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

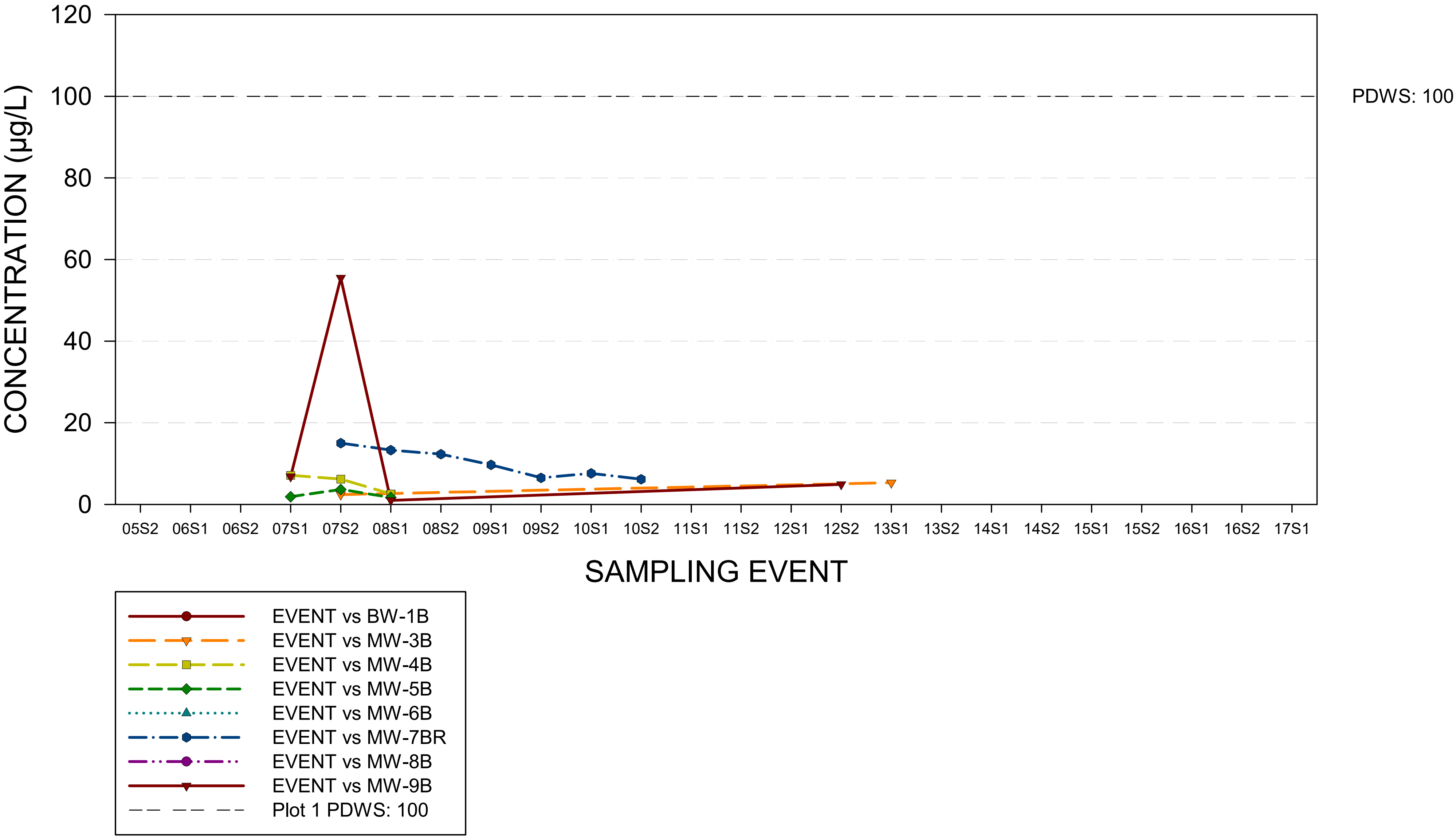




CHLOROFORM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
0
1
2
3
4
5
6
7
8
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1

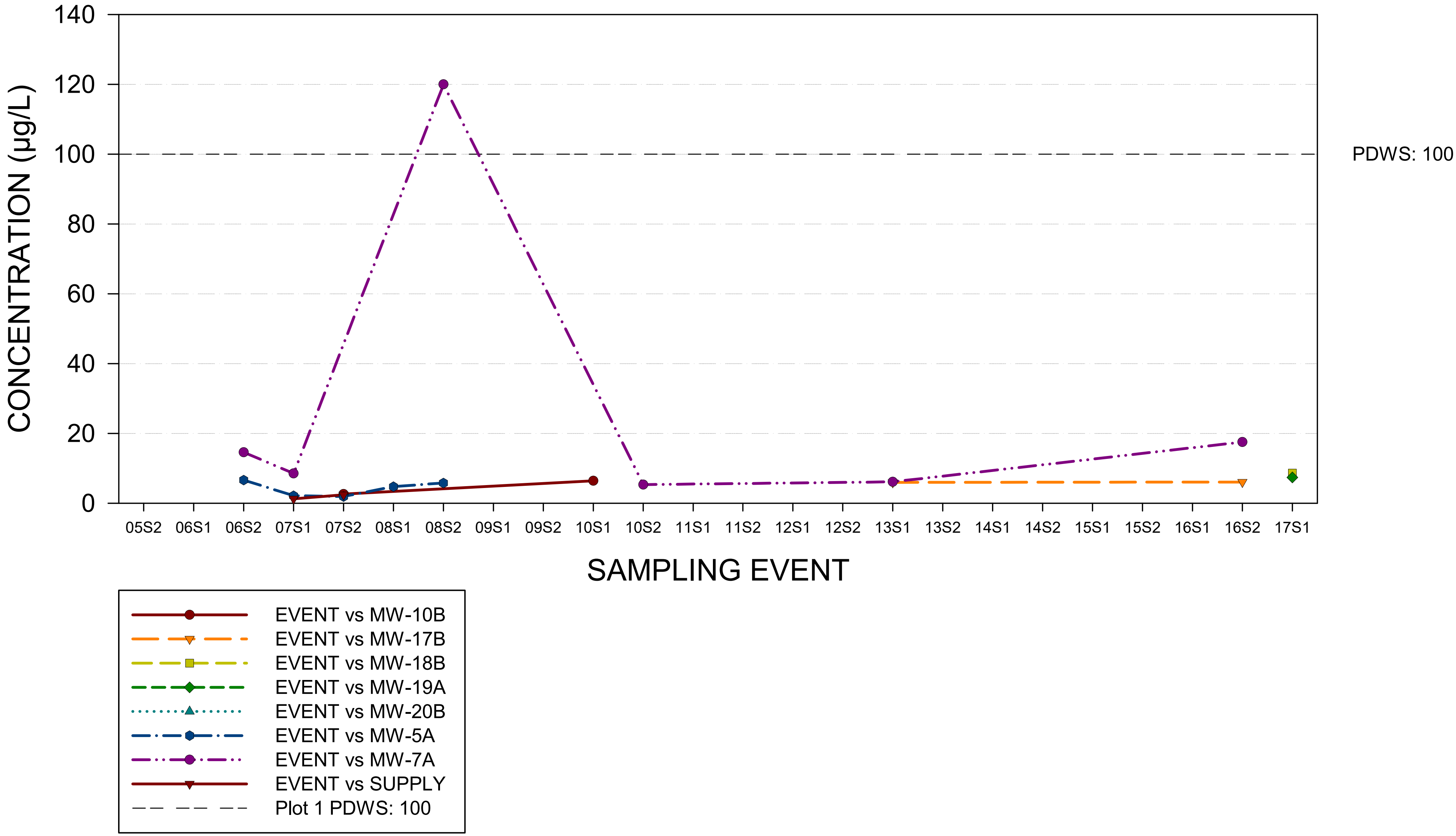
CHROMIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



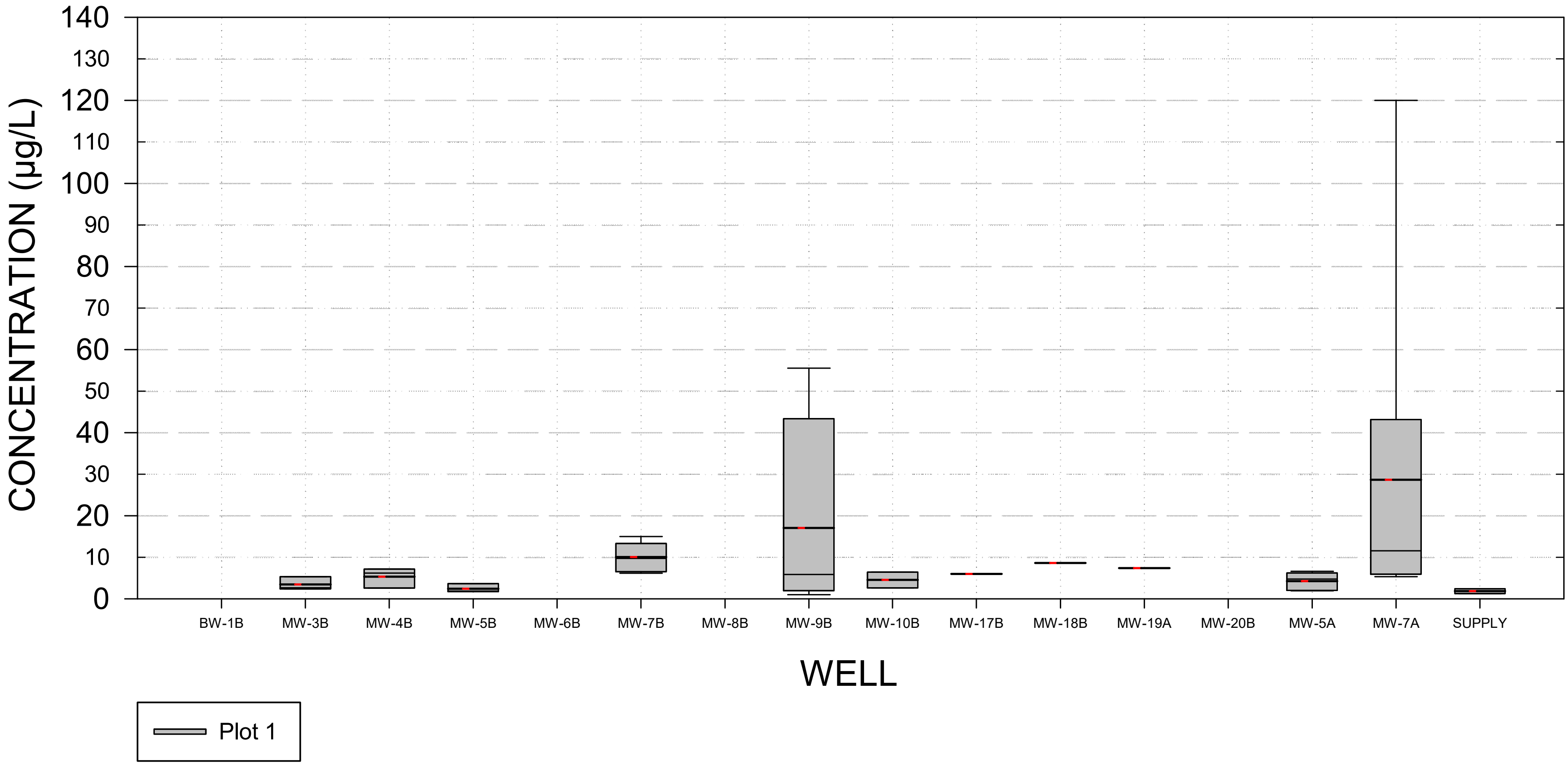
CHROMIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



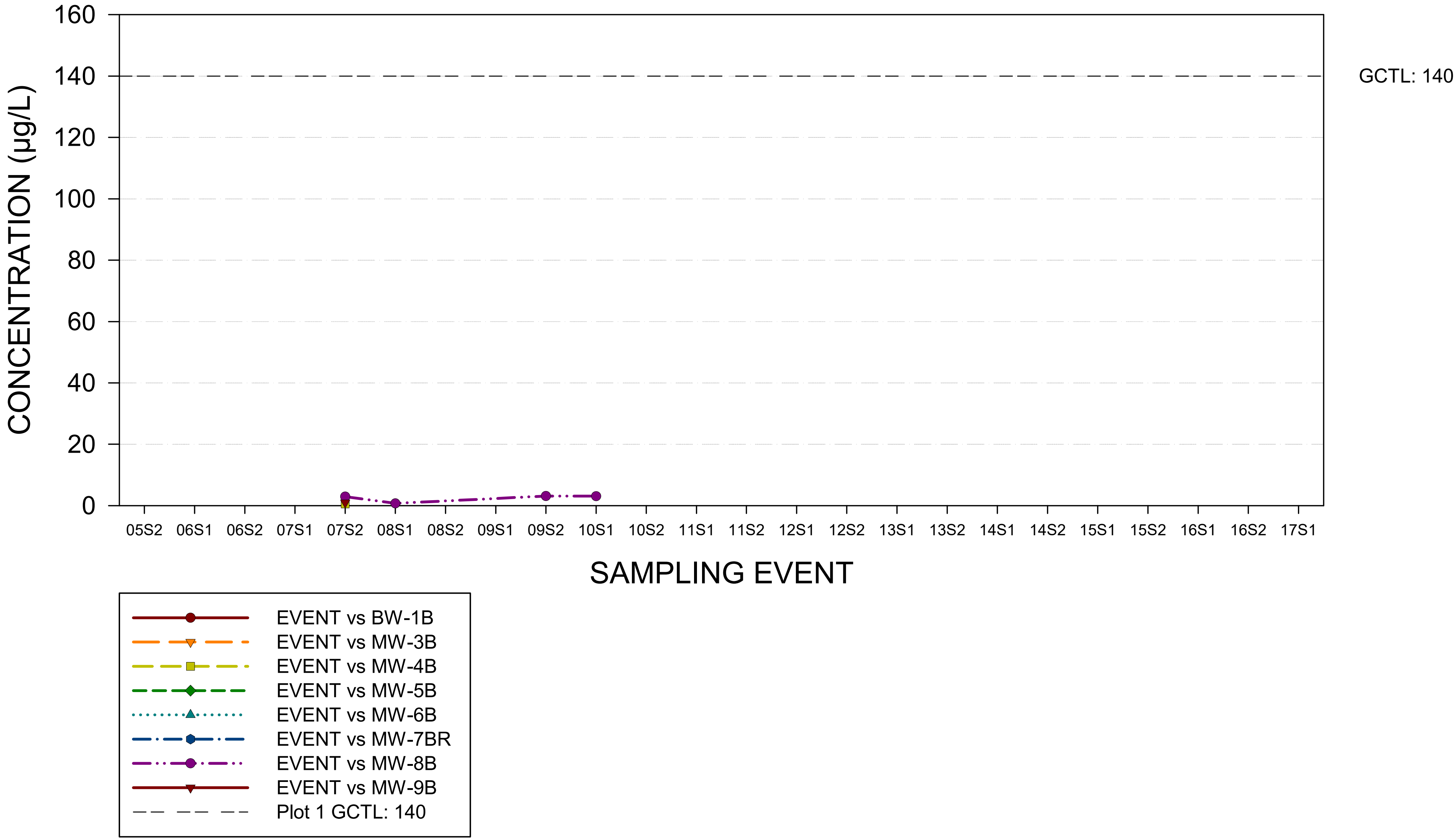
CHROMIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



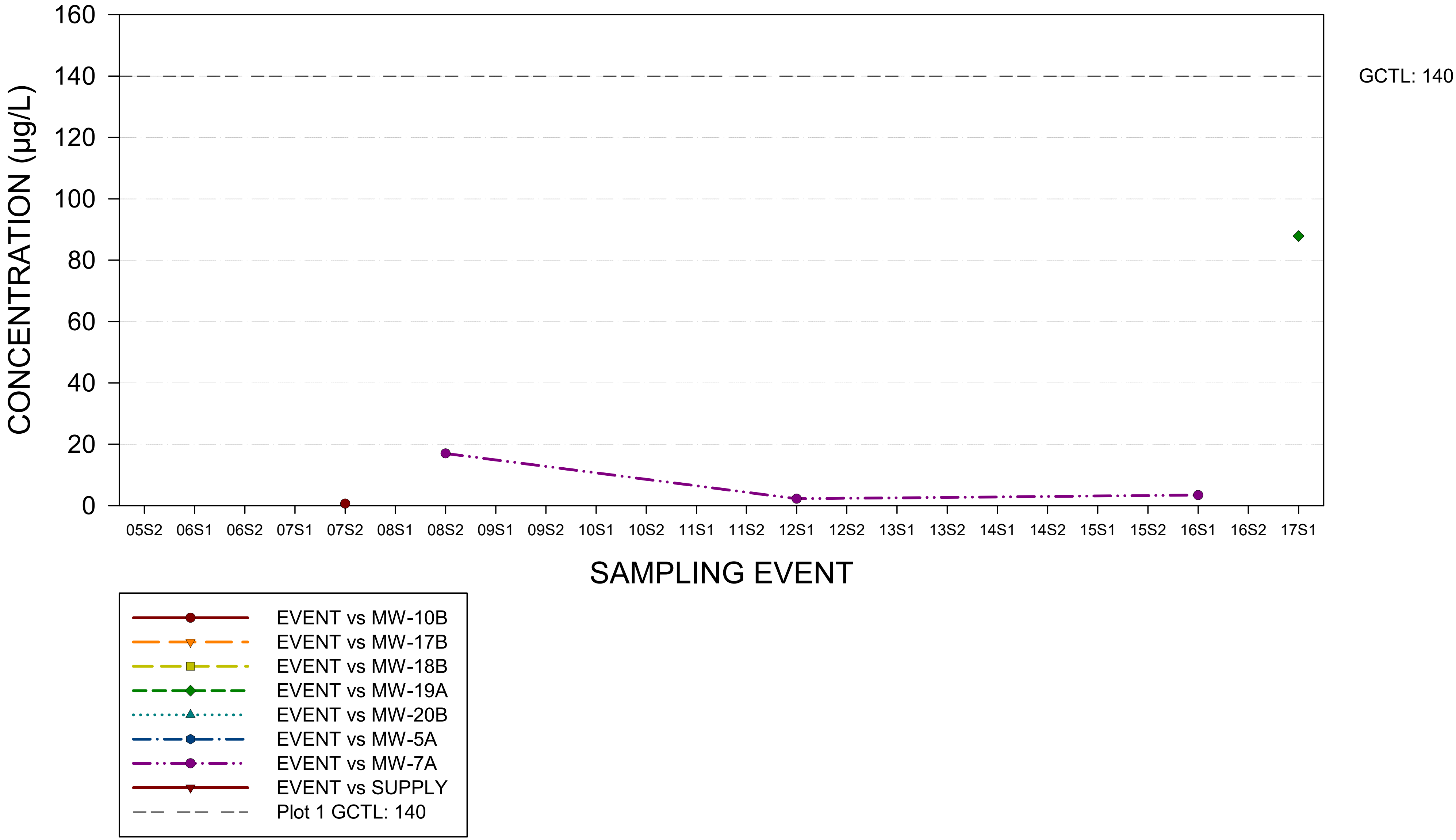
COBALT

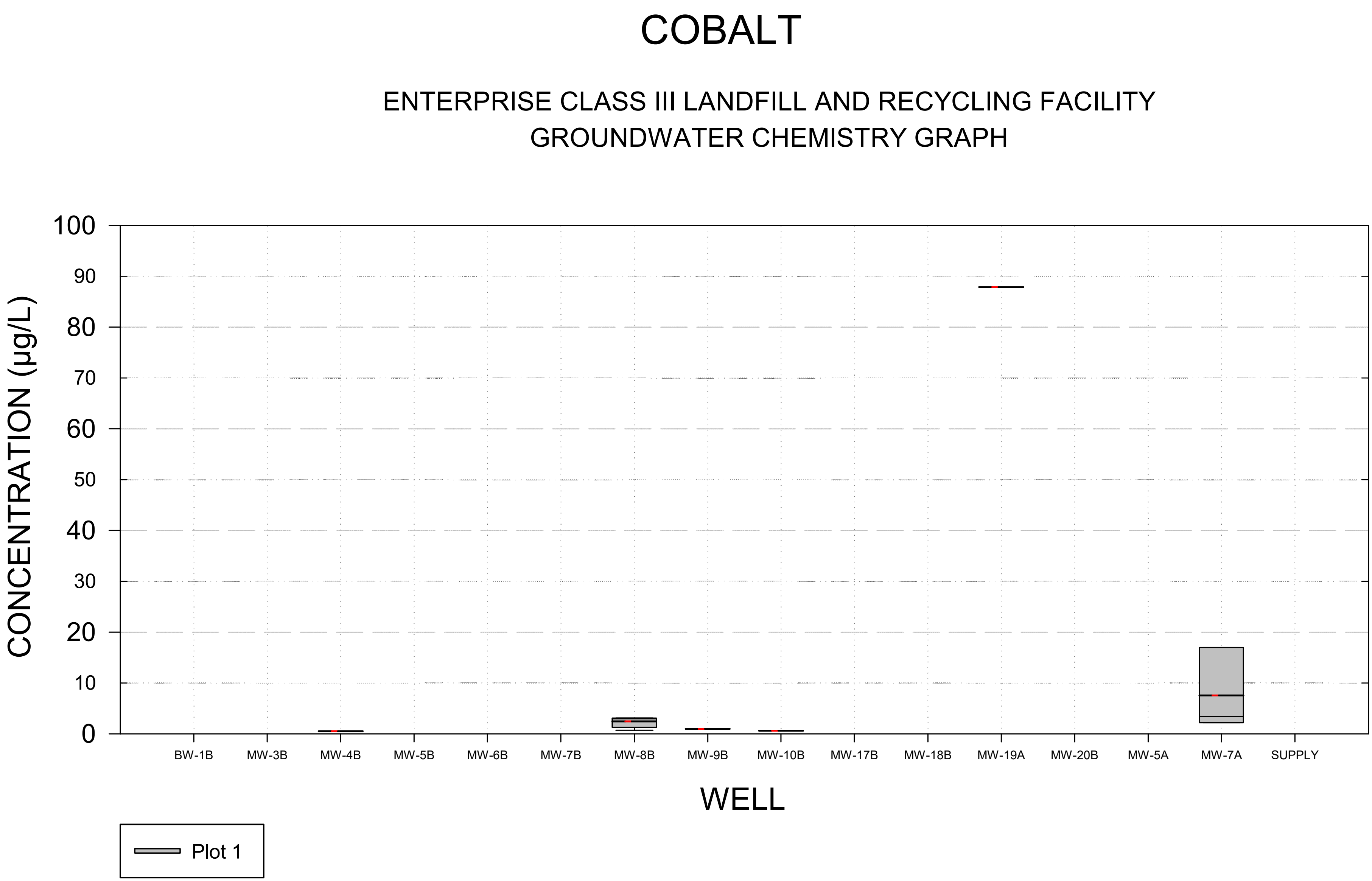
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

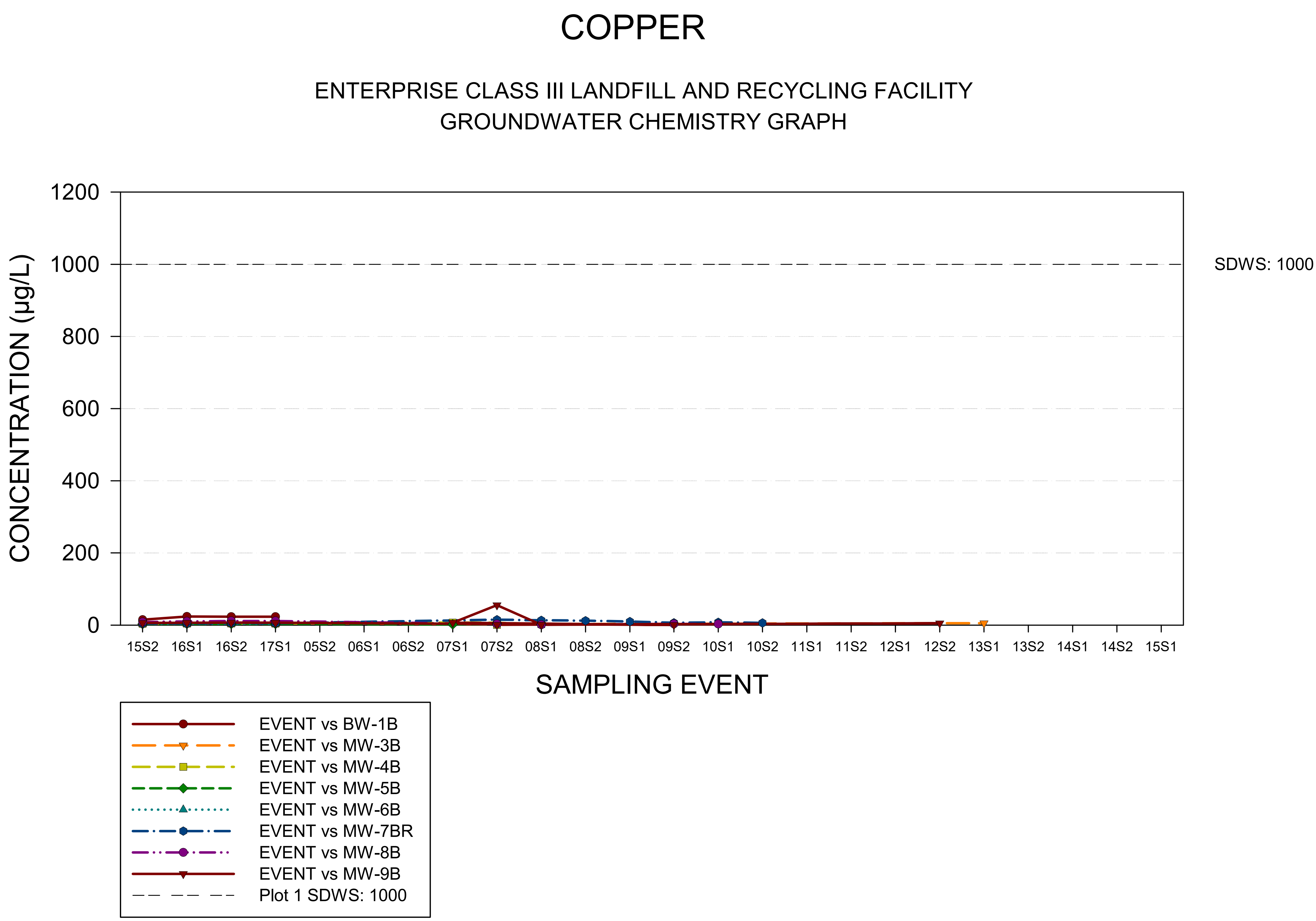


COBALT

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

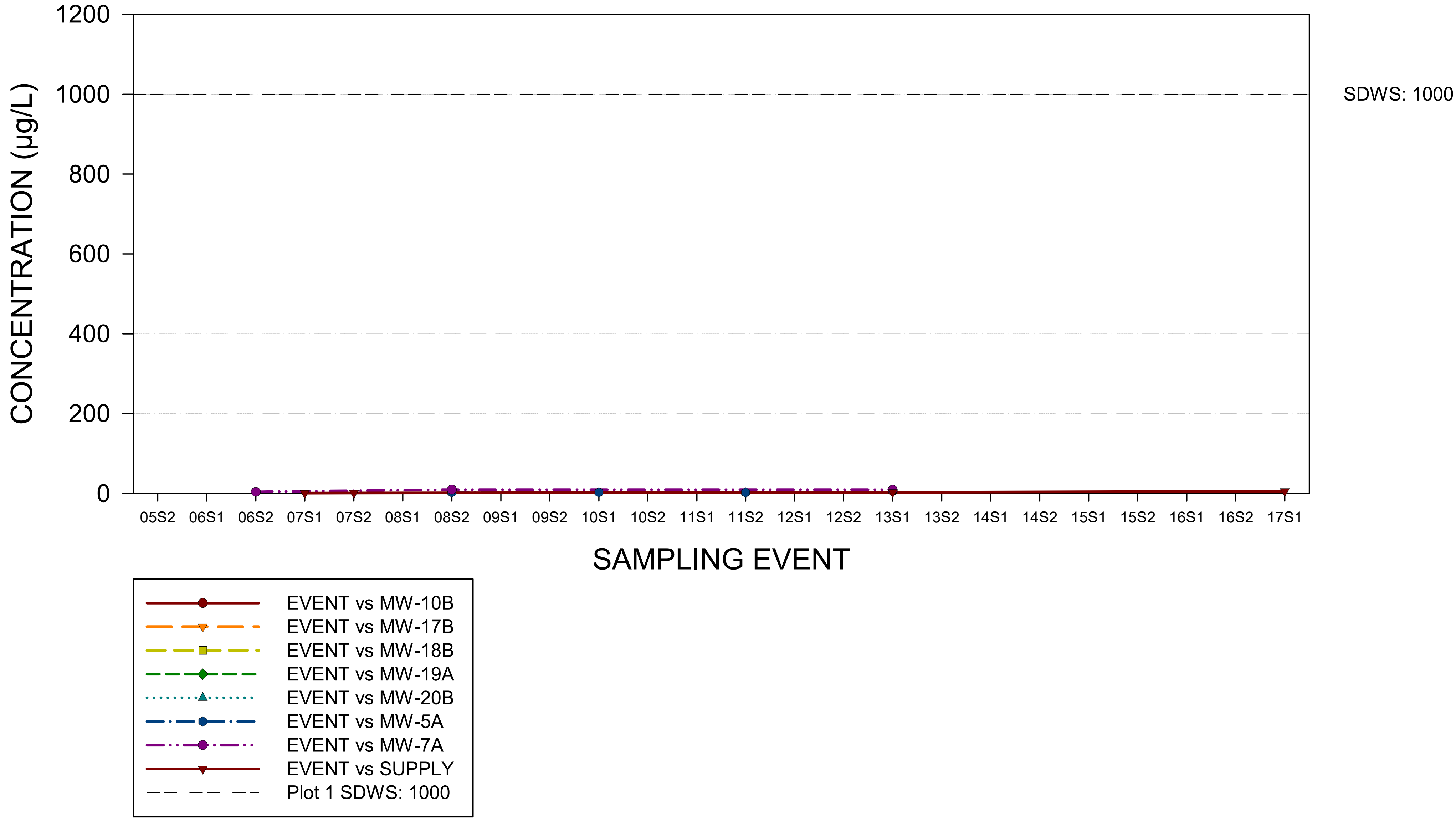



COBALT
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
100
90
80
70
60
50
40
30
20
10
0
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1


COPPER
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
1200
1000
800
600
400
200
0
SDWS: 1000
15S2
16S1
16S2
17S1
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 SDWS: 1000

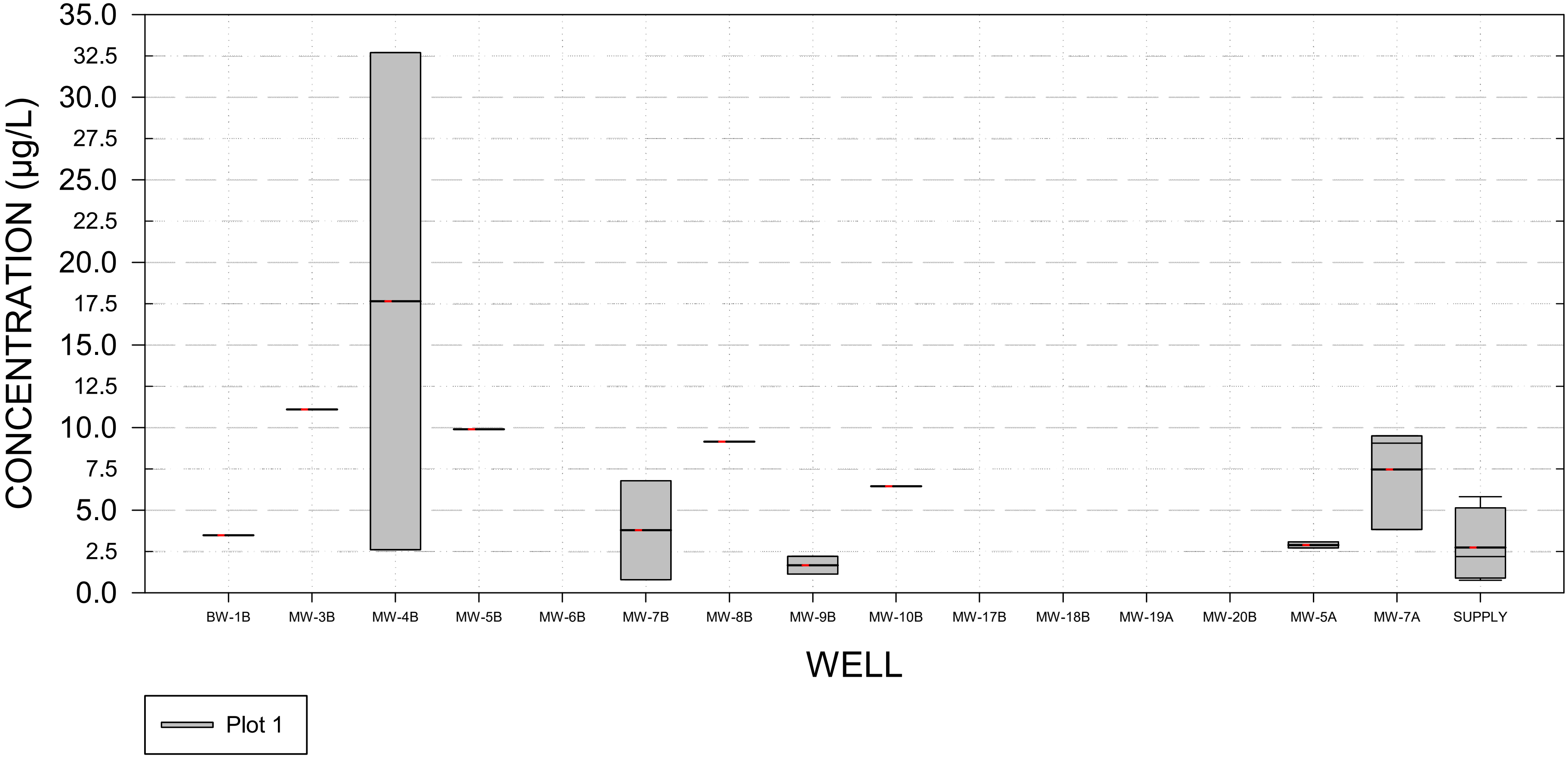
COPPER

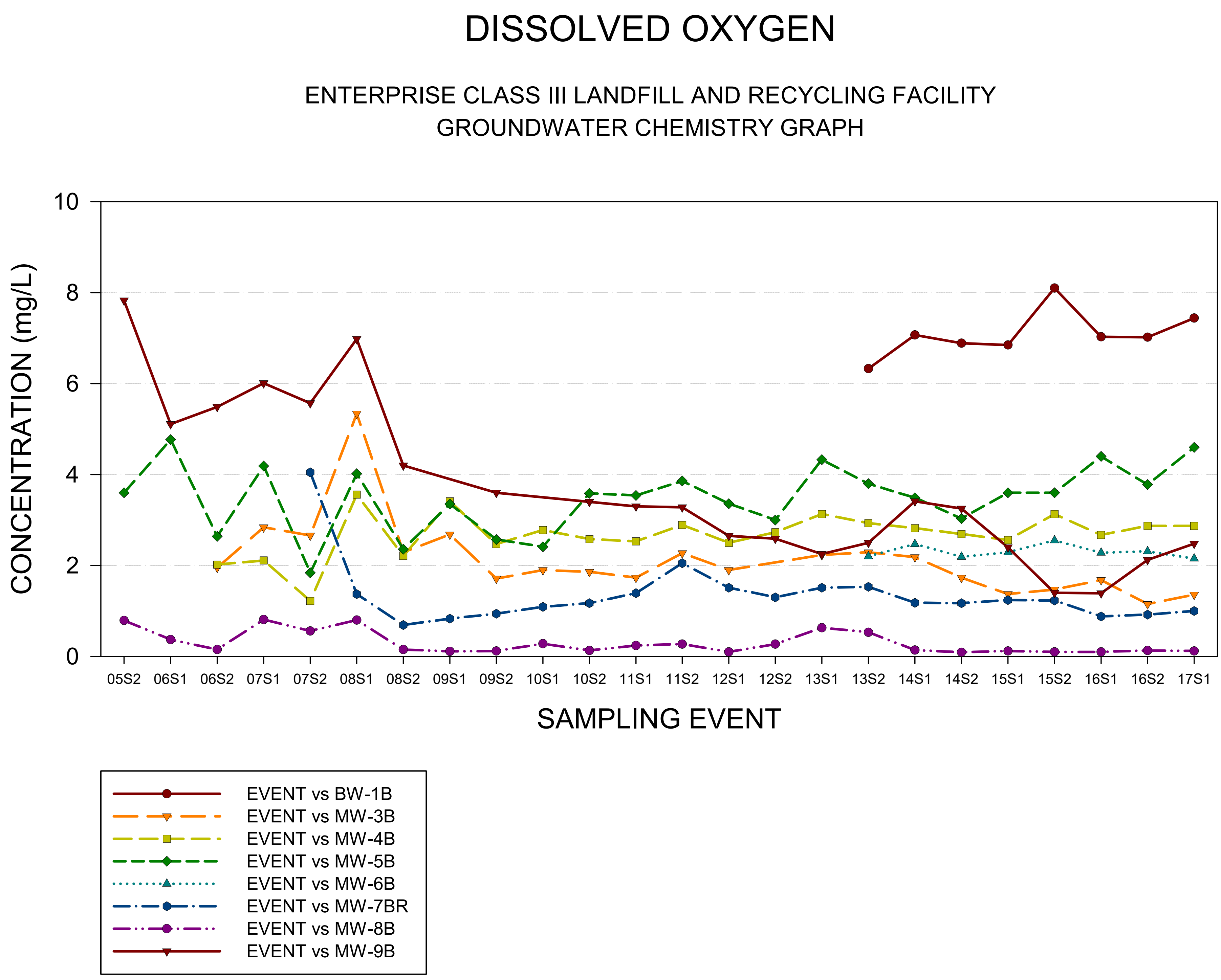
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



COPPER

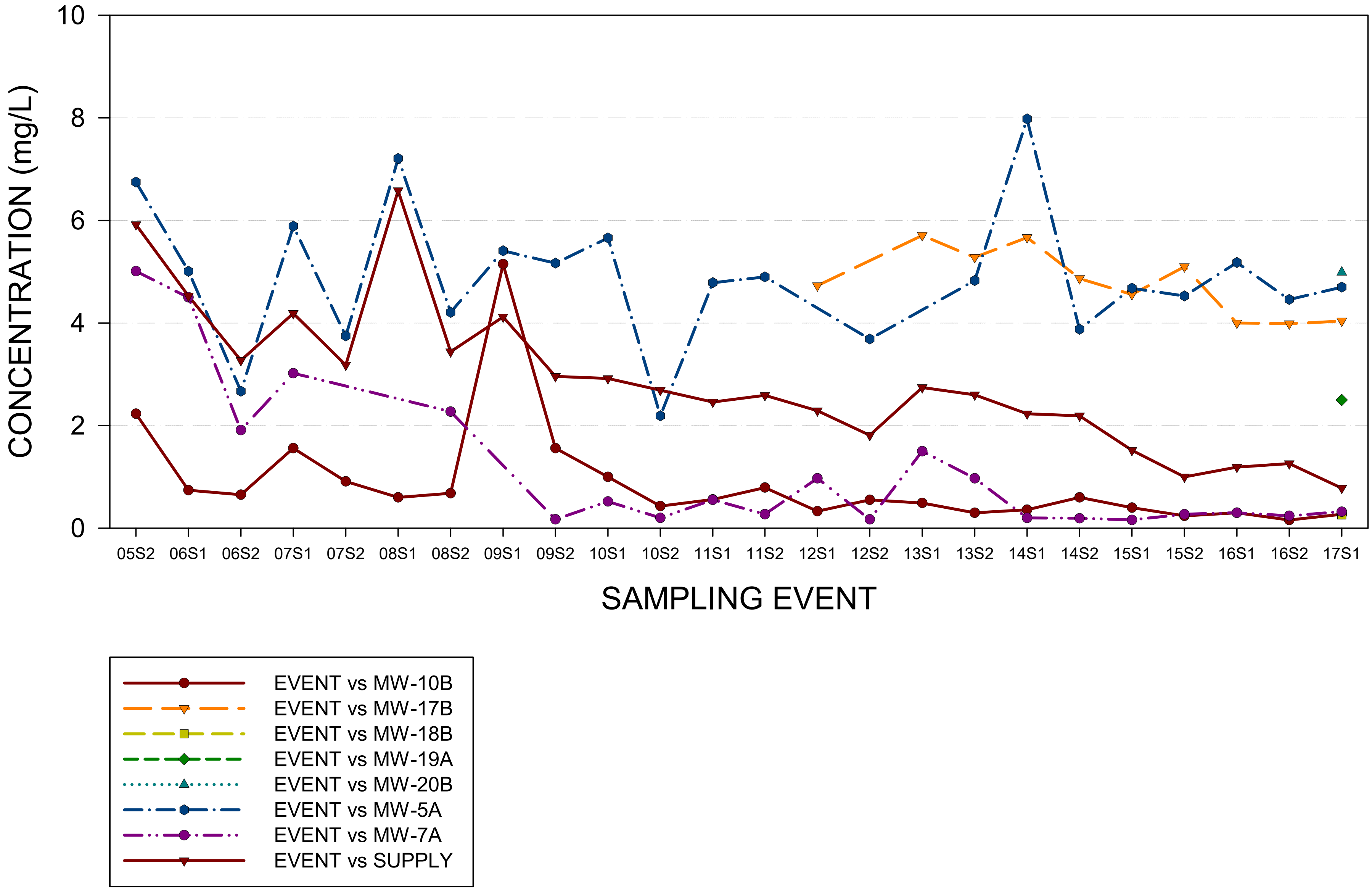
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH




DISSOLVED OXYGEN
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (mg/L)
0
2
4
6
8
10
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B

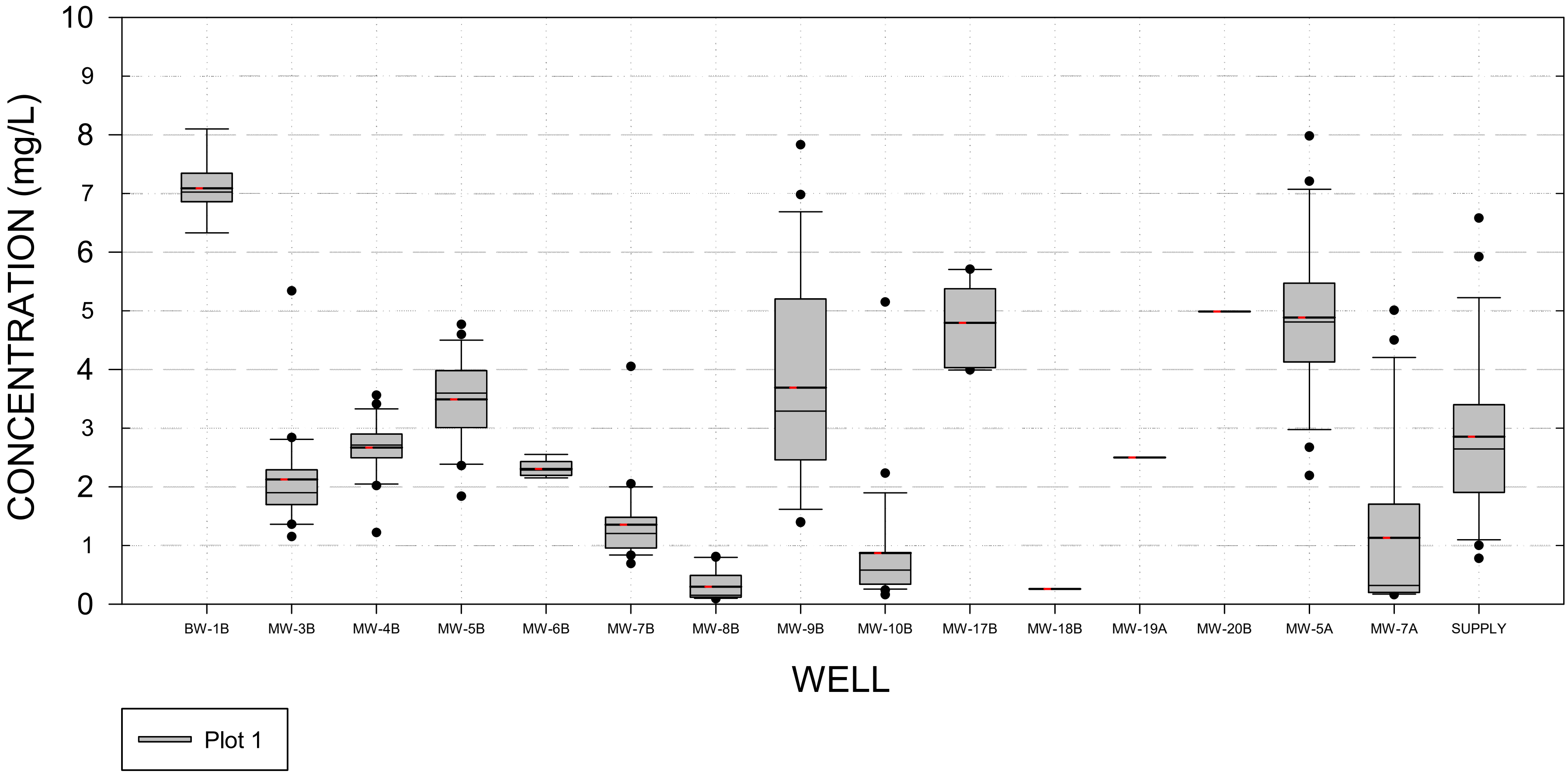
DISSOLVED OXYGEN

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



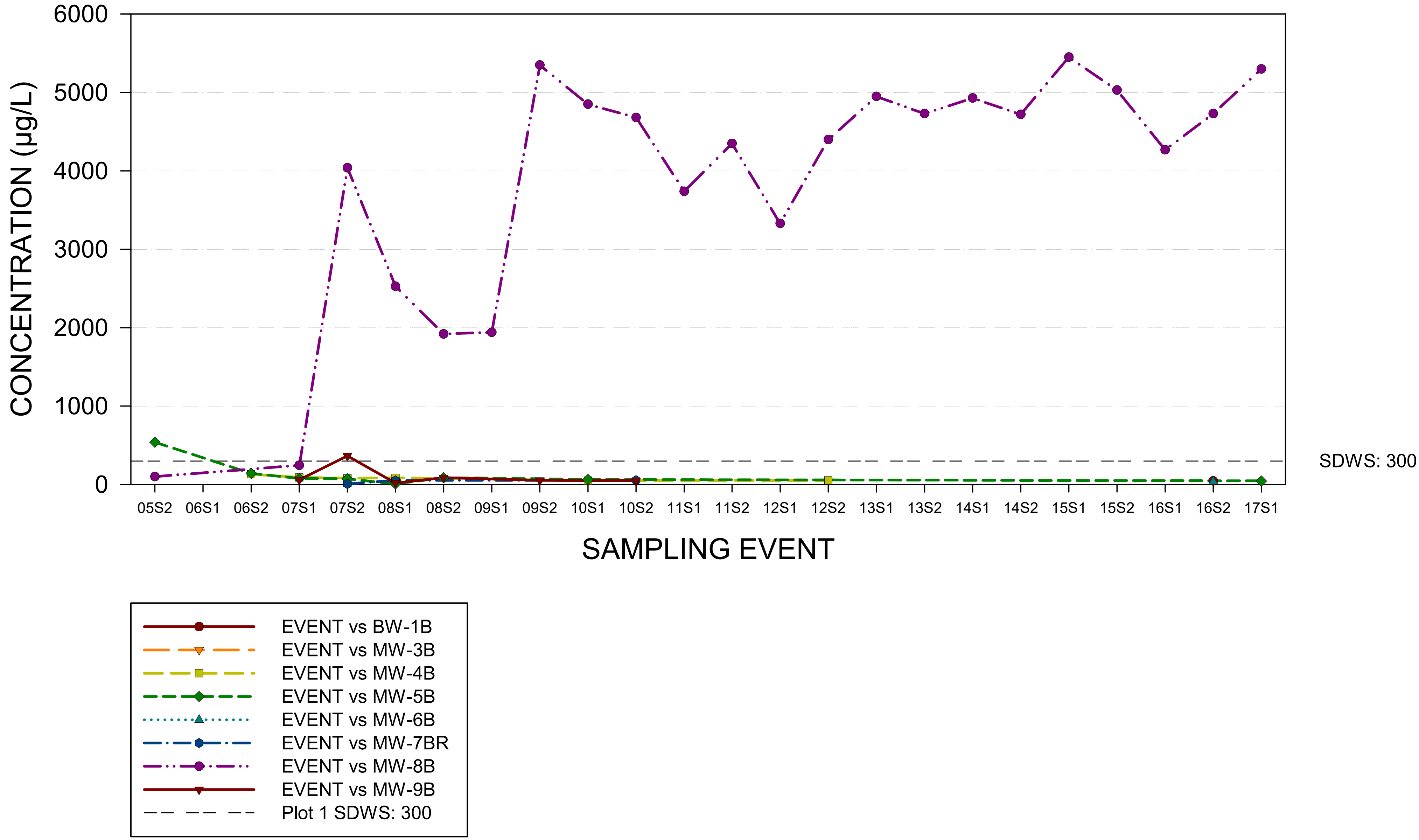
DISSOLVED OXYGEN

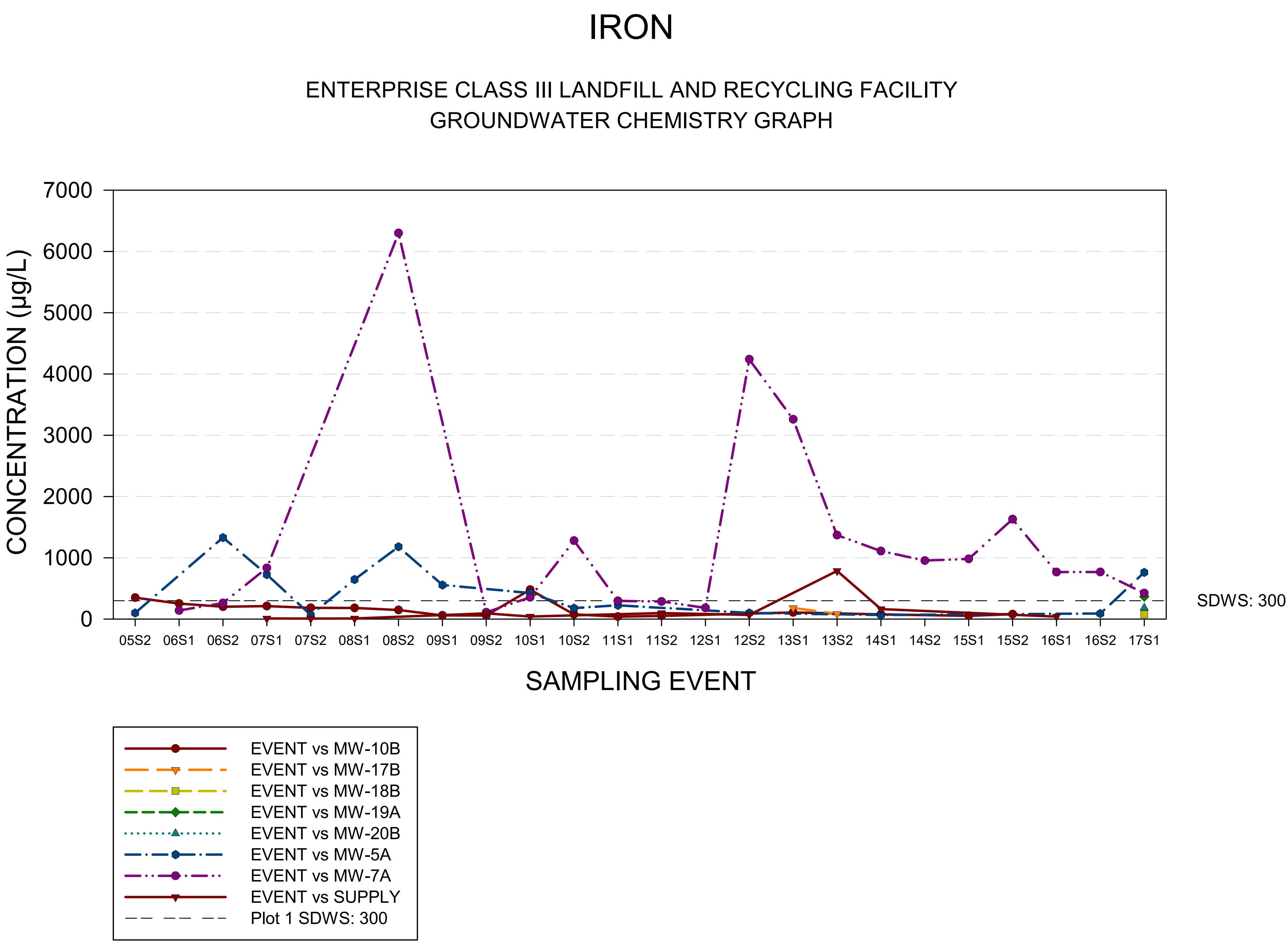
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



IRON

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

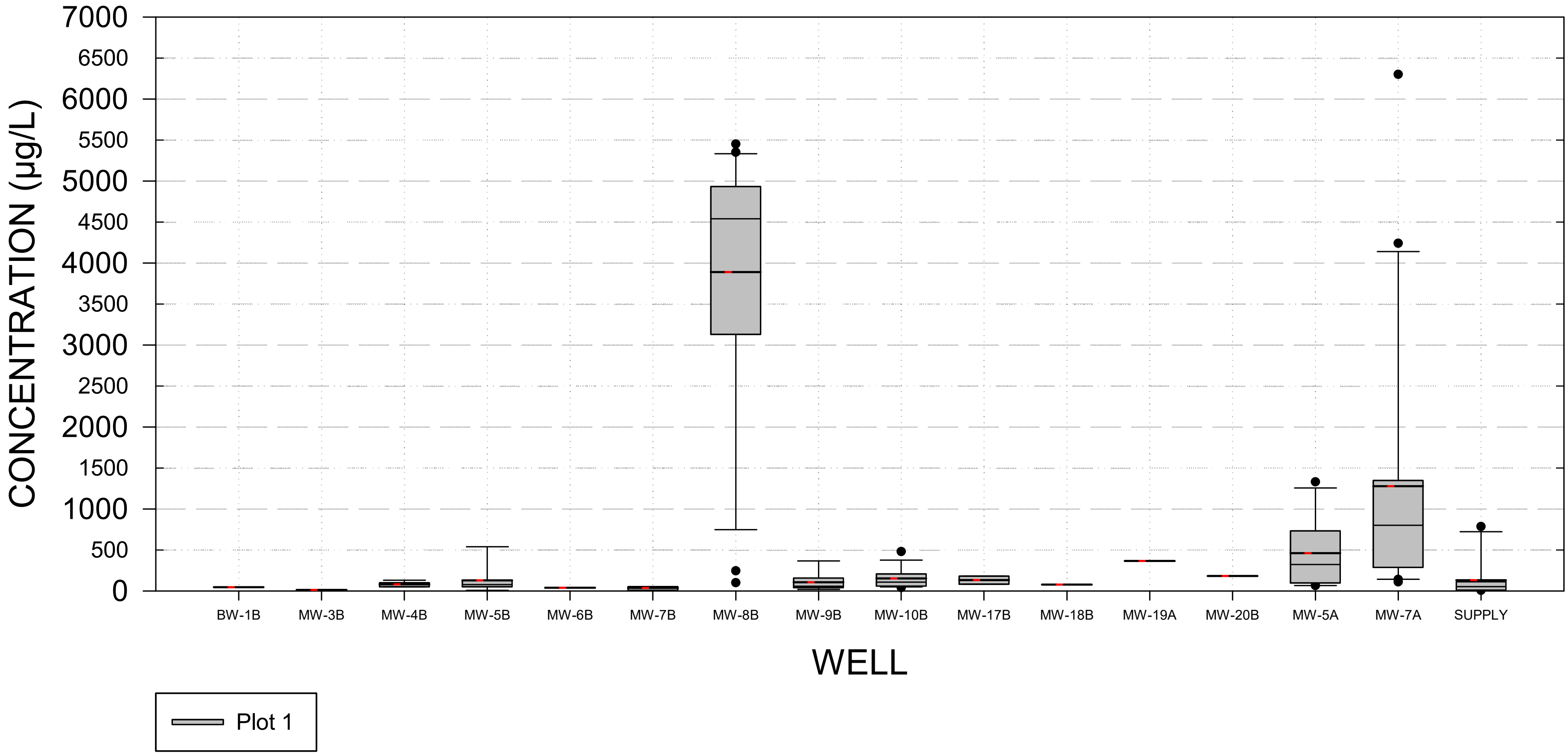




IRON
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
7000
6000
5000
4000
3000
2000
1000
0
SDWS: 300
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 SDWS: 300

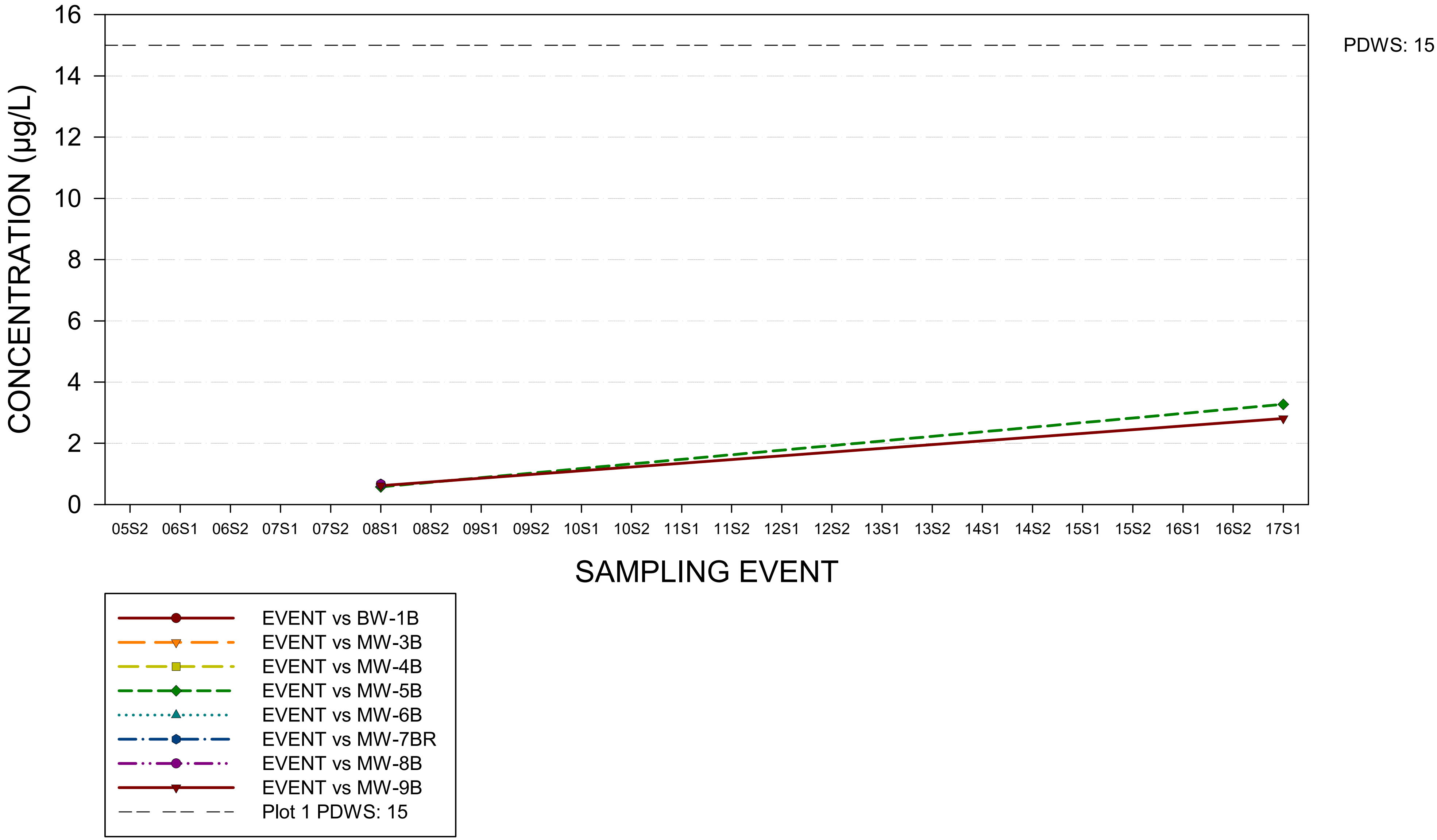
IRON

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



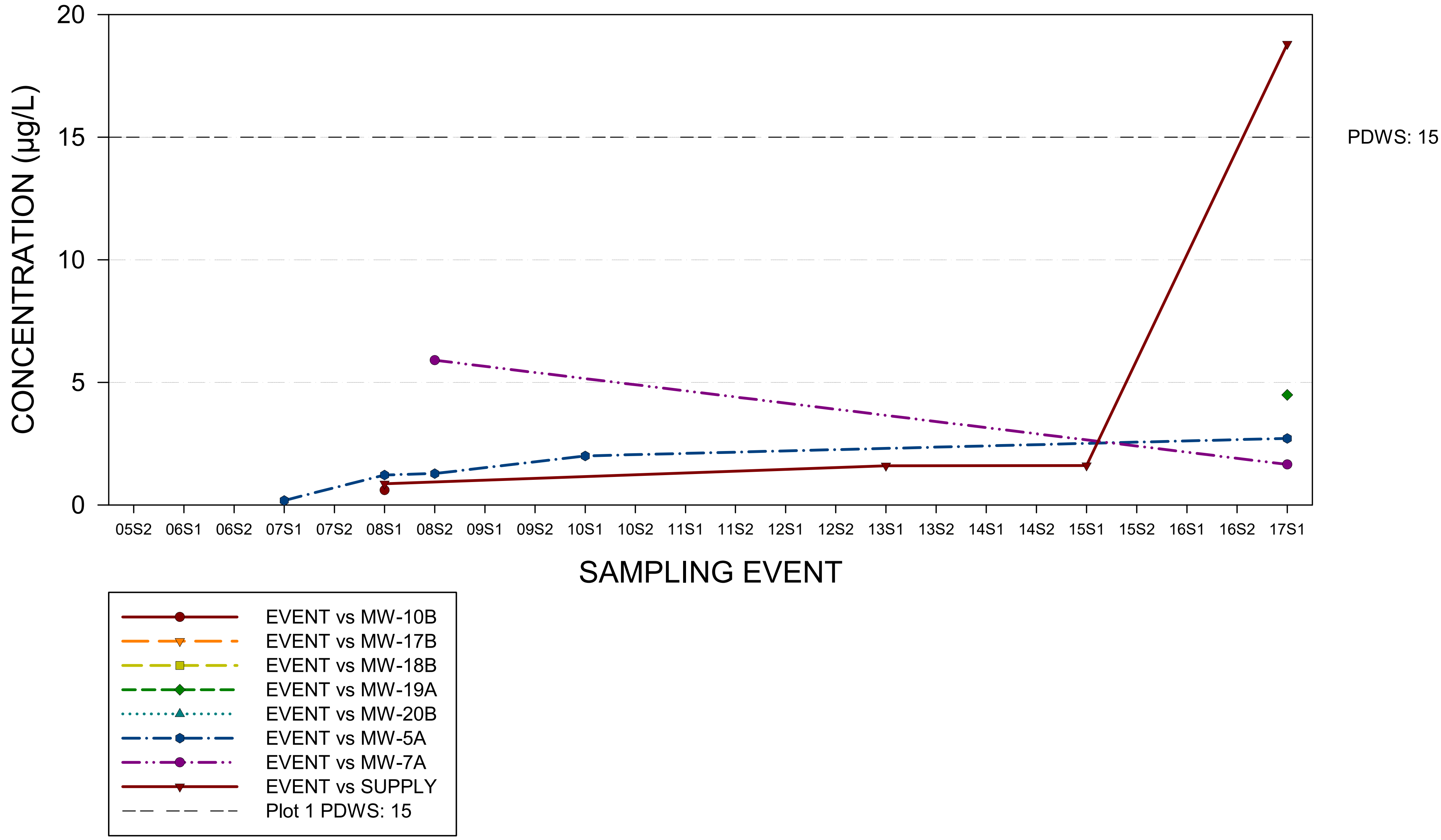
LEAD

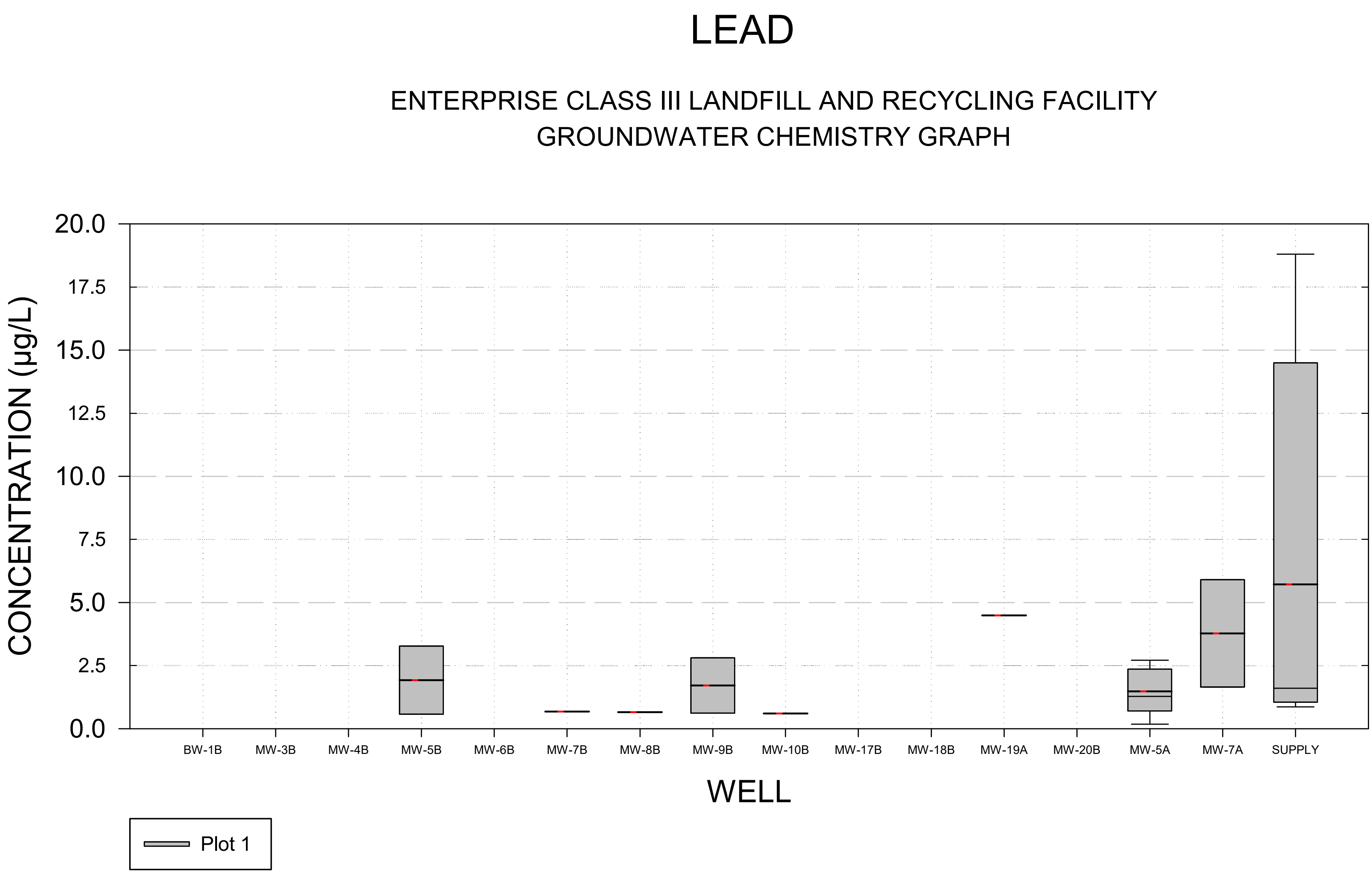
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



LEAD

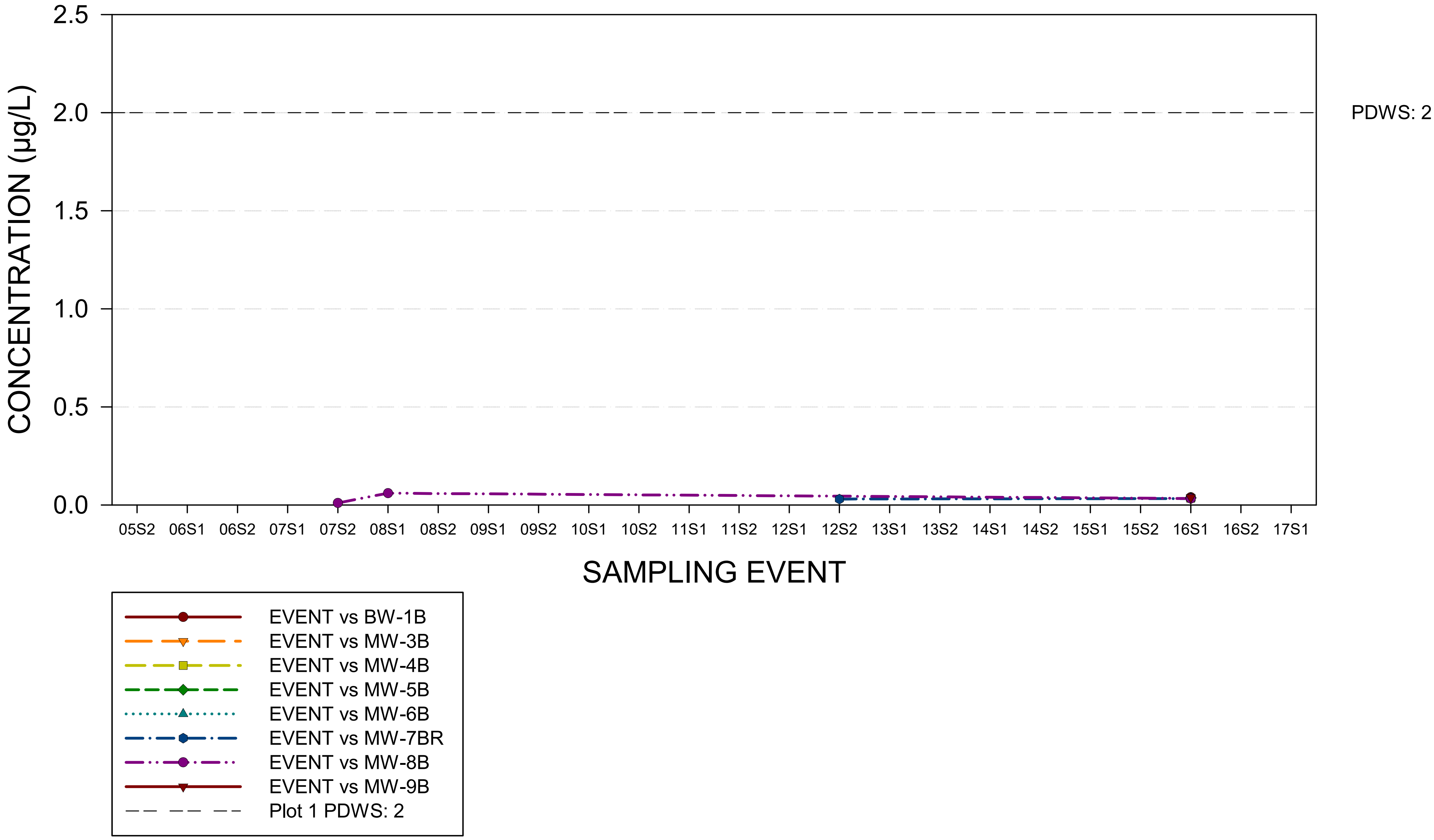
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH




LEAD
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1

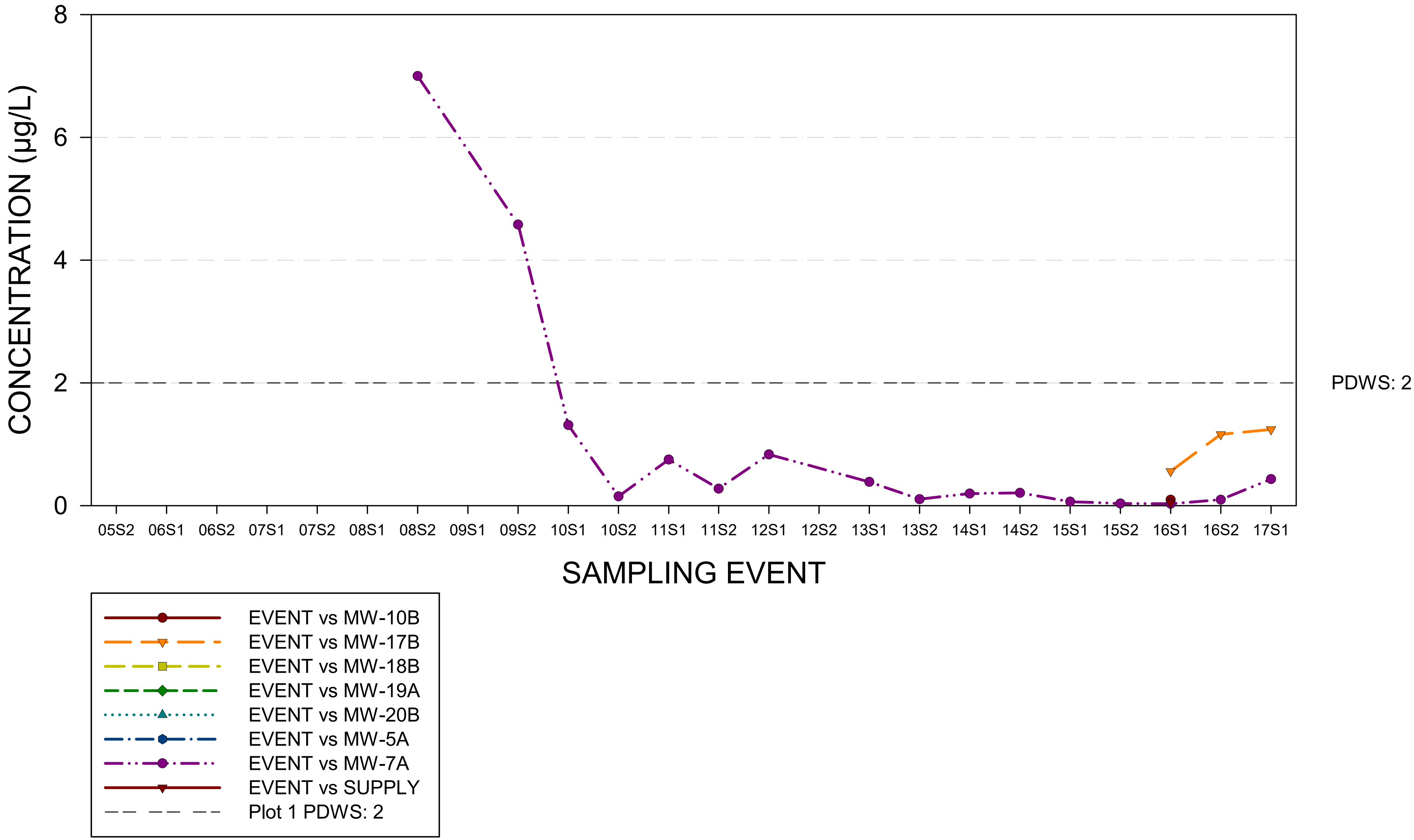
MERCURY

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



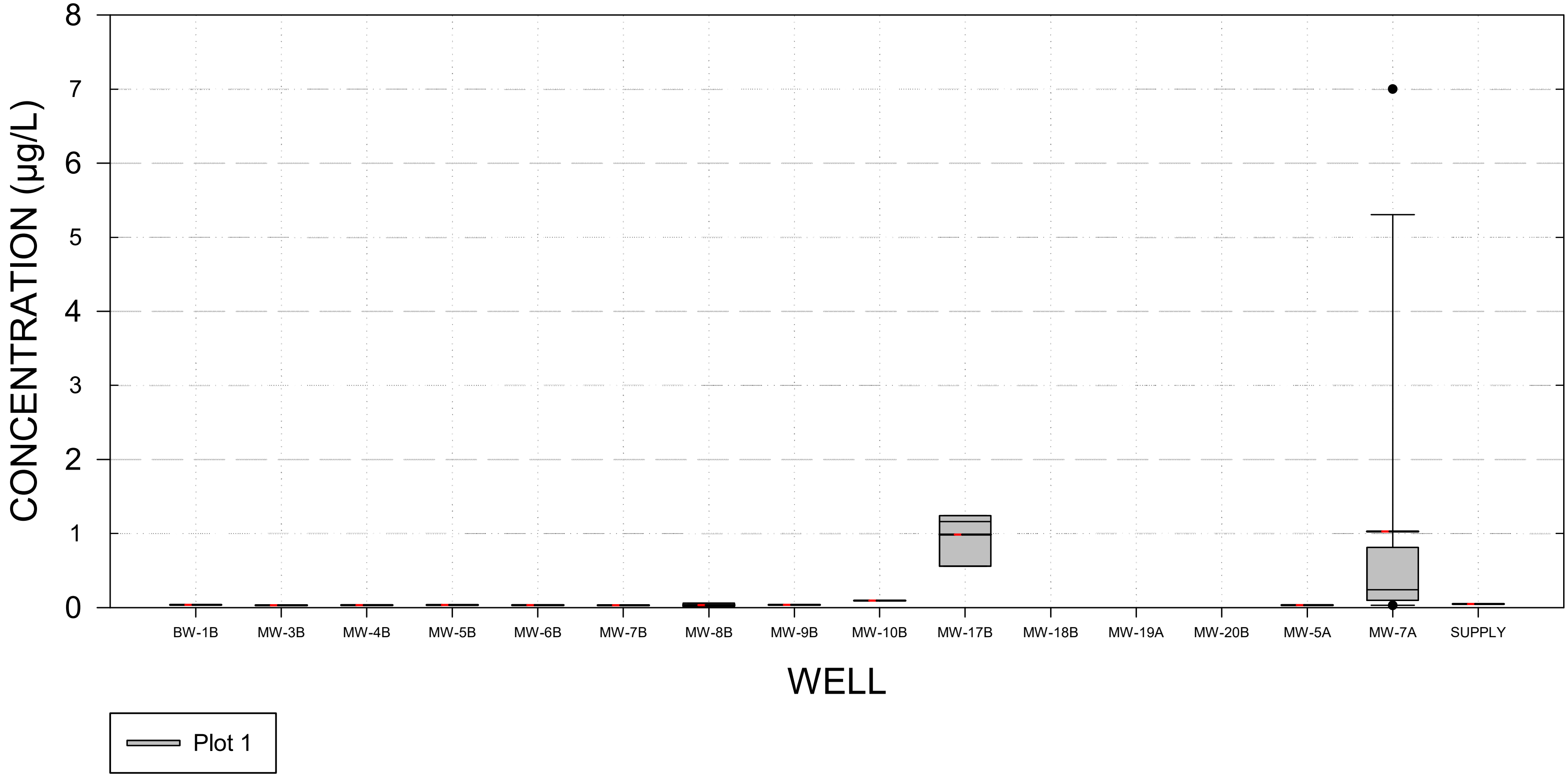
MERCURY

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



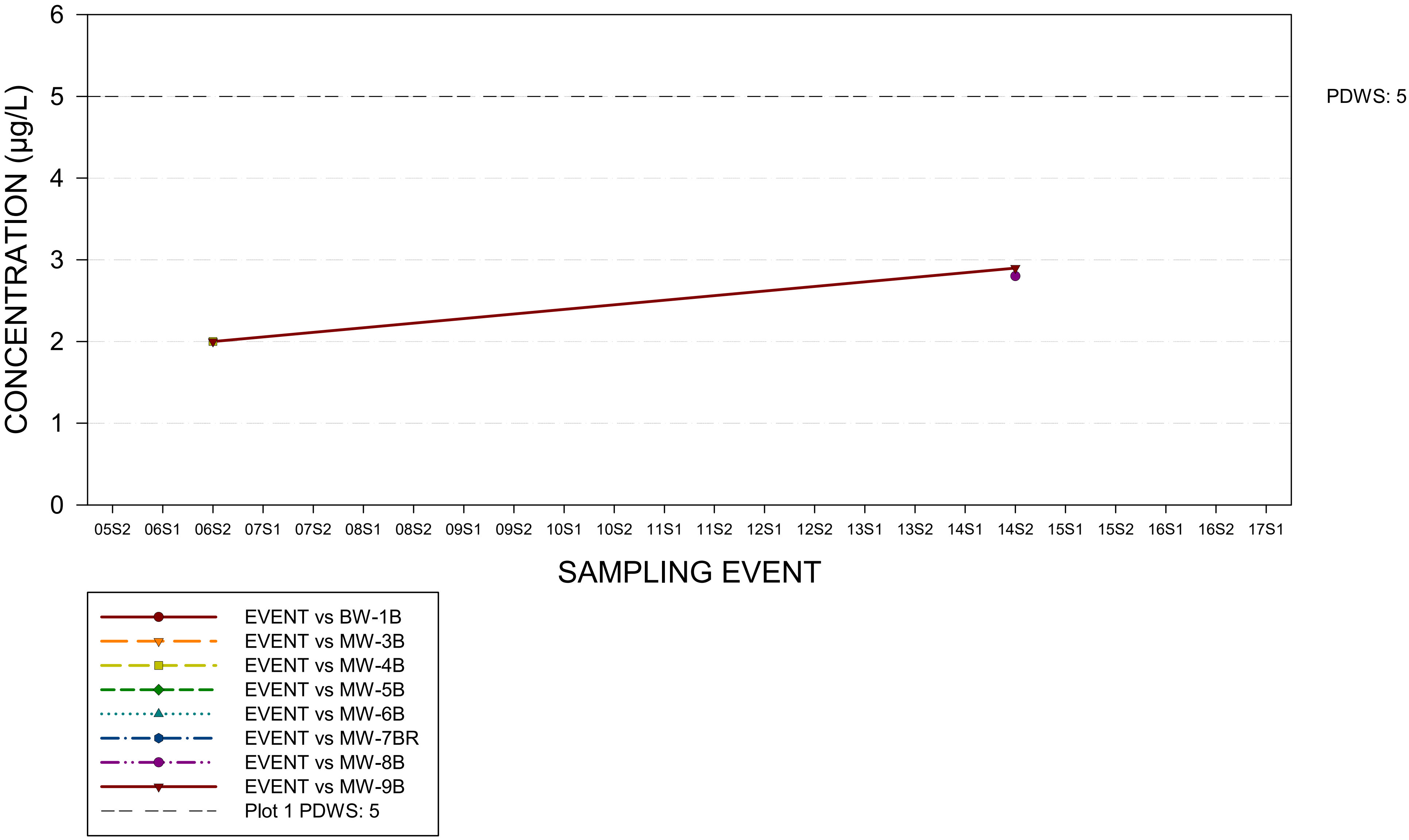
MERCURY

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



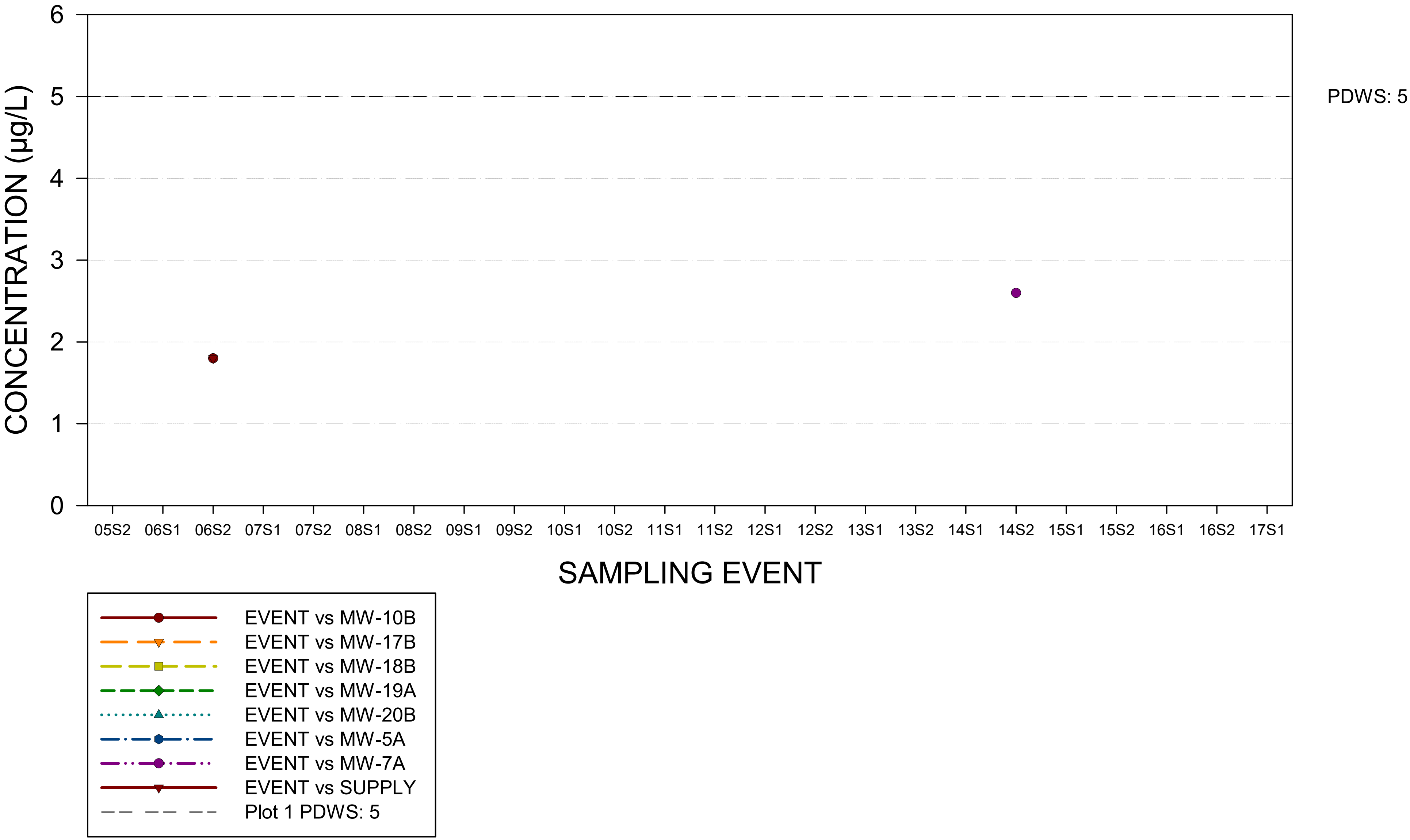
METHYLENE CHLORIDE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



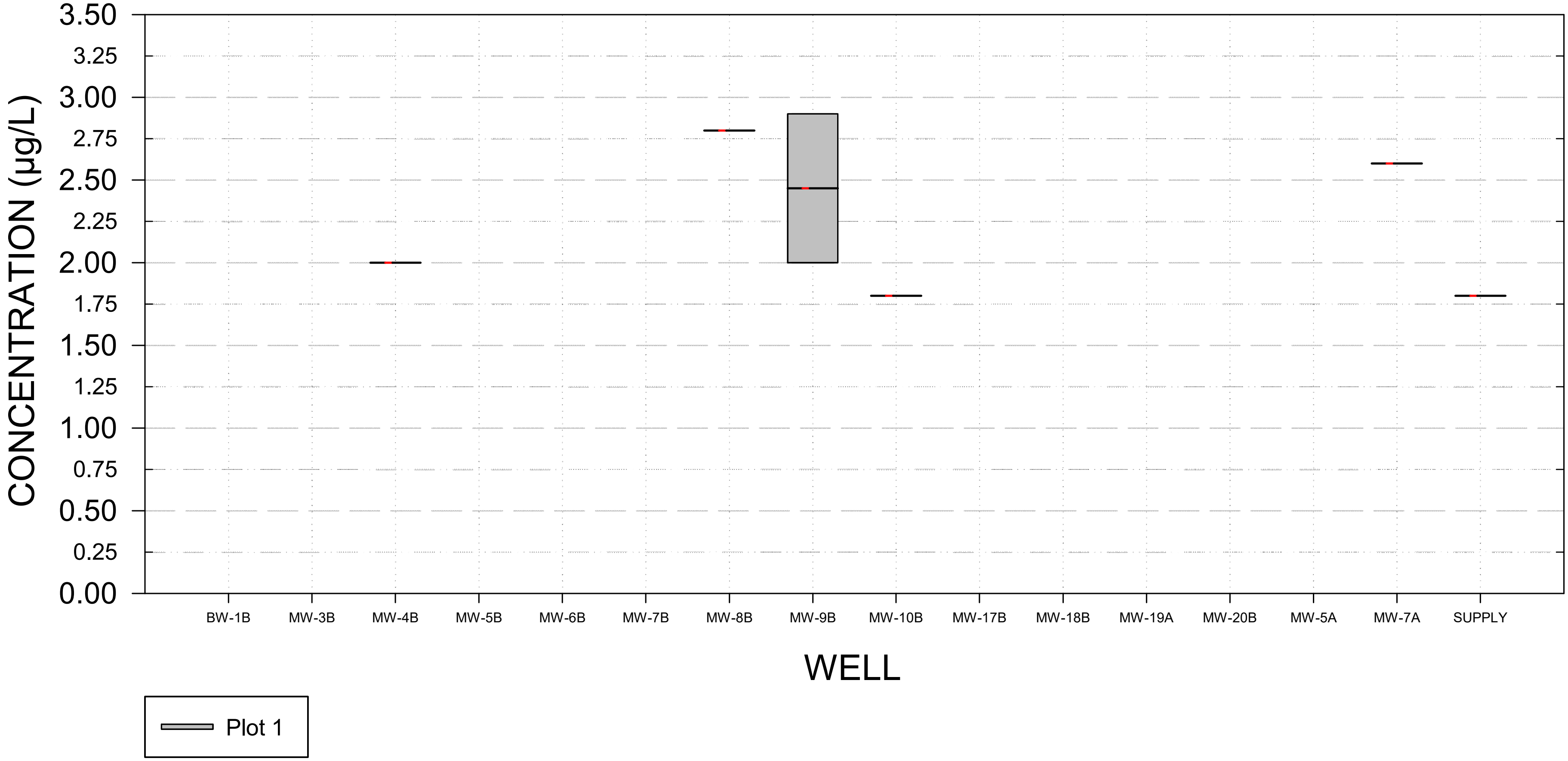
METHYLENE CHLORIDE

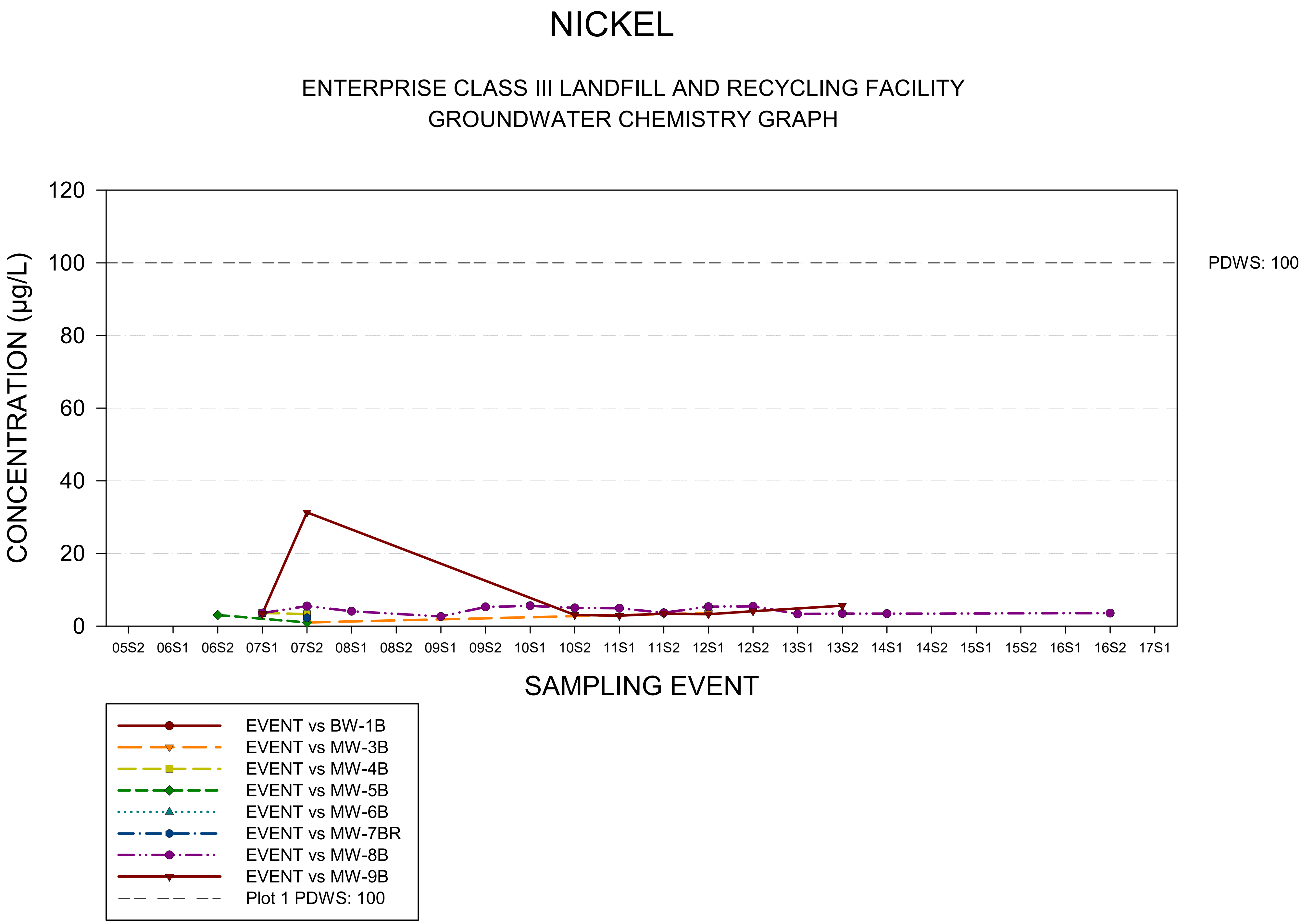
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

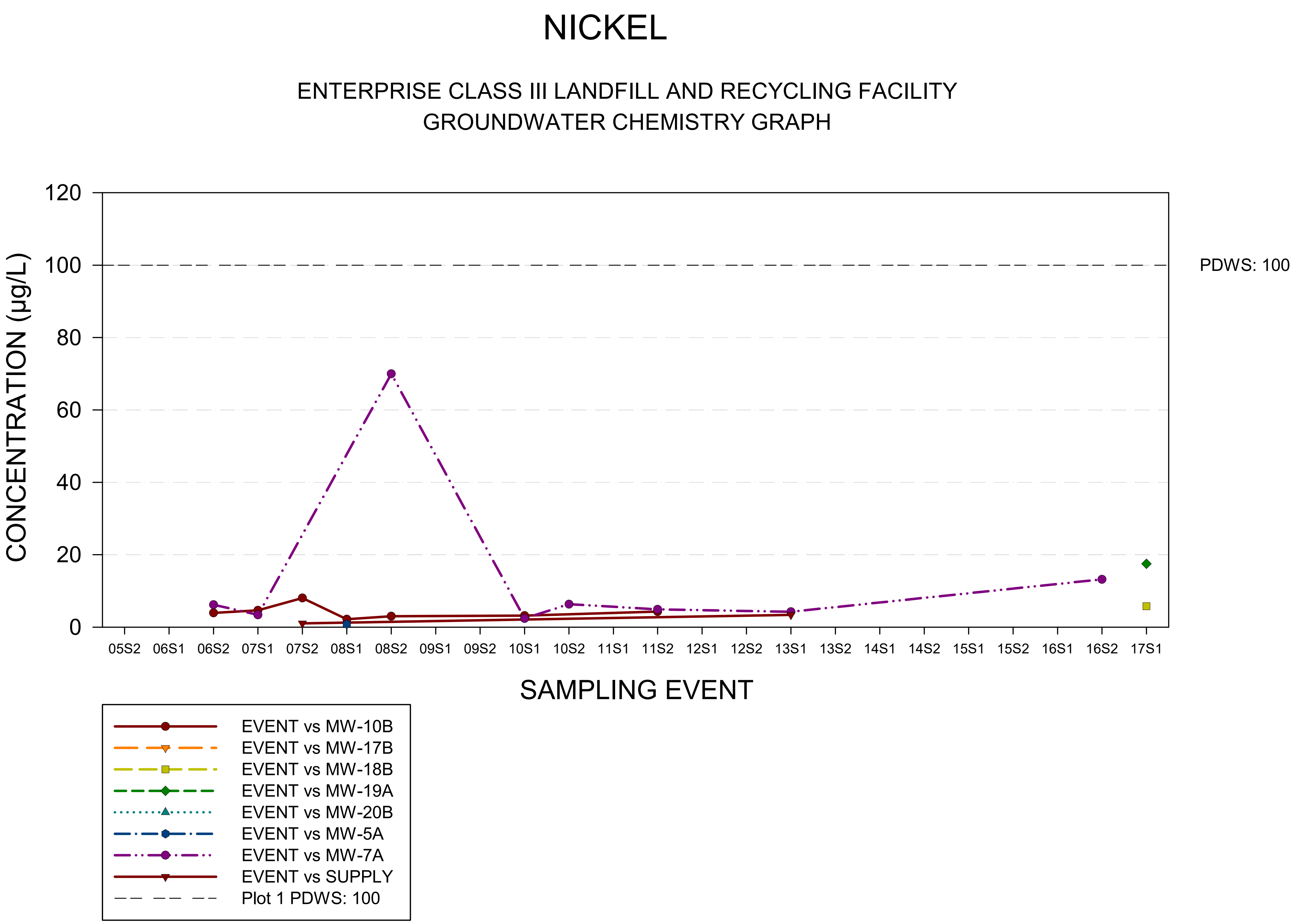


METHYLENE CHLORIDE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

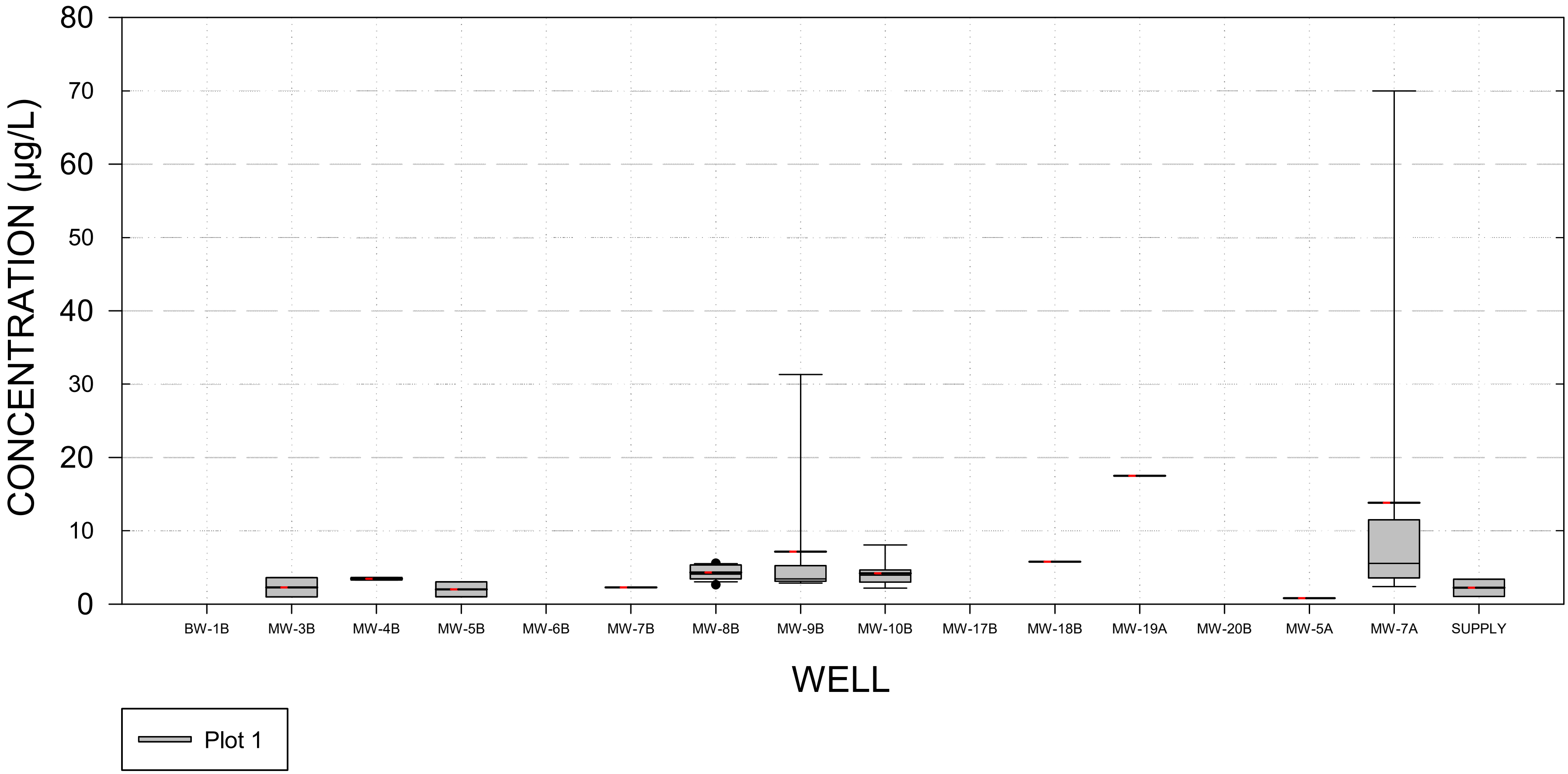



NICKEL
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
120
100
80
60
40
20
0
PDWS: 100
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 PDWS: 100


NICKEL
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
120
100
80
60
40
20
0
PDWS: 100
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 PDWS: 100

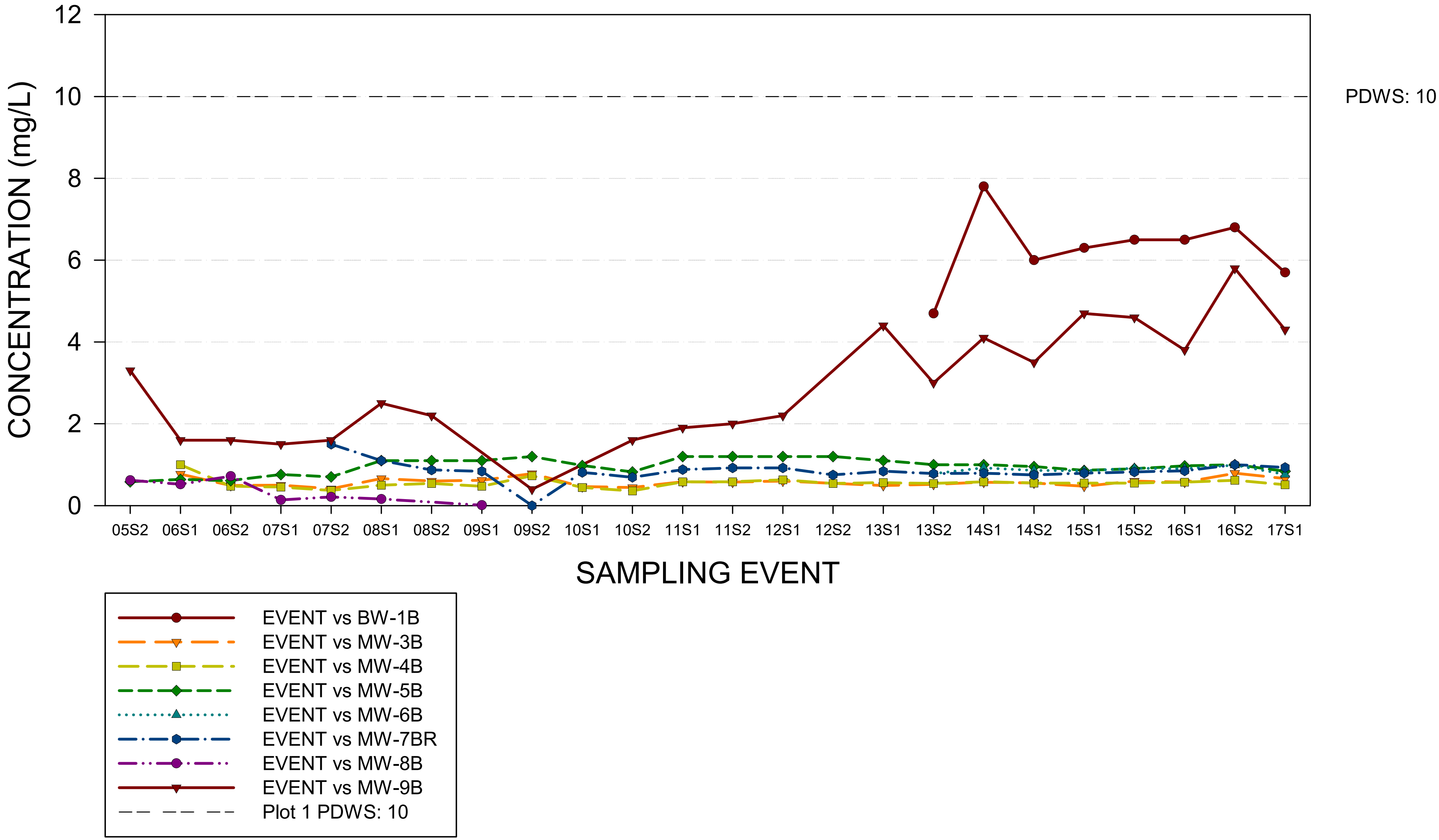
NICKEL

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



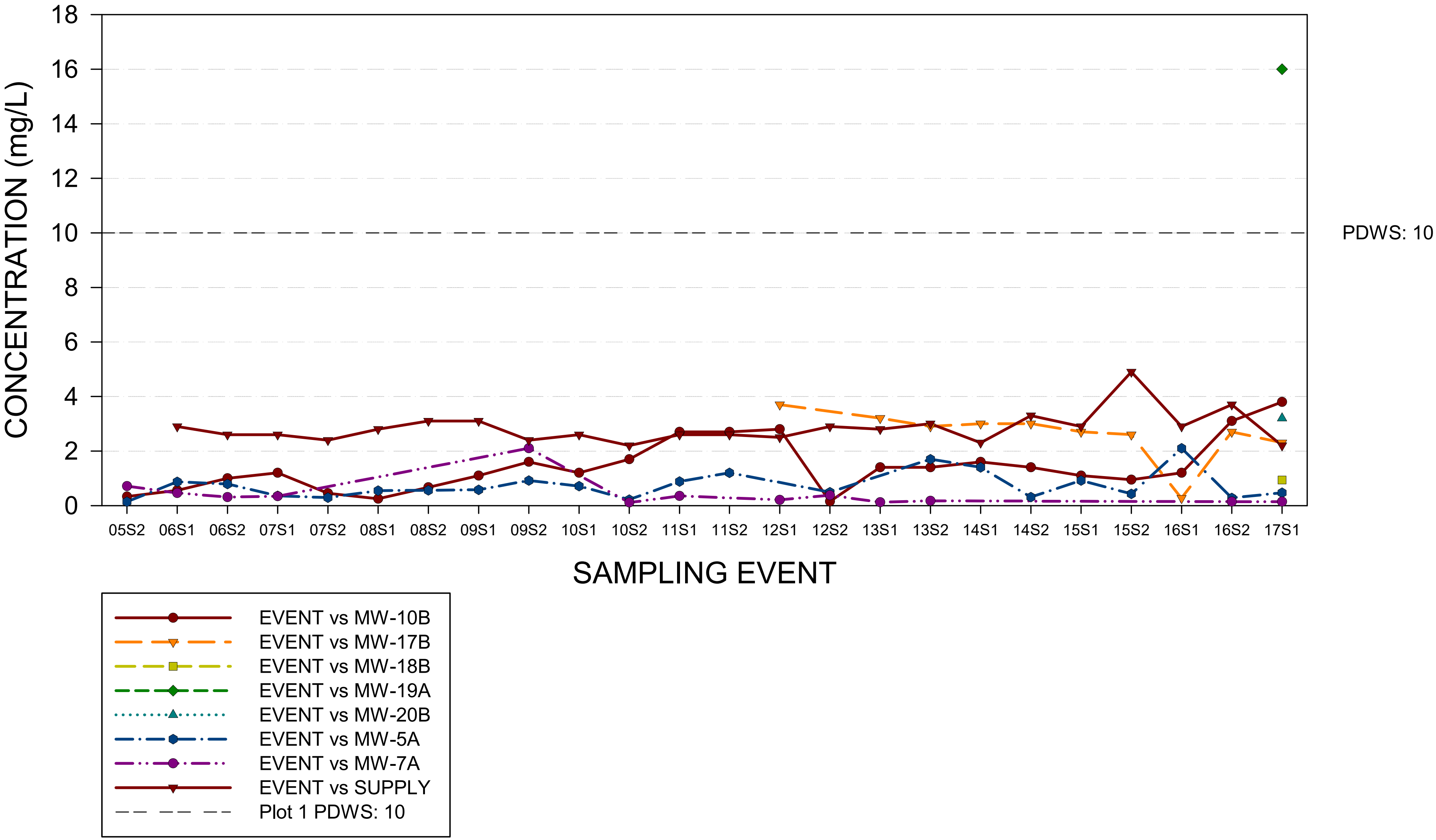
NITRATE AS NITROGEN

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



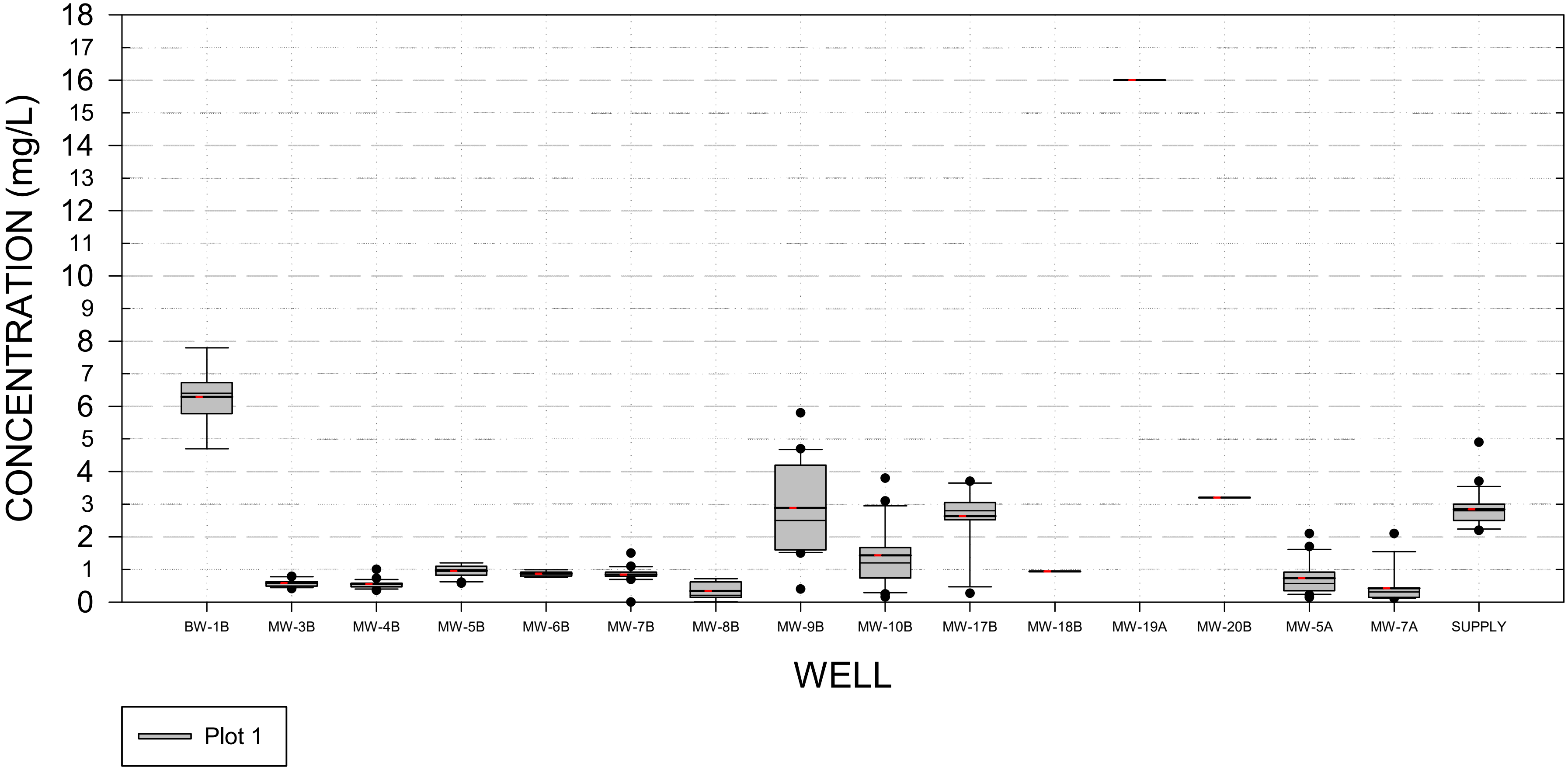
NITRATE AS NITROGEN

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



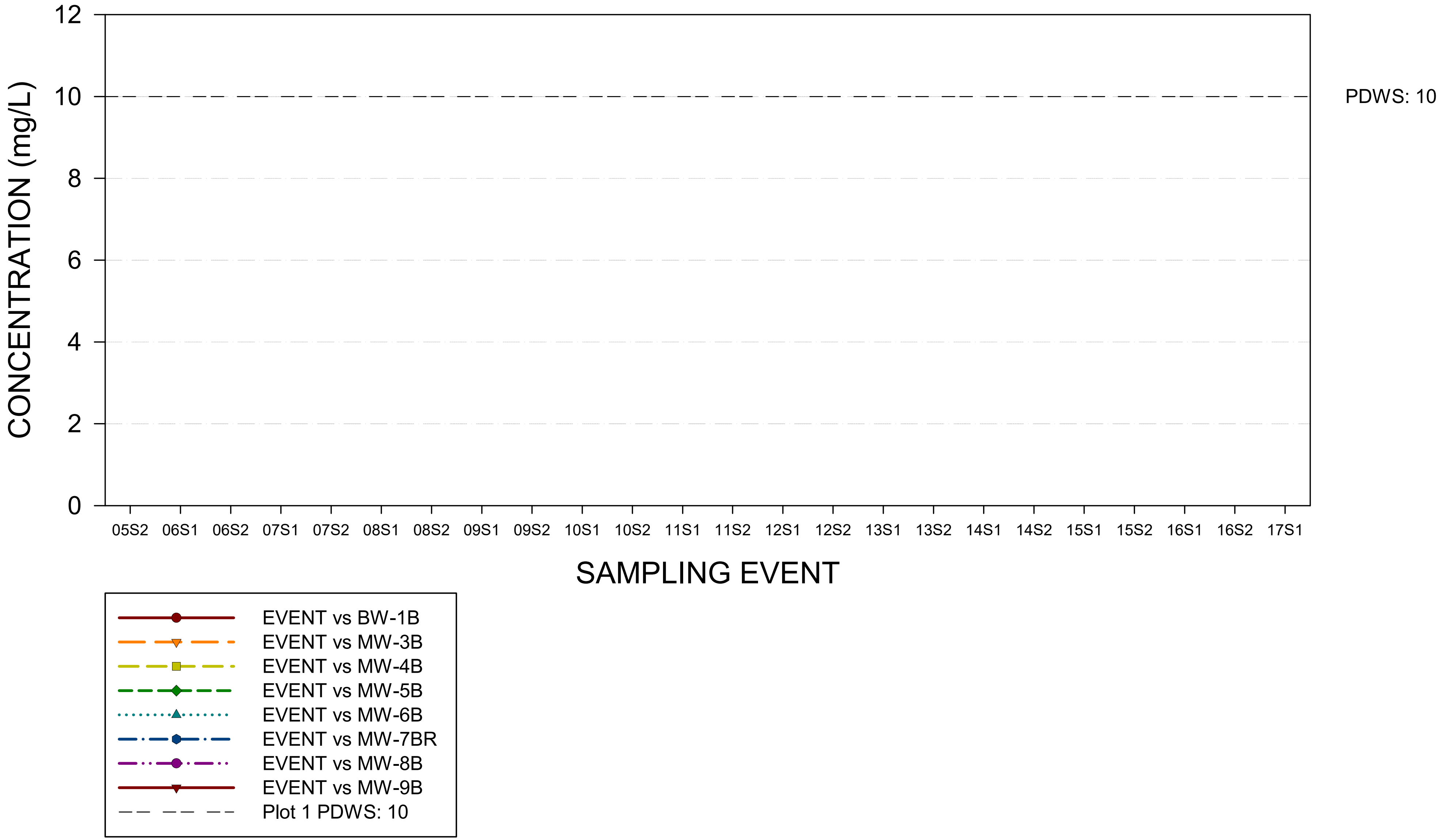
NITRATE AS NITROGEN

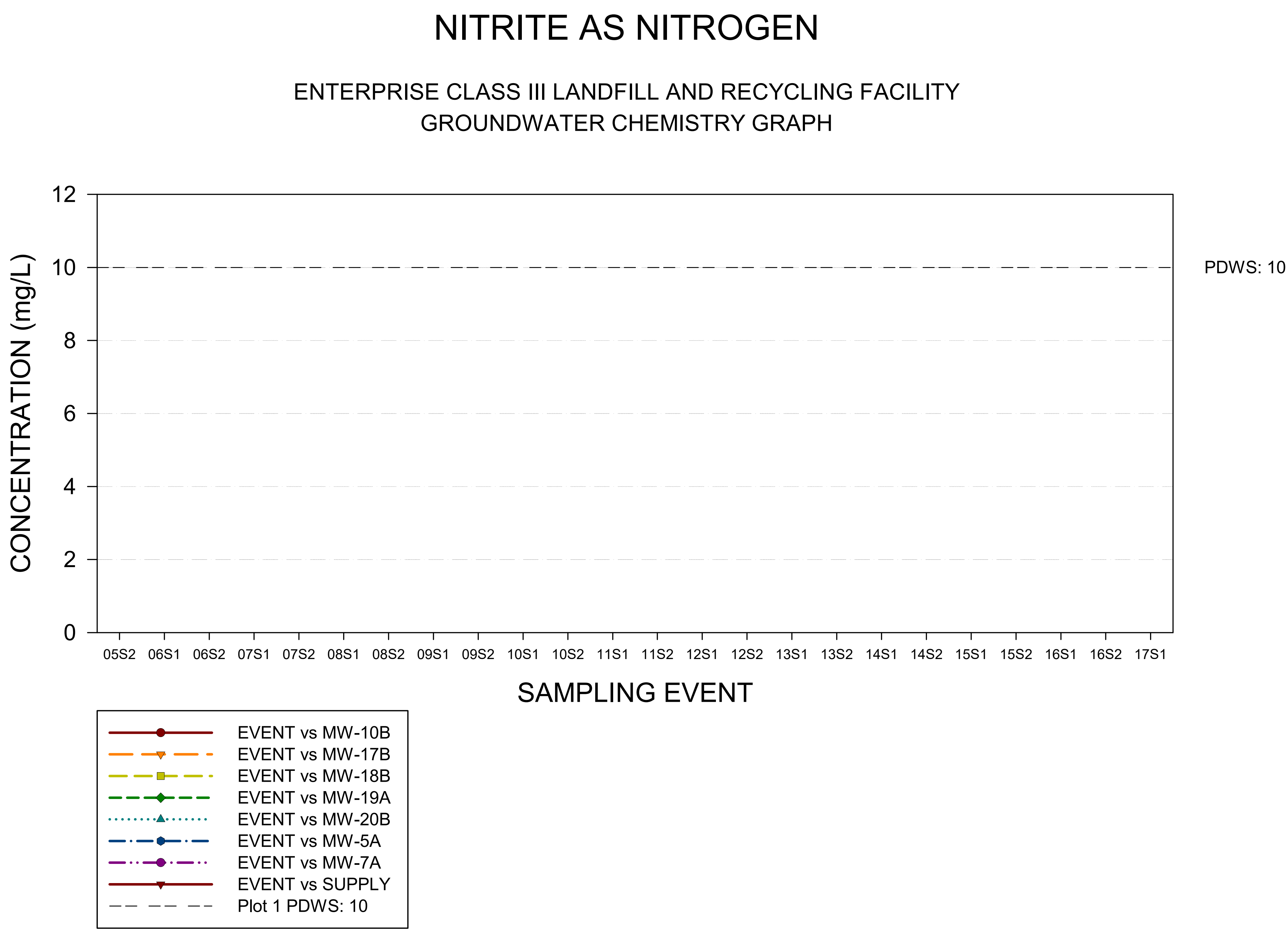
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



NITRITE AS NITROGEN

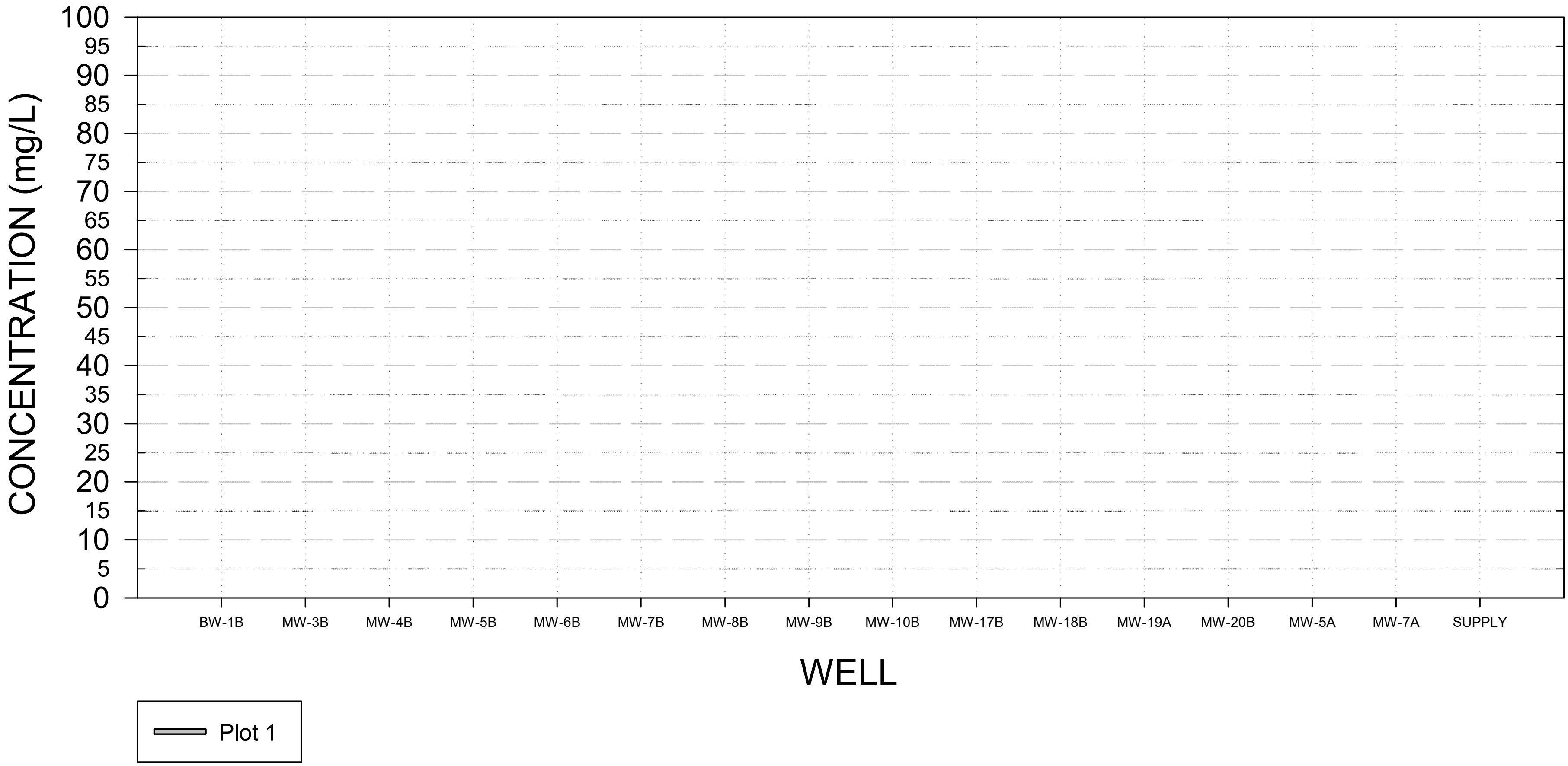
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH




NITRITE AS NITROGEN
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (mg/L)
0
2
4
6
8
10
12
PDWS: 10
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 PDWS: 10

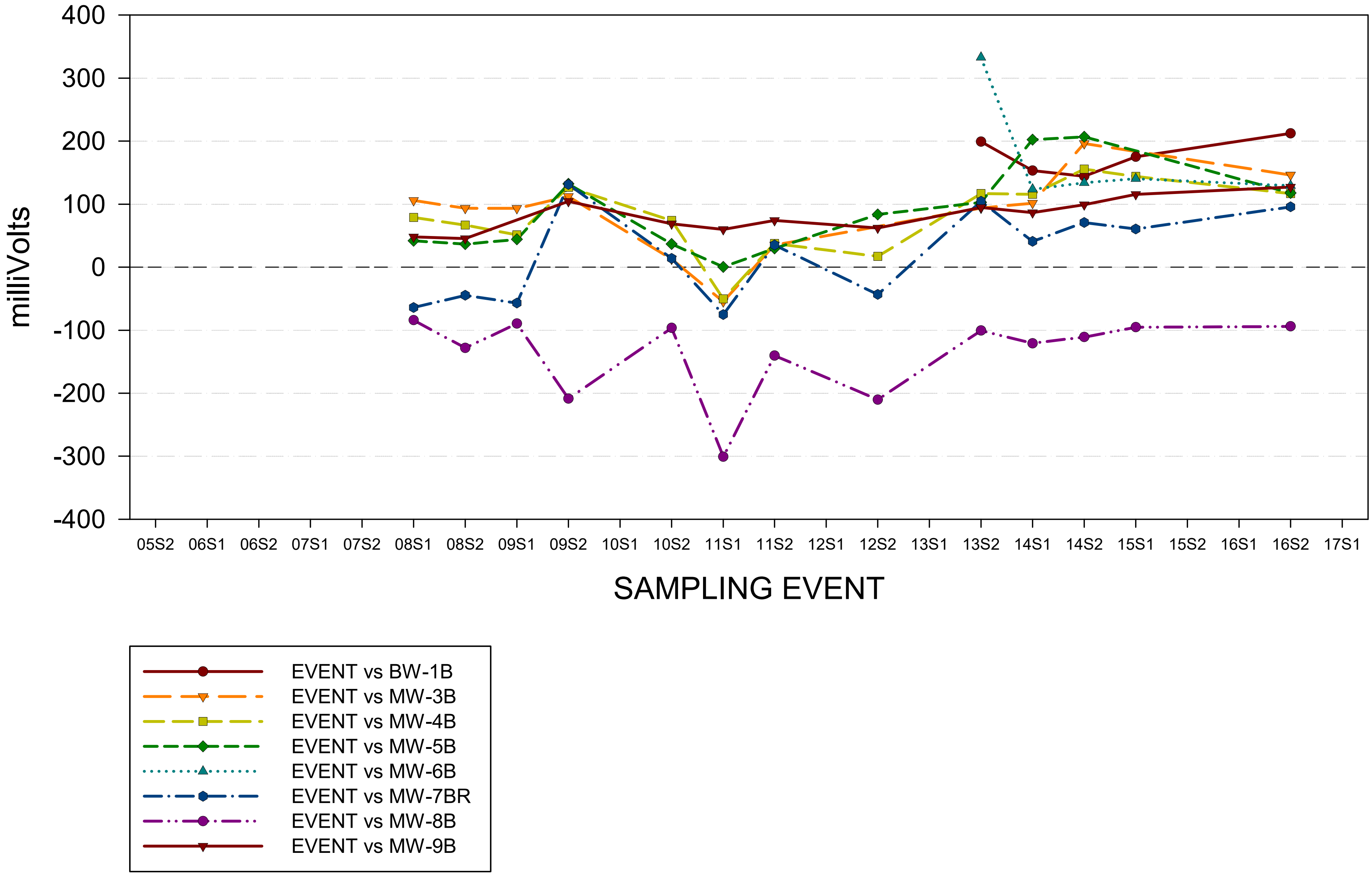
NITRITE AS NITROGEN

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



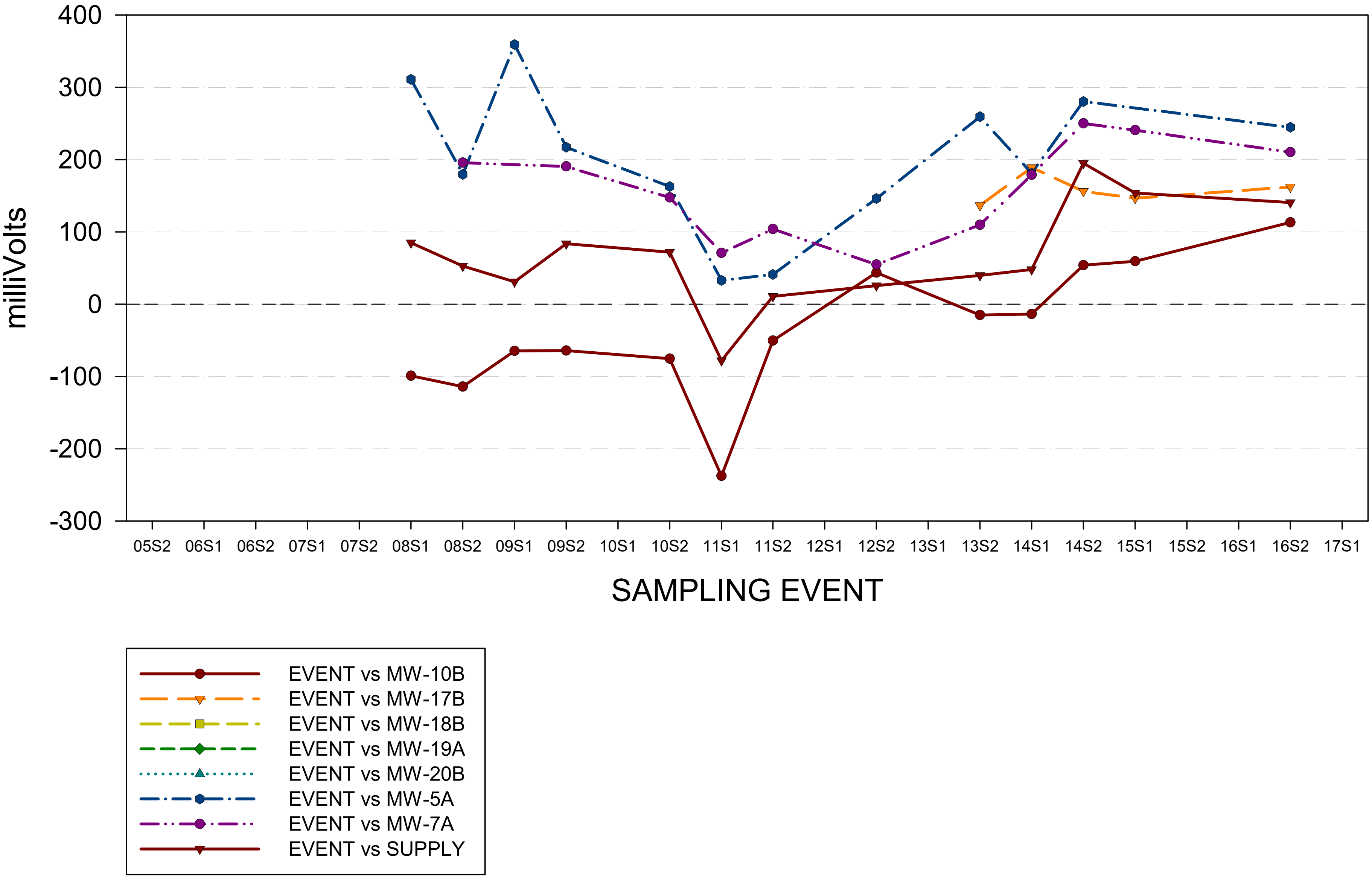
OXIDATION / REDUCTION POTENTIAL

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



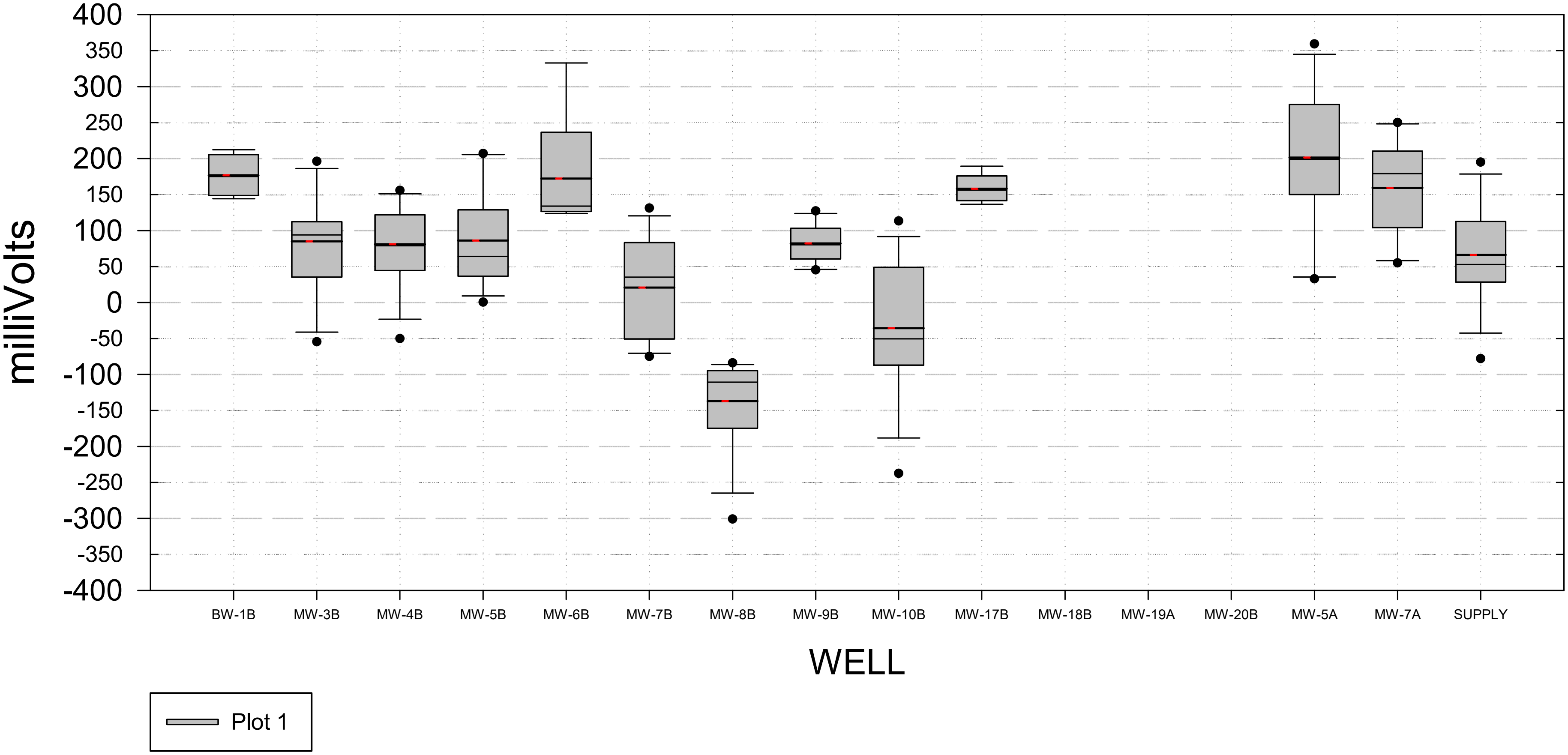
OXIDATION / REDUCTION POTENTIAL

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



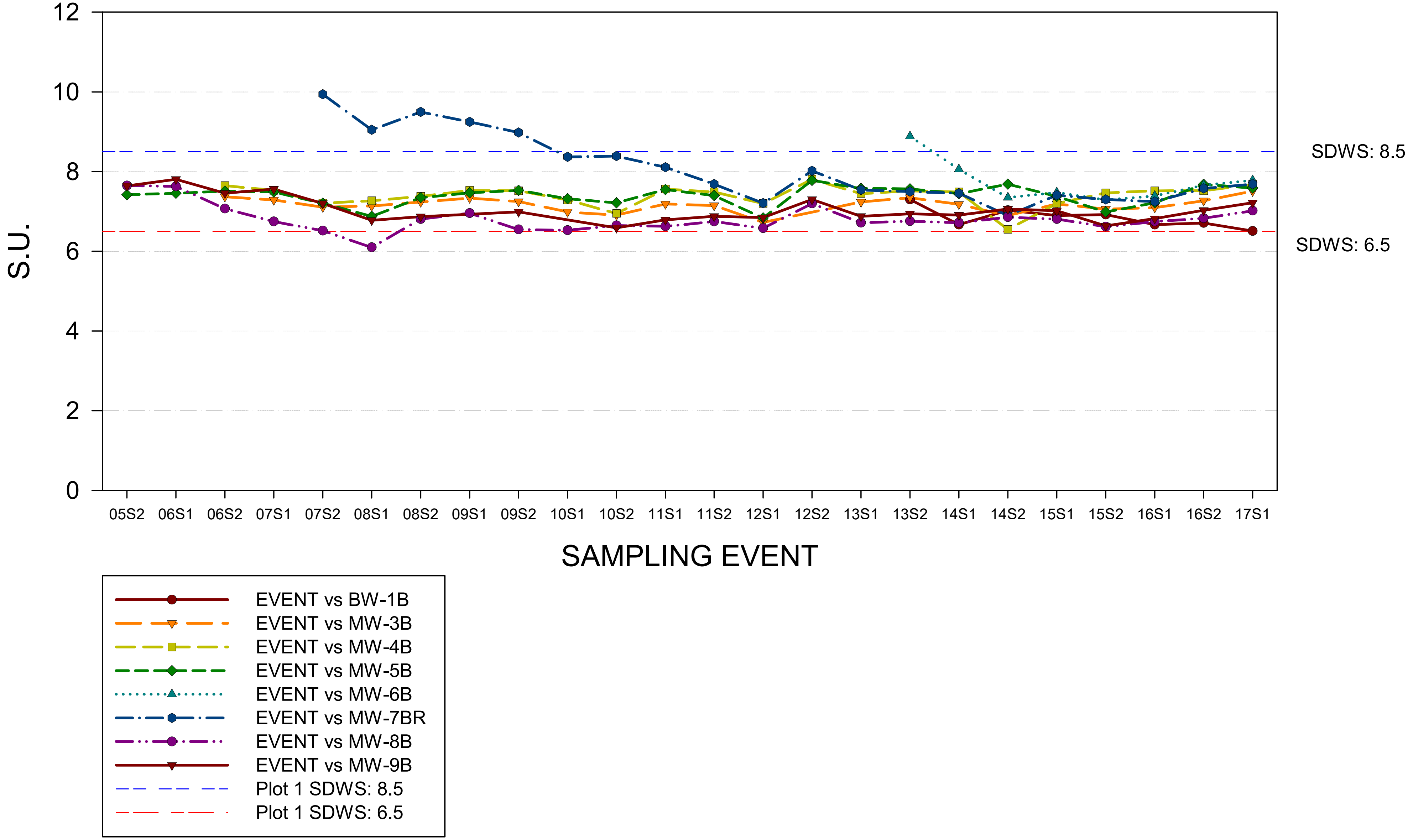
OXIDATION / REDUCTION POTENTIAL

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



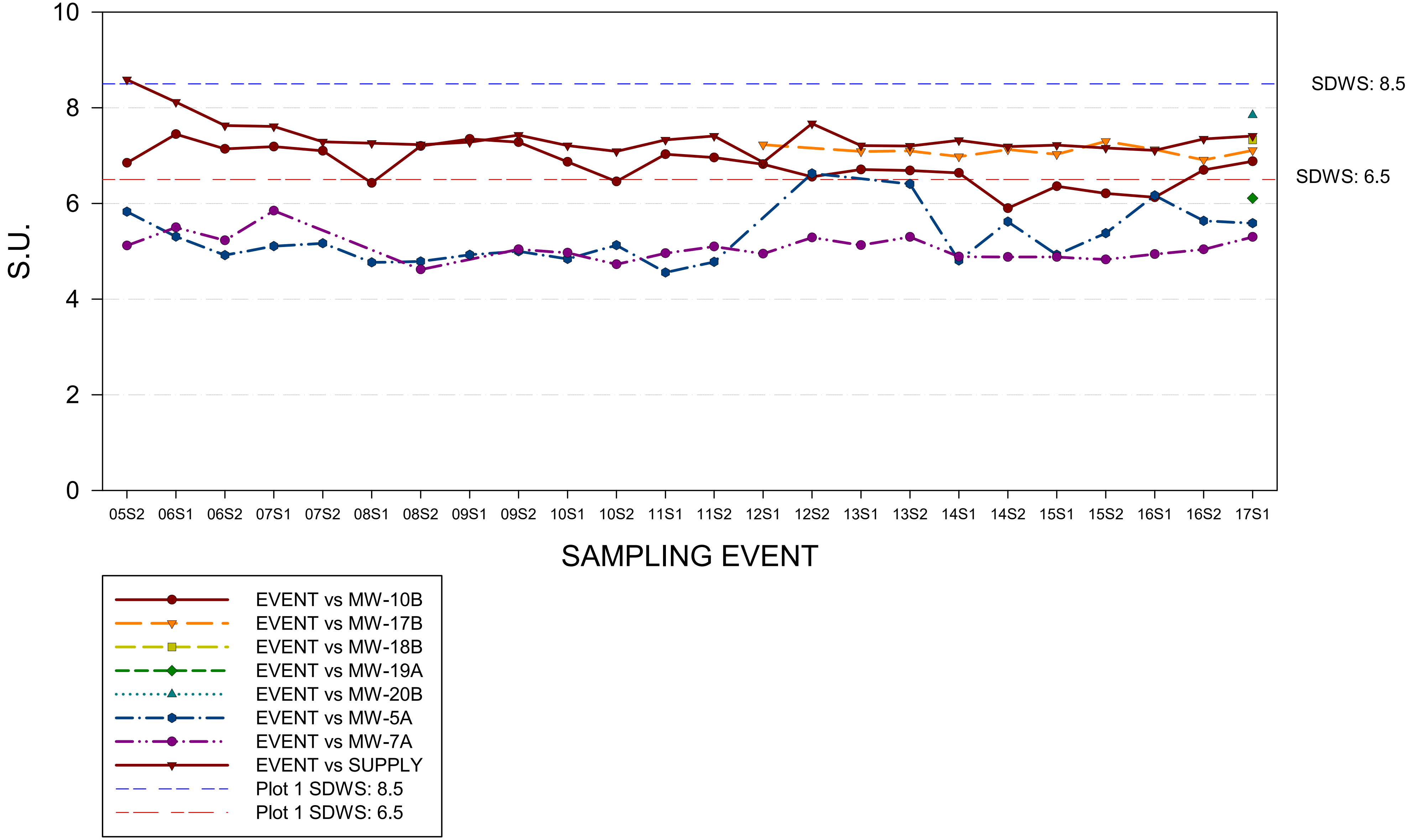
PH

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



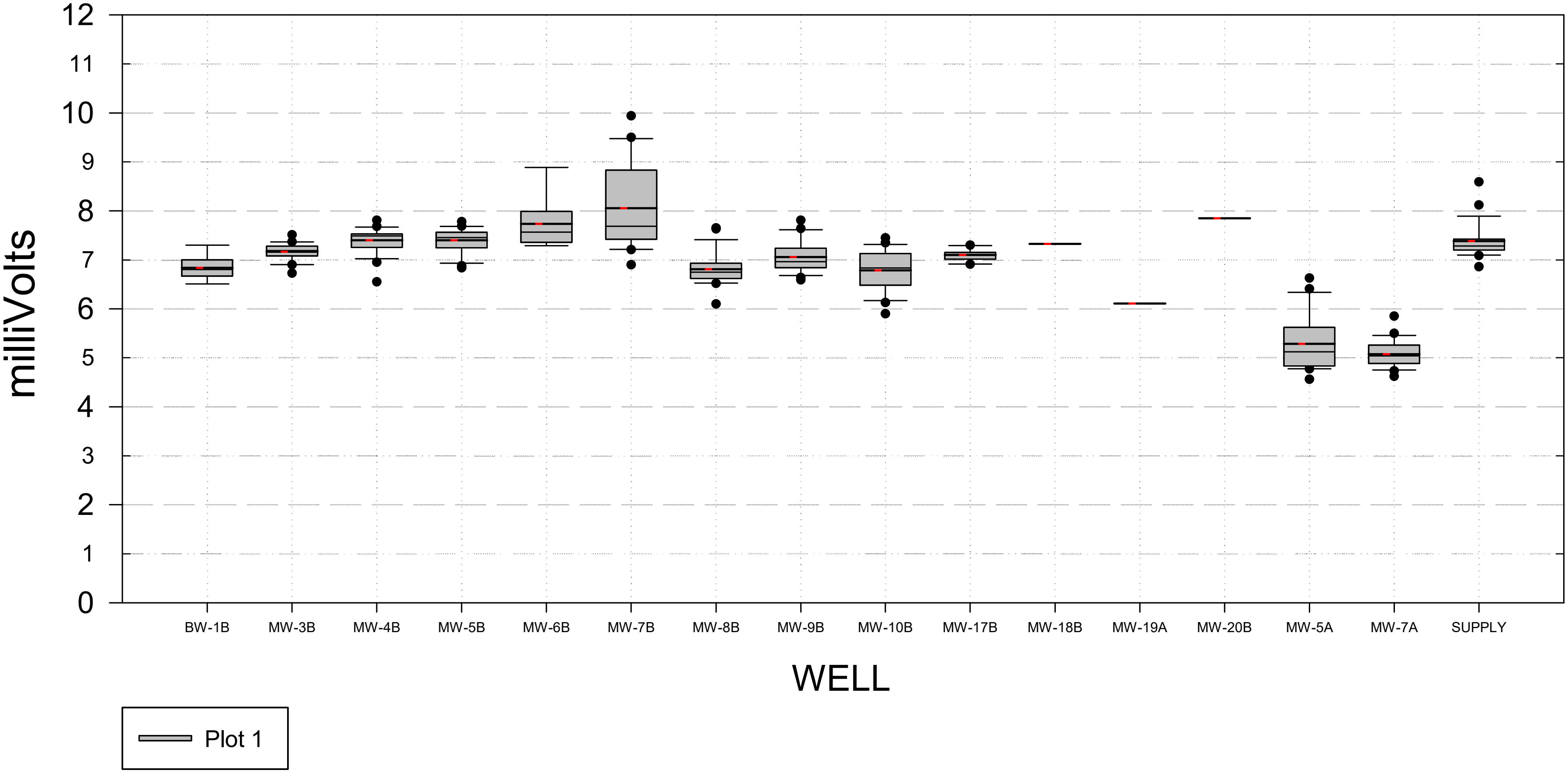
PH

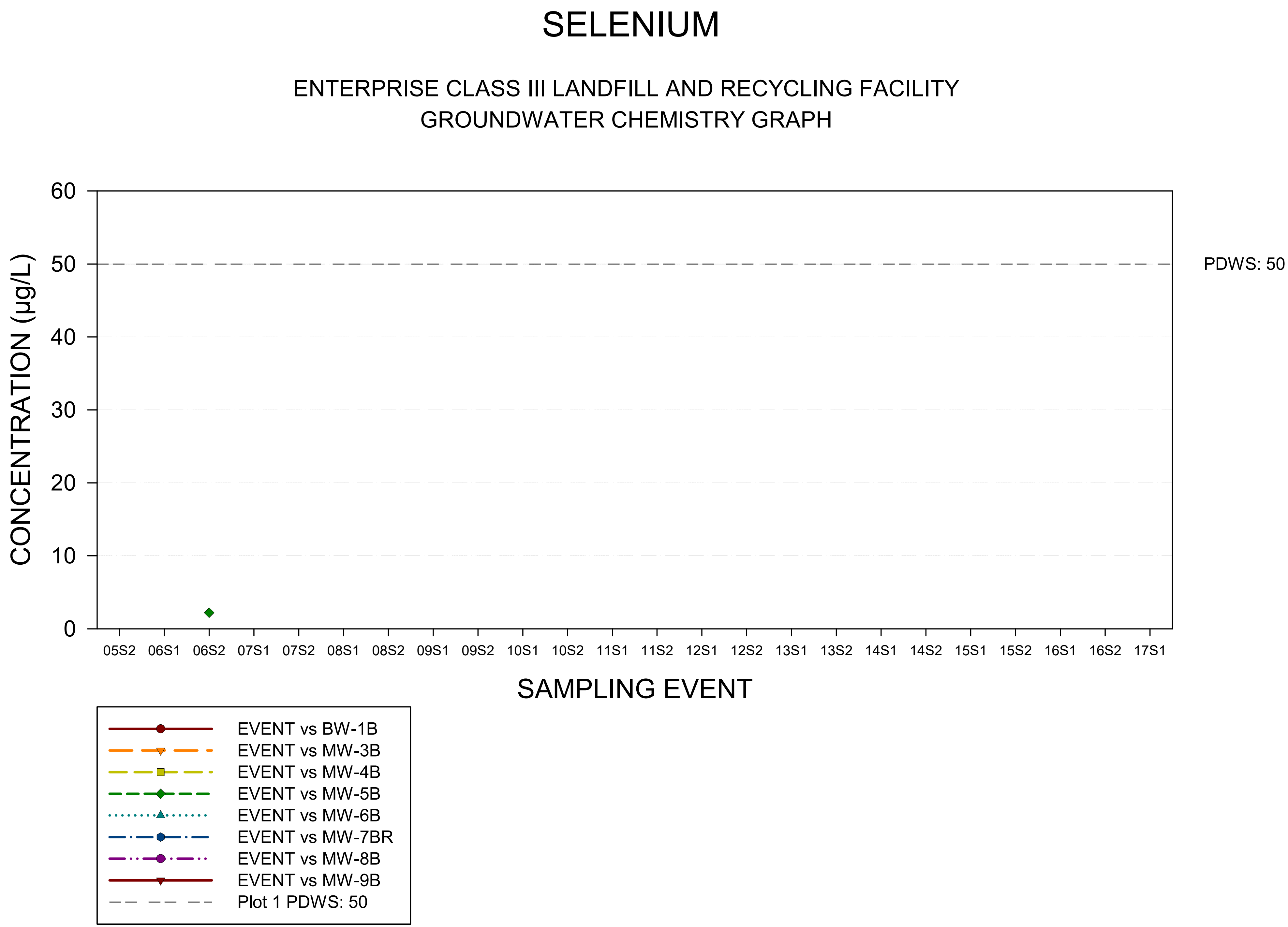
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



PH

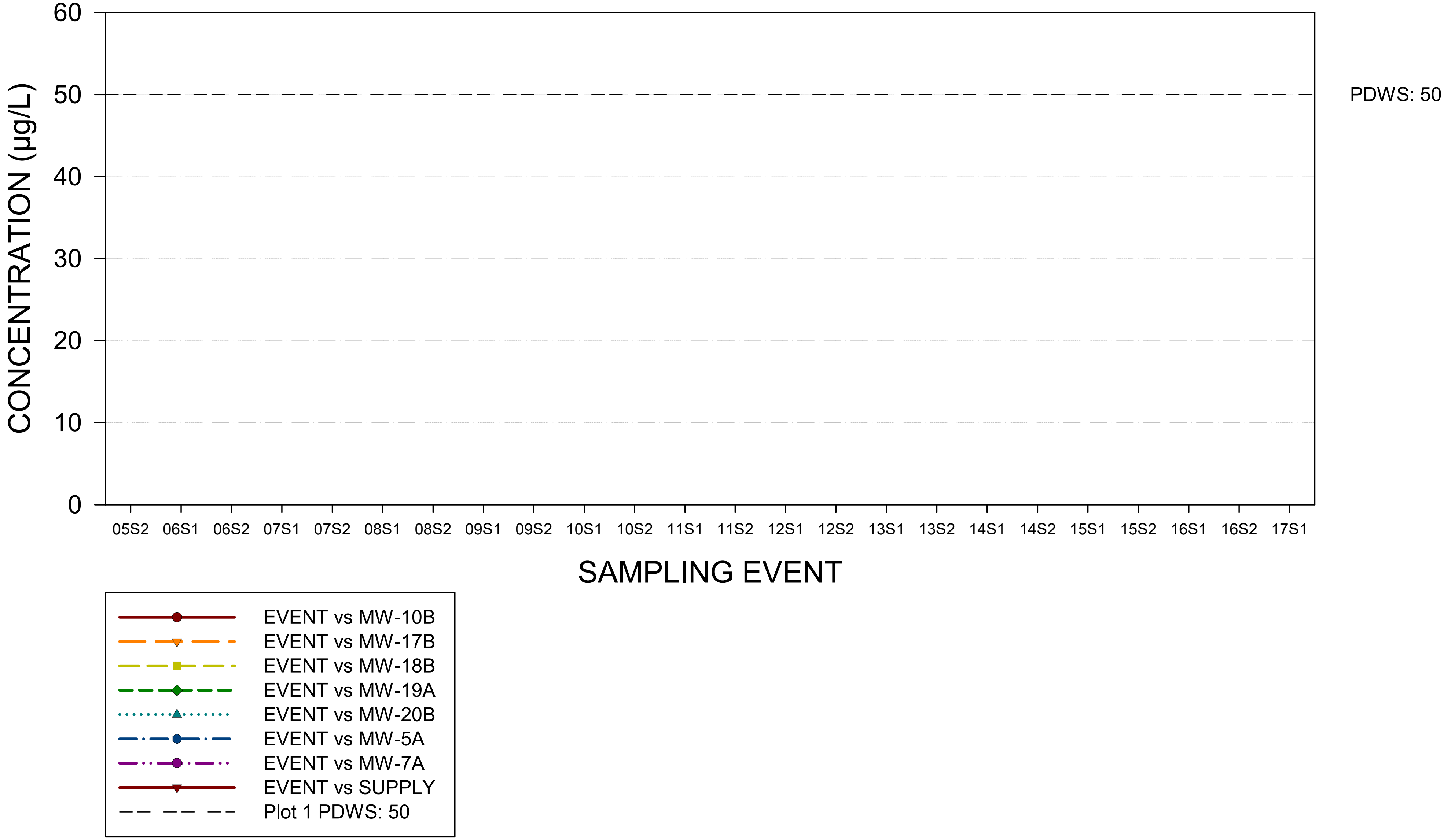
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH




SELENIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
60
50
40
30
20
10
0
PDWS: 50
05S2 06S1 06S2 07S1 07S2 08S1 08S2 09S1 09S2 10S1 10S2 11S1 11S2 12S1 12S2 13S1 13S2 14S1 14S2 15S1 15S2 16S1 16S2 17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 PDWS: 50

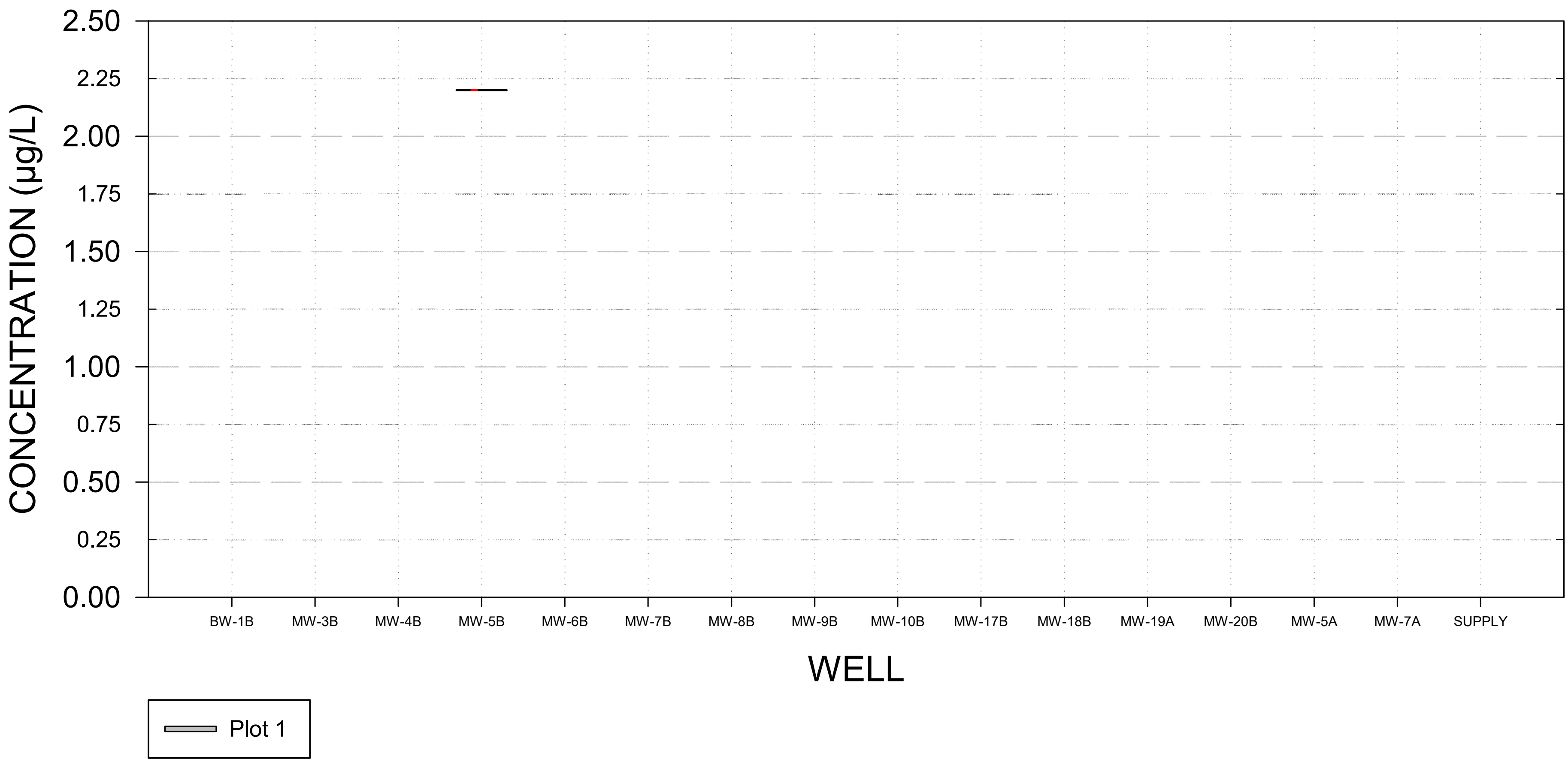
SELENIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



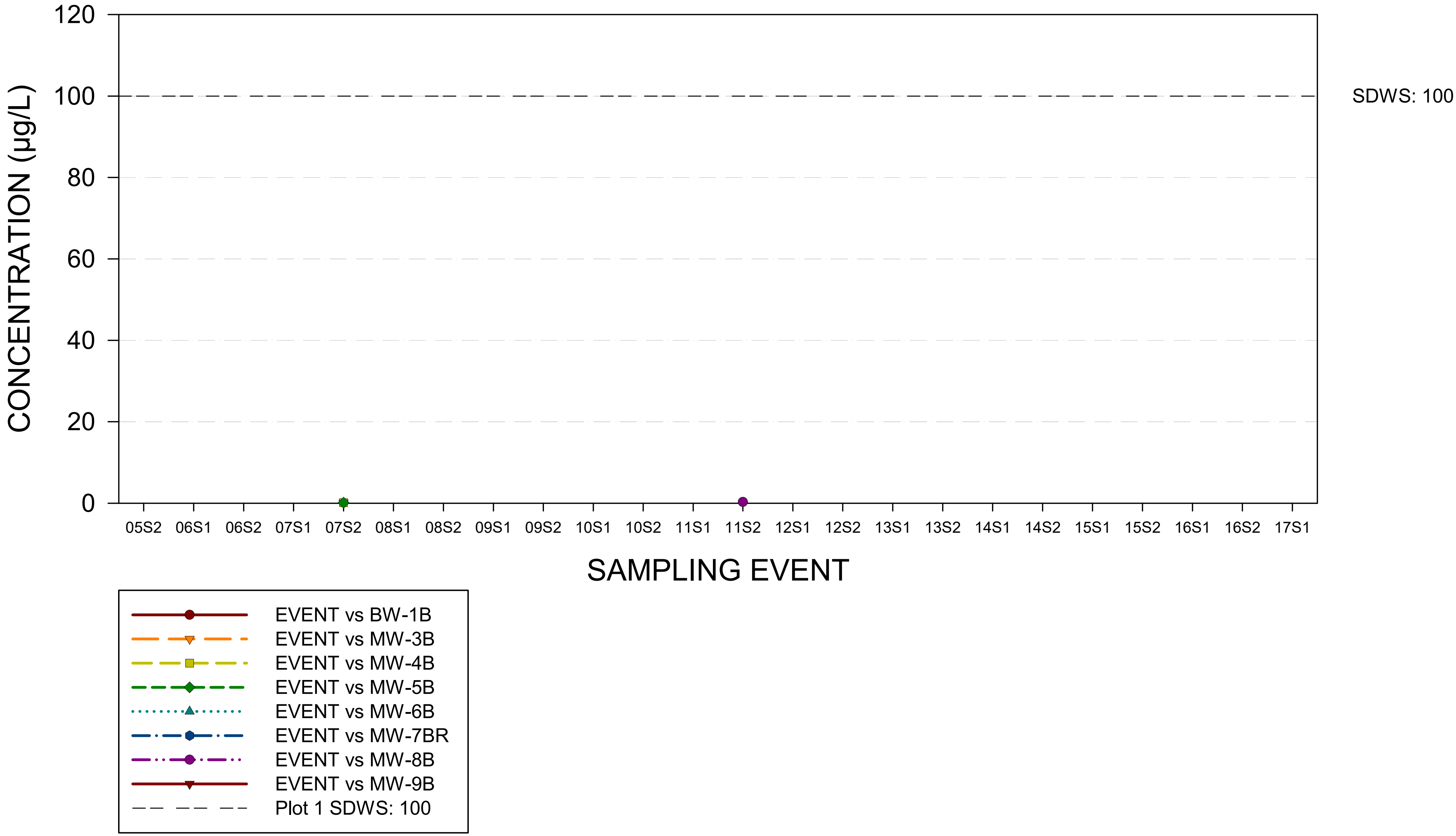
SELENIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



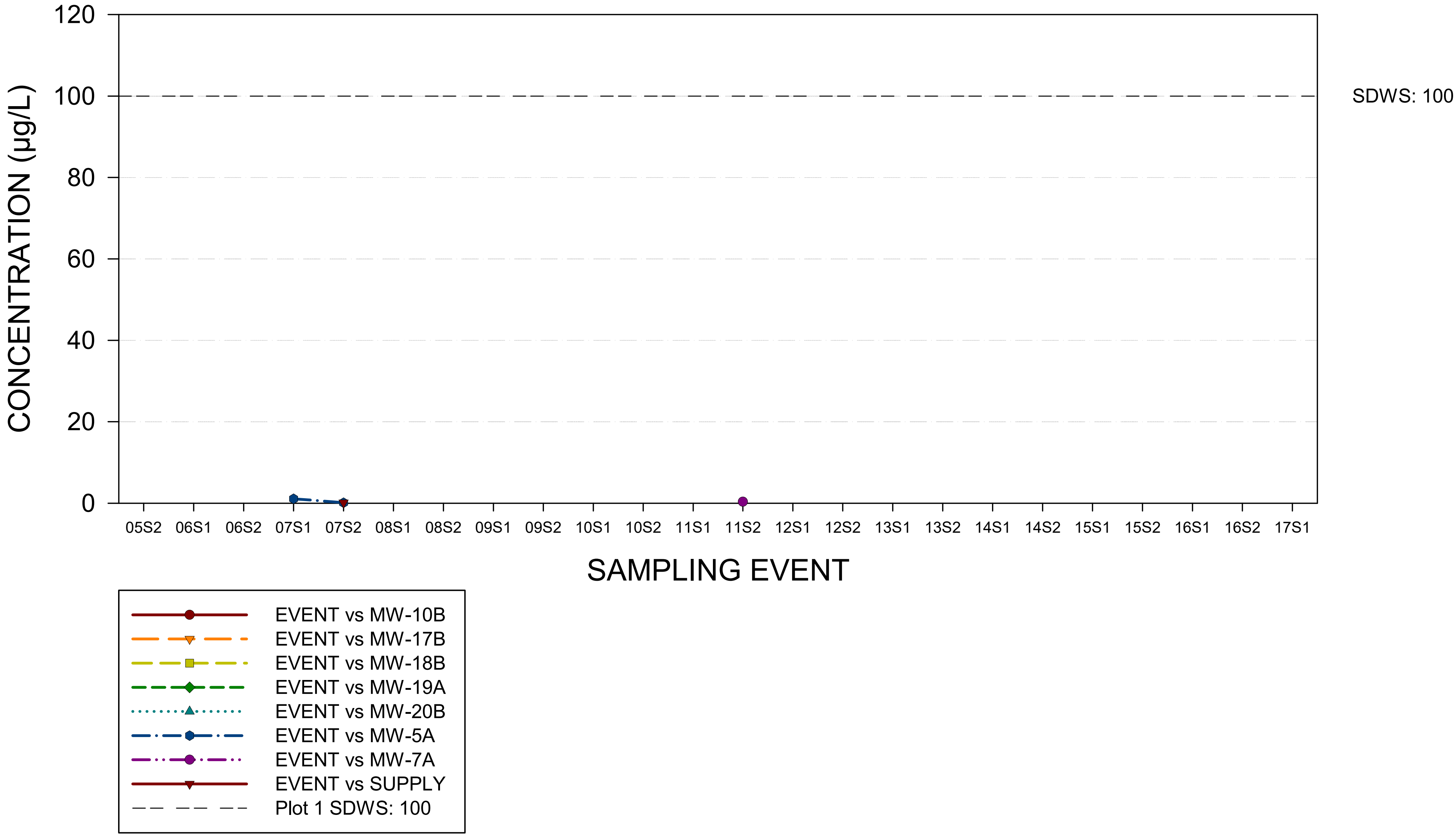
SILVER

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



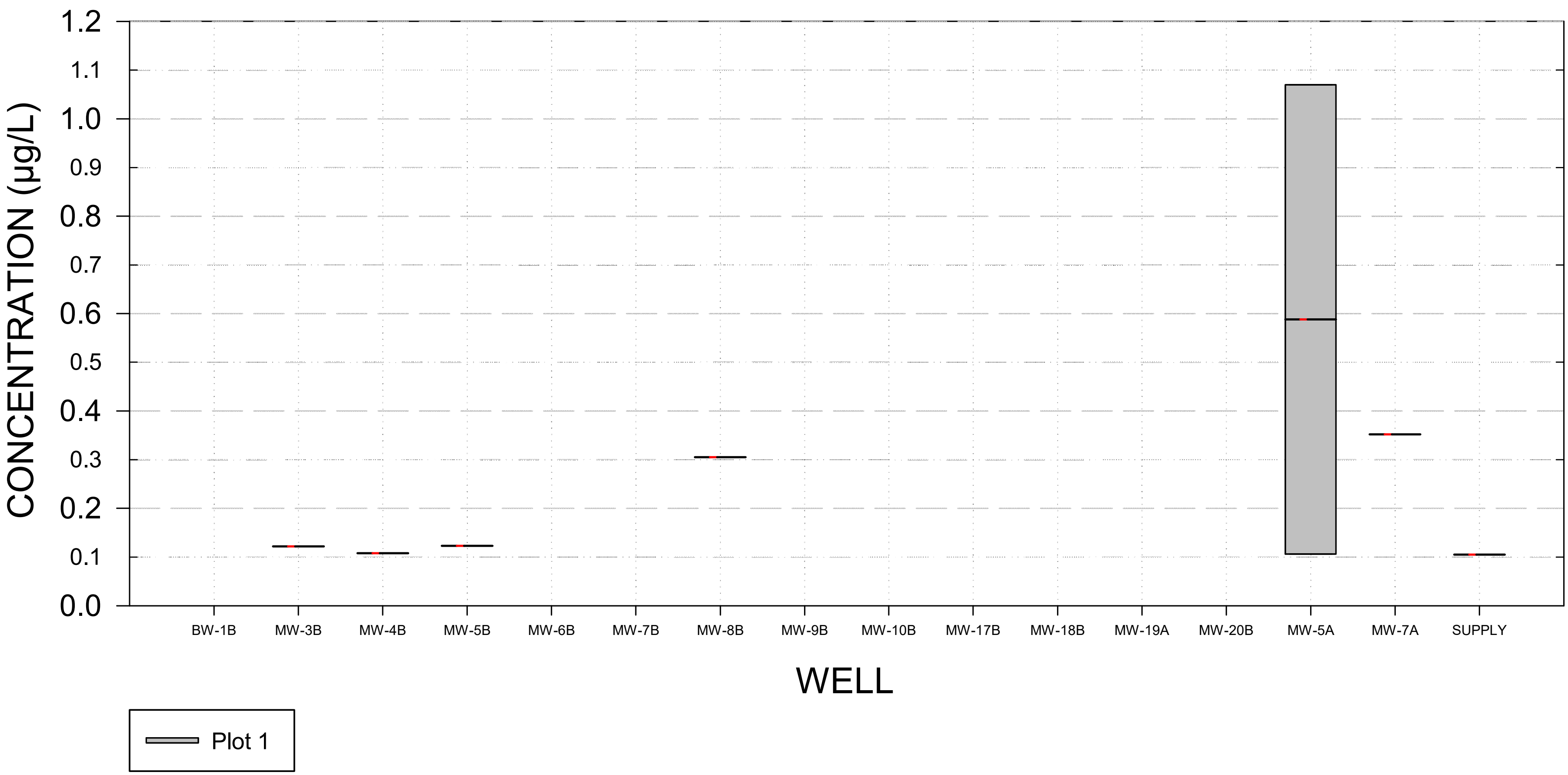
SILVER

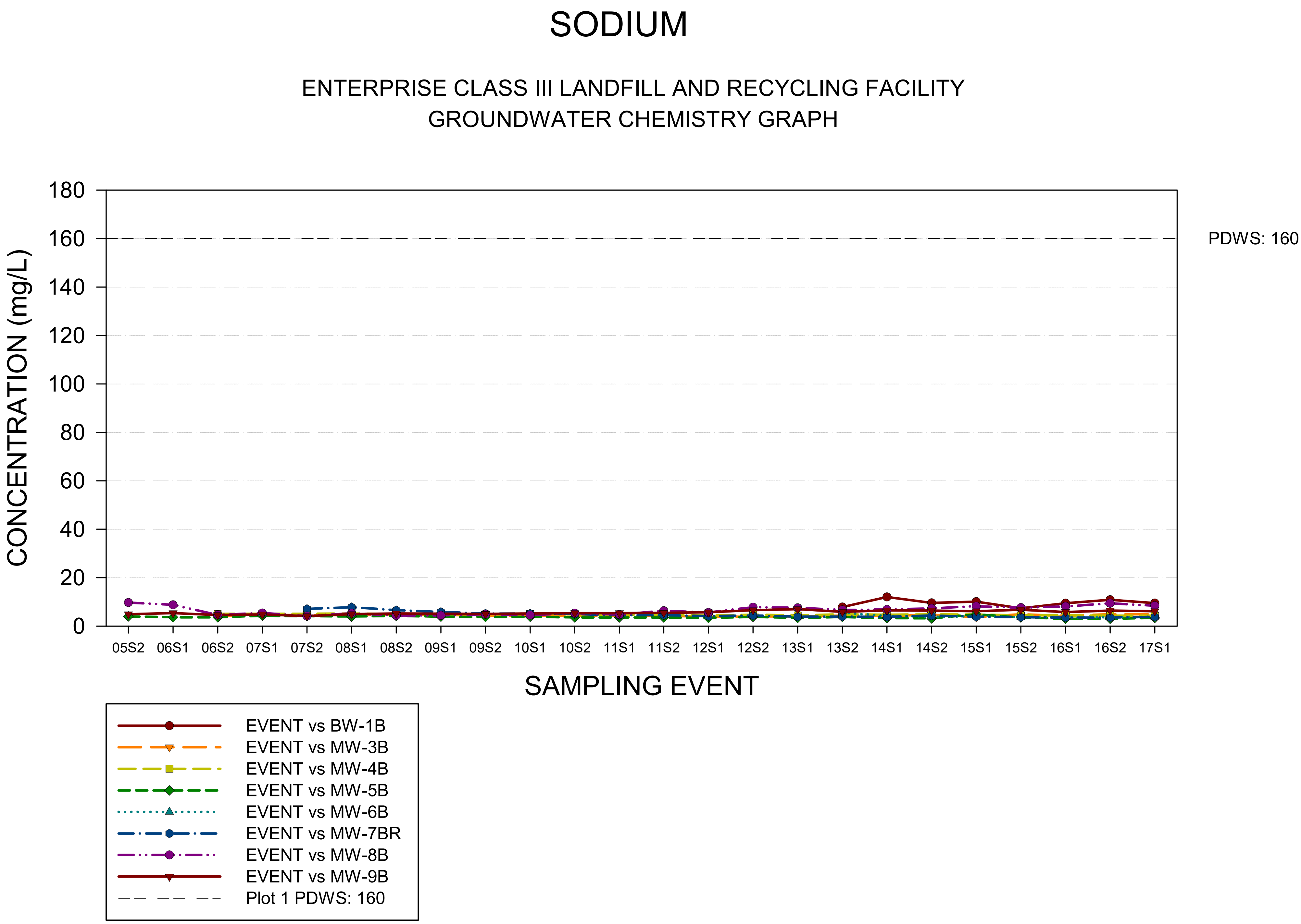
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



SILVER

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

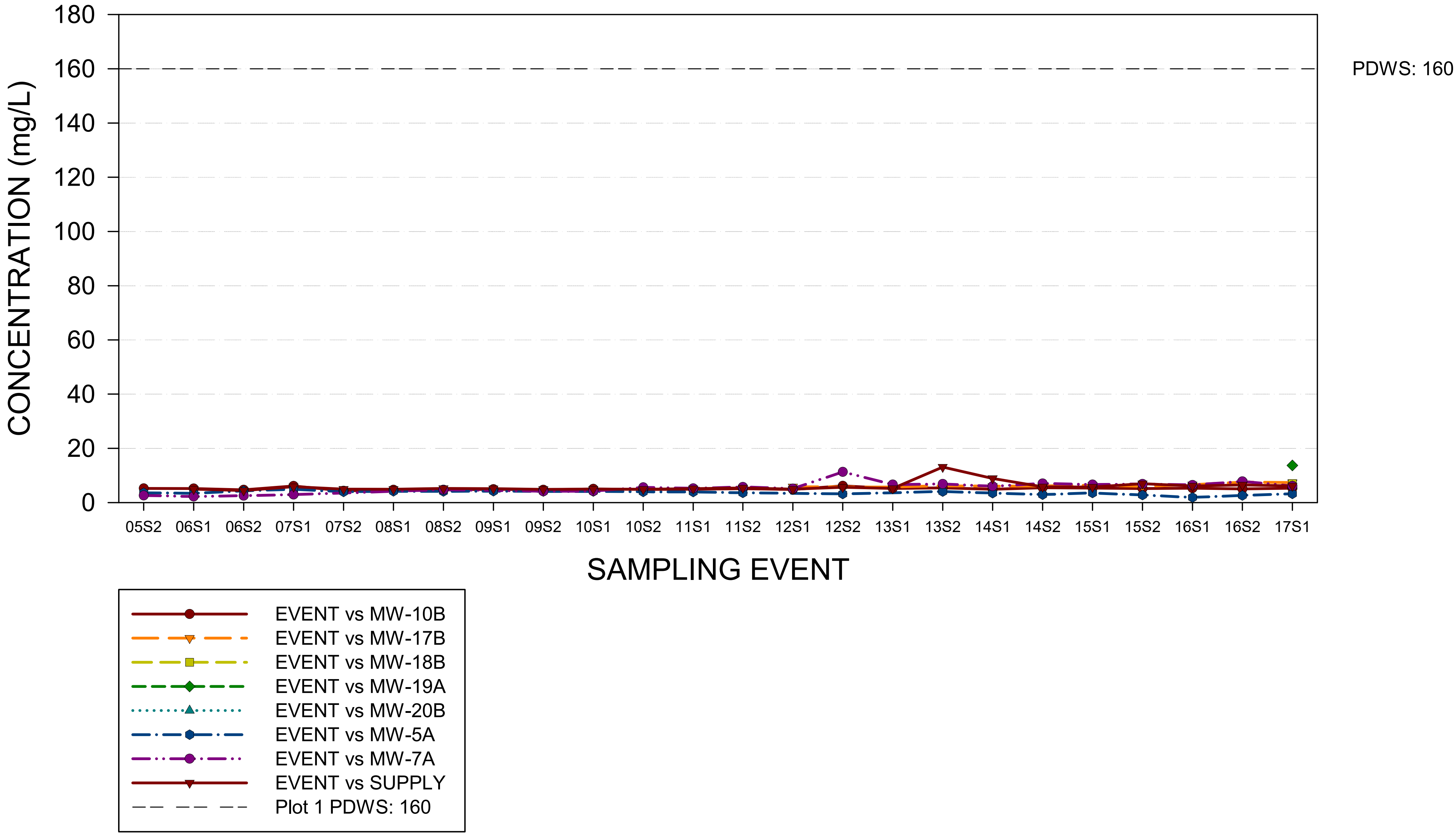




SODIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (mg/L)
0
20
40
60
80
100
120
140
160
180
PDWS: 160
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 PDWS: 160

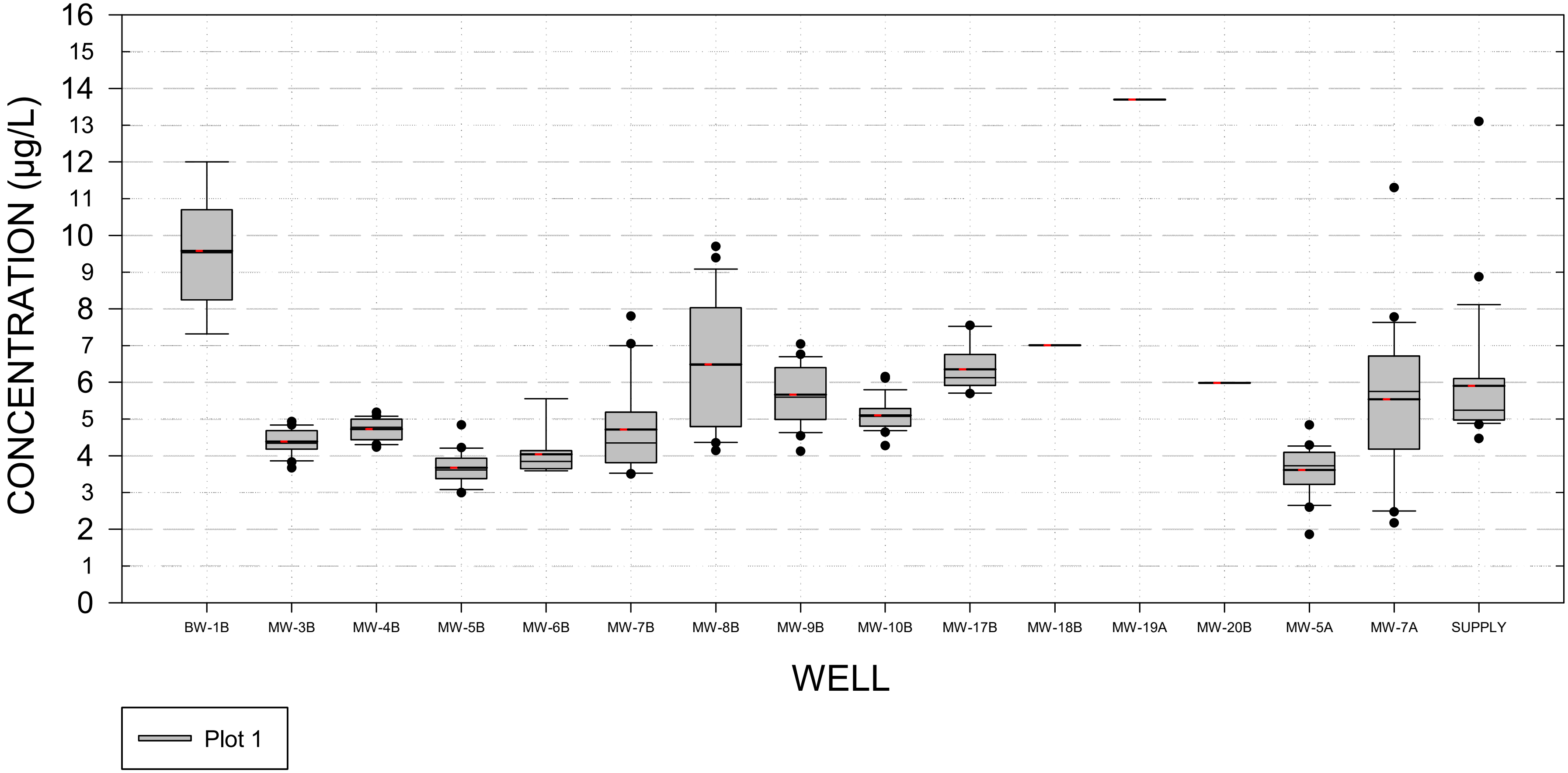
SODIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



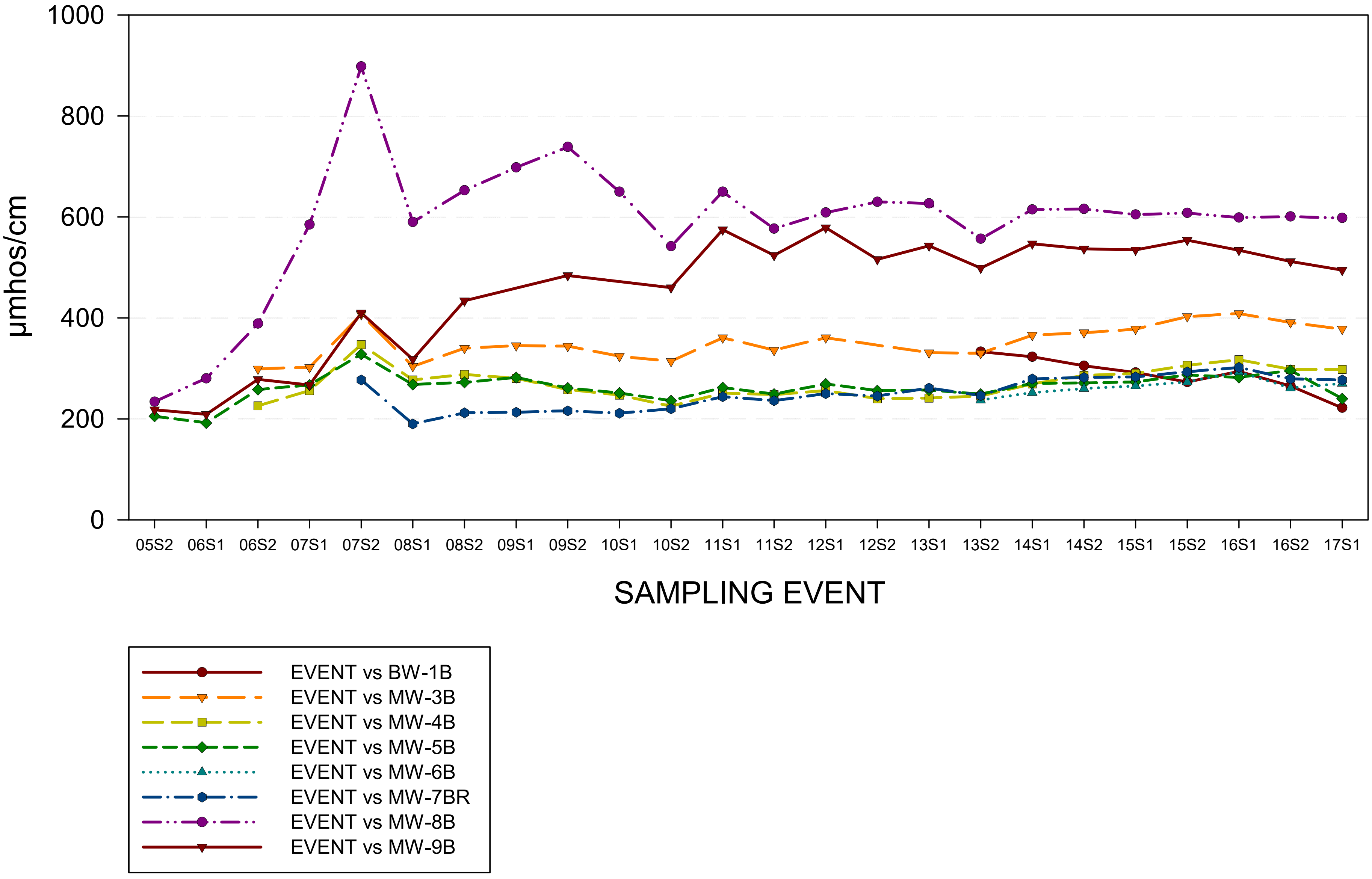
SODIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



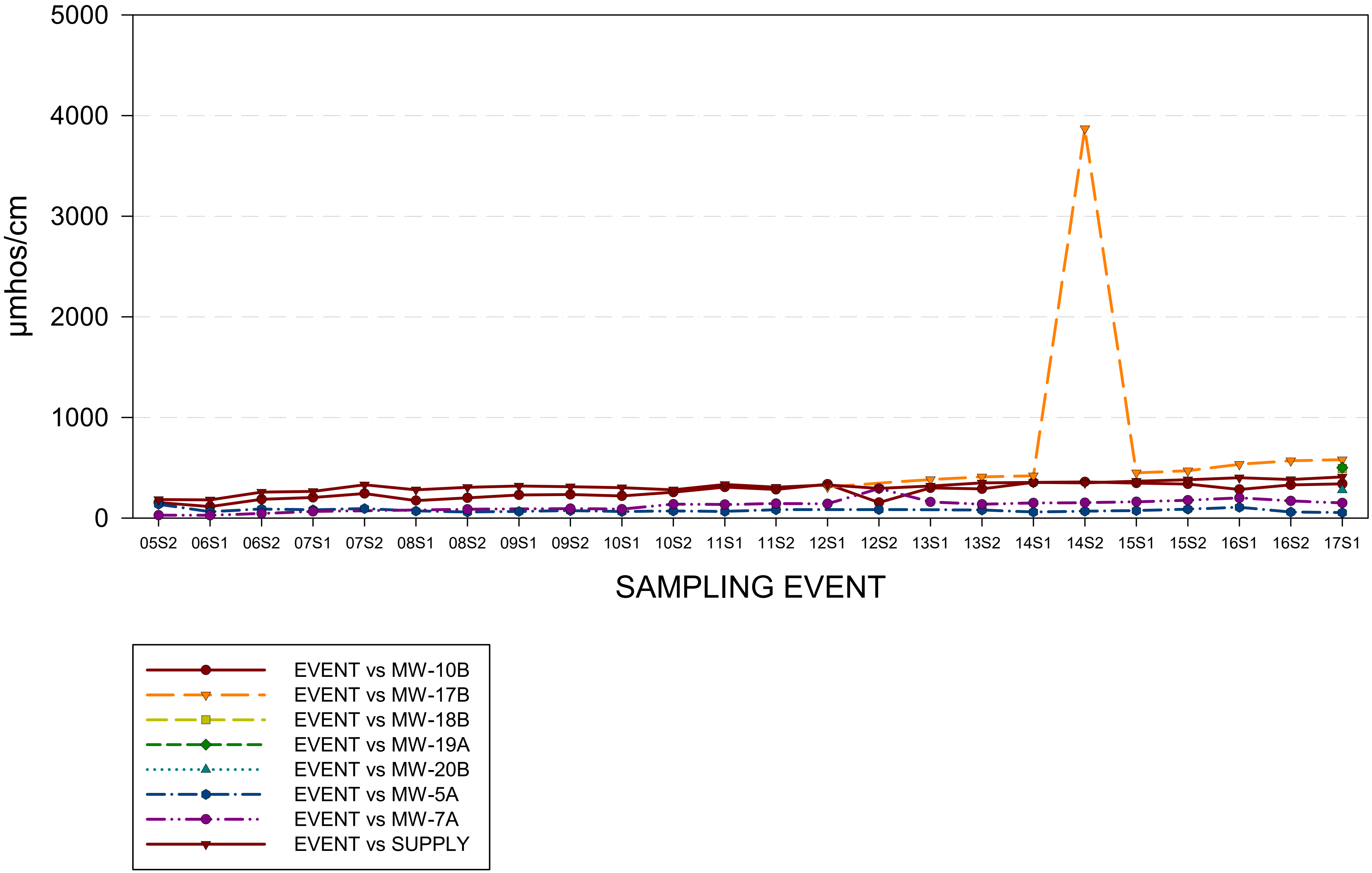
SPECIFIC CONDUCTANCE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



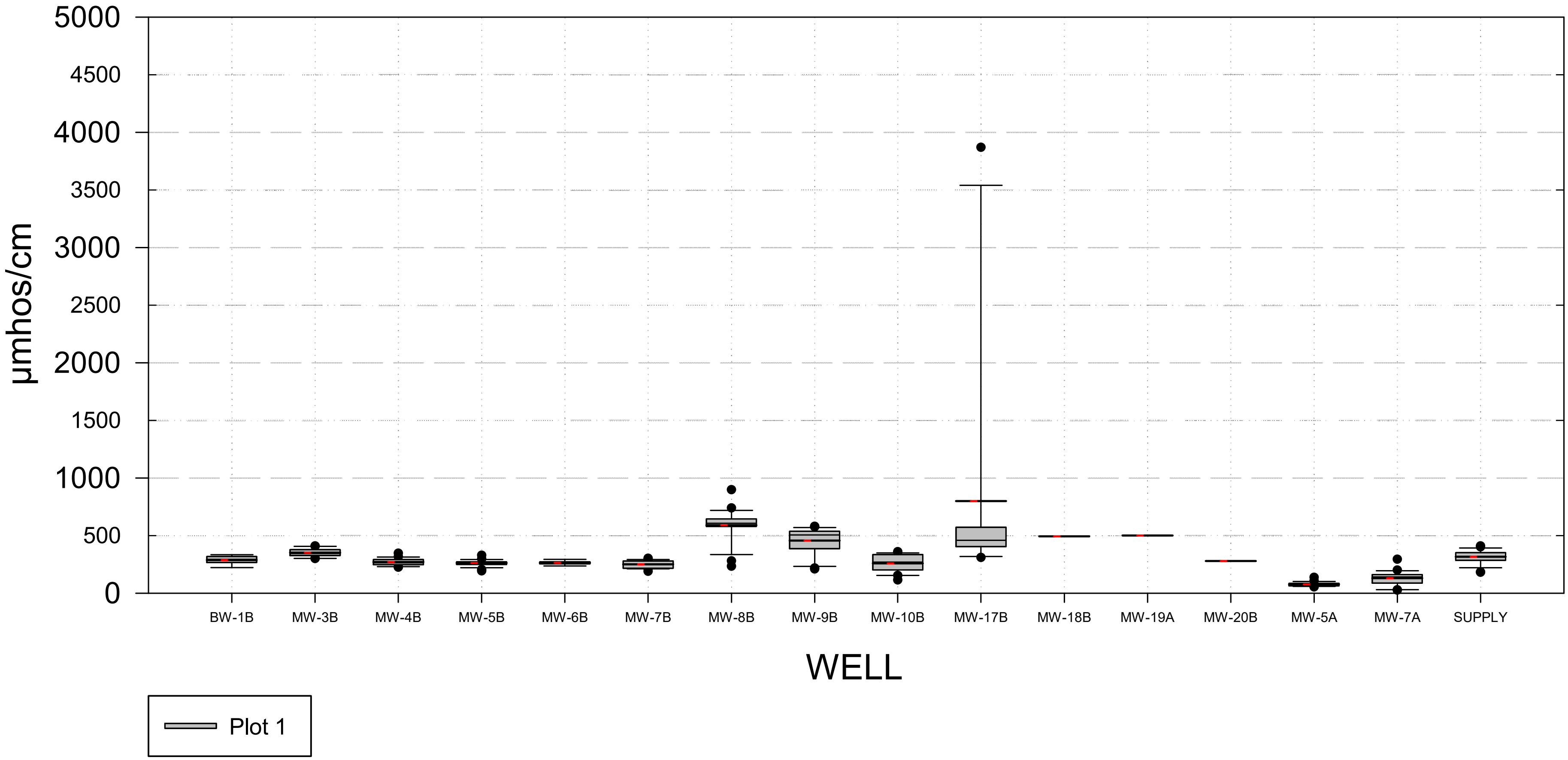
SPECIFIC CONDUCTANCE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



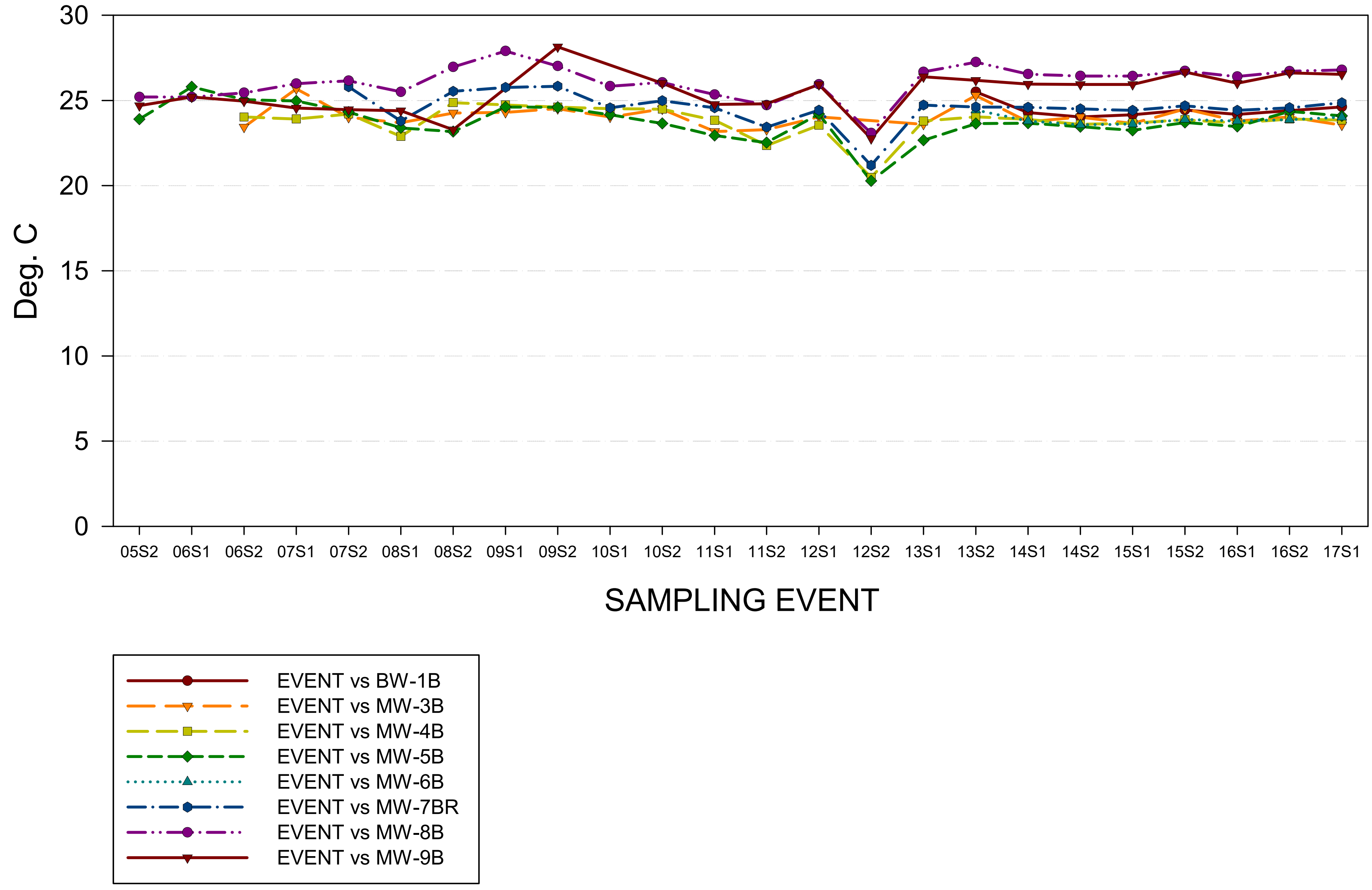
SPECIFIC CONDUCTANCE

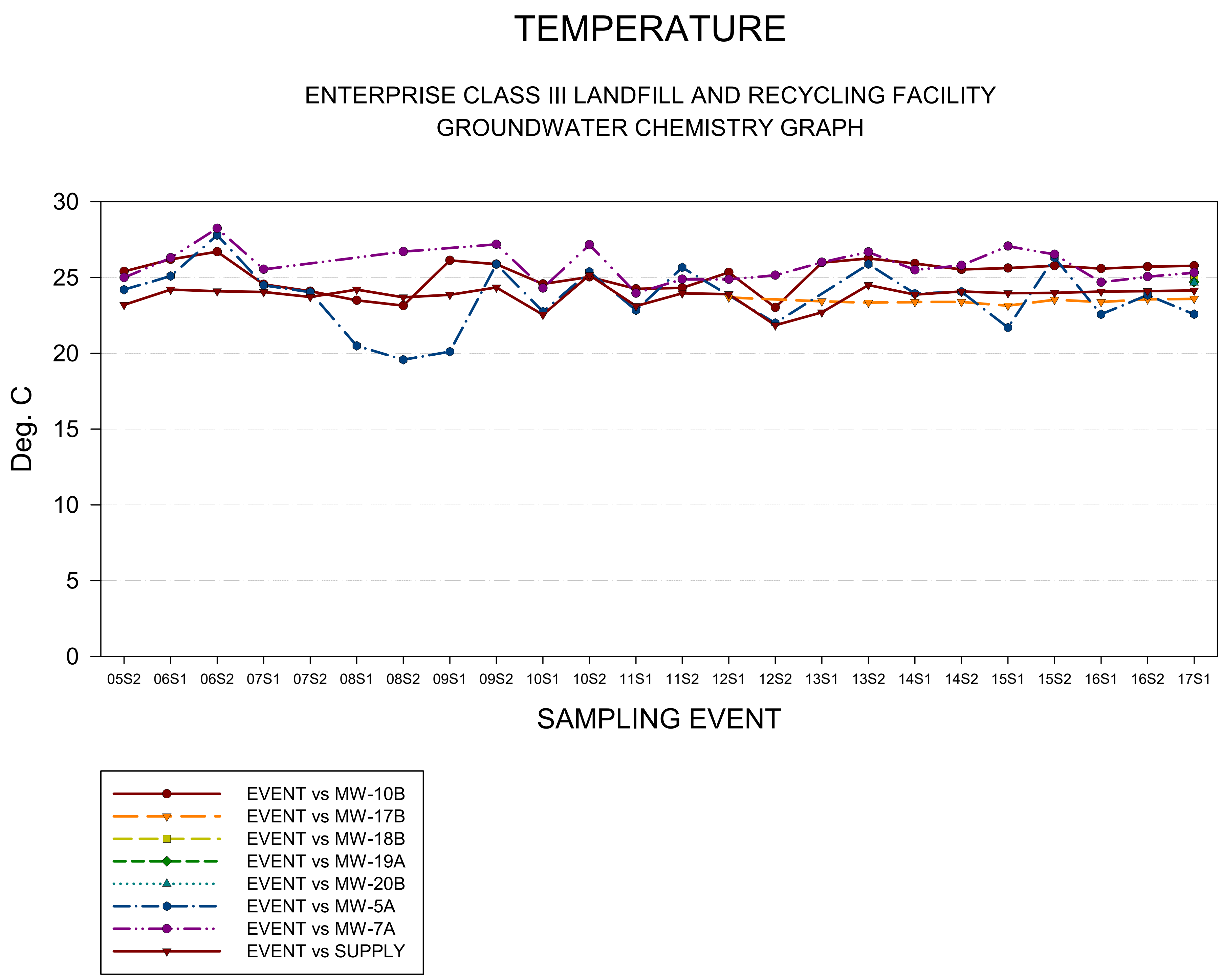
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



TEMPERATURE

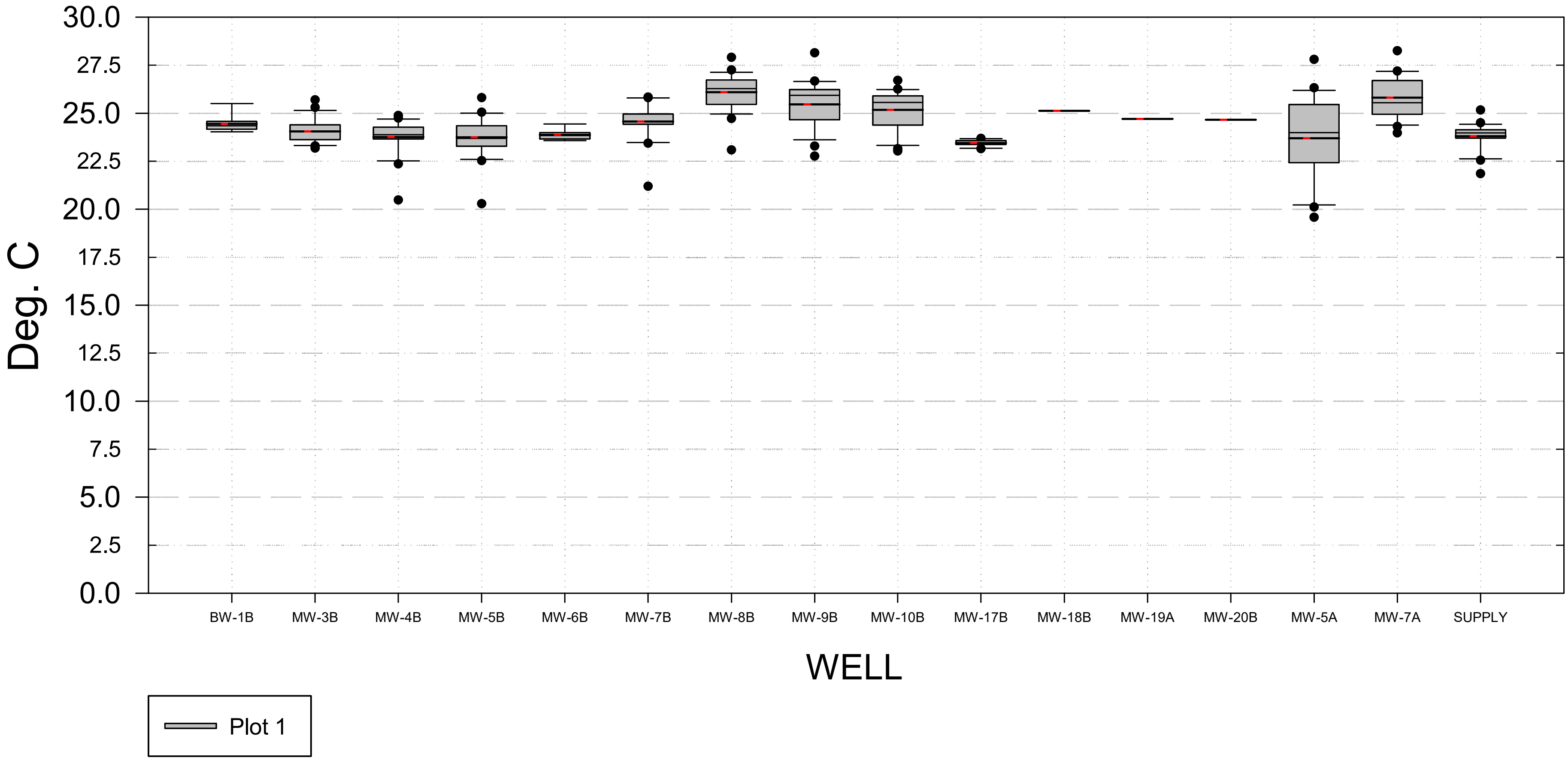
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH




TEMPERATURE
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
Deg. C
0
5
10
15
20
25
30
05S2 06S1 06S2 07S1 07S2 08S1 08S2 09S1 09S2 10S1 10S2 11S1 11S2 12S1 12S2 13S1 13S2 14S1 14S2 15S1 15S2 16S1 16S2 17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY

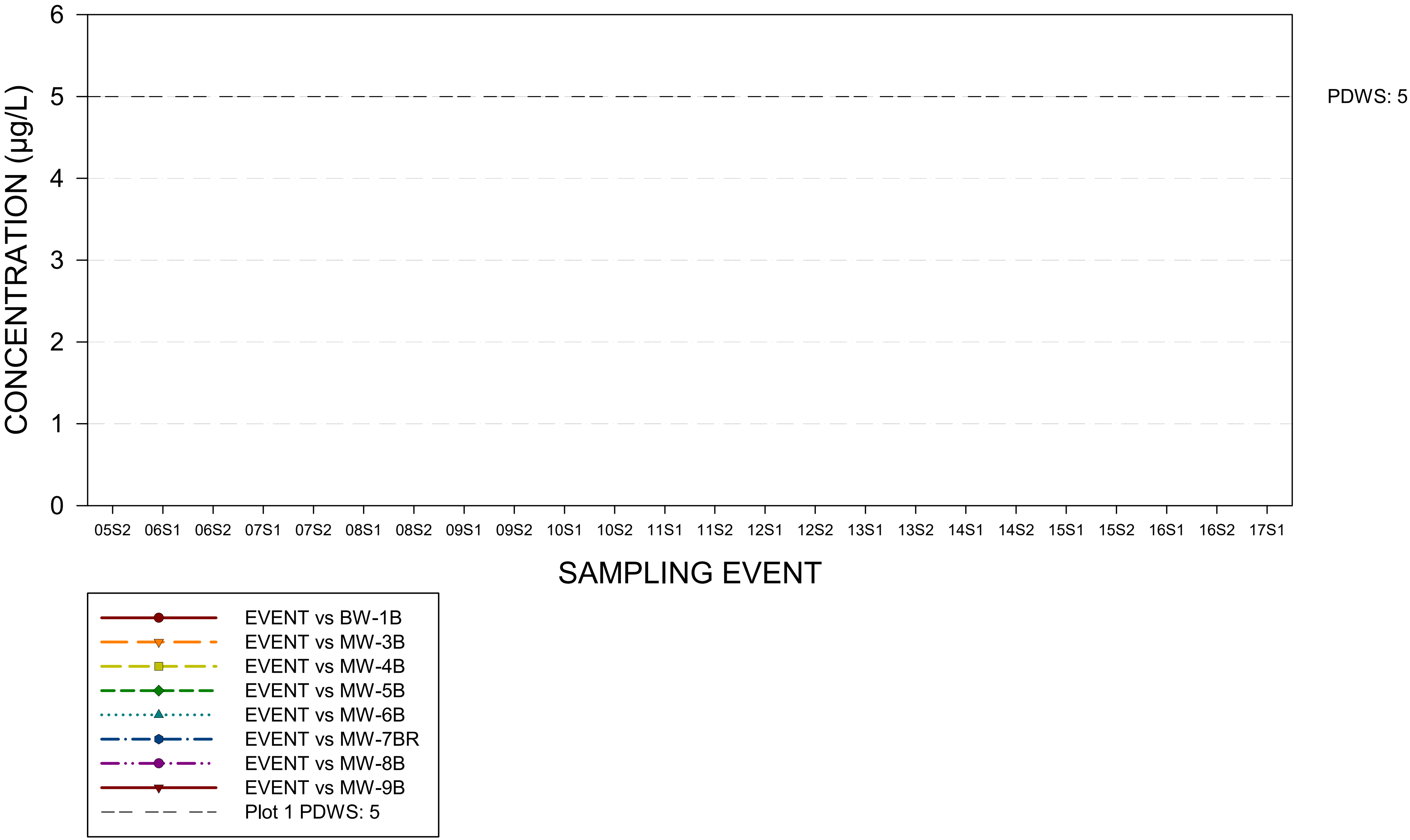
TEMPERATURE

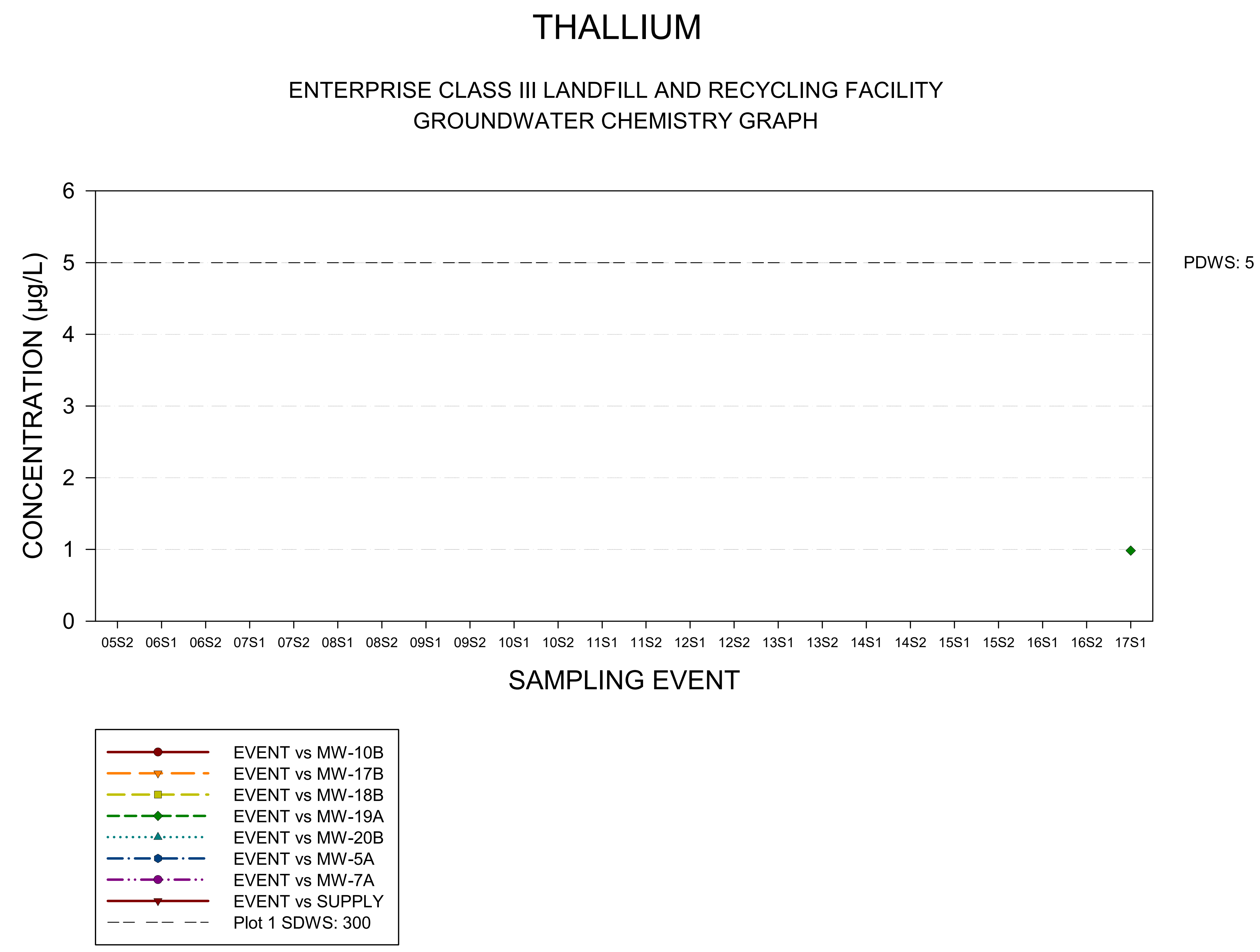
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

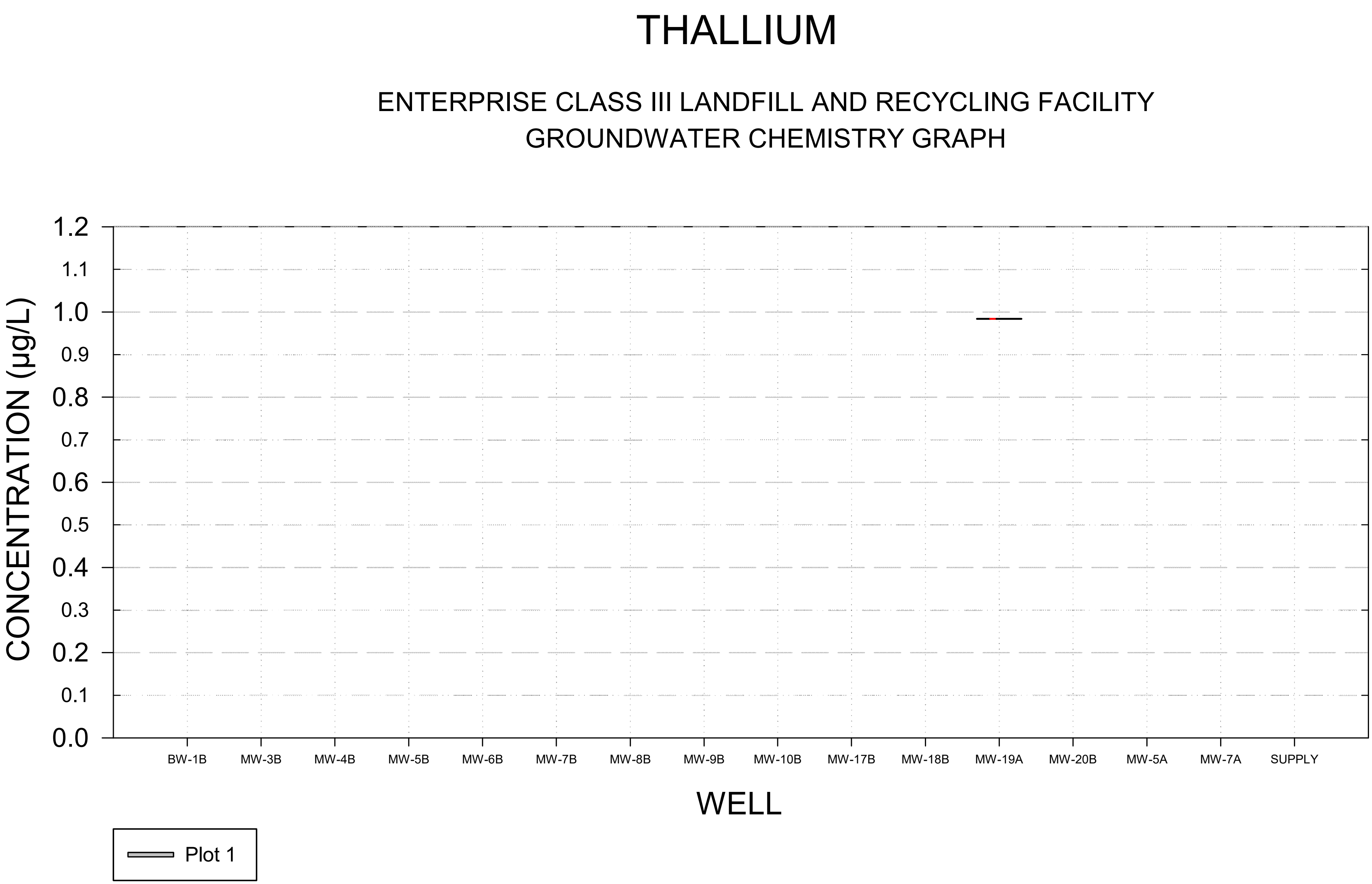


THALLIUM

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

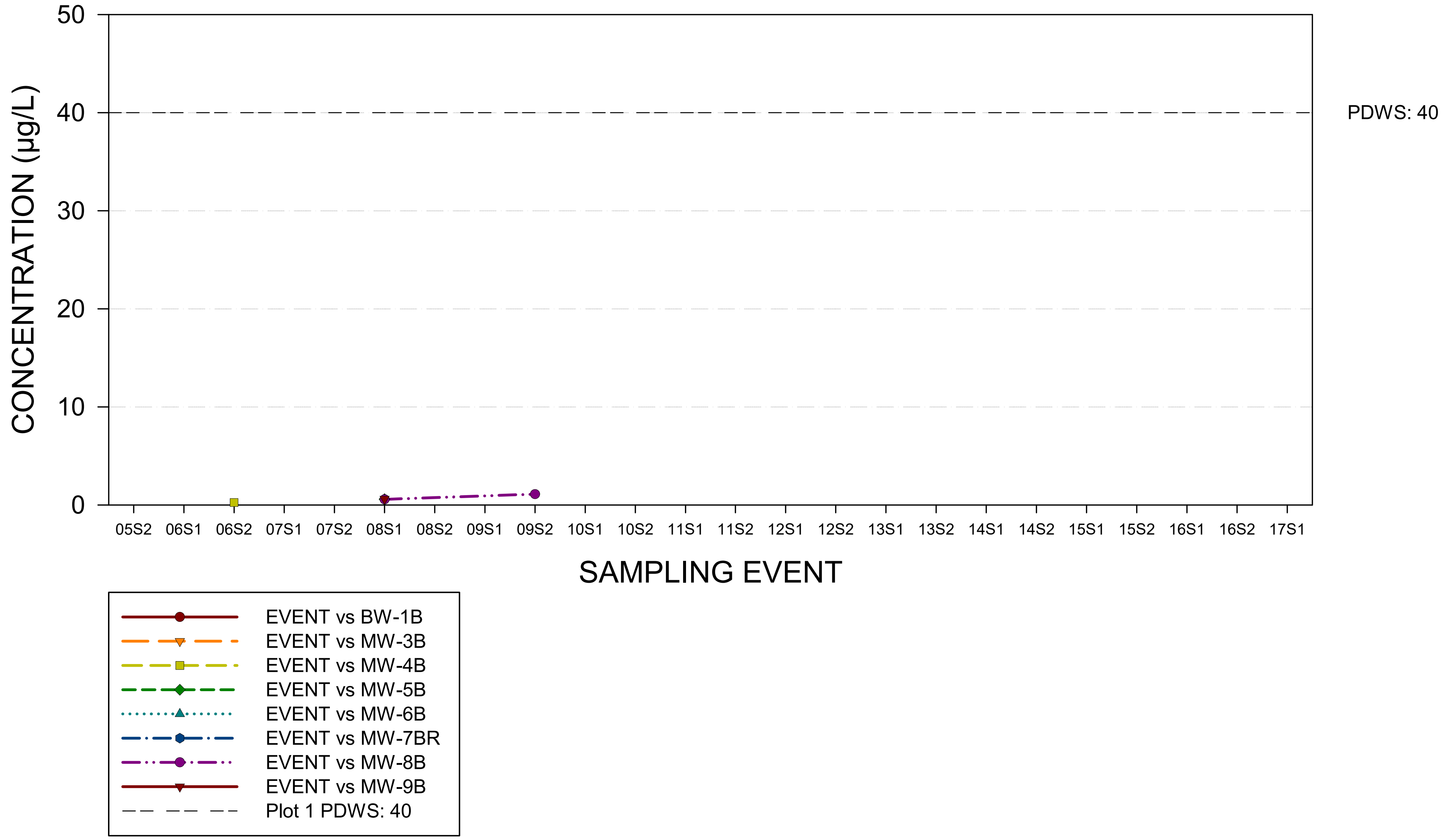



THALLIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
0
1
2
3
4
5
6
PDWS: 5
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 SDWS: 300


THALLIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1

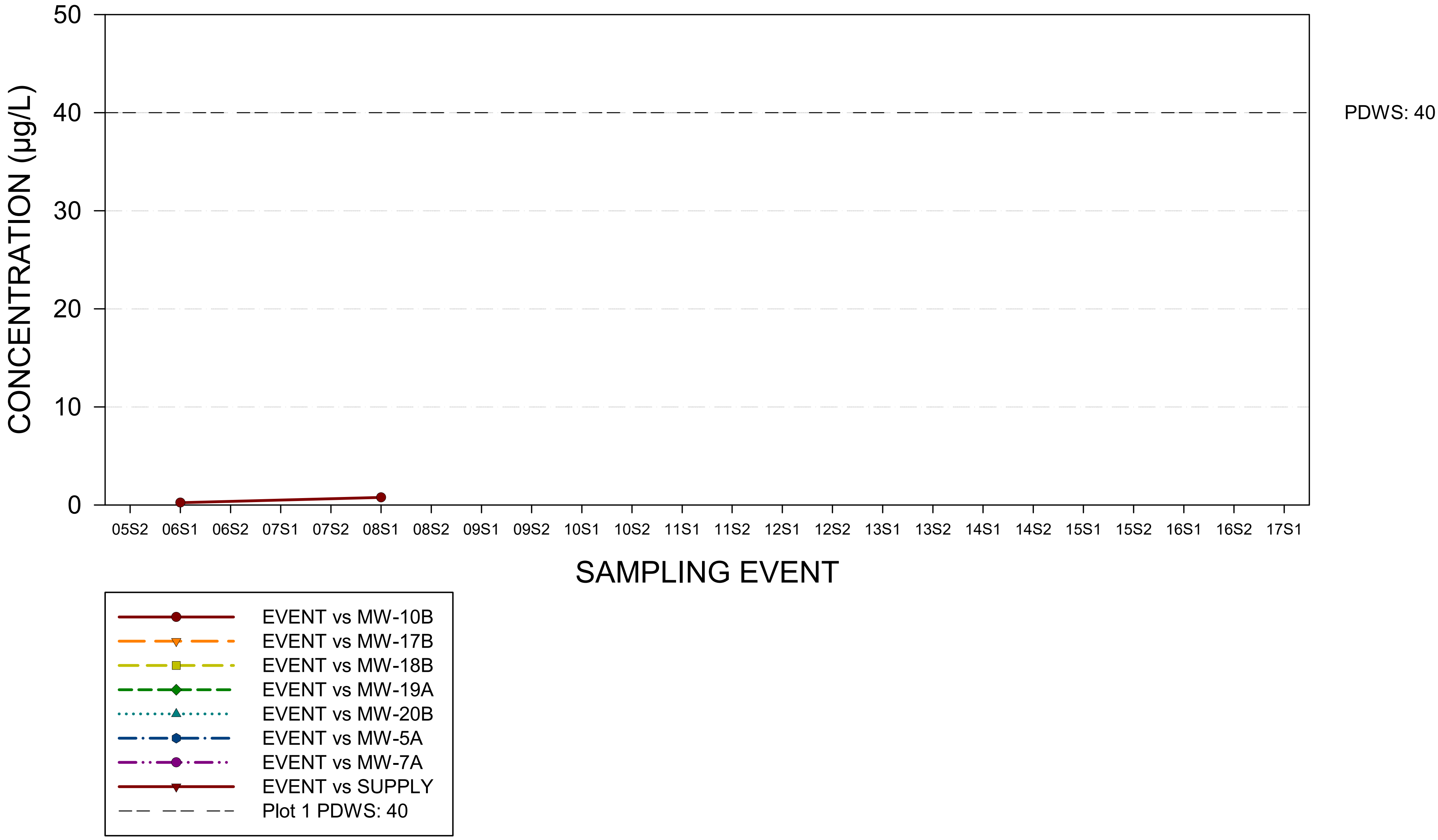
TOLUENE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



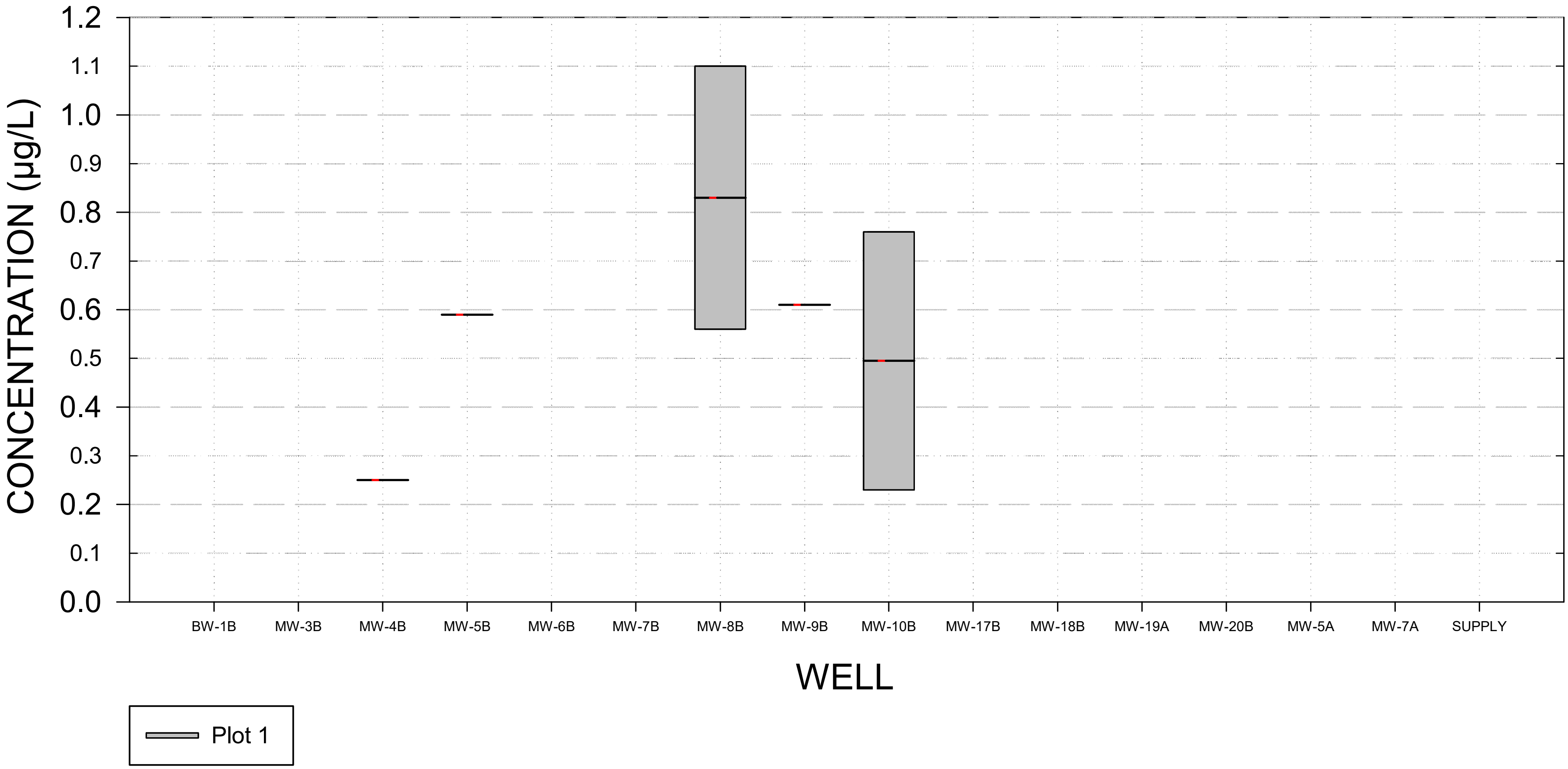
TOLUENE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



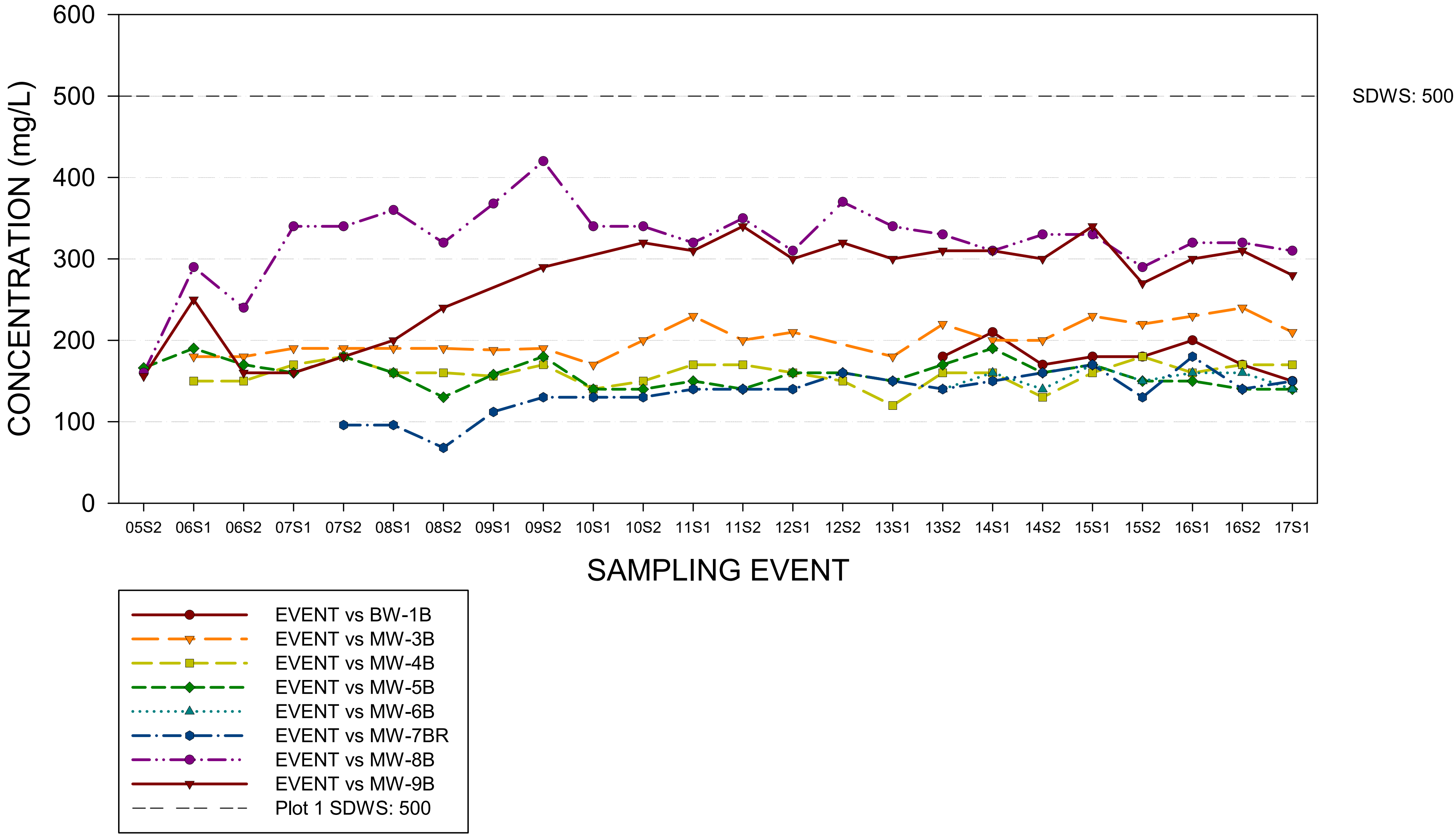
TOLUENE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



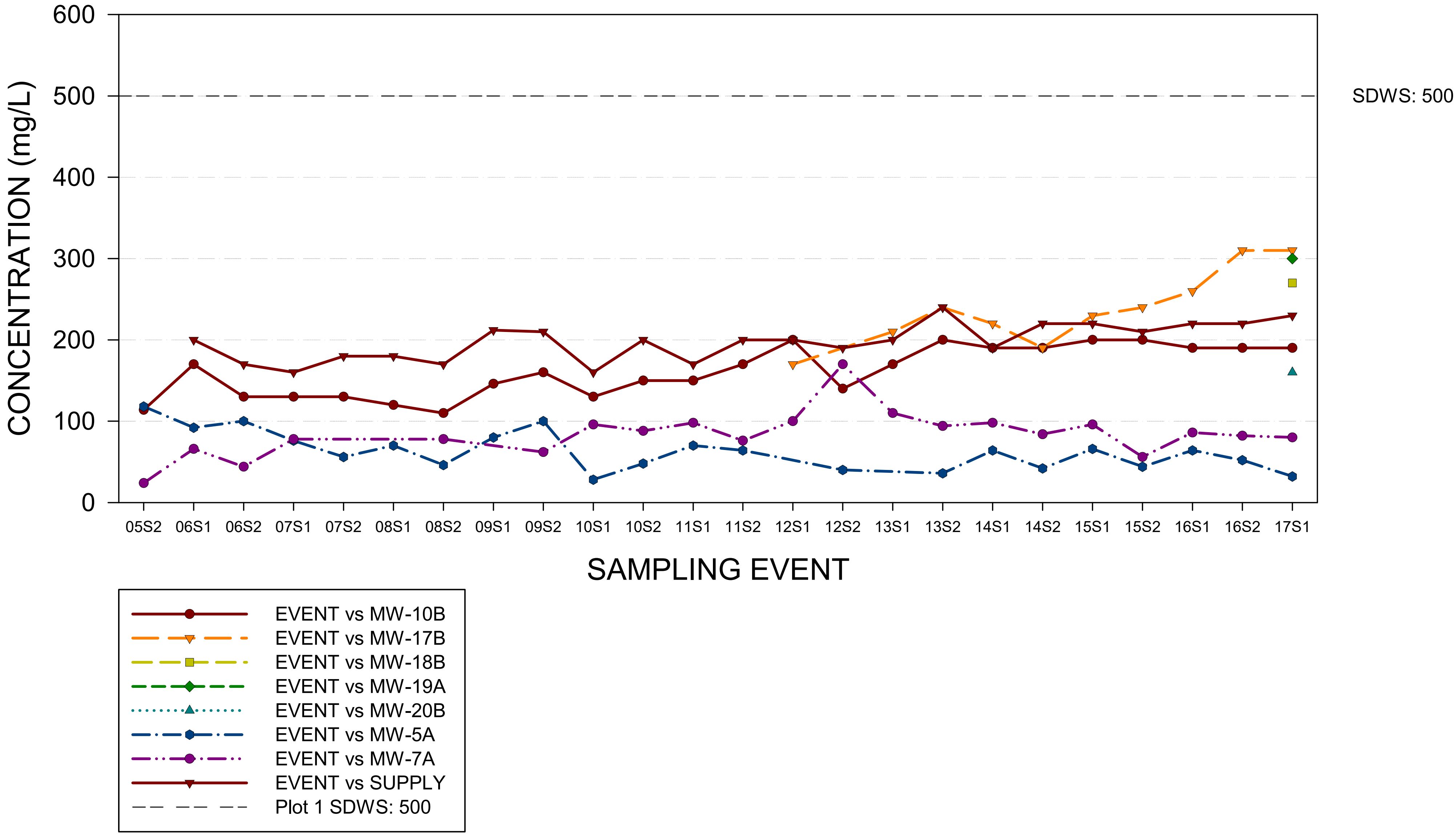
TOTAL DISSOLVED SOLIDS

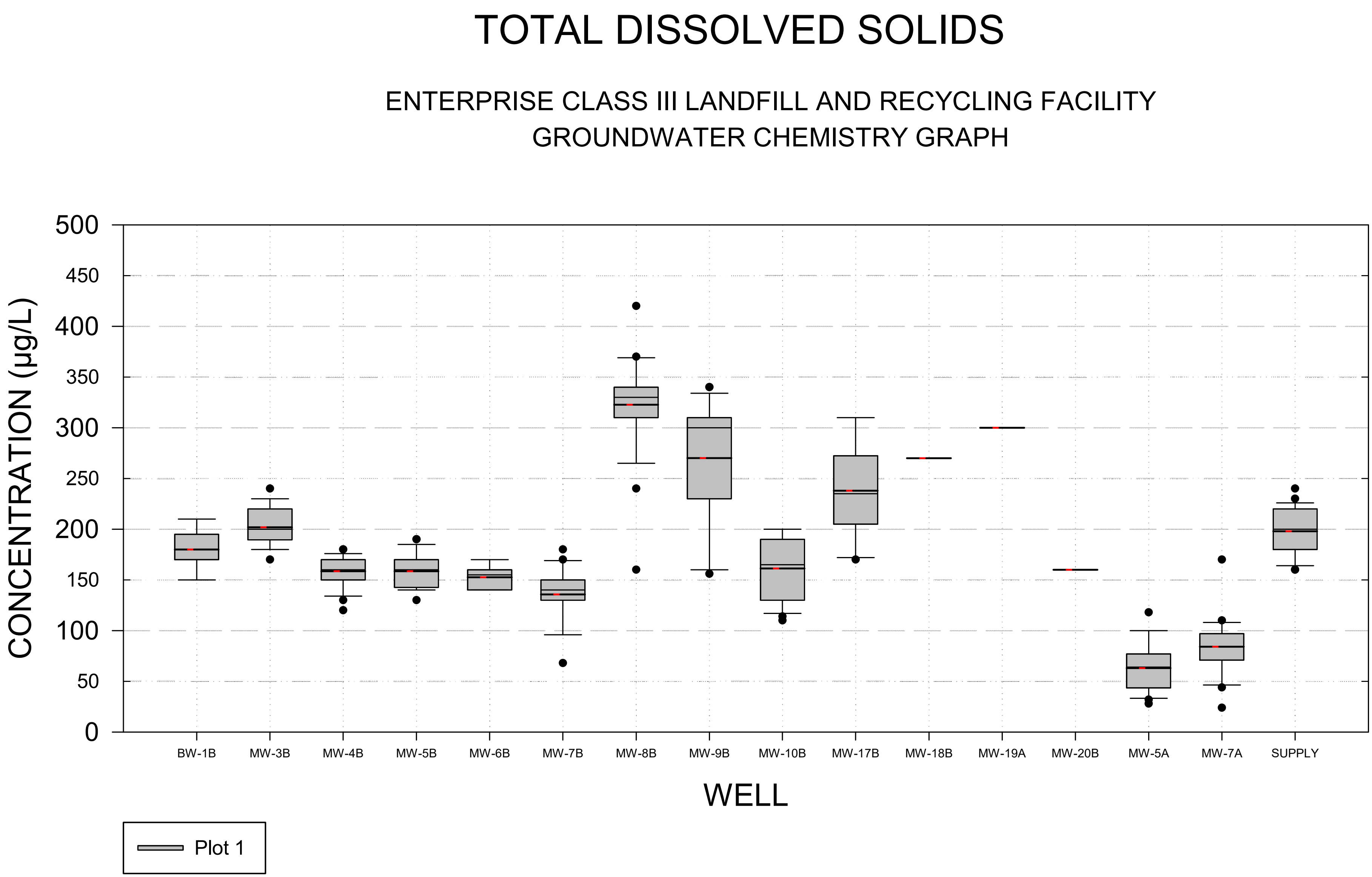
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



TOTAL DISSOLVED SOLIDS

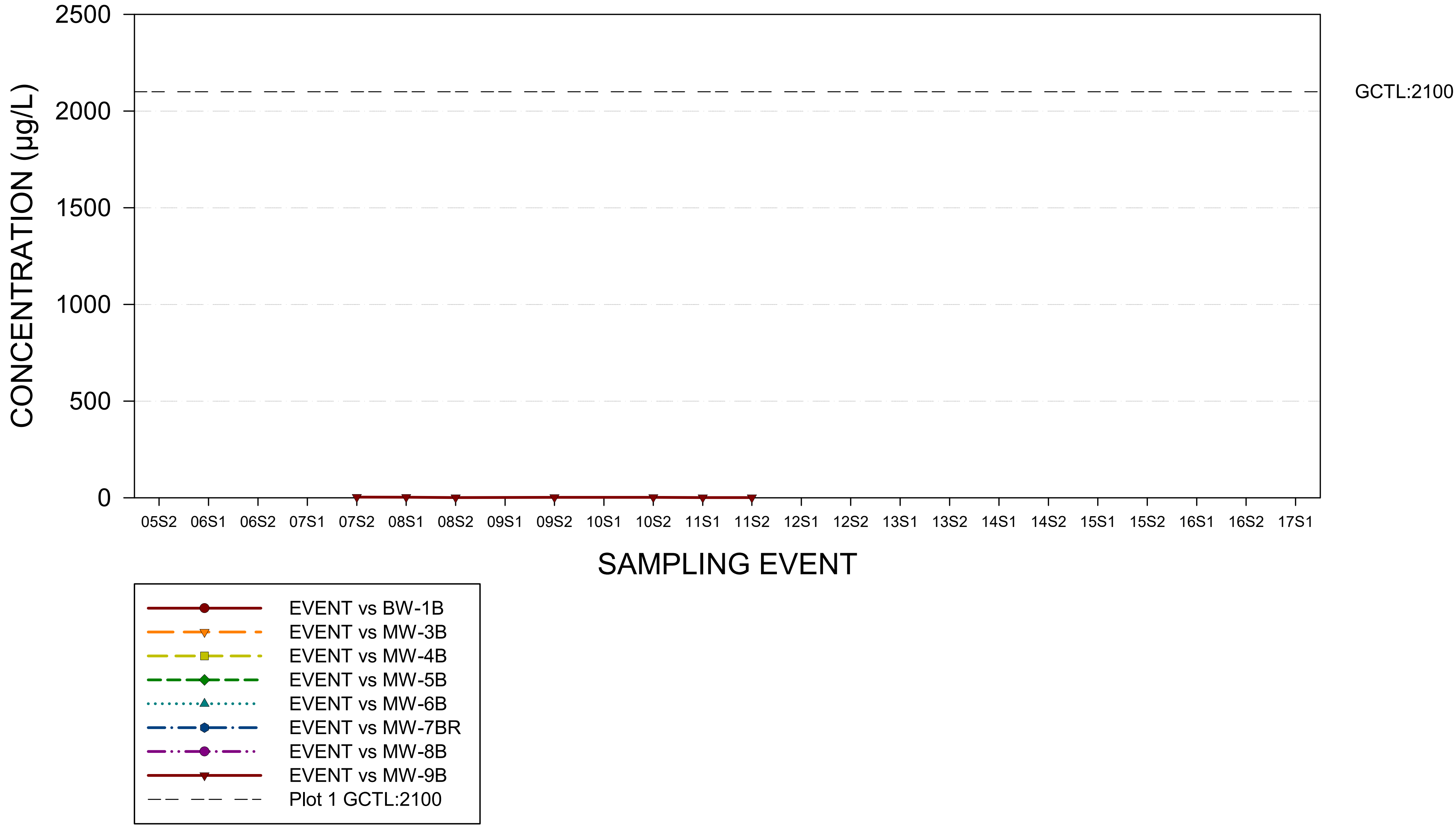
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

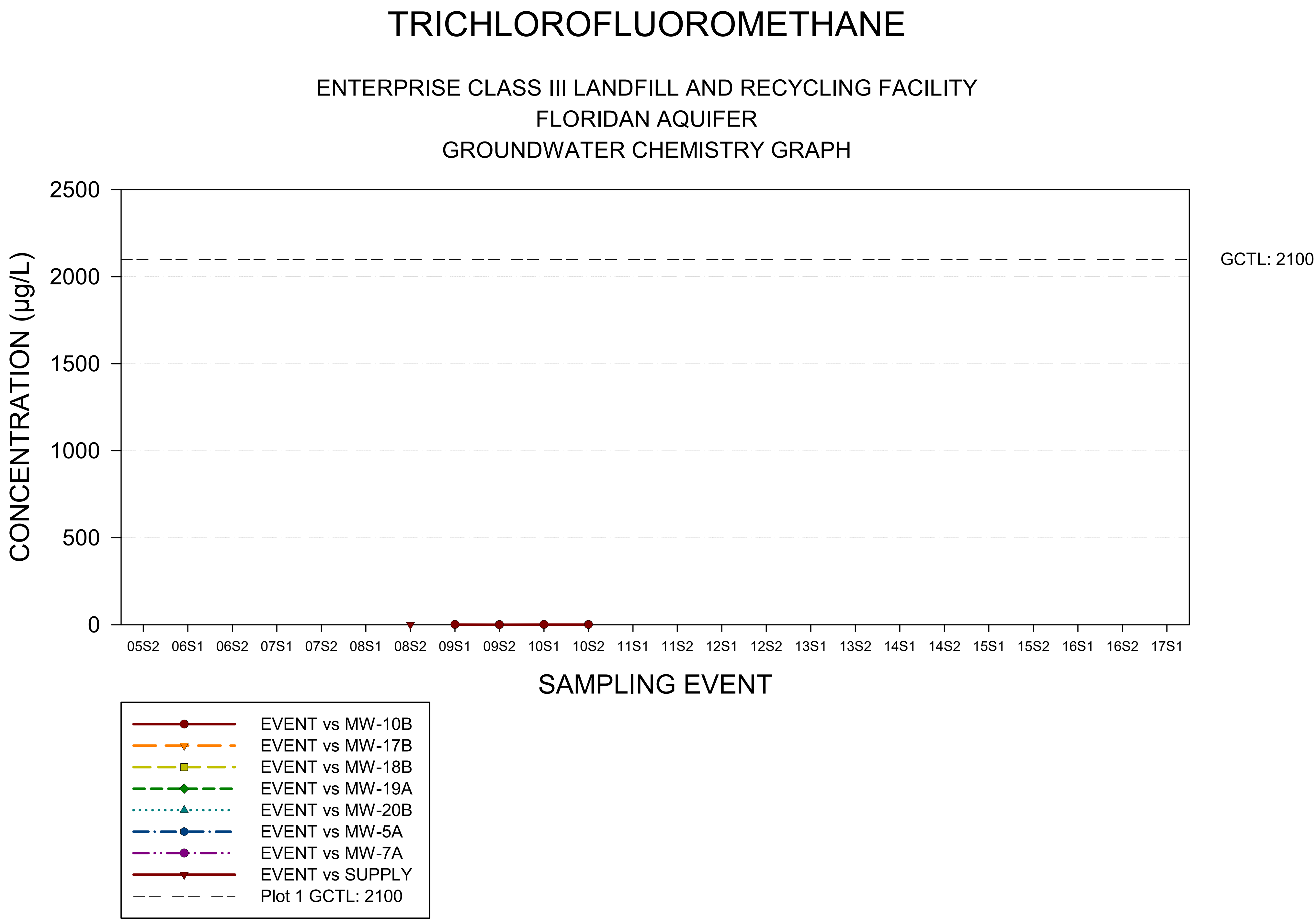



TOTAL DISSOLVED SOLIDS
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
500
450
400
350
300
250
200
150
100
50
0
BW-1B
MW-3B
MW-4B
MW-5B
MW-6B
MW-7B
MW-8B
MW-9B
MW-10B
MW-17B
MW-18B
MW-19A
MW-20B
MW-5A
MW-7A
SUPPLY
WELL
Plot 1

TRICHLOROFLUOROMETHANE

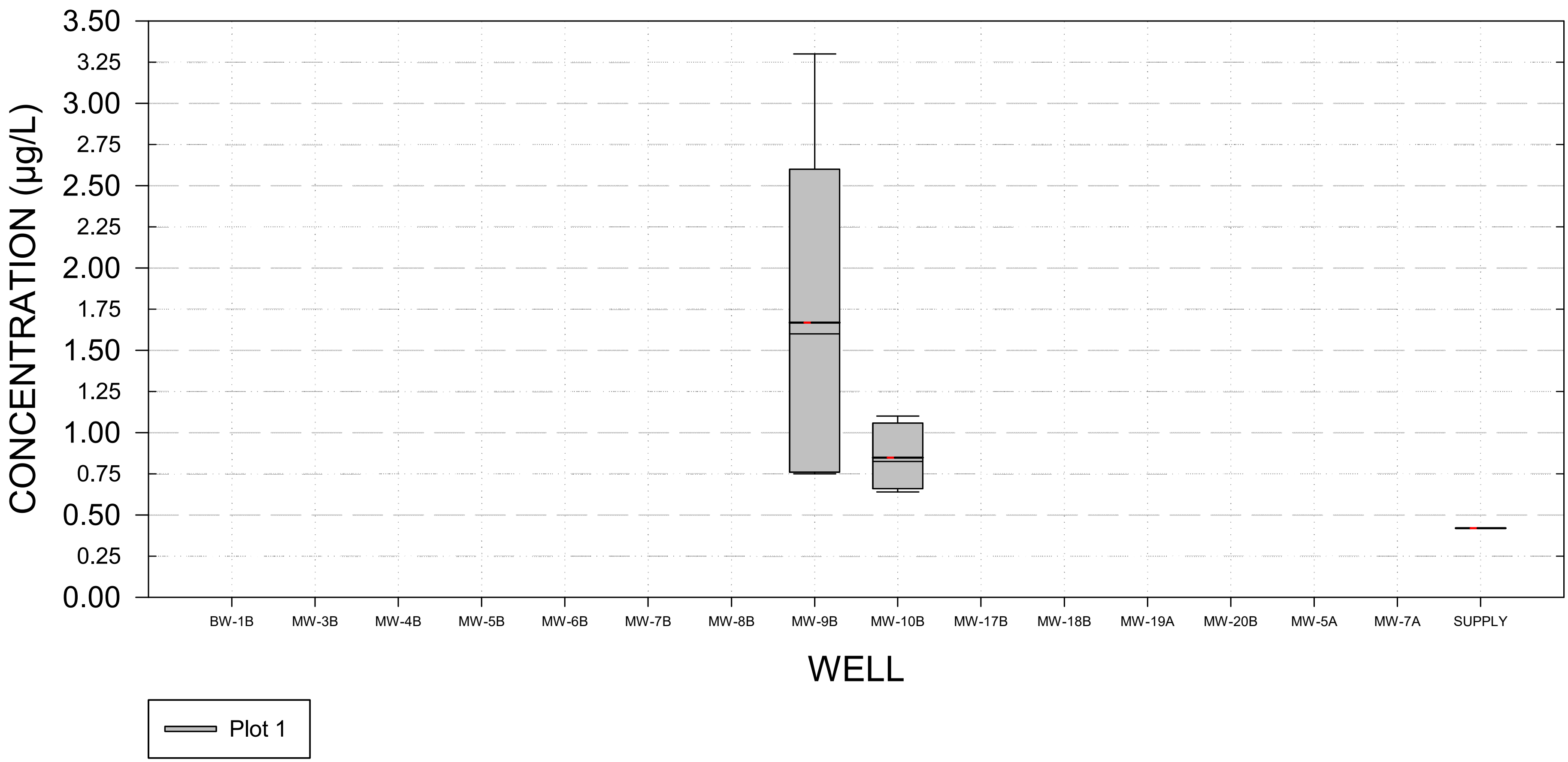
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

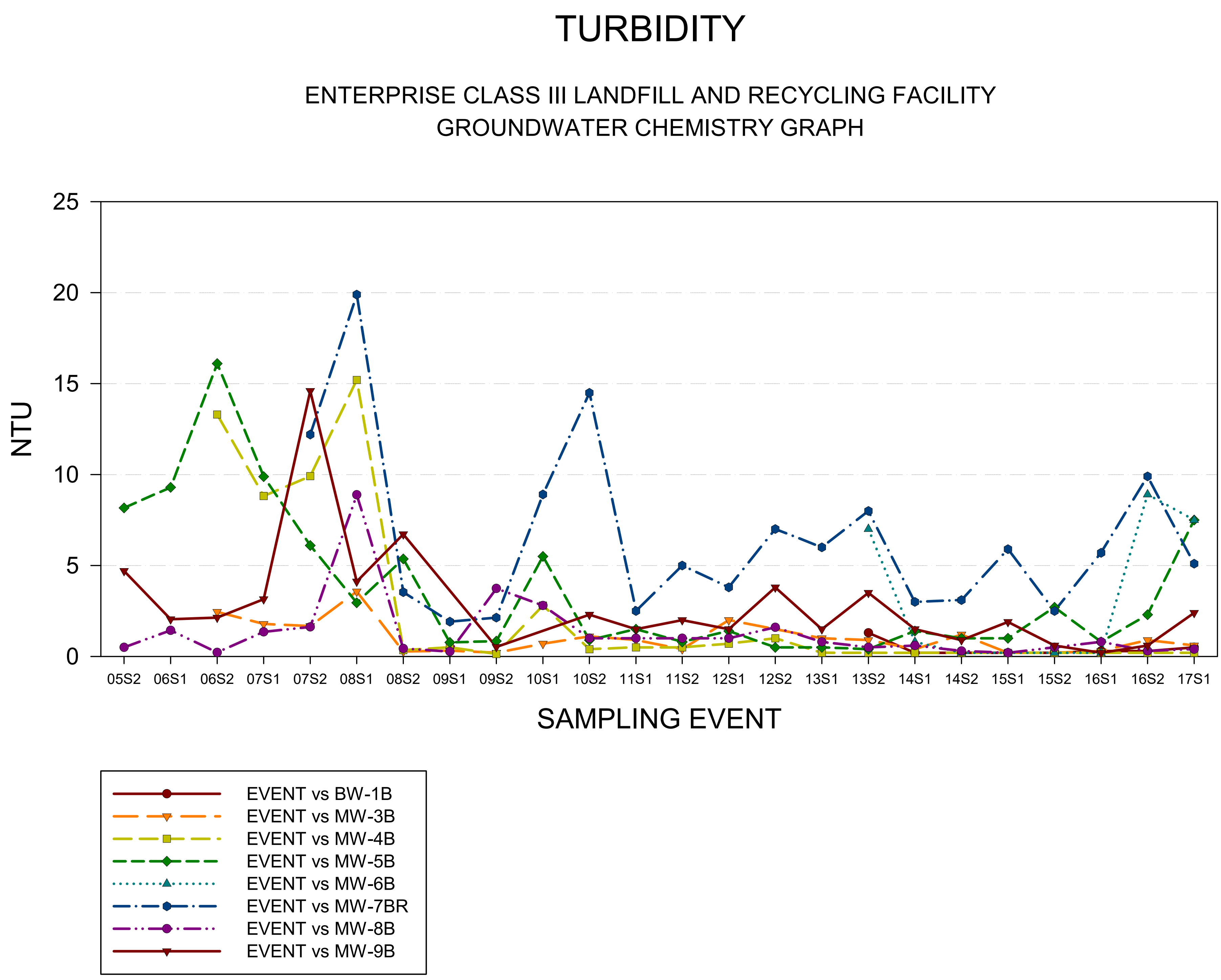


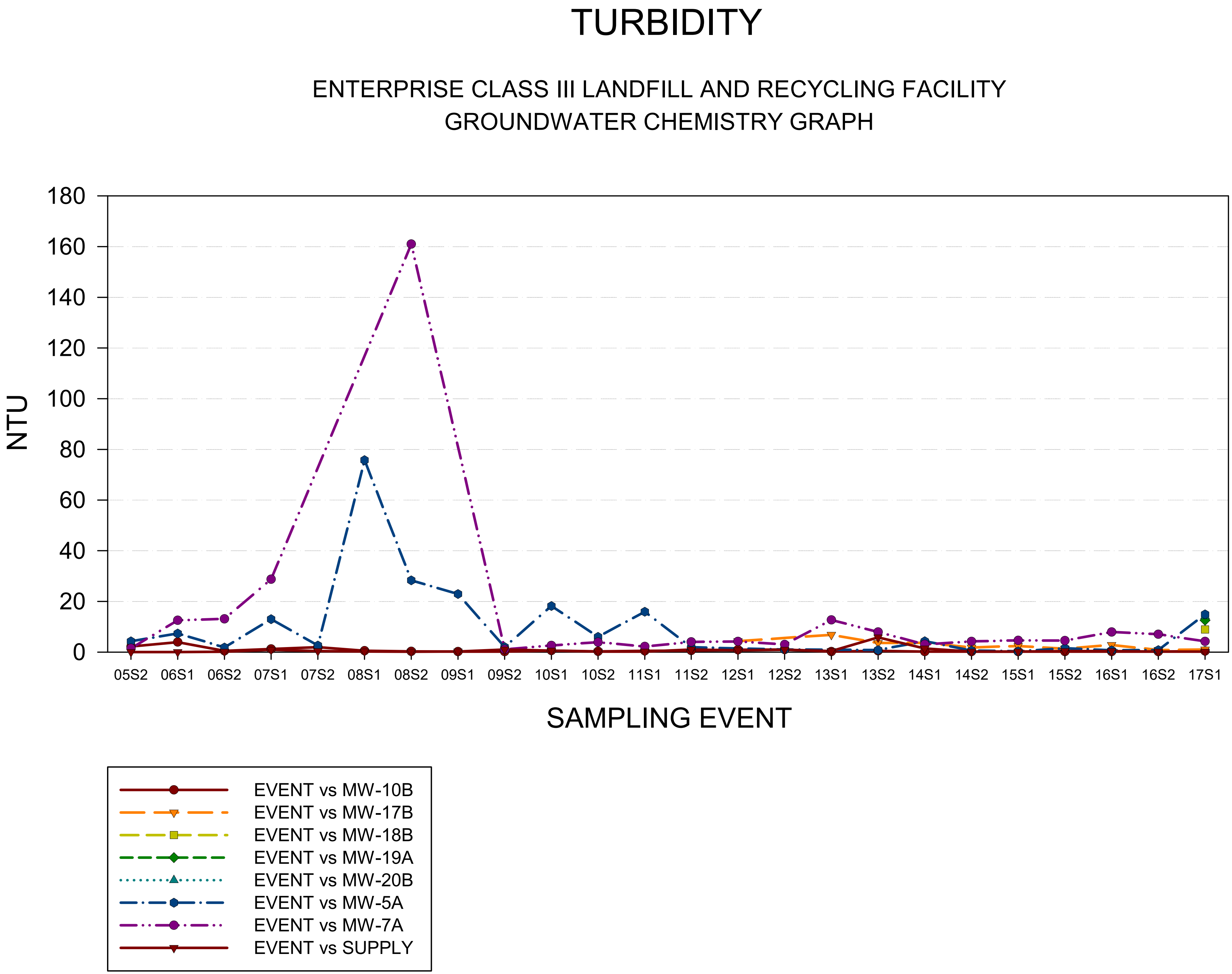

TRICHLOROFLUOROMETHANE
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
FLORIDAN AQUIFER
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
2500
2000
1500
1000
500
0
GCTL: 2100
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 GCTL: 2100

TRICHLOROFLUOROMETHANE

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

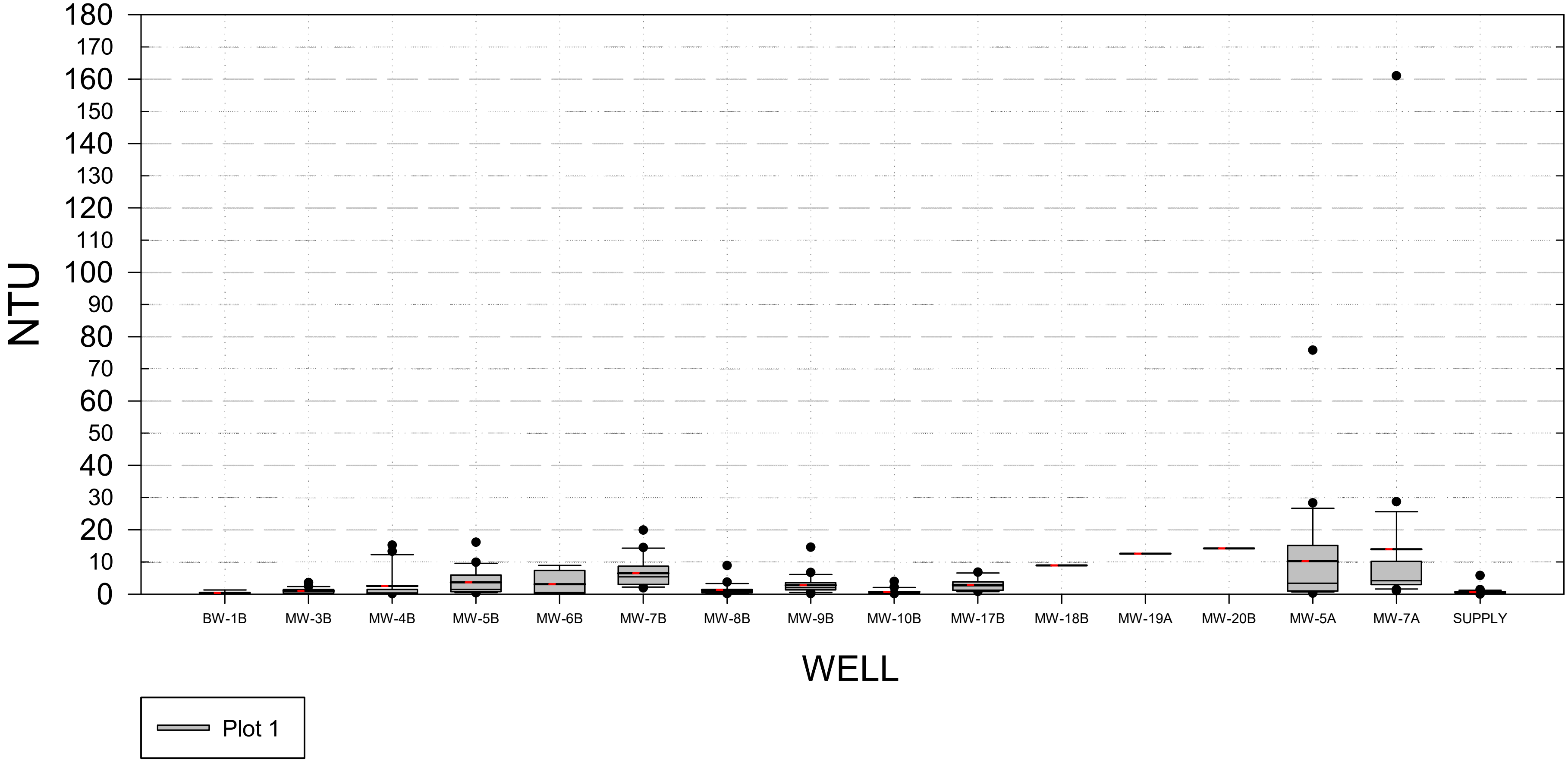


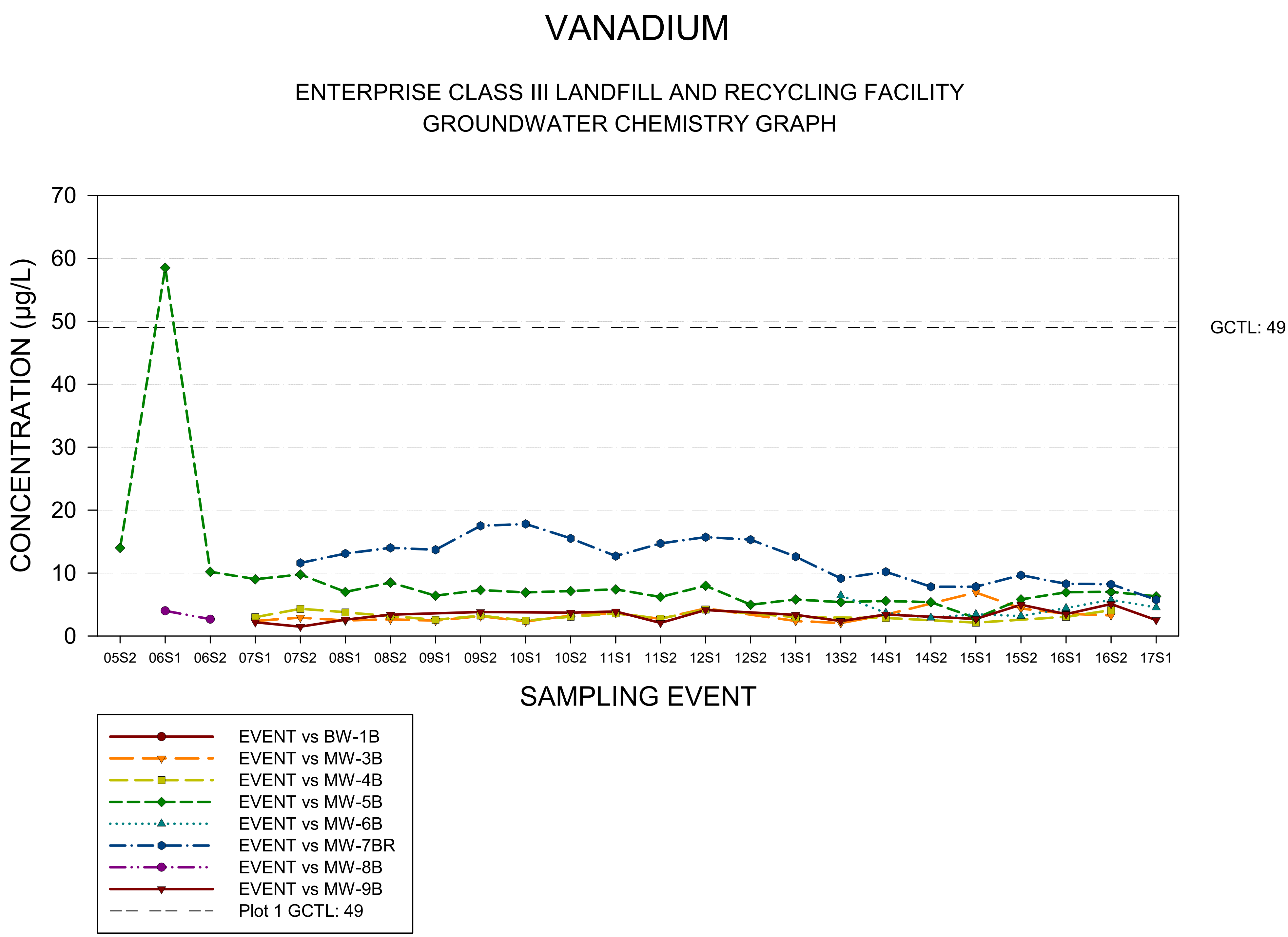

TURBIDITY
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
NTU
0
5
10
15
20
25
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B

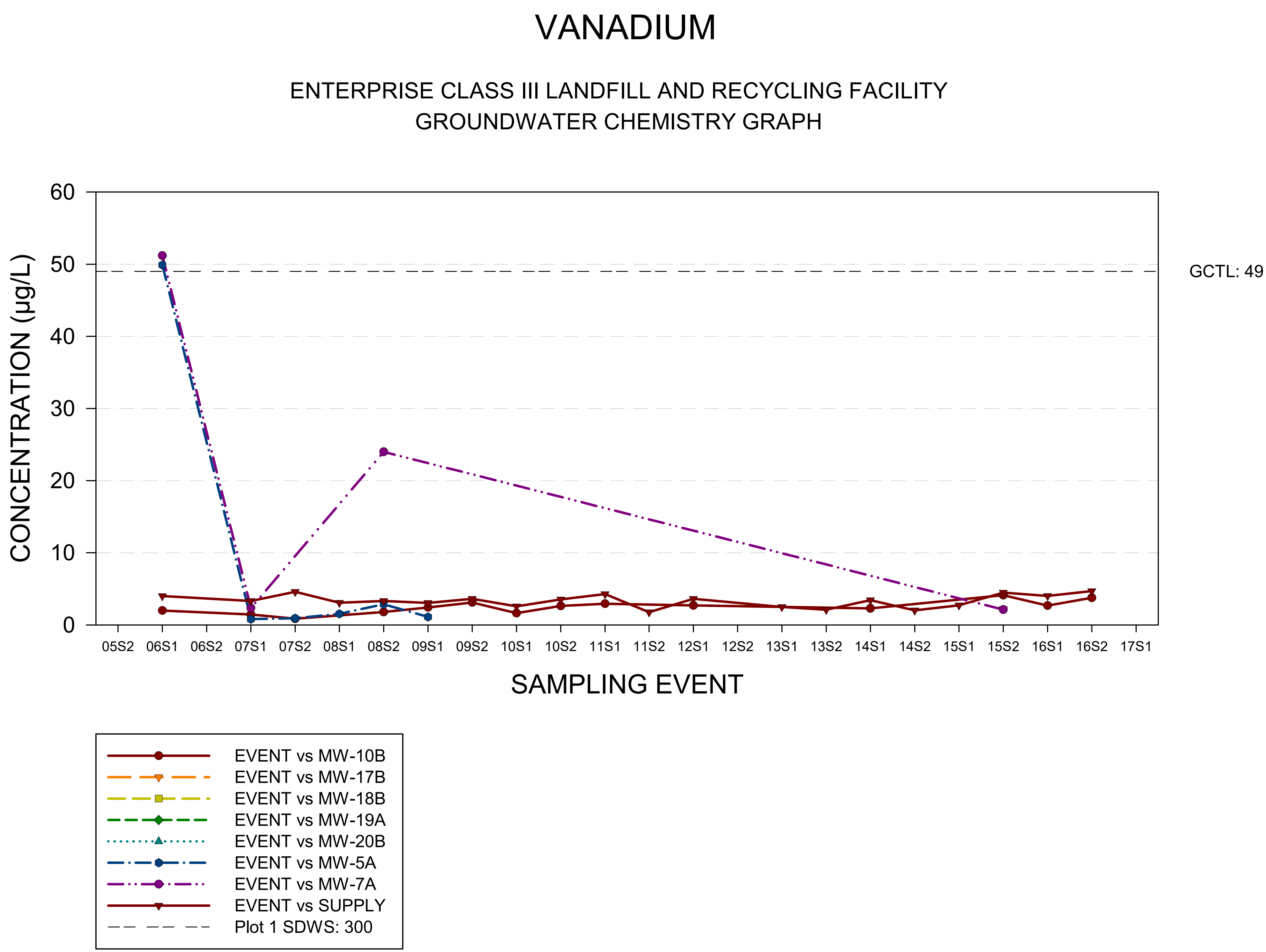

TURBIDITY
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
NTU
180
160
140
120
100
80
60
40
20
0
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY

TURBIDITY

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



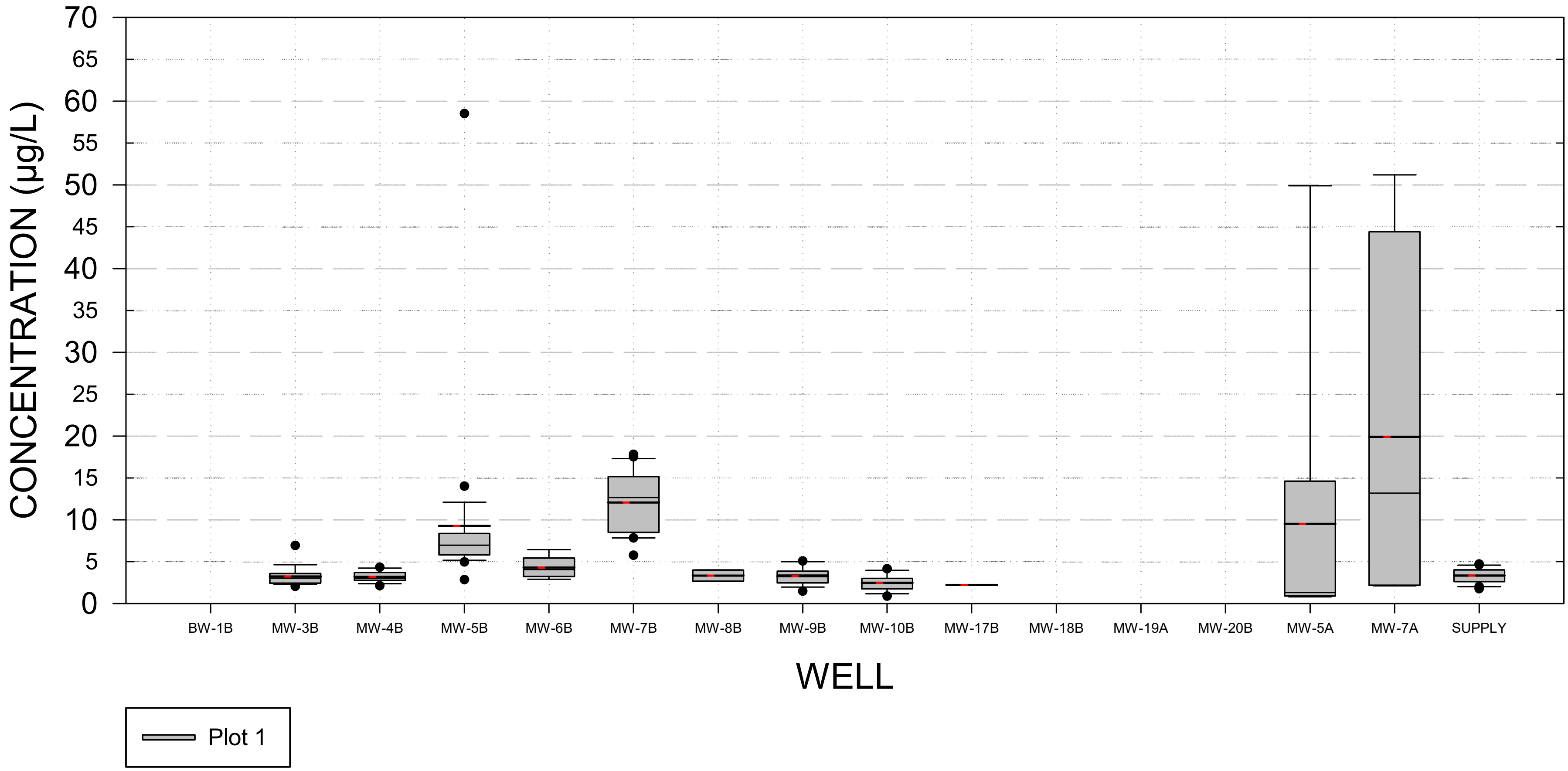

VANADIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
0
10
20
30
40
50
60
70
GCTL: 49
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs BW-1B
EVENT vs MW-3B
EVENT vs MW-4B
EVENT vs MW-5B
EVENT vs MW-6B
EVENT vs MW-7BR
EVENT vs MW-8B
EVENT vs MW-9B
Plot 1 GCTL: 49



VANADIUM
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
60
50
40
30
20
10
0
GCTL: 49
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 SDWS: 300

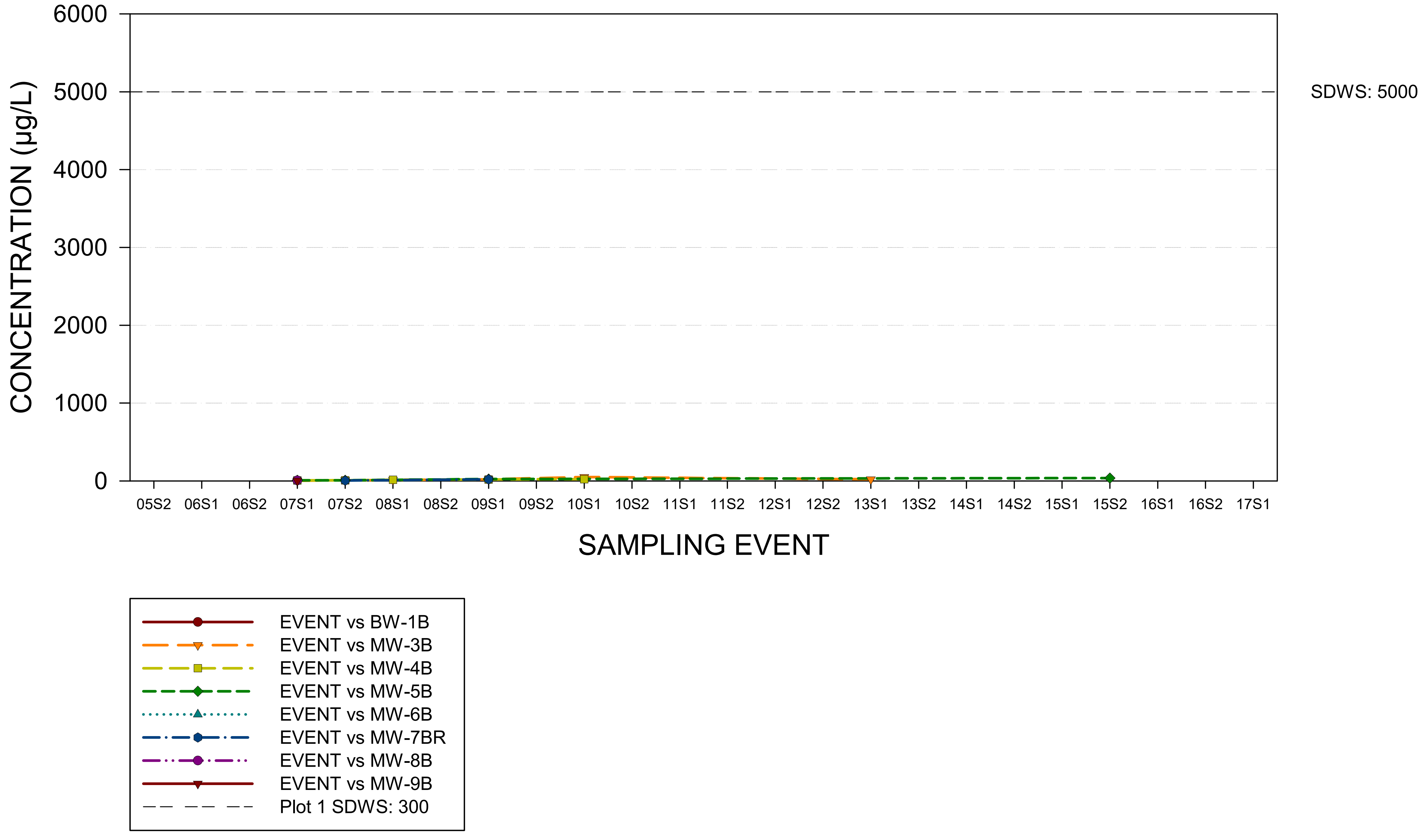
VANADIUM

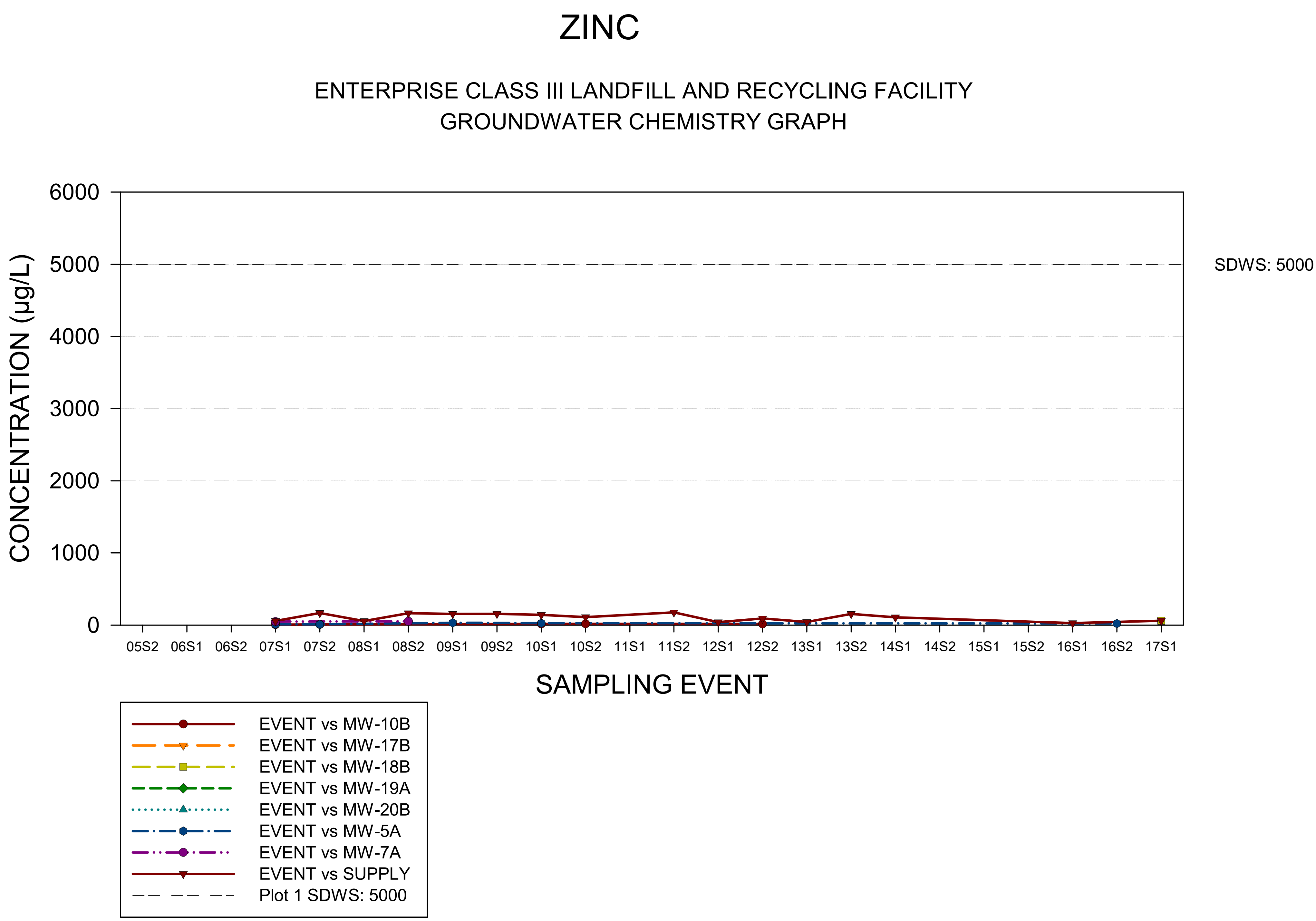
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH



ZINC

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

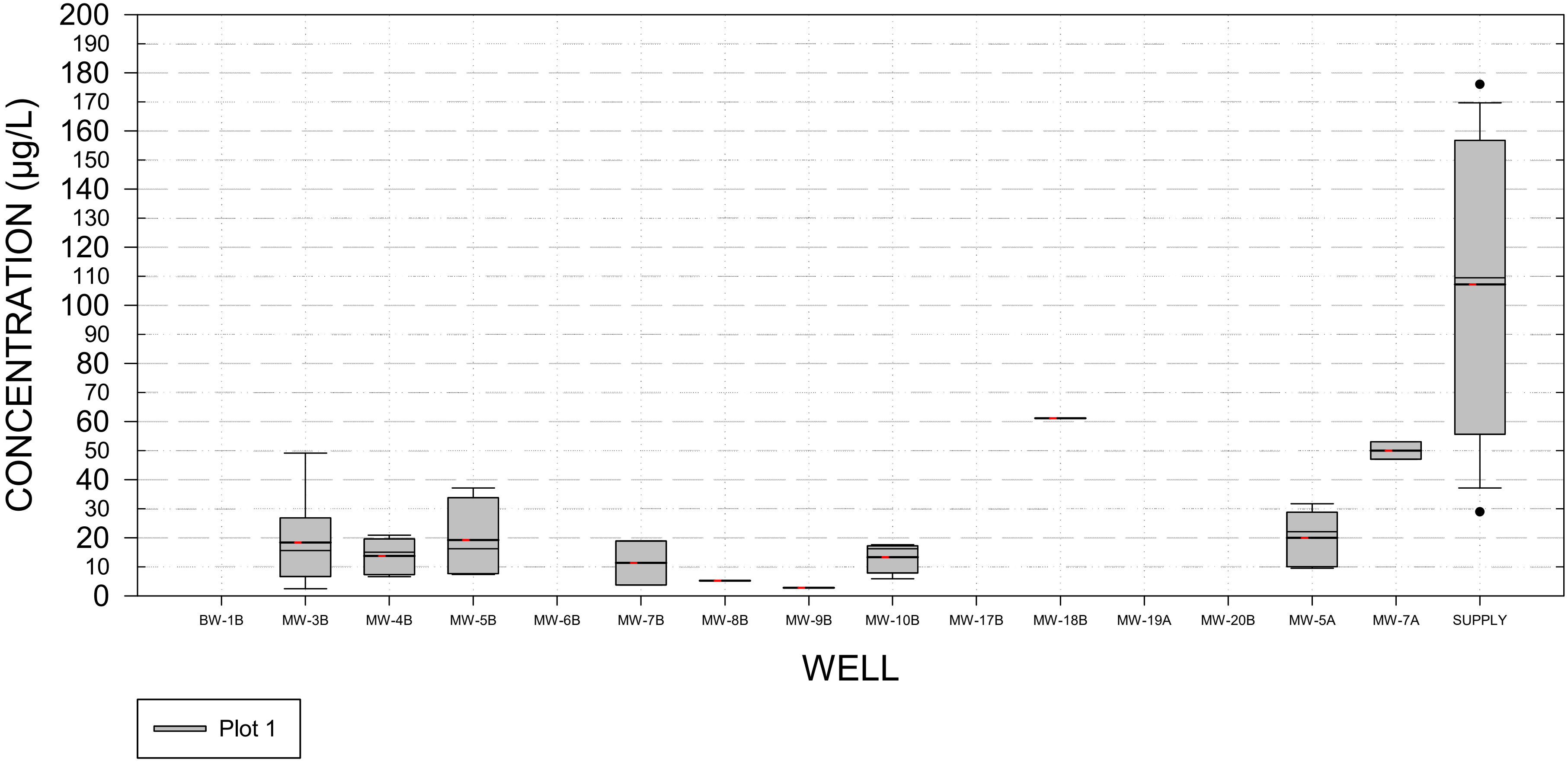


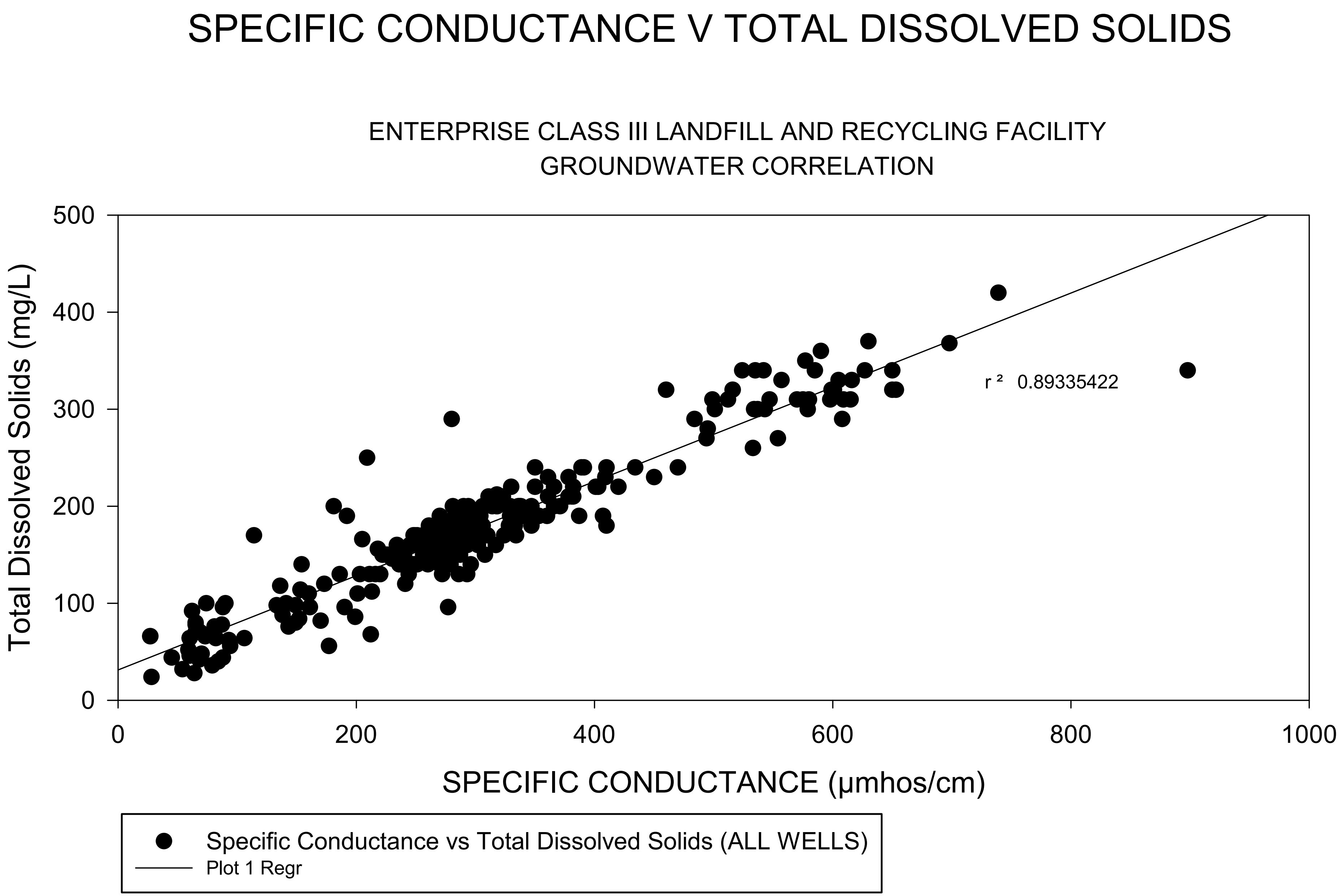


ZINC
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH
CONCENTRATION (µg/L)
6000
5000
4000
3000
2000
1000
0
SDWS: 5000
05S2
06S1
06S2
07S1
07S2
08S1
08S2
09S1
09S2
10S1
10S2
11S1
11S2
12S1
12S2
13S1
13S2
14S1
14S2
15S1
15S2
16S1
16S2
17S1
SAMPLING EVENT
EVENT vs MW-10B
EVENT vs MW-17B
EVENT vs MW-18B
EVENT vs MW-19A
EVENT vs MW-20B
EVENT vs MW-5A
EVENT vs MW-7A
EVENT vs SUPPLY
Plot 1 SDWS: 5000

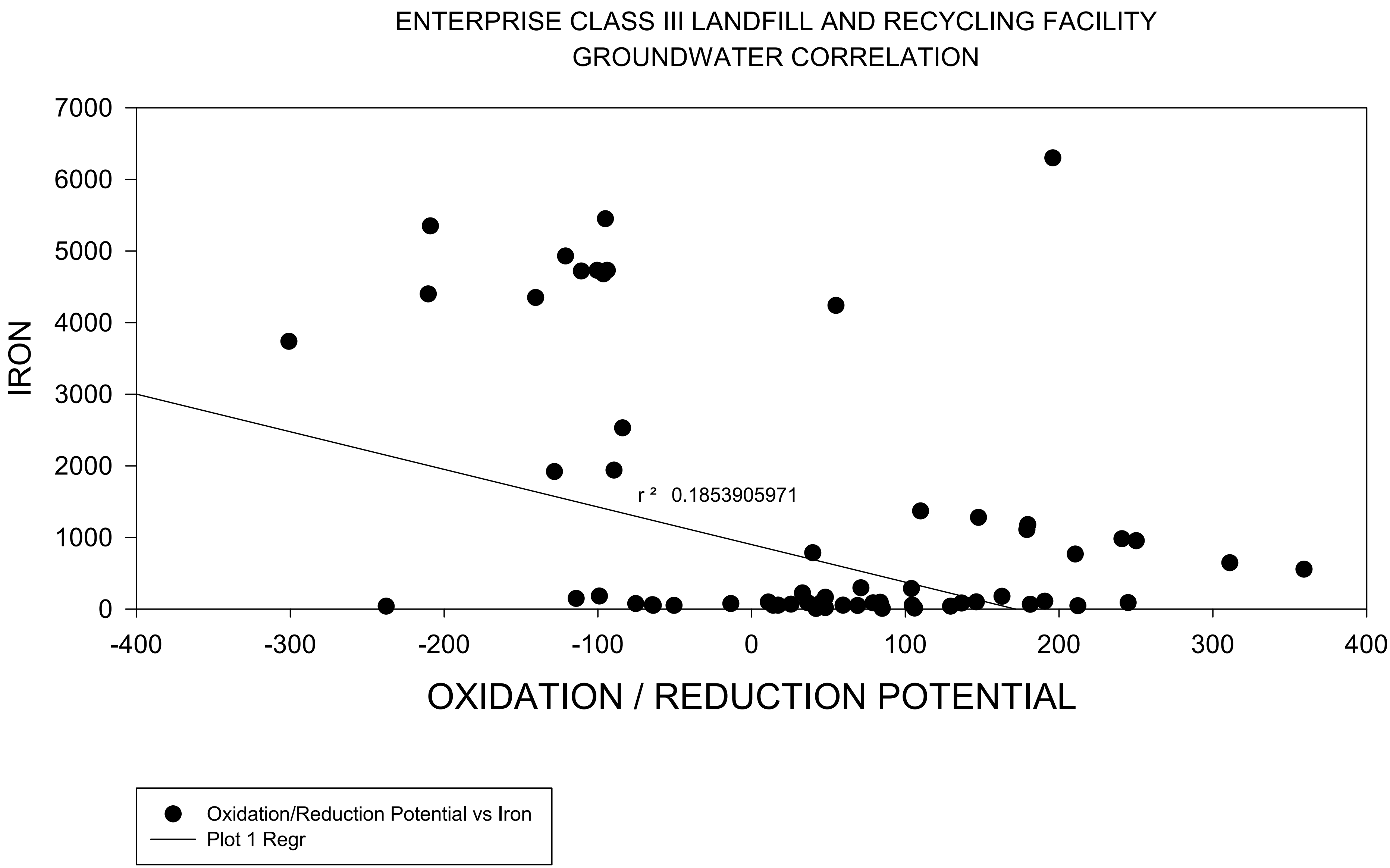
ZINC

ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CHEMISTRY GRAPH

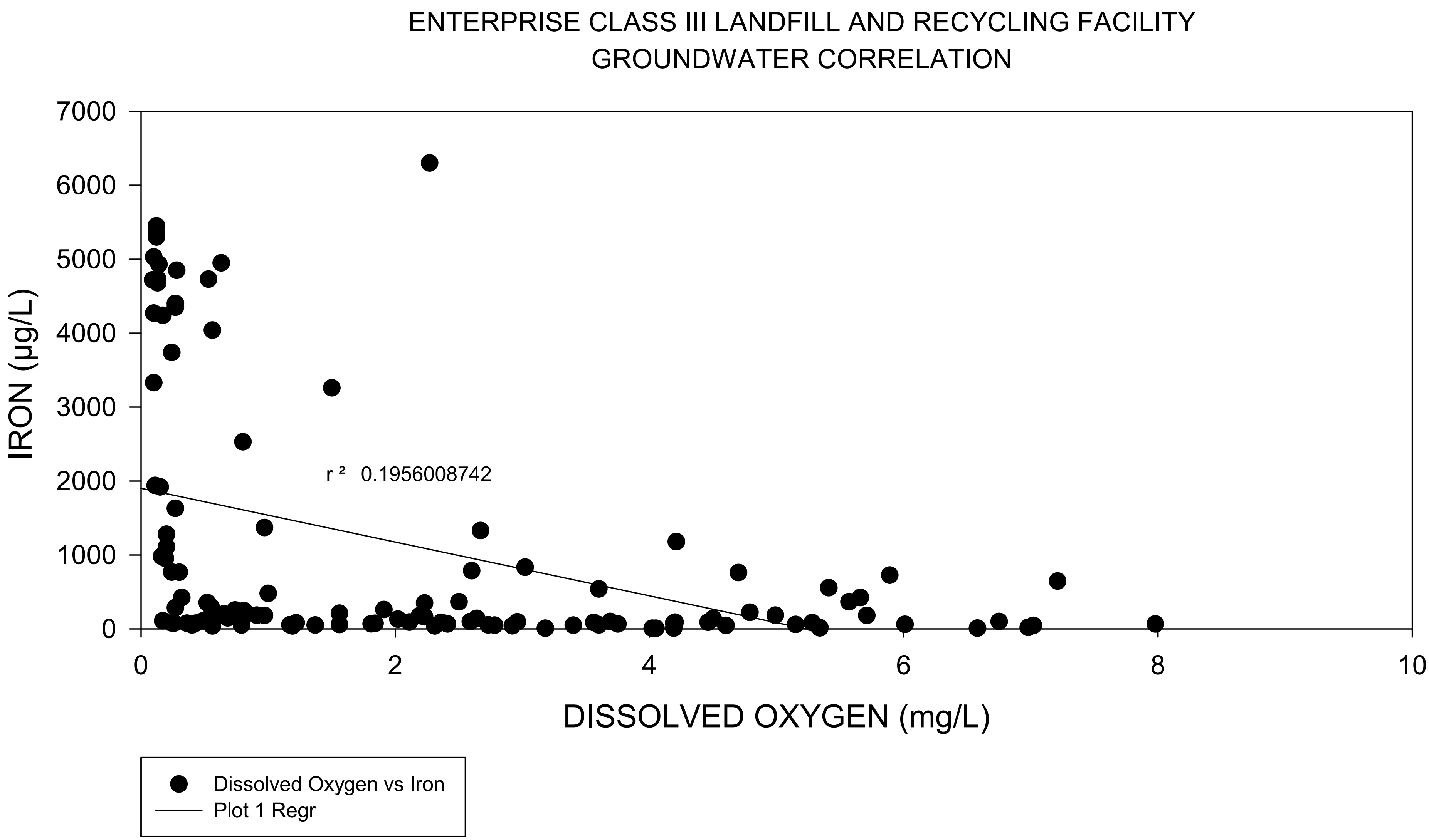



SPECIFIC CONDUCTANCE V TOTAL DISSOLVED SOLIDS
ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CORRELATION
Total Dissolved Solids (mg/L)
0
100
200
300
400
500
0
200
400
600
800
1000
SPECIFIC CONDUCTANCE (µmhos/cm)
r ² 0.89335422
Specific Conductance vs Total Dissolved Solids (ALL WELLS)
Plot 1 Regr

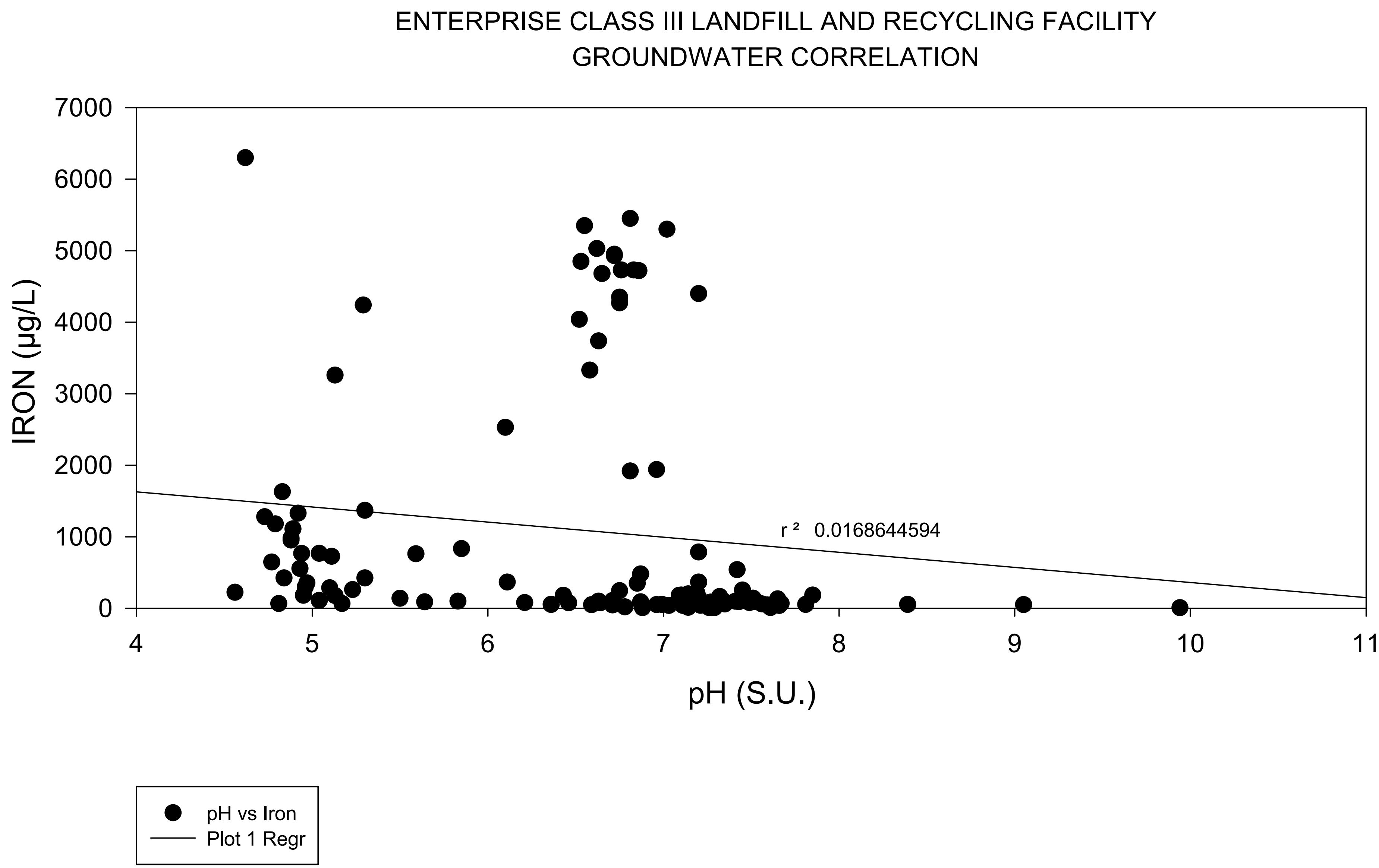
OXIDATION / REDUCTION POTENTIAL VS IRON



DISSOLVED OXYGEN VS IRON



pH VS IRON



ENTERPRISE CLASS III LANDFILL AND RECYCLING FACILITY
GROUNDWATER CORRELATION
7000
6000
5000
4000
3000
2000
1000
0
IRON (µg/L)
r ² 0.0168644594
4
5
6
7
8
9
10
11
pH (S.U.)
pH vs Iron
Plot 1 Regr

FDEP FORM 62-701.900(1) CHECKLIST SUPPORT

PART I
GEOTECHNICAL INVESTIGATION REQUIREMENTS
APPENDIX I-1

UNIVERSAL ENGINEERING SCIENCES REPORT

UNIVERSAL
ENGINEERING SCIENCES

GEOTECHNICAL EXPLORATION

Proposed Enterprise Class III Landfill Cell #17
NWC of Enterprise Rd. and Auton Rd.
Dade City, Florida

UES Project No. 0830.1500202

PREPARED FOR:

Angelo's Materials
c/o Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, FL 32606

PREPARED BY:

Universal Engineering Sciences
9802 Palm River Road
Tampa, Florida 33619
(813) 740-8506

August 30, 2017
(Revised, February 2, 2018)

UNIVERSAL
ENGINEERING SCIENCES
Consultants In: Geotechnical Engineering • Environmental Sciences
Geophysical Services • Construction Materials Testing • Threshold Inspection
Building Inspection • Plan Review • Building Code Administration

LOCATIONS:
- Atlanta
- Daytona Beach
- Fort Myers
- Fort Pierce
- Gainesville
- Jacksonville
- Miami
- Ocala
- Orlando (Headquarters)
- Palm Coast
- Panama City
- Pensacola
- Rockledge
- Sarasota
- St. Petersburg
- Tampa
- Tifton
- West Palm Beach

August 30, 2017
(Revised, February 2, 2018)

Angelo's Materials
c/o Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, FL 32606

Attention: John Locklear, P.E.

Reference: Geotechnical Services
Enterprise Landfill, Cell #17
NWC of Enterprise Rd. and Auton Rd.
Dade City, Pasco County, Florida
UES Project No. 0830.1500202
UES Report No. 1485772

Dear Mr. Locklear:

Universal Engineering Sciences, Inc. (UES) has completed the review and analysis of information provided by Locklear & Associates, Inc. (L&A) related to the Enterprise Landfill Cell #17 Permit modification.

This report contains the results of our study, an engineering interpretation of the subsurface data obtained with respect to the project characteristics described to us, geotechnical design recommendations, and general construction and site preparation considerations.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association with Angelo's Materials. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Respectfully submitted,

UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization No. 549

Dušan Jovanović
Senior Project Manager

MARK K. HARDY
LICENSE
NO. 57233
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Mark K. Hardy, P.E.
Regional Manager
Professional Engineer No. 57233
Date:

9802 Palm River Rd. • Tampa, Florida 33619 • Tel (813) 740-8506 • Fax (813) 740-8706
www.UniversalEngineering.com

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LIST OF APPENDICES

1.0 INTRODUCTION

1.1 GENERAL

In this report we present the results of our review of information provided by L&A for the proposed Enterprise Class III Landfill Cell #17, located on NWC of Enterprise Rd. and Auton Rd. in Dade City, Pasco County, Florida. This report contains the results of our review, an engineering interpretation of the subsurface data obtained with respect to the project characteristics described to us, and our recommendations for geotechnical design and general site preparation. Our scope of services was in general accordance with email request provided by Walker Wrenn. At that time we received all of the pertinent information provided by the client.

1.2 PROJECT DESCRIPTION

We understand that the project consists of a new landfill Cell #17. Previous cell configuration included Cells #13 and #14. These two, previously contemplated cells were combined into a new Cell #17. We were provided with a copy of the site layout with cell configurations and used this in our review. In addition we were provided with a boring location plan and boring logs prepared by others. Also Cross Sections of relative borings were provided for our use. The information provided by the client is attached in Appendix C.

Our analyses are based upon the above considerations. If any of this information is incorrect, or if you anticipate any changes, please inform Universal Engineering Sciences so that we may review our recommendations, and make revisions as needed.

A general location map of the project area appears in Appendix A: Site Location Map. Also included in Appendix A for your reference are a Site Aerial Photograph, USGS Site Topographic Map and SCS Soil Survey Map.

2.0 PURPOSE AND METHODOLOGIES

2.1 PURPOSE

The purpose of our services was:

- to review general subsurface conditions at the site using Standard Penetration Test (SPT) borings provided by the Client;
- to interpret and review the subsurface conditions with respect to the proposed landfill construction;
- to evaluate the general potential for sinkhole development at the subject site;
- to provide a geotechnical engineering report which summarizes all relevant data and presents results of our geotechnical evaluation;

This report presents an evaluation of based upon data provided by L&A. Universal was not involved in direct supervision of the field work as it was performed and therefore assumes that work performed and data provided is accurate.

2.2 FIELD EXPLORATION

The subsurface conditions were explored with fourteen (14) borings advanced to depths ranging from 25 to 65 feet, while performing the Standard Penetration Test.

2.3 LABORATORY TESTING

The soil samples recovered from the test borings were visually classified by the Client's technical staff. No additional laboratory testing results were provided at this time.

3.0 FINDINGS

3.1 SURFACE CONDITIONS

At the start of our geotechnical exploration, we reviewed aerial photographs available from the Pasco County Property Appraiser's office and TerraServer USA, USGS topographic quadrangle maps, and the USDA Soil Conservation Service (SCS) Soil Survey of Pasco County for relevant information about the site. According to USGS topographic information, the elevation across the property is on the order of +80 feet to +125 feet NGVD. The site is presently vacant land with portions of the site used for ongoing landfill activities.

3.2 GEOLOGY/HYDROLOGY

The regional geology of Pasco County consists of unconsolidated sands with intervals of silts and clay of Pleistocene to recent age. The underlying bedrock is massive limestone of the Eocene Age.

According to the Geologic Map of the State of Florida, 2001, the surficial deposits underlying the site and the general vicinity are classified as the Hawthorn Group (Th) of Miocene geologic age. The Hawthorn Group sediments are light olive gray and blue gray, poorly to moderately consolidated, clayey sands to silty clays.

The Oligocene Suwannee Limestone (Ts) generally lies below the Hawthorn Group sediments in the region. The Suwannee Limestone generally consists of a white to cream, poorly to well indurated, fossiliferous limestone. The upper portion of the limestone is highly variable due to paleo-weathering it is not uncommon for limestone to be found at relatively shallow depths (< 50 feet) or at depths greater than 100 feet below the land surface.

Two aquifer systems provide water supplies to Pasco County. These two aquifers consist of an uppermost "non-artesian" surficial aquifer and the underlying artesian (Floridan) aquifer.

The "non-artesian" surficial aquifer lies within the unconsolidated quartz sands of Pleistocene to Recent age. The approximate thickness of the "non-artesian" system is forty feet. The regional artesian groundwater flow direction is generally west towards the Gulf of Mexico. The "non-artesian" aquifer which is considered not potable is a source of water for small volume irrigation wells of two-inch diameter or less. The Floridan aquifer lies in massive limestone bedrock and produces high volumes of fresh water.

3.3 SUBSURFACE CONDITIONS

3.3.1 SOIL SURVEY

According to SCS, there are two native, surficial soil groups underlying this site. A summary of selected properties for the identified soil groups on the site is included below in Table 1. The location of these groups can be observed on the SCS Soil Survey Map provided in the Appendix A.

TABLE 1
SUMMARY OF SOIL INFORMATION

Soil Map Unit & Name	Hydrologic Soil Group	Water Table Type	SHWT Depth	Shrink-Swell Potential	Corrosion Risk	
					Steel	Concrete
32-Lake fine sand, 0 to 5 percent slopes	A	---	>6’	Low	Low	High
72-Orlando fine sand, 0 to 5 percent slopes	A	---	>6’	Low	Low	High

3.3.2 SOIL BORINGS

The boring locations and subsurface conditions provided by L&A are illustrated in Appendix B: Boring Location Plan and Boring Logs. The classifications and descriptions shown on the logs are based upon the data provided and Universal did not review the soils soil samples. The general subsurface soil profile on the site, based on the soil boring information provided, is described below. For more detailed information, please refer to the boring logs.

The subsurface stratigraphy encountered at the boring locations generally consists of clayey sand and sandy clay followed by limestone. In Borings B-102 and B-105 sand stratum was found above the upper limestone surface. In Borings 102, 104 and 106 limestone was not encountered within the reach of the borings. These borings were extended to 50 or 55 feet of depth. The limestone was found at shallower depths of 12 to 15 feet within the eastern portion of the proposed Cell #17 area compared to the western portion where it ranged from 30 to 55+ feet.

The shallow water table information was not provided to us and thus not presented in the boring logs.

The boring logs and related information included in this report are indicators of subsurface conditions only at the specific locations and times noted. Therefore, subsurface conditions, including groundwater levels and depth of limestone, at other locations on the site may differ from conditions which exist at the sampling locations. However, the subsurface soil conditions appear not to vary significantly across the site.

3.4 GROUNDWATER

Groundwater data was not provided to us therefore Universal cannot make any opinions about groundwater in this evaluation.

Based on our experience, due to the close proximity of a rather impermeable clayey sand stratum to ground surface it is somewhat difficult to determine groundwater table. Within the clayey sand stratum, the groundwater level cannot be determined from the saturation of recovered soil samples. In order to determine the water table level, it would be required that the boreholes remain open and a steady state water level be achieved in the borehole. However, Southwest Florida Water Management District rules require that boreholes penetrating through clayey soils into water bearing soils be backfilled with cement grout upon completion of the boring.

As presented by the Client elevation of +72 feet NGVD is used as the SHGWT elevation. This has been the value established since the initial hydrogeologic investigation.

Mud rotary method was used to advance the SPTs in Cell 17 so it was difficult to determine the water table, however we looked at groundwater elevation data for wells adjacent to Cell 17 and believe that +72 feet NGVD is appropriate.

3.5 SINKHOLE POTENTIAL EVALUATION

A sinkhole can be defined as “a depression caused by soil and other materials subsiding into an open hole or void below the ground surface.” This phenomenon is not uncommon in karst geology, where soils are underlain by limestone material which has been partially dissolved by the groundwater. The resulting voids in the rock provide paths through which water can travel, taking erodible soil with it.

In much of the Central and Western Florida vicinity, the soil which occurs in close proximity above the limestone consists of a light green to gray clay to silty or clayey sand resulting from marine deposits, commonly termed the “Hawthorn Formation.” This confining layer tends to form a barrier to the vertical movement of groundwater. The groundwater level in the limestone in this area is termed the Florida aquifer and is under pressure. The groundwater level or piezometric surface in the soils above the confining layer frequently differs from that which exists in the underlying porous limestone because the confining layer prevents an interconnected hydrostatic condition. Provided the confining layer remains intact, the two groundwater regimes can remain independent.

The shallow water table is located within the upper sands and rests on top of the confining layer. The upper water table is not confined or under pressure. The water pressure above the top of the confining layer is simply defined by the height, or depth of groundwater which lies above the confining layer. If a well or standpipe were to penetrate the confining layer into the underlying rock, then the water pressure in the deep water table could be evaluated as the level of water within the standpipe. If the pressure causes the water to rise higher than the level of the shallow water table, then the groundwater regime can be described as having a “net upward gradient.” If, however, the water in the upper water table is higher than the water in the standpipe, then the condition exhibits a “net downward gradient.”

If an opening develops in the confining layer, connecting the voids or caverns in the limestone bedrock below to the relatively sandy soils above, then the soil and groundwater conditions might become unbalanced. In some instances, the clay in the confining layer soils may crack, either from shrinkage, such as may result from dry periods when the shallow water table is absent, or from shifting of the limestone bedrock. In other cases, these soils have little clay content, and are inherently more susceptible to erosion. The result can be a breach in the confining layer. If the groundwater has a net downward gradient, then the erodible soils lying both above and below the confining layer can “ravel” through the opening in the confining layer and/or into cavities and fractures in the bedrock, similar to the behavior of sand falling through the orifice of an hourglass. Over a period ranging from hours to possible many years, the loss of material causes the soil above to loosen until it is incapable of supporting the material above, and it subsides under the weight. The resulting sinkhole can damage or destroy man-made structures on the near-surface soils.

Although breaches of the confining layer are fairly common, it generally takes a long time for the loose zone to extend to the surface and cause a sinkhole. Therefore, even in areas of “high sinkhole potential”, the incidence of surface expressions (sinkholes) can be infrequent. Although some notable Florida sinkholes have been large, most of the sinkholes observed within the Central Florida area have been smaller than 25 feet in diameter. In Western Florida, sinkholes typically can be even smaller, generally in the range of 10 feet in diameter or less.

Sinkhole activity may be indicated by the presence of some of the following conditions or occurrences:

- a loose or raveled zone within the sandy overburden soil, or clay confining layer, indicating movement of the soils into voids into the limestone below;

- the presence of an opening in the confining layer, as indicated by boring through the layer and finding either little or no thickness of clay;

- reduced water pressure in the soil voids (“pore pressure”) with increasing depth, indicating downward flow of water;

- depressed, or absent groundwater table;

- depression of the top of, or opening, or voids within, the limestone bedrock; and

- loss of drilling fluid circulation while advancing a borehole.

No loose or ravelled soil zones were noted above the upper limestone surface in the borings provided to us borings by L&A. Majority of the borings exhibit a competent protective cohesive soil stratum above the limestone. In addition, none of the borings appear to have experienced total loss of drilling fluid circulation. Based on the provided boring data the upper limestone zone appears to be fairly competent. The majority of the borings exhibit N-values of 20 or higher within the upper limestone zone. Based on our experience the limestone with N-values less that 10 can be considered weathered. Only boring B-103 encountered N-values of 6 and 8 within the upper limestone zone which followed by limestone with N-value of 41 and 50/2”. All of the borings terminated within the limestone were terminated with N-value of 30 or higher.

Based on the above information, it is our opinion that the potential for sinkhole occurrence at the subject site is average for the area which was initially assessed as low.

4.0 CONCLUSIONS

Our conclusions are made based upon a review of the attached soil test data and our understanding of the proposed construction. If the landfill plan, sections, or grading plans change from those discussed previously, we request the opportunity to review and possibly amend our conclusions with respect to those changes.

Additionally, if subsurface conditions are encountered during the mining stage, which were not encountered in the borings, e.g., seepage, buried muck, fissured clays, etc., report those conditions immediately to us for observation and recommendations.

5.0 LIMITATIONS

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible subsurface variations. An Association of Engineering Firms Practicing in the Geosciences (ASFE) publication, "Important Information About This Geotechnical Engineering Report" appears in Appendix D, and will help explain the nature of geotechnical issues. Further, we present documents in Appendix D: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

Do not apply any of this report's conclusions or recommendations if the nature, design, or location of the facilities is changed. If changes are contemplated, UES must review them to assess their impact on this report's applicability. Also, note that UES is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of this report's subsurface data or engineering analyses without the express written authorization of UES.

* * * * * * * * *

APPENDIX A

UNIVERSAL ENGINEERING SCIENCES

PROPOSED CLASS III LANDFILL, CELL 17
NWC OF ENTERPRISE ROAD AND AUTON ROAD
DADE CITY, PASCO COUNTY, FLORIDA

SITE LOCATION MAP

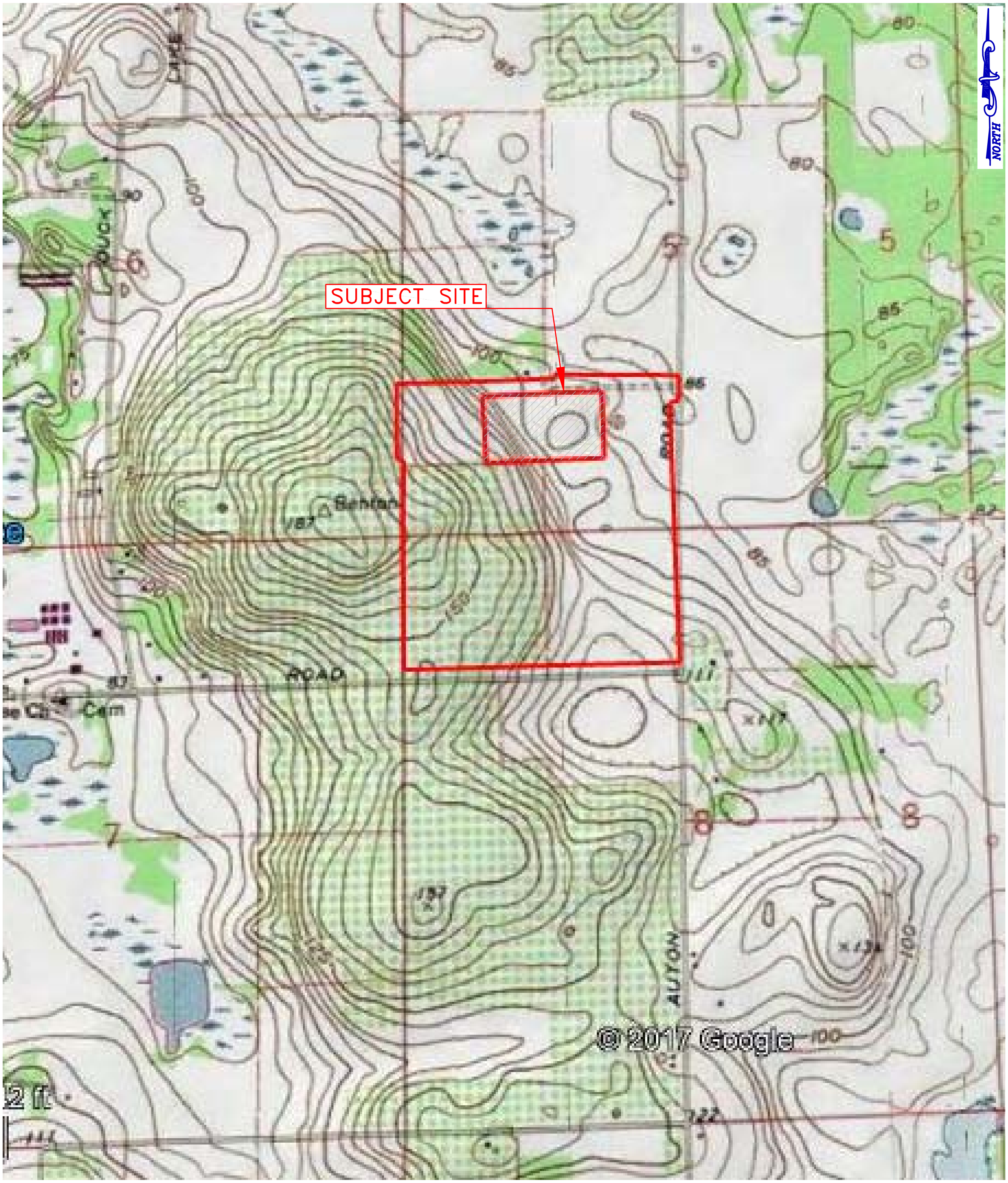
CLIENT: ANGELO'S MATERIALS		DRAWN BY: SC	DATE: AUGUST 25, 2017
SCALE: NOT TO SCALE	PROJECT NO: 0830.1500202	REVIEWED BY: DJ	APPENDIX: A

UNIVERSAL
ENGINEERING SCIENCES

PROPOSED CLASS III LANDFILL, CELL 17
NWC OF ENTERPRISE ROAD AND AUTON ROAD
DADE CITY, PASCO COUNTY, FLORIDA

SITE AERIAL PHOTOGRAPH

CLIENT: ANGELO'S MATERIALS		DRAWN BY: SC	DATE: AUGUST 25, 2017
SCALE: NOT TO SCALE	PROJECT NO: 0830.1500202	REVIEWED BY: DJ	APPENDIX: A



UNIVERSAL ENGINEERING SCIENCES	PROPOSED CLASS III LANDFILL, CELL 17 NWC OF ENTERPRISE ROAD AND AUTON ROAD DADE CITY, PASCO COUNTY, FLORIDA	
	SITE TOPOGRAPHIC MAP	
	CLIENT: ANGELO'S MATERIALS	DRAWN BY: SC	DATE: AUGUST 25, 2017
	SCALE: NOT TO SCALE	PROJECT NO: 0830.1500202	REVIEWED BY: DJ	APPENDIX: A

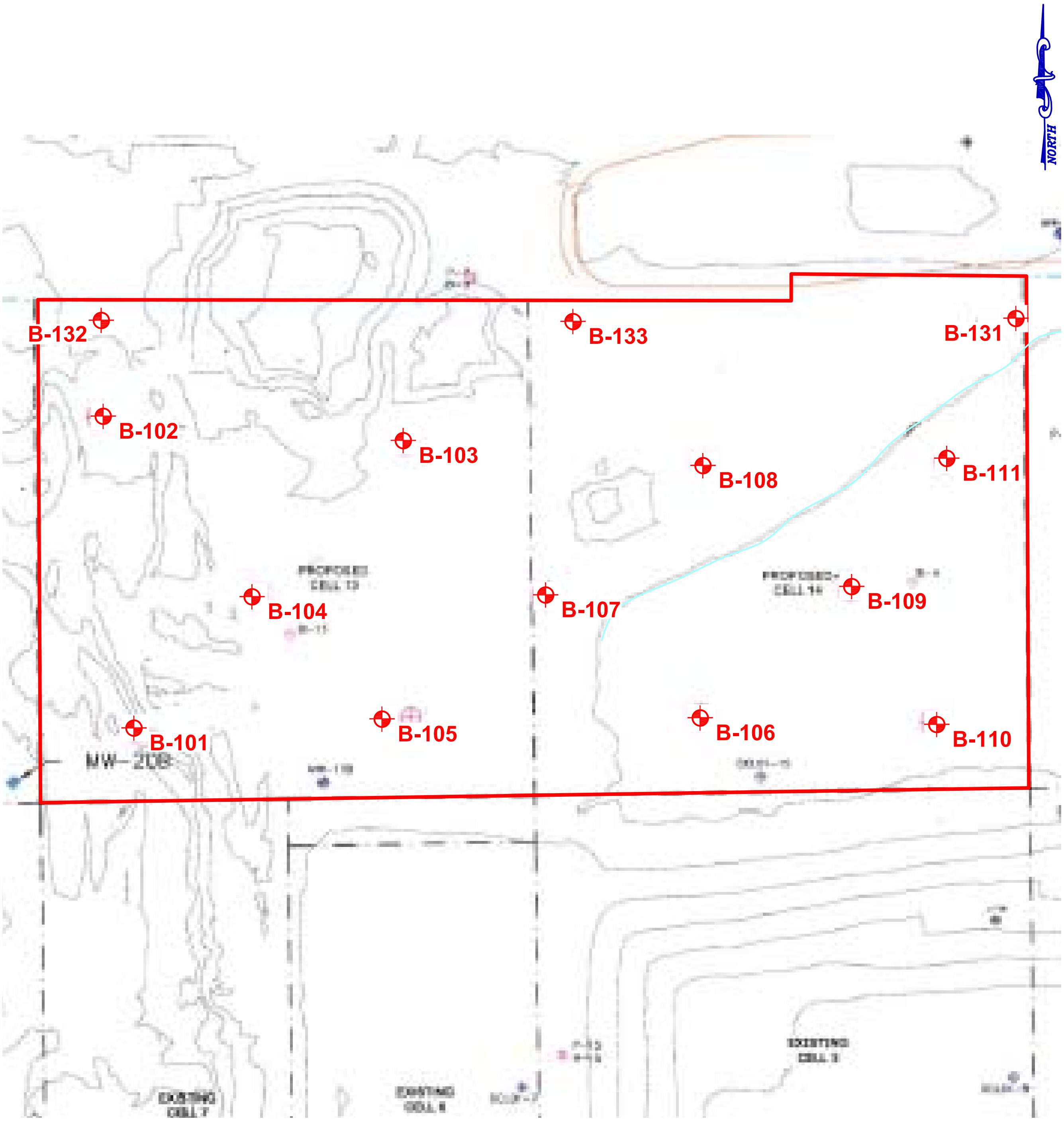
UNIVERSAL ENGINEERING SCIENCES

PROPOSED CLASS III LANDFILL, CELL 17
NWC OF ENTERPRISE ROAD AND AUTON ROAD
DADE CITY, PASCO COUNTY, FLORIDA

SCS SOIL SURVEY MAP

CLIENT: ANGELO'S MATERIALS		DRAWN BY: SC	DATE: AUGUST 25, 2017
SCALE: NOT TO SCALE	PROJECT NO: 0830.1500202	REVIEWED BY: DJ	APPENDIX: A

APPENDIX B



LEGEND:

B–1 Approximate SPT boring location

UNIVERSAL ENGINEERING SCIENCES

PROPOSED CLASS III LANDFILL, CELL 17
NWC OF ENTERPRISE ROAD AND AUTON ROAD
DADE CITY, PASCO COUNTY, FLORIDA

BORING LOCATION PLAN

CLIENT: ANGELO'S MATERIALS		DRAWN BY: SC	DATE: FEB. 31, 2018
SCALE:	PROJECT NO: 0830.1500202	REVIEWED BY: DJ	APPENDIX: B

BORING FIELD REPORT

B-101

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/26/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	4,4,5	9		Pale brown fine sand (SP)
10	4,3,4	7		Light gray sandy clay (CL)
15	3,3,3	6		Light gray clay (CL) with sand
20	2,2,3	5		Pale brown sandy clay (CL)
25	1,1,2	3		Light gray clay (CL) with sand
30	1,2,2	4		Light gray clay (CL)
35	8,10,10	20		Light gray limestone (LS)
40	13,13,14	27		Light gray limestone (LS)
	50/1"	R		Light gray limestone (LS)
45				Boring terminated at 43.5 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 43.5 feet bls

Ground surface elevation = 89.86 ft. NGVD

Florida West Coordinates = 1454538.70 N, 612506.86 E

Locklear & Associates

BORING FIELD REPORT

B-102

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/26/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	5,5,8	13		Brown sandy clay (CL)
10	3,3,4	7		Brown sandy clay (CL)
15	3,3,3	6		Brown fine sand (SP)
20	12,12,16	28		Brown fine sand (SP)
25	9,11,15	26		Brown fine sand (SP)
30	9,10,11	21		Brown fine sand (SP)
35	4,6,5	11		Brown fine sand (SP)
40	3,3,4	7		Brown fine sand (SP)
				Brown fine sand (SP)
45	6,7,7	14		
50	9,14,20	34		Brown fine sand (SP)
				Boring terminated at 50 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring

Notes & additional data/info. (specify if other materials used):

Total depth = 50 feet bls

Ground surface elevation = 82.85 ft. NGVD

Florida West Coordinates = 1454337.62 N, 612688.31 E

Locklear & Associates

BORING FIELD REPORT

B-103

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/27/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	2,2,3	5		Brown sandy clay (CL)
10	2,2,3	5		Brown sandy clay (CL)
15	3,4,6	10		Gray clay (CL) with sand
20	4,5,9	14		Brown sandy clay (CL)
25	3,3,6	9		Brown sandy clay (CL)
30	2,2,2	4		Brown clay (CL) with limestone in the tip
	50/1"	R		Light gray limestone (LS)
35				
	50/0"	R		Light gray limestone (LS)
40				Boring terminated at 38.5 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
45				
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 38.5 feet bls

Ground surface elevation = 79.78 ft. NGVD

Florida West Coordinates = 1454185.57 N, 612549.13 E

Locklear & Associates

BORING FIELD REPORT B-104

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC — Boring completed: 6/27/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls — Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	4,5,5	10		Light brown sandy clay (CL)
10	2,2,2	4		Gray sandy clay (CL)
15	4,3,3	6		Gray sandy clay (CL)
20	3,3,3	6		Gray sandy clay (CL)
25	11,13,14	27		Brown clayey sand (SC)
30	10,12,14	26		Brown clayey sand (SC)
35	8,7,6	13		Brown fine sand (SP) with clay
40	20,17,15	32		Brown fine sand (SP) with clay
45	14,18,16	34		Brown fine sand (SP) with clay
50	13,20,20	40		Brown fine sand (SP) with clay
				Boring terminated at 50 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring

Notes & additional data/info. (specify if other materials used):

Total depth = 505 feet bls

Ground surface elevation = 79.93 ft. NGVD

Florida West Coordinates = 1454200.03 N, 612859.75 E

Locklear & Associates

BORING FIELD REPORT

B-105

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/27/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	3,3,5	8		Gray clay (CL) with sand
10	3,3,3	6		Gray clay (CL)
15	2,2,3	5		Gray sandy clay (CL)
20	2,2,3	5		Brown sandy clay (CL)
25	12,12,14	26		Brown fine sand (SP)
30	10,10,12	22		Brown fine sand (SP)
35	10,10,9	19		Gray limestone (LS)
	50/2"	R		Light gray limestone (LS)
40				
	50/1"	R		Light gray limestone (LS)
45				Boring terminated at 43.5 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 43.5 feet bls

Ground surface elevation = 80.30 ft. NGVD

Florida West Coordinates = 1454339.69 N, 613008.50 E

Locklear & Associates

BORING FIELD REPORT

B-106

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	2,2,3	5		Light brown sandy clay (CL)
10	5,4,5	9		Gray sandy clay (CL)
15	5,6,7	13		Gray clayey sand (SC)
20	4,4,4	8		Gray sandy clay (CL)
25	6,7,8	15		Gray sandy clay (CL)
30	5,7,9	16		Gray sandy clay (CL)
35	6,6,7	13		Gray clayey sand (SC)
40	4,5,8	13		Gray clayey sand (SC)
45	5,5,5	10		Gray sandy clay (CL) Loss of drilling fluid circulation was not observed or noted at the time of the boring
50	4,5,7	12		Gray clayey sand (SC)
55	6,6,8	14		Gray clayey sand (SC) Boring terminated at 55 feet bls

Notes & additional data/info. (specify if other materials used):

Total depth = 55 feet bls

Ground surface elevation = 81.52 ft. NGVD

Florida West Coordinates = 1454510.26 N, 612856.15 E

Locklear & Associates

BORING FIELD REPORT

B-107

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls

Boring completed: 6/28/2017
Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	3,3,4	7		Gray sandy clay (CL)
10	5,5,6	16		Gray sandy clay (CL)
15	4,5,5	10		Gray limestone (LS)
20	28,20,21	41		Light gray limestone (LS)
	50/2"	R		Light gray limestone (LS)
25				Boring terminated at 23.5 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
30				
35				
40				
45				
50				

Notes & additional data/info. (specify if other materials used):
Total depth = 23.5 feet bls
Ground surface elevation = 80.11 ft. NGVD
Florida West Coordinates = 1454486.21 N, 613193.16 E

Locklear & Associates

BORING FIELD REPORT

B-108

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	5,5,5	10		Gray sandy clay (CL)
10	4,5,6	11		Gray sandy clay (CL)
15	3,4,4	8		Light gray clay (CL) with limestone in the tip
20	17,21,26	47		Light gray limestone (LS)
25	25,50/2"	R		Light gray limestone (LS)
				Boring terminated at 25 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
30				
35				
40				
45				
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 25 feet bls

Ground surface elevation = 76.35 ft. NGVD

Florida West Coordinates = 1454343.16 N, 613358.25 E

Locklear & Associates

BORING FIELD REPORT

B-109

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Boring completed: 6/29/2017
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls
Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	2,2,3	5		Gray sandy clay (CL)
10	3,3,4	7		Gray sandy clay (CL)
15	3,3,3	6		Light gray clay (CL) with limestone in the tip
20	12,14,14	28		Light gray limestone (LS)
25	17,20,24	44		Light gray limestone (LS)
				Boring terminated at 25 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
30				
35				
40				
45				
50				

Notes & additional data/info. (specify if other materials used):
Total depth = 25 feet bls
Ground surface elevation = 76.35 ft. NGVD
Florida West Coordinates = 1454202.94 N, 613188.12 E

Locklear & Associates

BORING FIELD REPORT

B-110

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	2,2,3	5		Gray clay (CL)
10	5,8,12	20		Gray sandy clay (CL)
15	6,6,7	13		Gray sandy clay (CL)
20	3,7,7	14		Light gray limestone (LS)
25	13,22,27	49		Light gray limestone (LS)
30	13,20,24	44		Light gray limestone (LS)
				Boring terminated at 30 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
35				
40				
45				
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 30 feet bls

Ground surface elevation = 74.77

Florida West Coordinates = 1454491.33 N, 613466.17 E

Locklear & Associates

BORING FIELD REPORT

B-111

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	3,2,3	5		Gray sandy clay (CL)
10	3,4,6	10		Gray sandy clay (CL)
15	4,4,5	11		Gray sandy clay (CL)
20	13,13,18	31		Light gray limestone (LS)
25	10,10,11	21		Light gray limestone (LS)
30	14,13,17	30		Light gray limestone (LS)
				Boring terminated at 30 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
35				
40				
45				
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 30 feet bls

Ground surface elevation = 74.82

Florida West Coordinates = 1454232.54 N, 613480.98 E

Locklear & Associates

BORING FIELD REPORT

B-131

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Boring completed: 12/18/2017
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls
Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	3,3,4	7		Brown (with orange) sandy clay (CL)
10	5,7,8	15		Gray sandy clay (CL)
15	5,8,11	19		Gray sandy clay (CL)
20	5,6,6	12		Gray sandy clay (CL)
25	3,4,4	8		Gray and brown sandy clay (CL)
30	4,4,4	8		Gray and brown sandy clay (CL)
35	3,3,3	6		White weathered limestone (LS)
40	3,4,4	8		White weathered limestone (LS)
45	20,21,33	54		White limestone (LS)
				Boring terminated at 45 feet bls
				Partial loss of drilling fluid circulation was observed at 38' bls
50				100% loss of drilling fluid was not observed

Notes & additional data/info. (specify if other materials used):
Total depth = 45 feet bls
Ground surface elevation = 79.60
Florida West Coordinates = 1454639.36 N, 613470.98 E

Locklear & Associates

BORING FIELD REPORT

B-132

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Boring completed: 12/18/2017
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls
Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	6,10,13	23		Brown clayey sand (SC)
10	5,7,8	15		Gray and brown clayey sand (SC)
15	3,6,8	14		Gray and brown clayey sand (SC)
20	10,13,15	28		Orange/brown sand (SP) with trace clay
25	10,12,16	28		Orange/brown sand (SP) with trace clay
30	6,7,10	17		Orange/brown sand (SP) with trace clay
35	9,11,15	26		Orange/brown sand (SP) with trace clay
40	4,6,7	13		Orange/brown sand (SP) with trace clay
45	8,13,12	25		Orange/brown sand (SP) with trace clay
50	4,4,5	9		Orange/brown clayey sand (SC)

Notes & additional data/info. (specify if other materials used):
Total depth = 43.5 feet bls
Ground surface elevation = 80.12
Florida West Coordinates = 1454639.36 N, 612435.46 E

Locklear & Associates

BORING FIELD REPORT

B-132 (continued)

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 12/18/2017

Drilling Method: Standard Penetration Test

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
50				
55	13,15,14	23		Orange/brown clayey sand (SC)
60	15,22,29	15		White limestone (LS)
65	23,20, 50/3"	R		White limestone (LS)

Boring terminated at 65 feet bls

Loss of drilling fluid circulation was not observed or noted at the time of the boring

Notes & additional data/info. (specify if other materials used):

BORING FIELD REPORT

B-133

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls

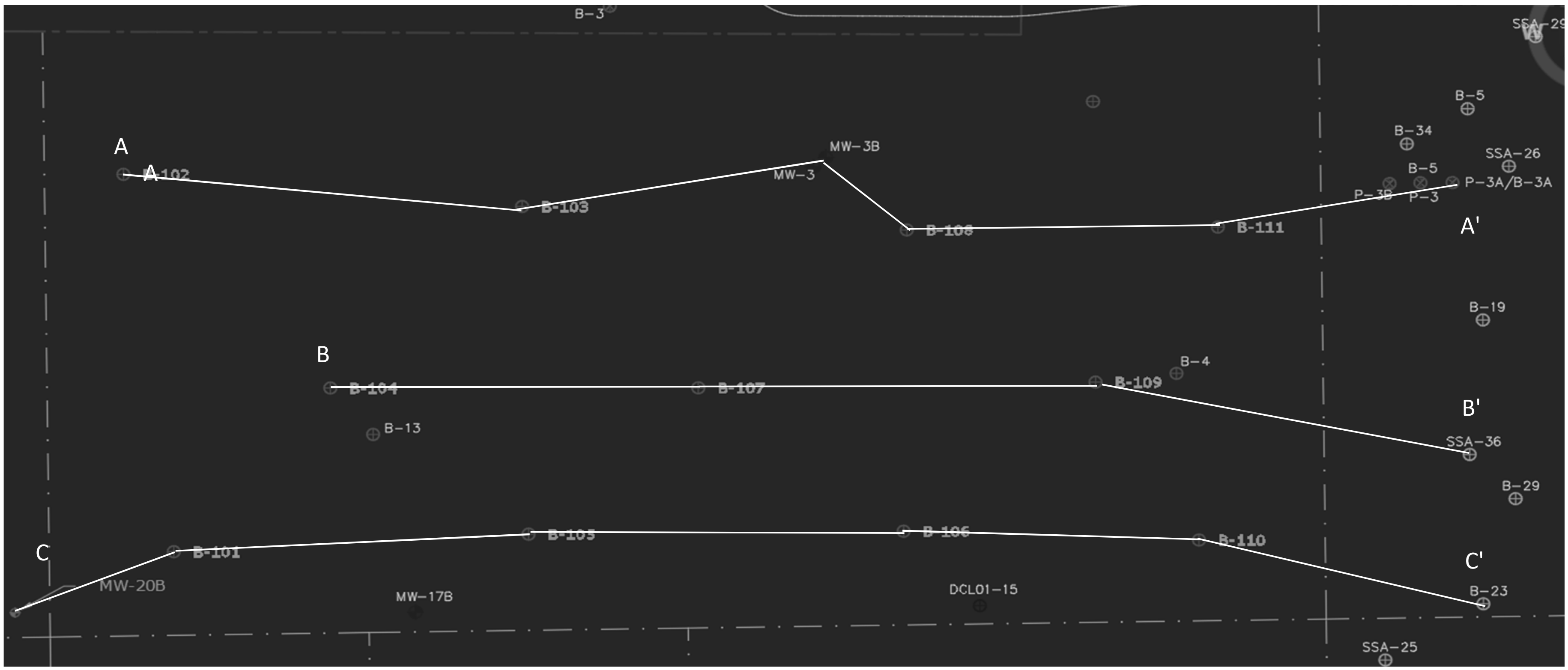
Boring completed: 12/1/17
Geologist: JDL

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0				
5	3,3,3	6		Sandy clay (CL)
10	3,3,3	6		Sandy clay (CL)
15	27,50/5"	R		Limestone (LS)
20	42,33,22	55		Limestone (LS)
25	18,21,23	44		Limestone (LS)
				Boring terminated at 25 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
30				
35				
40				
45				
50				

Notes & additional data/info. (specify if other materials used):
Total depth = 25 feet bls
Ground surface elevation = 82.42
Florida West Coordinates = 1454639.36 N, 612895.64 E

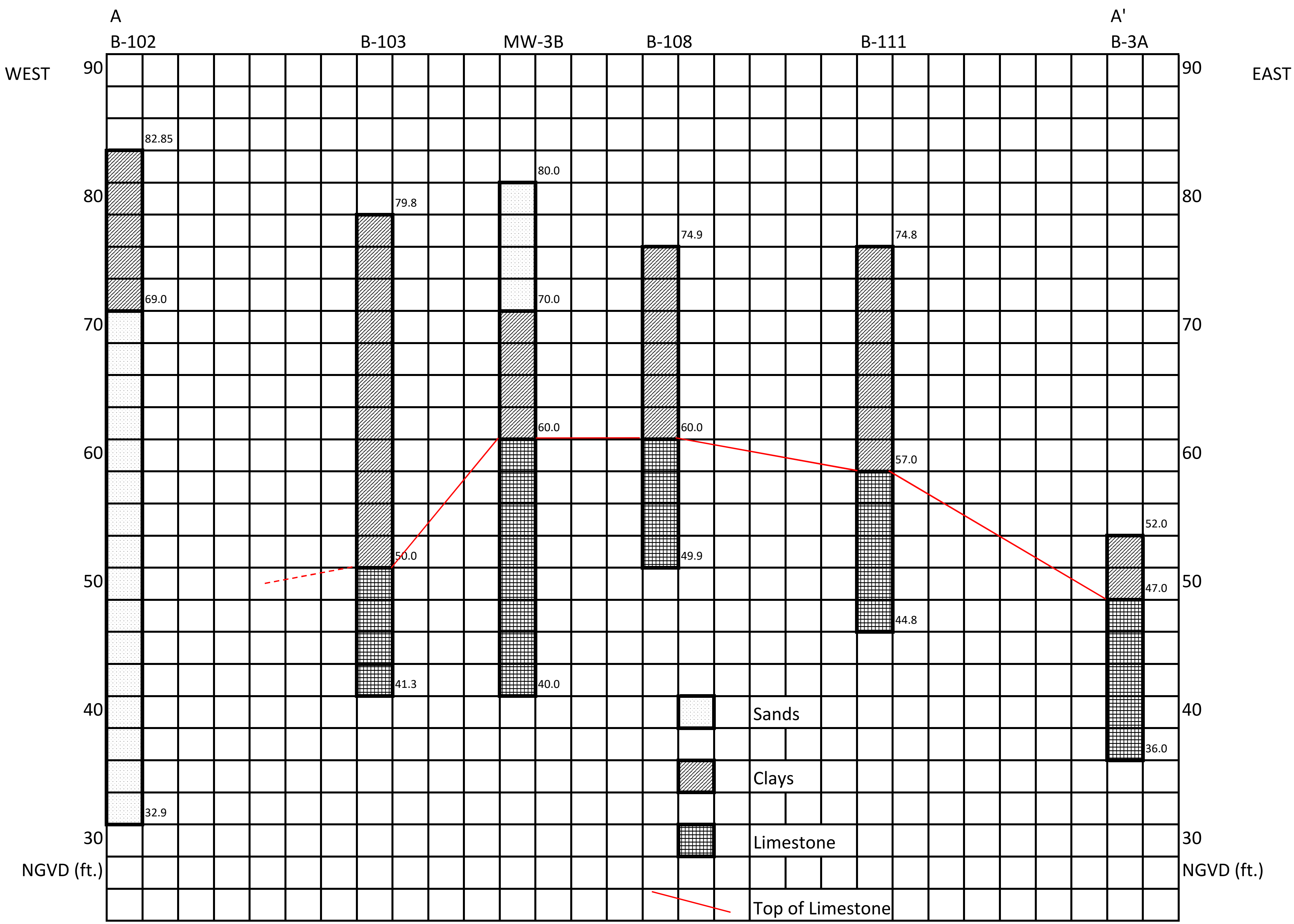
Locklear & Associates

APPENDIX C

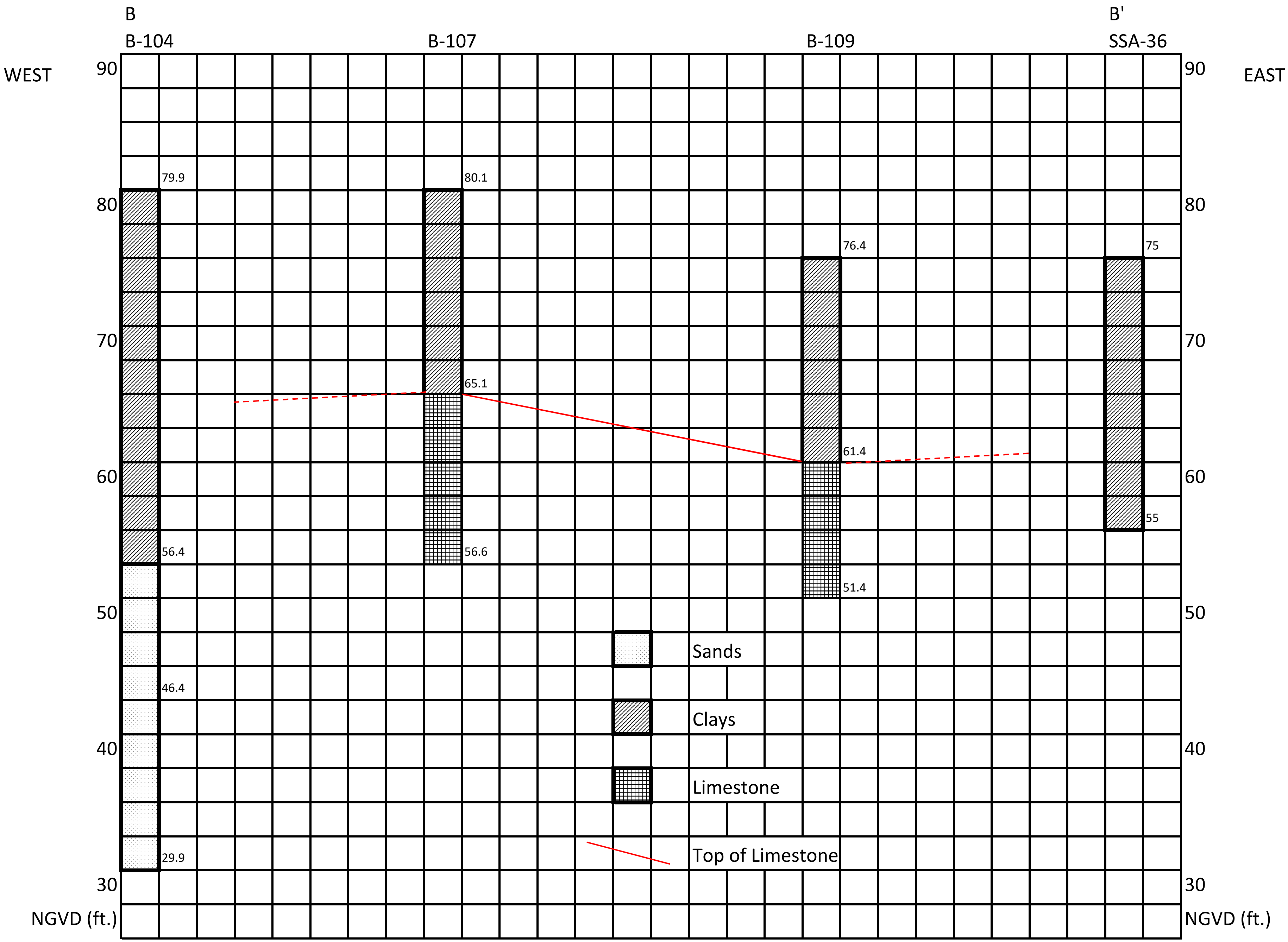


B-3
SSA-29
B-5
B-34
SSA-26
MW-3B
A
B-102
MW-3
B-5
P-3A/B-3A
P-3B
P-3
B-103
B-108
B-111
A'
B-19
B
B-4
B-104
B-107
B-109
B'
B-13
SSA-36
B-29
B-105
B-106
B-110
C
B-101
C'
MW-20B
B-23
DCL01-15
MW-17B
SSA-25

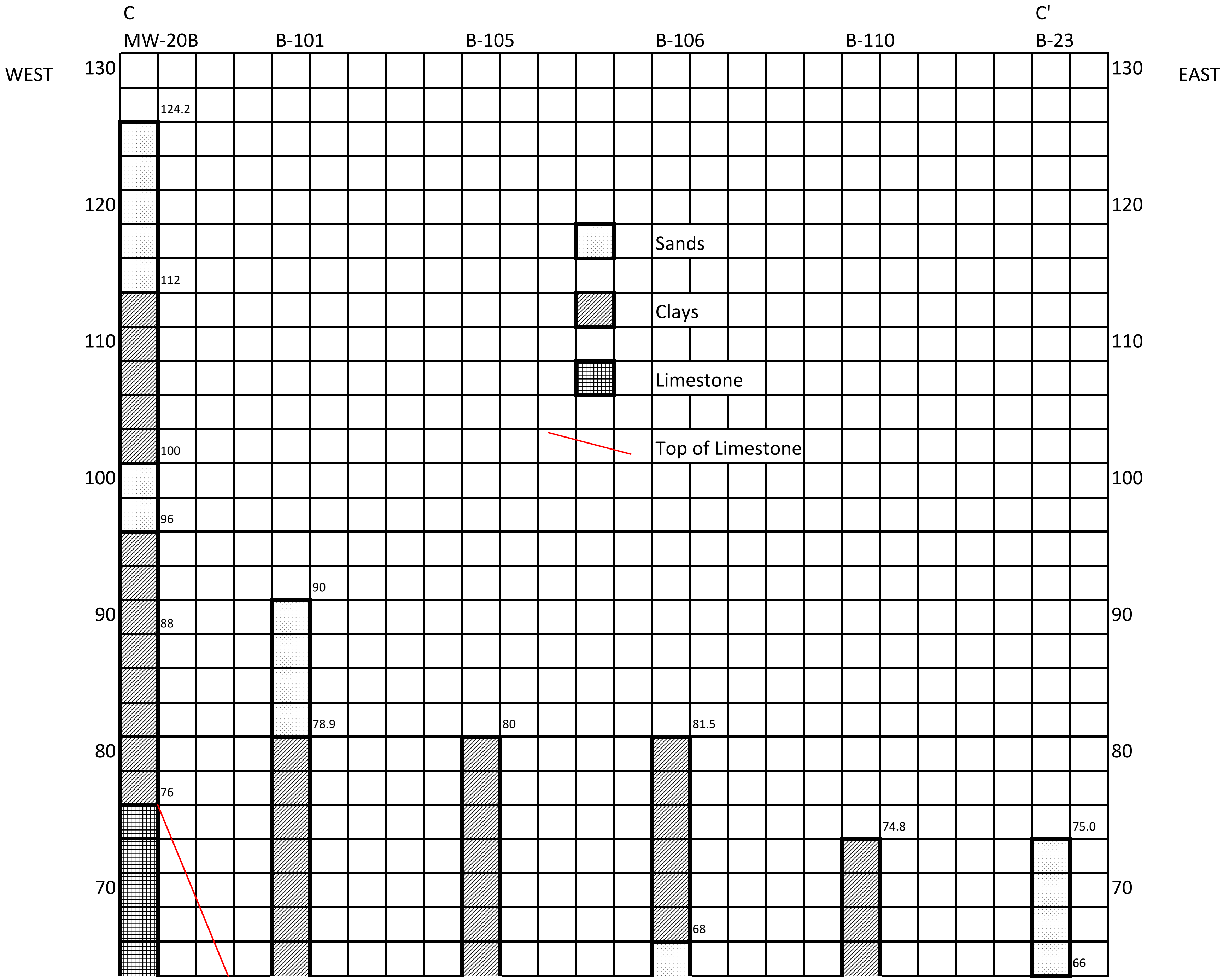
Angelo's - Enterprise Facility Cell 17 Permit Modification

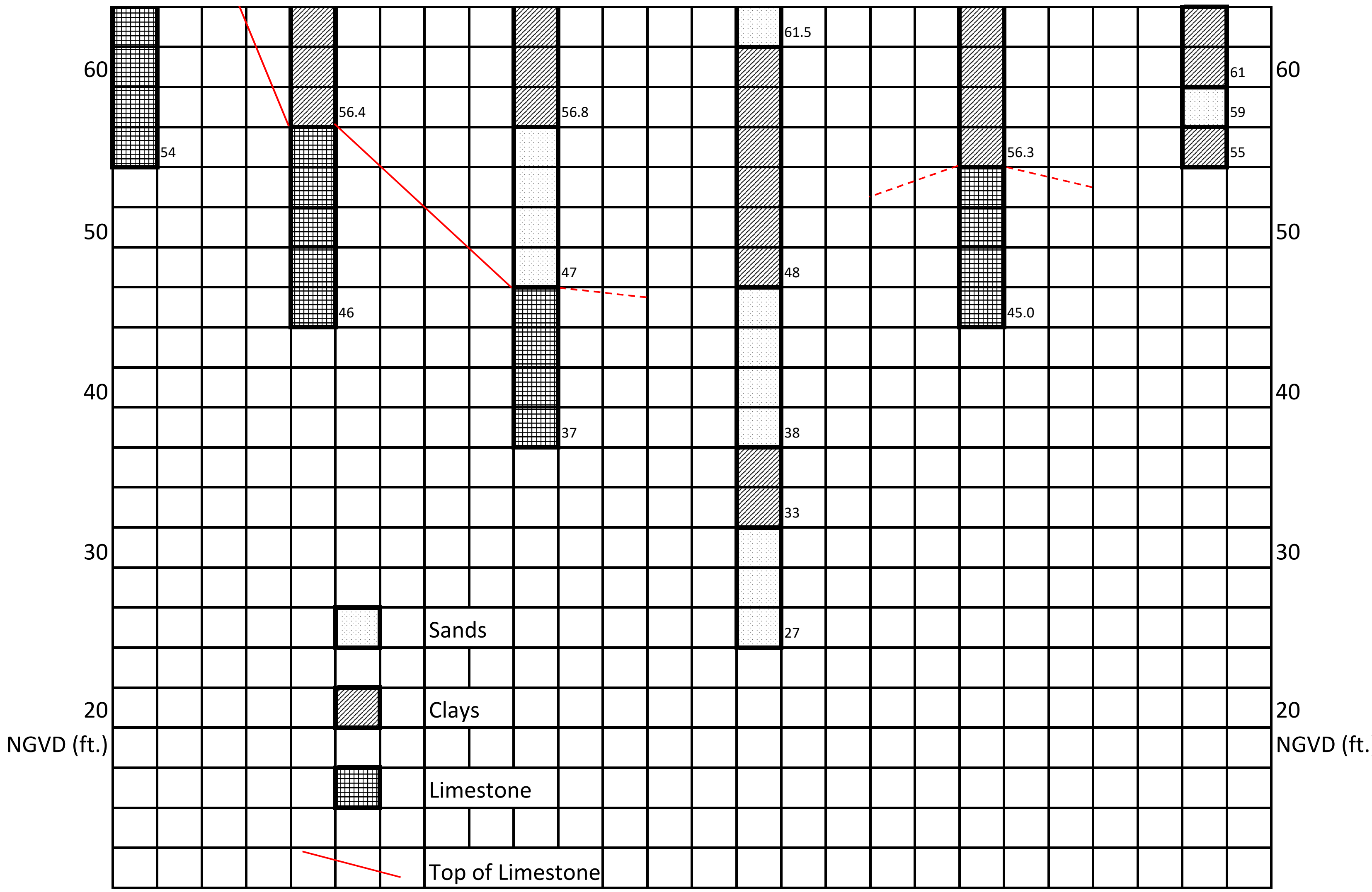


Angelo's - Enterprise Facility Cell 17 Permit Modification



Angelo's - Enterprise Facility Cell 17 Permit Modification





60
50
40
30
20
NGVD (ft.)
60
50
40
30
20
NGVD (ft.)
54
56.4
46
56.8
47
37
61.5
48
38
33
27
56.3
45.0
61
59
55
Sands
Clays
Limestone
Top of Limestone

UNIVERSAL
ENGINEERING SCIENCES

GEOTECHNICAL EXPLORATION

Proposed Dade City - Class III Landfill
NEC of Enterprise Road and Auton Road
Dade City, Florida

UES File No. 80010-002-01

Prepared By:

Universal Engineering Sciences
5804 Breckenridge Parkway, Suite E
Tampa, Florida 33610
(813) 740-8506

May 5, 2000

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May 5, 2000

Hartman & Associates, Inc.
201 East Pine Street, Suite 1000
Orlando, Florida 32801

Attention: James Golden

Subject: Geotechnical Exploration
Proposed Dade City - Class III Landfill
Dade City, Florida
UES File No. 80010-002-01

Dear Mr. Golden:

Universal Engineering Sciences, Inc. has completed the subsurface exploration of the site for the proposed Class III Landfill in Dade City, Florida. The scope of our services was planned in conjunction with and authorized by, you.

This report contains the results of our study, an engineering interpretation of these with respect to the project characteristics described to us, our conclusions and recommendations.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Respectfully submitted,

Universal Engineering Sciences, Inc.

Dusan Jovanovic
Project Engineer

Wayne Pandorf, P.E.
Tampa Regional Manager
Registered Professional Engineer No. 30254

DJ/WP:df
cc: Client (5)

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 GENERAL

In this report, we present the results of the subsurface exploration of the site for a proposed Class III Landfill. We have divided this report into the following sections:

- SCOPE OF SERVICES - Defines what we did
- FINDINGS - Describes what we encountered
- RECOMMENDATIONS - Describes what we encourage you to do
- LIMITATIONS - Describes the restrictions inherent in this report
- SUMMARY - Reviews the material in this report
- APPENDICES - Presents support materials referenced in this report.

1.2 PROJECT DESCRIPTION

We understand a Class III Landfill is anticipated at the subject site. We were provided with a faxed and reduced proposed landfill plan and two cross sections prepared by Hartman & Associates, Inc. We used these drawings in preparing our exploration and performing our analyses. In general, the debris fill will be about 60 feet thick. Soil will be mined from the site to create the capacity along the western half of the site.

Although detailed loading information has not been supplied, based on the available literature and verbal consultation with you, we have agreed on a unit weight of landfill material to be 1775 lb/cu yard (65 pcf).

Our analyses are based upon the above considerations. If any of this information is incorrect or if you anticipate any changes, inform Universal Engineering Sciences so that we may review our recommendations.

The site is located at the northwest corner of Enterprise Road and Auton Road in Dade City, Florida. A general location map of the project area appears in Appendix A: Site Location Map.

2.0 SCOPE OF SERVICES

2.1 PURPOSE

The purpose of our services was:

- to explore the general subsurface conditions at the site;
- to interpret and review the subsurface conditions with respect to the proposed landfill construction;

- to evaluate the general potential for sinkhole development at the subject site;
- to evaluate stability of the mine cuts and final landfill slopes;
- to provide a geotechnical engineering report which summarizes all relevant data and presents results of our geotechnical evaluation;

This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards. Universal Engineering Sciences would be pleased to perform these services, if you desire.

2.2 FIELD EXPLORATION

The subsurface conditions were explored with eleven (11) borings advanced to depths ranging from 45 to 95 feet, while performing the Standard Penetration Test. During the course of the exploration, twelve (12) "undisturbed" Shelby tube samples were obtained at locations and depths selected by Hartman and Associates field representatives.

The boring locations were selected and determined by Hartman and Associates, Inc., at the time of the field exploration.

The boring locations were surveyed upon completion by Hartman & Associates, Inc.,and this information made available to us.

Our drilling crew advanced the borings based upon locations staked by others in the field.

In addition, nine (9) piezometers were installed at locations selected by Hartman and Associates, Inc.

Jar samples of the soils encountered will be held in our laboratory for your inspection for 60 days upon issuance of this report unless we are notified otherwise.

2.3 LABORATORY TESTING

The soil samples recovered from the soil test borings were returned to our laboratory and then an engineer visually examined and reviewed the field descriptions. Representative soil samples were subjected to laboratory testing consisting of eighteen (18) Gradation Determinations eleven (11) Percent Fines tests, twenty nine (29) Natural Moisture Content Tests, ten (10) Atterberg Limits Tests and eleven (11) Laboratory Soil Permeability Tests.

We performed these tests to aid in classifying the soils and to help to evaluate the general engineering characteristics of the site soils. The permeability test samples and Gradation Analysis samples were selected by Hartman and Associates. See Appendix B: Boring Logs, Laboratory Test Summary, Soil Classification Chart for further data and explanations.

3.0 FINDINGS

3.1 SURFACE CONDITIONS

A Universal Engineering Sciences engineer performed a visual site inspection of the subject property to gain a "hands-on" familiarity with the project area.

General site topographic information was obtained from the USGS Quadrangle Map and from the site survey drawing provided by Hartman & Associates, inc. it is apparent that the site is hilly, with the highest point on-site at an approximate elevation of 170 feet NGVD. The high ground located is near the mid-point of the west property line and slopes away towards the southeast property corner at an elevation 110 feet and the northeast property corner at elevation 85 feet. Vegetation on the site consists mainly of grass and scattered oak and pine trees on the east portion of the site while the west portion is an orange grove.

We reviewed U.S.G.S. topographic quadrangle maps, and the USDA Soil Conservation Service Soil Survey of Pasco County for relevant information about the site.

3.2 GEOLOGY/HYDROGEOLOGY

The regional geology of Pasco County consists of unconsolidated sands with intervals of silts and clay of Pleistocene to recent age. The underlying bedrock is massive limestone of the Eocene Age.

Two aquifer systems provide water supplies to Pasco County. These two aquifers consist of an uppermost "non-artesian" surficial aquifer and the underlying artesian (Floridan) aquifer.

The "non-artisan" surficial aquifer lies within the unconsolidated quartz sands of Pleistocene to Recent age. The approximate thickness of the "non-artesian" system is forty feet. The regional artesian groundwater flow direction is generally west towards the Gulf of Mexico. The "non-artesian" aquifer (which is considered not potable) is a source of water for small volume irrigation wells of two-inch diameter or less. The Floridan aquifer lies in massive limestone bedrock and produces high volumes of fresh water.

3.3 SUBSURFACE CONDITIONS

The boring locations and detailed subsurface conditions are illustrated in Appendix B: Boring Location Plan and Boring Logs. The classifications and descriptions shown on the logs are generally based upon visual characterizations of the recovered soil samples and a limited number of laboratory tests Also, see Appendix B: Soils Classification Chart, for further explanation of the symbols and placement of data on the Boring Logs.

Based on the soil boring information, general soil profile can be described as follows:

The surficial sand deposit found throughout the site consists of brown, orangish brown, and dark brown sand. This surficial sand deposit was three to twenty seven feet thick. The surficial sand was loose to medium dense in consistency. The underlying cohesive strata consist of clayey sand to sandy clay. The amount of fines varies with depth and from location to location. Intrusions of sand strata can be found within this predominately cohesive layer. The clayey sands were loose to medium dense while the clay was soft to stiff. The upper limestone surface was found below the clayey sandy/clay layer. The limestone was contacted at depths ranging from 32 to 67 feet. The upper limestone surface generally slopes in the same direction as the existing surficial grade.

For purpose of this study, we reviewed the U.S. Department of Agriculture Soil Conservation Services Pasco County Soil Survey. As shown in Appendix A, the surficial site soils belong to Astatula, Lake, Appredondo and Zolfo formations.

Based on the temporary piezometer readings provided by the client the groundwater at the size varied from 14 to 73 feet below existing grades, as measured at the end of March, 2000. This corresponds to an approximate elevation of 61.3 feet NGVD.

No detectable water was found in the upper sand deposits at the higher elevation of the site. The "non-artesian" ground water table is not present at this time due to lack of rainfall over the past 12 months.

3.4 SINKHOLE POTENTIAL EVALUATION

A sinkhole can be defined as "a depression caused by soil and other materials subsiding into an open hole or void below the ground surface." This phenomenon is not uncommon in karst geology, where soils are underlain by limestone material which has been partially dissolved by the groundwater. The resulting voids in the rock provide paths through which water can travel, taking erodible soil with it.

In much of the Central and Western Florida vicinity, the soil which occurs in close proximity above the limestone consists of a light green to gray clay to silty or clayey sand resulting from marine deposits, commonly termed the "Hawthorn Formation." This confining layer tends to form a barrier to the vertical movement of groundwater. The groundwater level in the limestone in this area is termed the Florida aquifer and is under pressure. The groundwater level or piezometric surface in the soils above the confining layer frequently differs from that which exists in the underlying porous limestone because the confining layer prevents an interconnected hydrostatic condition. Provided the confining layer remains intact, the two groundwater regimes can remain independent.

The shallow water table is located within the upper sands and rests on top of the confining layer. The upper water table is not confined or under pressure. The water pressure above the top of the confining layer is simply defined by the height, or depth of groundwater which lies above the confining layer. If a well or standpipe were to penetrate the confining layer into the underlying rock, then the water pressure in the deep water table could be evaluated as the level of water within the standpipe. If the pressure causes the water to rise higher than the level of the shallow water table, then the groundwater regime can be described as having a "net upward gradient." If, however, the water in the upper water table is higher than the water in the standpipe, then the condition exhibits a "net downward gradient."

If an opening develops in the confining layer, connecting the voids or caverns in the limestone bedrock below to the relatively sandy soils above, then the soil and groundwater conditions might become unbalanced. In some instances, the clay in the confining layer soils may crack, either from shrinkage, such as may result from dry periods when the shallow water table is absent, or from shifting of the limestone bedrock. In other cases, these soils have little clay content, and are inherently more susceptible to erosion. The result can be a breach in the confining layer. If the groundwater has a net downward gradient, then the erodible soils lying both above and below the confining layer can "ravel" through the opening in the confining layer and/or into cavities and fractures in the bedrock, similar to the behavior of sand falling through the orifice of an hourglass. Over a period ranging from hours to possible many years, the loss of material causes the soil above to loosen until it is incapable of supporting the material above, and it subsides under the weight. The resulting sinkhole can damage or destroy man-made structures on the near-surface soils.

Although breaches of the confining layer are fairly common, it generally takes a long time for the loose zone to extend to the surface and cause a sinkhole. Therefore, even in areas of "high sinkhole potential", the incidence of surface expressions (sinkholes) can be infrequent. Although some notable Florida sinkholes have been large, most of the sinkholes observed within the Central Florida area have been smaller than 25 feet in diameter. In Western Florida. sinkholes typically can be even smaller, generally in the range of 10 feet in diameter or less.

Sinkhole activity may be indicated by the presence of some of the following conditions or occurrences:

- a loose or raveled zone within the sandy overburden soil. or clay confining layer, indicating movement of the soils into voids into the limestone below;

- the presence of an opening in the confining layer. as indicated by boring through the layer and finding either little or no thickness of clay;

- reduced water pressure in the soil voids ("pore pressure") with increasing depth, indicating downward flow of water;

- depressed. or absent groundwater table;

- depression of the top of, or opening, or voids within, the limestone bedrock; and
- loss of drilling fluid circulation while advancing a borehole.

Since the majority of sinkholes develop along the natural joints within the underlying limerock, their surficial expression in the form of small circular/oval depressions can be used to project the rock joint pattern at the ground surface in a form of lineaments. The term "lineament" refers to any natural landscape pattern which may have certain geometric regularity and reflects the underlying rock joint pattern.

The lineament features of the study area as determined by UES are presented on USGS Map in Appendix A. These lineament patterns were determined from land surface featured depicted on the Dade City and Branchborough U.S.G.S Quadrangle Topographic Maps. As can be observed on this figure, no significant lineament traverse the site.

No significant loose or ravelled soil zones were detected in our borings above the upper limestone surface.

Based on the above lineament study and subsurface exploration information, it is our opinion that the potential for sinkhole occurrence at the subject site is low.

3.5 STABILITY OF MINE CUT AND LANDFILL SLOPES

Based on the information provided to us by the client, the landfill will have a top elevation between 125 to 170 feet (NGVD) and a side slope of 4.0 horizontal to 1.0 vertical.

Stability of the proposed landfill design section was evaluated by considering circular arc failure mode. The stability analyses were performed using the Modified Bishop's method in the computer program STABL4, which employs an iteration scheme to find the critical slip surface and the corresponding minimum factor of safety. Based on our stability analyses, the minimum factor of safety of the proposed landfill design section was analyzed to be in excess of 3.0.

It is our understanding that a final slope of 1.5 horizontal to 1.0 vertical is anticipated for the mine cuts, prior to placement of landfill material. The stability of these slopes was also evaluated using the same methodology. The safety factor for the mine cut slope assuming subsurface conditions depicted in borings B-1, B-3, B-8, B-9 and B-10 was estimated to be 1.7 or higher.

3.6 BEARING CAPACITY OF SUBGRADE

As part of our geotechnical evaluation, analyses were performed to estimate the bearing capacity of the foundation soil beneath the proposed landfill cells. Considering a final landfill thickness of 80 feet and a total unit weight of refuse of 65 pcf, the differential vertical stress on the foundation soil at the base of the landfill was calculated to vary between -5500 and 1850 psf. Based on the subsurface profiles encountered in the soil boring, our calculations indicate that the proposed landfill will have a factor of safety much greater than 3 against bearing capacity failure.

3.7 SETTLEMENT OF SUBGRADE AND LANDFILL MASS

Settlement of the soil layers beneath the proposed landfill cell was computed using average N-values obtained from the SPT boring B-5 conducted as part of this study. Based on an average N-value of 6 blows per foot, the total settlement of the foundation soil was estimated to be on the order of magnitude of one inch. Settlement of the foundation soil is expected to decrease to zero at the toe of the landfill slope, and at the points where the net fill load becomes equal to the former native overburden load in mined area. Accordingly, the differential settlement within the foundation soil from the crest to the toe of the proposed landfill design section is expected to be less than one inch. Settlement of the foundation soil will occur in small instantaneous increments as the landfill is raised.

The settlement of landfill mass that occurs due to compression and decomposition of the landfill material is extremely difficult to predict due to many unknowns pertaining to the composition of landfill material, dynamics of fill placement, etc. Based on the available literature, the total settlement of a landfill mass may be as much as 25% of the original landfill thickness. We estimate the post closure settlement of top of the landfill due to compaction and decomposition of landfill material to be on the order of 10-15 feet. This settlement is expected to be uneven and erratic depending on the composition of fill material.

4.0 RECOMMENDATIONS

4.1 GENERAL

The following recommendations are made based upon a review of the attached soil test data and our understanding of the proposed construction. If the landfill plan, sections, or grading plans change from those discussed previously, we request the opportunity to review and possibly amend our recommendations with respect to those changes.

Additionally, if subsurface conditions are encountered during the mining stage, which were not encountered in the borings, e.g., seepage, buried muck, fissured clays, etc., report those conditions immediately to us for observation and recommendations.

In this section of the report, we present our general recommendations for stability of mine cut and landfill slopes.

The permanent mine cut slopes may be as steep as 1.5 horizontal to 1 vertical (1.5H:IV). Run off of stormwater down the slope should be prevented by construction of berms along the top of the slope. Furthermore, ponding of water above the top of the slope should be prevented. Also, for exposed slope heights of over 40 feet, it may be necessary to construct a bench to control surface water runoff and divert the concentration of runoff away from the lower slope areas.

5.0 LIMITATIONS

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible subsurface variations.

Further, we present documents in Appendix C: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

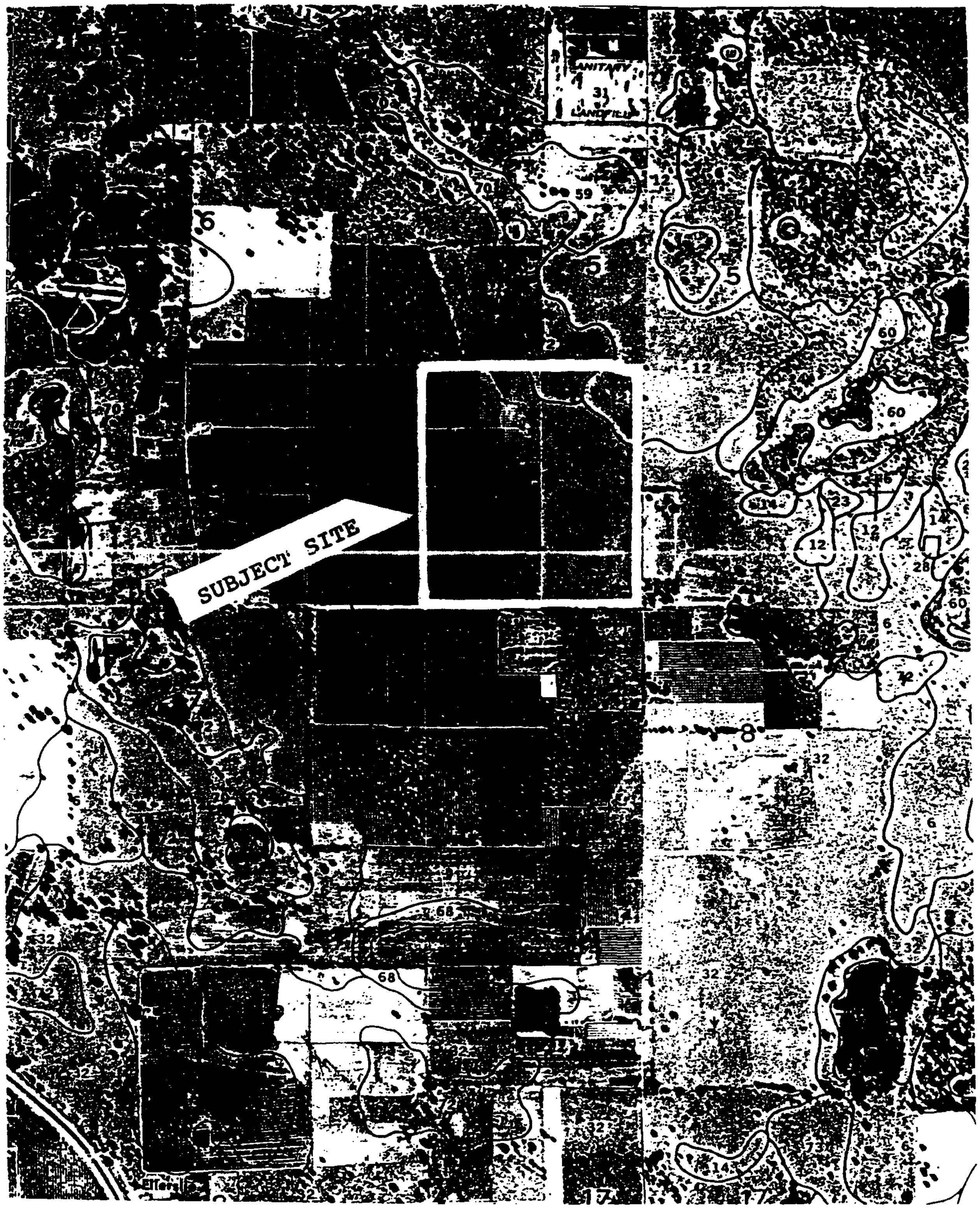
6.0 REFERENCES

David E. Daniel: Municipal Practice for Waste Disposal (1993)
David Gordon Wilson: Handbook of Solid Waste Management (1988)
Dean K. Wall and Chris Zeiss: Municipal Landfill Biodegradation and Settlement (Journal of Environmental Engineering, Vol 121, No. 5 March 1995)
USGS 7.5 Minute Series Quadrangle Maps Dade City, Florida 1960 (photo revised 1988) and Branchborough, Florida 1960 (photo revised 1987).

APPENDIX A

IMAGE QUALITY

AS YOU REVIEW THE NEXT GROUP OF IMAGES, PLEASE NOTE THAT THE ORIGINAL DOCUMENTS WERE OF POOR QUALITY.



C:\PROJECT FILES\2000\800\80010\002-01\SCS-MAP

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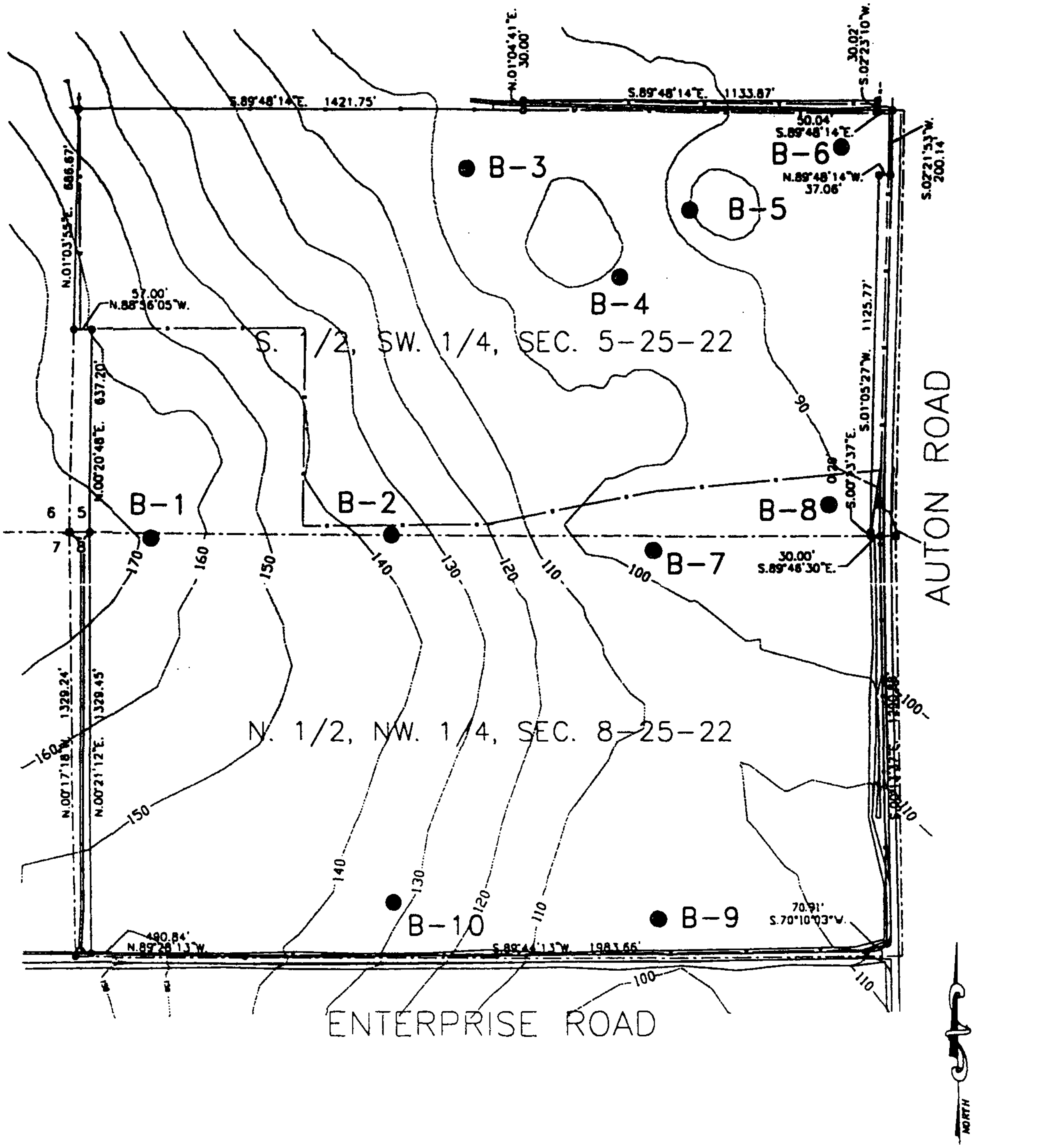
PROPOSED CLASS III LANDFILL
NWC OF ENTERPRISE RD. AND AUTON RD.
DADE CITY, FLORIDA

SOIL CONSERVATION SERVICES MAP

DRAWN BY:	D.J.	DATE:	MAY, 2000	CHECKED BY:	W.P.	DATE:	MAY, 2000
SCALE:	1" = 2000'	PROJECT NO:	80010-002-01	REPORT NO:		APPENDIX:	A

APPENDIX B

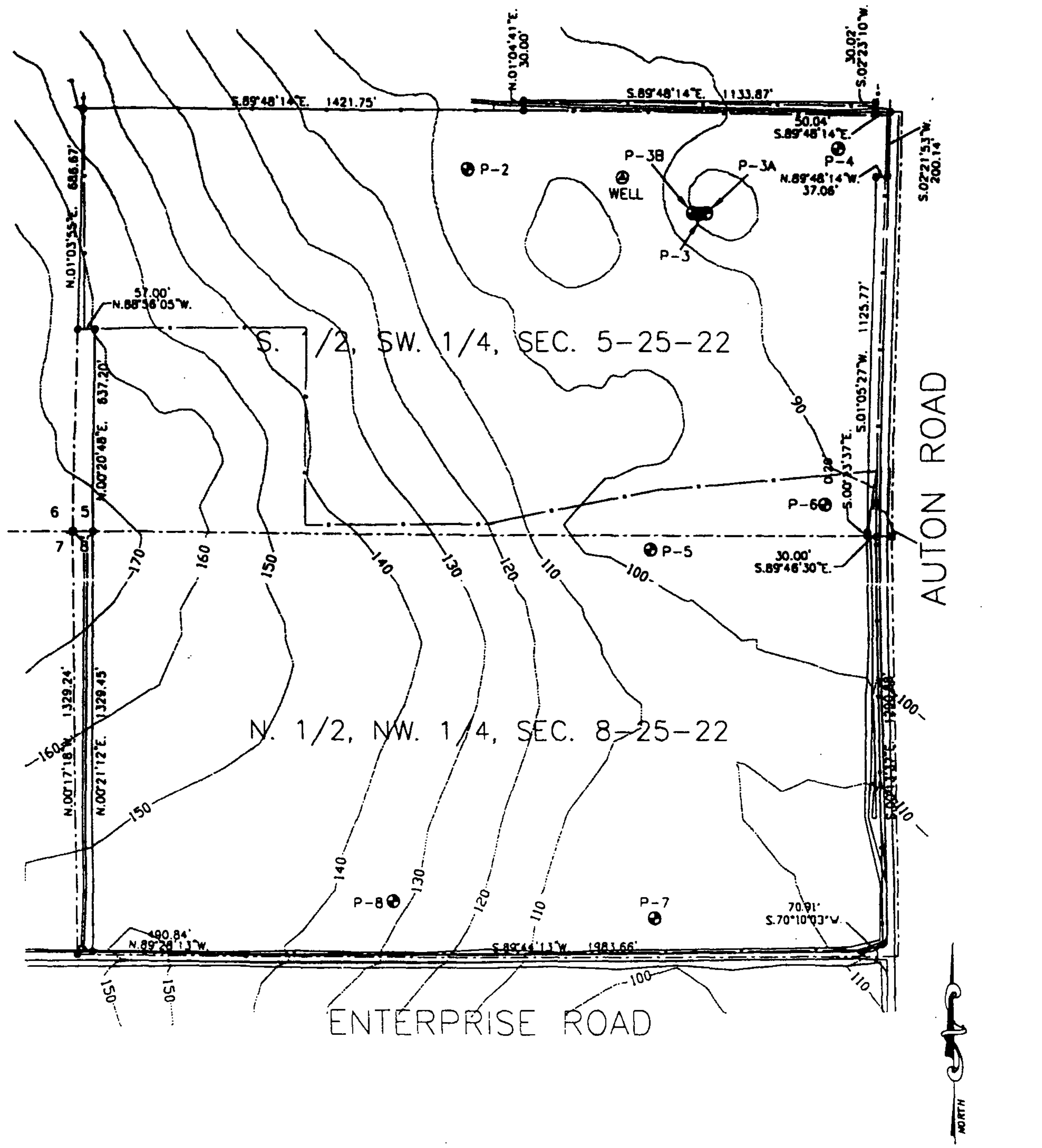


LEGEND:

● B-1 Approximate SPT boring location

UNIVERSAL ENGINEERING SCIENCES	PROPOSED CLASS III LANDFILL NWC OF ENTERPRISE RD. AND AUTON RD. DADE CITY, FLORIDA						
	BORING LOCATION PLAN						
	DRAWN BY:	D.J.	DATE: MAY, 2000	CHECKED BY:	W.P.	DATE:	MAY, 2000
	SCALE:	1" = 500'	PROJECT NO: 80010-002-01	REPORT NO:		APPENDIX:	B

C:\PROJECT FILES\2000\800\80010\002-01\BOR-LOC



0' 250' 500'
SCALE: 1" = 500'

LEGEND:

P-8 Approximate piezometer location

PROPOSED CLASS III LANDFILL
NWC OF ENTERPRISE RD. AND AUTON RD.
DADE CITY, FLORIDA

PIEZOMETER LOCATION PLAN

UNIVERSAL
ENGINEERING SCIENCES

DRAWN BY: D.J.	DATE: MAY, 2000	CHECKED BY: W.P.	DATE: MAY, 2000
SCALE: 1" = 500'	PROJECT NO: 80010-002-01	REPORT NO:	APPENDIX: B

C:\PROJECT FILES\2000\800\80010\002-01\PIEZO-LOC

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO	80010-002-01
REPORT NO.:	
PAGE.	1

PROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION:

REMARKS: Hole grouted

BORING DESIGNATION: **B-01** SHEET: **1 of 1**

SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

G S. ELEVATION (ft). 169.60 DATE STARTED: 3/3/00

WATER TABLE (ft): DATE FINISHED: 3/3/00

DATE OF READING. DRILLED BY: D E.

EST W.S W T (ft) TYPE OF SAMPLING. SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (feet/day)	ORG CONT (%)
0						Orangish brown sand (SP)						
5		2-2-2	4									
10		3-4-5	9									
15		6-6-8	14			Orangish brown clayey sand (SC)						
20		4-4-8	12			Orangish brown sandy clay with cemented sand particles (CH)						
25		8-8-11	19									
30		7-7-9	16			Gray brown to brown sand (SP)						
35		4-4-8	12			Light gray sandy clay with silt and phosphate (CL)						
40		4-4-4	8			Light gray and yellowish brown mottled sandy clay with silt (CL)						
45		5-8-8	16			Light greenish gray sandy clay with silt (CL)						
50		4-5-7	12									
55		6-8-12	20									
60		15-23-24	47			Tan limestone						
65		13-50/2	50/2									
70		50/5 5	50/5 5									
75		40-50/3	50/3				32 1	17 2				
80		50/1 5	50/1 5									
85		50/4	50/4			with intrusions of dark brown, yellowish brown and gray mottled clayey sand (SC)						
90		32-14-9	23				41	35 9				
95		3-3-4	7			Drilling fluid circulation loss @ 93 feet with intrusions of greenish gray sandy clay (CH)						
						Boring Terminated at 95 feet						

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OJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

BORING DESIGNATION: **B-02** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP 25S RANGE. 22E

CLIENT. Sid Larkin and Sons c/o Hartman & Associates, Inc
G S. ELEVATION (ft): 136 90 DATE STARTED: 3/6/00
LOCATION:
WATER TABLE (ft): DATE FINISHED 3/6/00
REMARKS Hole grouted
DATE OF READING DRILLED BY. D E.
EST W.S W T (ft). TYPE OF SAMPLING SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0						Orangish brown sand (SP)						
						Orangish brown clayey sand (SC)						
5		6-8-12	20									
10		11-14-19	33									
15		6-8-9	17									
						Orangish brown sand with clay (SP-SC)						
20		7-11-14	25									
						Orangish brown clayey sand (SC)						
25		6-7-7	14									
						Orangish brown and gray mottled clayey sand (SC)						
30		6-4-4	8									
						Orangish brown clayey sand (SC)						
35		4-4-4	8									
40		4-3-4	7									
45							42.8	23 7	47	28	7 0E-5	
50		3-4-5	9									
55		3-3-3	6									
						Orangish brown and grayish brown mottled clayey sand (SC)						
60		3-3-4	7									
65		6-10-12	22				37.6	36 5				
						Drilling fluid circulation loss @ 67 feet						
						Tan limestone						
70		27-50/5 5	50/5 5									
		50/ 5	50/ 5			No recovery						
75						Boring Terminated at 73.5 feet						

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ROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

BORING DESIGNATION: **B-03** SHEET **1 of 1**
SECTION. 8 and 5 TOWNSHIP: 25S RANGE: 22E

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc
LOCATION:
REMARKS. Hole grouted

G.S ELEVATION (ft): 95 60
WATER TABLE (ft):
DATE OF READING.
EST W S.W.T (ft).

DATE STARTED: 3/13/00
DATE FINISHED. 3/15/00
DRILLED BY: D E.
TYPE OF SAMPLING SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT)	W T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0						Brown sand to sand with silt (SP to SP-SM)						
5		2-2-2	4									
10		2-2-3	5									
15		9-10-14	24			Gray and orangish brown motled clayey sand (SC)						
20		6-5-6	11			Dark brown, orangish brown and gray mottled clayey sand (SC)	43.2	31 3				
25							48 5	28.6	57	36	1 9E-4	
30		3-7-7	14									
35		4-5-5	10			Light greenish gray clayey sand (SC)	42.5	56 6				
40		3-3-3	6			Dark brown orangish brown gray and black sandy clay with silt (CL)						
45		3-3-3	6			Dark brown orangish brown and gray mottled layey sand (SC)						
50		1-1-1/12 3-4-3	2/18 7			Tan limestone Drilling fluid circulation loss @ 50 feet						
55												

#11 5555 DADE... MASTER GDT 5/4/00

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OJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

BORING DESIGNATION **B-03A** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc
LOCATION:
REMARKS.

G.S. ELEVATION (ft): 95.60
WATER TABLE (ft): 31.0
DATE OF READING: 4/20/2000
EST. W S W.T (ft)

DATE STARTED: 4/20/00
DATE FINISHED: 4/20/00
DRILLED BY: D.E
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0						Rotary wash to 43.5 feet						
5												
10												
15												
20												
25												
30				▼								
35												
40												
45		5-6-7	13			Dark brown orangish brown and gray mottled layey sand (SC)						
50		2-2-1	3			Tan limestone						
		15-30-37	67									
55		30-42-50/3	50/3									
60		42-50/3	50/3			Boring Terminated at 59.3 feet						

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PROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

BORING DESIGNATION: B-04 **SHEET:** 1 of 1
SECTION: 8 and 5 **TOWNSHIP:** 25S **RANGE:** 22E

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc
LOCATION:
REMARKS: Hole grouted

G.S. ELEVATION (ft): 98.10
WATER TABLE (ft):
DATE OF READING:
EST. W.S.W.T. (ft):

DATE STARTED: 3/7/00
DATE FINISHED: 3/7/00
DRILLED BY: D.E.
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0						Orangish brown sand (SP)						
5		2-2-3	5									
10		5-7-8	15			Orangish brown, dark brown and gray sand with silt and clay (SP-SM to SP-SC)						
15		4-5-7	12			Orangish brown, dark brown and gray sandy clay (CH)						
20		3-4-5	9				63.6	32.2				
25							55.6	29.9	65	45	2.2E-5	
30		4-5-6	11									
35		3-5-7	12			Orangish brown, dark brown gray and black clayey sand (SC)						
40		5-4-5	9									
45		10-4-15	19			Tan limestone						
50		10-12-14	26									

Boring Terminated at 50 feet

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PROJECT: Proposed Class III Landfill
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Dade City, Florida

BORING DESIGNATION: **B-05** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc
LOCATION:
REMARKS: Hole grouted

G.S. ELEVATION (ft): 77.80
WATER TABLE (ft): N.F.
DATE OF READING:
EST. W.S.W.T. (ft):

DATE STARTED: 3/15/00
DATE FINISHED: 3/15/00
DRILLED BY: D.E
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (feet/day)	ORG. CONT. (%)
0						Orangish brown sand (SP)						
5		3-3-3	6									
						Dark brown sand (SP)						
10		2-2-2	4									
						Orangish brown sand (SP)						
15		2-2-2	4									
20		3-3-4	7				8.0	26.8				
25		4-3-4	7				7.1	26.2				
						Orangish brown, brown and gray mottled clayey sand (SC)						
30		2-3-5	8									
						Orangish brown, brown and gray mottled sandy clay (CH)						
35		4-4-6	10									
						Light gray and gray motled clayey sand (SC)						
40		4-5-7	12				47.7	24.8	60	41	2.9E-5	
45		2-3-3	6									
50		3-2-2	4									
						No recovery						
55		2-2-2	4			Drilling fluid circulation loss @ 55 feet						
						Orangish brown, brown, gray and black mottled sandy clay (CH)						
60		3-2-2	4									
						Tan limestone						
65		2-3-20	23									

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PROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION:

REMARKS:

BORING DESIGNATION: **B-06** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

G.S. ELEVATION (ft): 83.30
WATER TABLE (ft): 20
DATE OF READING: 3/15/2000
EST. W.S.W.T. (ft):

DATE STARTED: 3/15/00
DATE FINISHED: 3/15/00
DRILLED BY: D.E
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0						Light brown sand (SP)						
5		3-3-3	6									
						Light brown, dark brown and gray mottled sand with silt (SP-SM)						
10		7-9-8	17									
15		7-7-7	14			Light brown, dark brown and gray mottled sandy clay (CH)	52.3	31.1	71	48	4.2E-4	
						Light brown, dark brown and gray mottled clayey sand (SC)	26.5	18.2				
20		6-7-9	16	▼		Gray and dark brown mottled sandy clay (CH)	51.8	30.9	69	51	1.5E-4	
25												
30		4-4-4	8				66.9	43.2				
						Light brown, dark brown and gray mottled clayey sand (SC)						
35		2-2-3	5									
						Gray sand with silt (SP-SM)						
40		3-6-10	16									
						Brown, yellowish brown and gray mottled sandy clay (CL)						
45		4-12-15	27									
						Light brown orangish brown and white sandy clay (CH)						
50		4-6-7	13									
		50/2	50/2			No recovery						
55						Boring Terminated at 53.7 feet						

#11-5555 DADE MASTER.GDT 5/4/00

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JJECT: Proposed Class III Landfill
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Dade City, Florida

BORING DESIGNATION: **B-07** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc
LOCATION:
REMARKS: Hole grouted

G.S. ELEVATION (ft): 93.30
WATER TABLE (ft)
DATE OF READING.
EST. W S W T (ft).

DATE STARTED: 3/15/00
DATE FINISHED: 3/15/00
DRILLED BY: D E.
TYPE OF SAMPLING SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT)	W T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (feet/day)	ORG. CONT (%)
0						Brown sand with silt (SP-SM)						
5		3-3-3	6									
						Dark brown sand with silt (SP-SM)						
10		4-4-4	8									
						Orangish brown sand with silt (SP-SM)						
15		4-5-5	10									
						Brown sand with silt and clay (SP-SM to SP-SC)						
20		4-5-5	10									
						Brown sandy clay (CH)	57.0	34	73	51	3 0E-5	
25		4-5-6	11			No recovery						
						Gray, light brown and dark brown mottled clayey sand (SC)						
30		5-5-6	11				41.8	39.3				
35		5-5-7	12				22.2	26 1				
						Tan limestone						
40		4-7-8	15			Drilling fluid circulation loss @ 40 feet						
45		11-5-8	13									

MASTER COT 5000

411 5555 DADE

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PROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION:

REMARKS: Hole grouted

BORING DESIGNATION: **B-08** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

G.S. ELEVATION (ft): 92.90
WATER TABLE (ft):
DATE OF READING
EST W S W T (ft):

DATE STARTED: 3/16/00
DATE FINISHED: 3/16/00
DRILLED BY: D.E.
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (feet/day)	ORG CONT. (%)
0						Orangish brown sand with silt and clay (SP-SM to SP-SC)						
5		2-3-6	9									
10		7-8-13	21									
15		8-11-13	24									
20		6-7-6	13			Orangish brown and gray mottled clayey sand (SC)						
25						Light brown clayey sand (SC)	23.9	17.1	20	NP	3.7E-3	
30		5-4-4	8				23.1	24.6				
35		4-3-4	7			Light brown, dark brown and gray mottled sandy clay (CH)	57.3	36.5				
40		4-4-4	8			Light brown, orangish brown and gray mottled clayey sand (SC)						
45		5-7-9	16			Tan limestone						
50		10-10-14	24			Boring Terminated at 50 feet						

UES-5555 DADECITY GPJ MASTER GDT 5/4/00

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Dade City, Florida

BORING DESIGNATION **B-09** SHEET **1 of 1**
SECTION. 8 and 5 TOWNSHIP 25S RANGE. 22E

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION.

REMARKS: *Hole grouted*

G S. ELEVATION (ft): 101 10
WATER TABLE (ft).
DATE OF READING
EST. W S W.T (ft)

DATE STARTED:
DATE FINISHED.
DRILLED BY D E.
TYPE OF SAMPLING SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (feet/day)	ORG CONT (%)
0						Orangish brown sand (SP)						
5		2-2-1	3									
8						Light gray, light brown and orangish brown, mottled sandy clay with silt (CL)						
10		8-12-13	25									
12						Light gray, light brown and orangish brown, mottled clayey sand (SC)						
15		6-5-6	11									
20		6-7-5	12				27.5	19.6	NP	NP	7 6E-3	
25		4-4-5	9									
28						Light gray, light brown and orangish brown, mottled sand with silt and cemented sand particles (SP-SM)						
30		8-6-7	13									
35		6-7-7	14									
38						Light grayish brown sand with silt to silty sand (SP-SM to SM)						
40		6-5-6	11									
45		5-11-13	24				12 8	24 2				
48						No recovery						
50		7-7-11	23									
53						Light gray light brown and orangish brown, mottled clayey sand (SC)						
55		11-11-17	28									
58						Light brown and yellowish brown mottled clayey sand (SC)						
60		3-4-25	29				46 3	33 4				
63						Tan limestone						
65		12-10-13	23									
70		12-12-20	32									
75		25-50/2	50/2									
		50/ 5	50/ 5									
		50/3	50/3									
80												
85		5-6-10	16			Boring Terminated at 85 feet						

#11-5155 DADECITY MASTER GDT

UNIVERSAL ENGINEERING SCIENCES
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OJECT:	Proposed Class III Landfill NWC of Enterprise Road and Auton Road Dade City, Florida	BORING DESIGNATION: **B-10**	SHEET: **1 of 1**
		SECTION: 8 and 5 TOWNSHIP: 25S	RANGE: 22E
CLIENT:	Sid Larkin and Sons c/o Hartman & Associates, Inc	G.S. ELEVATION (ft): 132.70	DATE STARTED: 3/16/00
LOCATION:		WATER TABLE (ft):	DATE FINISHED: 3/16/00
REMARKS:	Hole grouted	DATE OF READING	DRILLED BY: D.E.
		EST. W.S.W.T. (ft):	TYPE OF SAMPLING: SPT

DEPTH (FT.)	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0				Orangish brown sand with silt (SP-SM)						
5	2-2-2	4								
				Yellowish brown clayey sand (SC)						
10	45-20-26	46								
				Light brown, orangish brown and dark brown mottled clayey sand (SC)						
15	10-12-17	29								
20	8-10-15	25								
25	7-10-8	18								
				Yellowish brown sand with silt (SP-SM)						
30	7-8-12	20								
				Light brown, orangish brown and brown mottled clayey sand (SC)						
35	6-5-7	12								
				Yellowish brown sand (SP)						
40	10-7-8	15								
				Light brown and yellowish brown mottled sandy clay (CH)						
45	5-4-5	9								
50					73.3	47.5	118	81	2.9E-5	
				Light brown, yellowish brown and gray mottled clayey sand with cemented sand particles (SC)						
55	10-8-7	15								
60	4-4-6	10			34.6	41.5				
				Tan limestone						
65	3-2-15	17		Drilling fluid circulation loss @ 65 feet						
70	40-13-22 50/5	35 50/5		Boring Terminated at 70 feet	13.4	14.3				
75										

IMAGE QUALITY

AS YOU REVIEW THE NEXT GROUP OF IMAGES, PLEASE NOTE THAT THE ORIGINAL DOCUMENTS WERE OF POOR QUALITY.

LABORATORY TEST SUMMARY

BORING/ PIEZO. NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (feet)	NATURAL MOISTURE CONTENT (%)	PASSING NO. 200 SIEVE (%)	PASSING NO. 100 SIEVE (%)	PASSING NO. 60 SIEVE (%)	PASSING NO. 40 SIEVE (%)	PASSING NO. 10 SIEVE (%)	PASSING NO. 4 SIEVE (%)	LIQUID LIMIT (%)	PLAST- ICITY INDEX (%)	VERTICAL PERMEAB. K (ft/day)	UNIFIED SOIL CLASS.
B-1	15	74.0	17.2	32.1	43.8	59.4	63.0	68.8	100.0				limestone
B-1	18	41.0	35.9	41.0	51.2	58.4	61.6	68.7	72.1				limestone
B-2	U-1	45.0	23.7	42.8						47	28	7.00E-05	
B-2	12	64.5	36.5	37.6	74.3	84.9	87.9	93.0	95.1				SC
B-3	4	19.5	31.3	43.2	65.8	91.7	96.8	99.6	100.0				SC
B-3	U-1	25.0	28.6	48.5						57	36	1.90E-04	SC
B-3	7	34.5	56.6	42.5	77.1	88.8	94.0	99.2	100.0				SC
B-4	4	19.5	32.2	63.6	81.5	97.6	99.8	100.0	100.0				CH
B-4	U-1	25.0	29.9	55.6						65	45	2.20E-05	CH
B-5	4	21.5	26.8	8.0	27.4	78.5	96.4	99.2	99.8				SP
B-5	5	24.5	26.2	7.1	28.8	77.5	94.4	96.8	97.5				SP
B-5	U-1	40.0	24.8	47.7						60	41	2.90E-05	SC
B-6	U-1	17.0	31.1	52.3						71	48	4.20E-04	CH
B-6	4	21.5	18.2	26.5	36.5	72.5	88.2	92.9	94.2				CH
B-6	U-2	22.0	30.9	51.8						69	51	1.50E-04	CH
B-6	5	29.5	43.2	66.9	78.8	93.8	97.6	99.8	100.0				CH
B-7	U-1	23.0	34.0	57.0						73	51	3.00E-03	CH
B-7	6	29.5	39.3	41.8	78.0	95.2	99.4	100.0	100.0				SC
B-7	7	34.5	26.1	22.2	62.6	92.2	99.3	99.5	99.6				SC
B-8	U-1	25.0	17.1	23.9						20	NP	3.70E-03	SC
B-8	5	29.5	24.6	23.1	37.5	85.9	96.7	99.0	99.3				SC
B-8	6	34.5	36.5	57.3	77.0	96.1	99.5	100.0	100.0				CH
B-9	U-1	20.0	19.6	27.5						NP	NP	7.60E-03	SC
B-9	9	44.5	24.2	12.8	63.6	99.6	100.0	100.0	100.0				SM
B-9	11	59.5	33.4	46.3	92.1	98.1	99.4	100.0	100.0				SC
B-10	U-1	52.0	47.5	73.3						118	91	2.90E-05	CH
B-10	10	59.5	41.5	34.6	53.4	62.4	66.7	79.2	88.4				SC
B-10	12	69.5	14.3	13.4	16.5	19.6	23.2	37.1	49.0				limestone
P-3B	U-1	14.0	10.5	6.7								8.5	SP-SM

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

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STABL4
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ORIGINALLY CODED BY:
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--Slope Stability Analysis--
Simplified Janbu Method of Slices
or Simplified Bishop Method

PROBLEM DESCRIPTION Dade City Landfill, East Side of fill @
B-8, B-7, B-2 & B-1

BOUNDARY COORDINATES

7 Top Boundaries
20 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	400.00	92.00	470.00	92.00	1
2	470.00	92.00	695.00	96.00	1
3	695.00	96.00	810.00	125.00	4
4	810.00	125.00	1215.00	145.00	4
5	1215.00	145.00	1410.00	150.00	4
6	1410.00	150.00	1615.00	161.00	4
7	1615.00	161.00	2800.00	171.00	4
8	695.00	96.00	750.00	80.00	1
9	750.00	80.00	1320.00	80.00	1
10	1320.00	80.00	1950.00	85.00	2
11	1950.00	85.00	2600.00	100.00	2
12	2600.00	100.00	2760.00	155.00	2
13	2760.00	155.00	2800.00	171.00	1
14	400.00	66.00	690.00	66.00	2
15	690.00	66.00	1250.00	75.00	2
16	1250.00	75.00	1320.00	80.00	2
17	400.00	55.00	690.00	55.00	3
18	690.00	55.00	1250.00	57.00	3
19	1250.00	57.00	1850.00	55.00	3
20	1850.00	55.00	2800.00	110.00	3

ISOTROPIC SOIL PARAMETERS

4 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	115.0	120.0	.0	32.0	.00	.0	1
2	120.0	125.0	.0	34.0	.00	.0	1
3	120.0	125.0	.0	38.0	.00	.0	1
4	65.0	65.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 3 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	400.00	70.00
2	1750.00	70.00
3	2800.00	90.00

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 600.00 ft. and X = 800.00 ft.

Each Surface Terminates Between X =1200.00 ft. and X =1400.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = .00 ft.

200.00 ft. Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	711.11	100.06
2	910.40	116.93
3	1109.59	134.95
4	1212.73	144.89

Circle Center At X = ****** ; Y = ****** and Radius, ******

*** 9.566 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	600.00	94.31
2	798.31	68.35
3	998.08	77.93
4	1192.99	122.76
5	1246.89	145.82

Circle Center At X = 844.5 ; Y = 1191.6 and Radius, 1124.2

*** 9.885 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	666.67	95.50
2	864.04	63.16
3	1062.98	83.64
4	1222.89	145.20

Circle Center At X = 886.7 ; Y = 819.9 and Radius, 757.1

*** 10.300 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	666.67	95.50
2	863.46	59.83
3	1062.80	76.12
4	1251.19	143.26
5	1255.21	146.03

Circle Center At X = 901.0 ; Y = 827.9 and Radius, 769.0

*** 10.670 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	600.00	94.31
2	797.57	63.25
3	997.51	68.18
4	1193.32	108.94
5	1286.62	146.84

Circle Center At X = 870.3 ; Y = 1169.9 and Radius, 1109.0

*** 10.963 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	711.11	100.06
2	910.91	109.10
3	1110.20	125.95
4	1276.43	146.58

Circle Center At X = 580.1 ; Y = 5210.1 and Radius, 5111.7

*** 11.183 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	688.89	95.89
2	885.27	57.99
3	1084.45	76.04
4	1264.79	146.28

Circle Center At X = 921.1 ; Y = 771.1 and Radius, 714.1

*** 11.316 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	666.67	95.50
2	861.34	49.62
3	1060.27	70.22
4	1220.35	145.14

Circle Center At X = 899.8 ; Y = 648.9 and Radius, 600.6

*** 11.483 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	622.22	94.71
2	816.83	48.56
3	1016.53	59.52
4	1204.91	126.70
5	1230.54	145.40

Circle Center At X = 878.8 ; Y = 743.4 and Radius, 697.6

*** 11.532 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	644.44	95.10
2	837.97	44.62
3	1037.12	63.04
4	1210.91	144.80

Circle Center At X = 885.0 ; Y = 621.2 and Radius, 578.5

*** 11.733 ***

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STABL4

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--Slope Stability Analysis--
Simplified Janbu Method of Slices
or Simplified Bishop Method

PROBLEM DESCRIPTION Dade City Landfill, Mine Slope Stability
@ B-1

BOUNDARY COORDINATES

7 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	900.00	113.00	914.50	113.00	6
2	914.50	113.00	937.00	128.00	5
3	937.00	128.00	959.50	143.00	4
4	959.50	143.00	974.50	153.00	3
5	974.50	153.00	982.00	158.00	2
6	982.00	158.00	1000.00	170.00	1
7	1000.00	170.00	1700.00	185.00	1
8	982.00	158.00	1700.00	158.00	2
9	974.50	153.00	1700.00	153.00	3
10	959.50	143.00	1700.00	143.00	4
11	937.00	128.00	1700.00	128.00	5
12	914.50	113.00	1700.00	120.00	6

ISOTROPIC SOIL PARAMETERS

6 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	115.0	120.0	.0	32.0	.00	.0	1
2	120.0	125.0	.0	34.0	.00	.0	1
3	120.0	125.0	2000.0	.0	.00	.0	1
4	120.0	125.0	.0	38.0	.00	.0	1
5	120.0	125.0	2000.0	.0	.00	.0	1
6	125.0	125.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	900.00	70.00

2	1700.00	70.00

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 900.00 ft.
and X = 950.00 ft.

Each Surface Terminates Between X =1000.00 ft.
and X =1100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = .00 ft.

20.00 ft. Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	900.00	113.00
2	919.71	109.61
3	939.71	110.05
4	959.25	114.30
5	977.62	122.21
6	994.14	133.48
7	1008.21	147.70
8	1019.29	164.35
9	1021.85	170.47

Circle Center At X = 927.4 ; Y = 213.5 and Radius, 104.1

*** 1.736 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	905.56	113.00
2	925.37	110.30
3	945.36	110.85
4	965.00	114.65
5	983.76	121.59
6	1001.14	131.49
7	1016.68	144.08
8	1029.96	159.03
9	1037.39	170.80

Circle Center At X = 932.0 ; Y = 232.7 and Radius, 122.6

*** 1.752 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	900.00	113.00
2	919.62	109.11
3	939.61	109.83
4	958.89	115.12
5	976.45	124.70
6	991.34	138.06
7	1002.77	154.47
8	1008.98	170.19

Circle Center At X = 926.5 ; Y = 195.3 and Radius, 86.5

*** 1.800 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	905.56	113.00
2	925.05	108.51
3	945.02	107.58
4	964.85	110.23
5	983.88	116.37
6	1001.51	125.81
7	1017.18	138.25
8	1030.37	153.28
9	1040.66	170.43
10	1040.83	170.88

Circle Center At X = 940.2 ; Y = 219.1 and Radius, 111.6

*** 1.883 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	911.11	113.00
2	931.00	110.90
3	951.00	111.21
4	970.82	113.90
5	990.17	118.94
6	1008.78	126.27
7	1026.38	135.77
8	1042.71	147.31
9	1057.55	160.73
10	1066.86	171.43

Circle Center At X = 938.5 ; Y = 277.4 and Radius, 166.7

*** 1 903 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	916.67	114.44
2	936.36	110.98
3	956.34	112.06
4	975.54	117.63
5	992.99	127.40
6	1007.78	140.87
7	1019.14	157.33
8	1024.34	170.52

Circle Center At X = 941.6 ; Y = 198.6 and Radius, 87.8

*** 1.920 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	938.89	129.26
2	958.76	131.53
3	977.21	139.25
4	992.77	151.81
5	1004.21	168.22
6	1004.85	170.10

Circle Center At X = 940.8 ; Y = 200.2 and Radius, 71.0

*** 1.959 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	916.67	114.44
2	936.65	113.68
3	956.50	116.18
4	975.67	121.88
5	993.65	130.62
6	1009.98	142.18
7	1024.20	156.24
8	1034.72	170.74

Circle Center At X = 931.3 ; Y = 235.9 and Radius, 122.4

*** 2.050 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	944.44	132.96
2	964.38	131.33
3	983.37	137.59
4	998.43	150.76
5	1007.16	168.75
6	1007.23	170.15

Circle Center At X = 958.4 ; Y = 181.3 and Radius, 50.3

*** 2.106 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	922.22	118.15
2	941.47	112.70
3	961.45	112.00
4	981.03	116.10
5	999.06	124.75
6	1014.50	137.47
7	1026.46	153.50
8	1033.74	170.72

Circle Center At X = 954.3 ; Y = 194.8 and Radius, 83.1

*** 2.118 ***

APPENDIX C

CONSTRAINTS AND RESTRICTIONS

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until construction begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other explorations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of exploration. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

APPENDIX D

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

CONSTRAINTS AND RESTRICTIONS

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until construction begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other explorations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of exploration. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

FDEP FORM 62-701.900(1) CHECKLIST SUPPORT

PART I
GEOTECHNICAL INVESTIGATION REQUIREMENTS
APPENDIX I-2

SLOPE STABILITY ANALYSIS

11012 N. Ridgedale Road
Temple Terrace, Florida 33617
(813) 629-1965 office
(813) 914-7347 fax

February 08, 2018 Project No. 17-01-0111.01

Mr. John Locklear, P.G.
President
Locklear & Associates, Inc.
4140 NW 37th Place, Suite A
Gainesville, Florida 32606

RE: Slope Stability, Settlement, and Bearing Capacity Analysis
Enterprise Class III Landfill – Cell 17 Expansion
Dade City, Florida

Dear Mr. Locklear,

Civil Design Services, Inc. (CDS) is submitting the following Slope Stability, Settlement, and Bearing Capacity Analysis Report (Report) to Locklear & Associates, Inc. (L&A) for the Cell 17 Expansion for continued Class III solid waste operations at the Enterprise Class III Landfill (Landfill), located in Dade City, Florida. It is our understanding that the following items are proposed as part of the expansion permit;

- Cell 17, the combined area of the cells formerly designated as Cell 13 and 14, will be constructed west of Cell 16;
- Cell 17 will be constructed with 3(H):1(V) ratio sideslopes from the perimeter maintenance road to the first terrace at approximately EL 140 (final buildout);
- 3(H):1(V) sideslopes will continue from the first terrace to a second terrace at EL 190, then up to a crest at EL 215, and slope to a final buildout elevation of Elevation 220;
- The bottom of the Cell 17 area will be constructed with a compacted 3-foot clay layer that will be connected with the north end of floors for Cell 5, 6, and 7. The Cell 17 floor bottom will slope toward the north. Water collected in the Cell 17 area will conveyed by an header that drains toward the east and to a pump station located east of Cell 16;
- Grading for Cell 17 floor, waste filling, and final closure will be as shown in the Permit Drawings prepared by Locklear and Associates, Inc. for the Cell 17 Expansion.
- Grading for final closure of Cell 1 – 17 will be as shown in the Permit Drawings prepared by Locklear and Associates, Inc.

The purpose and limitation of the scope of this Report is to evaluate the above proposed Cell 17 expansion and to evaluate the stability of the waste materials with the proposed geometry, estimate the settlement of the bottom area of the Cells 17 area, and estimate the bearing capacity of the foundation with the Cell 17 area, based upon boring information referenced in this Report. Previous geotechnical and hydrogeological reports, submitted by others, evaluated the subsurface conditions for potential activity in the karst layers beneath the site and are strictly the responsibility of others. Reference the Cell 17 Expansion Permit Application for additional evaluations and recommendations made by others to support the overall Cell 17 expansion.

<u>Reference Documents</u>

The following documents were reviewed and select information contained within these reference documents was used as part of this analyses. The reference documents are as follows;

Reference No 1. Universal Engineering Sciences – Geotechnical Exploration dated August 30, 2017 (Revised February 2, 2018).

- Karst Activity
- Boring Logs B-101 through B-111, & B131-133 in Universal 2017 Report

Reference No 2. Universal Engineering Sciences – Geotechnical Exploration dated May, 2000.

- Boring Logs B-1 through B-10.

Reference No 3. Hartman and Associates, Inc. – Geotechnical Exploration dated February, 2001.

- Boring Logs B-11 through B-17.

Reference No 4. Universal Engineering Science. – Geotechnical Exploration dated January, 2001.

- Boring Logs DCL01-1 through DCL01-15.

Reference No 5. Locklear and Associates, Inc. – Angelo's Class III Cell 17 Expansion Permit Application, dated February of 2017.

Refer to Attachment A for boring logs used for slope stability modeling. Other borings have been submitted to FDEP in prior applications.

<u>Slope Stability Model Analysis</u>

L&A prepared the permit modification Plans (Plans) for the Landfill. These Plans were used as the basis for modeling the slope geometry.

The boring logs referenced above were reviewed and similar soil types, with similar SPT N-values, were grouped together for the purpose of modeling. Breaks in soils types or SPT N-values were assigned to layers to differentiate between stronger or weaker soils. This allows for a better representation of failure planes, and thus stability of the foundation, as the failure planes shear through the different layers.

The estimated shear strength for the soils shown in the boring logs is contained in Attachment B.

The waste equipment used in the analyses were a CAT D8T WH dozer; a CAT 826H compactor; and a CAT 740B off-road dump truck. All equipment types are used onsite and/or are representative of typical waste and construction equipment used at landfills. Refer to Attachment C of this Report for equipment loads and manufacturer data. Note: the CAT 740B off-road dump truck produces the largest point loads and thus will be the equipment most likely to effect the slope stability modeling. Thus, only the CAT 740B was modeled.

The seasonal high groundwater table (SHGWT) was estimated by L&A to be at EL 72. It is our understanding that previous measurements in local peizometers in the northeast corner of the Facility may have been recorded in perched water tables; however, for this Report EL 72.0 was used as the SHGWT.

Two sets of Slope Stability Models were completed as follows;

- Cell 17 Expansion – The permit application is for the expansion of the Cell 17 area and models were prepared to demonstrate stability for the expansion.
  - Refer to Figure 1 – Cell 1 through 17 Expansion and Cross Section
  - Refer to Figure 2 – Cell 17 North/South Model (Eastside of Cell 17) Cross Section
  - Refer to Figure 3 – Cell 17 North/South Model (Westside of Cell 17) Cross Section
  - Refer to Figure 4 – Cell 17 - West to East Cross Section
  - Refer to Figure 5 – Cell 1 Cross Section
  - Refer to Figure 6 – Cell 2 Cross Section
  - Refer to Figure 7 – Cell 7 Cross Section

Note: Since the geometry of the sideslope and location of benches changed from previous configurations, slope stability cross sections and models were prepared for the other disposal cells.

A review of the information in the above Reference documents, and the modeling assumptions made above, are reasonable for completing the slope stability analyses prepared by CDS for the proposed Cell 17 expansion.

Slope Stability Analysis

PCSTABL was used to model and estimate slope stability of the Landfill during operational conditions using typical site waste equipment and waste filling during operations and final buildout. Both BLOCK and CIRCULAR failure modes were evaluated. BLOCK failure modes are used to evaluate sliding failure planes and CIRCULAR failure modes are used to evaluate shallow and deep rotational stability of the waste and foundation soils.

All cross sections were modeled with, and without, temporary waste equipment loading conditions.

All equipment loads were modeled at the crest of the slope, a position that would induce the greatest stress on the slopes and thus generate the lowest Factor of Safety.

A typical input file of the slope stability models for the BLOCK and CIRCULAR searches has been placed prior to the graphical output of the models. In each scenario, the profile and failure search routines were adjusted to determine the lowest Factor of Safety.

The graphical output files of the slope stability analyses are contained in the following attachments;

- Attachment D – North/South Section - Cell 17 (Eastside) Expansion – CIRCULAR & BLOCK Analysis
- Attachment E – North/South Section - Cell 17 (Westside) Expansion – CIRCULAR & BLOCK Analysis
- Attachment F – West to East Section - Cell 17 (Westside) Expansion – CIRCULAR & BLOCK Analysis
- Attachment G – Cell 1 – CIRCULAR & BLOCK Analysis
- Attachment H – Cell 2 – CIRCULAR & BLOCK Analysis
- Attachment I – Cell 7 – CIRCULAR & BLOCK Analysis

Summary of Slope Stability Model Results

Table 1 summarizes the slope stability mode results. As shown in Table 1, the slopes are stable and have a factor of safety above 1.5.

Table 1. Summary of Slope Stability Models

Cross Section	Circular Failure	Block Failure	Equipment (Circular)
Cell 17 N/S (Eastside)	**2.2**	**2.5**	**2.2**
Cell 17 N/S (Westside)	**2.3**	**2.6**	**2.2**
Cell 17 West to East	**2.3**	**2.6**	**2.2**
Cell 1	**2.2**	**2.4**	**2.1**
Cell 2	**2.2**	**2.7**	**2.2**
Cell 7	**2.2**	**2.7**	**2.2**

As shown in Table 1, the overall slope stability scenarios meet the minimum Factors of Safety of 1.5 and are therefore considered stable.

Settlement Estimates

Settlement of the foundation soil beneath the proposed collection header on the northern side of the proposed Cell 17 expansion was evaluated. The proposed collection header will collect liquids from the Cell 17 area and convey the collected drainage toward a lift station located east of Cell 16.

Settlement of the soils beneath the Cell 17 header will be a function of soil types, soil compressibility, and the change in stress induced on the soils after the overburden is removed and waste is added. The entire site has been excavated over the years and a significant amount of overburden has been removed. The topography (pre-mining activities) was used to compute the stress the soils have already been exposed to. Since the soils have already been exposed to a level of stress and consolidation, no addition settlement can occur until the stresses due to the waste exceed the stresses incurred prior to mining activities.

Note: the Landfill is being excavated to form the bottom of the cells. In some cased, some of the soils shown in the boring have already been excavated; therefore, settlement estimates in these excavated layers was not computed. In some cases the existing ground elevations are below the proposed cell floor so clayey soils will be placed and compacted in lifts to form the 3-foot clay barrier foundation. Compaction of the clayey soils in lifts will result in a dense soil and settlement in the “fill” soils will be thus significantly reduced by compaction during construction.

TOE DRAIN SETTLEMENT

The additional borings, B-131 through B-133, we placed directly within the proposed toe drain swale in Cell 17. Boring B-3was utilized in the settlement analysis since there soils in the logs would potentially allow for more settlement that Boring B133.

Settlement estimates were computed along the alignment of the toe drain starting on the high western end of Cell 17 and computed along the alignment to the low end at the Lift Station east of Cell 16. Typical soil properties based upon soil types, relative in-situ density, and consolidation coefficients were made at each location and for each soil layer group.

Contained in Attachment J are the soil properties and settlement estimates along the toe drain. Listed below in Table 2 is a summary of the estimated settlement.

Table 2. Settlement Summary along the Toe Drain

		West End Cell 17 B-132		B-3		Eastside Cell 17 B-131		Cell 16 B-5		Lift Station B21		
Initial												
Elevation		79.3		77.95		76.09		75.67		75.16		
Length (ft)			450		620		140		170			
Slope	0.3%											
Final												
Settlement		0.00		0.00		0.06		0.13		0.05		
Elevation		79.30		77.95		76.03		75.54		75.11	Header	
Length (ft)			450		620		140		170		1380	LF
Difference			1.35		1.92		0.49		0.43		4.19	ft
Slope (%)			0.3%		0.3%		0.3%		0.3%		0.30%	

As shown in Table 2, the overall drainage is maintained toward the east and the lift station.

CELL 17 FLOOR SETTLEMENT

Settlement calculation were completed and the estimated settlement computed for Boring B-101 through B-111 (the floor of Cell 17). The floor drains toward the north, northeast to the toe drain. Refer to Attachment K

As shown in Plan View of Cell 17, the overall drainage is maintained toward the toe drain after settlement.

Bearing Capacity Estimation

Bearing capacity is the capacity of the soils to support loads applied to the foundation soils. The bearing capacity of soil below the landfill disposal area is the maximum average contact loading, or pressure, exerted on the bottom of the landfill disposal cells and the loading (stress) on the foundation soils which should not produce a shear failure in the soil. This is a function of soil layers, waste unit weight, and depth of waste at that location.

To estimate the bearing capacity of the soils below the landfill disposal cell, the unit weight of the Class III waste was incrementally increased in the Slope Stability Model with the lowest Factor of Safety to evaluate the capacity of the foundation materials to support the higher material unit weight. The unit weight was increased from a typical Class III unit weight of 50 pound per cubic foot (1,350 pounds per cubic yard) to 100 pcf (2700 pcy) typically seen in heavier ash monofills.

The results of the modeling indicate an increase in the unit weight for waste from 50 pounds per cubic foot (pcf) to 100 pcf for does not result in a decrease slope stability models below the minimum regulated FS of 1.5. Based upon these model results, the foundation can support a unit weight of 100 pcf and would be representative of the ultimate bearing capacity of the foundation. Refer to Attachment L for bearing capacity models.

At the crest of the expansion, at EL 215, the underlying base of disposal Cell 17 at approximately El 80 (+/-), thus 135 feet of waste will be placed over the landfill foundation at this location. The ultimate bearing capacity (maximum bearing capacity) is therefore estimated to be 13,500 pounds per square foot (100 pcf *135 feet). The proposed loading on the landfill foundation is only estimated to be 6,750 psf (50 pcf * 135 feet); therefore, the proposed expansion has sufficient additional foundation bearing capacity to accommodate the proposed design.

Conclusions

- **Based upon the PCSTABL Model results, and the assumptions stated in this Report, a minimum Factor of Safety of 1.5 or greater was achieved for the proposed Cell 17 expansion.**

- **Based upon the PCSTABL Model results, and the assumptions stated in this Report, a minimum Factor of Safety of 1.5 or greater was achieved for the modification of the sideslopes and final grading of the Cells 1 through 16.**

- **The slope of the Cell 17 header collection pipe maintained toward the lift station after settlement. The slope on the header maintains a minimum slope greater than 0.3%, after settlement, as required.**

- **Based upon the model results, the foundation soils beneath have sufficient bearing capacity strength for the proposed Cell 17 landfill modifications.**

Please call the undersigned if you have any questions.

Sincerely,
Civil Design Services, Inc.

Joseph H. O'Neill, P.E.
Vice President

2/8/2018
Joseph H. O'Neill, P.E.
P.E. No. 52049

Civil Design Services, Inc.
11012 N. Ridgedale Road
Temple Terrace, Florida 33617
Certificate of Authorization 28923

List of Figures

List of Attachments

FIGURE 1

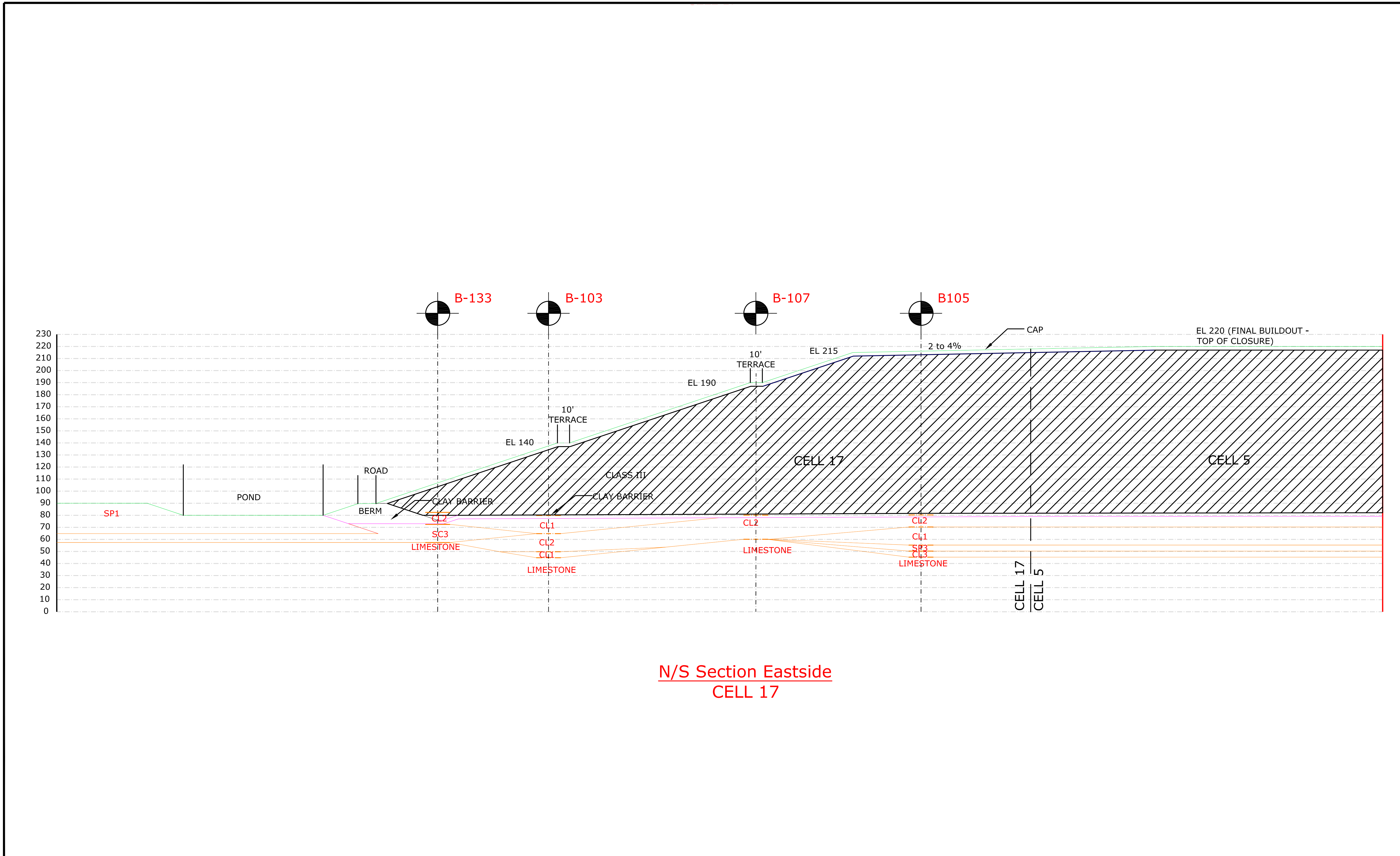
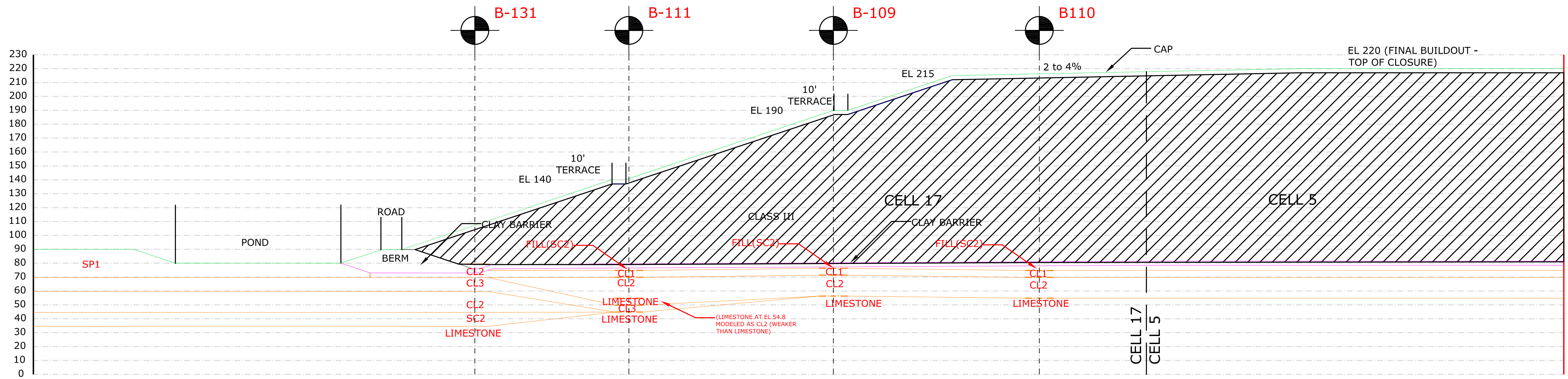
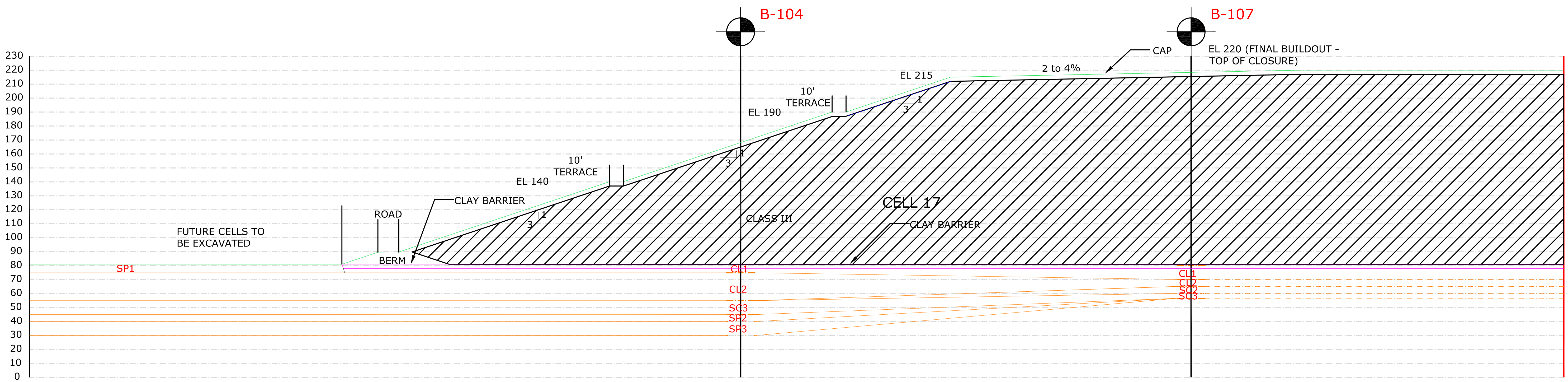


FIGURE 2. CELL 17 EXPANSION, NORTH/SOUTH (EASTSIDE) SLOPE STABILITY SECTION



N/S Section Westside
CELL 17

FIGURE 3. CELL 17 EXPANSION, NORTH - SOUTH (WEST) SLOPE STABILITY SECTION



SECTION WEST TO EAST
CELL 17

FIGURE 4. CELL 17 EXPANSION, WEST TO EAST SLOPE STABILITY SECTION

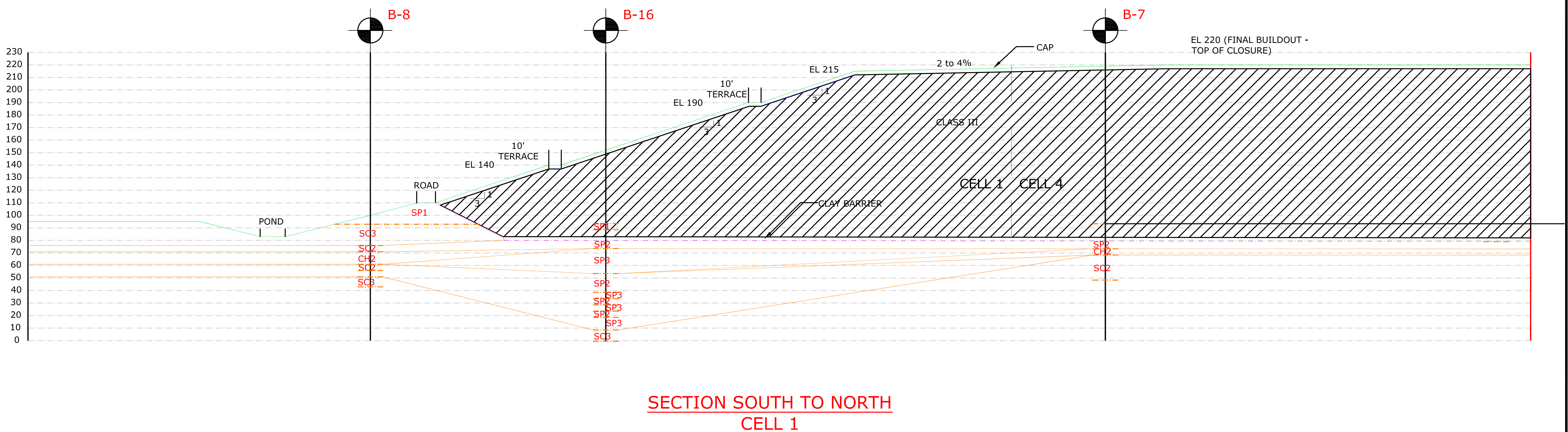
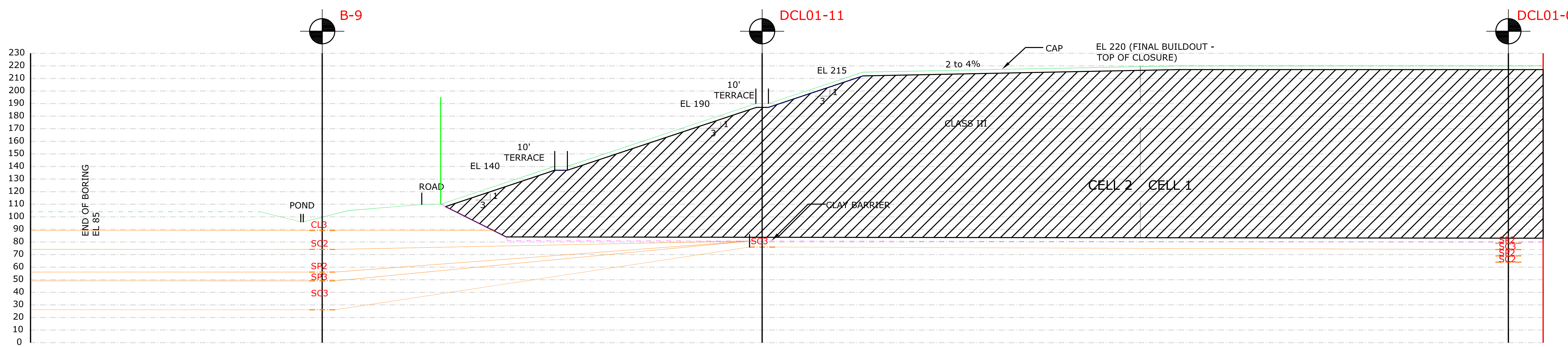
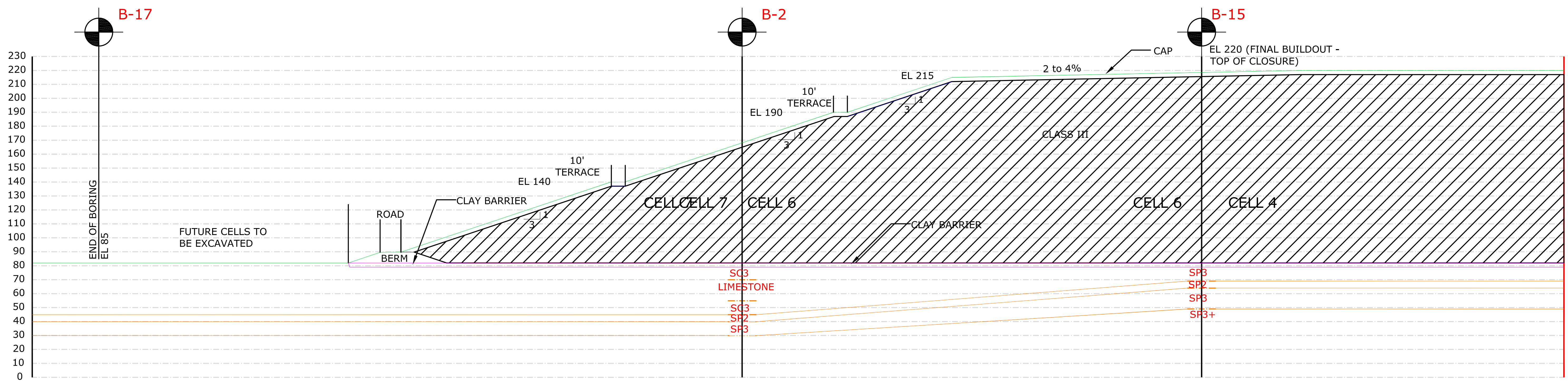


FIGURE 5. CELL 17 EXPANSION, CELL 1 SLOPE STABILITY SECTION



SECTION SOUTH TO NORTH
CELL 2

FIGURE 6. CELL 17 EXPANSION, CELL 2 SLOPE STABILITY SECTION



SECTION WEST TO EAST
CELL 7

FIGURE 7. CELL 17 EXPANSION, CELL 7 SLOPE STABILITY SECTION

ATTACHMENT A

ATTACHMENT B

Soil Properties - Strength for Slope Stability

Sands, Silty Sands, Clayey Sands

SPT Blow Count	Description	Dr*	Dr avg
0-4	Very Loose	0-15	10
4-10	Loose	15-30	20
10-30	Medium	35-65	50
30-50	Dense	65-85	75
>50	Very Dense	85-100	90

Clays

SPT Blow Count	Description	Dr avg
<2	Very Soft	10
2-4	Soft	20
4-8	Medium	50
8-15	Stiff	75
15-30	Very Stiff	90
>30	Hard	100

References:

1) SPT vs Soil Relative Density
" Soil Mechanics; 1969 Lambe and Whitman, Table 3.3"

2) SPT vs Cohesive Soil Shear Strength, Soil Properties
" Soil Mechanics; 1969 Lambe and Whitman, Table 7.4"

3) SPT vs Cohesionless Soil Shear Strength - *"Principles of Geotechnical Engineering, 1985, B. Das, Table 13.3"*

Soils for Slope Stability Models

Model Soil ID	Soil Types	SPT N	Dr	Description	Shear Strengh Properties phi	c	Comment
1	SP1	0-4	Very Loose	Poorly Grade Sands, Fine Sand, Silty Sand	26	0	Model using "low strength" for conservative results
2	SP2	4-10	Loose		30	0	
3	SP3	10-30	Medium		34	0	
4	SC1	0-4	Very Loose	Very fine sands, sands with clays	26	0	Model using "low strength" for conservative results
5	SC2	4-10	Loose		30	0	
6	SC3	10-30	Medium		34	0	
7	CL1	0-4	Very Loose	clays with sand and silts, low PI index	28	0	Model using "low strength" for conservative results
8	CL2	4-10	Loose		30	0	Transition from Sands to Clays
9	CL3	10-30	Medium		34	0	
10	CH1	<2	Very Soft	Clays with High PI index	0	100	Model using "low strength" for conservative results
11	CH2	2-4	Soft		0	750	
12	CH3	4-8	Medium		0	1000	
13	SP 2		Loose-med	Perimeter Berm - Sandy to allow for flow	30	0	sandy soils - typ medium compaction
14	SP2		Loose-med	Closure Cap	30	0	Sandy to Sandy Clay soils available onsite
15	CL 3		Loose-med	Compacted Clay Barrier	30	0	Compacted sandy-clay - typ med to high strength
16	Waste			Class III waste	35	0	Typically higher strength - model low at 35
17	Foundation	>30-40	Dense	Limetone, fractured limestone	40	0	Hard, high strength soils - failure planes above this layer

Cohesionless Soils - SP, SP/SM. SM. SC, (Transition to CL)

SPT N-values	Estimated	Modeled	
0-5	26-30	26-28	low SPT N values; low density, weak shear strenght layer
5-10	28-35	30	
10-30	35-42	34	
30-50	38-46	40	

* Reference 3

Cohesive Soils - CL, CH

SPT N-values	Estimated		Modeled
<2	< .25 tsf	<500 psf	100
2-4	0.25-0.50 tsf	500-1,000	750
4-8	0.50-1.00 tsf	1,000-2,000	1000
8-15	1.00-2.00 tsf	2,000-4,000 psf	
15-30	2.00-4.00 tsf	4,000-8,000 psf	
>30	>4.00 tsf	>8,000 psf	

* Reference 2

ATTACHMENT C

	Civil Design Services, Inc. **11012 N. Ridgedale Road** **Temple Terrace, FL 33617** **(813) 629-1965 office** **(813) 914-7347 fax** **www.civildesignservicesinc.com**	***Project Name*** **Angleos Recycling and Disposal Facility** Class III Modification 41111 Enterprise Road Dade City, Florida 33525-1589	**Slope Stability Evaluation** Estimated Equipment Surface Loads

Equipment Surface Loads

Operations and Closure

CAT 8T WH Dozer

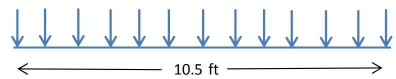
Equipment Weight (Operating) =	91,270.0 lbf	
Weight per Track =	45,635.0 lbf (2 tracks)	
Track Contact Area (both tracks)	5,554.0 in^2	
Per Track	2,777.0 in^2	
Track Length =	10.5 ft	

Surface Loading

Load =	45,635.0 lbf
Area =	2,777.0 in2
Contact Pressure (Force/Area) =	16.43 psi
	2,366.38 psf

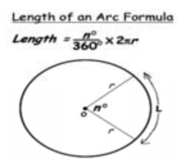
LOADING PATTERN

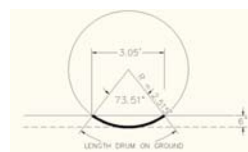
Approximately 2,400.00 psf



CAT 826H Compactor

Equipment Weight (Operating) =	81,498.0 lbf
Weight per Drum =	20,374.5 lbf (4 drums)
Drum Width =	3.94 ft
Drum Diameter =	5.03 ft
Drum Radius =	2.515 ft





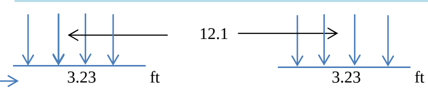
Assumption on Wheels

	6 in Wheel pentration into waste (compacted)
n =	73.51 degrees (from CADD)
Drum Length on Ground L =	3.23 ft
Drum Width =	3.94 ft
Drum Length on Ground L =	3.23 ft
Area of Each Drum =	12.71 sf
Distance Centerline to Centerline Drum =	12.1 ft

Surface Loading

Load =	20,374.5 lbf
Area =	12.7 sf
Contact Pressure (Force/Area) =	1,602.61 psf

LOADING PATTERN



Approximately 1,700.00 psf

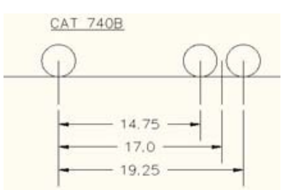
Equipment Surface Loads

Operations and Closure

Fully Loaded

Equipment Weight (Operating) = 165,311.0 lbf

Front Axle	50,977.0 lbf	per tire ===>	25,488.5 lbf
Center Axle	57,997.0 lbf	per tire ===>	28,998.5 lbf
Rear Axle	56,335.0 lbf	per tire ===>	28,167.5 lbf
	165,309.0 lbf		
	(negligible difference of 2 lbf)		

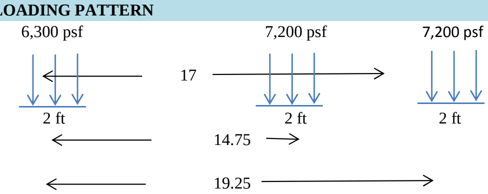


Tires 29R 25	Contact Area			Tires (Contact Area)
Front Axle	583 in^2	============>	4.049 ft^2	30.4 in wide
Center Axle	583 in^2	============>	4.049 ft^2	19.2 length
Rear Axle	583 in^2	============>	4.049 ft^2	

Pressure

Front Axle	Load per axle/area	43.7 psi	6,295.6 psf (Say 6,300 psf)
Center Axle	Load per axle/area	49.7 psi	7,162.6 psf (Say 7,200 psf)
Rear Axle	Load per axle/area	48.3 psi	6,957.3 psf (Say 7,000 psf)

LOADING PATTERN



CAT D8T WH DOZER

CATERPILLAR D8R WHA CRAWLER TRACTOR

VIEW ARTICLES ON THIS ITEM

Print specification

Looking to purchase this item?

See all Caterpillar D8R WHA Crawler Tractor being sold at Ritchie Bros. auctions.

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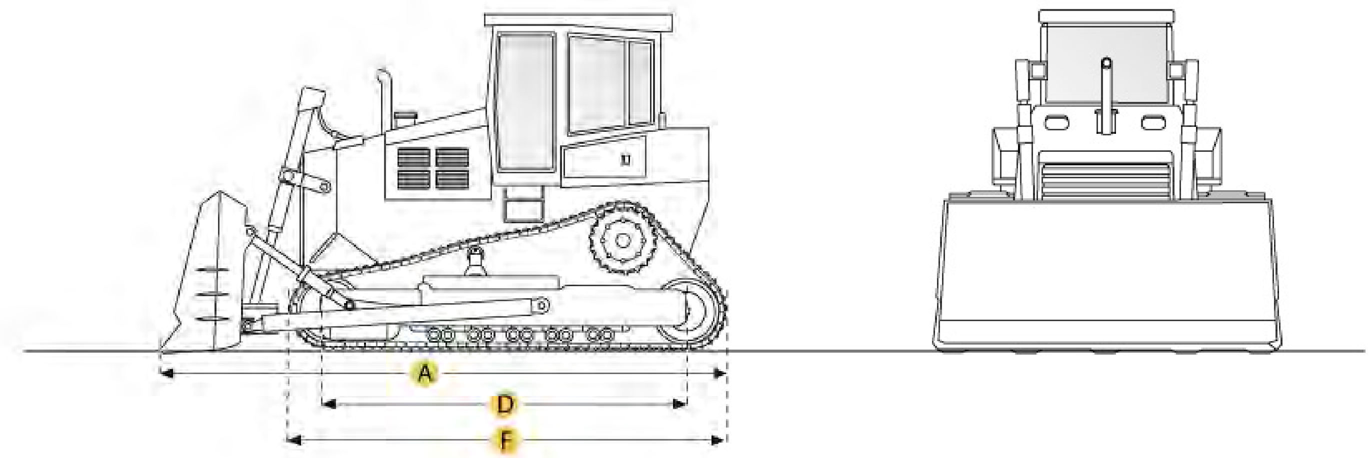

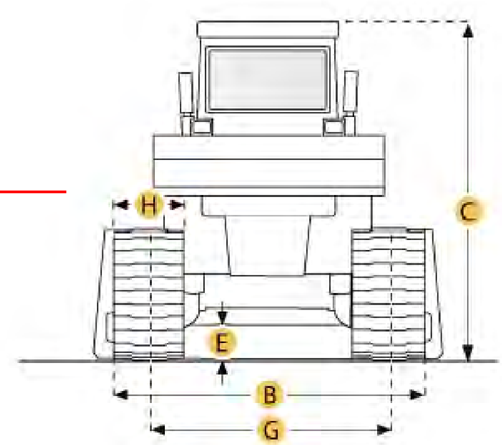

Selected Dimensions

Dimensions		
A. LENGTH W/ BLADE	21 ft in	6390 mm
B. WIDTH OVER TRACKS	8.9 ft in	2700 mm
C. HEIGHT TO TOP OF CAB	8.8 ft in	2670 mm
D. LENGTH OF TRACK ON GROUND	10.5 ft in	3210 mm
E. GROUND CLEARANCE	1.9 ft in	585 mm
F. LENGTH W/O BLADE	16.2 ft in	4930 mm

Undercarriage		
G. TRACK GAUGE	6.8 ft in	2080 mm
H. STANDARD SHOE SIZE	22 in	560 mm

Specification

Engine		
MAKE	Caterpillar	
MODEL	3406ETA	
GROSS POWER	305 hp	227.4 kw
POWER MEASURED @	2100 rpm	
DISPLACEMENT	890.9 cu in	14.6 L
NUMBER OF CYLINDERS	6	

Operational		
OPERATING WEIGHT	82880.6 lb	37594 kg
FUEL CAPACITY	165.1 gal	625 L

Transmission		
NUMBER OF FORWARD GEARS	3	
NUMBER OF REVERSE GEARS	3	
MAX SPEED - FORWARD	6.6 mph	10.6 km/h
MAX SPEED - REVERSE	8.6 mph	13.8 km/h

Undercarriage

North America (/en_US/language-selector.html)

PRODUCTS (/EN_US/PRODUCTS.HTML) | PARTS (/EN_US/PARTS.HTML) | SUPPORT (/EN_US/SUPPORT.HTML)

COMPANY (/EN_US/COMPANY.HTML)

WASTE HANDLING DOZERS (/EN_US/PRODUCTS/NEW/EQUIPMENT/DOZERS/WASTE-HANDLING-DOZERS.HTML)

D8T WH (TIER 4 INTERIM/STAGE IIIB)

FINANCING & INSURANCE
See our Current Offers
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REQUEST A QUOTE (/EN_US/BUILD-QUOTE/REQUEST-A-QUOTE.HTML PRODUCTPATHNEW=/CONTENT/CATDOTCOM/EN HANDLING-DOZERS/18266806&PRODUCTNAMEN 29)

MACHINE COMPARISON (HTTP://WWW.SPECCHECK.COM/LITE/SELEC MODID=ZX6EGOXTS3E.JQJQJ.&X=7IOLTELY =2)

VIEW PRODUCT DOWNLOADS

IMAGE COMING SOON

Image Coming Soon

PHOTO

IMAGE COMING SOON




1 of 2

SPECIFICATIONS | BENEFITS & FEATURES | RELATED PRODUCTS

OVERVIEW

The Cat® D8T Waste Handler has earned a reputation for best-in-class versatility, productivity and resale value. Landfill customers choose the D8T WH because it excels at multiple tasks from pushing trash and spreading cover to cell construction and closing. Cat Waste Handlers are designed and built from the frame up to handle the demands of landfill work – and they do it with industry leading comfort and reliability. The D8T WH meets U.S. Tier 4 Interim/EU Stage IIIB emission standards.

ENGINE

UNITS: US METRIC

Engine Model	Cat® C15 ACERT™
Flywheel Power	310.0 hp
Bore	5.4 in
Stroke	6.75 in
Displacement	928.0 in3
Emissions	U.S. Tier 4 Interim/EU Stage IIIB
Global Emissions	U.S. Tier 4 Interim/EU Stage IIIB
Gross Power – ISO 14396	318.0 hp
Gross Power – ISO 14396 (DIN)	322.0 hp
Gross Power – SAE J1995	348.0 hp
Net Power – EU 80/1269	310.0 hp
Net Power – ISO 9249	310.0 hp
Net Power – ISO 9249 (DIN)	314.0 hp
Net Power – SAE J1349	310.0 hp

SERVICE REFILL CAPACITIES

Cooling System	20.3 gal
Engine Crankcase*	10.0 gal
Final Drives (each)	3.3 gal
Hydraulic Tank	19.8 gal
Pivot Shaft Compartment	10.6 gal
Powertrain	41.0 gal
Roller Frames (each)	17.2 gal
Fuel Tank	170.0 gal

WEIGHTS

Operating Weight	85650.0 lb
Operating Weight – LGP WHA	91270.0 lb
Operating Weight – SU Blade WHA	85650.0 lb
Shipping Weight – LGP WHA	77840.0 lb
Shipping Weight – WHA	72220.0 lb

UNDERCARRIAGE

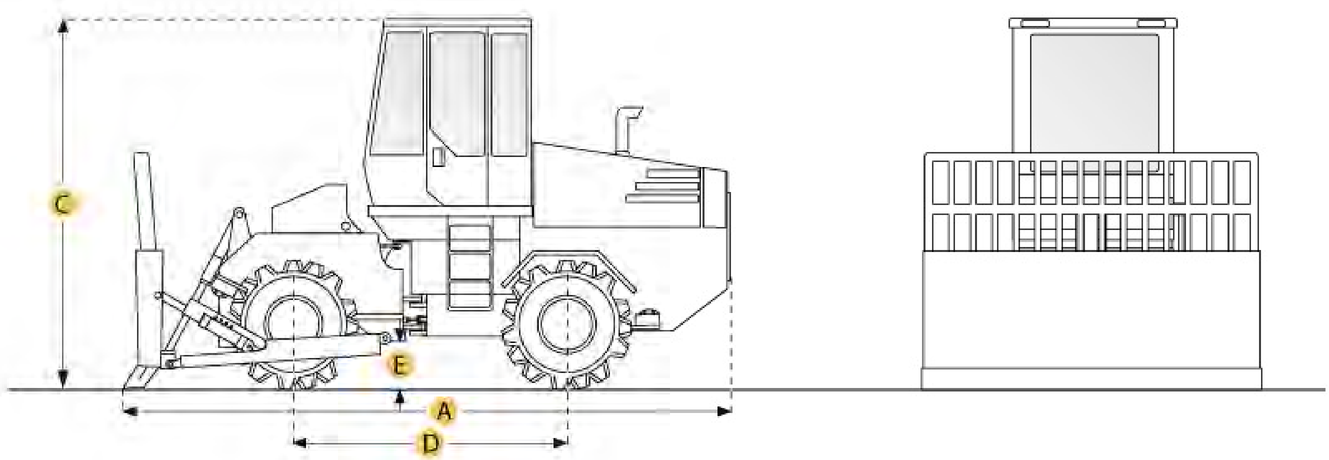
Track Gauge	82.0 in
Track Gauge – LGP	92.0 in
Length of Track on Ground	10.5 ft
Ground Contact Area	5554.0 in2
Track Rollers/Side	8
Ground Clearance	24.3 in
Ground Contact Area – LGP	9576.0 in2
Grouser Height	3.0 in
Number of Carrier Rollers	1 per side (optional)
Pitch	8.5 in
Shoe Type	Moderate Service
Shoes/Side	44
Width of Shoe	24.0 in
Width of Shoe – LGP	38.0 in

BLADES

Capacity (SAE J1265)	26.1 yd3
Capacity (SAE J1265)	32.4 yd3
Capacity (SAE J1265)	27.6 yd3

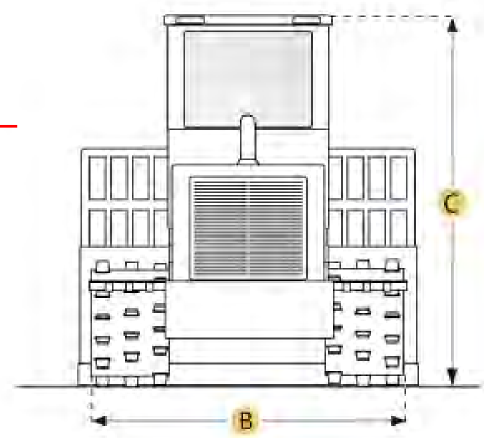
CAT 826H COMPACTOR

CATERPILLAR 826H COMPACTOR



Selected Dimensions

Dimensions		
A. LENGTH WITH BLADE ON GROUND	27.3 ft in	8332 mm
C. HEIGHT TO TOP OF CAB	13.8 ft in	4193 mm
D. WHEELBASE	12.1 ft in	3700 mm
E. GROUND CLEARANCE	1.6 ft in	488 mm



Specification

Engine		
MAKE	Caterpillar	
MODEL	C15 diesel with ACERT Technology	
GROSS POWER	401 hp	299 kw
NET POWER	354 hp	264 kw
DISPLACEMENT	927.6 cu in	15.2 L
Operational		
OPERATING WEIGHT	81498 lb	36966.9 kg
FUEL CAPACITY	177.5 gal	672 L
HYDRAULIC SYSTEM FLUID CAPACITY	23.3 gal	88 L
ENGINE OIL CAPACITY	9 gal	34 L
COOLING SYSTEM FLUID CAPACITY	21.7 gal	82 L
TRANSMISSION FLUID CAPACITY	16.4 gal	62 L
Transmission		
NUMBER OF FORWARD GEARS	2	
NUMBER OF REVERSE GEARS	2	
MAX SPEED	6.6 mph	10.6 km/h
Wheels		
FRONT WHEELS DRUM WIDTH	47.2 in	1200 mm
FRONT WHEELS DRUM DIAMETER	60.3 in	1532 mm
REAR WHEELS DRUM WIDTH	47.2 in	1200 mm
REAR WHEELS DRUM DIAMETER	60.3 in	1532 mm

LANDFILL COMPACTORS (/EN_US/PRODUCTS/NEW/EQUIPMENT/COMPACTORS/LANDFILL-COMPACTORS.HTML)

826H

FINANCING & INSURANCE
See our Current Offers (/en_US/promotions/financing-solutions.html)

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Enter Zip Code GO

REQUEST A QUOTE	(/EN_US/BUILD-QUOTE/REQUEST-A-QUOTE.HTML? PRODUCTPATHNEW=/CONTENT/CATDOTCOM/EN_ COMPACTORS/18191806&PRODUCTNAMENEW=82
MACHINE COMPARISON	(HTTP://WWW.SPECCHECK.COM/LITE/SELECT MODID=BTZ6AAWH38O.JQJQJ.&X=7IOLTELY
USED LANDFILL COMPACTORS	(HTTP://CATUSED.CAT.COM/EN/COMPACTOR RESULTS.HTML?PRODUCTFAMILYCATEGORY
RENT LANDFILL COMPACTORS	(HTTP://WWW.CATRENTALSTORE.COM/EQUI EQUIPMENT/LANDFILL-COMPACTORS)

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:2)

826H - 2011, Global Landfill Compactors

PHOTO 360 VIEW

SPECIFICATIONS BENEFITS & FEATURES EQUIPMENT

OVERVIEW

Caterpillar put the first 826 landfill compactor to work in 1978. Since then, customers like you have helped us improve the safety, reliability and productivity of this very popular machine. Our H Series model has enhanced visibility and comfort from a new ergonomic cab. Operators have greater line of sight to areas around the machine, and with CAES installed, the 826H has the ability to be more efficient, lowering your operating costs.

ENGINE UNITS: US METRIC

Gross Power	401.0 hp
Net Power	354.0 hp
Engine Model	Cat® C15 ACERT™
Flywheel Power	354.0 hp
Torque Rise	19.0 %
Bore	5.4 in
Stroke	6.7 in
Displacement	927.56 in3
Peak Torque – Gross	1387.0 ft-lb

TRANSMISSION

Forward 1	3.6 mph
Forward 2	6.03 mph
Reverse 1	4.1 mph
Reverse 2	6.59 mph

HYDRAULIC SYSTEM

Vane Pump Output @ 2,000 rpm and 6900 kPa (1,000 psi)	93.0 gal/min
Relief Valve Setting	3506.29 psi
Lift Cylinder Bore x Stroke	120.65 mm × 915 mm (4.74 in × 36.02 in)

AXLES

Front	Planetary – Fixed
Oscillating Rear	±5°

BRAKES

Standards	Meet OSHA, SAE J1473 DEC84, ISO 3450:1985 standards

WHEELS – CHEVRON-PATTERN, CHOPPER BLADES

Drum Width	3.94 ft
Drum Diameter	5.03 ft
Diameter with Blades	6.07 ft
Blades per Wheel	24

STRAIGHT BLADE

Capacity	17.0 yd3
Width Over End Bits	14.77 ft
Moldboard Length	14.14 ft
Height	6.23 ft

U-BLADE

Capacity	21.84 yd3
Height	6.81 ft
Moldboard Straight Length	6.81 ft
Moldboard U-Length	4.09 ft
U-Angle	25°
Width Over End Bits	14.43 ft

SEMI U-BLADE

Capacity	18.97 yd3
Height	6.43 ft
Moldboard Semi U-Length	1.51 ft
Moldboard Straight Length	11.92 ft
Semi U-Angle	25°
Width Over End Bits	14.73 ft

SERVICE REFILL CAPACITIES

Fuel Tank	177.52 gal
Cooling System	21.66 gal
Crankcase	8.98 gal
Transmission	16.38 gal
Differentials and Final Drives – Front	23.78 gal
Differentials and Final Drives – Rear	23.78 gal
Hydraulic Tank	23.25 gal

WEIGHTS

Operating Weight	81498.0 lb

CAB

ROPS/FOPS	Meets SAE and ISO standards

SOUND PERFORMANCE

Standards	Meet ANSI/SAE and ISO standards

DIMENSIONS (APPROXIMATE)

Center Line of Rear Axle to Hitch	7.46 ft
Width over Wheels	12.5 ft
Width over Endbits (Blade)	14.77 ft
Turning Radius – Inside	10.57 ft
Turning Radius – Outside	24.06 ft

HYDRAULIC STEERING SYSTEM

Piston Pump Output @ 2,000 rpm and 7000 kPa (1,015 psi)	49.0 gal/min
Relief Valve Setting	3499.0 psi

CAT 740B OFF-ROAD DUMP TRUCK

RITCHIE Specs Everything about Equipment

Select language

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Home → Spec Search → Construction Equipment → Articulated Dump Truck → Caterpillar → 740B

CATERPILLAR 740B ARTICULATED DUMP TRUCK

VIEW ARTICLES ON THIS ITEM

Print specification

Looking to purchase this item?

See all Caterpillar 740B Articulated Dump Truck being sold at Ritchie Bros. auctions.

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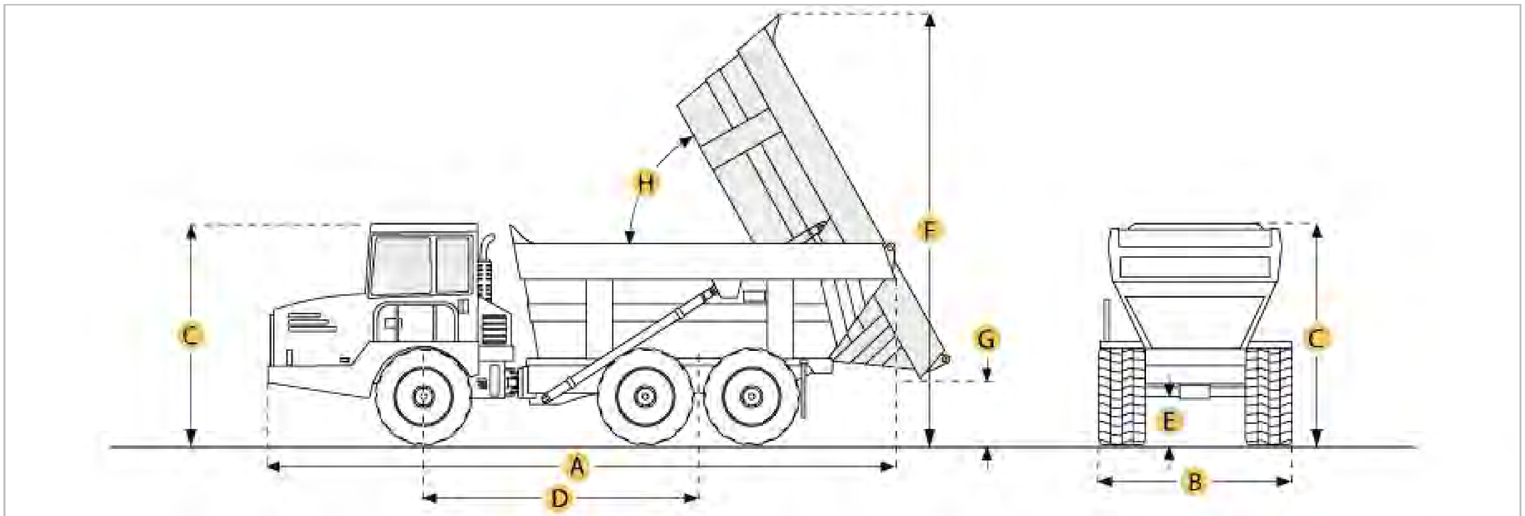
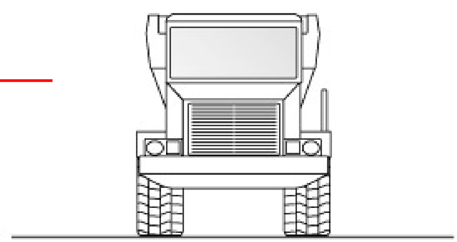
Just complete this form and a Ritchie Bros. representative will contact you.



Selected Dimensions

Dimensions		
A. OVERALL LENGTH	36.1 ft in	11000 mm
B. OVERALL WIDTH	12.4 ft in	3770 mm
C. OVERALL HEIGHT	13.3 ft in	4039 mm
D. WHEELBASE	17.2 ft in	5229 mm
E. GROUND CLEARANCE	1.9 ft in	577 mm
F. DUMP HEIGHT	23.3 ft in	7092 mm
G. DUMP GROUND CLEARANCE	2.3 ft in	697 mm

Dump		
H. DUMP ANGLE	70 degrees	



Specification

Engine		
MAKE	Caterpillar	
MODEL	C15	
GROSS POWER	489 hp	364.6 kw
NET POWER	474 hp	353.5 kw
POWER MEASURED @	1700 rpm	
DISPLACEMENT	926 cu in	15.2 L
TORQUE MEASURED @	1200 rpm	
MAX TORQUE	1819 lb ft	2466.2 Nm

Operational		
FUEL CAPACITY	147.9 gal	560 L
HYDRAULIC SYSTEM FLUID CAPACITY	86.6 gal	328 L
COOLING SYSTEM FLUID CAPACITY	21.1 gal	80 L
ENGINE OIL CAPACITY	10 gal	38 L
TRANSMISSION FLUID CAPACITY	19 gal	72 L
TIRE SIZE	29.5R25	

Transmission

740B EJ

FINANCING & INSURANCE
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Enter Zip Code GO

REQUEST A QUOTE (/EN_US/BUILD-QUOTE/REQUEST-A-QUOTE.HTML?PRODUCTPATHNEW=/CONTENT/CATDOTCOM/EN_US TRUCKS/THREE-AXLE-ARTICULATED-TRUCKS/178072

MACHINE COMPARISON (HTTP://WWW.SPECCHECK.COM/LITE/SELECT.A MODID=C36.ZZXZZ.MAYW6GC.JQJQJ.&X=7IOLT

USED ARTICULATED TRUCKS (HTTP://CATUSED.CAT.COM/EN/CATERPILLAR/A RESULTS.HTML?PRODUCTFAMILYCATEGORY=1(

RENT ARTICULATED TRUCKS (HTTP://WWW.CATRENTALSTORE.COM/EQUIPM TRUCKS)

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:2)

740B Ejector Articulated Trucks

PHOTO 360 VIEW

2 of 2

SPECIFICATIONS BENEFITS & FEATURES EQUIPMENT

OVERVIEW

The new Cat® 740B ej with 38 tonnes (42 tons) rated payload offers proven reliability and durability, high productivity, superior operator comfort and lower operating costs. The spacious two-person cab with forward facing passenger seat and off road oil/nitrogen front suspension cylinders keep the operator comfortable through out the working day. The true “on-the-go” Automatic Traction Control (ATC) automatically modulates the correct level of Inter-Axle and Cross-Axle differential lock engagement which will improve cycle times and productivity. No operator interaction. Strong, durable Cat ACERT™ engines with the Tier 4 Interim/EU Stage IIIB exhaust emission solution and electronically controlled smooth shifting transmissions deliver high productivity with low fuel consumption. There are significant changes/improvements to the engine/transmission software that result in smoother gear changes.

ENGINE

UNITS: US METRIC

Engine Model	Cat® C15 ACERT™
Gross Power – SAE J1995	489.0 hp
Net Power – SAE J1349	474.0 hp
Bore	5.4 in
Stroke	6.75 in
Displacement	926.0 in3
Engine Model Tier 4 Interim/EU Stage IIIB	Cat® C15 ACERT™
Net Power – ISO 14396	484.0 hp

WEIGHTS

Rated Payload	42.0 tons

BODY CAPACITIES

Heaped SAE 2:1	30.2 yd3
Struck	23.3 yd3

TRANSMISSION

Forward 1	5.5 mph
Forward 2	7.5 mph
Forward 3	10.2 mph
Forward 4	13.7 mph
Forward 5	18.6 mph
Forward 6	25.1 mph
Forward 7	34.0 mph
Reverse 1	5.2 mph
Reverse 2	7.2 mph

SOUND LEVELS

Interior Cab	79.0 dB(A)

OPERATING WEIGHTS

Front Axle – Empty	47357.0 lb
Center Axle – Empty	17919.0 lb
Rear Axle – Empty	16257.0 lb
Total – Empty	81536.0 lb
Front Axle – Rated Load	3620.0 lb
Center Axle – Rated Load	40078.0 lb
Rear Axle – Rated Load	40078.0 lb
Total – Rated Load	83776.0 lb
Front Axle – Loaded	50977.0 lb
Center Axle – Loaded	57997.0 lb
Rear Axle – Loaded	56335.0 lb
Total – Loaded	165311.0 lb

BODY PLATE THICKNESS

Front	0.24 in
Side	0.24 in
Base	0.39 in

SERVICE REFILL CAPACITIES

Fuel Tank	149.3 gal
Cooling System	21.1 gal
Hydraulic System	89.0 gal
Engine Crankcase	9.0 gal
Transmission	19.0 gal
Final Drives/Differential	60.8 gal

RL-4K (24/24)(L-4)

Tire Size: 29.5R25

Extra tread radial loader tire designed for use in rock or load and carry service.

For rock or load and carry service, here is a long wearing radial loader tire available in multiple tread configurations. The 24/24 (24 lugs per side) is ideally suited for both general and load and carry service.

Available in ply ratings: *, **
Available locations: North America, Europe / Africa / Mid East

PAGE OPTIONS

Printable Version

Features

- 150-Level tread depth--50% deeper than standard L-3
- High tensile steel belt package
- Radial construction
- Tire available in multiple tread configurations
- Unique synthetic / natural rubber compound

Benefits

- Extra tread for long wear
- Impact and cut resistant
- Improved treadwear and cooler running than bias construction
- 24/24 (24 lugs per side) appropriate for both general or load and carry service
- Long wearing tread and advanced cut resistance

Change unit of measure: US Metric

Tire Specs | Loads and Inflations

Rim Width & Flange	Min. Dual Spacing (in)	Overall Width (in)	Overall Diameter (in)	Load Sect. & Growth (in)	Static Load Radius (in)	Revolutions per Mi	Gross Contact Area (in^2)	Tire Vol. (gal)	Tread Depth ($^1/_{32}$in)	TMPH (2S)	TMPH (4S)	TMPH (6S)
25.00-3.5		30.4	75.7	33.6	33	278	583	325	72		90	85

ATTACHMENT D

ROTATIONAL (CIRCULAR) FAILURE

SLOPE STABILITY

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:08PM
Run By: Civil Design Service, Inc
Input Data Filename: C:ns_cel~1.
Output Filename: C:ns_cel~1.OUT
Plotted Output Filename: C:ns_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17_ North South Section_Eastside

BOUNDARY COORDINATES
12 Top Boundaries
65 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	90.00	72.00	90.00	1
2	72.00	90.00	102.00	80.00	1
3	102.00	80.00	221.00	80.00	1
4	221.00	80.00	249.80	89.60	15
5	249.80	89.60	264.80	89.80	15
6	264.80	89.80	415.40	140.00	14
7	415.40	140.00	425.40	140.00	14
8	425.40	140.00	575.40	190.00	14
9	575.40	190.00	585.40	190.00	14
10	585.40	190.00	660.40	215.00	14
11	660.40	215.00	910.40	220.00	14
12	910.40	220.00	1100.00	220.00	14
13	264.80	89.80	274.30	89.80	15
14	274.30	89.80	415.90	137.00	16
15	415.90	137.00	425.90	137.00	16
16	425.90	137.00	575.90	187.00	16
17	575.90	187.00	585.90	187.00	16
18	585.90	187.00	660.90	212.00	16
19	660.90	212.00	910.40	217.00	16
20	910.40	217.00	1100.00	217.00	16
21	274.30	89.80	315.70	76.00	15
22	315.70	76.00	320.70	76.00	15
23	320.70	76.00	329.70	79.00	15
24	329.70	79.00	800.00	81.50	15
25	800.00	81.50	1100.00	81.50	15
26	221.00	80.00	242.00	73.00	1
27	242.00	73.00	321.20	73.00	7
28	321.20	73.00	326.90	74.80	7
29	326.90	74.80	330.20	76.00	1
30	330.20	76.00	800.00	78.50	1
31	800.00	78.50	1100.00	78.50	1
32	326.90	74.80	418.00	74.80	7
33	418.00	74.80	438.00	74.80	7
34	438.00	74.80	565.00	76.40	7
35	565.00	76.40	585.00	76.40	7
36	585.00	76.40	713.00	74.80	7
37	713.00	74.80	733.00	74.80	7
38	733.00	74.80	1100.00	74.80	7
39	.00	69.60	307.28	69.60	9
40	307.28	69.60	327.28	69.60	9
41	327.28	69.60	418.00	69.80	8
42	418.00	69.80	438.00	69.80	8
43	438.00	69.80	565.00	71.40	8
44	565.00	71.40	585.00	71.40	8
45	585.00	71.40	713.00	69.80	8
46	713.00	69.80	733.00	69.80	8
47	733.00	69.80	1100.00	69.80	8
48	.00	59.90	307.28	59.60	8
49	307.28	59.60	327.28	59.60	8
50	327.28	69.60	418.00	49.80	9
51	418.00	49.80	438.00	49.80	9

```
    52        438.00      49.80     565.00      56.43        9
    53        327.28      59.60     418.00      44.80        8
    54        565.00      56.40     585.00      56.40       17
    55        585.00      56.40     713.00      54.80       17
    56        713.00      54.80     733.00      54.80       17
    57        733.00      54.80    1100.00      54.80       17
    58           .00      44.60     307.28      44.60        5
    59        307.28      44.60     327.28      44.60        5
    60        327.28      44.60     418.00      44.80        5
    61           .00      34.60     307.28      34.60       17
    62        307.28      34.60     327.28      34.60       17
    63        327.28      34.60     418.00      44.80       17
    64        418.00      44.80     438.00      44.80       17
    65        438.00      44.80     565.00      56.40       17
 ISOTROPIC SOIL PARAMETERS
  17 Type(s) of Soil
  Soil  Total  Saturated  Cohesion Friction   Pore   Pressure   Piez.
  Type Unit Wt. Unit Wt. Intercept   Angle  Pressure Constant Surface
   No.  (pcf)    (pcf)     (psf)     (deg)   Param.    (psf)    No.
    1   105.0    110.0        .0     26.0     .00        .0      1
    2   107.0    112.0        .0     30.0     .00        .0      1
    3   110.0    115.0        .0     34.0     .00        .0      1
    4    85.0    100.0        .0     26.0     .00        .0      1
    5    95.0    105.0        .0     30.0     .00        .0      1
    6   100.0    115.0        .0     34.0     .00        .0      1
    7    85.0    100.0        .0     28.0     .00        .0      1
    8    95.0    105.0        .0     30.0     .00        .0      1
    9   100.0    115.0        .0     34.0     .00        .0      1
   10    80.0    100.0     100.0       .0     .00        .0      1
   11    95.0    105.0     750.0       .0     .00        .0      1
   12   100.0    115.0    1500.0       .0     .00        .0      1
   13   110.0    115.0        .0     30.0     .00        .0      1
   14   110.0    115.0        .0     30.0     .00        .0      1
   15    95.0    105.0        .0     30.0     .00        .0      1
   16    50.0     50.0        .0     35.0     .00        .0      1
   17   120.0    130.0        .0     40.0     .00        .0      1
  1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
  Unit Weight of Water =  62.40
  Piezometric Surface No.  1 Specified by  2 Coordinate Points
    Point      X-Water     Y-Water
     No.         (ft)        (ft)
      1           .00       72.00
      2       1100.00       72.00
 BOUNDARY LOAD(S)
      1 Load(s) Specified
  Load        X-Left      X-Right     Intensity     Deflection
   No.         (ft)        (ft)      (lb/sqft)       (deg)
    1         660.40      670.90       2400.0           .0
  NOTE - Intensity Is Specified As A Uniformly Distributed
         Force Acting On A Horizontally Projected Surface.
  SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
  A Critical Failure Surface Searching Method, Using A Random
  Technique For Generating Circular Surfaces, Has Been Specified.
10000 Trial Surfaces Have Been Generated.
  100 Surfaces Initiate From Each Of100 Points Equally Spaced
  Along The Ground Surface Between  X =  75.00 ft.
                              and  X = 264.80 ft.
  Each Surface Terminates Between   X = 660.40 ft.
                              and   X =1000.00 ft.
  Unless Further Limitations Were Imposed, The Minimum Elevation
  At Which A Surface Extends Is  Y =   .00 ft.
  10.00 ft. Line Segments Define Each Trial Failure Surface.
  Following Are Displayed The Ten Most Critical Of The Trial
        Failure Surfaces Examined.  They Are Ordered - Most Critical
        First.
        * * Safety Factors Are Calculated By The Modified Bishop Method * *
        Failure Surface Specified By 44 Coordinate Points
          Point      X-Surf      Y-Surf
           No.        (ft)        (ft)
            1        264.80       89.80
```

2	274.59	91.84
3	284.37	93.93
4	294.14	96.07
5	303.90	98.25
6	313.65	100.47
7	323.39	102.75
8	333.11	105.07
9	342.83	107.43
10	352.53	109.84
11	362.23	112.30
12	371.91	114.80
13	381.58	117.35
14	391.24	119.95
15	400.88	122.59
16	410.51	125.27
17	420.13	128.01
18	429.74	130.78
19	439.33	133.60
20	448.91	136.47
21	458.48	139.39
22	468.03	142.34
23	477.57	145.35
24	487.09	148.40
25	496.60	151.49
26	506.10	154.63
27	515.58	157.81
28	525.04	161.04
29	534.49	164.31
30	543.93	167.63
31	553.34	170.99
32	562.75	174.40
33	572.13	177.85
34	581.50	181.34
35	590.85	184.88
36	600.19	188.47
37	609.51	192.10
38	618.81	195.77
39	628.09	199.49
40	637.36	203.25
41	646.61	207.05
42	655.84	210.90
43	665.05	214.79
44	665.80	215.11

Circle Center At X = -162.0 ; Y = 2159.8 and Radius, 2113.5

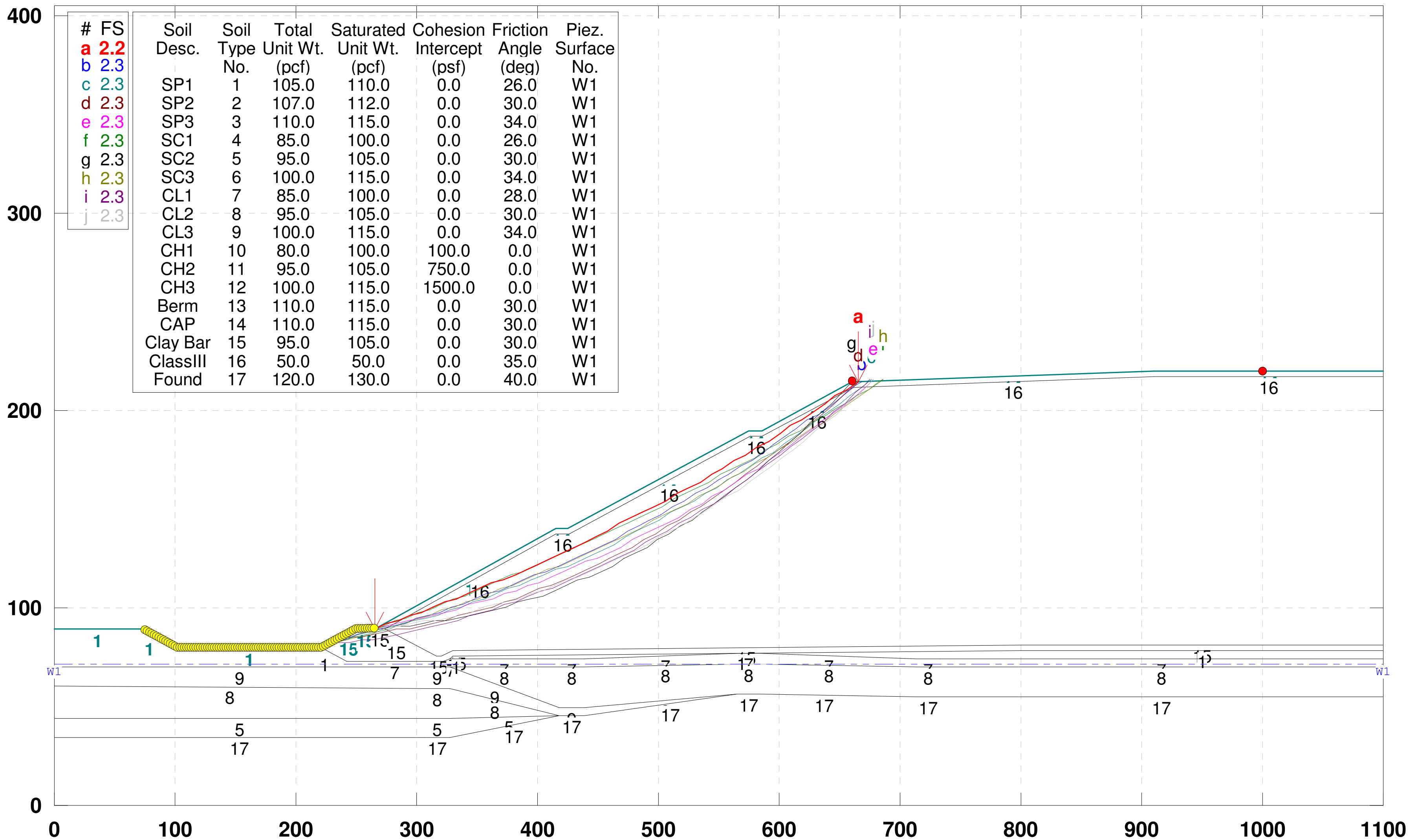
*** 2.233 ***

Failure Surface Specified By 47 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	230.29	83.10
2	240.19	84.52
3	250.08	86.02
4	259.95	87.58
5	269.82	89.20
6	279.68	90.89
7	289.52	92.65
8	299.36	94.47
9	309.18	96.36
10	318.98	98.31
11	328.78	100.32
12	338.56	102.41
13	348.33	104.55
14	358.08	106.77
15	367.82	109.04
16	377.54	111.38
17	387.24	113.79
18	396.93	116.26
19	406.61	118.80
20	416.26	121.40
21	425.90	124.06
22	435.52	126.79

Angelos Class III Cell 17 Expansion Cell 17_ North South Section_Eastside

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL17~1\NS_CEL~1.PL2 Run By: Civil Design Service, Inc 2/7/2018 6:08PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

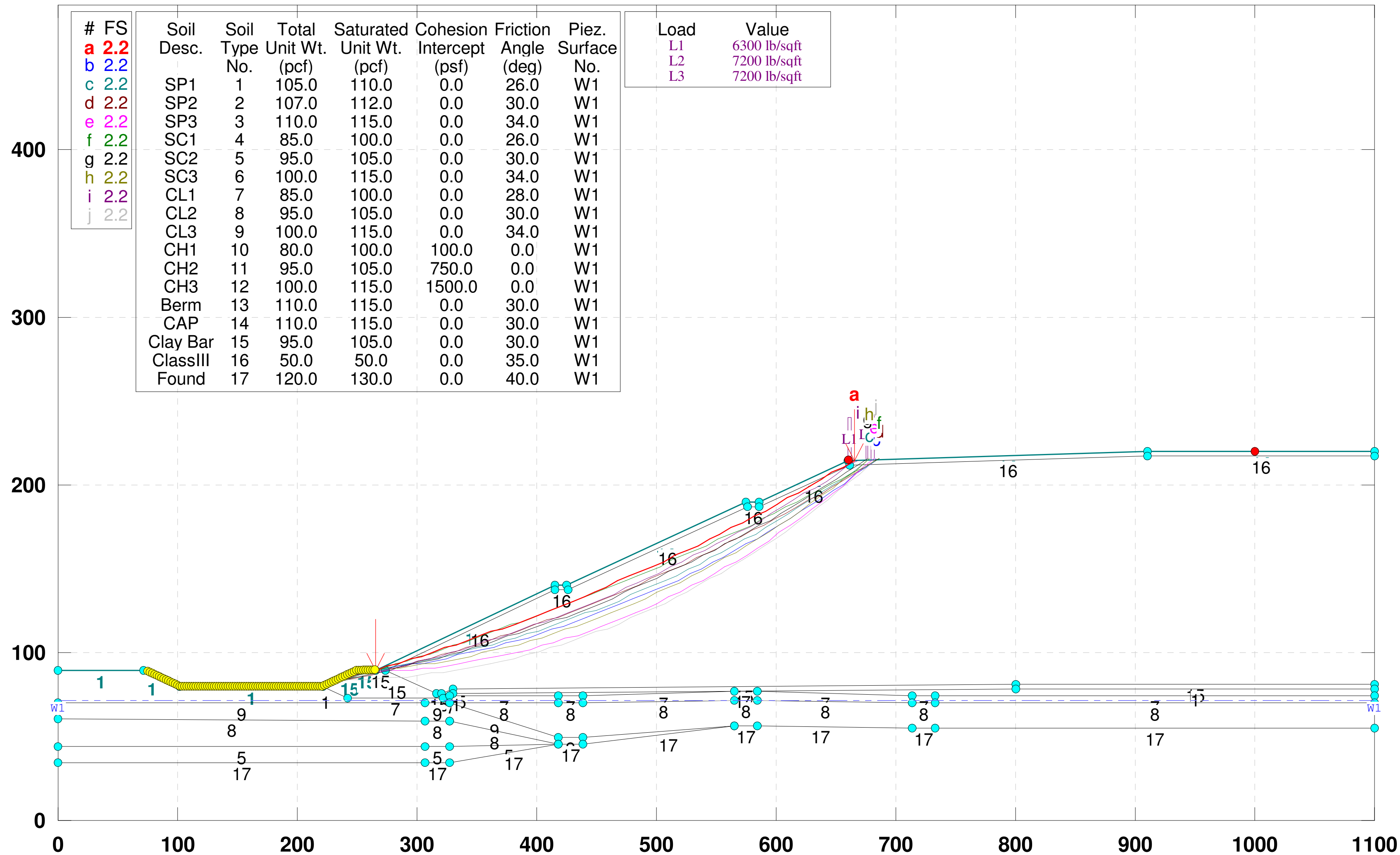
STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Eastside-CAT 740B

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL17~1\NS_CEL~1.PL2   Run By: Civil Design Service, Inc   2/7/2018   11:17PM



#	FS
a	2.2
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.2
h	2.2
i	2.2
j	2.2

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

BLOCK FAILURE SLOPE STABILITY

(SUBGRADE)

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:19PM
Run By: Civil Design Service, Inc
Input Data Filename: C:ns_cel~1.
Output Filename: C:ns_cel~1.OUT
Plotted Output Filename: C:ns_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17_ North South Section_Eastside
BOUNDARY COORDINATES
12 Top Boundaries
65 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	90.00	72.00	90.00	1
2	72.00	90.00	102.00	80.00	1
3	102.00	80.00	221.00	80.00	1
4	221.00	80.00	249.80	89.60	15
5	249.80	89.60	264.80	89.80	15
6	264.80	89.80	415.40	140.00	14
7	415.40	140.00	425.40	140.00	14
8	425.40	140.00	575.40	190.00	14
9	575.40	190.00	585.40	190.00	14
10	585.40	190.00	660.40	215.00	14
11	660.40	215.00	910.40	220.00	14
12	910.40	220.00	1100.00	220.00	14
13	264.80	89.80	274.30	89.80	15
14	274.30	89.80	415.90	137.00	16
15	415.90	137.00	425.90	137.00	16
16	425.90	137.00	575.90	187.00	16
17	575.90	187.00	585.90	187.00	16
18	585.90	187.00	660.90	212.00	16
19	660.90	212.00	910.40	217.00	16
20	910.40	217.00	1100.00	217.00	16
21	274.30	89.80	315.70	76.00	15
22	315.70	76.00	320.70	76.00	15
23	320.70	76.00	329.70	79.00	15
24	329.70	79.00	800.00	81.50	15
25	800.00	81.50	1100.00	81.50	15
26	221.00	80.00	242.00	73.00	1
27	242.00	73.00	321.20	73.00	7
28	321.20	73.00	326.90	74.80	7
29	326.90	74.80	330.20	76.00	1
30	330.20	76.00	800.00	78.50	1
31	800.00	78.50	1100.00	78.50	1
32	326.90	74.80	418.00	74.80	7
33	418.00	74.80	438.00	74.80	7
34	438.00	74.80	565.00	76.40	7
35	565.00	76.40	585.00	76.40	7
36	585.00	76.40	713.00	74.80	7
37	713.00	74.80	733.00	74.80	7
38	733.00	74.80	1100.00	74.80	7
39	.00	69.60	307.28	69.60	9
40	307.28	69.60	327.28	69.60	9
41	327.28	69.60	418.00	69.80	8
42	418.00	69.80	438.00	69.80	8
43	438.00	69.80	565.00	71.40	8
44	565.00	71.40	585.00	71.40	8
45	585.00	71.40	713.00	69.80	8
46	713.00	69.80	733.00	69.80	8
47	733.00	69.80	1100.00	69.80	8
48	.00	59.90	307.28	59.60	8
49	307.28	59.60	327.28	59.60	8
50	327.28	69.60	418.00	49.80	9
51	418.00	49.80	438.00	49.80	9

52	438.00	49.80	565.00	56.43	9
53	327.28	59.60	418.00	44.80	8
54	565.00	56.40	585.00	56.40	17
55	585.00	56.40	713.00	54.80	17
56	713.00	54.80	733.00	54.80	17
57	733.00	54.80	1100.00	54.80	17
58	.00	44.60	307.28	44.60	5
59	307.28	44.60	327.28	44.60	5
60	327.28	44.60	418.00	44.80	5
61	.00	34.60	307.28	34.60	17
62	307.28	34.60	327.28	34.60	17
63	327.28	34.60	418.00	44.80	17
64	418.00	44.80	438.00	44.80	17
65	438.00	44.80	565.00	56.40	17

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.
SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.
200 Trial Surfaces Have Been Generated.
2 Boxes Specified For Generation Of Central Block Base
Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	280.00	72.00	400.00	72.00	20.00
2	450.00	72.00	675.00	72.00	20.00

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Janbu Method * *
Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	249.78	89.59

2	254.97	84.41
3	264.20	80.54
4	273.58	77.09
5	283.08	73.98
6	292.85	71.84
7	535.51	75.00
8	542.58	82.08
9	548.70	89.98
10	555.69	97.13
11	562.02	104.88
12	569.08	111.95
13	576.09	119.09
14	580.57	128.03
15	585.23	136.88
16	590.65	145.28
17	595.38	154.09
18	602.45	161.16
19	607.65	169.71
20	614.40	177.08
21	618.69	186.12
22	625.76	193.19
23	627.16	203.09
24	627.24	203.95

*** 2.548 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.07	90.89
2	275.90	87.45
3	285.31	84.07
4	295.30	83.84
5	303.90	78.74
6	311.19	71.89
7	475.86	78.87
8	482.60	86.26
9	489.23	93.75
10	493.71	102.69
11	499.45	110.88
12	506.07	118.37
13	509.54	127.75
14	516.21	135.20
15	522.76	142.76
16	528.74	150.77
17	535.72	157.93
18	541.99	165.72
19	543.03	175.67
20	546.51	180.37

*** 2.575 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	254.86	89.67
2	258.66	88.12
3	268.46	86.11
4	275.90	79.43
5	283.30	72.71
6	553.64	80.01
7	559.08	88.40
8	566.10	95.52
9	572.98	102.78
10	580.05	109.85
11	585.00	118.54
12	587.91	128.11
13	594.79	135.36
14	600.09	143.84
15	606.94	151.12
16	613.97	158.24
17	618.81	166.99
18	625.86	174.08
19	632.87	181.21

Angelos Class III Cell 17 Expansion Cell 17_ North South Section_Eastside

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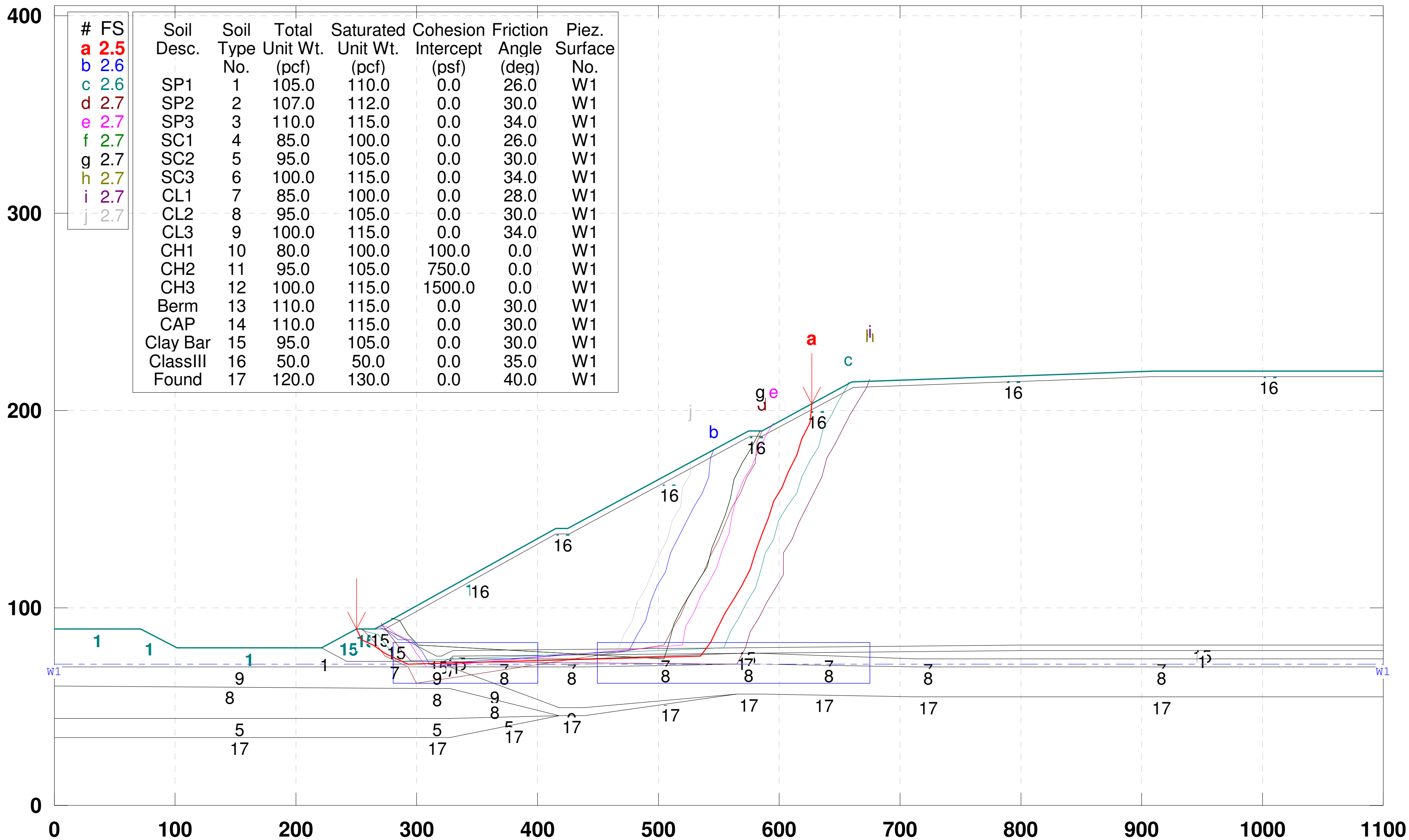

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.5

Safety Factors Are Calculated By The Modified Janbu Method

STED

ATTACHMENT E

ROTATIONAL (CIRCULAR) FAILURE

SLOPE STABILITY

**** STABL6H ****

by

Purdue University

--Slope Stability Analysis--

Simplified Janbu, Simplified Bishop

or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:30PM
Run By: Civil Design Service, Inc
Input Data Filename: C:ns_cel~1.
Output Filename: C:ns_cel~1.OUT
Plotted Output Filename: C:ns_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17_ North South Section_Westside

BOUNDARY COORDINATES
12 Top Boundaries
59 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	90.00	72.00	90.00	1
2	72.00	90.00	105.00	80.00	1
3	105.00	80.00	221.00	80.00	1
4	221.00	80.00	249.80	89.60	15
5	249.80	89.60	264.80	89.80	15
6	264.80	89.80	415.40	140.00	14
7	415.40	140.00	425.40	140.00	14
8	425.40	140.00	575.40	190.00	14
9	575.40	190.00	585.40	190.00	14
10	585.40	190.00	660.40	215.00	14
11	660.40	215.00	910.40	220.00	14
12	910.40	220.00	1100.00	220.00	14
13	264.80	89.80	274.30	89.80	15
14	274.30	89.80	415.90	137.00	16
15	415.90	137.00	425.90	137.00	16
16	425.90	137.00	575.90	187.00	16
17	575.90	187.00	585.90	187.00	16
18	585.90	187.00	660.90	212.00	16
19	660.90	212.00	910.40	217.00	16
20	910.40	217.00	1100.00	217.00	16
21	274.30	89.80	315.70	76.00	15
22	315.70	76.00	320.70	76.00	15
23	320.70	76.00	332.70	80.00	15
24	332.70	80.00	800.00	82.00	15
25	800.00	82.00	1100.00	82.20	15
26	221.00	80.00	242.00	73.00	1
27	242.00	73.00	321.20	73.00	6
28	321.20	73.00	333.20	77.00	7
29	333.20	77.00	549.10	77.90	7
30	549.10	77.90	808.00	79.00	8
31	808.00	79.00	1100.00	79.20	8
32	242.00	73.00	266.70	64.80	1
33	321.20	73.00	398.00	64.80	6
34	.00	64.80	266.70	64.80	6
35	398.00	64.80	418.00	64.80	8
36	418.00	64.80	549.10	77.90	8
37	570.00	60.10	590.00	60.10	17
38	590.00	60.10	707.00	70.30	7
39	707.00	70.30	1100.00	70.30	7
40	.00	57.40	306.00	57.40	17
41	306.00	57.40	326.00	57.40	17
42	326.00	57.40	398.00	64.80	8
43	590.00	60.10	707.00	55.30	3
44	707.00	55.30	727.00	55.30	3
45	727.00	55.30	1100.00	55.30	3
46	590.00	60.10	707.00	50.30	9
47	707.00	50.30	727.00	50.30	9
48	727.00	50.30	1100.00	50.30	17
49	590.00	60.10	707.00	45.30	17
50	707.00	45.30	727.00	45.30	17
51	727.00	45.30	1100.00	45.30	17

52	326.00	57.40	367.60	49.80	17
53	367.60	49.80	398.00	49.80	7
54	398.00	49.80	418.00	49.80	7
55	418.00	49.80	505.10	53.60	7
56	505.10	53.60	570.00	60.10	17
57	367.60	49.80	398.00	44.80	17
58	398.00	44.80	418.00	44.80	17
59	418.00	44.80	505.10	53.60	17

ISOTROPIC SOIL PARAMETERS

17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

20000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of200 Points Equally Spaced
Along The Ground Surface Between X = 75.00 ft.
and X = 270.00 ft.

Each Surface Terminates Between X = 660.40 ft.
and X = 800.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = .00 ft.

15.00 ft. Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	266.08	90.23
2	280.82	93.00
3	295.54	95.89
4	310.23	98.91
5	324.90	102.06
6	339.54	105.33
7	354.15	108.72

8	368.73	112.24
9	383.28	115.88
10	397.80	119.65
11	412.29	123.54
12	426.74	127.56
13	441.16	131.69
14	455.54	135.96
15	469.89	140.34
16	484.19	144.84
17	498.46	149.47
18	512.69	154.22
19	526.88	159.09
20	541.02	164.08
21	555.13	169.19
22	569.18	174.42
23	583.20	179.77
24	597.16	185.24
25	611.08	190.83
26	624.96	196.54
27	638.78	202.37
28	652.55	208.31
29	666.27	214.37
30	668.00	215.15

Circle Center At X = -51.2 ; Y = 1820.1 and Radius, 1758.8

*** 2.250 ***

Failure Surface Specified By 32 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	224.93	81.31
2	239.70	83.88
3	254.46	86.58
4	269.19	89.40
5	283.90	92.34
6	298.58	95.40
7	313.24	98.58
8	327.88	101.88
9	342.48	105.30
10	357.06	108.84
11	371.60	112.50
12	386.12	116.28
13	400.60	120.18
14	415.06	124.20
15	429.47	128.34
16	443.86	132.59
17	458.21	136.96
18	472.52	141.45
19	486.79	146.06
20	501.03	150.79
21	515.23	155.63
22	529.38	160.59
23	543.50	165.66
24	557.57	170.85
25	571.60	176.16
26	585.59	181.58
27	599.53	187.11
28	613.43	192.76
29	627.27	198.52
30	641.08	204.40
31	654.83	210.39
32	665.40	215.10

Circle Center At X = -81.3 ; Y = 1881.5 and Radius, 1826.0

*** 2.253 ***

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.04	90.88
2	282.75	93.84
3	297.43	96.91
4	312.09	100.10
5	326.72	103.38

Angelos Class III Cell 17 Expansion Cell 17_ North South Section_Westside

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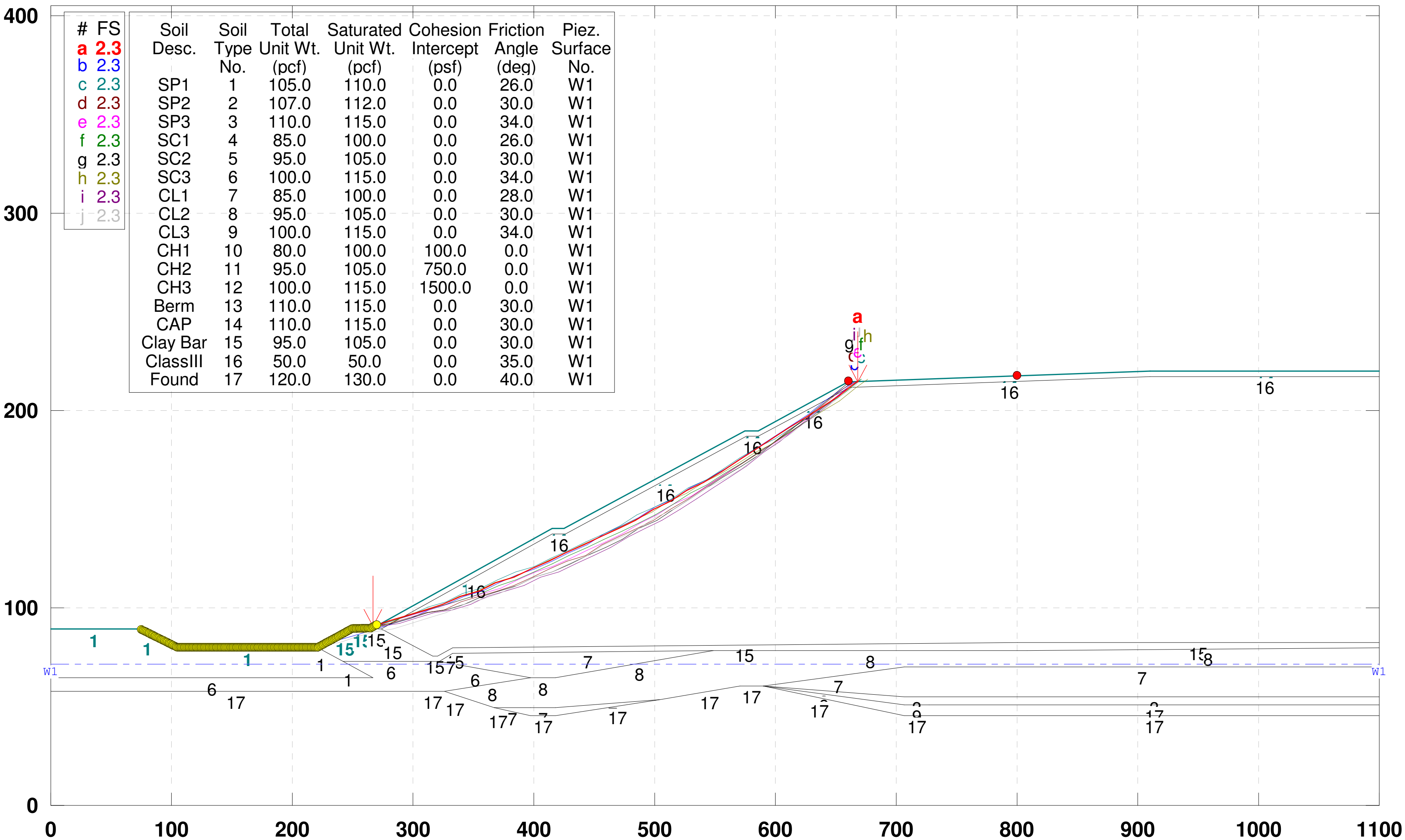


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

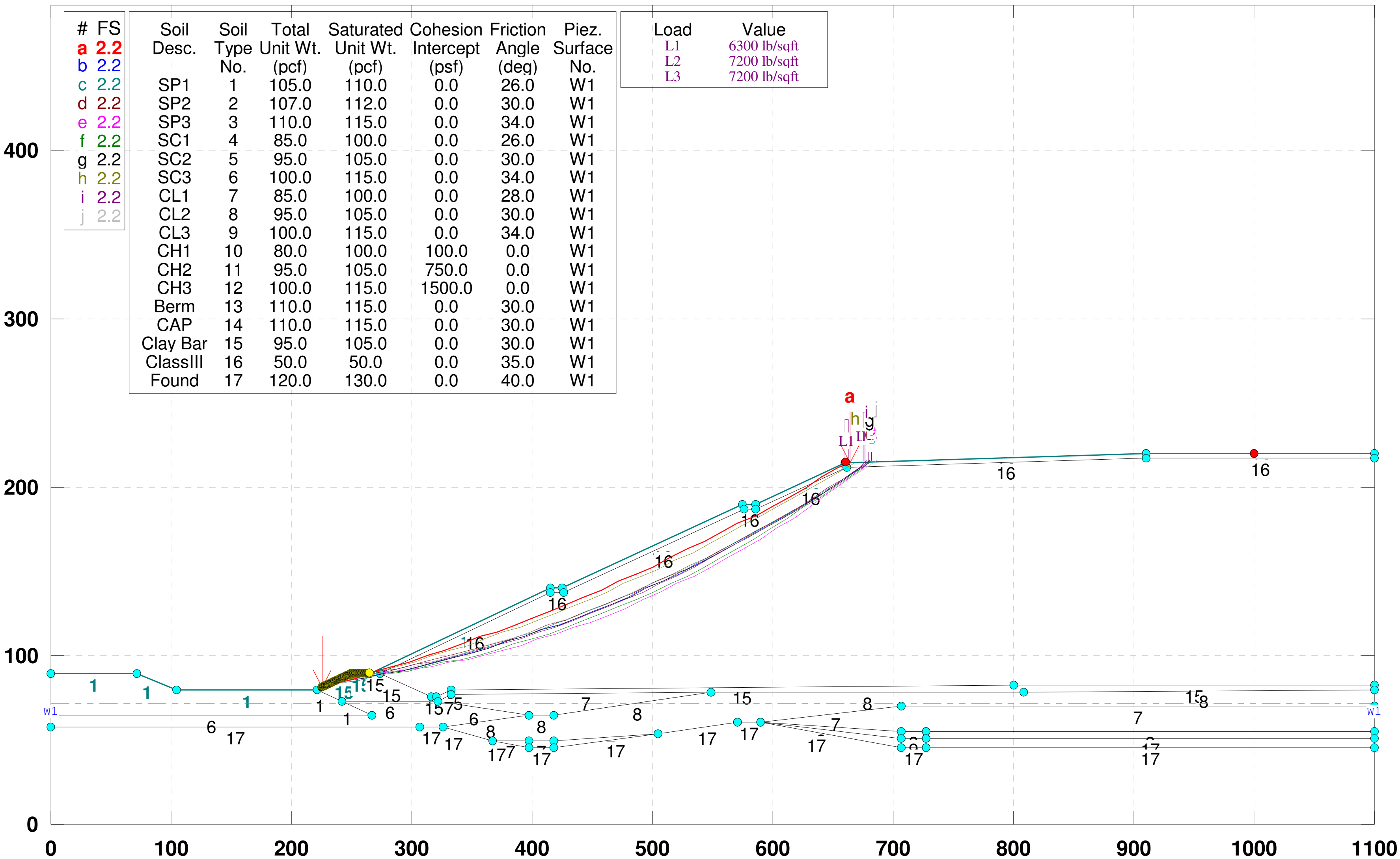
STABL6H FSmin=2.3

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Westside CAT 740B

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL17~2\NS_CEL~1.PL2 Run By: Civil Design Service, Inc 2/7/2018 11:20PM



#	FS
a	2.2
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.2
h	2.2
i	2.2
j	2.2

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

BLOCK FAILURE SLOPE STABILITY

(SUBGRADE)

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:38PM
Run By: Civil Design Service, Inc
Input Data Filename: C:ns_cel~1.
Output Filename: C:ns_cel~1.OUT
Plotted Output Filename: C:ns_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17_ North South Section_Westside

BOUNDARY COORDINATES
12 Top Boundaries
59 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	90.00	72.00	90.00	1
2	72.00	90.00	105.00	80.00	1
3	105.00	80.00	221.00	80.00	1
4	221.00	80.00	249.80	89.60	15
5	249.80	89.60	264.80	89.80	15
6	264.80	89.80	415.40	140.00	14
7	415.40	140.00	425.40	140.00	14
8	425.40	140.00	575.40	190.00	14
9	575.40	190.00	585.40	190.00	14
10	585.40	190.00	660.40	215.00	14
11	660.40	215.00	910.40	220.00	14
12	910.40	220.00	1100.00	220.00	14
13	264.80	89.80	274.30	89.80	15
14	274.30	89.80	415.90	137.00	16
15	415.90	137.00	425.90	137.00	16
16	425.90	137.00	575.90	187.00	16
17	575.90	187.00	585.90	187.00	16
18	585.90	187.00	660.90	212.00	16
19	660.90	212.00	910.40	217.00	16
20	910.40	217.00	1100.00	217.00	16
21	274.30	89.80	315.70	76.00	15
22	315.70	76.00	320.70	76.00	15
23	320.70	76.00	332.70	80.00	15
24	332.70	80.00	800.00	82.00	15
25	800.00	82.00	1100.00	82.20	15
26	221.00	80.00	242.00	73.00	1
27	242.00	73.00	321.20	73.00	6
28	321.20	73.00	333.20	77.00	7
29	333.20	77.00	549.10	77.90	7
30	549.10	77.90	808.00	79.00	8
31	808.00	79.00	1100.00	79.20	8
32	242.00	73.00	266.70	64.80	1
33	321.20	73.00	398.00	64.80	6
34	.00	64.80	266.70	64.80	6
35	398.00	64.80	418.00	64.80	8
36	418.00	64.80	549.10	77.90	8
37	570.00	60.10	590.00	60.10	17
38	590.00	60.10	707.00	70.30	7
39	707.00	70.30	1100.00	70.30	7
40	.00	57.40	306.00	57.40	17
41	306.00	57.40	326.00	57.40	17
42	326.00	57.40	398.00	64.80	8
43	590.00	60.10	707.00	55.30	3
44	707.00	55.30	727.00	55.30	3
45	727.00	55.30	1100.00	55.30	3
46	590.00	60.10	707.00	50.30	9
47	707.00	50.30	727.00	50.30	9
48	727.00	50.30	1100.00	50.30	17
49	590.00	60.10	707.00	45.30	17
50	707.00	45.30	727.00	45.30	17
51	727.00	45.30	1100.00	45.30	17

52	326.00	57.40	367.60	49.80	17
53	367.60	49.80	398.00	49.80	7
54	398.00	49.80	418.00	49.80	7
55	418.00	49.80	505.10	53.60	7
56	505.10	53.60	570.00	60.10	17
57	367.60	49.80	398.00	44.80	17
58	398.00	44.80	418.00	44.80	17
59	418.00	44.80	505.10	53.60	17

ISOTROPIC SOIL PARAMETERS

17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

200 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	280.00	72.00	400.00	72.00	20.00
2	450.00	72.00	675.00	72.00	20.00

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Janbu Method * *

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	249.78	89.59
2	254.97	84.41
3	264.20	80.54
4	273.58	77.09
5	283.08	73.98
6	292.85	71.84
7	535.51	75.00

8	542.58	82.08
9	548.70	89.98
10	555.69	97.13
11	562.02	104.88
12	569.08	111.95
13	576.09	119.09
14	580.57	128.03
15	585.23	136.88
16	590.65	145.28
17	595.38	154.09
18	602.45	161.16
19	607.65	169.71
20	614.40	177.08
21	618.69	186.12
22	625.76	193.19
23	627.16	203.09
24	627.24	203.95

*** 2.602 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	254.86	89.67
2	258.66	88.12
3	268.46	86.11
4	275.90	79.43
5	283.30	72.71
6	553.64	80.01
7	559.08	88.40
8	566.10	95.52
9	572.98	102.78
10	580.05	109.85
11	585.00	118.54
12	587.91	128.11
13	594.79	135.36
14	600.09	143.84
15	606.94	151.12
16	613.97	158.24
17	618.81	166.99
18	625.86	174.08
19	632.87	181.21
20	636.16	190.65
21	643.03	197.91
22	649.58	205.47
23	656.63	212.56
24	657.58	214.06

*** 2.603 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.07	90.89
2	275.90	87.45
3	285.31	84.07
4	295.30	83.84
5	303.90	78.74
6	311.19	71.89
7	475.86	78.87
8	482.60	86.26
9	489.23	93.75
10	493.71	102.69
11	499.45	110.88
12	506.07	118.37
13	509.54	127.75
14	516.21	135.20
15	522.76	142.76
16	528.74	150.77
17	535.72	157.93
18	541.99	165.72
19	543.03	175.67
20	546.51	180.37

*** 2.618 ***

Angelos Class III Cell 17 Expansion Cell 17_ North South Section_Westside

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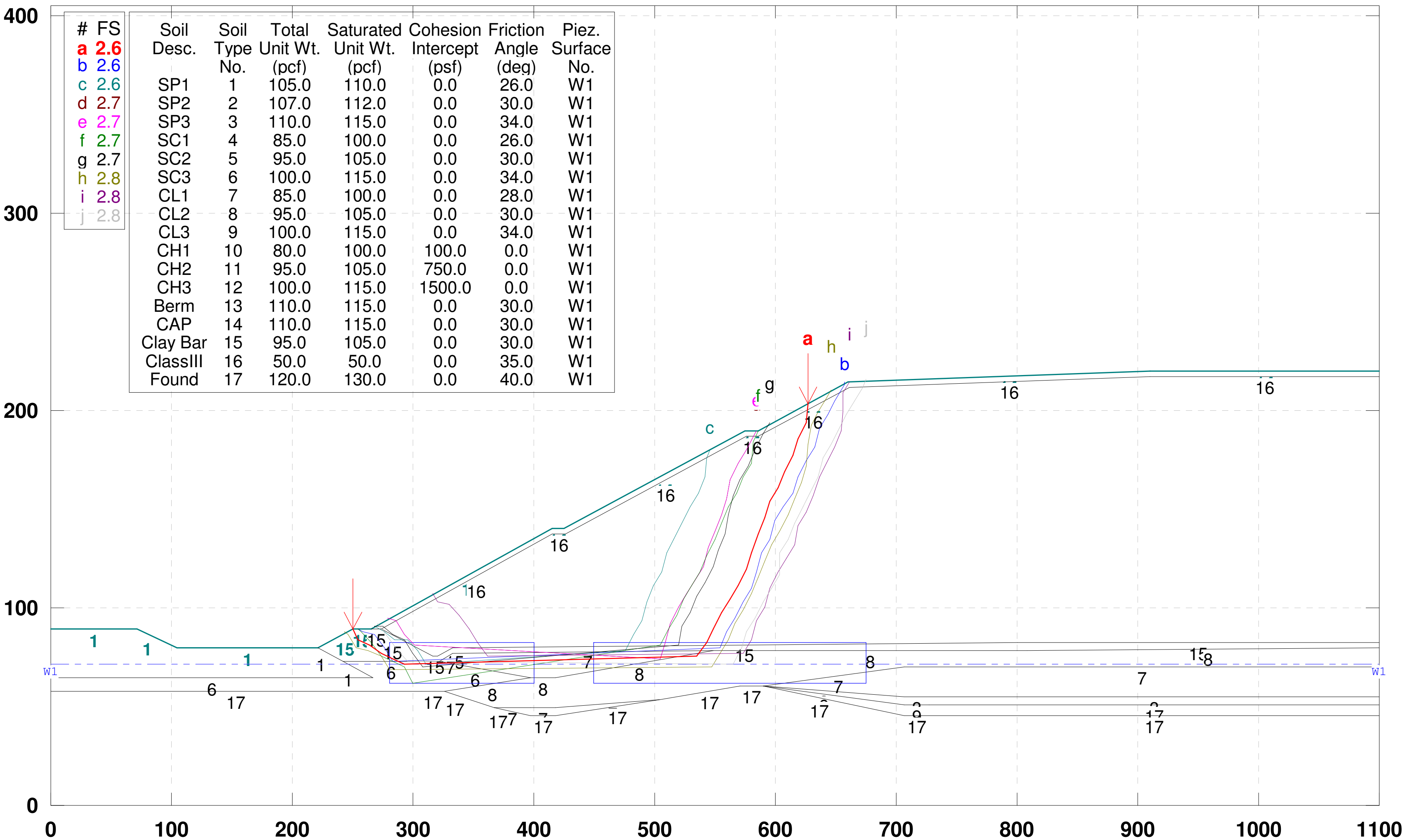


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.6

Safety Factors Are Calculated By The Modified Janbu Method

STED

ATTACHMENT F

ROTATIONAL (CIRCULAR) FAILURE

SLOPE STABILITY

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:48PM
Run By: Civil Design Service, Inc
Input Data Filename: C:we_cel~1.
Output Filename: C:we_cel~1.OUT
Plotted Output Filename: C:we_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17_ West to East Section

BOUNDARY COORDINATES
10 Top Boundaries
46 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	81.00	224.00	81.00	1
2	224.00	81.00	249.80	89.60	13
3	249.80	89.60	264.80	89.80	13
4	264.80	89.80	415.40	140.00	14
5	415.40	140.00	425.40	140.00	14
6	425.40	140.00	575.40	190.00	14
7	575.40	190.00	585.40	190.00	14
8	585.40	190.00	660.40	215.00	14
9	660.40	215.00	910.20	220.00	14
10	910.20	220.00	1100.00	220.00	14
11	264.80	89.80	274.30	89.80	13
12	274.30	89.80	415.90	137.00	16
13	415.90	137.00	425.90	137.00	16
14	425.90	137.00	575.90	187.00	16
15	575.90	187.00	585.90	187.00	16
16	585.90	187.00	660.90	212.00	16
17	660.90	212.00	910.40	217.00	16
18	910.40	217.00	1100.00	217.00	16
19	274.30	89.80	300.70	81.00	13
20	224.00	81.00	300.70	81.00	15
21	300.70	81.00	1100.00	81.00	15
22	224.00	81.00	225.00	78.00	1
23	225.00	78.00	1100.00	78.00	7
24	225.00	78.00	226.00	74.90	1
25	.00	74.90	226.00	74.90	8
26	226.00	74.90	499.80	74.90	8
27	499.80	74.90	519.80	74.90	8
28	519.80	74.90	822.80	70.10	8
29	822.80	70.10	842.80	70.10	8
30	.00	54.90	499.80	54.90	6
31	499.80	54.90	519.80	54.90	6
32	822.80	65.10	842.80	65.10	6
33	842.80	65.10	1100.00	65.10	6
34	519.80	54.90	822.80	60.10	6
35	822.80	60.10	1100.00	60.10	6
36	.00	44.90	499.80	44.90	2
37	499.80	44.90	519.80	44.90	2
38	519.80	44.90	822.80	56.60	2
39	822.80	56.60	842.80	56.60	6
40	842.80	56.60	1100.00	56.60	6
41	.00	39.90	499.80	39.90	3
42	499.80	39.90	519.80	39.90	3
43	519.80	39.90	822.80	56.60	3
44	.00	29.90	499.80	29.90	3
45	499.80	29.90	519.80	29.90	3
46	519.80	29.90	822.80	56.60	3

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.

1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.
SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
10000 Trial Surfaces Have Been Generated.
100 Surfaces Initiate From Each Of100 Points Equally Spaced
Along The Ground Surface Between X = 75.00 ft.
and X = 264.80 ft.
Each Surface Terminates Between   X = 660.40 ft.
and   X =1000.00 ft.
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y =   .00 ft.
10.00 ft. Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	264.80	89.80
2	274.60	91.78
3	284.40	93.80
4	294.18	95.87
5	303.95	97.98
6	313.72	100.15
7	323.47	102.36
8	333.21	104.61
9	342.94	106.92
10	352.66	109.27
11	362.37	111.67
12	372.07	114.11
13	381.75	116.60
14	391.43	119.14
15	401.09	121.72
16	410.73	124.35
17	420.37	127.03
18	429.99	129.75
19	439.60	132.52
20	449.19	135.34

21	458.78	138.20
22	468.34	141.11
23	477.90	144.06
24	487.44	147.06
25	496.96	150.11
26	506.47	153.20
27	515.97	156.34
28	525.45	159.52
29	534.91	162.75
30	544.36	166.02
31	553.79	169.34
32	563.21	172.71
33	572.61	176.12
34	582.00	179.57
35	591.36	183.07
36	600.71	186.62
37	610.05	190.21
38	619.36	193.84
39	628.66	197.52
40	637.94	201.25
41	647.20	205.01
42	656.45	208.83
43	665.67	212.69
44	671.67	215.23

Circle Center At X = -140.8 ; Y = 2128.3 and Radius, 2078.5

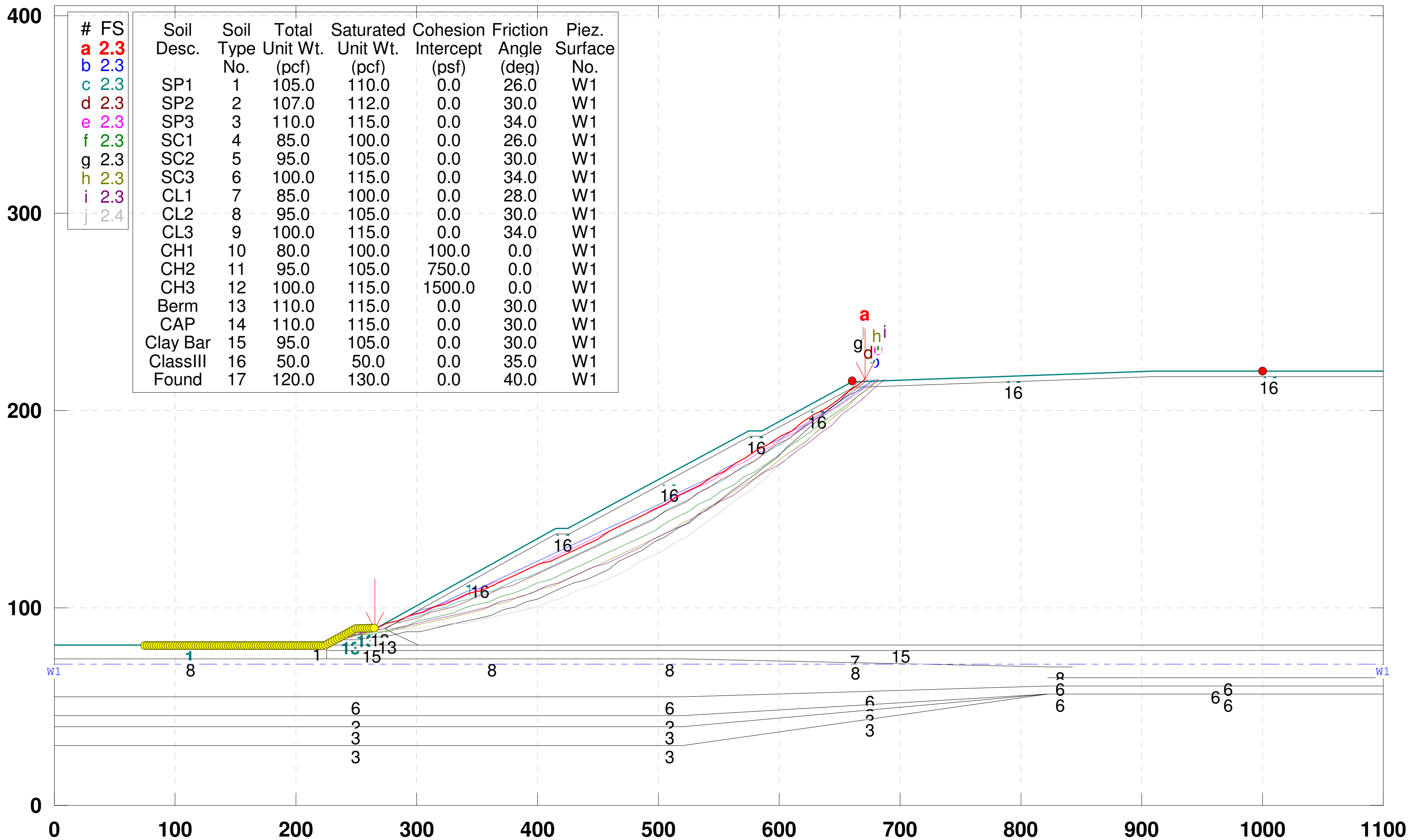
*** 2.255 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	264.80	89.80
2	274.56	91.97
3	284.32	94.17
4	294.06	96.41
5	303.80	98.68
6	313.53	100.99
7	323.25	103.33
8	332.97	105.71
9	342.67	108.12
10	352.37	110.57
11	362.06	113.05
12	371.73	115.56
13	381.40	118.11
14	391.06	120.70
15	400.71	123.32
16	410.35	125.98
17	419.99	128.67
18	429.61	131.39
19	439.22	134.15
20	448.82	136.94
21	458.41	139.77
22	468.00	142.63
23	477.57	145.53
24	487.13	148.46
25	496.68	151.42
26	506.22	154.42
27	515.75	157.45
28	525.26	160.52
29	534.77	163.62
30	544.27	166.76
31	553.75	169.93
32	563.22	173.13
33	572.69	176.37
34	582.14	179.64
35	591.57	182.95
36	601.00	186.29
37	610.41	189.66
38	619.82	193.07
39	629.20	196.51
40	638.58	199.98
41	647.95	203.49

Angelos Class III Cell 17 Expansion Cell 17_ West to East Section

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL17~3\WE_CEL~1.PL2 Run By: Civil Design Service, Inc 2/7/2018 6:48PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

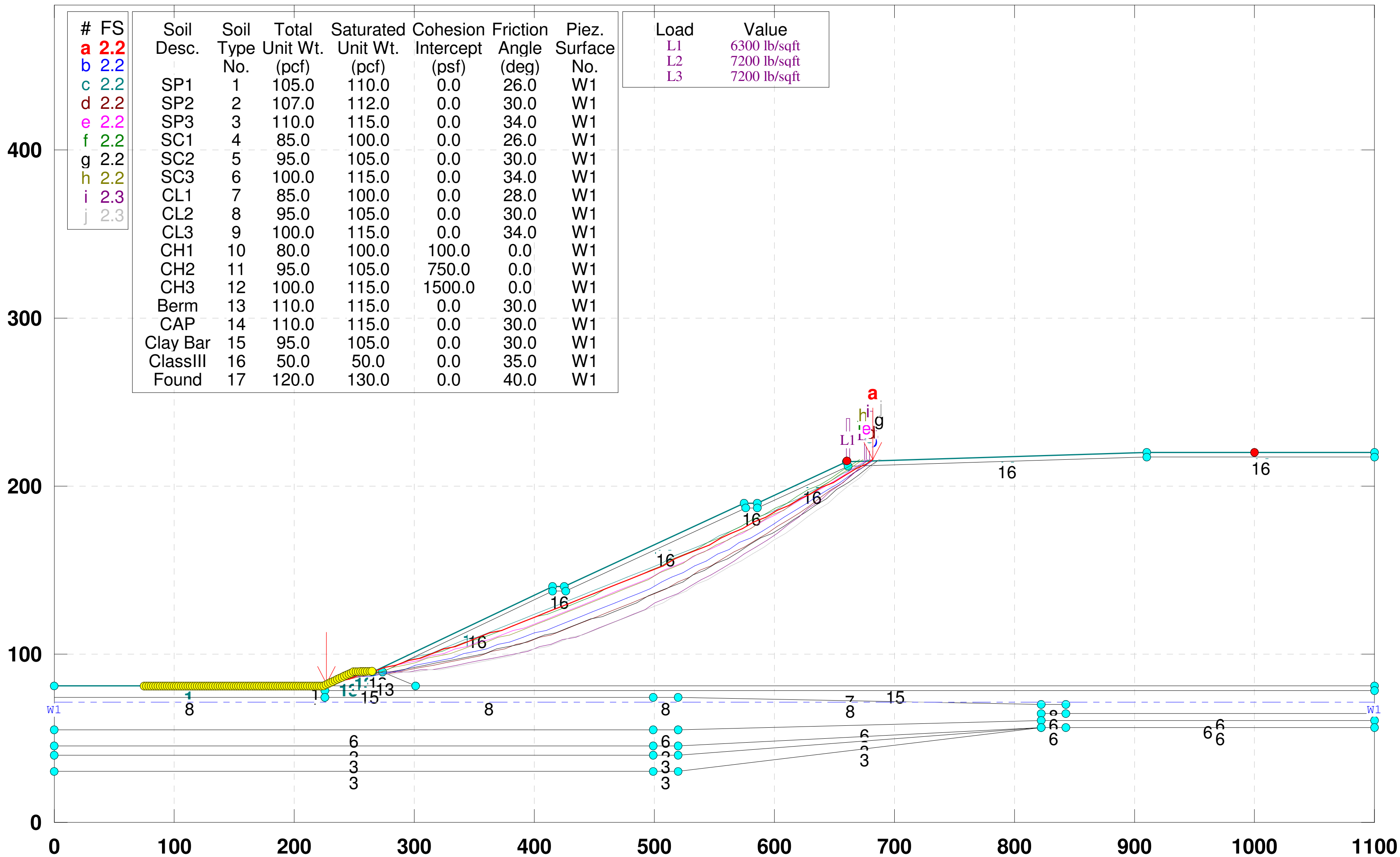
STABL6H FSmin=2.3

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 17_ West to East - CAT 740B

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL17~3\WE_CEL~1.PL2 Run By: Civil Design Service, Inc 2/7/2018 11:24PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

BLOCK FAILURE SLOPE STABILITY

(SUBGRADE)

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:45PM
Run By: Civil Design Service, Inc
Input Data Filename: C:we_cel~1.
Output Filename: C:we_cel~1.OUT
Plotted Output Filename: C:we_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17_ West to East Section

BOUNDARY COORDINATES
10 Top Boundaries
46 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	81.00	224.00	81.00	1
2	224.00	81.00	249.80	89.60	13
3	249.80	89.60	264.80	89.80	13
4	264.80	89.80	415.40	140.00	14
5	415.40	140.00	425.40	140.00	14
6	425.40	140.00	575.40	190.00	14
7	575.40	190.00	585.40	190.00	14
8	585.40	190.00	660.40	215.00	14
9	660.40	215.00	910.20	220.00	14
10	910.20	220.00	1100.00	220.00	14
11	264.80	89.80	274.30	89.80	13
12	274.30	89.80	415.90	137.00	16
13	415.90	137.00	425.90	137.00	16
14	425.90	137.00	575.90	187.00	16
15	575.90	187.00	585.90	187.00	16
16	585.90	187.00	660.90	212.00	16
17	660.90	212.00	910.40	217.00	16
18	910.40	217.00	1100.00	217.00	16
19	274.30	89.80	300.70	81.00	13
20	224.00	81.00	300.70	81.00	15
21	300.70	81.00	1100.00	81.00	15
22	224.00	81.00	225.00	78.00	1
23	225.00	78.00	1100.00	78.00	7
24	225.00	78.00	226.00	74.90	1
25	.00	74.90	226.00	74.90	8
26	226.00	74.90	499.80	74.90	8
27	499.80	74.90	519.80	74.90	8
28	519.80	74.90	822.80	70.10	8
29	822.80	70.10	842.80	70.10	8
30	.00	54.90	499.80	54.90	6
31	499.80	54.90	519.80	54.90	6
32	822.80	65.10	842.80	65.10	6
33	842.80	65.10	1100.00	65.10	6
34	519.80	54.90	822.80	60.10	6
35	822.80	60.10	1100.00	60.10	6
36	.00	44.90	499.80	44.90	2
37	499.80	44.90	519.80	44.90	2
38	519.80	44.90	822.80	56.60	2
39	822.80	56.60	842.80	56.60	6
40	842.80	56.60	1100.00	56.60	6
41	.00	39.90	499.80	39.90	3
42	499.80	39.90	519.80	39.90	3
43	519.80	39.90	822.80	56.60	3
44	.00	29.90	499.80	29.90	3
45	499.80	29.90	519.80	29.90	3
46	519.80	29.90	822.80	56.60	3

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.

1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.
SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Sliding Block Surfaces, Has Been
Specified.
400 Trial Surfaces Have Been Generated.
2 Boxes Specified For Generation Of Central Block Base
Length Of Line Segments For Active And Passive Portions Of
Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	280.00	72.00	400.00	72.00	20.00
2	450.00	72.00	675.00	72.00	20.00

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.
* * Safety Factors Are Calculated By The Modified Janbu Method * *
Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	254.86	89.67
2	258.66	88.12
3	268.46	86.11
4	275.90	79.43
5	283.30	72.71
6	553.64	80.01
7	559.08	88.40
8	566.10	95.52
9	572.98	102.78
10	580.05	109.85
11	585.00	118.54
12	587.91	128.11
13	594.79	135.36
14	600.09	143.84
15	606.94	151.12
16	613.97	158.24
17	618.81	166.99
18	625.86	174.08
19	632.87	181.21
20	636.16	190.65

21	643.03	197.91
22	649.58	205.47
23	656.63	212.56
24	657.58	214.06

*** 2.628 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	254.86	89.67
2	258.66	88.12
3	268.46	86.11
4	275.90	79.43
5	283.30	72.71
6	553.64	80.01
7	559.08	88.40
8	566.10	95.52
9	572.98	102.78
10	580.05	109.85
11	585.00	118.54
12	587.91	128.11
13	594.79	135.36
14	600.09	143.84
15	606.94	151.12
16	613.97	158.24
17	618.81	166.99
18	625.86	174.08
19	632.87	181.21
20	636.16	190.65
21	643.03	197.91
22	649.58	205.47
23	656.63	212.56
24	657.58	214.06

*** 2.628 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.07	90.89
2	275.90	87.45
3	285.31	84.07
4	295.30	83.84
5	303.90	78.74
6	311.19	71.89
7	475.86	78.87
8	482.60	86.26
9	489.23	93.75
10	493.71	102.69
11	499.45	110.88
12	506.07	118.37
13	509.54	127.75
14	516.21	135.20
15	522.76	142.76
16	528.74	150.77
17	535.72	157.93
18	541.99	165.72
19	543.03	175.67
20	546.51	180.37

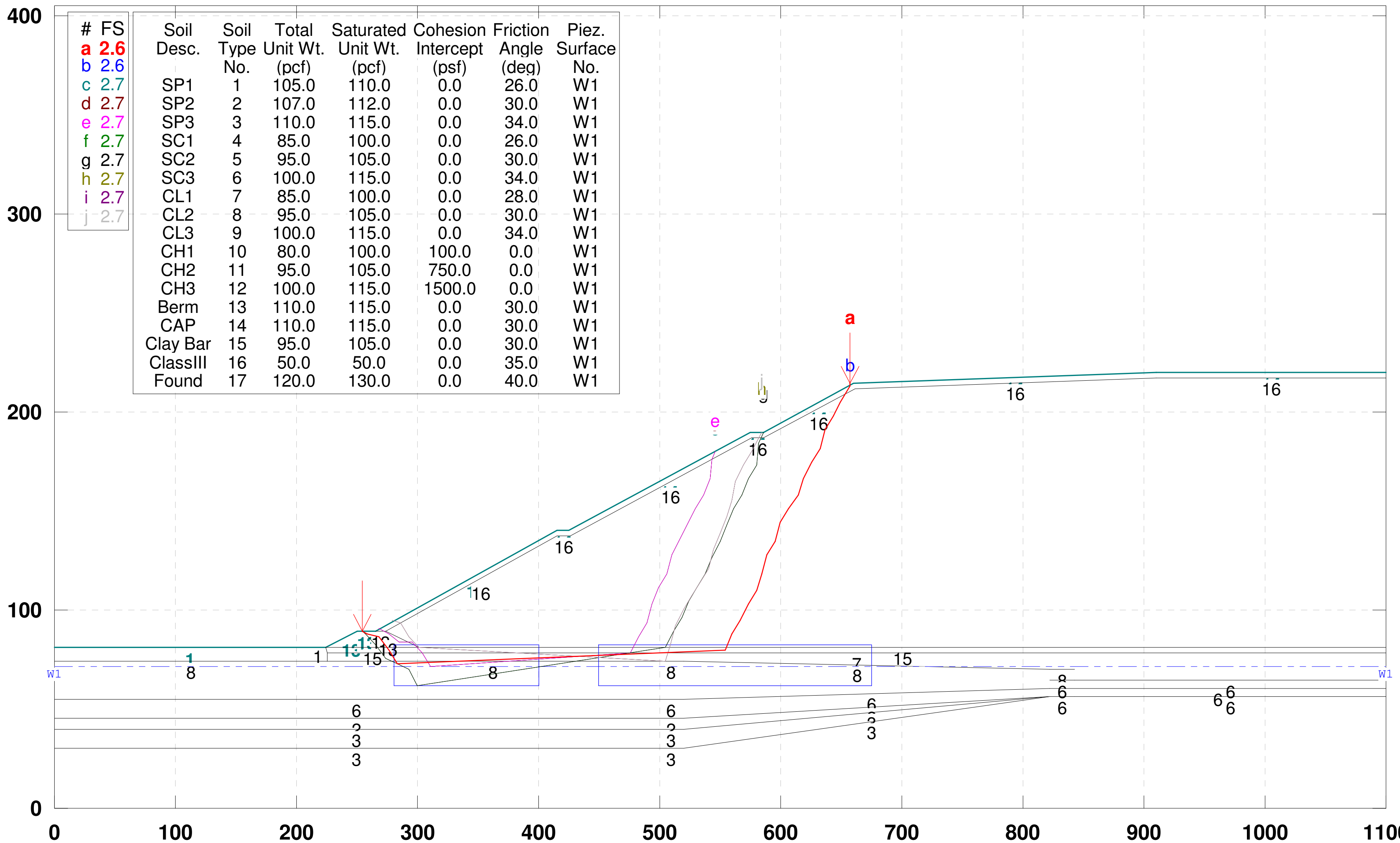
*** 2.650 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.07	90.89
2	275.90	87.45
3	285.31	84.07
4	295.30	83.84
5	303.90	78.74
6	311.19	71.89
7	475.86	78.87
8	482.60	86.26
9	489.23	93.75
10	493.71	102.69

Angelos Class III Cell 17 Expansion Cell 17_ West to East Section

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL17~3\WE_CEL~1.PL2 Run By: Civil Design Service, Inc 2/7/2018 6:45PM



#	FS
a	2.6
b	2.6
c	2.7
d	2.7
e	2.7
f	2.7
g	2.7
h	2.7
i	2.7
j	2.7

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.6

Safety Factors Are Calculated By The Modified Janbu Method

STED

ATTACHMENT G

ROTATIONAL (CIRCULAR) FAILURE

SLOPE STABILITY

**** STABL6H ****

by

Purdue University

--Slope Stability Analysis--

Simplified Janbu, Simplified Bishop

or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 7:03PM
Run By: Civil Design Service, Inc
Input Data Filename: C:cell_1.
Output Filename: C:cell_1.OUT
Plotted Output Filename: C:cell_1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 1

BOUNDARY COORDINATES
13 Top Boundaries
51 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	95.00	137.40	95.00	5
2	137.40	95.00	185.40	83.00	5
3	185.40	83.00	205.40	83.00	5
4	205.40	83.00	245.00	92.90	5
5	245.00	92.90	310.40	109.80	9
6	310.40	109.80	325.40	110.00	9
7	325.40	110.00	415.40	140.00	14
8	415.40	140.00	425.40	140.00	14
9	425.40	140.00	575.40	190.00	14
10	575.40	190.00	585.40	190.00	14
11	585.40	190.00	660.40	215.00	14
12	660.40	215.00	910.30	220.00	14
13	910.30	220.00	1200.00	220.00	14
14	325.40	110.00	329.20	108.10	1
15	329.20	108.10	415.90	137.00	16
16	415.90	137.00	425.90	137.00	16
17	425.90	137.00	575.90	187.00	16
18	575.90	187.00	585.90	187.00	16
19	585.90	187.00	660.90	212.00	16
20	660.90	212.00	910.40	217.00	16
21	910.40	217.00	1200.00	217.00	16
22	329.20	108.10	359.60	92.90	1
23	245.00	92.90	359.60	92.90	6
24	359.60	92.90	379.40	83.00	6
25	379.40	83.00	1200.00	82.00	15
26	379.40	83.00	380.40	80.00	6
27	.00	75.90	263.90	75.90	5
28	263.90	75.90	283.90	75.90	5
29	283.90	75.90	380.40	80.00	5
30	380.40	80.00	1200.00	79.00	2
31	.00	70.90	263.40	70.90	11
32	263.40	70.90	283.40	70.90	11
33	283.40	70.90	451.40	73.50	11
34	451.40	73.50	471.40	73.50	3
35	471.40	73.50	850.40	73.50	3
36	850.40	73.50	870.40	73.50	11
37	870.40	73.50	1200.00	73.50	11
38	283.40	60.90	451.40	73.50	3
39	.00	60.90	263.40	60.90	2
40	263.40	60.90	283.40	60.90	2
41	283.40	60.90	451.40	53.50	2
42	451.40	53.50	471.40	53.50	2
43	471.40	53.50	850.40	73.50	11
44	471.40	53.50	850.40	68.30	3
45	850.40	68.30	870.40	68.30	3
46	870.40	68.30	1200.00	68.30	5
47	.00	50.90	263.40	50.90	6
48	263.40	50.90	283.40	50.90	6
49	283.40	50.90	451.40	8.50	6
50	451.40	8.50	471.40	8.50	6
51	471.40	8.50	850.40	68.30	5

ISOTROPIC SOIL PARAMETERS

17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of100 Points Equally Spaced
Along The Ground Surface Between X = 200.00 ft.
and X = 245.00 ft.

Each Surface Terminates Between X = 660.40 ft.
and X =1000.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = .00 ft.

15.00 ft. Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 36 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	208.64	83.81
2	223.13	79.96
3	237.75	76.57
4	252.46	73.66
5	267.26	71.22
6	282.13	69.26
7	297.06	67.78
8	312.03	66.78
9	327.02	66.26
10	342.02	66.23
11	357.01	66.67
12	371.98	67.60
13	386.92	69.01
14	401.80	70.91
15	416.61	73.27

16	431.34	76.12
17	445.96	79.43
18	460.48	83.22
19	474.86	87.47
20	489.10	92.18
21	503.19	97.35
22	517.09	102.97
23	530.81	109.03
24	544.33	115.53
25	557.64	122.46
26	570.71	129.82
27	583.54	137.59
28	596.11	145.78
29	608.41	154.36
30	620.43	163.33
31	632.15	172.69
32	643.57	182.42
33	654.67	192.51
34	665.44	202.95
35	675.86	213.73
36	677.32	215.34

Circle Center At X = 335.6 ; Y = 532.3 and Radius, 466.1

*** 2.215 ***

Failure Surface Specified By 35 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	210.91	84.38
2	225.37	80.39
3	239.96	76.89
4	254.65	73.88
5	269.44	71.36
6	284.30	69.33
7	299.22	67.80
8	314.19	66.77
9	329.18	66.25
10	344.18	66.22
11	359.17	66.70
12	374.14	67.67
13	389.06	69.15
14	403.93	71.12
15	418.73	73.59
16	433.43	76.55
17	448.03	80.00
18	462.51	83.93
19	476.84	88.35
20	491.02	93.24
21	505.03	98.61
22	518.85	104.44
23	532.47	110.73
24	545.87	117.47
25	559.04	124.65
26	571.96	132.27
27	584.62	140.32
28	597.00	148.78
29	609.09	157.65
30	620.88	166.93
31	632.36	176.59
32	643.50	186.63
33	654.31	197.03
34	664.76	207.80
35	671.50	215.22

Circle Center At X = 337.5 ; Y = 515.1 and Radius, 449.0

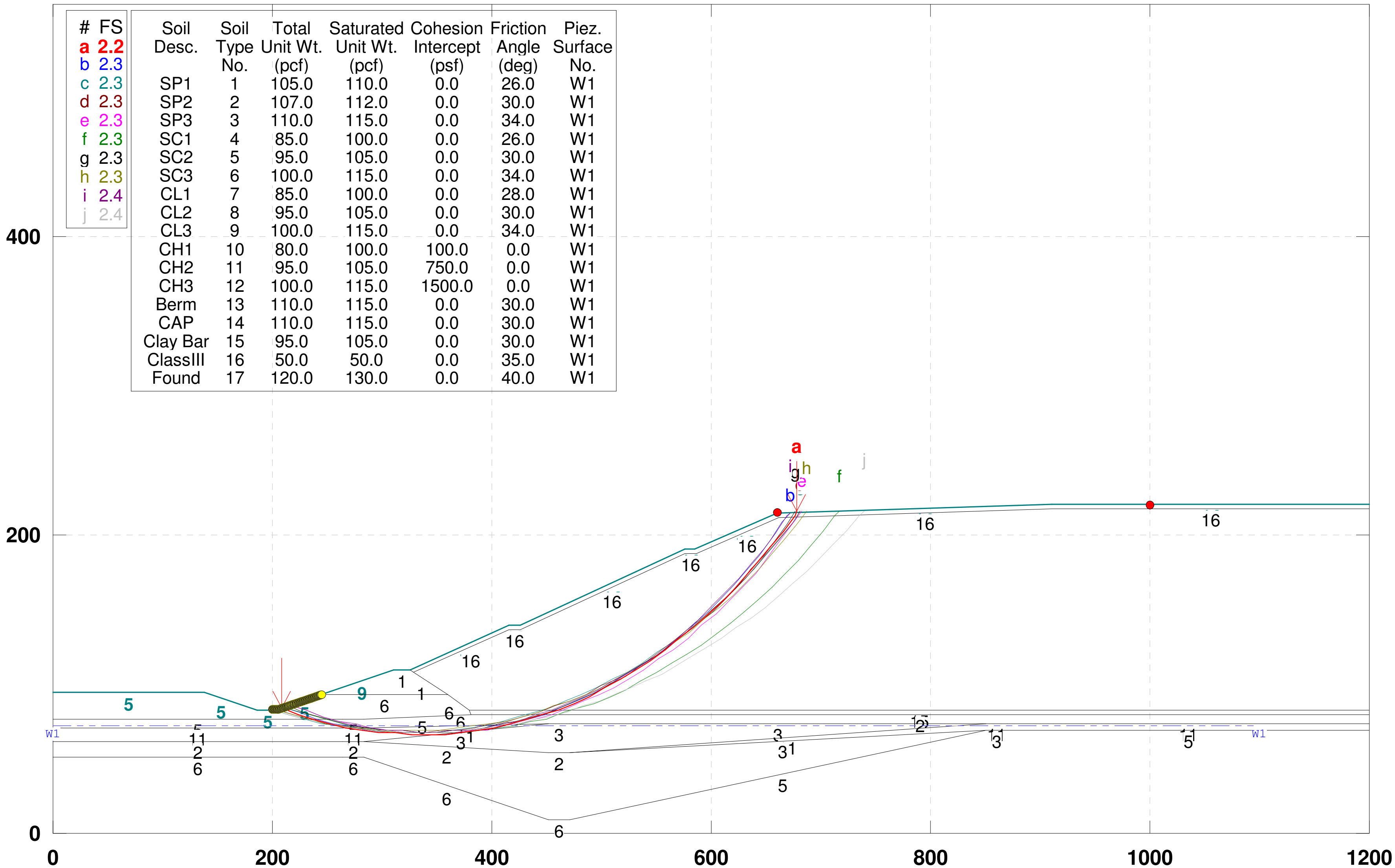
*** 2.255 ***

Failure Surface Specified By 36 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	200.46	83.00
2	215.05	79.53
3	229.74	76.50
4	244.51	73.91

Angelos Class III Cell 17 Expansion Cell 1

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL1~1\CELL_1.PL2 Run By: Civil Design Service, Inc 2/7/2018 7:03PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

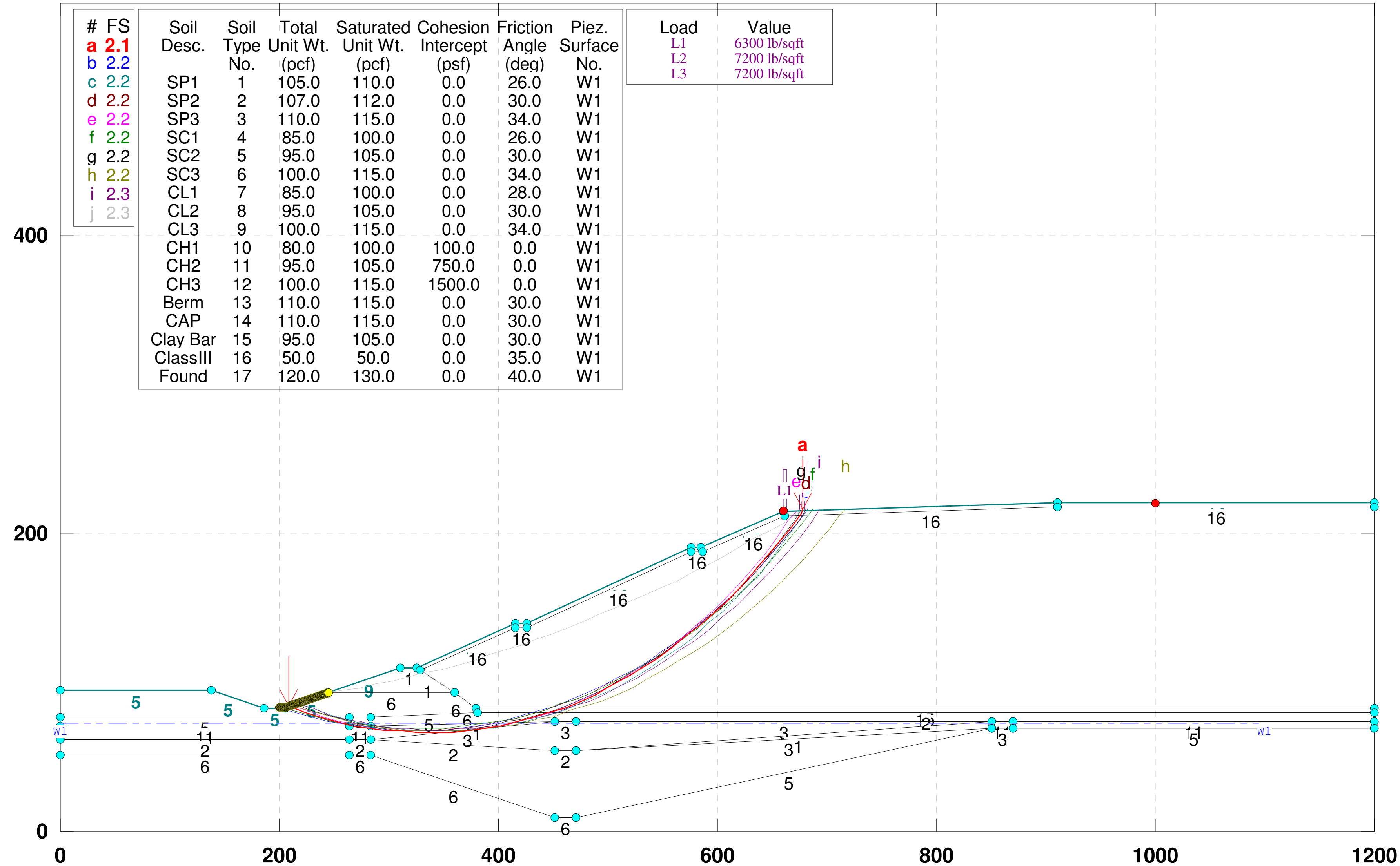
STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 1 - CAT 740B Off-Road Dump Truck

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL1~1\CELL_1.PL2 Run By: Civil Design Service, Inc 2/7/2018 11:06PM



#	FS
a	2.1
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.2
h	2.2
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft

STABL6H FSmin=2.1

Safety Factors Are Calculated By The Modified Bishop Method

STED

BLOCK FAILURE SLOPE STABILITY

(SUBGRADE)

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 6:56PM
Run By: Civil Design Service, Inc
Input Data Filename: C:cell_1.
Output Filename: C:cell_1.OUT
Plotted Output Filename: C:cell_1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 1

BOUNDARY COORDINATES
13 Top Boundaries
51 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	95.00	137.40	95.00	5
2	137.40	95.00	185.40	83.00	5
3	185.40	83.00	205.40	83.00	5
4	205.40	83.00	245.00	92.90	5
5	245.00	92.90	310.40	109.80	9
6	310.40	109.80	325.40	110.00	9
7	325.40	110.00	415.40	140.00	14
8	415.40	140.00	425.40	140.00	14
9	425.40	140.00	575.40	190.00	14
10	575.40	190.00	585.40	190.00	14
11	585.40	190.00	660.40	215.00	14
12	660.40	215.00	910.30	220.00	14
13	910.30	220.00	1200.00	220.00	14
14	325.40	110.00	329.20	108.10	1
15	329.20	108.10	415.90	137.00	16
16	415.90	137.00	425.90	137.00	16
17	425.90	137.00	575.90	187.00	16
18	575.90	187.00	585.90	187.00	16
19	585.90	187.00	660.90	212.00	16
20	660.90	212.00	910.40	217.00	16
21	910.40	217.00	1200.00	217.00	16
22	329.20	108.10	359.60	92.90	1
23	245.00	92.90	359.60	92.90	6
24	359.60	92.90	379.40	83.00	6
25	379.40	83.00	1200.00	82.00	15
26	379.40	83.00	380.40	80.00	6
27	.00	75.90	263.90	75.90	5
28	263.90	75.90	283.90	75.90	5
29	283.90	75.90	380.40	80.00	5
30	380.40	80.00	1200.00	79.00	2
31	.00	70.90	263.40	70.90	11
32	263.40	70.90	283.40	70.90	11
33	283.40	70.90	451.40	73.50	11
34	451.40	73.50	471.40	73.50	3
35	471.40	73.50	850.40	73.50	3
36	850.40	73.50	870.40	73.50	11
37	870.40	73.50	1200.00	73.50	11
38	283.40	60.90	451.40	73.50	3
39	.00	60.90	263.40	60.90	2
40	263.40	60.90	283.40	60.90	2
41	283.40	60.90	451.40	53.50	2
42	451.40	53.50	471.40	53.50	2
43	471.40	53.50	850.40	73.50	11
44	471.40	53.50	850.40	68.30	3
45	850.40	68.30	870.40	68.30	3
46	870.40	68.30	1200.00	68.30	5
47	.00	50.90	263.40	50.90	6
48	263.40	50.90	283.40	50.90	6
49	283.40	50.90	451.40	8.50	6
50	451.40	8.50	471.40	8.50	6
51	471.40	8.50	850.40	68.30	5

ISOTROPIC SOIL PARAMETERS

17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	250.00	70.00	325.00	70.00	30.00
2	350.00	70.00	650.00	70.00	30.00

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Janbu Method * *

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	221.23	86.96
2	222.20	86.75
3	231.52	83.12
4	239.28	76.82
5	248.35	72.61
6	256.79	67.23
7	264.19	60.51
8	498.00	77.42
9	504.97	84.60
10	511.37	92.28
11	517.61	100.10
12	518.88	110.02
13	523.19	119.05
14	529.19	127.04
15	529.94	137.01

16	535.74	145.16
17	536.15	155.15
18	542.42	162.94
19	549.28	170.22
20	556.02	177.61
21	557.57	184.06

*** 2.374 ***

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	229.57	89.04
2	231.00	87.61
3	240.78	85.53
4	250.03	81.73
5	257.19	74.75
6	266.36	70.75
7	275.70	67.19
8	525.91	77.37
9	529.03	86.87
10	533.89	95.62
11	539.66	103.78
12	546.61	110.97
13	553.23	118.46
14	560.17	125.66
15	566.70	133.24
16	569.19	142.92
17	575.34	150.81
18	582.32	157.97
19	589.29	165.15
20	592.12	174.73
21	594.01	184.55
22	600.62	192.06
23	602.13	195.58

*** 2.533 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	234.58	90.29
2	235.11	90.05
3	243.32	84.35
4	251.76	78.99
5	261.42	76.38
6	268.56	69.38
7	277.68	65.29
8	493.98	76.17
9	501.05	83.24
10	508.11	90.32
11	513.63	98.66
12	516.54	108.23
13	519.18	117.87
14	520.07	127.83
15	525.48	136.24
16	532.33	143.53
17	532.71	153.52
18	539.77	160.60
19	546.43	168.06
20	550.77	177.07
21	556.90	183.83

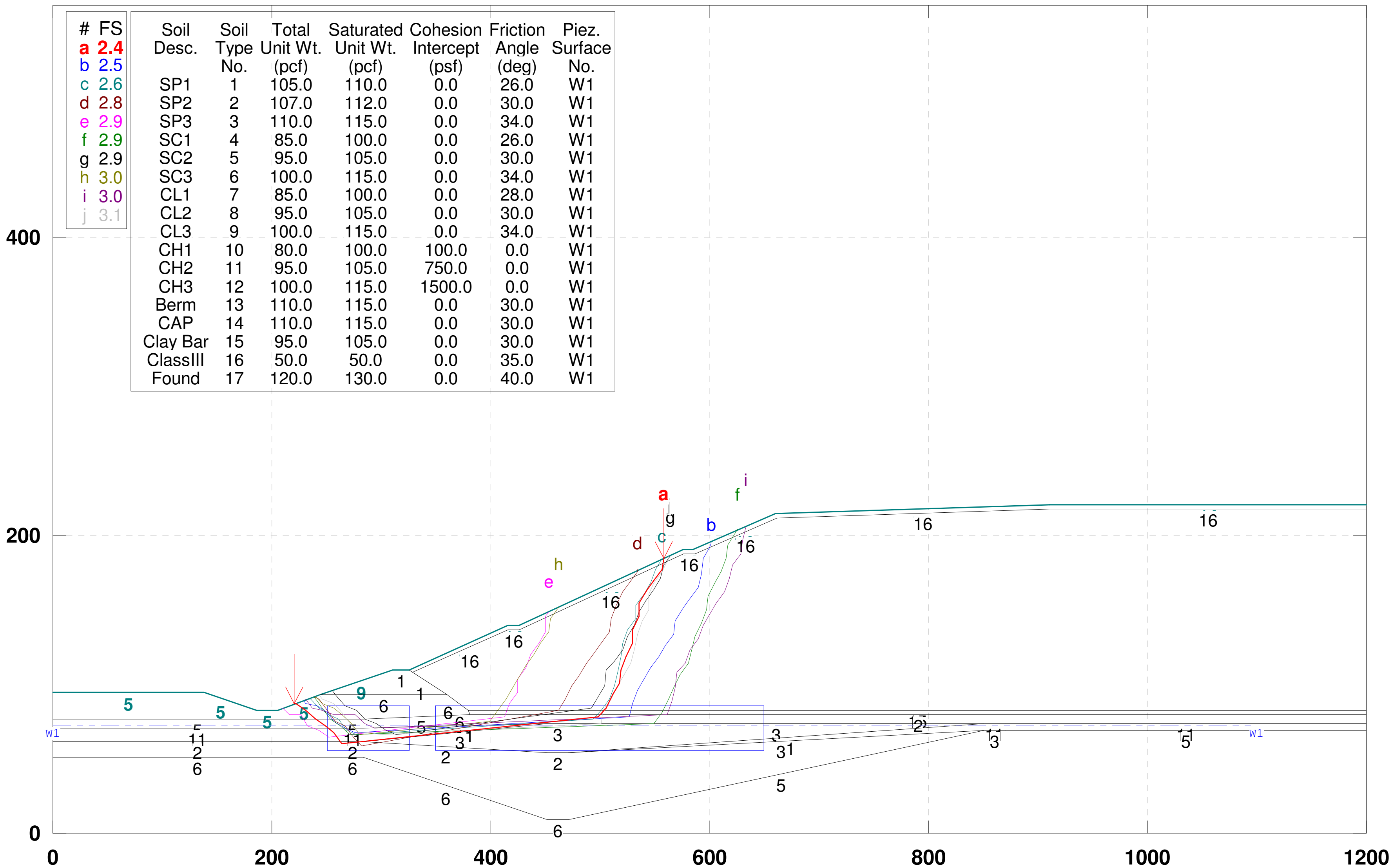
*** 2.577 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	239.12	91.43
2	243.33	89.45
3	250.41	82.39
4	257.55	75.38
5	266.81	71.63
6	274.07	64.75
7	282.11	58.80
8	461.31	82.93

Angelos Class III Cell 17 Expansion Cell 1

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL1~1\CELL_1.PL2 Run By: Civil Design Service, Inc 2/7/2018 6:56PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.4

Safety Factors Are Calculated By The Modified Janbu Method

STED

ATTACHMENT H

ROTATIONAL (CIRCULAR) FAILURE

SLOPE STABILITY

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 8:00PM
Run By: Civil Design Service, Inc
Input Data Filename: C:cell_2.
Output Filename: C:cell_2.OUT
Plotted Output Filename: C:cell_2.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 2

BOUNDARY COORDINATES
13 Top Boundaries
41 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	104.00	182.40	104.00	9
2	182.40	104.00	214.40	96.00	9
3	214.40	96.00	216.40	96.00	9
4	216.40	96.00	252.40	105.00	9
5	252.40	105.00	310.40	109.80	9
6	310.40	109.80	325.40	110.00	9
7	325.40	110.00	415.40	140.00	14
8	415.40	140.00	425.40	140.00	14
9	425.40	140.00	575.40	190.00	14
10	575.40	190.00	585.40	190.00	14
11	585.40	190.00	664.00	215.00	14
12	664.00	215.00	910.30	220.00	14
13	910.30	220.00	1200.00	220.00	14
14	325.40	110.00	329.20	108.10	9
15	329.20	108.10	415.90	137.00	9
16	415.90	137.00	425.90	137.00	9
17	425.90	137.00	575.90	187.00	9
18	575.90	187.00	585.90	187.00	9
19	585.90	187.00	660.90	212.00	9
20	660.90	212.00	910.40	217.00	9
21	910.40	217.00	1200.00	217.00	9
22	329.20	108.10	367.20	89.10	9
23	.00	89.10	221.40	89.10	5
24	221.40	89.10	241.40	89.10	5
25	241.40	89.10	367.20	89.10	5
26	367.20	89.10	377.40	84.00	5
27	377.40	84.00	1200.00	84.00	15
28	377.40	84.00	387.40	83.00	5
29	387.40	81.00	570.40	80.80	5
30	570.40	80.80	1200.00	80.00	6
31	570.40	76.00	590.40	76.00	2
32	590.40	76.00	1200.00	74.00	2
33	.00	74.20	221.40	74.20	2
34	221.40	74.20	241.40	74.20	2
35	241.40	74.20	570.40	80.80	3
36	.00	56.10	221.40	56.10	3
37	221.40	56.10	241.40	56.10	3
38	241.40	56.10	570.40	80.80	3
39	.00	26.10	221.40	26.10	2
40	221.40	26.10	241.40	26.10	2
41	241.40	26.10	570.40	76.00	2

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1

6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.
SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
10000 Trial Surfaces Have Been Generated.
100 Surfaces Initiate From Each Of100 Points Equally Spaced
Along The Ground Surface Between X = 159.00 ft.
and X = 325.40 ft.
Each Surface Terminates Between X = 660.00 ft.
and X =1000.00 ft.
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = .00 ft.
15.00 ft. Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	325.40	110.00
2	340.14	112.77
3	354.86	115.68
4	369.55	118.73
5	384.20	121.91
6	398.83	125.24
7	413.42	128.70
8	427.99	132.30
9	442.51	136.04
10	457.00	139.92
11	471.46	143.93
12	485.87	148.08
13	500.24	152.37
14	514.58	156.79
15	528.87	161.35
16	543.11	166.04
17	557.32	170.87
18	571.47	175.84
19	585.58	180.93
20	599.64	186.16
21	613.65	191.52
22	627.60	197.02
23	641.51	202.65
24	655.36	208.40
25	669.15	214.29

26	671.09	215.14

Circle Center At X = 40.4 ; Y = 1668.0 and Radius, 1583.8

*** 2.205 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	325.40	110.00
2	340.25	112.09
3	355.08	114.39
4	369.87	116.89
5	384.62	119.59
6	399.34	122.49
7	414.02	125.59
8	428.65	128.89
9	443.23	132.39
10	457.77	136.09
11	472.25	139.99
12	486.68	144.08
13	501.06	148.38
14	515.37	152.86
15	529.62	157.55
16	543.81	162.42
17	557.92	167.49
18	571.97	172.75
19	585.95	178.20
20	599.84	183.85
21	613.66	189.68
22	627.40	195.70
23	641.06	201.90
24	654.63	208.30
25	668.11	214.87
26	668.54	215.09

Circle Center At X = 179.4 ; Y = 1199.5 and Radius, 1099.3

*** 2.216 ***

Failure Surface Specified By 32 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	251.44	104.76
2	266.44	105.26
3	281.42	105.98
4	296.39	106.93
5	311.34	108.10
6	326.28	109.49
7	341.19	111.11
8	356.08	112.95
9	370.94	115.01
10	385.76	117.29
11	400.55	119.79
12	415.30	122.51
13	430.01	125.46
14	444.67	128.62
15	459.29	132.00
16	473.85	135.60
17	488.36	139.41
18	502.80	143.44
19	517.19	147.69
20	531.51	152.15
21	545.77	156.83
22	559.95	161.71
23	574.05	166.81
24	588.08	172.12
25	602.03	177.63
26	615.90	183.36
27	629.68	189.29
28	643.36	195.42
29	656.96	201.76
30	670.46	208.30
31	683.86	215.04
32	684.57	215.42

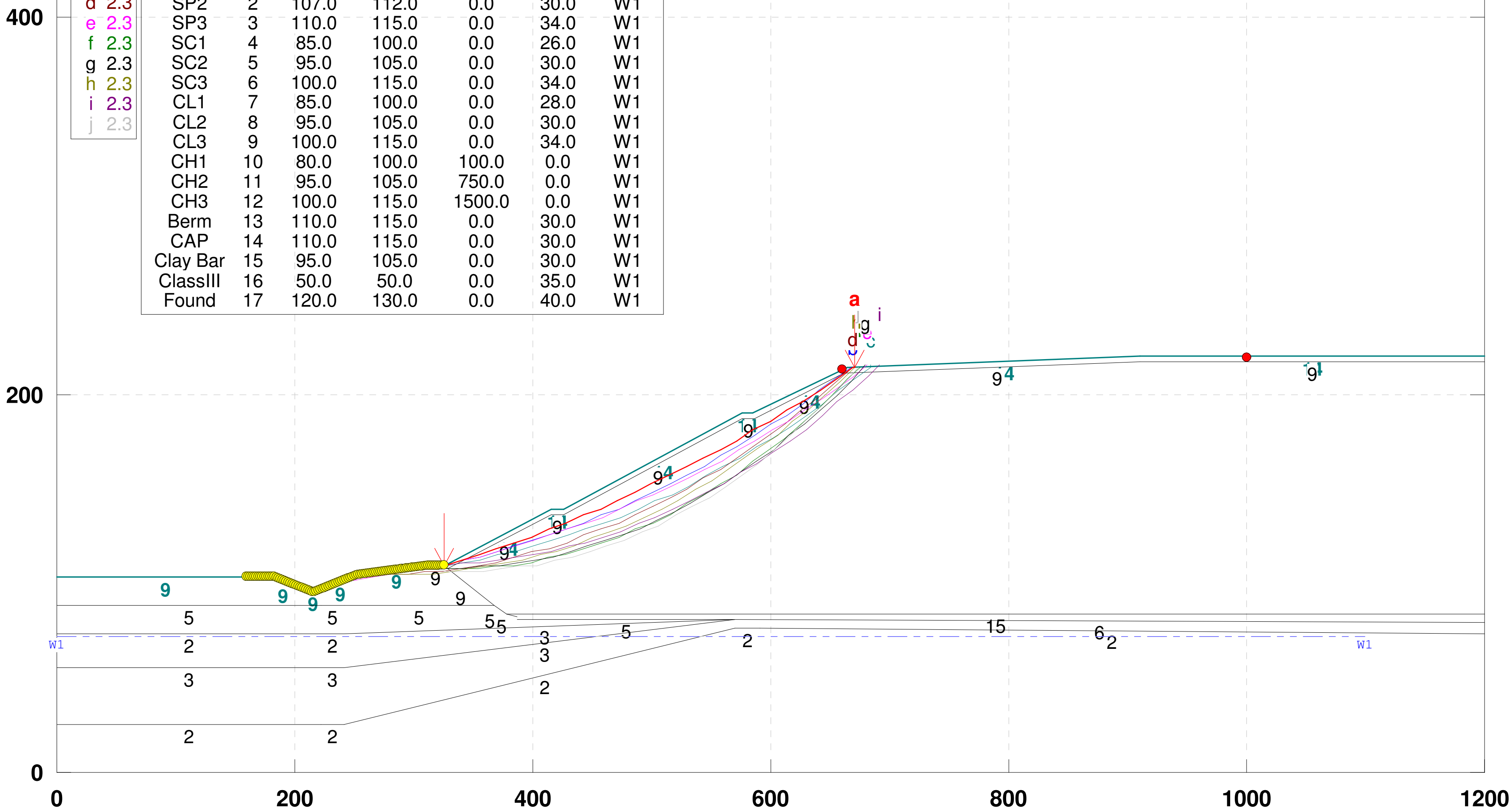
Circle Center At X = 225.5 ; Y = 1109.4 and Radius, 1004.9

Angelos Class III Cell 17 Expansion Cell 2

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL2~1\CELL_2.PL2 Run By: Civil Design Service, Inc 2/7/2018 8:00PM

#	FS
a	2.2
b	2.2
c	2.3
d	2.3
e	2.3
f	2.3
g	2.3
h	2.3
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1



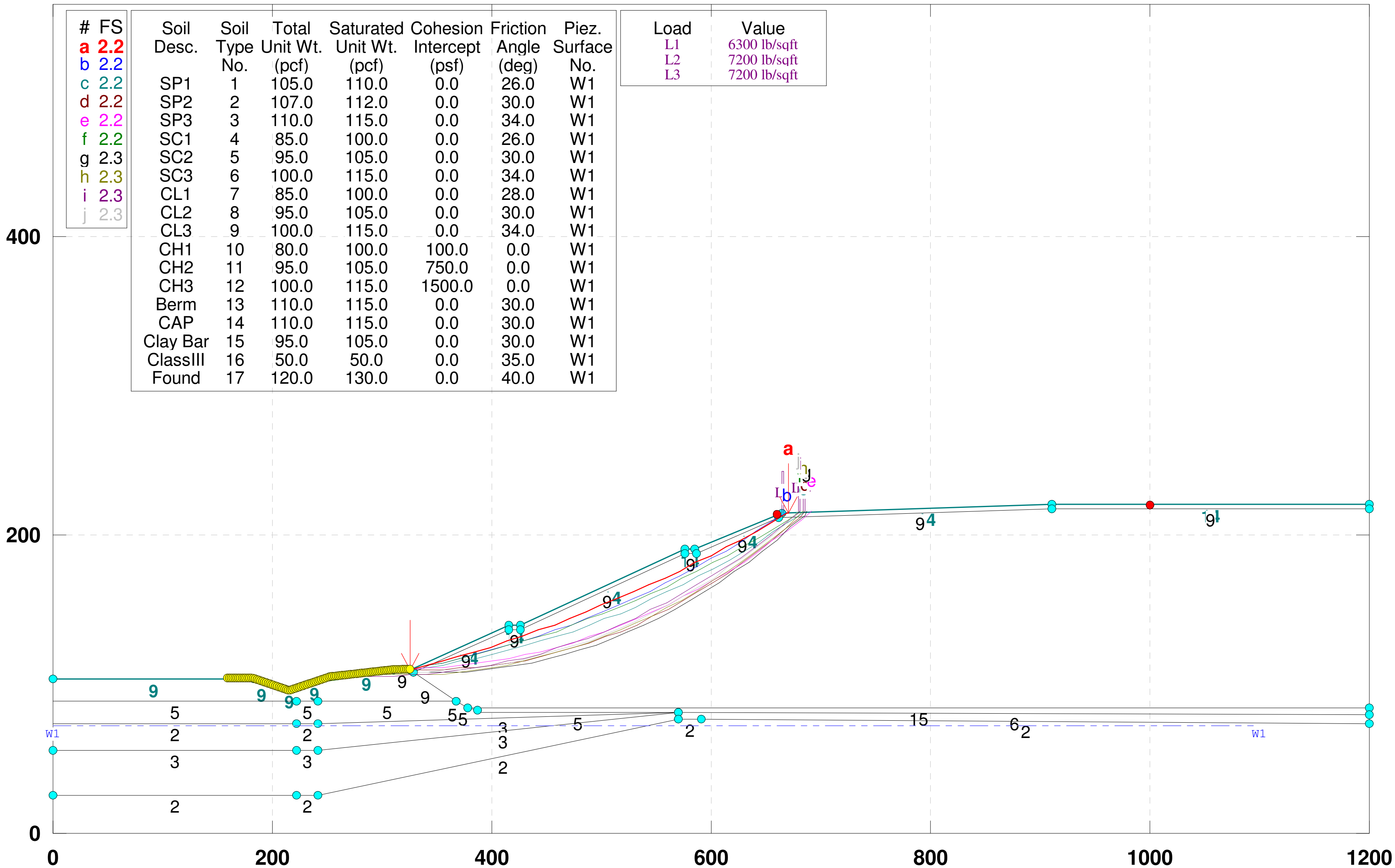
STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 2 - CAT 740B Off Road Dump Truck

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL2~1\CELL_2.PL2   Run By: Civil Design Service, Inc   2/7/2018   11:09PM



#	FS
a	2.2
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.3
h	2.3
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

BLOCK FAILURE SLOPE STABILITY

(SUBGRADE)

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 7:16PM
Run By: Civil Design Service, Inc
Input Data Filename: C:cell_2.
Output Filename: C:cell_2.OUT
Plotted Output Filename: C:cell_2.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 2

BOUNDARY COORDINATES
13 Top Boundaries
41 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	104.00	182.40	104.00	9
2	182.40	104.00	214.40	96.00	9
3	214.40	96.00	216.40	96.00	9
4	216.40	96.00	252.40	105.00	9
5	252.40	105.00	310.40	109.80	9
6	310.40	109.80	325.40	110.00	9
7	325.40	110.00	415.40	140.00	14
8	415.40	140.00	425.40	140.00	14
9	425.40	140.00	575.40	190.00	14
10	575.40	190.00	585.40	190.00	14
11	585.40	190.00	664.00	215.00	14
12	664.00	215.00	910.30	220.00	14
13	910.30	220.00	1200.00	220.00	14
14	325.40	110.00	329.20	108.10	9
15	329.20	108.10	415.90	137.00	9
16	415.90	137.00	425.90	137.00	9
17	425.90	137.00	575.90	187.00	9
18	575.90	187.00	585.90	187.00	9
19	585.90	187.00	660.90	212.00	9
20	660.90	212.00	910.40	217.00	9
21	910.40	217.00	1200.00	217.00	9
22	329.20	108.10	367.20	89.10	9
23	.00	89.10	221.40	89.10	5
24	221.40	89.10	241.40	89.10	5
25	241.40	89.10	367.20	89.10	5
26	367.20	89.10	377.40	84.00	5
27	377.40	84.00	1200.00	84.00	15
28	377.40	84.00	387.40	83.00	5
29	387.40	81.00	570.40	80.80	5
30	570.40	80.80	1200.00	80.00	6
31	570.40	76.00	590.40	76.00	2
32	590.40	76.00	1200.00	74.00	2
33	.00	74.20	221.40	74.20	2
34	221.40	74.20	241.40	74.20	2
35	241.40	74.20	570.40	80.80	3
36	.00	56.10	221.40	56.10	3
37	221.40	56.10	241.40	56.10	3
38	241.40	56.10	570.40	80.80	3
39	.00	26.10	221.40	26.10	2
40	221.40	26.10	241.40	26.10	2
41	241.40	26.10	570.40	76.00	2

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1

6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1100.00	72.00

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	660.40	670.90	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.
SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Sliding Block Surfaces, Has Been
Specified.
200 Trial Surfaces Have Been Generated.
2 Boxes Specified For Generation Of Central Block Base
Length Of Line Segments For Active And Passive Portions Of
Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	250.00	70.00	325.00	70.00	30.00
2	350.00	70.00	650.00	70.00	30.00

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.
* * Safety Factors Are Calculated By The Modified Janbu Method * *
Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	236.73	101.08
2	242.42	97.80
3	250.54	91.97
4	257.63	84.92
5	267.49	83.25
6	277.06	80.33
7	476.25	82.66
8	483.27	89.79
9	489.22	97.83
10	496.28	104.91
11	501.99	113.11
12	508.75	120.49
13	515.33	128.02
14	521.38	135.98
15	528.14	143.34
16	535.20	150.42
17	541.40	158.27
18	547.80	165.95
19	552.64	174.71
20	559.28	182.18
21	561.56	185.39

*** 2.697 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	264.89	106.03
2	267.88	104.07
3	277.82	103.03
4	287.37	100.07
5	295.79	94.67
6	303.24	88.00
7	313.24	87.79
8	321.42	82.05
9	557.04	84.32
10	563.58	91.89
11	567.97	100.87
12	573.63	109.12
13	580.52	116.36
14	587.57	123.46
15	590.26	133.09
16	596.40	140.98
17	603.47	148.05
18	608.55	156.67
19	615.62	163.74
20	621.65	171.72
21	624.73	181.23
22	629.93	189.77
23	637.00	196.85
24	643.55	204.41
25	648.99	210.23

*** 2.760 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	259.19	105.56
2	265.83	99.07
3	273.01	92.11
4	281.80	87.36
5	290.28	82.05
6	534.99	80.74
7	542.06	87.82
8	549.06	94.95
9	554.48	103.36
10	561.53	110.45
11	565.04	119.81
12	571.97	127.02
13	577.45	135.39
14	583.55	143.32
15	589.47	151.37
16	594.98	159.72
17	596.97	169.52
18	598.00	179.47
19	599.81	189.30
20	600.64	194.85

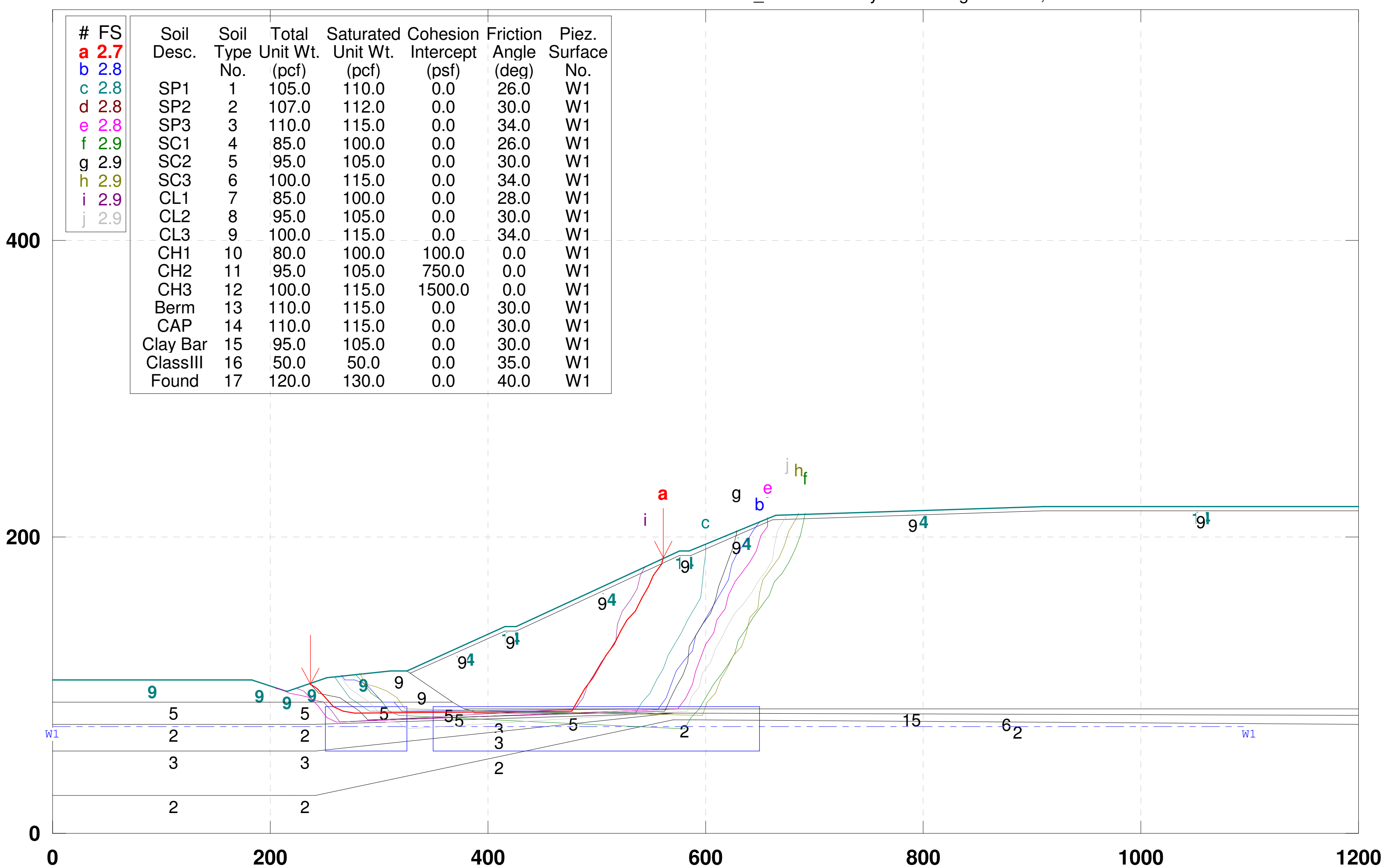
*** 2.804 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	206.09	98.08
2	208.23	96.75
3	217.87	94.07
4	227.75	92.56
5	237.74	92.08
6	244.95	85.15
7	252.02	78.08
8	261.31	74.39
9	574.98	84.45
10	581.69	91.87
11	587.62	99.91
12	590.74	109.42
13	594.95	118.49
14	599.89	127.18
15	606.92	134.29
16	611.23	143.31
17	617.86	150.80

Angelos Class III Cell 17 Expansion Cell 2

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL2~1\CELL_2.PL2 Run By: Civil Design Service, Inc 2/7/2018 7:16PM



#	FS
a	2.7
b	2.8
c	2.8
d	2.8
e	2.8
f	2.9
g	2.9
h	2.9
i	2.9
j	2.9

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.7

Safety Factors Are Calculated By The Modified Janbu Method

STED

ATTACHMENT I

ROTATIONAL (CIRCULAR) FAILURE

SLOPE STABILITY

**** STABL6H ****

by

Purdue University

--Slope Stability Analysis--

Simplified Janbu, Simplified Bishop

or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 7:11PM
Run By: Civil Design Service, Inc
Input Data Filename: C:cell_7.
Output Filename: C:cell_7.OUT
Plotted Output Filename: C:cell_7.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 7

BOUNDARY COORDINATES
10 Top Boundaries
36 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	82.00	227.00	82.00	6
2	227.00	82.00	249.80	89.60	13
3	249.80	89.60	264.80	89.80	13
4	264.80	89.80	415.40	140.00	14
5	415.40	140.00	425.40	140.00	14
6	425.40	140.00	575.40	190.00	14
7	575.40	190.00	585.40	190.00	14
8	585.40	190.00	660.40	215.00	14
9	660.40	215.00	910.30	220.00	14
10	910.30	220.00	1100.00	220.00	14
11	264.80	89.80	274.30	89.80	13
12	274.30	89.80	415.90	137.00	16
13	415.90	137.00	425.90	137.00	16
14	425.90	137.00	575.90	187.00	16
15	575.90	187.00	585.90	187.00	16
16	585.90	187.00	660.90	212.00	16
17	660.90	212.00	910.40	217.00	16
18	910.40	217.00	1100.00	217.00	16
19	274.30	89.80	297.70	82.00	13
20	297.70	82.00	1100.00	82.00	13
21	227.00	82.00	228.00	79.00	3
22	228.00	79.00	1100.00	79.00	3
23	.00	44.90	499.80	44.90	2
24	499.80	44.90	519.80	44.90	2
25	519.80	44.90	829.70	69.00	2
26	829.70	69.00	849.70	69.00	2
27	849.70	69.00	1100.00	69.00	2
28	.00	39.90	499.80	39.90	3
29	499.80	39.90	519.80	39.90	3
30	519.80	39.90	829.70	64.00	3
31	829.70	64.00	1100.00	64.00	3
32	.00	29.90	499.80	29.90	3
33	499.80	29.90	519.80	29.90	3
34	519.80	29.90	829.70	49.00	17
35	829.70	49.00	849.70	49.00	17
36	849.70	49.00	1100.00	49.00	17

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1

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  11    95.0    105.0     750.0        .0     .00        .0      1
  12   100.0    115.0    1500.0        .0     .00        .0      1
  13   110.0    115.0        .0      30.0     .00        .0      1
  14   110.0    115.0        .0      30.0     .00        .0      1
  15    95.0    105.0        .0      30.0     .00        .0      1
  16    50.0     50.0        .0      35.0     .00        .0      1
  17   120.0    130.0        .0      40.0     .00        .0      1
 1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
 Unit Weight of Water =  62.40
 Piezometric Surface No.  1 Specified by  2 Coordinate Points
   Point      X-Water     Y-Water
    No.         (ft)        (ft)
     1           .00       72.00
     2       1100.00       72.00
BOUNDARY LOAD(S)
     1 Load(s) Specified
 Load        X-Left      X-Right     Intensity     Deflection
  No.         (ft)         (ft)      (lb/sqft)       (deg)
   1         660.40       670.90       2400.0          .0
 NOTE - Intensity Is Specified As A Uniformly Distributed
        Force Acting On A Horizontally Projected Surface.
 SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
 A Critical Failure Surface Searching Method, Using A Random
 Technique For Generating Circular Surfaces, Has Been Specified.
10000 Trial Surfaces Have Been Generated.
 100 Surfaces Initiate From Each Of100 Points Equally Spaced
 Along The Ground Surface Between  X =  75.00 ft.
                                 and  X = 268.80 ft.
 Each Surface Terminates Between   X = 660.40 ft.
                                and   X =1000.00 ft.
 Unless Further Limitations Were Imposed, The Minimum Elevation
 At Which A Surface Extends Is  Y =   .00 ft.
 10.00 ft. Line Segments Define Each Trial Failure Surface.
 Following Are Displayed The Ten Most Critical Of The Trial
       Failure Surfaces Examined.  They Are Ordered - Most Critical
       First.
       * * Safety Factors Are Calculated By The Modified Bishop Method * *
       Failure Surface Specified By 44 Coordinate Points
         Point      X-Surf      Y-Surf
          No.        (ft)        (ft)
           1        266.84       90.48
           2        276.57       92.78
           3        286.30       95.12
           4        296.01       97.49
           5        305.72       99.89
           6        315.42      102.32
           7        325.11      104.79
           8        334.79      107.28
           9        344.47      109.81
          10        354.14      112.38
          11        363.79      114.97
          12        373.44      117.60
          13        383.08      120.26
          14        392.71      122.95
          15        402.33      125.68
          16        411.95      128.43
          17        421.55      131.22
          18        431.14      134.04
          19        440.73      136.90
          20        450.30      139.78
          21        459.87      142.70
          22        469.42      145.65
          23        478.97      148.63
          24        488.50      151.64
          25        498.03      154.69
          26        507.54      157.77
          27        517.05      160.87
          28        526.54      164.02
          29        536.02      167.19
          30        545.50      170.39
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31	554.96	173.63
32	564.41	176.90
33	573.85	180.20
34	583.28	183.53
35	592.70	186.89
36	602.10	190.28
37	611.50	193.71
38	620.88	197.17
39	630.25	200.66
40	639.61	204.18
41	648.96	207.73
42	658.30	211.31
43	667.62	214.92
44	668.22	215.16

Circle Center At X = -415.7 ; Y = 2996.3 and Radius, 2984.9
*** 2.230 ***
Failure Surface Specified By 44 Coordinate Points

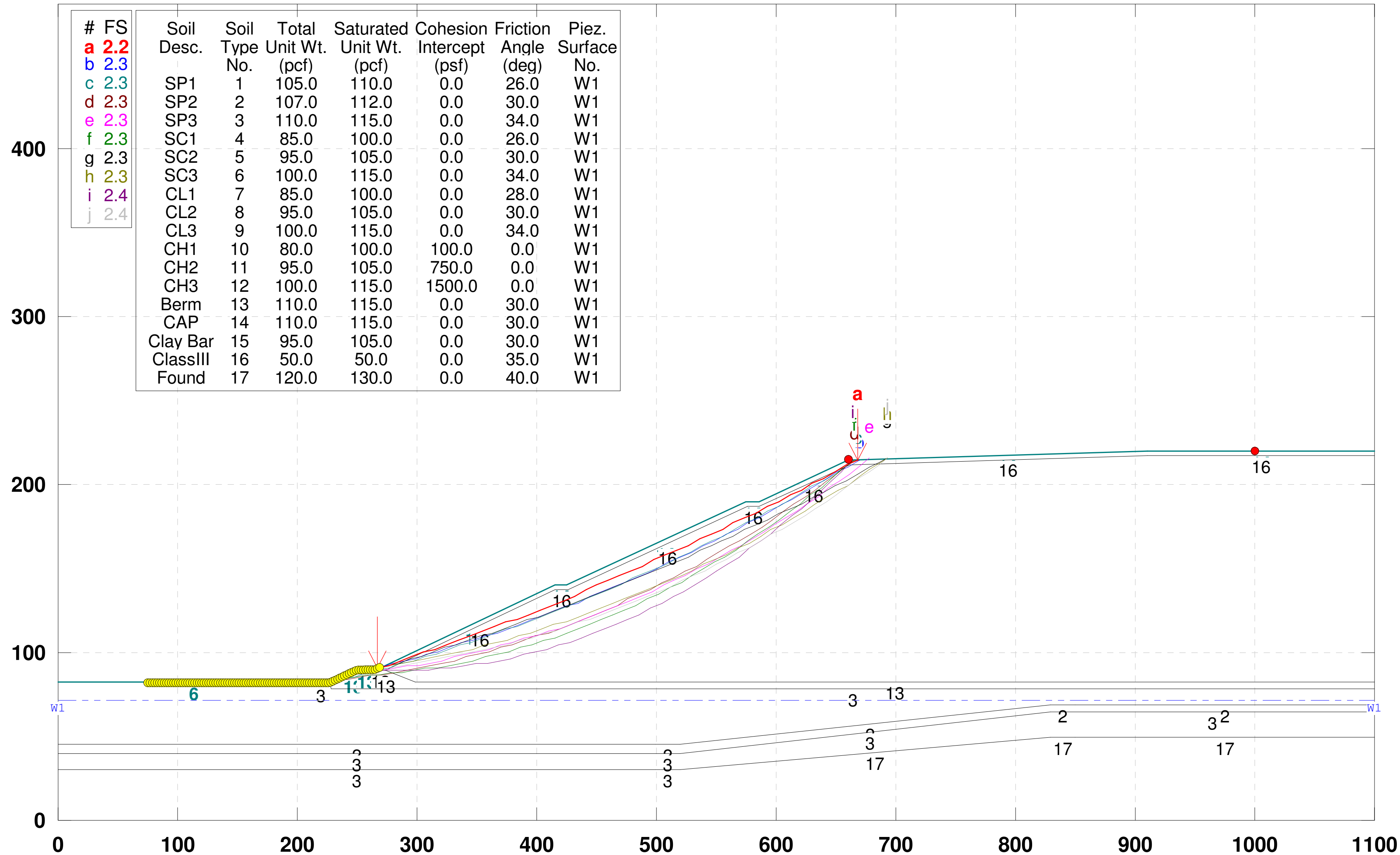
Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.80	91.13
2	278.63	92.98
3	288.45	94.88
4	298.25	96.84
5	308.05	98.85
6	317.83	100.91
7	327.61	103.03
8	337.37	105.20
9	347.12	107.43
10	356.85	109.72
11	366.58	112.05
12	376.28	114.44
13	385.98	116.89
14	395.66	119.39
15	405.33	121.94
16	414.99	124.55
17	424.63	127.21
18	434.25	129.93
19	443.86	132.70
20	453.45	135.52
21	463.03	138.39
22	472.59	141.32
23	482.14	144.31
24	491.66	147.34
25	501.18	150.43
26	510.67	153.57
27	520.14	156.77
28	529.60	160.02
29	539.04	163.32
30	548.46	166.67
31	557.87	170.08
32	567.25	173.53
33	576.61	177.04
34	585.96	180.61
35	595.28	184.22
36	604.58	187.89
37	613.87	191.61
38	623.13	195.38
39	632.37	199.20
40	641.59	203.07
41	650.79	207.00
42	659.96	210.97
43	669.11	215.00
44	669.52	215.18

Circle Center At X = -57.0 ; Y = 1852.7 and Radius, 1791.4
*** 2.254 ***
Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	227.69	82.23
2	237.54	83.95

Angelos Class III Cell 17 Expansion Cell 7

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL7~1\CELL_7.PL2 Run By: Civil Design Service, Inc 2/7/2018 7:11PM



#	FS
a	2.2
b	2.3
c	2.3
d	2.3
e	2.3
f	2.3
g	2.3
h	2.3
i	2.4
j	2.4

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

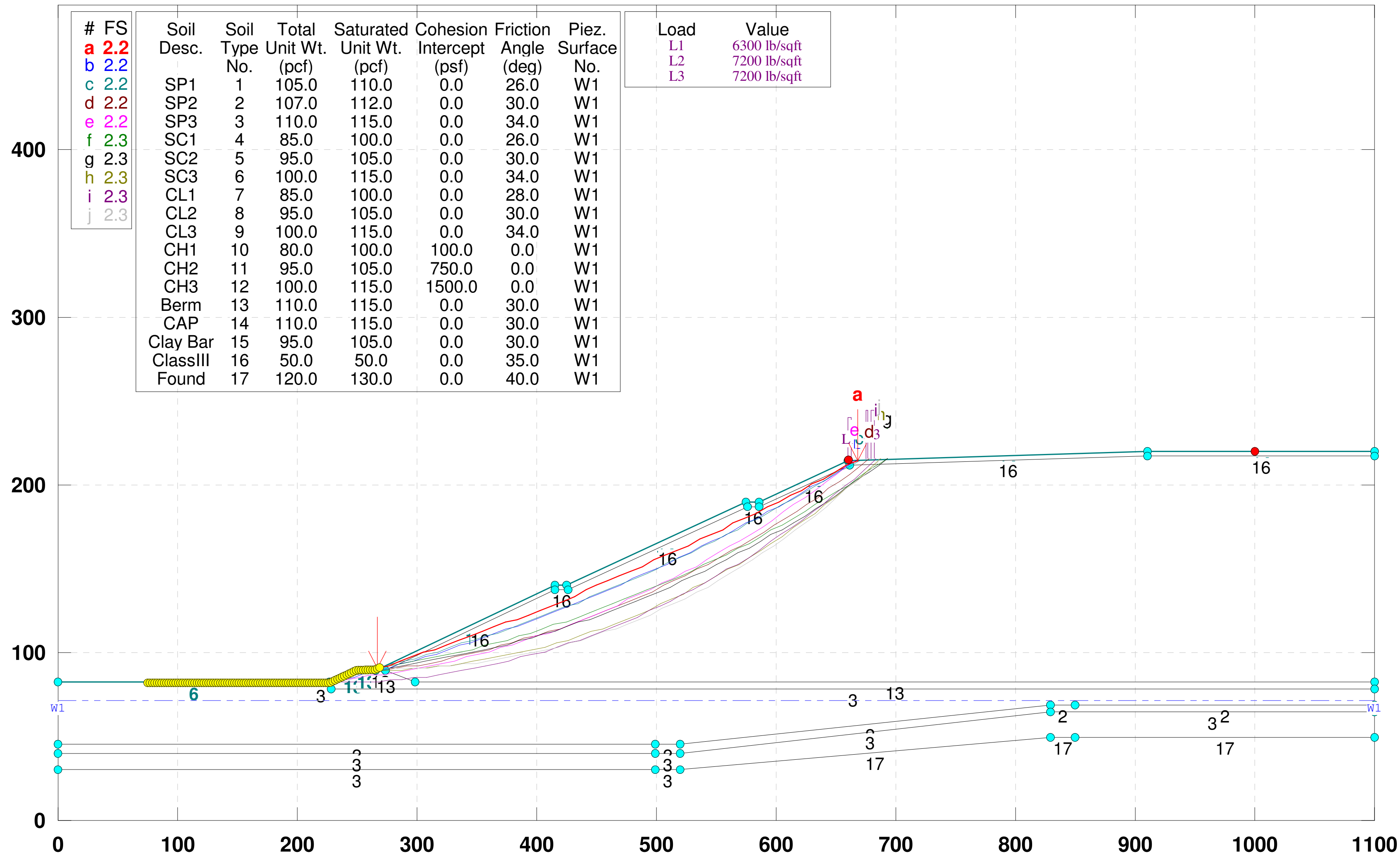
STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 7 - CAT 740B Off Road Dump Truck

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL7~1\CELL_7.PL2 Run By: Civil Design Service, Inc 2/7/2018 11:12PM



#	FS
a	2.2
b	2.2
c	2.2
d	2.2
e	2.2
f	2.3
g	2.3
h	2.3
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

BLOCK FAILURE SLOPE STABILITY

(SUBGRADE)

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/7/2018
Time of Run: 7:08PM
Run By: Civil Design Service, Inc
Input Data Filename: C:cell_7.
Output Filename: C:cell_7.OUT
Plotted Output Filename: C:cell_7.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 7

BOUNDARY COORDINATES
10 Top Boundaries
36 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	82.00	227.00	82.00	6
2	227.00	82.00	249.80	89.60	13
3	249.80	89.60	264.80	89.80	13
4	264.80	89.80	415.40	140.00	14
5	415.40	140.00	425.40	140.00	14
6	425.40	140.00	575.40	190.00	14
7	575.40	190.00	585.40	190.00	14
8	585.40	190.00	660.40	215.00	14
9	660.40	215.00	910.30	220.00	14
10	910.30	220.00	1100.00	220.00	14
11	264.80	89.80	274.30	89.80	13
12	274.30	89.80	415.90	137.00	16
13	415.90	137.00	425.90	137.00	16
14	425.90	137.00	575.90	187.00	16
15	575.90	187.00	585.90	187.00	16
16	585.90	187.00	660.90	212.00	16
17	660.90	212.00	910.40	217.00	16
18	910.40	217.00	1100.00	217.00	16
19	274.30	89.80	297.70	82.00	13
20	297.70	82.00	1100.00	82.00	13
21	227.00	82.00	228.00	79.00	3
22	228.00	79.00	1100.00	79.00	3
23	.00	44.90	499.80	44.90	2
24	499.80	44.90	519.80	44.90	2
25	519.80	44.90	829.70	69.00	2
26	829.70	69.00	849.70	69.00	2
27	849.70	69.00	1100.00	69.00	2
28	.00	39.90	499.80	39.90	3
29	499.80	39.90	519.80	39.90	3
30	519.80	39.90	829.70	64.00	3
31	829.70	64.00	1100.00	64.00	3
32	.00	29.90	499.80	29.90	3
33	499.80	29.90	519.80	29.90	3
34	519.80	29.90	829.70	49.00	17
35	829.70	49.00	849.70	49.00	17
36	849.70	49.00	1100.00	49.00	17

ISOTROPIC SOIL PARAMETERS
17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1

```
  11    95.0    105.0     750.0       .0     .00        .0      1
  12   100.0    115.0    1500.0       .0     .00        .0      1
  13   110.0    115.0        .0     30.0     .00        .0      1
  14   110.0    115.0        .0     30.0     .00        .0      1
  15    95.0    105.0        .0     30.0     .00        .0      1
  16    50.0     50.0        .0     35.0     .00        .0      1
  17   120.0    130.0        .0     40.0     .00        .0      1
 1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
 Unit Weight of Water =  62.40
 Piezometric Surface No.  1 Specified by  2 Coordinate Points
   Point      X-Water     Y-Water
    No.         (ft)        (ft)
     1           .00       72.00
     2       1100.00       72.00
BOUNDARY LOAD(S)
     1 Load(s) Specified
 Load        X-Left      X-Right     Intensity     Deflection
  No.         (ft)        (ft)      (lb/sqft)        (deg)
   1         660.40      670.90       2400.0           .0
 NOTE - Intensity Is Specified As A Uniformly Distributed
        Force Acting On A Horizontally Projected Surface.
 SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED
 A Critical Failure Surface Searching Method, Using A Random
 Technique For Generating Sliding Block Surfaces, Has Been
 Specified.
 200 Trial Surfaces Have Been Generated.
 2 Boxes Specified For Generation Of Central Block Base
 Length Of Line Segments For Active And Passive Portions Of
 Sliding Block Is  10.0
 Box        X-Left     Y-Left    X-Right    Y-Right      Height
 No.         (ft)       (ft)       (ft)       (ft)        (ft)
  1         250.00      70.00     325.00      70.00      30.00
  2         350.00      70.00     650.00      70.00      30.00
 Following Are Displayed The Ten Most Critical Of The Trial
       Failure Surfaces Examined.  They Are Ordered - Most Critical
       First.
       * * Safety Factors Are Calculated By The Modified Janbu Method * *
       Failure Surface Specified By 20 Coordinate Points
         Point      X-Surf      Y-Surf
          No.        (ft)        (ft)
           1        254.13       89.66
           2        255.40       88.44
           3        265.20       86.46
           4        274.62       83.12
           5        283.52       78.55
           6        519.10       82.35
           7        525.86       89.72
           8        529.71       98.95
           9        535.51      107.09
          10        538.84      116.52
          11        545.91      123.59
          12        552.08      131.46
          13        559.09      138.59
          14        564.88      146.75
          15        568.69      155.99
          16        573.80      164.59
          17        579.05      173.10
          18        586.12      180.17
          19        593.16      187.28
          20        593.43      192.68
             ***     2.728   ***
       Failure Surface Specified By 14 Coordinate Points
         Point      X-Surf      Y-Surf
          No.        (ft)        (ft)
           1        283.33       95.98
           2        287.79       93.46
           3        297.12       89.86
           4        305.51       84.41
           5        314.43       79.90
           6        375.54       81.35
```

7	381.97	89.01
8	385.99	98.17
9	392.91	105.39
10	399.84	112.60
11	403.70	121.83
12	410.72	128.95
13	417.65	136.15
14	420.87	140.00

*** 2.768 ***

Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.83	89.77
2	271.25	88.27
3	281.25	88.15
4	290.04	83.39
5	369.39	76.17
6	376.34	83.36
7	382.69	91.09
8	389.33	98.56
9	396.07	105.95
10	402.91	113.24
11	408.33	121.64
12	413.64	130.12
13	415.08	139.89

*** 2.810 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	282.72	95.77
2	287.93	91.78
3	295.04	84.74
4	303.46	79.35
5	522.10	82.73
6	528.82	90.14
7	531.36	99.81
8	538.32	107.00
9	545.33	114.13
10	552.06	121.52
11	558.42	129.24
12	561.70	138.69
13	567.80	146.61
14	572.09	155.65
15	574.05	165.45
16	578.27	174.52
17	585.31	181.61
18	592.03	189.02
19	596.68	193.76

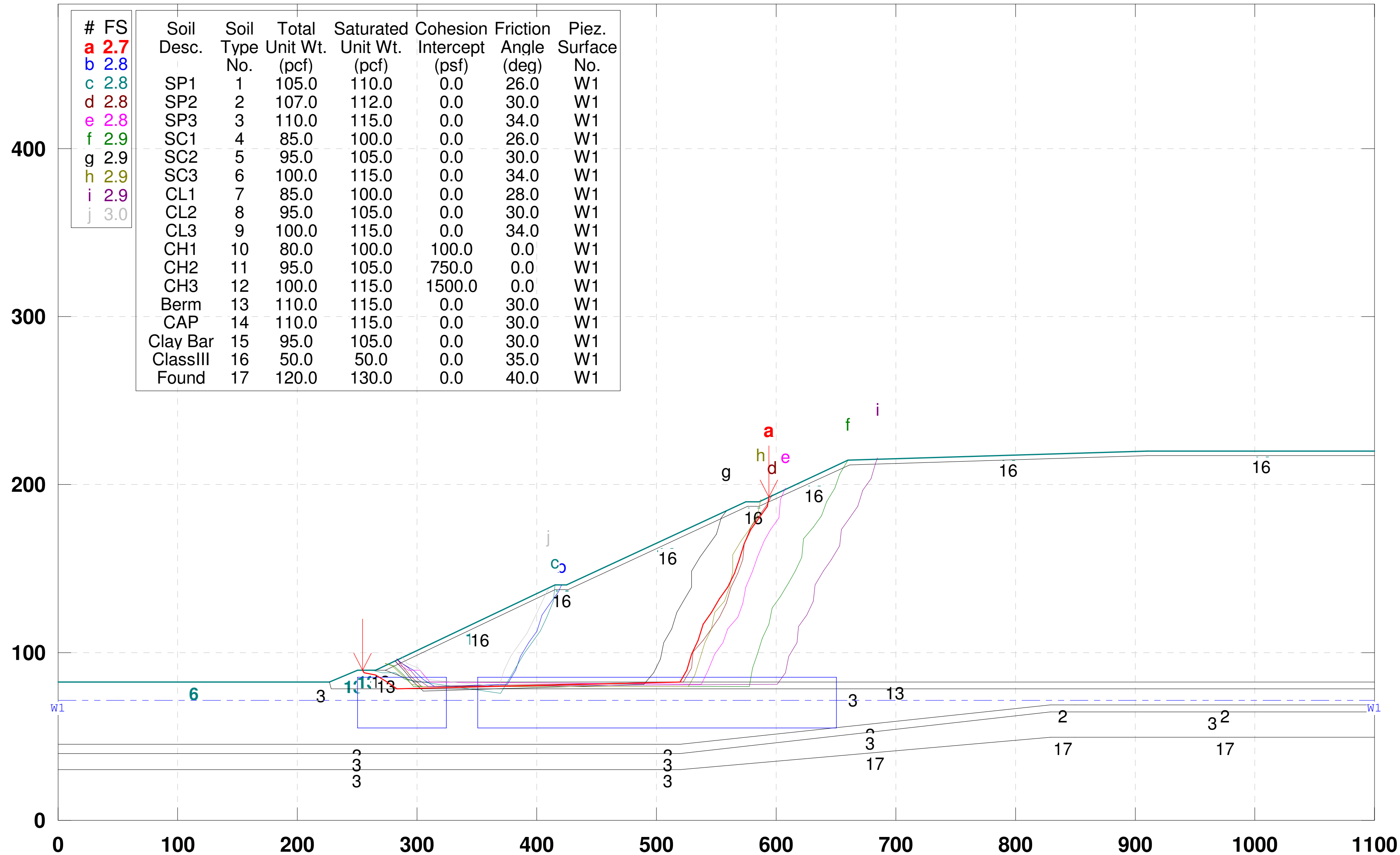
*** 2.811 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	281.49	95.36
2	283.10	93.86
3	292.24	89.80
4	302.20	88.81
5	310.22	82.84
6	537.99	81.13
7	542.76	89.92
8	547.96	98.46
9	554.88	105.68
10	560.16	114.18
11	567.20	121.28
12	572.57	129.71
13	575.18	139.37
14	579.97	148.14
15	584.83	156.89
16	589.54	165.70
17	595.73	173.56
18	602.68	180.75

Angelos Class III Cell 17 Expansion Cell 7

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL7~1\CELL_7.PL2 Run By: Civil Design Service, Inc 2/7/2018 7:08PM



#	FS
a	2.7
b	2.8
c	2.8
d	2.8
e	2.8
f	2.9
g	2.9
h	2.9
i	2.9
j	3.0

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.7

Safety Factors Are Calculated By The Modified Janbu Method

STED

ATTACHMENT J

NO.	DATE	REVISION DESCRIPTION	BY

Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

TOE DRAIN PLAN PROFILE

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING:

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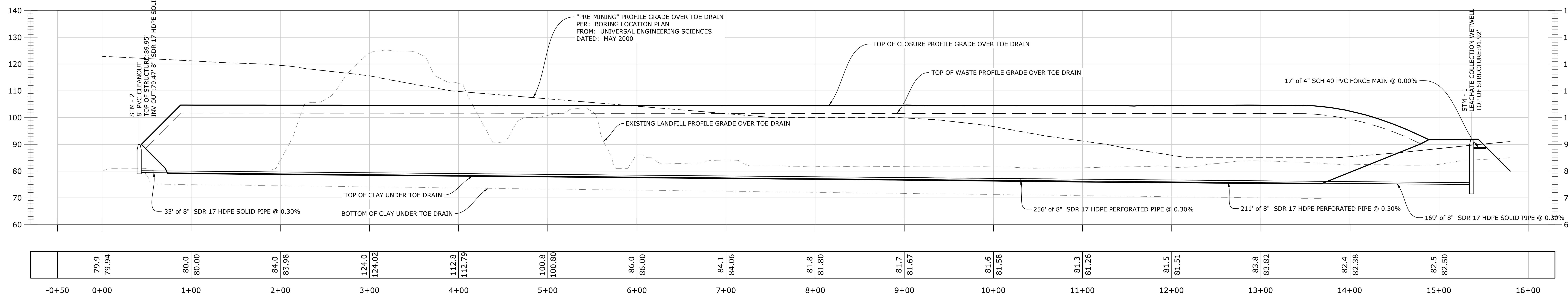
REVIEW ONLY-NOT FOR CONSTRUCTION

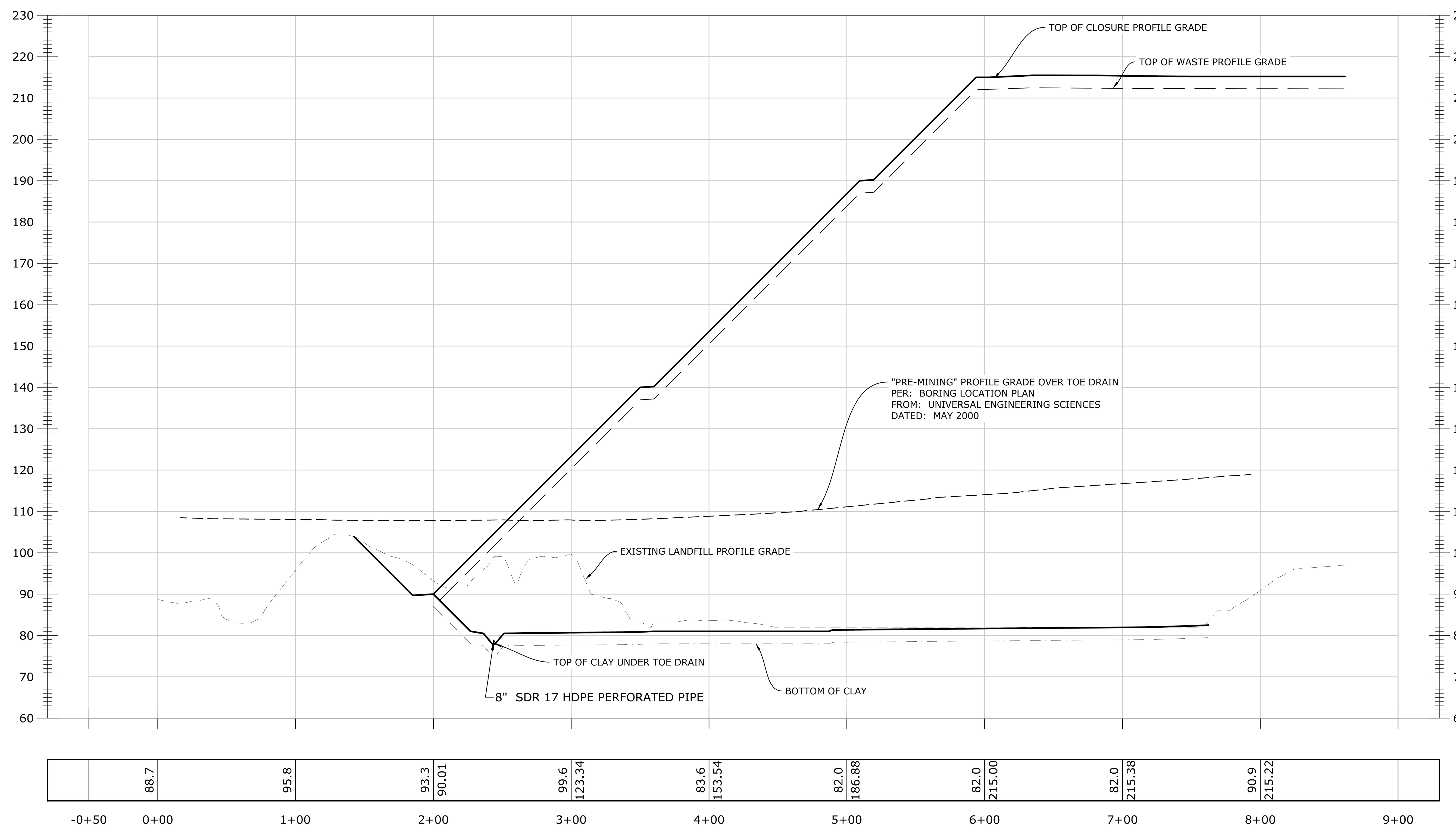
NORTH

0 60 120
GRAPHIC SCALE

SECTION VIEW A-A'



SECTION VIEW B-B'



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NO.	DATE	REVISION DESCRIPTION	BY

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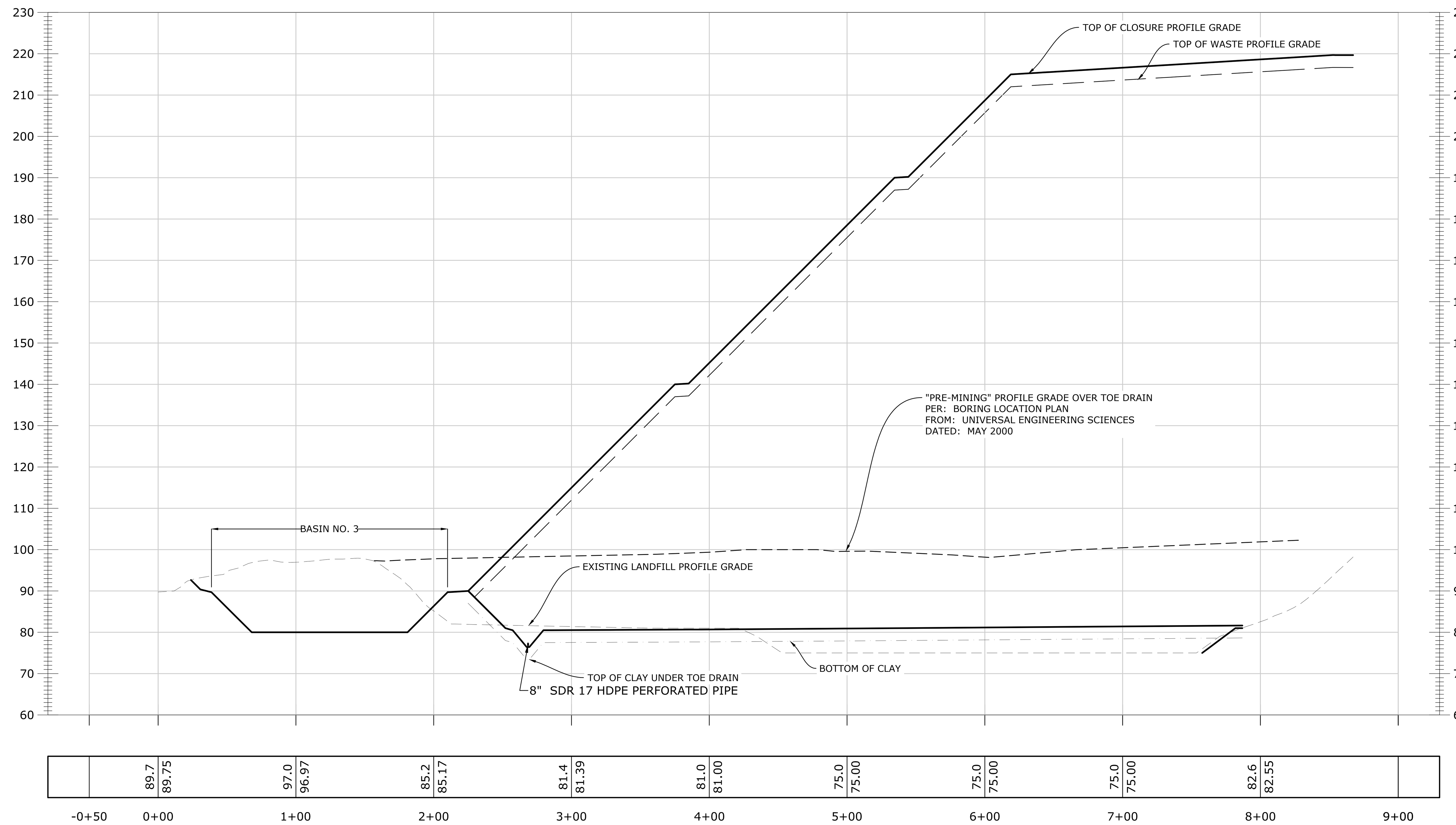
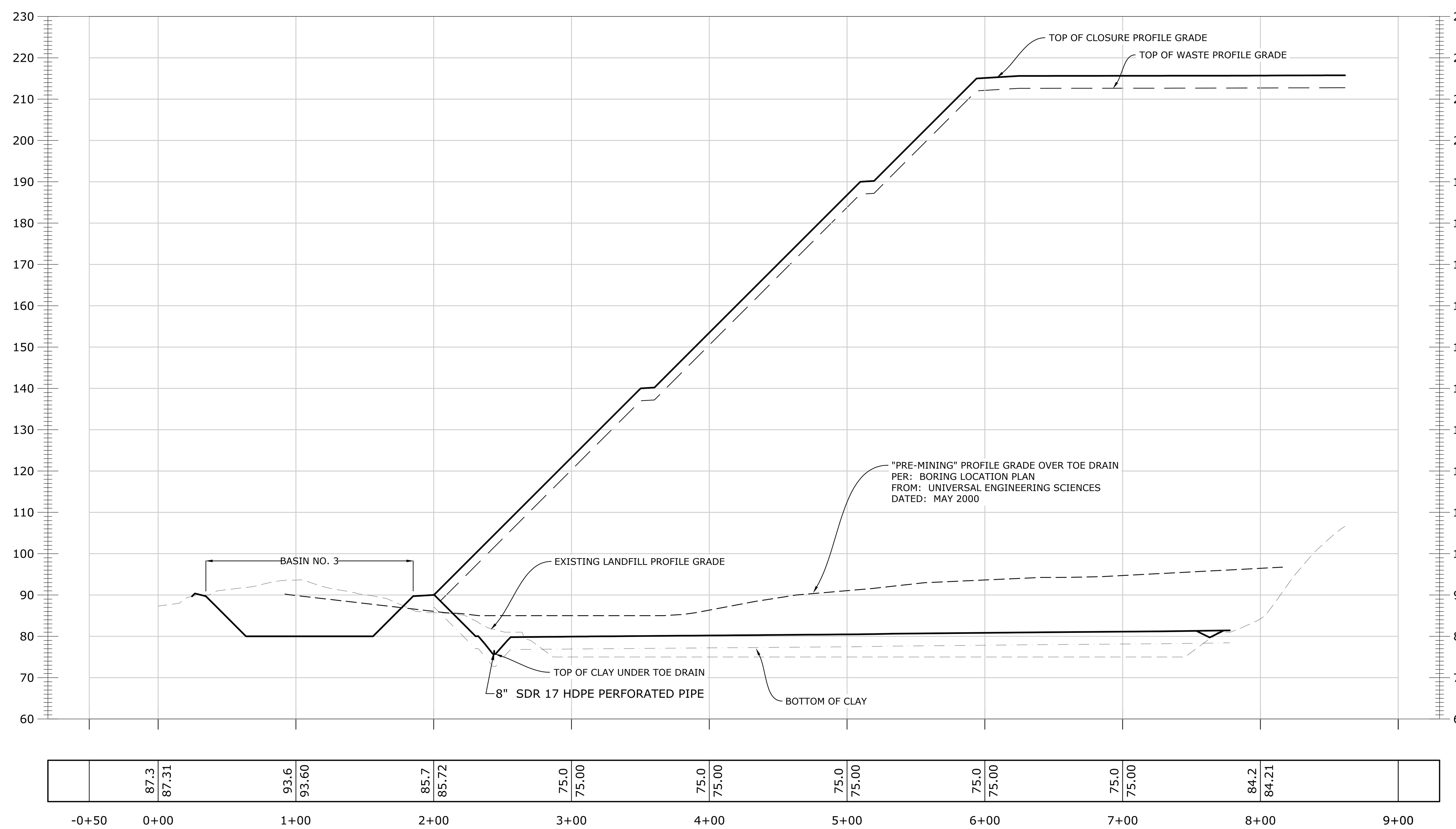
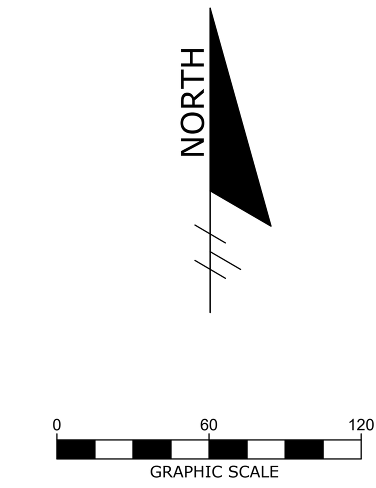


SECTION VIEW
C-C'



SECTION VIEW
D-D'



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APPROVED BY	LJB

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TOE DRAIN PLAN PROFILE

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING:

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Soil Properties - Settlement Estimates

Sands, Silty Sands, Clayey Sands

SPT Blow Count	Description	Dr*	Dr avg
0-4	Very Loose	0-15	10
4-10	Loose	15-30	20
10-30	Medium	35-65	50
30-50	Dense	65-85	75
>50	Very Dense	85-100	90

*Dr - Relative Density (Reference 1)

Clays

SPT Blow Count	Description	Dr avg
<2	Very Soft	10
2-4	Soft	20
4-8	Medium	50
8-15	Stiff	75
15-30	Very Stiff	90
>30	Hard	100

References: 1) SPT vs Soil Relative Density
" Soil Mechanics; 1969 Lambe and Whitman, Table 7.4"

2) Soil Types, Soil Properties
" Soil Mechanics; 1969 Lambe and Whitman, Table 3.2"

3) Soil Consolidation Coefficent vs Soil Type
Sands - "Basic Soils Engineering, 1969 B.K. Hough, Table 5-1"

4) Clays - *"Principles of Geotechnical Engineering, 1985, B. Das, Table 7.1"*

Soil Types (Reference 2)

SP

emin	0.2
emax	0.95
Gs	2.65
Moisture	12

SPT N	Eo	γdry	γsat	γmoist	
0-4	0.875	88.2	117.3	98.8	
4-10	0.8	91.9	119.6	102.9	
10-30	0.575	105.0	127.8	117.6	
30-50	0.3875	119.2	136.6	133.5	
>50	0.275	129.7	143.2	143.2	Saturated

SP - Esimated Consolidation Coefficient *Reference 3

Cc	=a(Emax-b)		
	0.05625	a =	0.075
		Emax =	0.95
		b =	0.2

SC

emin	0.3
emax	0.9
Gs	2.65
Moisture	12

SPT N	Eo	γdry	γsat	γmoist
0-4	0.84	89.9	118.4	100.7
4-10	0.78	92.9	120.2	104.0
10-30	0.6	103.4	126.8	115.8
30-50	0.45	114.0	133.4	127.7
>50	0.36	121.6	138.1	136.2

SC - Esimated Consolidation Coefficient *Reference 3

Cc	=a(Emax-b)		
	0.138	a =	0.23
		Emax =	0.9
		b =	0.3

Clays

emin	0.4
emax	2
Gs	2.65
Moisture	30

SPT N	Eo	γdry	γsat	γmoist	
<2	1.84	58.2	98.7	75.7	
2-4	1.68	61.7	100.8	80.2	
4-8	1.2	75.2	109.2	97.7	
8-15	0.8	91.9	119.6	119.4	
15-30	0.56	106.0	128.4	128.4	Saturated
>30	0.4	118.1	135.9	135.9	Saturated

Clay - Esimated Consolidation Coefficient *Reference 4

Cc = (0.156Eo)+0.107

SPT N	Eo	Cc
<2	1.84	0.29774
2-4	1.68	0.27278
4-8	1.2	0.1979
8-15	0.8	0.1355
15-30	0.56	0.09806
>30	0.4	0.0731

Reference No. 1
Settlement

Table 7.4 Standard Penetration Test

Relative Density of Sand		Strength of Clay		
Penetration Resistance N (blows/ft)	Relative Density	Penetration Resistance N (blows/ft)	Unconfined Compressive Strength (tons/ft^2)	Consistency
0–4	Very loose	<2	<0.25	Very soft
4–10	Loose	2–4	0.25–0.50	Soft
10–30	Medium	4–8	0.50–1.00	Medium
30–50	Dense	8–15	1.00–2.00	Stiff
>50	Very dense	15–30	2.00–4.00	Very stiff
		>30	>4.00	Hard

From Terzaghi and Peck, 1948.

In certain countries, such as Holland, subsoil conditions are such that penetration testing has proved to be a relatively reliable technique. More sophisticated techniques [such as the friction jacket cone (Begemann, 1953)] have been widely used.

The vane test has proved to be a very useful method of determining the shear strength of soft clays and silts. Figure 7.6 shows various sizes and shapes of vanes which have been used for field testing. The vane is forced into the ground and then the torque required to rotate the vane is measured. The shear strength is determined from the torque required to shear the soil along the vertical and horizontal edges of the vane.

As later chapters in this book will show, a proper subsoil investigation should include the determination of water pressure at various depths within the subsoil. Methods of determining pore water pressure are discussed in Part IV. Part IV also notes how the permeability of a subsoil can be estimated from pumping tests.

Various load tests and field compaction tests may be highly desirable in important soil projects. In this type of test, a small portion of the subsoil to be loaded by the prototype is subjected to a stress condition in the field which approximates that under the completed structure. The engineer extrapolates the results of the field tests to predict the behavior of the prototype.

7.7 SUBSOIL PROFILES

Figures 7.7 to 7.17 present a group of subsoil profiles and Table 7.5 gives some information on the geological history of the various profiles. The purposes of presenting these profiles are to:

1. Indicate how geological history influences soil characteristics.
2. Give typical values of soil properties.
3. Show dramatically the large variability in soil behavior with depth.
4. Illustrate how engineers have presented subsoil data.

Three considerations were used in the selection of the profiles: first, examples were chosen with different types of geological history; second, most of the profiles are ones for which there are excellent references giving considerably more detail on the characteristics of the soil and engineering problems involved with the particular profile; and finally, most of the profiles selected have been involved in interesting and/or important soil engineering projects.

Some of the soil characteristics shown in the profiles have already been described in this book. These characteristics include water content, unit weight, void ratio, porosity, Atterberg limits, and particle size. Other characteristics, particularly those referring to strength and compressibility, will be discussed in detail in later portions of this book. Reference will then be made back to these profiles.

The profiles illustrate many concepts presented in the preceding parts of this book; some of them are discussed in the remaining part of this section.

Stress History

In a normally consolidated sedimentary soil both the void ratio and water content decrease with depth in the profile, and the strength therefore increases. This characteristic is illustrated in several of the profiles, e.g., the Norwegian marine clay (Fig. 7.7), the Thames Estuary clay (Fig. 7.10), and the Canadian clay (Fig. 7.11). The London clay is overconsolidated since it was compressed by a greater overburden than now exists. Erosion removed some of the original overburden. As would be expected, the overconsolidated London clay does not

Reference No. 2
Settlement

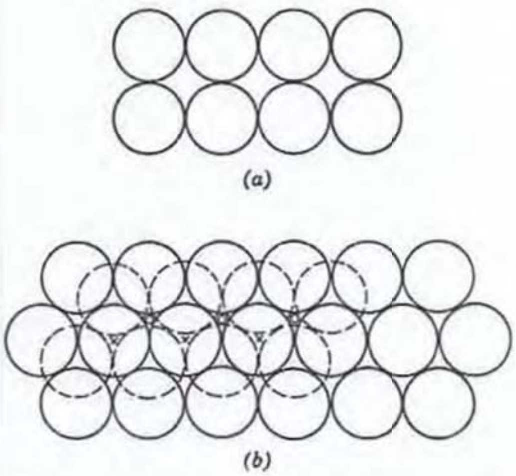

Fig. 3.2 Arrangements of uniform spheres. (*a*) Plan and elevation view: simple cubic packing. (*b*) Plan view: dense packing. Solid circles, first layer; dashed circles, second layer; ∘, location of sphere centers in third layer: face-centered cubic array; ×, location of sphere centers in third layer: close-packed hexagonal array. (From Deresiewicz, 1958.)

these simple packings can be computed from the geometry of the packings, and the results are given in Table 3.2.

This table also gives densities for some typical granular soils in both the "dense" and "loose" states. A variety of tests have been proposed to measure the maximum and minimum void ratios (Kolbuszewski, 1948). The test to determine the maximum density usually involves some form of vibration. The test to determine minimum density usually involves pouring oven-dried soil into a container. Unfortunately, the details of these tests have not been entirely standardized, and values of the maximum density and minimum density for a given granular soil depend on the procedure used to determine them. By using special measures, one can obtain densities greater than the so-called maximum density. Densities considerably less than the so-called minimum density can be obtained, especially with very fine sands and silts, by slowly sedimenting the soil into water or by fluffing the soil with just a little moisture present.

Table 3.2 Maximum and Minimum Densities for Granular Soils

	Void Ratio		Porosity (%)		Dry Unit Weight (pcf)	
Description	e_{max}	e_{min}	n_{max}	n_{min}	$\gamma_{d\,min}$	$\gamma_{d\,max}$
Uniform spheres	0.92	0.35	47.6	26.0	—	—
Standard Ottawa sand	0.80	0.50	44	33	92	110
Clean uniform sand	1.0	0.40	50	29	83	118
Uniform inorganic silt	1.1	0.40	52	29	80	118
Silty sand	0.90	0.30	47	23	87	127
Fine to coarse sand	0.95	0.20	49	17	85	138
Micaceous sand	1.2	0.40	55	29	76	120
Silty sand and gravel	0.85	0.14	46	12	89	146

B. K. Hough, *Basic Soils Engineering*. Copyright © 1957, The Ronald Press Company, New York.

The smaller the range of particle sizes present (i.e., the more nearly uniform the soil), the smaller the particles, and the more angular the particles, the smaller the minimum density (i.e., the greater the opportunity for building a loose arrangement of particles). The greater the range of particle sizes present, the greater the maximum density (i.e., the voids among the larger particles can be filled with smaller particles).

A useful way to characterize the density of a natural granular soil is with *relative density* D_r, defined as

$$D_r = \frac{e_{max} - e}{e_{max} - e_{min}} \times 100\%$$
$$= \frac{\gamma_{d\,max}}{\gamma_d} \times \frac{\gamma_d - \gamma_{d\,min}}{\gamma_{d\,max} - \gamma_{d\,min}} \times 100\% \qquad (3.1)$$

where

e_{min} = void ratio of soil in densest condition
e_{max} = void ratio of soil in loosest condition
e = in-place void ratio
$\gamma_{d\,max}$ = dry unit weight of soil in densest condition
$\gamma_{d\,min}$ = dry unit weight of soil in loosest condition
γ_d = in-place dry unit weight

Table 3.3 characterizes the density of granular soils on the basis of relative density.

Table 3.3 Density Description

Relative Density (%)	Descriptive Term
0–15	Very loose
15–35	Loose
35–65	Medium
65–85	Dense
85–100	Very dense

MOISTURE TEST
$\omega = \frac{M_1}{M_\omega}$

Values of water content for natural granular soils vary from less than 0.1% for air-dry sands to more than 40% for saturated, loose sand.

Typical Values of Phase Relationships for Cohesive Soils

The range of values of phase relationships for cohesive soils is much larger than for granular soils. Saturated sodium montmorillonite at low confining pressure can exist at a void ratio of more than 25; saturated clays

Reference No. 3
Settlement

B. K. HOUGH, formerly Professor of Civil Engineering at Cornell University and Lehigh University, is presently a consulting engineer with his own consulting firm in Ithaca, N. Y. He has also taught at Massachusetts Institute of Technology. He received his undergraduate and graduate degrees from Massachusetts Institute of Technology. A former student of Professor Terzaghi at M. I. T., he has worked chiefly in soil mechanics ever since, and now has a record of forty years of extensive and varied experience in professional practice, teaching, and research.

BASIC SOILS ENGINEERING

B. K. HOUGH

SECOND EDITION

References for Settlement

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values [illegible] 5 and 0.270, respectively; a curve plotted on this basis is included in Fig. 5-12 for comparative purposes.

Values of the constants a and b of Eq. (5-7) obtained from tests on laboratory prepared specimens of many different soil types, including those described above, are summarized in Table 5-1. The values given

TABLE 5–1

Values of the Constants of Equation (5–7) for Typical Materials

	Type of Soil	Value of Constant a	Value of Constant b*
	Uniform cohesionless material ($C_u \leq 2$)		
	Clean gravel	0.05	0.50
	Coarse sand	0.06	0.50
SP	Medium sand	0.07	0.50
	Fine sand	0.08	0.50
	Inorganic silt	0.10	0.50
	Well-graded, cohesionless soil		
SP/SM	Silty sand and gravel	0.09	0.20
	Clean, coarse to fine sand	0.12	0.35
SM	Coarse to fine silty sand	0.15	0.25
SC	Sandy silt (inorganic)	0.18 0.21 0.23	0.25 SM/SC
	Inorganic, cohesive soil		
CL	Silt, some clay; silty clay; clay	0.29	0.27
	Organic, fine-grained soil		
	Organic silt, little clay	0.35	0.50

* The value of the constant b should be taken as e_{min} whenever the latter is known or can conveniently be determined. Otherwise, use tabulated values as a rough approximation.

for materials such as sand and gravel, which are too coarse for testing in consolidometers of conventional size, represent assumptions based on study of available settlement records.

5–16. GENERALIZATIONS AS TO COMPRESSIBILITY

Before describing procedures for utilizing Eq. (5-7) for evaluation of the compression index in practical applications, it may be instructive to consider certain general aspects of compressibility which are evident from the discussion which has thus far been presented. These generalities may be stated in the following manner.

At a given void ratio, a (confined) *uniform* material is less compressible than one which is well graded.

Considering (confined) uniform materials at a given void ratio, the [illegible] particle size, the more compressible is the material.

Soils in general with bulky, angular, or rounded part[illegible]s are less compressible than those with flat particles.

Clays with needle-shaped particles, such as attapulgite (and to a lesser degree, halloysite), are less compressible than those with plate-shaped particles, montmorillonite (plate-shaped particles plus expanding lattice) in particular.

Materials of any given type which include significant amounts of mica and/or organic matter are more (sometimes considerably more) compressible than those of the same type which do not.

As an overall generalization, the greater its void ratio prior to loading, the greater is the compressibility of any given soil type; and vice versa.[15]

5–17. INITIAL DENSITY OF SOIL FORMATIONS

It is evident that information on the original, "no-load" void ratio of a formation must be available if the C_c, e_0 relationship is to be used directly for estimating soil compressibility. A rather general impression apparently exists to the effect that sedimentary formations, at least, are laid down initially in a condition approximating their maximum void ratio. Skempton's work suggests that this is true in the case of fine-grained sedimentary formations, clay in particular. Coupled with this belief is the assumption that the present, in-place condition of such formations is entirely the result of loading subsequent to deposition. If these assumptions could be completely accepted, the value e_{max} could be substituted for e_0 in Eq. (5-7) and application of the equation would be greatly simplified.

Unfortunately, there are many reasons for doubting the general ap[illegible]cability of such assumptions as the above. For example, in a texturally uniform deposit of fine-grained sand or silt, if these assumptions were valid, the void ratio of the material would steadily decrease with depth and at any given depth would have the same value at points which laterally are some distance apart. The finding of such a condition in a natural formation, however, is very much more the exception than the rule. In many cases, void ratio varies quite unpredictably both laterally and with depth. Most surprising to the layman, perhaps, is the finding that void ratio often *increases* with depth, loose sand layers being found beneath more compact surface layers and soft clay intervals underlying stiff clay.

The construction of compression diagrams based on use of the C_c, e_0 relationship in the manner described in the next section is often helpful

[15] This, of course, is the j[illegible]ation for the expenditure of [illegible]siderable sums of money to compact both [illegible]ills and natural soil formations [illegible] to loading.

sting.

·ield Compression Diagrams

-18. DEFINITION

As the term is used in this book, a field compression diagram is a ressure-void ratio curve originating at or passing through a point which epresents the in-place density of an element in a natural soil formation earth fill and the existing overburden pressure.

-19. CONSTRUCTION AND UTILIZATION

The recommended construction should be performed on semilog paper ith pressure and void ratio scales appropriate to the conditions of the roblem. The void ratio scale should cover the range from e_{max} to e_{min} or the material in question. For the pressure scale, it is usually sufficient make provision for two logarithmic cycles ranging from 0.1 to 1.0 and om 1.0 to 10.0 tons per sq. ft., respectively.

A pressure-void ratio curve originating at $e = e_{max}$ and $p = 0.1$ ton er sq. ft. is then constructed as shown in Fig. 5-14, by utilization of ne relationship,

$$C_c = a(e_{max} - b)$$

or clay soils, e_{max} can be taken as the void ratio at the liquid limit. or other soil types, an indication of e_{max} can be obtained by reference Table 2-3 or by test on representative material. Although of less ractical importance, it may be of interest to draw a second diagram, riginating at e_{min}. The latter may be assumed to be a horizontal line.

The two diagrams described above establish limits on the area within hich a point representing the in-place condition of the soil will fall cept in a very few cases, which are mentioned later. Points A, B, nd C in Fig. 5-14 represent examples of in-place condition points for dinary situations.

If a plotting of the in-place void ratio and overburden pressure for soil element of any type results in a point such as point A, close the uppermost limiting diagram, it may reasonably be assumed that e material was laid down in an approximation of its loosest condition nd that the subsequent reduction in void ratio was due entirely to eight of present overburden. If the soil is a cohesive type it would

tio and pressure plot at point B, it should be presumed, ... at ..., that it is precompressed and that the field compression diagr

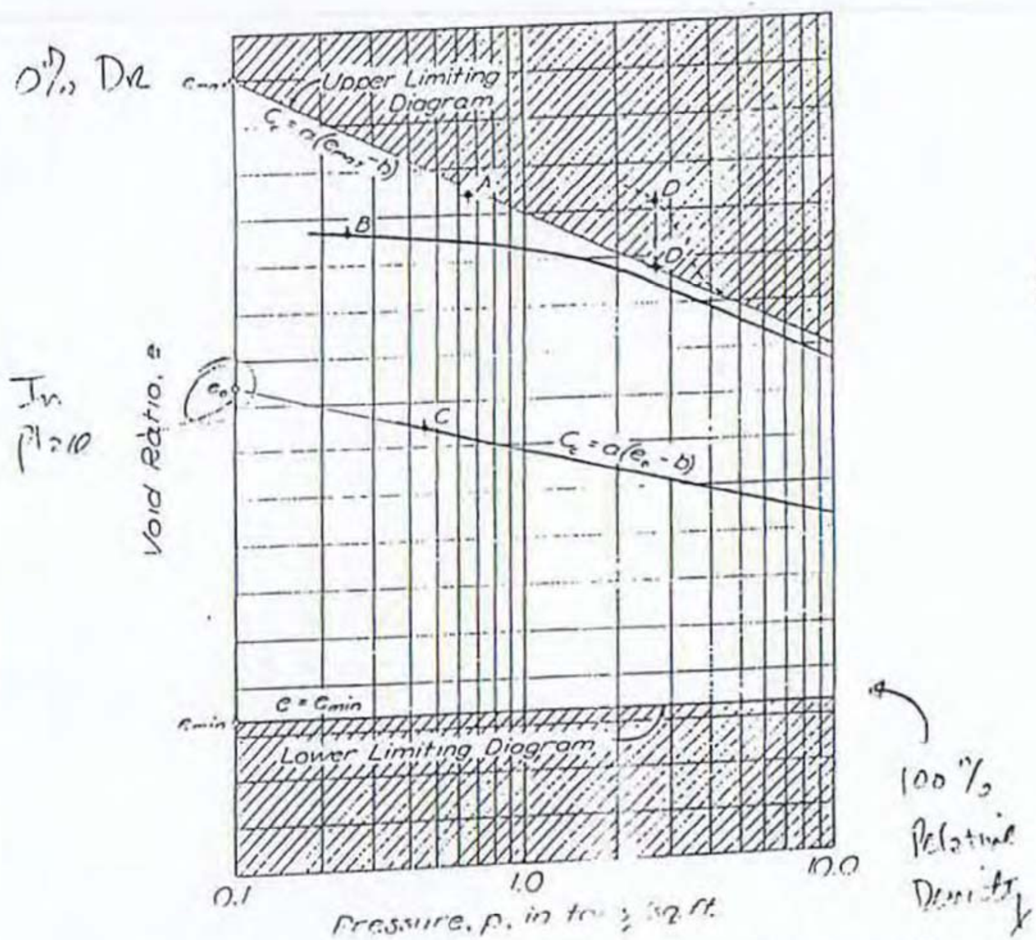

Fig. 5-14. Illustration of procedure for con...ucting field compression diagrams.

will resemble that shown by the full line d...gram through B in Fig. 5-14. This plotting provides a reasonable ...s for recommending a program of undisturbed sampling and labor... testing even though greater than ordinary expense may be involve...

Reference No. 4
Settlement

However, if the e vs. $\log p$ curve is given, it is possible to simply pick Δe off the plot for the appropriate range of pressures. This figure may be substituted into Eq. (7.18) for calculation of settlement, S.

7.8 Compression Index (C_c)

The compression index for calculation of field settlement due to consolidation can be determined by graphic construction (as shown in Figure 7.12) after obtaining laboratory test results for void ratio and pressure.

Terzaghi and Peck (1967) suggest the following empirical expressions for compression index:

for undisturbed clays

$$C_c = 0.009(LL - 10) \tag{7.24}$$

for remolded clays

$$C_c = 0.007(LL - 10) \tag{7.25}$$

where LL = liquid limit, in percent

In the absence of laboratory consolidation data, Eq. (7.24) is often used for approximate calculation of primary consolidation in the field.

Several other correlations for compression index are also available now. They have been developed by testing various clays. Some of these correlations are given in Table 7.1.

7.9 Swell Index (C_s)

The swell index is appreciably smaller in magnitude than the compression index and can generally be determined from laboratory tests. In most cases

$$C_s \simeq \frac{1}{5} \text{ to } \frac{1}{10} C_c \tag{7.26}$$

Table 7.1 Correlations for Compression Index, C_c*

Equation	Reference	Region of applicability
$C_c = 0.007(LL - 7)$	Skempton	Remolded clays
$C_c = 0.01 w_N$		Chicago clays
$C_c = 1.15(e_O - 0.27)$	Nishida	All clays
$C_c = 0.30(e_O - 0.27)$	Hough	Inorganic cohesive soil: silt, silty clay, clay
$C_c = 0.0115 w_N$		Organic soils, peats, organic silt, and clay
$C_c = 0.0046(LL - 9)$		Brazilian clays
$C_c = 0.75(e_O - 0.5)$		Soils with low plasticity
$C_c = 0.208 e_O + 0.0083$		Chicago clays
$C_c = 0.156 e_O + 0.0107$		All clays

*After Rendon-Herrero (1980)

Note: e_O = *in situ* void ratio; w_N = *in situ* water content

Boring B-132

Final Stress Due to Buildout						Initial Stress Due to Pre-Mining Soil Stress					
Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)	Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
106	79.5	Class III	26.5	50	1,325.0	79.5	120	SC	40.5	110.0	4,455.0

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Stress Soil & Pre-Mining (psf)	Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
														Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 120. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
79.5						0.0		0.0	4,455.0	1,325.0				
	SC	7.5	3.75	14-23	115.8		434.1	434.1	4,889.1	1,759.1	0.6	0.138	0.00	
SHGWT EL 72						434.1		868.1	5,757.2	2,627.2				
	SC	7.04	3.52	14-23	126.8		226.5	1,094.7	6,851.9	3,721.9	0.6	0.138	0.00	
EL 64.96						226.5		1,321.2	8,173.0	5,043.0				
	SP	30	15	13-28	127.8		980.6	2,301.7	10,474.8	7,344.8	0.575	0.05625	0.00	
EL 34.96						980.6		3,282.3	13,757.1	10,627.1				
	SC	10	5	9	120.2		289.2	3,571.5	17,328.6	14,198.6	0.78	0.138	0.00	
EL 24.96						289.2		3,860.7	21,189.3	18,059.3				
	SC/LS	5	2.5	29	126.8		160.9	4,021.6	25,210.9	22,080.9	0.6	0.138	0.00	
EL 19.96						160.9		4,182.5	29,393.4	26,263.4				
	END	59.54	(Total Boring 65ft - Ground EL 79.96 (in 2017); EL 19.96 (60 BLS) high SPT; EL 14.96 (65 BLS) limestone; refusal)										**0.00**	**ft - Estimated Settlement**
													0.0	**in - Estimated Settlement**

Boring B-3

Final Stress Due to Buildout							Initial Stress Due to Pre-Mining Soil Stress					
Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)		Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
106	77.95	Class III	28.05	50	1,402.5		77.95	108	SP & SC	30.05	110.0	3,305.5

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
														Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 108. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
77.95						0.0		0.0	3,305.5	1,402.5				
	SC	5.95	2.975	10-14	115.8		344.4	344.4	3,649.9	1,746.9	0.6	0.138	0.00	
SHGWT EL 72						344.4		688.7	4,338.6	2,435.6				
	SC	14	7	10-14	126.8		450.5	1,139.2	5,477.8	3,574.8	0.6	0.138	0.00	
EL 58						450.5		1,589.6	7,067.4	5,164.4				
	CL	5	2.5	6	109.2		117.0	1,706.6	8,774.0	6,871.0	1.2	0.1979	0.00	
EL 53						117.0		1,823.6	10,597.6	8,694.6				
	SC	8	4	2-6	118.4		223.8	2,047.5	12,645.1	10,742.1	0.84	0.138	0.00	
EL 45						223.8		2,271.3	14,916.4	13,013.4				
	SC/LS	0	0	7	120.2		0.0	2,271.3	17,187.6	15,284.6	0.78	0.138	0.00	
EL 45	LS					0.0		2,271.3	19,458.9	17,555.9				
	END	32.95	(Total Boring 50ft - Ground EL 95 (in 2000); limestone @ EL45)										**0.00**	**ft - Estimated Settlement**
													0.0	**in - Estimated Settlement**

Boring B-131

Final Stress Due to Buildout							Initial Stress Due to Pre-Mining Soil Stress					
Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)		Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
106	76.09	Class III	29.91	50	1,495.5		76.09	88	SP & SC	11.91	110.0	1,310.1

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
														Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 88. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
76.09						0.0		0.0	1,310.1	1,495.5				
	SC	4.09	2.045	12-19	115.8		236.7	236.7	1,546.8	1,732.2	0.6	0.138	0.02	
SHGWT EL 72						236.7		473.4	2,020.2	2,205.6				
	SC	10.46	5.23	12-19	126.8		336.6	810.0	2,830.2	3,015.6	0.6	0.138	0.02	
EL 61.54						336.6		1,146.5	3,976.7	4,162.1				
	SC	10	5	6-8	120.2		289.2	1,435.7	5,412.5	5,597.9	0.78	0.138	0.01	
EL 51.54						289.2		1,725.0	7,137.4	7,322.8				
	SC	15	7.5	6-8	120.2		433.8	2,158.8	9,296.2	9,481.6	0.78	0.138	0.01	
EL 36.54						433.8		2,592.6	11,888.8	12,074.2				
	SC/LS	0	0	54	138.1		0.0	2,592.6	14,481.4	14,666.8	0.36	0.138	0.00	
EL 36.54	LS					0.0		2,592.6	17,074.0	17,259.4				
	END	39.55	(Total Boring 45ft - Ground EL 81.54 (in 2017); limestone @ EL36.54)										**0.06**	**ft - Estimated Settlement**
													0.8	**in - Estimated Settlement**

Boring B-5

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
106	75.67	Class III	30.33	50	1,516.5

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
75.67	84	SP & SC	8.33	110.0	916.3

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
														Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 84. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
75.67						0.0		0.0	916.3	1,516.5				
	SP	3.67	1.835	4-7	102.9		188.8	188.8	1,105.1	1,705.3	0.8	0.05625	0.02	
SHGWT EL 72						188.8		377.6	1,482.7	2,082.9				
	SP	6	3	4-7	119.6		171.6	549.2	2,031.9	2,632.1	0.8	0.05625	0.02	
EL 66						171.6		720.8	2,752.7	3,352.9				
	SC	4	2	8	120.2		115.7	836.5	3,589.2	4,189.4	0.78	0.138	0.02	
EL 62						115.7		952.2	4,541.4	5,141.6				
	CH	5	2.5	10	119.6		143.0	1,095.2	5,636.6	6,236.8	0.8	0.1355	0.02	
EL 57						143.0		1,238.2	6,874.8	7,475.0				
	SC	17	8.5	4-12	120.2		491.7	1,729.8	8,604.6	9,204.8	0.78	0.138	0.04	
EL 40						491.7		2,221.5	10,826.1	11,426.3				
	CH	8	4	4	100.8		153.7	2,375.2	13,201.3	13,801.5	1.2	0.1979	0.01	
EL 32	LS													
	END	43.67	(Total Boring 45ft - Ground EL 80 (in 2000); limestone @ EL36.54)										**0.13**	**ft - Estimated Settlement**
													1.6	**in - Estimated Settlement**

Boring B-21

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
94	75.16	Class III	18.84	75	1,413.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
75.16	86	SP & SC	10.84	110.0	1,192.4

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
														Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 86. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
75.16						0.0		0.0	1,192.4	1,413.0				
	SC	3.16	1.58	4-9	104.0		164.4	164.4	1,356.8	1,577.4	0.78	0.138	0.02	
SHGWT EL 72						164.4		328.8	1,685.6	1,906.2				
	SC	4	2	4-9	120.2		115.7	444.5	2,130.1	2,350.7	0.78	0.138	0.01	
EL 68						115.7		560.2	2,690.2	2,910.8				
	CL	4	2	5	109.2		93.6	653.8	3,344.0	3,564.6	1.2	0.1979	0.01	
EL 64						93.6		747.4	4,091.3	4,311.9				
	CL	6	3	4	100.8		115.3	862.6	4,953.9	5,174.5	1.68	0.27278	0.01	
EL 58						115.3		977.9	5,931.8	6,152.4				
	SC	3	1.5	4	118.4		83.9	1,061.8	6,993.6	7,214.2	0.78	0.138	0.003	
EL 55														
	END	20.16	(Total Boring 20ft - Ground EL 75 (in 2003); Minor fill to floor bottom EL 75.16)										**0.05**	**ft - Estimated Settlement**
													0.6	**in - Estimated Settlement**

ATTACHMENT K

NO.	DATE	REVISION DESCRIPTION	BY

Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:
PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:
TOE DRAIN PLAN PROFILE

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING:

REVIEW ONLY-NOT FOR CONSTRUCTION

C:\Civil 3D Projects\02000-217-17_03\CADD\Misc\CADD Files\Header Pipe_PLAN PROFILE.dwg PLOT DATE 1/29/2018 9:37 AM BY MAF

Boring B-101

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
160	82.5	Class III	77.5	50	3,875.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
82.5	130	SP & SC	47.5	110.0	5,225.0

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El 82.5								0	5,225.0	3,875.0				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 130. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
	SP	1.64	0.82	9	102.9		84.4	84.4	5,309.4	3,959.4	0.8	0.05625	0.00	
80.86						84.4		168.7	5,478.1	4,128.1				
	CL	8.86	4.43	6-7	97.7		432.9	601.6	6,079.7	4,729.7	1.2	0.1979	0.00	
SHGWT EL 72						432.9		1,034.5	7,114.2	5,764.2				
	CL	2.14	1.07	6-7	109.2		50.1	1,084.6	8,198.7	6,848.7	1.2	0.1979	0.00	
EL 69.86						50.1		1,134.6	9,333.4	7,983.4				
	CL	14	7	3-4	100.8		268.9	1,403.6	10,736.9	9,386.9	1.68	0.27278	0.00	
EL 55.86						268.9		1,672.5	12,409.4	11,059.4				
	SC/LS	9.5	4.75	20-27	126.8		305.7	1,978.1	14,387.5	13,037.5	0.6	0.138	0.00	
EL 46.36														
	END	36.14	(Total Boring 43.5ft - Ground EL 89.86(in 2017); Excavate floor bottom EL 82.5										**0.00**	**ft - Estimated Settlement**
													0.0	**in - Estimated Settlement**

Boring B-102

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
160	81.25	Class III	78.75	50	3,937.5

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.25	122	SP & SC	40.75	110.0	4,482.5

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El 81.25								0	4,482.5	3,937.5				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 122. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
	CL	3.4	1.7	13	119.4		203.0	203.0	4,685.5	4,140.5	0.8	0.1355	0.00	
77.85						203.0		406.1	5,091.6	4,546.6				
	CL	5.85	2.925	7	97.7		285.8	691.9	5,783.4	5,238.4	1.2	0.1979	0.00	
SHGWT EL 72						285.8		977.7	6,761.1	6,216.1				
	CL	3.15	1.575	7	109.2		73.7	1,051.4	7,812.5	7,267.5	1.2	0.1979	0.00	
EL 68.85						73.7		1,125.1	8,937.6	8,392.6				
	SP	6	3	6	119.6		171.6	1,296.7	10,234.3	9,689.3	0.8	0.05625	0.00	
EL 62.85						171.6		1,468.3	11,702.6	11,157.6				
	SP	10	5	21-28	127.8		326.9	1,795.1	13,497.7	12,952.7	0.575	0.05625	0.00	
EL 52.85						326.9		2,122.0	15,619.7	15,074.7				
	SP	15	7.5	7-14	119.6		429.0	2,551.0	18,170.7	17,625.7	0.575	0.05625	0.00	
EL 37.85						429.0		2,980.0	21,150.7	20,605.7				
	SP	5	2.5	34	136.6		185.5	3,165.5	24,316.2	23,771.2	0.3875	0.05625	0.00	
EL 32.85														
	END	48.4	(Total Boring 50ft - Ground EL 82.85 (in 2003); Minor excavation to floor bottom EL 81.25)										**0.00**	**ft - Estimated Settlement**
													0.0	**in - Estimated Settlement**

Boring B-103

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
140	81	Class III	59	50	2,950.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81	108	SP & SC	27	110.0	2,970.0

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor EL 81								0	2,970.0	2,950.0				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 108. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
	SC	1.22	0.61	10	104.0		63.5	63.5	3,033.5	3,013.5	0.78	0.138	0.00	
79.78						63.5		126.9	3,160.4	3,140.4				
	CL	7.78	3.89	5	97.7		380.1	507.0	3,667.4	3,647.4	1.2	0.1979	0.00	
SHGWT EL 72						380.1		887.1	4,554.6	4,534.6				
	CL	7.25	3.625	5	109.2		169.7	1,056.8	5,611.4	5,591.4	1.2	0.1979	0.00	
EL 64.75						169.7		1,226.4	6,837.8	6,817.8				
	CL	9.97	4.985	9-14	119.6		285.1	1,511.6	8,349.4	8,329.4	0.8	0.1355	0.00	
EL 54.78						285.1		1,796.7	10,146.1	10,126.1				
	CL	5	2.5	4	100.8		96.0	1,892.8	12,038.9	12,018.9	1.2	0.1979	0.00	
EL 49.78						96.0		1,988.8	14,027.7	14,007.7				
	LS	8.5	4.25	>50	135.9		312.6	2,301.4	16,329.1	16,309.1	0.4	0.0731	0.00	
EL 41.28	LS													
	END	39.72	(Total Boring 38.5ft - Ground EL 79.78 (in 2017); Minor Fill of compacted clay to floor bottom EL 81)										**0.00**	**ft - Estimated Settlement**
													0.0	**in - Estimated Settlement**

Boring B-104

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
160	81.5	Class III	78.5	50	3,925.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.5	123	SP & SC	41.5	110.0	4,565.0

Soil Layers		Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor EL	81.5								0	4,565.0	3,925.0				
		SC	1.57	0.785	10	104.0		81.7	81.7	4,646.7	4,006.7	0.6	0.138	0.00	
	79.93						81.7		163.4	4,646.7	4,006.7				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 123. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
		CL	5	2.5	10	119.4		298.6	461.9	5,108.6	4,468.6	0.8	0.1355	0.00	
	74.93						298.6		760.5	5,869.1	5,229.1				
		CL	2.93	1.465	4-6	97.7		143.1	903.6	6,772.7	6,132.7	1.2	0.1979	0.00	
SHGWT EL	72						143.1		1,046.8	7,819.5	7,179.5				
		CL	17.07	8.535	4-6	109.2		399.4	1,446.2	9,265.7	8,625.7	1.2	0.1979	0.00	
EL	54.93						399.4		1,845.7	11,111.4	10,471.4				
		SC	10	5	26-27	126.8		321.8	2,167.4	13,278.8	12,638.8	0.6	0.138	0.00	
EL	44.93						321.8		2,489.2	15,768.0	15,128.0				
		SP	5	2.5	13	127.8		163.4	2,652.6	18,420.5	17,780.5	0.575	0.05625	0.00	
EL	39.93						163.4		2,816.0	21,236.6	20,596.6				
		SP	10	5	32-40	136.6		371.0	3,187.0	24,423.6	23,783.6	0.3875	0.05625	0.00	
EL	29.93														
		END	50	(Total Boring 50ft - Ground EL 79.96 (in 2017); Minor fill to floor bottom EL 81.5)										**0.00**	**ft - Estimated Settlement**
														0.0	**in - Estimated Settlement**

Boring B-105

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
217	81.75	Class III	135.25	50	6,762.5

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.75	106	SP & SC	24.25	110.0	2,667.5

Soil Layers		Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El	81.75								0	2,667.5	6,762.5				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 106. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
		SC	1.45	0.725	10	104.0		75.4	75.4	2,742.9	6,837.9	0.78	0.138	0.04	
	80.3						75.4		150.9	2,893.8	6,988.8				
		CL	8.3	4.15	'5-8	97.7		405.5	556.4	3,450.2	7,545.2	1.2	0.1979	0.25	
SHGWT EL	72						405.5		961.9	4,412.1	8,507.1				
		CL	16.7	8.35	5-8	109.2		390.8	1,352.7	5,764.7	9,859.7	1.2	0.1979	0.35	
EL	55.3						390.8		1,743.4	7,508.2	11,603.2				
		SP	10	5	22-26	119.6		286.0	2,029.4	9,537.6	13,632.6	0.575	0.05625	0.06	
EL	45.3						286.0		2,315.4	11,853.1	15,948.1				
		SC/LS	4	2	19	126.8		128.7	2,444.1	14,297.2	18,392.2	0.6	0.138	0.04	
EL	41.3						128.7		2,572.8	16,870.0	20,965.0				
		LS	4.5	2.25	>50	138.1		170.3	2,743.2	19,613.2	23,708.2	0.36	0.138	0.04	
EL	36.8														
		END	44.95	(Total Boring 43.55ft - Ground EL 80.3 (in 2017); Minor Fill of compacted clay to floor bottom EL 81.75)										**0.78**	**ft - Estimated Settlement**
														9.4	**in - Estimated Settlement**

Boring B-106

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
217	81.5	Class III	135.5	50	6,775.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.5	105	SP & SC	23.5	110.0	2,585.0

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
														Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 105. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
Floor EL 81.5						0.0		0.0	2,585.0	6,775.0				
	CL	9.5	4.75	5-9	97.7		464.1	464.1	3,049.1	7,239.1	1.2	0.1979	0.32	
SHGWT EL 72						464.1		928.3	3,977.4	8,167.4				
	CL	5.48	2.74	5-9	109.2		128.2	1,056.5	5,033.9	9,223.9	1.2	0.1979	0.13	
EL 66.52						128.2		1,184.7	6,218.6	10,408.6				
	SC	5	2.5	13	126.8		160.9	1,345.6	7,564.3	11,754.3	0.6	0.138	0.08	
EL 61.52						160.9		1,506.5	9,070.7	13,260.7				
	CL	15	7.5	8-16	119.6		429.0	1,935.5	11,006.2	15,196.2	0.8	0.1355	0.16	
EL 46.52						429.0		2,364.5	13,370.7	17,560.7				
	SC	10	5	13	120.2		289.2	2,653.7	16,024.4	20,214.4	0.6	0.138	0.09	
EL 36.52						289.2		2,942.9	18,967.3	23,157.3				
	CL	5	2.5	10	119.6		143.0	3,085.9	22,053.2	26,243.2	0.8	0.1355	0.03	
EL 31.52						143.0		3,228.9	25,282.1	29,472.1				
	SC	5	2.5	12-14	126.8		160.9	3,389.8	28,671.9	32,861.9	0.6	0.138	0.03	
EL 26.52														
	END	54.98	(Total Boring 55ft - Ground EL 81.52 (in 2017); Minor Fill of compacted clay to floor bottom EL 81.5)										**0.83**	**ft - Estimated Settlement**
													10.0	**in - Estimated Settlement**

Boring B-107

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
195	81.4	Class III	113.6	50	5,680.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.4	106	SP & SC	24.6	110.0	2,706.0

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El 81.4								0	2,706.0	5,680.0				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 106. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
	SC	1.29	0.645	10	104.0		67.1	67.1	2,773.1	5,747.1	0.78	0.138	0.03	
80.11						67.1		134.2	2,907.3	5,881.3				
	CL	8.11	4.055	7	97.7		396.2	530.4	3,437.8	6,411.8	1.2	0.1979	0.20	
SHGWT EL 72						396.2		926.7	4,364.4	7,338.4				
	CL	7.25	3.625	7	109.2		169.7	1,096.3	5,460.8	8,434.8	1.2	0.1979	0.12	
EL 64.75						169.7		1,266.0	6,726.7	9,700.7				
	CL	9.97	4.985	11	119.6		285.1	1,551.1	8,277.8	11,251.8	0.8	0.1355	0.10	
EL 54.78						285.1		1,836.3	10,114.1	13,088.1				
	SC	5	2.5	10	126.8		160.9	1,997.1	12,111.2	15,085.2	0.6	0.138	0.04	
EL 49.78						160.9		2,158.0	14,269.2	17,243.2				
	SC/LS	8.5	4.25	41	138.1		321.8	2,479.8	16,749.0	19,723.0	0.45	0.138	0.06	
EL 41.28	LS													
	END	40.12	(Total Boring 38.5ft - Ground EL 79.78 (in 2017); Minor Fill of compacted clay to floor bottom EL 81)										**0.55**	**ft - Estimated Settlement**
													6.6	**in - Estimated Settlement**

Boring B-108

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
140	80.75	Class III	59.25	50	2,962.5

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
80.75	100	SP & SC	19.25	110.0	2,117.5

Soil Layers		Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El	80.75								0	2,117.5	2,962.5				Note: Settlement numbers are conservative
		SC	5.85	2.925	10	104.0		304.3	304.3	2,421.8	3,266.8	0.78	0.138	0.06	since ground level in Pre-mininig years
	74.9						304.3		608.7	3,030.5	3,875.5				indicated existing ground surface elevation in
		CL	2.9	1.45	11	119.4		173.2	781.8	3,812.4	4,657.4	0.8	0.1355	0.02	this area was approximately EL 100.
SHGWT EL	72						173.2		955.0	4,767.4	5,612.4				Therefore, soils below the bottom clay barrier
		CL	7.1	3.55	11	119.6		203.1	1,158.1	5,925.4	6,770.4	0.8	0.1355	0.03	proposed for the Cell 17 area were initially
EL	64.9						203.1		1,361.1	7,286.6	8,131.6				stressed during the pre-mining years. The
		CL	5	2.5	8	119.6		143.0	1,504.1	8,790.7	9,635.7	1.2	0.1979	0.02	excavation and removal of soils to form the
EL	59.9						143.0		1,647.1	10,437.8	11,282.8				bottom barrier soil with replacement of
		SC/LS	5	2.5	8	120.2		144.6	1,791.7	12,229.6	13,074.6	0.78	0.138	0.01	lighter waste material will result in virtual no
EL	54.9						144.6		1,936.3	14,165.9	15,010.9				increase is stress and thus no additional
		SC/LS	5	2.5	47	133.4		177.5	2,113.9	16,279.8	17,124.8	0.45	0.138	0.01	settlement at this location.
EL	49.9														
		END	30.85	(Total Boring 25ft - Ground EL 74.9 (in 2017); Minor Fill of compacted clay to floor bottom EL 80.75)										**0.15**	**ft - Estimated Settlement**
														1.8	**in - Estimated Settlement**

Boring B-109

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
140	81.1	Class III	58.9	50	2,945.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.1	99.25	SP & SC	18.15	110.0	1,996.5

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El 81.1								0	1,996.5	2,945.0				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 99.25. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
	SC	4.75	2.375	10	104.0		247.1	247.1	2,243.6	3,192.1	0.78	0.138	0.06	
76.35						247.1		494.2	2,737.8	3,686.3				
	CL	4.35	2.175	5-7	97.7		212.5	706.7	3,444.6	4,393.1	1.2	0.1979	0.04	
SHGWT EL 72						212.5		919.3	4,363.9	5,312.4				
	CL	10.65	5.325	5-7	109.2		249.2	1,168.5	5,532.3	6,480.8	1.2	0.1979	0.07	
EL 61.35						249.2		1,417.7	6,950.0	7,898.5				
	CL	5	2.5	6	109.2		117.0	1,534.7	8,484.7	9,433.2	1.2	0.1979	0.02	
EL 56.35						117.0		1,651.7	10,136.4	11,084.9				
	SC/LS	5	2.5	28	126.8		160.9	1,812.6	11,949.0	12,897.5	0.6	0.138	0.01	
EL 51.35	LS													
	END	29.75	(Total Boring 25ft - Ground EL 76.35 (in 2017); Minor Fill of compacted clay to floor bottom EL 81.1)										**0.20**	**ft - Estimated Settlement**
													2.4	**in - Estimated Settlement**

Boring B-110

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
217	81.5	Class III	135.5	50	6,775.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
81.5	98	SP & SC	16.5	110.0	1,815.0

Soil Layers	Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El 81.5								0	1,815.0	6,775.0				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 98. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
	SC	6.73	3.365	10	104.0		350.1	350.1	2,165.1	7,125.1	0.78	0.138	0.27	
74.77						350.1		700.2	1,815.0	6,775.0				
	CL	2.77	1.385	5	97.7		135.3	835.6	2,650.6	7,610.6	1.2	0.1979	0.11	
SHGWT EL 72						135.3		970.9	3,621.5	8,581.5				
	CL	7.23	3.615	5	109.2		169.2	1,140.1	4,761.5	9,721.5	1.2	0.1979	0.20	
EL 64.77						169.2		1,309.3	6,070.8	11,030.8				
	CL	5	2.5	20	128.4		165.0	1,474.3	7,545.1	12,505.1	0.56	0.09806	0.07	
EL 59.77						165.0		1,639.3	9,184.3	14,144.3				
	CL	5	2.5	13	119.6		143.0	1,782.3	10,966.6	15,926.6	0.8	0.1355	0.06	
EL 54.77						143.0		1,925.3	12,891.9	17,851.9				
	SC/LS	5	2.5	14	126.8		160.9	2,086.1	14,978.0	19,938.0	0.6	0.138	0.05	
EL 49.77						160.9		2,247.0	17,225.0	22,185.0				
	SC/LS	5	2.5	44-49	133.4		177.5	2,424.5	19,649.5	24,609.5	0.45	0.138	0.05	
EL 44.77														
	END	36.73	(Total Boring 30ft - Ground EL 74.77 (in 2017); Minor Fill of compacted clay to floor bottom EL 81.5)										**0.82**	**ft - Estimated Settlement**
													9.8	**in - Estimated Settlement**

Boring B-111

Final Stress Due to Buildout

Top EL (ft)	Floor (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
130	80.5	Class III	49.5	50	2,475.0

Initial Stress Due to Pre-Mining Soil Stress

Floor (ft)	Top of Boring (ft)	Material	Depth (ft)	Unit Weight (pcf)	Stress (psf)
80.5	95	SP & SC	14.5	110.0	1,595.0

Soil Layers		Type	(ft-total)	(ft-mid)	SPT N	Weight (pcf)	End Layer Stress (psf)	Mid-Layer Stress (psf)	Soil Stress (psf)	Initial Stress Soil & Pre-Mining (psf)	Final Stress Soil & Waste (psf)	Eo	Cc	Computed Settlement (ft)	Comment
Floor El	80.5								0	1,595.0	2,475.0				Note: Settlement numbers are conservative since ground level in Pre-mininig years indicated existing ground surface elevation in this area was approximately EL 95. Therefore, soils below the bottom clay barrier proposed for the Cell 17 area were initially stressed during the pre-mining years. The excavation and removal of soils to form the bottom barrier soil with replacement of lighter waste material will result in virtual no increase is stress and thus no additional settlement at this location.
		SC	5.68	2.84	10	104.0		295.5	295.5	1,890.5	2,770.5	0.78	0.138	0.07	
	74.82						295.5		591.0	1,595.0	2,475.0				
		CL	2.82	1.41	5	97.7		137.8	728.8	2,323.8	3,203.8	1.2	0.1979	0.04	
SHGWT EL	72						137.8		866.5	3,190.3	4,070.3				
		CL	2.18	1.09	5	109.2		51.0	917.5	4,107.8	4,987.8	1.2	0.1979	0.02	
EL	69.82						51.0		968.6	5,076.4	5,956.4				
		CL	15	7.5	10-11	119.6		429.0	1,397.6	6,474.0	7,354.0	0.8	0.1355	0.06	
EL	54.82						429.0		1,826.6	8,300.5	9,180.5				
		SC/LS	5	2.5	31	133.4		177.5	2,004.1	10,304.6	11,184.6	0.45	0.138	0.02	
EL	49.82						177.5		2,181.6	12,486.2	13,366.2				
		SC/LS	5	2.5	21	126.8		160.9	2,342.5	14,828.7	15,708.7	0.6	0.138	0.01	
EL	44.82														
		END	35.68	(Total Boring 30ft - Ground EL 74.82 (in 2017); Minor Fill of compacted clay to floor bottom EL 80.5)										**0.22**	**ft - Estimated Settlement**
														2.6	**in - Estimated Settlement**

ATTACHMENT L

Angelos Class III Cell 17 Expansion Cell 17_ North South Section_Eastside

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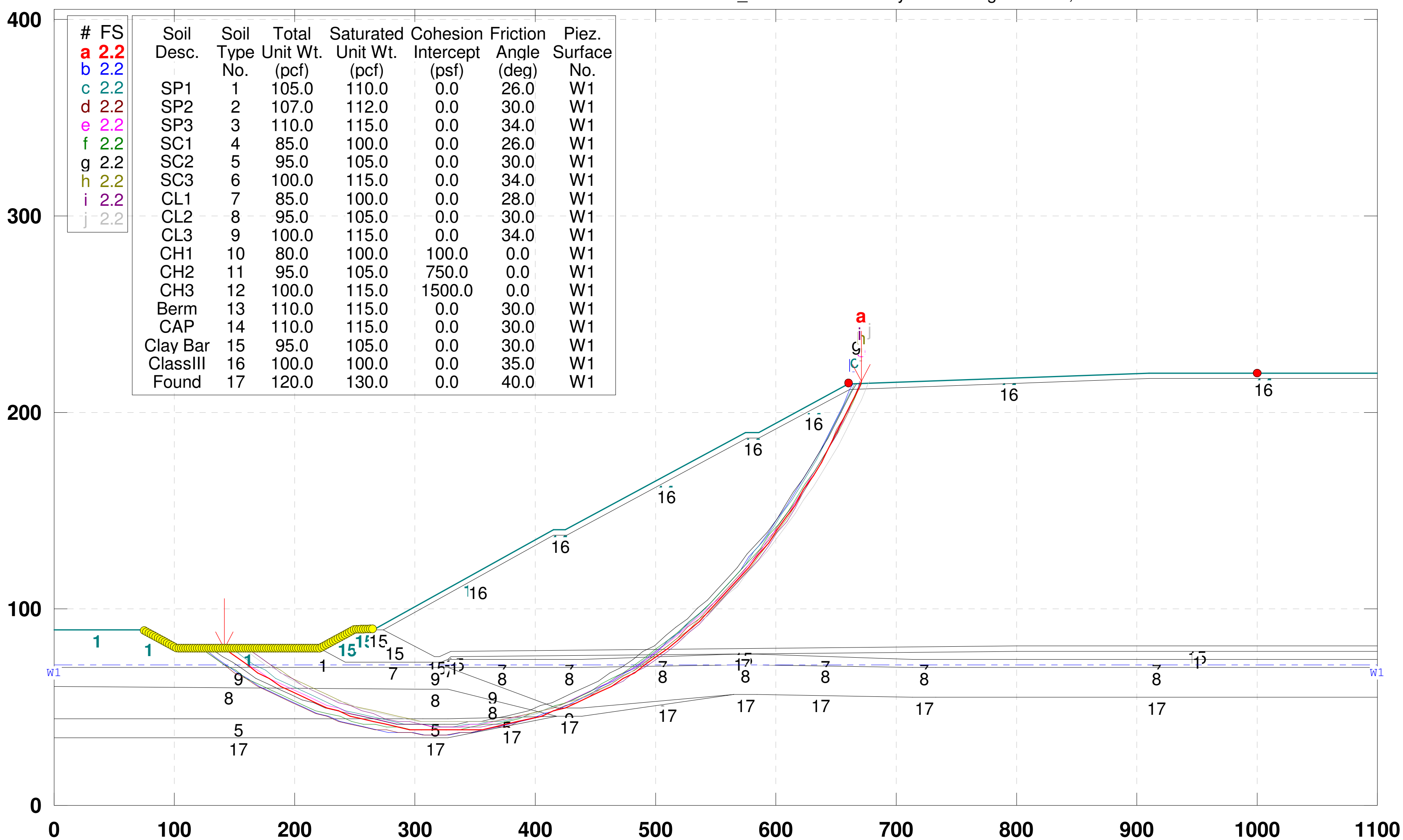
#	FS
a	2.2
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.2
h	2.2
i	2.2
j	2.2

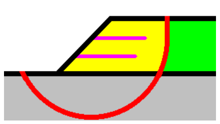
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	100.0	100.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1



STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED



Angelos Class III Cell 17 Expansion Cell 17_ North South Section_Westside

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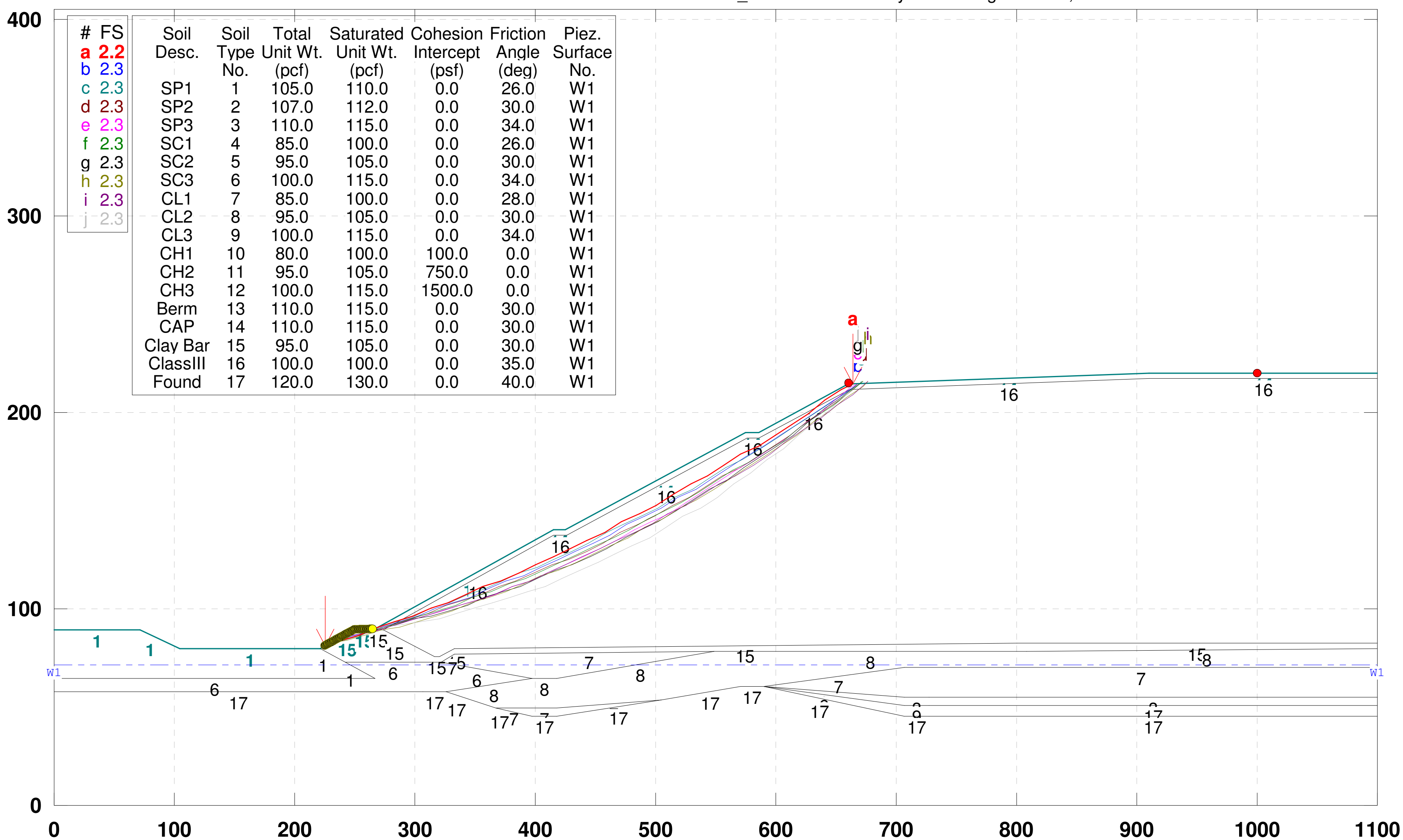

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	100.0	100.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 17_ West to East Section

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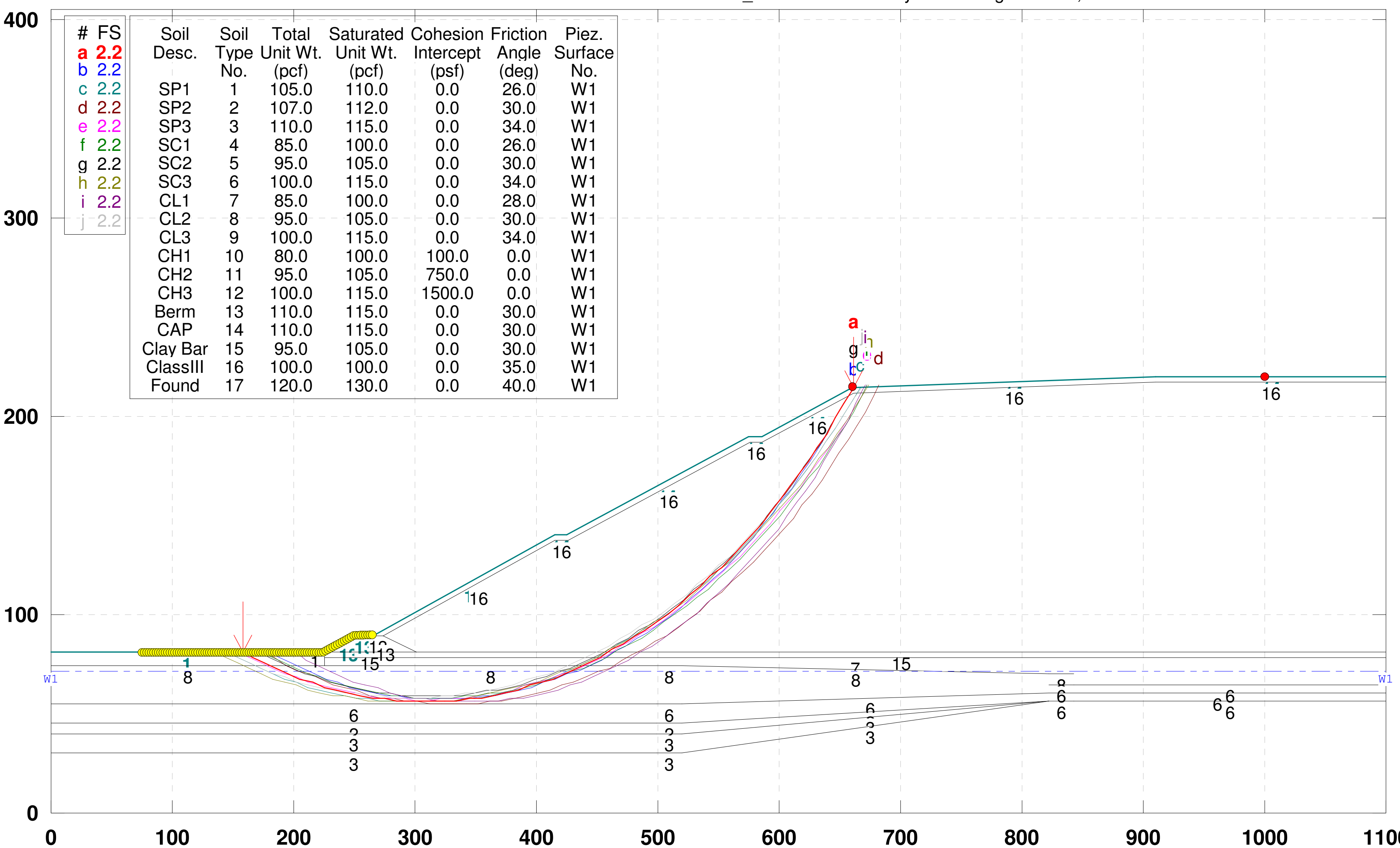


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	100.0	100.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

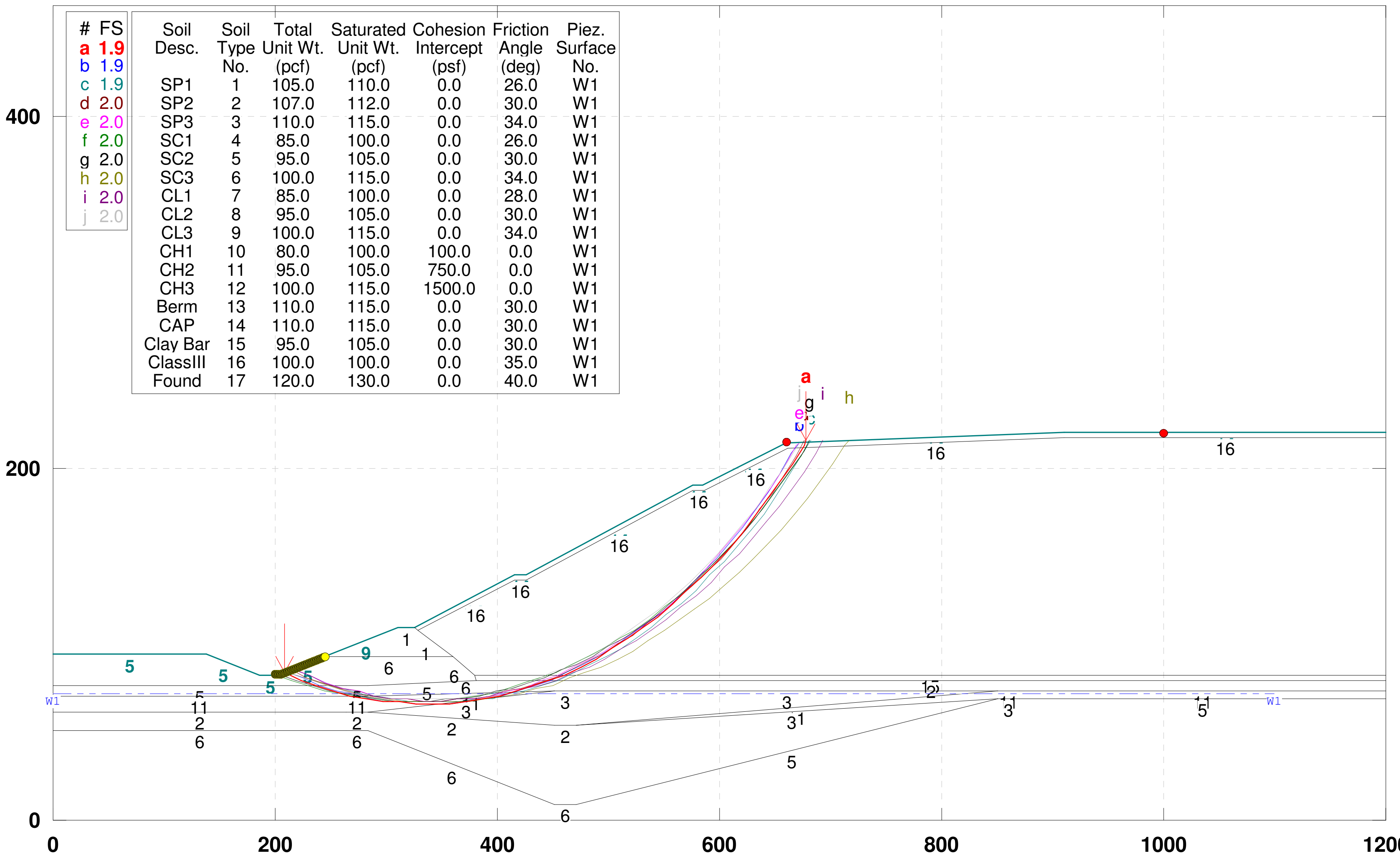
STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 1

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~2\CELL1~1\CELL_1.PL2 Run By: Civil Design Service, Inc 2/7/2018 8:05PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	100.0	100.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=1.9

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 2

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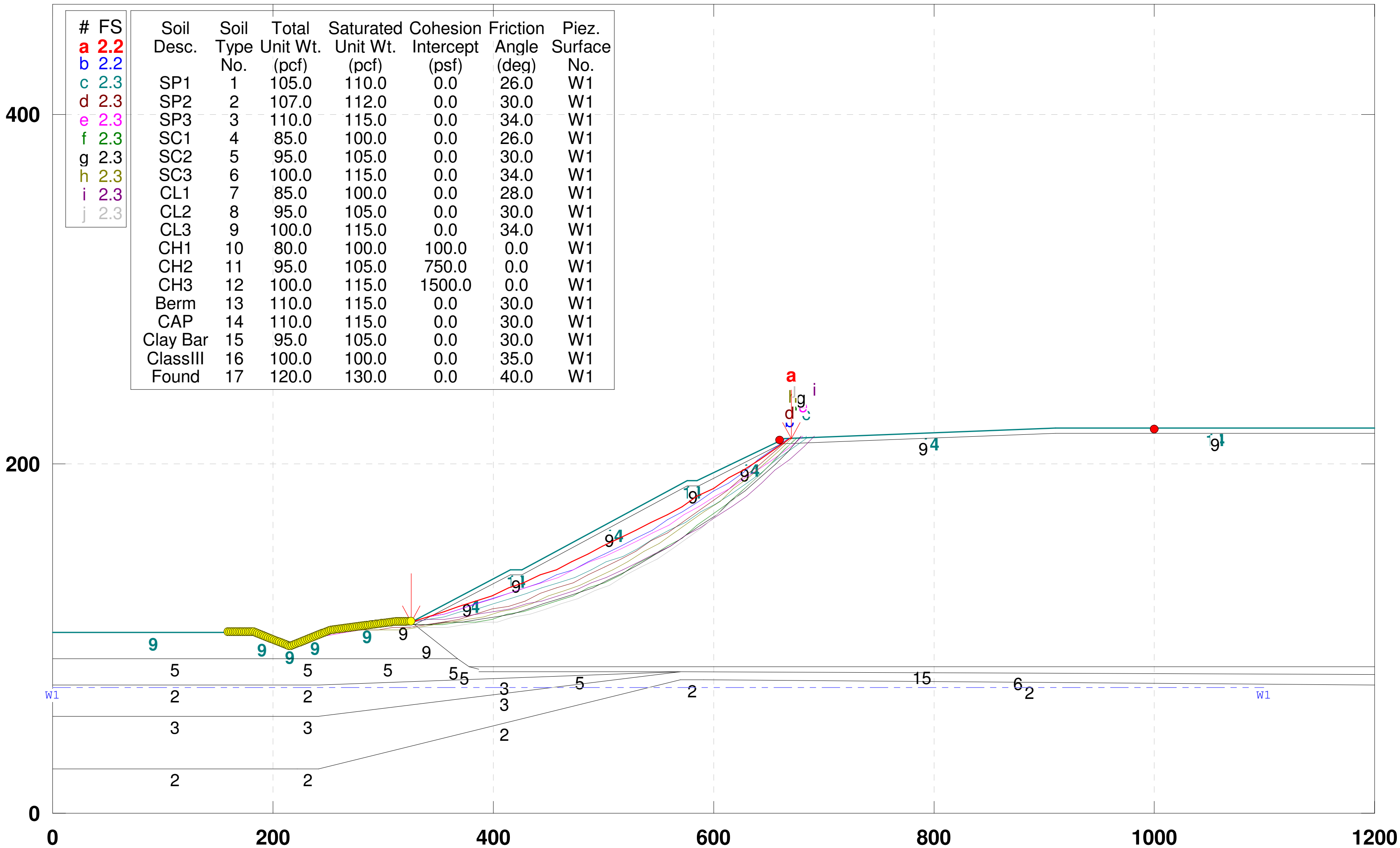

#	FS
a	2.2
b	2.2
c	2.3
d	2.3
e	2.3
f	2.3
g	2.3
h	2.3
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	100.0	100.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

Angelos Class III Cell 17 Expansion Cell 7

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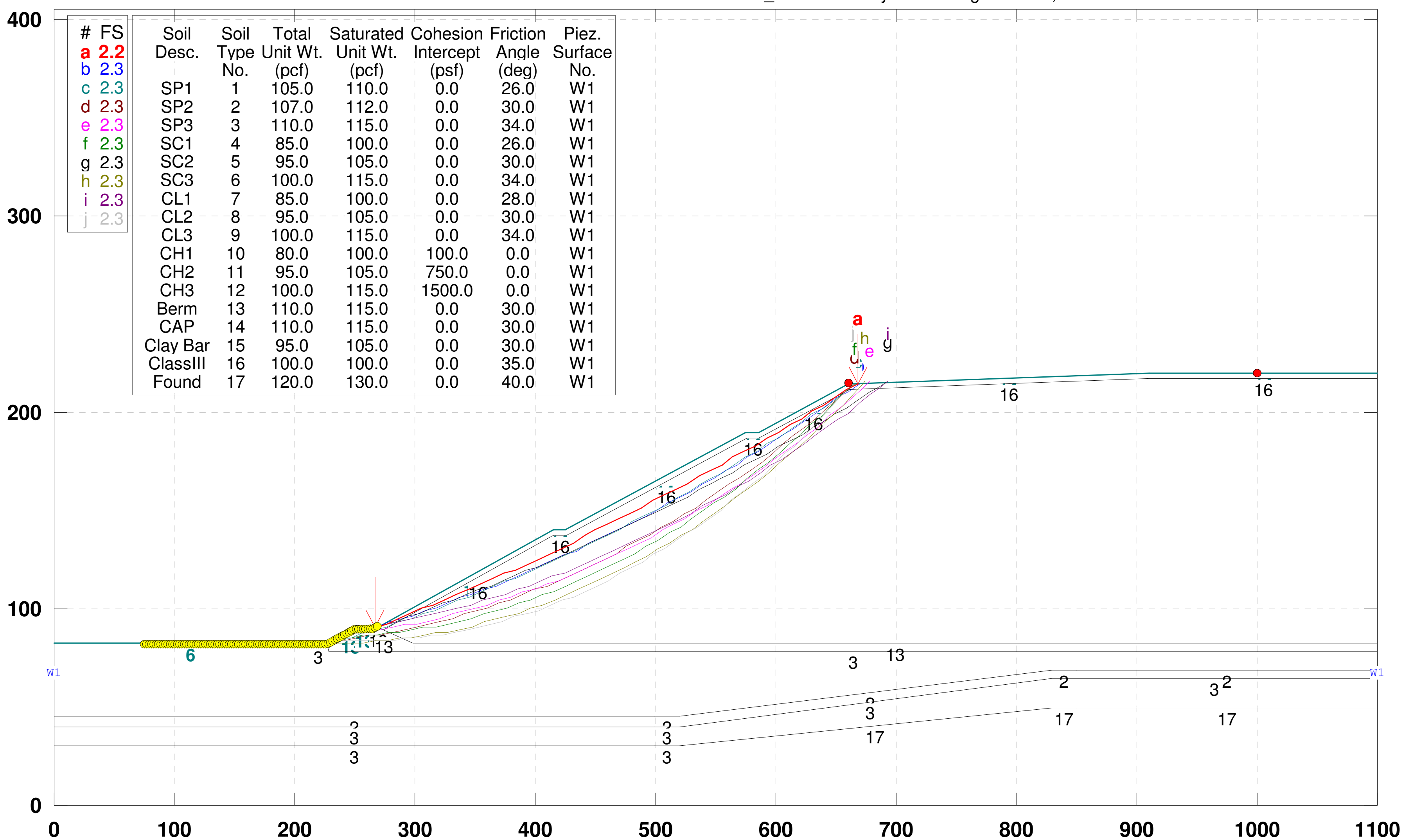

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	100.0	100.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

BORING FIELD REPORT

B-101

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Boring completed: 6/26/2017

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
0 (89.86)				
5	4,4,5	9		Pale brown fine sand (SP) SP N=9
10 (80.86)	4,3,4	7		Light gray sandy clay (CL)
15	3,3,3	6		Light gray clay (CL) with sand CL N=6-7
20 (69.86)	2,2,3	5		Pale brown sandy clay (CL)
25	1,1,2	3		Light gray clay (CL) with sand CL N=3-4
30	1,2,2	4		Light gray clay (CL)
35 (55.86)	8,10,10	20		Light gray limestone (LS) SC/LS
40	13,13,14	27		Light gray limestone (LS) N=20-27
(46.36)	50/1"	R		Light gray limestone (LS) LS Refusal
45				Boring terminated at 43.5 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
50				

Notes & additional data/info. (specify if other materials used):

Total depth = 43.5 feet bls

Ground surface elevation = 89.86 ft. NGVD

Florida West Coordinates = 1454538.70 N, 612506.86 E

Locklear & Associates

BORING FIELD REPORT

B-102

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/26/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil	
82.85	0					
77.85	5	5,5,8	13		Brown sandy clay (CL)	CL N=13
	10	3,3,4	7		Brown sandy clay (CL)	CL N=7
68.85	15	3,3,3	6		Brown fine sand (SP)	SP N=6
62.85	20	12,12,16	28		Brown fine sand (SP)	
	25	9,11,15	26		Brown fine sand (SP)	SP N= 21 - 28
52.85	30	9,10,11	21		Brown fine sand (SP)	
	35	4,6,5	11		Brown fine sand (SP)	SP N=7 -14
	40	3,3,4	7		Brown fine sand (SP)	
37.85	45	6,7,7	14		Brown fine sand (SP)	SP N=34
32.85	50	9,14,20	34		Brown fine sand (SP)	

Boring terminated at 50 feet bls

Loss of drilling fluid circulation was not observed or noted at the time of the boring

Notes & additional data/info. (specify if other materials used):

Total depth = 50 feet bls

Ground surface elevation = 82.85 ft. NGVD

Florida West Coordinates = 1454337.62 N, 612688.31 E

Locklear & Associates

BORING FIELD REPORT

B-103

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/27/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
79.78	0				
	5	2,2,3	5		Brown sandy clay (CL) CL N=5
	10	2,2,3	5		Brown sandy clay (CL)
64.78	15	3,4,6	10		Gray clay (CL) with sand
	20	4,5,9	14		Brown sandy clay (CL) CL N=9-14
54.78	25	3,3,6	9		Brown sandy clay (CL) CL N=4
49.78	30	2,2,2	4		Brown clay (CL) with limestone in the tip ~~XXXX~~ /LS Refusal
		50/1"	R		Light gray limestone (LS)
	35				
41.28		50/0"	R		Light gray limestone (LS)
	40				Boring terminated at 38.5 feet bls
					Loss of drilling fluid circulation was not observed or noted at the time of the boring
	45				
	50				

Notes & additional data/info. (specify if other materials used):

Total depth = 38.5 feet bls

Ground surface elevation = 79.78 ft. NGVD

Florida West Coordinates = 1454185.57 N, 612549.13 E

Locklear & Associates

BORING FIELD REPORT

B-104

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls

Boring completed: 6/27/2017
Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil	
79.93	0					CL1
74.93	5	4,5,5	10		Light brown sandy clay (CL)	N=10
	10	2,2,2	4		Gray sandy clay (CL)	CL2
	15	4,3,3	6		Gray sandy clay (CL)	N=4-6
	20	3,3,3	6		Gray sandy clay (CL)	
54.93	25	11,13,14	27		Brown clayey sand (SC)	SC3
	30	10,12,14	26		Brown clayey sand (SC)	N= 26-27
44.93	35	8,7,6	13		Brown fine sand (SP) with clay	SP2 N=13.
39.93	40	20,17,15	32		Brown fine sand (SP) with clay	SP3
	45	14,18,16	34		Brown fine sand (SP) with clay	N = 32-40
29.93	50	13,20,20	40		Brown fine sand (SP) with clay	

Boring terminated at 50 feet bls
Loss of drilling fluid circulation was not observed or noted at the time of the boring

Notes & additional data/info. (specify if other materials used):
Total depth = 505 feet bls
Ground surface elevation = 79.93 ft. NGVD
Florida West Coordinates = 1454200.03 N, 612859.75 E

Locklear & Associates

BORING FIELD REPORT

B-105

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Boring completed: 6/27/2017
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls
Geologist: WW

Elevation	Depth	SPT Data ASTM D1586 per 6"	N	Description of Soil	
80.30	0				
	5	3,3,5	8	Gray clay (CL) with sand	
	10	3,3,3	6	Gray clay (CL)	CL
	15	2,2,3	5	Gray sandy clay (CL)	N = 5 - 8
	20	2,2,3	5	Brown sandy clay (CL)	
55.3	25	12,12,14	26	Brown fine sand (SP)	SP
	30	10,10,12	22	Brown fine sand (SP)	N = 22 - 26
45.3	35	10,10,9	19	Gray limestone (LS)	SC/LS N = 19
41.3		50/2"	R	Light gray limestone (LS)	~~XLXA~~ LS Refusal
	40				
36.8		50/1"	R	Light gray limestone (LS)	
	45			Boring terminated at 43.5 feet bls	
				Loss of drilling fluid circulation was not observed or noted at the time of the boring	
	50				

Notes & additional data/info. (specify if other materials used):
Total depth = 43.5 feet bls
Ground surface elevation = 80.30 ft. NGVD
Florida West Coordinates = 1454339.69 N, 613008.50 E

Locklear & Associates

BORING FIELD REPORT

B-106

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls

Boring completed: 6/28/2017
Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
81.52	0				
	5	2,2,3	5		Light brown sandy clay (CL)
	10	5,4,5	9		Gray sandy clay (CL) CL N=5-9
66.52	15	5,6,7	13		Gray clayey sand (SC) SC N=13
61.52	20	4,4,4	8		Gray sandy clay (CL)
	25	6,7,8	15		Gray sandy clay (CL) CL
	30	5,7,9	16		Gray sandy clay (CL) B-16
46.52	35	6,6,7	13		Gray clayey sand (SC) SC
	40	4,5,8	13		Gray clayey sand (SC) N=13
36.52	45	5,5,5	10		Gray sandy clay (CL) CL N=10
31.52	50	4,5,7	12		Gray clayey sand (SC) SC N=12-14
26.52	55	6,6,8	14		Gray clayey sand (SC)

Loss of drilling fluid circulation was not observed or noted at the time of the boring

Boring terminated at 55 feet bls

Notes & additional data/info. (specify if other materials used):
Total depth = 55 feet bls
Ground surface elevation = 81.52 ft. NGVD
Florida West Coordinates = 1454510.26 N, 612856.15 E

Locklear & Associates

BORING FIELD REPORT

B-107

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Boring completed: 6/28/2017
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls
Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	Description of Soil
80.11	0			
	5	3,3,4	7	Gray sandy clay (CL) CL1 N=7
70.11	10	5,5,6	16 11	Gray sandy clay (CL) CL2 N=11
65.11	15	4,5,5	10	Gray limestone (LS) SC/LS 2 N=10
60.11	20	28,20,21	41	Light gray limestone (LS) SC/LS 3 N=41
56.61		50/2"	R	Light gray limestone (LS) YRKL
	25			Boring terminated at 23.5 feet bls Loss of drilling fluid circulation was not observed or noted at the time of the boring
	30			
	35			
	40			
	45			
	50			

Notes & additional data/info. (specify if other materials used):
Total depth = 23.5 feet bls
Ground surface elevation = 80.11 ft. NGVD
Florida West Coordinates = 1454486.21 N, 613193.16 E

Locklear & Associates

BORING FIELD REPORT

B-108

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Elevation	Depth	SPT Data ASTM D1586 per 6"	N	Description of Soil
74.90	0			
	5	5,5,5	10	Gray sandy clay (CL) CL N=10-11
64.9	10	4,5,6	11	Gray sandy clay (CL) CL N=8
59.9	15	3,4,4	8	Light gray clay (CL) with limestone in the tip SC/LS N=8
54.9	20	17,21,26	47	Light gray limestone (LS) S/LS N=47
49.9	25	25,50/2"	R	Light gray limestone (LS) Boring terminated at 25 feet bls Loss of drilling fluid circulation was not observed or noted at the time of the boring
	30			
	35			
	40			
	45			
	50			

Notes & additional data/info. (specify if other materials used):
Total depth = 25 feet bls
Ground surface elevation = 74.90 ft. NGVD
Florida West Coordinates = 1454343.16 N, 613358.25 E

Locklear & Associates

BORING FIELD REPORT

B-109

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/29/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	Description of Soil	
76.35	0				
	5	2,2,3	5	Gray sandy clay (CL)	CL
	10	3,3,4	7	Gray sandy clay (CL)	N = 5-7
61.35	15	3,3,3	6	Light gray clay (CL) with limestone in the tip	CL N = 6
56.35	20	12,14,14	28	Light gray limestone (LS)	SL/LS N = 28
51.35	25	17,20,24	44	Light gray limestone (LS) Boring terminated at 25 feet bls	
				Loss of drilling fluid circulation was not observed or noted at the time of the boring	
	30				
	35				
	40				
	45				
	50				

Notes & additional data/info. (specify if other materials used):

Total depth = 25 feet bls

Ground surface elevation = 76.35 ft. NGVD

Florida West Coordinates = 1454202.94 N, 613188.12 E

Locklear & Associates

BORING FIELD REPORT

B-110

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	Description of Soil	
74.77	0				
	5	2,2,3	5	Gray clay (CL)	CL N= 5
64.77	10	5,8,12	20	Gray sandy clay (CL)	CL N= 20
59.77	15	6,6,7	13	Gray sandy clay (CL)	CL N= 13
54.77	20	3,7,7	14	Light gray limestone (LS)	SC/LS N=14
49.77	25	13,22,27	49	Light gray limestone (LS)	SC/LS N= 44-49
44.77	30	13,20,24	44	Light gray limestone (LS) Boring terminated at 30 feet bls	TD
				Loss of drilling fluid circulation was not observed or noted at the time of the boring	
	35				
	40				
	45				
	50				

Notes & additional data/info. (specify if other materials used):

Total depth = 30 feet bls

Ground surface elevation = 74.77

Florida West Coordinates = 1454491.33 N, 613466.17 E

Locklear & Associates

BORING FIELD REPORT

B-111

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 6/28/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

Elevation	Depth	SPT Data ASTM D1586 per 6"	N	Description of Soil
74.82	0			CL N=5
69.82	5	3,2,3	5	Gray sandy clay (CL)
	10	3,4,6	10	Gray sandy clay (CL) CL N=10-11
	15	4,4,5	11	Gray sandy clay (CL)
54.82	20	13,13,18	31	Light gray limestone (LS) SC/LS N=31
49.82	25	10,10,11	21	Light gray limestone (LS) SC/LS N=21
44.82	30	14,13,17	30	Light gray limestone (LS)
				Boring terminated at 30 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring
	35			
	40			
	45			
	50			

Notes & additional data/info. (specify if other materials used):

Total depth = 30 feet bls

Ground surface elevation = 74.82

Florida West Coordinates = 1454232.54 N, 613480.98 E

Locklear & Associates

BORING FIELD REPORT

B-131

Site: Enterprise Road Recycling and Disposal Facility
Boring Driller: Jackson Drilling Services LLC
Drilling Method: Standard Penetration Test
Hand Auger from 0 - 3.5 feet bls

Boring completed: 12/18/2017
Geologist: WW

Elev.	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
79.6	0				
	5	3,3,4	7		Brown (with orange) sandy clay (CL)
					G2
69.6	10	5,7,8	15		Gray sandy clay (CL)
	15	5,8,11	19		Gray sandy clay (CL) G3
59.6	20	5,6,6	12		Gray sandy clay (CL)
	25	3,4,4	8		Gray and brown sandy clay (CL)
					G2
	30	4,4,4	8		Gray and brown sandy clay (CL)
44.6	35	3,3,3	6		White weathered limestone (LS)
					SC2
	40	3,4,4	8		White weathered limestone (LS)
34.6	45	20,21,33	54		White limestone (LS)
					Boring terminated at 45 feet bls
					Partial loss of drilling fluid circulation was observed at 38' bls
	50				100% loss of drilling fluid was not observed

Notes & additional data/info. (specify if other materials used):
Total depth = 45 feet bls
Ground surface elevation = 79.60
Florida West Coordinates = 1454639.36 N, 613470.98 E

Locklear & Associates

BORING FIELD REPORT

B-132

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 12/18/2017

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: WW

	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
80.12	0				
	5	6,10,13	23		Brown clayey sand (SC) SC
	10	5,7,8	15		Gray and brown clayey sand (SC) SC
	15	3,6,8	14		Gray and brown clayey sand (SC)
60.12	20	10,13,15	28		Orange/brown sand (SP) with trace clay
	25	10,12,16	28		Orange/brown sand (SP) with trace clay SP
	30	6,7,10	17		Orange/brown sand (SP) with trace clay
	35	9,11,15	26		Orange/brown sand (SP) with trace clay
	40	4,6,7	13		Orange/brown sand (SP) with trace clay
35.12	45	8,13,12	25		Orange/brown sand (SP) with trace clay SC
30.12	50	4,4,5	9		Orange/brown clayey sand (SC)

Notes & additional data/info. (specify if other materials used):

Total depth = 43.5 feet bls

Ground surface elevation = 80.12

Florida West Coordinates = 1454639.36 N, 612435.46 E

Locklear & Associates

BORING FIELD REPORT

B-132 (continued)

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Drilling Method: Standard Penetration Test

Boring completed: 12/18/2017

Geologist: WW

Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
50				Sc
55	13,15,14	23		Orange/brown clayey sand (SC)
60	15,22,29	15		White limestone (LS) Sc
65	23,20, 50/3"	R		White limestone (LS)
				Boring terminated at 65 feet bls
				Loss of drilling fluid circulation was not observed or noted at the time of the boring

25,12

15,12

Notes & additional data/info. (specify if other materials used):

Locklear & Associates

BORING FIELD REPORT

B-133

Site: Enterprise Road Recycling and Disposal Facility

Boring Driller: Jackson Drilling Services LLC

Boring completed: 12/1/17

Drilling Method: Standard Penetration Test

Hand Auger from 0 - 3.5 feet bls

Geologist: JDL

	Depth	SPT Data ASTM D1586 per 6"	N	symbol	Description of Soil
82.42	0				
	5	3,3,3	6		Sandy clay (CL) 4 2
72.42	10	3,3,3	6		Sandy clay (CL)
	15	27,50/5"	R		Limestone (LS) SC 3
	20	42,33,22	55		Limestone (LS)
57.42	25	18,21,23	44		Limestone (LS)
					Boring terminated at 25 feet bls
					Loss of drilling fluid circulation was not observed or noted at the time of the boring
	30				
	35				
	40				
	45				
	50				

Notes & additional data/info. (specify if other materials used):

Total depth = 25 feet bls

Ground surface elevation = 82.42

Florida West Coordinates = 1454639.36 N, 612895.64 E

Locklear & Associates

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO	80010-002-01
REPORT NO :	
PAGE	2

'OJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION:

REMARKS: Hole grouted

BORING DESIGNATION **B-02** SHEET: **1 of 1**
SECTION 8 and 5 TOWNSHIP 25S RANGE 22E

G.S. ELEVATION (ft) 136.90
WATER TABLE (ft)
DATE OF READING
EST. W.S.W.T. (ft)

DATE STARTED: 3/6/00
DATE FINISHED 3/6/00
DRILLED BY D.E
TYPE OF SAMPLING SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (feet/day)	ORG. CONT. (%)
0						Orangish brown sand (SP)						
						Orangish brown clayey sand (SC)						
5		6-8-12	20									
10		11-14-19	33									
15		6-8-9	17									
						Orangish brown sand with clay (SP-SC)						
20		7-11-14	25									
						Orangish brown clayey sand (SC)						
25		6-7-7	14									
						Orangish brown and gray mottled clayey sand (SC)						
30		6-4-4	8									
						Orangish brown clayey sand (SC)						
35		4-4-4	8									
40		4-3-4	7									
							42.8	23.7	47	28	7.0E-5	
45												
50		3-4-5	9									
		EL 82										
55		3-3-3	6			SC 2						
						Orangish brown and grayish brown mottled clayey sand (SC)						
60		3-3-4	7									
						SC 3						
65		6-10-12	22				37.5	36.5				
		EL 70				Drilling fluid circulation loss @ 67 feet						
						Tan limestone						
70		27-50/5.5	50/5.5									
		50/5	50/5			No recovery						
						Boring Terminated at 73.5 feet						
75												

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO. 80010-002-01
REPORT NO.
PAGE 8

BORING DESIGNATION: **B-07** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

PROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc
LOCATION:
REMARKS: Hole grouted

G.S. ELEVATION (ft): 93.30
WATER TABLE (ft):
DATE OF READING
EST. W.S.W.T (ft):

DATE STARTED: 3/15/00
DATE FINISHED: 3/15/00
DRILLED BY: D.E.
TYPE OF SAMPLING: SPT

	DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
93.3	0						Brown sand with silt (SP-SM) SP 2						
	5		3-3-3	6			Dark brown sand with silt (SP-SM)						
	10		4-4-4	8			Orangish brown sand with silt (SP-SM)						
	15		4-5-5	10			Brown sand with silt and clay (SP-SM to SP-SC)						
73.3	20		4-5-5	10			Brown sandy clay (CH) CH 2	57.0	34	73	51	3.0E-5	
							No recovery						
68.3	25		4-5-6	11			Gray, light brown and dark brown mottled clayey sand (SC)						
	30		5-5-6	11			SC 2	41.8	39.3				
	35		5-5-7	12			56.3	22.2	26.1				
							Tan limestone						
	40		4-7-8	15			Drilling fluid circulation loss @ 40 feet						
48.3	45		11-5-8	13									

0-4
4-10
10-30

#11 5555 DADE C... MASTER CUT ...

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO	80010-002-01
REPORT NO.:	
PAGE:	9

ROJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION:

REMARKS: Hole grouted

BORING DESIGNATION: **B-08** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

G.S. ELEVATION (ft): 92.90 DATE STARTED: 3/16/00
WATER TABLE (ft): DATE FINISHED: 3/16/00
DATE OF READING: DRILLED BY: D.E.
EST. W.S.W.T. (ft): TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG CONT (%)
0 (92,9)						Orangish brown sand with silt and clay (SP-SM to SP-SC) SC 3						
5	X	2-3-6	9									
10	X	7-8-13	21									
15 (75,9)	X	8-11-13	24									
						Orangish brown and gray mottled clayey sand (SC) SC 2						
20 (70,9)	X	6-7-6	13									
						Light brown clayey sand (SC) SC 2						
25							23.9	17.1	20	NP	3.7E-3	
							23.1	24.6				
30 (60,9)	X	5-4-4	8									
						Light brown, dark brown and gray mottled sandy clay (CH) CH 2	57.3	36.5				
35 (55,9)	X	4-3-4	7									
						Light brown, orangish brown and gray mottled clayey sand (SC) SC 2						
40 (50,9)	X	4-4-4	8									
						Tan limestone 50,9 SC 3						
45	X	5-7-9	16									
50 (42,9)	X	10-10-14	24									
						Boring Terminated at 50 feet						

0-4
4-10
10-30

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO	80010-002-01
REPORT NO :	
PAGE	10

BORING DESIGNATION: **B-09** SHEET: **1 of 1**
SECTION: 8 and 5 TOWNSHIP: 25S RANGE: 22E

OJECT: Proposed Class III Landfill
NWC of Enterprise Road and Auton Road
Dade City, Florida

CLIENT: Sid Larkin and Sons c/o Hartman & Associates, Inc

LOCATION:

REMARKS: Hole grouted

G.S. ELEVATION (ft): 101.10
WATER TABLE (ft):
DATE OF READING:
EST. W.S.W.T. (ft):

DATE STARTED:
DATE FINISHED:
DRILLED BY: D E
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	PI	K (feet/day)	ORG. CONT. (%)
0						Orangish brown sand (SP)						
5		2-2-1	3	94.1		G						
						Light gray, light brown and orangish brown, mottled sandy clay with silt (CL) CL3						
10		8-12-13	25	89.1								
						Light gray, light brown and orangish brown, mottled clayey sand (SC)						
15		6-5-6	11									
20		6-7-5	12			SC2	27.5	19.6	NP	NP	7.6E-3	
25		4-4-5	9	EL 74.1								
						Light gray, light brown and orangish brown, mottled sand with silt and cemented sand particles (SP-SM)						
30		8-6-7	13									
35		6-7-7	14			SP2						
						Light grayish brown sand with silt to silty sand (SP-SM to SM)						
40		6-5-6	11									
45		5-11-13	24	EL 56.1			12.8	24.2				
						No recovery SP3						
50		7-7-11	23	EL 49.1								
						Light gray, light brown and orangish brown mottled clayey sand (SC)						
55		11-11-17	28									
						Light brown and yellowish brown mottled clayey sand (SC)	46.3	33.4				
60		3-4-25	29									
						Tan limestone						
65		12-10-13	23									
70		12-12-20	32									
75		25-50/2	50/2			EL 26.1						
		50/5 50/3	50/5 50/3									
80												
85		5-6-10	16			Boring Terminated at 85 feet						

B11 1995 DADECITY GPJ MASTER GDT

Larkin property log.

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-15 | 1 of 6

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
5				3 1 2 3		①	Orange VF SAND		
10				9 14 17 17		②	Orange VF-F SAND		
15				4 2 2 1		③	SAME AS ABOVE		
20				4 5 6 6		⑤	SAME AS ABOVE		
25				4 5 5 4		⑥	Orange V-F SAND		
30				5 6 6		7	Orange-light brown VF SAND		

PROJECT
NUMBER: 99-331.01 PS
NAME: Enterprise Rd

CLIENT: Sid Larkin
LOCATION: Dade City

BORING
GR. ELEV.: ~ 134' NVGD
DIA-TYPE: boring
DEPTH: 160.5'
DATE STARTED: 2/21/01
DATE ENDED: 2/25/01

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE: Mud Rotary - S. 45
CREW: Joe, Eddie
SUPERVISOR: Leroy
UES

PIEZ/WELL
CASING DIAM.: ~~N/A~~
CASING TYPE: P-13
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-15 | 2 of 6

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
				7			EL 82 Cell 7		EL 82
35				9 9 12 13	21	8	Orange V. fine SAND minor black mottled slightly silty.		
40				9 9 10 13	19	9	Orange - brown F-VF SAND		SP3
45				4 15 15 13	30	10	Orange - light brown SAND with rock fragment.		↑ EL 69
									SP2
50				6 5 8 8	13	11	Orange - brown F-SAND		↑ EL 64
									SP3
55				11 12 15 15	27	12	Orange to brownish VF-F SAND with black fragments.		
60				13 17 17	34	13	Orange to light brown VF-M SAND & minor Clay		

PROJECT
NUMBER:
NAME:
CLIENT:
LOCATION:

BORING
GR. ELEV.:
DIA-TYPE:
DEPTH:
DATE STARTED:
DATE ENDED:

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE:
CREW:
SUPERVISOR:

PIEZ/WELL
CASING DIAM.:
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-15 | 3 of 6

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
				20			rock fragments.		SP3 EL49 ↑
65				13 17 17	34	14	Orange to light brown VF.F ~~SAND~~ SAND.		
				22					SP4
70				20 24 33	9	15	Light brown to rusty F- SAND		↑ EL44
75				47			SAME AS ABOVE		
80				24 44 50/3	94	16	Orange to Dark Brown F-SAND, Slightly silty.		
85				30 40 50/3	94		SAME AS ABOVE		
90				22 32 41	73		Orange F. VF SAND with minnor clay materials.		

PROJECT
NUMBER:
NAME:
CLIENT:
LOCATION:

BORING
GR. ELEV.:
DIA-TYPE:
DEPTH:
DATE STARTED:
DATE ENDED:

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE:
CREW:
SUPERVISOR:

PIEZ/WELL
CASING DIAM.:
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-15 | 4 of 6

DEPTH (FT)	NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
95				48 32 22 42	65	19	Orange to light brown VF-V SAND, slightly silty		Boring stopped 5:45pm 2/21/01
97				48 8 8 8 8		20	Orange to light brown V-SAND, slightly silty.		
100				1 2 2 3	4	21	SAME AS ABOVE		
105				1 2 2 4	4	22	Orange F-VF SAND Slightly silty and minor clay.		
110				2 5 7 13	12	23	Dark Brown VF SAND Slightly silty, minor clay		Push Shelby tube into formation at 18" lost during recovery. NO SAMPLE
115				5 6 9 13	15	24	Brownish to light V.F SAND, slightly silty		
120				2 3 4	7	25	slightly silty. VF-F SAND, black pigment of		

PROJECT
NUMBER:
NAME:
CLIENT:
LOCATION:

BORING
GR. ELEV.:
DIA-TYPE:
DEPTH:
DATE STARTED:
DATE ENDED:

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE:
CREW:
SUPERVISOR:

PIEZ/WELL
CASING DIAM.:
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-15 | 5 of 6

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
				50/6			minor clay.		
125				8 11 22 23	33	26	Light to gray VF to M SAND with black pigment of rock fragments		
130				22 30 32 /3	62	27	Gray to white F-VF SAND Well sorted, slightly silty.		Boring stopped 4.30pm 2/22/01
135				30 50/6	<50	28	Light-brown VF ~~to F~~ SAND, Well sorted.		2/25/01 Boring started 8.30am
140				50/6	<50	29	Gray to light brown VF to F SAND, Well rounded, sorted.		
5				21 35 50/6	85	30	Same as above		
150				30 36 30	66	31	Gray to White Sandy CLAY, slightly silty.		USES sample of SPT @ 10.30

PROJECT
NUMBER:
NAME:
CLIENT:
LOCATION:

BORING
GR. ELEV.:
DIA-TYPE:
DEPTH:
DATE STARTED:
DATE ENDED:

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE:
CREW:
SUPERVISOR:

PIEZ/WELL
CASING DIAM.:
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.

engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-15 | 6 of 6

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
	SS			30 8 9 11 13		32	75 Hard. Same as above		UGS sample Sieve/ VERTICAL
155				7 8 13 40		33	Gray Sandy CLAY slightly silty, mottled.		KV
160				5 7 19 15		34	Dark gray — CLAY END OF BORING		
5									
0									
5									
0									

7
8
13
40

525

PROJECT

NUMBER: 99-331.01

NAME: Lankin LF.

CLIENT:

LOCATION:

BORING

GR. ELEV.:

DIA-TYPE: 2"

DEPTH: 160.5

DATE STARTED:

DATE ENDED: 2/25/01

GROUNDWATER

DEPTH:

TIME:

DATE:

REMARKS:

DRILLING

RIG TYPE:

CREW:

SUPERVISOR:

PIEZ/WELL

CASING DIAM.:

CASING TYPE:

CASING DEPTH:

SCREEN DEPTH:

SCREEN LENGTH:

FILTER PACK:

RISER HEIGHT ALS:

T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.

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FIELD BORING LOG

B-16 | 1 of 4

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
							Top Soil Dark to brown soil.		EL 93.5
							SP1		SP1
5	1			1 2 2 2	4		Orange to dark VF SAND, silty, minor clay.		88.6
10	2			2 3 4 4	7		Dark brown V-VF SAND, slightly silty, minor clay.		
									SP2
15	3			4 5 9 12	14		Brown to light gray VF-M SAND.		
20	4		5 5 5 6		10		Light Brown to gray VF SAND, slightly clay.		EL 73.5
									SP3
25	5			5 6 7 9	13		same as above		
30	6			8 6 8	14		Light brown VF SAND slightly Silty		

PROJECT

NUMBER: 99-331.01.05

NAME: Enterprise Rd

CLIENT: Larkin Property

LOCATION: Dade City

BORING

GR. ELEV.: 98' NGVD

DIA-TYPE: Boring

DEPTH: 93.5'

DATE STARTED: 2/26/01

DATE ENDED: 2/27/01

GROUNDWATER

DEPTH:

TIME:

DATE:

REMARKS:

DRILLING

Mud / SPT

RIG TYPE: 45

CREW: Joe + Eddie

SUPERVISOR: Le Roy West

PIEZ/WELL

CASING DIAM.: NA

CASING TYPE:

CASING DEPTH:

SCREEN DEPTH:

SCREEN LENGTH:

FILTER PACK:

RISER HEIGHT ALS:

T.O.C. ELEV.:

REMARKS

Ba

HARTMAN & ASSOCIATES, INC.

engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-16 | 2 of 4

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
35	7			8 7 7 8	15		Brown V-VF SAND with black rock fragments		SP3
40	8			12 5 5 7	12		Brown VF SAND. Slightly silty		EL 53.5
45	9			9 5 4 4	8		Same as above		
50	10			5 5 3 3	6		Light brown V-VF SAND, slightly silty.		SP2
55	11			5 5 4 5	9		Dark brown VF SAND, silty, rock fragments.		EL 38.5
60	12			6 6 8 8	16		Dark brown VF SAND slightly silty.		SP3

EL 33.5

PROJECT

NUMBER: 99-331.01 PS

NAME: Enterprise Rd

CLIENT:

LOCATION: Dade City

BORING

GR. ELEV.:

DIA-TYPE:

DEPTH: 55

DATE STARTED: 2/26/01

DATE ENDED:

GROUNDWATER

DEPTH:

TIME:

DATE:

REMARKS:

DRILLING

RIG TYPE:

CREW:

SUPERVISOR:

PIEZ/WELL

CASING DIAM.:

CASING TYPE:

CASING DEPTH:

SCREEN DEPTH:

SCREEN LENGTH:

FILTER PACK:

RISER HEIGHT ALS:

T.O.C. ELEV.:

REMARKS

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FIELD BORING LOG

B-16 | 3 of 4

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
65	13			3 4 5 5	9		Dark brown VF SAND, Clayey Sand, slightly Silty.		SP 2 EL 28.5
70	14			8 10 15 17	25		Dark brown VF SAND Slightly Silty		SP 3 EL 23.5
75	15			4 5 10 18	15		Mottled light Brown VF Sand, Silty.		SP 2 EL 18.5
80	16			20 21 22 24	43		light brown VF SAND, well sorted, slightly Silty		SP 3
85	17			9 10 15 8	25		Same as above		EL 8.5
90	18			5 7 11	18		light Brown to Gray sandy CLAY		SC

PROJECT
NUMBER:
NAME:
CLIENT:
LOCATION:

BORING
GR. ELEV.:
DIA-TYPE:
DEPTH:
DATE STARTED:
DATE ENDED:

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE:
CREW:
SUPERVISOR:

PIEZ/WELL
CASING DIAM.:
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.

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FIELD BORING LOG

B-16 | 4 of 4

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
				13			US #1 (30.5' - 32.0')		Push shelby tube — 90.5 - 92 YES
	19			9 8 9 9	17		Brown to Gray Sandy CLAY, Slightly Silty		EL - 0.5
95							END OF BORING		94
100									
5									
0									
5									
0									

PROJECT

NUMBER:
NAME:
CLIENT:
LOCATION:

BORING

GR. ELEV.:
DIA–TYPE:
DEPTH:
DATE STARTED:
DATE ENDED:

GROUNDWATER

DEPTH:
TIME:
DATE:
REMARKS:

DRILLING

RIG TYPE:
CREW:
SUPERVISOR:

PIEZ/WELL

CASING DIAM.:
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.

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FIELD BORING LOG

B-17 | 1 of 3

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
							Approximate Depths + Descrip		BASED on Drillers Observations
0–5							SAND Brown		
5–10							L Yellow Brown SAND		
15							CLAY		
20									
25									
30							Clayey SAND		

PROJECT

NUMBER: 99-331.01

NAME: Enterprise Rd Larkin Property

CLIENT: Sid Larkin

LOCATION: Dade City

BORING

GR. ELEV.: ~150' NGVD

DIA-TYPE:

DEPTH: 65' bls

DATE STARTED: 2/20/01

DATE ENDED: 2/20/01

GROUNDWATER

DEPTH:

TIME:

DATE:

REMARKS:

DRILLING

Mud Rotary

RIG TYPE: 45

CREW: Joe

SUPERVISOR: Leroy

UES

PIEZ/WELL

CASING DIAM.: NA

CASING TYPE:

CASING DEPTH:

SCREEN DEPTH:

SCREEN LENGTH:

FILTER PACK:

RISER HEIGHT ALS:

T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.

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FIELD BORING LOG

B-17 | 2 of 3

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
							SAND		
35									
40									
							Clayey SAND w/cemented sand		
45									
							Sandy CLAY to Clayey SAND		
50									
55									
60									

PROJECT

NUMBER: 99-331.01

NAME: Enterprise Rd Larkin Property

CLIENT: Sid Larkin

LOCATION: Dade City

BORING

GR. ELEV.: ~150 ft NGVD

DIA-TYPE:

DEPTH: 65' bls

DATE STARTED: 2/20/01

DATE ENDED: 2/20/01

GROUNDWATER

DEPTH:

TIME:

DATE:

REMARKS:

DRILLING

Mud Rotary

RIG TYPE: 45

CREW: Joe

SUPERVISOR: Leroy

UES

PIEZ/WELL

CASING DIAM.: NA

CASING TYPE:

CASING DEPTH:

SCREEN DEPTH:

SCREEN LENGTH:

FILTER PACK:

RISER HEIGHT ALS:

T.O.C. ELEV.:

REMARKS

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants

FIELD BORING LOG

B-17 | 3 of 3

DEPTH (FT)	SAMPLE NO/TYPE	SYMBOL	% REC.	BLOWS PER 6"	N-VALUE	BORING LOG	MATERIAL DESCRIPTION CLASSIFICATION	WELL	REMARKS
							EXCAVATED		
65							END OF BORING		
							EL 85		
							EL 82 (cell)		
70									
5									
0									
5									
0									

PROJECT
NUMBER: 99-331.01 P5
NAME: Enterpris Rd Larkin Property
CLIENT: Sid Larkin
LOCATION: Dade City

BORING
GR. ELEV.: ~150 ft NGVD
DIA-TYPE:
DEPTH: 65' bls
DATE STARTED: 2/20/01
DATE ENDED: 2/20/01

GROUNDWATER
DEPTH:
TIME:
DATE:
REMARKS:

DRILLING
RIG TYPE: Mud Rotary 45
CREW: Joe
SUPERVISOR: Leroy UES

PIEZ/WELL
CASING DIAM.: NA
CASING TYPE:
CASING DEPTH:
SCREEN DEPTH:
SCREEN LENGTH:
FILTER PACK:
RISER HEIGHT ALS:
T.O.C. ELEV.:

REMARKS

Test Boring Log

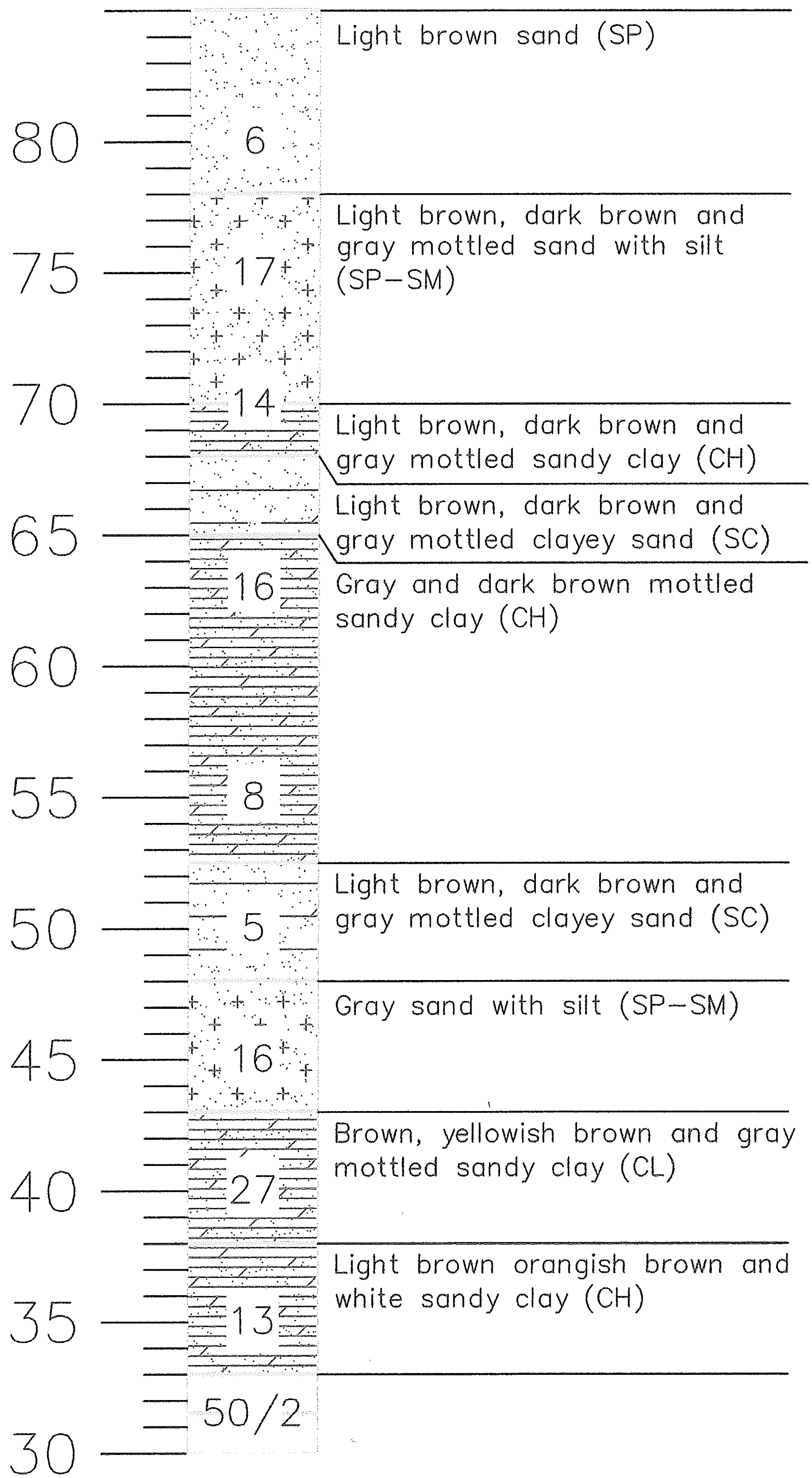
Project: Dade City landfill	Boring No. DCL 01-11
Client: Angelo Iafrate	Sheet 1 of 2
Drilling Contractor: Universal	Job No.:
Purpose: Agg Exploration	Meas. Pt. Elev.:
	Ground Elev.: 106'
	Datum: NAD 83
	Date Started: 1-18-01
	Date Finished: 1-18-01
	Driller: Leroy Prince
	Inspector: Bill Begley

Drilling Method: Drag bit, wash		SAMPLE	CORE	CASING
Drill Rig Type: CME-55	TYPE	SS		
Water Level:	DIAM.	2"		
Measuring Point:	WEIGHT	140 lbs		
Date of Measurement:	FALL	30"		

Depth (feet)	Sample Numbers	Blow Counts	Unified Classification	Graphic Log	Geologic Description	Remarks
0						
4–5					Light brown Sand. Fine gr. mod well sorted. Rounded - Subrounded.	Hand Auger Sample
5						
9–11		4 3 6 3			Very Pale orange Sandy Silt/clay, Some gravel, very soft	80% Rec.
10						
14		4			very Pale orange	

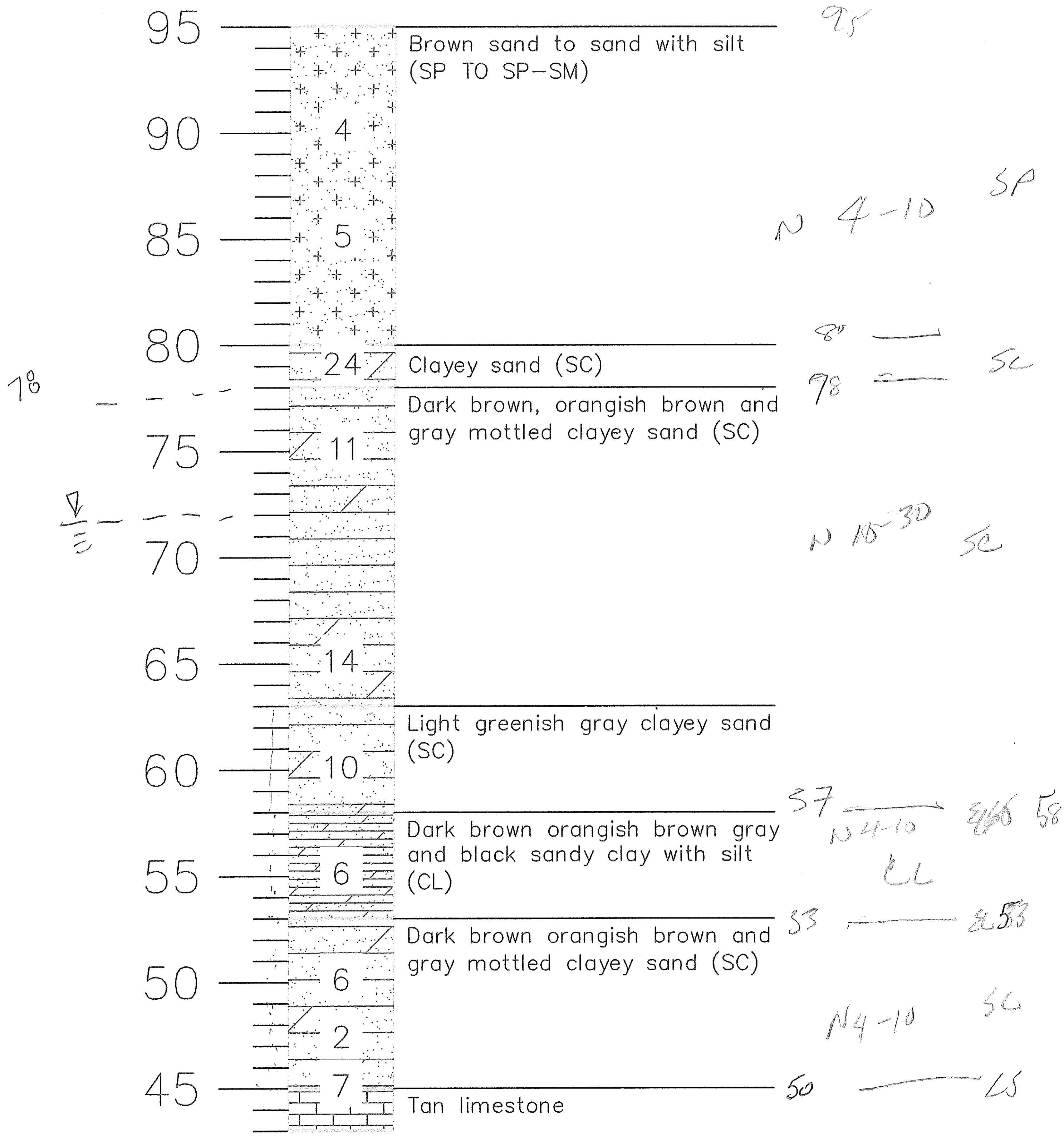
Test Boring Log					Boring No.: DCL 01-11	Sheet 2 of 2
Depth (feet)	Sample Numbers	Blow Counts	Unified Classif-ication	Graphic Log	Geologic Description	Remarks
14–15		4 5 5			Sandy Clay, or Clayey Sand	60% Rec.
20		2 3 3 3	6		Very Pale orange Sandy Clay.	100% Rec.
22					EL 84	
25		2 2 4 4	6		S.A.A. SC2 EL 81	100% Rec
					SC3	
30		3 4 11 8	15		Very Pale orange & Pale yellowish orange Sandy Clay, Phospate specs. Limestone	75% Rec.
32					EL 76	

B-06 (3/15/00)



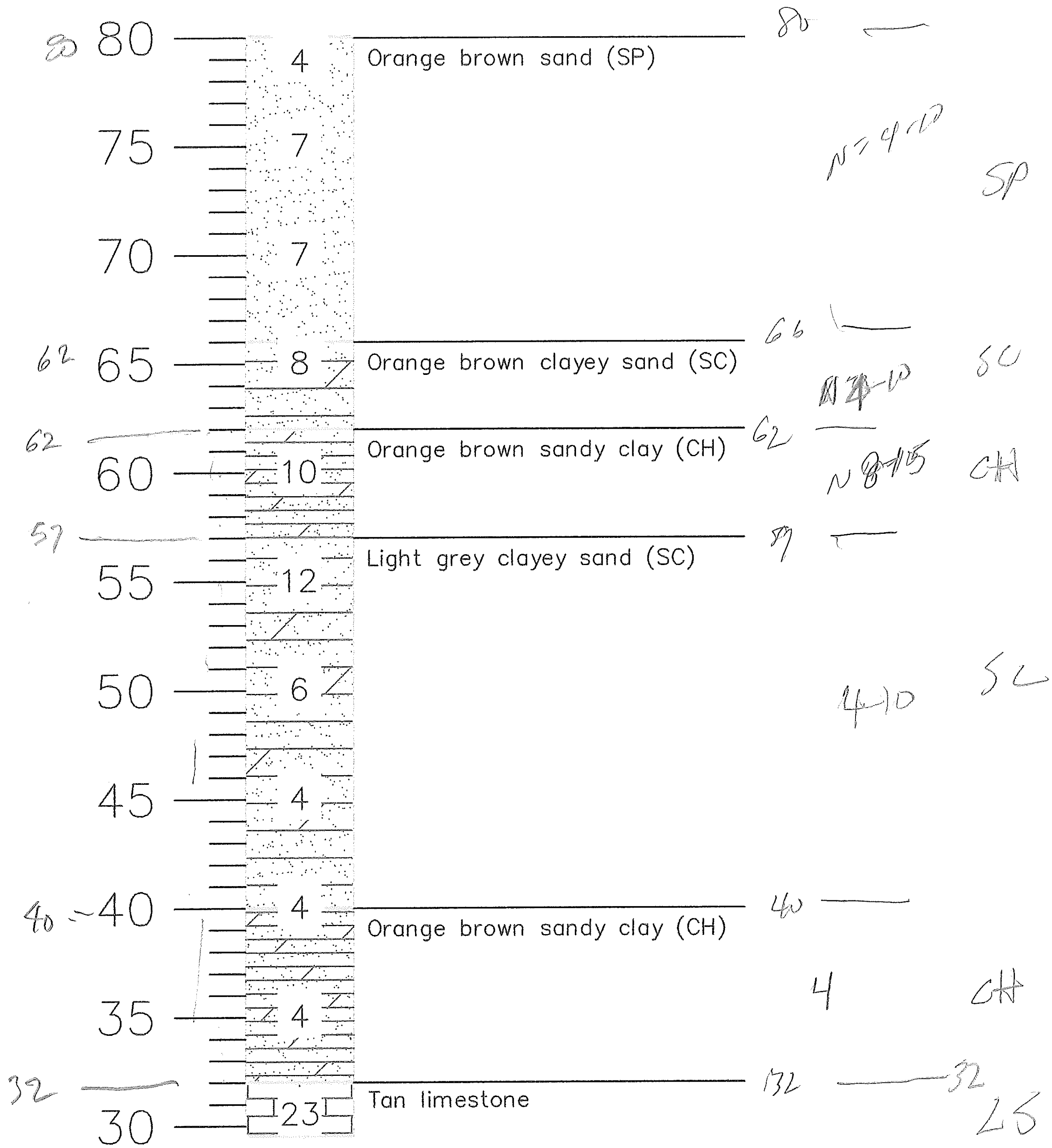
80
75
70
65
60
55
50
45
40
35
30
6
17
14
16
8
5
16
27
13
50/2
Light brown sand (SP)
Light brown, dark brown and gray mottled sand with silt (SP-SM)
Light brown, dark brown and gray mottled sandy clay (CH)
Light brown, dark brown and gray mottled clayey sand (SC)
Gray and dark brown mottled sandy clay (CH)
Light brown, dark brown and gray mottled clayey sand (SC)
Gray sand with silt (SP-SM)
Brown, yellowish brown and gray mottled sandy clay (CL)
Light brown orangish brown and white sandy clay (CH)

B–03* (3/13/00)



*Labeled as "B–03" by UES and "B–3" by Hartman

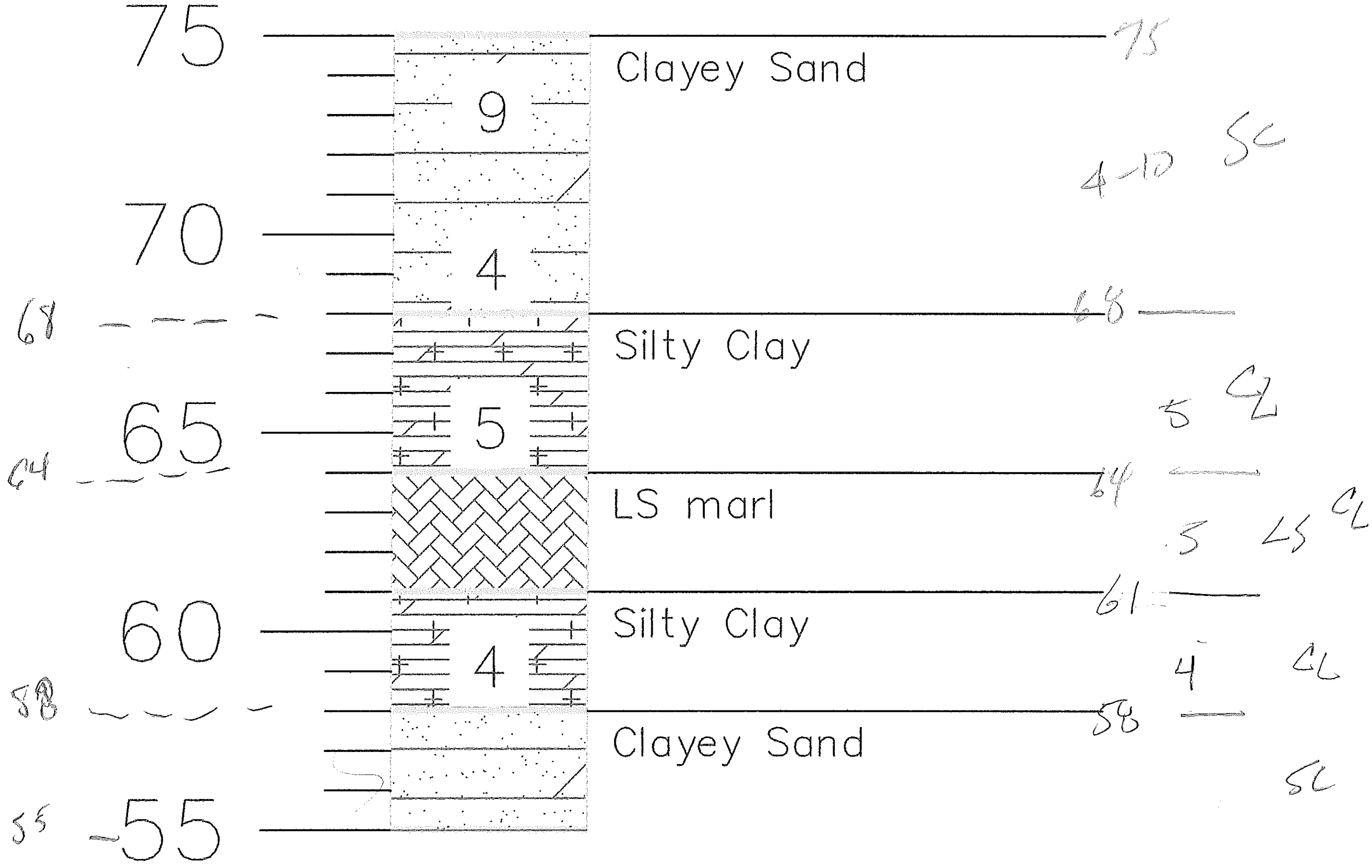
B-5* (3/13/00)



*Labeled as "B-05" by UES and "B-5" by Hartman

**Ground elevation listed as 77' MSL on boring log, however based on elevations of surrounding borings performed during the same time frame an elevation of 95' MSL was used.

B-21 (8/26/03)


75
Clayey Sand
9
70
4
68
Silty Clay
5
65
64
LS marl
60
Silty Clay
4
58
Clayey Sand
55
75
4-10 SC
68
5 CL
64
3 LS CL
61
4 CL
58
SC
55

SECTION 3

ENGINEERING REPORT

ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY
MAJOR PERMIT MODIFICATION
ENGINEERING REPORT

Prepared for:

ANGELO'S AGGREGATE MATERIALS, LTD
855 28th Street South
St. Petersburg, Florida 33712

Prepared by:

LOCKLEAR & ASSOCIATES, INC.
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Certificate of Authorization No.: 30066

~~NOVEMBER 2017~~ RAI 1 RESPONSE JANUARY 2018

Performed Under the
Supervision of

Lisa Baker 3-29-18

Lisa J. Baker, P.E.
Florida PE #74652

LISA J. BAKER
LICENSE
No. 74652
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

ENTERPRISE RECYCLING AND DISPOSAL FACILITY
ENGINEERING REPORT
TABLE OF CONTENTS

ATTACHMENTS

APPENDICES

SECTION 3
ENGINEERING REPORT

3.1 GENERAL

This Engineering Report is part of a comprehensive Florida Department of Environmental Protection (FDEP or Department) permit modification application for the Enterprise Road Class III Recycling and Disposal Facility (Facility) submitted by Locklear & Associates, Inc. (L&A) on behalf of Angelo's Aggregate Materials, Ltd. (Applicant). The Engineering Report is designed to meet the requirements of Rule 62-701, F.A.C. and Pasco County's Land Development Code (LDC) and includes the following major components (and their respective location within this Engineering Report):

- Plan Set dated September 2017 titled 2017 Plan Set, by Locklear & Associates, Inc. (Section 4);
- Figures (Appendix 3-C);
- An evaluation of the applicability of bottom liner and leachate collection system requirements (Section 2, Part G, G-1);
- Updated report evaluating geotechnical site conditions (Section 2, Part I, I-1);
- Updated Groundwater Monitoring Plan (Section 5);
- An analysis of slope stability (Section 2, Part I, I-2);
- Updated Closure and Reclamation Plan (Section 7);
- Updated financial assurance cost estimates (Section 7 Appendix 7-A);
- Updated Operations Plan (Section 3 Appendix 3-A);
- Updated Contingency Plan (Section 3 Appendix 3-B).

3.2 SITE LOCATION AND DESCRIPTION

The facility receives approximately 550 tons per day of Class III waste, which includes Construction and Demolition debris, from Pasco County and other surrounding Counties (including Pinellas, Hernando, Hillsborough and Polk). The Facility was originally permitted by the Department on October 5, 2001.

The subject site is located in Sections 5 and 8, Township 25 South, Range 22 East, in Pasco County, Florida, as shown on the United States Geological Survey (USGS) quadrangle map presented in Figure 3-1 in Appendix 3-C. More specifically, the Facility is located at the northwest corner of the intersection of Enterprise Road and Auton Road, southeast of Dade City, Florida (Figure 3-1 in Appendix 3-C). The site occupies approximately 160 acres of land on the north side of Enterprise Road. The square property is approximately 2,640 feet on a side and is located in the southwest quarter of Section 5 and the northwest quarter of Section 8.

There are no airports within 5 miles of the site, see Figure S-4 (Appendix 3-C).

3.2.1 Prohibition Compliance

In order to comply with Rule 62-701.300, F.A.C., the Facility will abide by the following:

- The Facility will not dispose of solid waste at the proposed site until proper permitting is obtained.

- Disposal of solid waste will not occur in areas that are: unable to provide support for the waste; geological formation or subsurface features that would allow unimpeded discharge to surface water on groundwater; are within 500 feet of an existing potable water well (Figure S-1 in Appendix 3-C); are within a dewatered pit; are in a frequently flooded area; are in a body of water; are within 200 feet of a surface water body that discharges offsite (Figure S-2 in Appendix 3-C); are on a right of way; are within 1,000 feet of an existing community potable water; or are within 3,000 ft. of Class I surface waters (Figure S-3 in Appendix 3-C).

- Open burning will not occur on the site unless the burning takes place in a permitted air curtain incinerator.

- Hazardous wastes, PCB's, biohazardous wastes, special wastes, liquids, and oily wastes will not be disposed of at the Facility. Random load checks and the use of spotters at the working face will ensure that these wastes are not placed for disposal at the Facility.

3.3 SURROUNDING LAND USES AND ZONING

Figure 3-2A in Appendix 3-C presents an aerial photograph map depicting the surrounding land uses and designated FDOT FLUCCS codes in the site vicinity. Open land, pastureland, row crop, tree crop, and upland hardwood forest land uses surround the site. A few scattered residences also surround the site. All adjoining properties are zoned AC. To the north is the East Pasco County Class I Sanitary Landfill, which is closed. To the east is an old borrow pit and agricultural land. South of the site is agricultural land and orange groves, and to the west are orange groves. Figure 3-2A in Appendix 3-C presents an aerial photograph map with future land use classifications.

Current site zoning designation, AC with a conditional use, is consistent with the Class III Landfill use. Revised Figure S-1 ~~5~~ depicts the locations of five (5) water wells proximate to the landfill limit. The well north of Cell 13 has been abandoned. The on-site non-potable Supply Well is operated and maintained by the facility and only utilized to flush on-site toilets. The well approximately 1000' south of the southeast corner of the facility is identified as "irrigation" by SWFWMD. The 500-foot setback from the approved landfill footprint to potable wells complies with the setback requirements of Rule 62-701.300(2)(C), F.A.C.

3.4 TOPOGRAPHY

The USGS 7.5 minute quadrangle map shown in Figure 3-1 in Appendix 3-C shows the land surface of the subject site has elevations ranging from 85 feet to 175 feet National Geodetic Vertical Datum (NGVD). Natural land surface generally slopes to the northeast on the northern half of the property and southeast on the southern half of the site. A 2013 site-specific topographic survey is shown on Sheets 1 and 2 of the 2017 Plan Set provided in Section 4.

3.4.1 100-Year Flood Prone Areas

Figure S-5 depicts a 100-year flood prone area map from the U.S. Federal Emergency Management Administration for the subject vicinity. As shown, the site is not within and would not be impacted by an estimated 100-year storm flood.

3.5 SOILS

According to the Soil Survey of Pasco County, Florida, published by the U.S. Department of Agriculture Soil Conservation Services (USDA-SCS), the majority of the subject site and surrounding areas are covered by fine sands. A copy of the USDA-SCS Soils Survey Map showing the mapped areas of the major soil types at the subject site and its vicinity is presented in Figure 3-5 Soil Survey Map, as referred to in the 2013 permit renewal application as submitted as part of the 2005 Enterprise Recycling and Disposal Facility Class III Landfill Permit Renewal Application, Pasco County, dated August 2005, prepared by Tetra-Tech HAI (TTHAI).

USDA-SCS soil type 12- Astatula fine sands encompass a small portion in the northeast portion of the site. Astatula sands are nearly level to gently sloping, and excessively drained mainly in the sandhills. Seasonal high water table (SHWT) is typically at a depth of 72 inches in Astatula soil. The permeability is very rapid throughout the soil. Both the available water capacity and natural fertility of the Astatula soil are low.

USDA soil type 32 - Lake fine sands comprise the majority of the soils found on the property. These soils are nearly level to gently sloping and excessively well drained. They occur along ridgetops and on low hillsides in the uplands. Permeability is rapid throughout the soil and the water table is below a depth of 120 inches. The available water capacity is very low in all layers and the natural fertility and organic matter content are both low.

USDA soil type 72 - Orlando fine sands are found in a small area in the northeast portion of the property. These soils are nearly level to gently sloping and well drained. The water table is typically at a depth greater than 72 inches with permeability of the soil rapid throughout. The available water capacity is low in the surface layer and very low in the other layers.

3.6 LANDFILL SITE IMPROVEMENTS

Portions of the 160-acre landfill site are also currently being operated as orange groves. The following site improvements have been installed to meet landfill operational requirements.

3.6.1 Entrance Facilities

An office trailer (gatehouse) is located onsite for the gate attendant. This trailer has hand washing and toilet facilities. Potable bottled water is supplied to the trailer. Electric and telephone services are available to the trailer office. Site entrance improvements also include an all-weather entrance roadway, scales and perimeter road as shown in Sheet C0.02 of the 2017 Plan Set provided in Section 4.

3.6.2 Roads

The primary haul route servicing the Facility is Enterprise Road. Enterprise Road is serviced by Clinton Avenue and C.R. 35A.

Enterprise Road has been improved to an all-weather access roadway from C.R. 35A to the entrance of the Facility. All on-site roads are maintained by the Applicant to allow for all weather access. Access roads to the working face are constructed from on-site soils and/or recovered materials such as concrete and asphalt. This is done on an as needed basis

3.6.3 Effective Barrier

A 6-foot high security fence has been constructed along the south and east boundaries. The security fence consists of a 6-foot high-galvanized chain link fence, hereafter referred to as the "security fence." A five-foot wire fence runs along the north and west property boundaries. The chain link fence has been installed in accordance with the permit issued October 2001. Three (3) foot square "NO TRESPASSING" signs with 5-inch letters have been installed at no less than 500-feet spacing and at all corners to notice unauthorized access. The only point of access into the facility will be through the gate at the entrance. This gate will be locked during closed hours.

An 8-foot high landscape berm has been constructed along the site's frontage to Enterprise and Auton Roads, see Sheet C0.02 of the 2017 Plan Set provided in Section 4.

3.6.4 Weighing or Measuring Incoming Waste

A scale system is used to keep records of materials received at the Facility. The scales are calibrated every six (6) months. Vehicles are weighed when they enter the Facility, and based upon the tare weight of the vehicle, the waste tonnage will be determined. Prior to unloading debris, the tonnage or volume of waste materials received will be determined and the appropriate fee assessed.

3.6.5 Vehicle Traffic Control and Unloading

Generally, truck traffic will be controlled on a first-in, first-out basis, as directed by the spotter at the working face. There is adequate space for truck staging at the site's entrance gate (7-8 trucks) to mitigate any queuing onto Enterprise Road. The Facility will discourage any truck staging prior to landfill opening. Signs will be posted at the entrance gate and on interior roads to guide truck traffic.

3.7 EXCAVATION OPERATIONS AND CELL CONSTRUCTION

On-site soils will be excavated according to the Pasco County Class I Mining Permit. The soils will be excavated and removed for various uses, including construction, roadways, and in landfilling operations. The County permit allows an excavation up to within a 200-foot setback from the property boundary and an excavation slope of 6H:1V. The Class I Mine will be "reclaimed" as a Class III landfill. The 6H:1V excavation slopes are associated with the mining of the existing soil. Once the landfill is ready to accept waste, the mine side slopes will be excavated to 2H:1V side slopes (cell slopes). Waste will be placed against this excavated slope and then built above existing grade. Drawing Sheets C1.00 and C1.10 of the 2017 Plan Set (Section 4) show the phasing of the cell construction and filling operation at the Facility.

Excavation slopes will not exceed 6H:1V pursuant to the Pasco County permit; however, once an excavation phase is complete and construction commences on a new cell, the slopes will be excavated to 2H:1V. A portion of the excavated soils from the mining operation will be used as landfill construction material. Excavated soils will be reserved to provide adequate cover material for the landfill operation. Cell construction will follow the sequence described in Section 3.8.

As new cells are excavated and constructed, the cells will be overexcavated to approximately three-feet below the approved excavation base grade to allow for the construction of a 3' clay layer. If limerock is encountered during construction, the following actions will be taken: **Where limerock is encountered at or below the elevation of the cell clay layer:**

- In the event that limerock is encountered during clay layer excavation or construction activities, the excavation / construction activities shall cease and the Department shall be notified by email within 24 hours of discovery.
- Excavation / construction activities related to determining location, elevation, and extent of limestone or to remediation in accordance with these procedures will resume no sooner than 24 hours after notice, unless otherwise directed by the Department
- Written notification will be submitted within 7 days of discovery.
- The written notification shall include the location, elevation, and extent of limestone noted on a plan sheet, a description of the materials encountered, and a description of the completion of excavation / clay backfill in the identified area or the anticipated timeframe for completion of these activities.
- The limerock will be over-excavated (5-feet laterally beyond limerock boundary and 3-feet vertically below the bottom of the compacted clay layer) and the area backfilled with clay meeting the specifications in the FDEP Operation/Construction permit and Engineering Report.
- Excavation / construction activities will resume no sooner than 24 hours after notice, unless otherwise directed by the Department

Where limerock is encountered during mining operations at elevations above the elevation of the cell clay layer and do not extend into the clay layer:

- Document on the limerock observation log the location, elevation, and extent of limestone noted on a plan sheet, and a description of the materials encountered
- Submit limerock observation log to FDEP within 7 days of discovery
- Where limerock is encountered within 10-feet of the design elevation of the top of compacted clay layer, in addition to the procedures noted above, overexcavate 1-foot vertically and laterally around the exposed limerock and backfill with compacted clay to temporarily prevent infiltration during mining operations.

If limerock encountered during mining operations at elevations above the cell clay layer extends to or below the elevation of the cell clay layer, the procedures identified above under the heading *"Where limerock is encountered at or below the elevation of the cell clay layer"* shall be followed.

Stockpiled clay, obtained from on-site excavation, will be sampled for laboratory proctor testing for use as cell floor and cell side slope material to construct a three-foot thick clay barrier layer. Material with acceptable permeability and proctor test results will be placed onto the constructed cell floor in lifts, and compacted by multiple passes with a 40,000 lb, D-6 Dozer, or equivalent.

A three-foot thick clay layer will also be placed on the 2H:1V side slopes of the exterior excavation side slopes of each cell where indicated on the drawings to complete the continuous clay barrier layer. Due to the steepness of the slope, clay placement and compaction will require an iterative process consisting of several horizontal lifts, stepped up progressively until the base elevation of the landfill is reached. In order to achieve the required compaction and hydraulic conductivity, as well as to achieve a constant three feet of clay along the slope, each lift along the cell wall will need to exceed three feet wide and be wide enough for the compacting equipment. Construction of the clay side slopes is shown on Drawing C4.00 of the 2017 Plan Set provided in Section 4. Soil in excess of three feet wide on the slopes may be removed after compaction and compliance testing have been approved. Acceptable test results means the results of the laboratory proctor and permeability tests indicate that the permeability of the material meets the requirements of the construction permit ($1x10^{-8}$ cm/s), and the optimum moisture content is not too high for the equipment to manage. Optimum moisture content for the on-site stockpiles has been approximately 13 to 20 percent.

The dozer will compact the material in the bottom of the excavation and up the side slopes into the dozer track marks. After each lift is compacted with the dozer, a 12-ton, 84-inch vibratory sheeps-foot roller, or equivalent, will be used to roll the material. The daily activities will be recorded, including any tie-in locations, thickness of each compacted lift, verification of the compaction and moisture content testing, verification of equipment used for compaction, and verification of dozer tracks at the tie-in surfaces (no smooth surfaces). Field logs and photographs documenting the field work will be provided to the Department. A topographic survey will confirm the top of excavation and top of clay grades.

Excavation will be such that 2H:1V slopes will only be encountered on the outer edge boundaries of each cell. A 3H:1V working face slope, beginning at the 2H:1V slope face, will be used for landfilling the waste.

A temporary stormwater and leachate diversion swale will be constructed immediately north of

Cell 15. The swale will extend east to west the full width of Cell 16 and slope to the west to the temporary stormwater pond in the proposed Cell 17 (formerly Cell 14) area. Leachate generated in existing cells 1-7 and 15 will move to the remaining temporary stormwater pond in the proposed Cell 17 (formerly Cell 14) area. Once Cell 16 construction is complete, the swale will remain in place while the initial lift of waste is placed across the entire floor of Cell 16. Once Cell 16 is "floored out", the swale will be removed for the remainder of operations. Leachate generated in existing cells 1-7 and 15 will then move to a temporary stormwater pond in the future Cell 14 area as it did prior to removal of the swales. The remainder of the leachate generated in cells 1-7, 15 and all leachate generated in Cell 16 will move to a toe drain extending east to west along the northern perimeter of Cell 16. The toe drain will slope west to east and terminate in a manhole located between Cell 16 and Pond 3. The toe drain will "daylight" approximately 3 feet above the bottom of the manhole. A dedicated pump with float control system will be installed in the manhole. Leachate will be pumped from the manhole through a pipe directly to Pond 3.

3.8 METHOD OF CELL SEQUENCE

Angelo's Aggregate Materials is currently filling in Cells 1 – 7 and 15 of the Class III Landfill, while construction of Cell 16 is being completed. The cell construction and filling sequence operations will be as follows:

Phasing Sequence 1	As shown in Drawing Sheets C1.00 and C1.01 Continue filling Cells 1, 2, 3, 4, 5, 6, 6B, 7 and 15 in 10 – 12 foot lifts to waste elevation of 172' Maximum slope is 3H:1V from base grade to waste elevation 167'; 1% to 2% grade from waste elevation 167' to 172' Sideslope berms and stormwater appurtenances are to be constructed at final closure. ~~Construct~~ Construction and filling of Cell 16 in accordance with permitted design
Phasing Sequence 2	As shown in Drawing Sheets C1.10 and C1.11 ~~Begin~~ Continue filling Cell 16 with 4 – 6 feet lift north of the temporary stormwater and leachate diversion swale until cell is floored out. Remove temporary swale and fill with 4 – 6 feet lift. Continue filling Cell 16 in 10 – 12 feet lifts from base grade to waste elevation 137'. Maximum slope is 3H:1V from base grade to waste elevation 137'. A 10-ft wide stormwater bench is to be constructed at elevation

137'.
Sideslope berms and stormwater appurtenances are to be constructed at final closure.
~~Construct~~ Construction and filling of Cell 17 (formerly Cells 13 & 14) in accordance with permitted design

Phasing Sequence 3

As shown in Drawing Sheets C2.00 and C2.10
~~Begin~~ Continue filling Cell 17 with 4 – 6 feet lift north of the temporary stormwater and leachate diversion swale until cell is floored out. Remove temporary swale and fill with 4 – 6 feet lift.
Continue filling Cell 17 in 10 – 12 feet lifts from base grade to waste elevation 137'. Maximum slope is 3H:1V from base grade to waste elevation 137'.
Sideslope berms and stormwater appurtenances are to be constructed at final closure.
Construct overall landfill vertical expansion to include maximum sideslope of 3H:1V from base grade to waste elevation 137', 187' and 212'; 1% to 2% grade from waste elevation 217' to 212'
10-ft wide stormwater benches to be constructed at waste elevations 137' and 187'.

Phasing Sequence 4

As shown in Drawing Sheets C3.00 and C3.10
Construct final closure cover system over Cells 1, 2, 3, 4, 5, 6, 6B, 7, 15, 16 and 17 in accordance with the revised overall landfill vertical expansion closure design.
Construct sideslope berms and stormwater appurtenances.
Construct landfill gas vents.

Lift height includes cover material. Due to the landfill bottom elevation, some lifts may not be a full 10 feet in height.

As each sequence is active, the following procedures will be followed.

- The access road to the working face will be constructed and graded as necessary.

- Waste will be compacted as it is placed. General lift height will be 10 feet and will come within three (3) feet of the final elevation to provide for final cover.

- The working face will remain approximately 100 feet in length.

- Avoid channelizing stormwater flows
- Use mulch, grass, and maintain intermediate covers
- Weekly cover of six (6) inches of soil will be placed on the working face.
- Intermediate cover of 12 inches of soil will be placed in areas that will not receive waste within 180 days. The cover may be removed immediately prior to placement of new waste.
- Stormwater runoff from the interior of the excavation and filling area will be diverted to the onsite temporary storage pond using a temporary interior swale and 6-foot berm. Perimeter berms will direct stormwater away from excavation and filling areas. The temporary stormwater pond will receive runoff until Pond 3 is developed.

3.8.1 Vertical Expansion / Conceptual Closure

The landfill is permitted to be completed to a maximum height of 175 feet, NGVD. Phase Sequencing 3 proposes an overall landfill vertical expansion. The proposed maximum height is 220 feet, NGVD with 10-feet benches at elevations 137 and 187 with 3H:1V sideslopes from base grade to elevation 212. The proposed vertical expansion final grading plan is shown on Drawing C2.00 of the 2017 Plan Set provided in Section 4. The Conceptual Closure Plan includes permitted Cells 1-7, and 15-17 (formerly Cells 13 & 14).

The Conceptual Closure Plan includes construction of berms on the stormwater benches that will direct stormwater to drop inlets and downcomer pipes spaced approximately every 400 – 500 feet along the benches. The downcomer pipes will discharge through an energy dissipater to the existing stormwater system. The facility's overall stormwater management system is governed by the mining operations and ERP Permits. Grades and elevation vary based on ongoing mining operations and topography. A detailed design that will tie the conceptual closure plan into the facility's stormwater management system will be submitted at the time of closure.

The top (1% to 2% grade) and side slope (3H:1V) designs provide for proper drainage and minimize rainfall infiltration into the landfill surface.

3.8.2 Erosion Control

The following engineering controls will be used to minimize erosion at the working face:

- Regrade a maximum of 100 linear feet of the outer edge slopes at a time to 2H:1V. The purpose of this recommendation is that a relatively small area will be subjected to surface erosion at any given time.

- Construct a berm along the top of the slope during the regrading to redirect any rainfall runoff away from the face of the slope. The area along the berm should be graded so as to allow rapid runoff along the top of the slope. Ponding of water near the top of the slope should not be allowed, since seepage through the slope may initiate slope erosion.

- As soon as possible following the construction of the clay layer, begin to fill against the Cell 16 2H:1V slope with the landfill material.

- For Cell 16 construction, filling shall begin immediately north of the east-west trending berm to be located near the southern boundary of Cell 16. The fill sequencing of Cell 16 is described in Section 3.8.

- For Cell 17 construction, filling shall begin immediately north of the east-west trending berm to be located near the southern boundary of Cell 17. The fill sequencing of Cell 17 is described in Section 3.8.

- Avoid channelizing stormwater flows

- Use mulch, grass, and maintain intermediate covers

3.8.3 Life Expectancy

The cell capacity and lifespan estimates for Cells 1 – 7, 15 - 17 have been estimated using the November 2013 topographic survey performed by Pickett and Associates (Sheets 1 and 2 of Section 4); and recent and projected tonnages.

Using the November 2013 topographic survey as a base, a three-dimensional AutoCAD model of Cells 1 – 7, 15 – 17 at closure was generated, using the following assumptions:

- For all cells 3H:1V side slopes from base grade to waste elevation 137’, 187’ and 212’; 1% to 2% grade from waste elevation 212’ to 217’
- 10-foot inset for benches at waste elevations 137-ft and 187-ft NGVD
- 36 inches of cover over the 83.80 acre 2D surface was subtracted from the maximum volume

The airspace volume remaining as of September 2017 was calculated to be approximately 7,845,813 yd^3 after accounting for the final cover volume of 388,993 yd^3.

The following design parameters were used to compute landfill design life remaining:

- **Density:** An in-place density of 1,350 lb/yd^3 (0.675 tons/ yd^3) was used for the design life estimate and is a typical density for Class III waste.

- **Waste acceptance rate:** a waste acceptance rate of 550 tons per day was used based on facility records.

The remaining life in Cells 1 – 7, 15 - 17 was calculated to be 28 years from the survey date, or 2042.

3.9 WASTE COMPACTION AND APPLICATION OF COVER

Waste received will be segregated based on compactibility. Bulky, incompressible items, such as concrete, asphalt, and tree debris, will be separated and stockpiled for future processing. Tree debris may be separated from the waste and periodically mulched on-site. The remaining debris is disposed of in designated cells using onsite equipment to place the debris and a Caterpillar 826 Compactor, or equivalent, to weekly compact the waste. Initial cover material is planned to be excavated from onsite areas and placed weekly in approximately 6-inch layers on the compacted lifts to control vectors, reduce rain infiltration and provide a more stable working face area. An intermediate cover of one (1) foot of compacted soil will be applied if final cover or an additional lift is not to be applied within 180 days of cell completion. Cell closure will occur when all permitted cells are filled. For final buildout grade and closure detail, see Drawing Sheets C3.00 and C3.10 of the 2017 Plan Set provided in Section 4, respectively. The Conceptual Closure Plan includes permitted Cells 1-7 and 15, 16 and proposed Cell 17. Fill grades shall be such that final cover elevations are not exceeded on all slopes.

Final cover consisting of 18 inches of compacted soil barrier layer and 18 inches of soil that will sustain vegetative growth, as specified in the Closure and Reclamation Plan provided in Section 7. Cell closure shall generally conform to the lines and maximum grades specified on Drawing Sheet C3.00 (2017 Plan Set provided in Section 4 and the requirements of Rule 62-701.600 F.A.C., Rule 62-701.400 (7), F.A.C., and Rule 62-701.400(8), F.A.C. Pesticides when deemed necessary to control rodents, insects and other vectors shall be used as specified by the Florida Department of Agriculture and Consumer Services. Uncontrolled and unauthorized scavenging shall not be permitted at the landfill site. Controlled recycling may be permitted by the Landfill Manager. Temporary storage of soil fill or recycling materials may occur within the inactive, or closed cell areas.

3.10 DESIGN OF GAS, LEACHATE AND STORMWATER CONTROLS

3.10.1 Gas Monitoring and Control

The type of materials to be disposed of in the Class III Landfill are not expected to generate significant amounts of methane or other gases since the landfill's design prevents groundwater contact. Therefore, no active gas control systems or venting is proposed. However, because some biodegradable waste may be accepted, a passive gas control system is proposed, see Section 3.10.1.5. The Landfill Manager will conduct daily and weekly inspections of the landfill and will check for objectionable odors or gas around the perimeter of the site. The Manager will notify the FDEP of any exceedances and immediately take corrective actions. Corrective actions will include placement of additional cover material or mulch, or lime containing materials such as crushed concrete that is documented to abate the odors. Quarterly gas point monitoring is currently conducted. The facility only accepts Class III debris for disposal and accepts no putrescible household wastes. Surface water and groundwater contact with the Class III wastes will be prevented by the approved facility design. Other best management practices to prevent odors include: 1) closure of each cell as it is completed; 2) weekly soil cover application; and, 3) immediate corrective actions to abate any detected onsite odors.

Gas Probe Locations

Gas monitoring points are spaced approximately 600 linear feet apart surrounding the landfill. Sheet C0.03 of the 2017 Plan Set provided in Section 4 presents these locations of the gas probes surrounding the landfill. Gas Probes (GP) 6 through 15 are existing, GP 1 through 5 and 16 are proposed and will be installed as part of future cell construction completion certification at closure. The remaining gas probes are to be installed in accordance with the following schedule in Table 3.10:

Table 3.10 Gas Probe Installation Schedule	
Gas Probe	**Cell Construction Completion**
GP-1	Future Cell 10 or closure
GP-2	Future Cell 11 or closure
GP-3	Future Cell 12 or closure
GP-4	Proposed Cell 17
GP-5	Proposed Cell 17
GP-16	Future Cell 9 or closure

Several existing gas probes on the southern and eastern portion of the property are currently located immediately adjacent to the disposal area rather than at the property boundary as required by Rule. Probes GP-6, -7 and -8 were abandoned and replaced with GP-6R, -7R and -8R along the property boundary on December 11, 2017. Probes GP-11, and -14 will be relocated to the property boundary as part of the construction activities for Cell 16. Probes GP-12 and -13 were abandoned and replaced with GP-12R and -13R along the property boundary in 2013.

Gas Probe Design

Figure 3-14 (provided in Appendix 3-C of the 2012 permit renewal application submitted by Kelner Engineering) presents the gas probe design for the subject landfill site. These gas probes are designed to be surface sealed and to provide a greater permeability than the surrounding sediments to act as collector points for any methane gas, if present. Based on the landfill design, all of the gas probes are designed to be approximately 20-foot in depth with an 18-foot open screen for the monitoring point, or to depth of adjacent waste. Table 3.10.1.2 presents supplemental information related to the anticipated and recently installed total depths of gas monitoring probes GP-4, GP-5, GP-6R, GP-7R and GP-8R and GP-11R and GP-14R. These depths will allow the screened interval to intercept the full cross-section of the landfilled waste that could potentially generate methane.

Table 3.10.1.2

Well	Elevation of the Bottom of Waste in the Adjacent Disposal Cell (ft., NGVD)	Elevation at Surface (ft., NGVD)	Total Depth (ft.)	Top of Perforated Section (ft., NGVD)	Bottom of Perforated Section (ft., NGVD)
GP-4	78	90	~~20~~ 15	88	~~70~~ 75
GP-5	78	90	~~20~~ 15	88	~~70~~ 75
GP-6R	78	~~90~~ 91	~~20~~ 16	~~88~~ 90	~~70~~ 75
GP-7R	78	~~90~~ 91	~~20~~ 16	~~88~~ 90	~~70~~ 75
GP-8R	78	~~90~~ 82	~~20~~ 7	~~88~~ 80	~~70~~ 75
GP-11R	82	120	40	118	80
GP-14R	86	115	30	113	85

The groundwater table may be encountered at depths of approximately 50-foot, or more below land surface (bls) across most of the site. Accordingly, gas probes are not designed to intercept the groundwater table. The gas probes are constructed of Schedule-40 polyvinyl chloride plastic pipe (PVC). The PVC casing and screen will be flush-threaded and have a screen slot size large enough to accommodate easy methane extraction from the monitoring point. The sand/bentonite slurry proposed for a surface seal will be a blend of 4 parts of sand to one part of granular bentonite. The sand and the bentonite will be mixed dry and hydrated immediately prior to placing it in the annular space of the borehole. The gas probe points are proposed to be installed by hollow-stem auger to construct an eight-inch borehole to be filled with pea gravel. The pea gravel will meet the requirements of FDOT standard size No. 10 aggregate washed pea gravel. Each gas probe will be protected by a surface mounted well protector and locked for security purposes. Each gas probe will terminate at the surface with a PVC ball valve to accommodate easy monitoring of methane levels, with a portable meter. The ball valve will remain closed between monitoring events and pre-purge measurements will be recorded. In the event of a positive gas measurement, the post-purge measurement will also be recorded.

Methane Gas Measurement

In accordance with the requirements of the current FDEP permits, methane gas levels are monitored at each of the active gas monitoring points quarterly, with results submitted to the FDEP. A lower explosive limit (LEL) meter will be used to measure methane levels from each of the gas probes. LEL meters, such as the MSA Model 260 or GEM 500 or equivalent, will be used to conduct this monitoring. These meters are capable of measuring percent volume of methane in air and the percent LEL level of the methane by volume. The meter will be calibrated in accordance with manufacturer's specifications prior to each methane monitoring event. Attachment 4 of the Operations Plan provided in Appendix H presents the proposed gas monitoring probe survey form to be used to conduct the quarterly monitoring at the subject site. This form will document at the time of each gas probe reading, air temperature in degrees Fahrenheit, methane levels in percent volume in air and percent LEL. The reporting action level for methane in air will be considered 5 percent by volume in air as measured by the lower explosive limit. The reporting action limit for methane in structures is 25% of the LEL, or 1.25% methane by volume. The results of each quarterly gas probe survey will be submitted to the Department on the presented form within two weeks of each monitoring event. These events are planned to be coordinated with the semi-annual groundwater monitoring at the subject site.

Gas Contingency Plan

The following Contingency Plan will be implemented if any of the measured gas monitoring points methane levels are detected above the 100% LEL of greater than 5 percent methane in air, or if 25% of the LEL or higher is measured in a structure. If this level of methane or greater is detected in any of the probes, the Facility operator will institute measurement of methane in nearby, at, or below grade structures, i.e., stormwater collection points, or any maintenance or office buildings within 100 feet of the subject gas probe on a weekly basis until these levels go below the 100% LEL at the subject probe. If methane levels measured in any on-site building exceed 25% of the LEL, building windows and/or doors will be opened for ventilation and all personnel evacuated until methane readings are maintained below 25% of the LEL for methane. The monitoring report for any event that detects methane above the LEL will also report methane levels from nearby structures, as indicated above, until the levels go below the methane LEL level or until corrective actions are conducted to reduce methane levels. The FDEP will be notified within seven days of any gas monitoring levels that exceed the reporting action levels.

Passive Gas Vents

Within 90 days of closure of each landfill cell, a passive landfill gas vent will be installed at the highest point of the cell to prevent explosions, fires and damages to vegetation from methane gas buildup. Sheet C3.00 shows the location of the 12 gas vents and Figure 3-16 (provided in Appendix 3-C of the 2012 permit renewal application submitted by Kelner Engineering) presents the design of a typical vent. The facility's gas emissions are expected to be far below the threshold of a Title V or an NSPS permit.

3.10.2 Leachate Control

Any leachate that may be produced at the landfill will be controlled with the use of a continuous 3-foot thick clay layer ($1x10^{-8}$ cm/s) that will be placed on the bottom of the cells. The clay layer beneath each individual cell will form a continuous barrier layer that will be graded to direct leachate to the remaining portion of the temporary stormwater pond in proposed Cell 17 (formerly Cell 14) during construction of Cell 16 and/or a toe drain extending east to west along the northern perimeter of Cells 16 and 17. The toe drain will slope from west to east and terminate in a manhole between Cell 16 and Pond 3. The toe drain will "daylight" approximately 3 feet above the bottom of the manhole. A dedicated pump with float control system will be used to transfer leachate from the manhole to Pond 3. During Cell 16 construction, leachate will continue to flow along the continuous bottom barrier layer towards the northern landfill boundary, and into the existing stormwater pond in proposed Cell 17 (formerly Cell 14). During excavation of permitted Cell 16, a temporary stormwater and leachate diversion swale shall be constructed along the southern perimeter of Cell 16 to divert leachate generated in Cells 1-7 and 15 to flow west to the temporary stormwater pond. During excavation of proposed Cell 17, a temporary stormwater and leachate diversion swale shall be constructed along the southern perimeter of Cell 17 to divert leachate generated in Cell 17 to flow towards the Cell 16 toe drain.

The controlled method of screening waste also supplements the leachate control. Because the Applicant privately owns the Enterprise Class III Landfill facility, most of the haulers, waste generators, and sources of waste are known to Angelo's and the scale house attendants. For those haulers that are unfamiliar to the Applicant, the scale house attendants question the haulers more intensely to determine the contents of their loads. The spotters and operators add additional monitoring at the active disposal location. The addition of video surveillance to the monitoring process of incoming wastes helps to identify fires or smoking loads. Combined methods of screening waste is an effective method to reduce any possible threat to public health or the environment.

3.10.3 Stormwater Controls

The approved Stormwater Management Plan for the landfill consists of berms, swales, and ponds constructed within the 200-foot landscape buffer zone to divert, collect and contain stormwater runoff from the completed site. These stormwater facilities are designated to retain the 100-year, 24-hour storm volume as required by Pasco County and the FDEP. During excavation, construction and waste disposal, stormwater will be controlled by a series of berms that direct stormwater to the stormwater pond located along the northeast corner of the site. Stormwater Pond 3 is permitted as an Industrial Wastewater Pond through FDEP. Additional details concerning the stormwater management system are provided in Drawing Sheets C3.00 and C3.10. A 6-foot berm adjacent to active and filled cells retains stormwater from the filling area and diverts stormwater from the excavation area to the stormwater pond. The remaining portion of the temporary stormwater pond will be filled as part of the construction of Cell 17.

3.11 EROSION CONTROL

The perimeter swales and ponds surrounding the landfill prevent stormwater from leaving the property. The series of berms described in Section 3.10.3 above will help prevent erosion.

Additionally, landfill side slopes will be constructed at 3H:1V from base grade to elevation 212' NGVD and will receive intermediate cover to be maintained until final landfill closure that will occur when all existing and proposed cells are filled. See the Reclamation and Closure Plan provided in Section 7 for further details.

3.12 FINAL GRADE PLAN

The filling sequence of the landfill is shown on Sheets C1.00 through C3.10 of the 2017 Plan Set provided in Section 4. The excavated areas will be certified to the approved bottom grades prior to accepting any waste material. The finished elevation after all fill material has been placed and final cover provided is designed to reclaim excavated areas.

3.13 SETBACKS AND VISUAL BUFFERS

The following setbacks (buffers) shall be used:

1. Minimum of 200 feet from the property boundary to landfill footprint.

2. Minimum of 500 feet setback from surrounding potable residential wells to landfill footprint.

Buffer areas maintain visual screening of the landfill by the following methods.

1. 8-foot high berms along the frontage of Enterprise and Auton roads.

2. Landscaping and trees to provide visual buffers within setback areas

3. Existing trees within the setbacks will be maintained.

3.14 FOUNDATION ANALYSIS

A Geotechnical analysis was conducted on the landfill site to evaluate if the base and geologic setting are capable of providing structural support. Universal Engineering Sciences, Inc. completed the Geotechnical Report included as Section 4 to the September 2005 Enterprise Recycling and Disposal Facility Class III Landfill Permit Renewal Application, prepared by TetraTech HAI, and updated as the January 25, 2006. Universal Engineering Sciences *Geotechnical Exploration – Update*, provided as an appendix to the February 2006 letter from Jennifer Diehl, P.E. to Mr. Steve Morgan Subject: Angelo's Aggregate Materials, Ltd. Enterprise Recycling and Disposal Class III Landfill Pending Permit Nos.: 177982-007-SC and 177982-008-SO Pasco County. The report concludes that the landfill base will adequately support the Class III landfill wastes without excessive settlement. It also states that the potential for sinkhole development on the site is low. In the event a sinkhole is discovered on-site, or within 500-feet of the site, the Department will be notified within 24 hours. A reclamation plan of action will be submitted to the Department within seven days. Please see Appendix G-1, Attachment 1 for Universal Engineering Sciences' Geotechnical Services / Documentation Review dated May 31, 2016 and Section 2 Part I, I-1 for a signed and sealed review and evaluation of historical site related geotechnical records and additional geotechnical data for the proposed Cell 17 area.

An updated foundation bearing capacity analysis was performed by Civil Design Services, Inc. and is provided in Section 2, Part I, I-2. The analysis demonstrates that the proposed Cell 17 and overall landfill vertical expansion has sufficient additional bearing capacity to accommodate the proposed design.

3.15 CERTIFICATION

Laboratory testing and observation of cell floor conditions during cell construction completion shall consist of the following:

- In-place density testing for each 12-inch thick soil lift, based on laboratory proctor test results for the construction material, will be recorded by a properly trained technician. These are to be conducted at the location of each permeability test.

- Thickness testing of each lift will be recorded at a minimum frequency of two tests per acre, per lift.

- Confirmation hydraulic conductivity testing of Shelby tube or drive cylinder samples of the compacted cell floor material will be performed at a minimum frequency of one test per lift, per acre.

- Observance for unstable areas such as limestone, sink holes and soft ground will be performed for each cell.

If the test data from a cell floor section does not meet the requirements of the anticipated conditions of the hydrologeological and geotechnical reports and the requirements of the facility construction permit, additional random samples may be tested from that cell section. If the additional testing demonstrates that the hydraulic conductivity meets the requirements, the cell will be considered acceptable. If not, that cell will be reworked or reconstructed so that it will meet these requirements.

Upon completion of construction of any cell within the disposal facility, the certification of construction completion will be provided to the FDEP on form 62-701.900(2), F.A.C. The applicant will provide the completed form to the FDEP, along with the quality assurance test results described above, and arrange for an inspection prior to acceptance of Class III wastes into the constructed disposal area.

3.16 OPERATIONS PLAN

The Landfill's Operations Plan is included as Appendix 3-A.

3.17 CONTINGENCY PLAN

The Landfill's Contingency Plan is included as Appendix 3-B.

ATTACHMENT 1
TOE DRAIN CALCULATIONS FOR LEACHATE COLLECTION

Project Name:	Enterprise Toe Drain Capacity Anal
Project Number:	02000-144-14
Designed By:	LJB Date: 1/2/2018
Checked By:	JHO Date: 1/2/2018

Problem Statement:

Demonstrate swale and pipe capacity of toe drain.

A. FLOW RATE AND RUNOFF VOLUME

Two Scenerios to Check;

Scenerio 1	Determine swale and pipe capacity of toe drain during Normal (Filled) Operations
Scenerio 2	Determine swale and pipe capacity of toe drain during Initial (Open Cell) Operations

Scenerio 1

A1. Per the HELP model results, calculations were performed to determine the maximum annual leachate flow rate for the landfill footprint boundary. See attached report for input parameters and calculated flow data.

$Q_{HELP\ Model}$ = 302,089 ft^3/year 4.4883
827.67 ft^3/day
0.0096 ft^3/sec Scenerio 1 - Flowrate needed to remove stormwater event
4.2994 gpm

Scenerio 2

A2. Estimated stormwater runoff over Cell 17 floor during early stages of filling.

SCS Rainfall-Runoff Relation:

$$Q := \frac{(P - 0.2 \cdot S)^2}{P + 0.8 \cdot S}$$

Q_{Runoff} = 0.79 inches

$$S := \frac{1000}{CN} - 10$$

S = 0.20

Design Data:

Q = Volume of runoff, inches	Calculated
P = Precipitation, inches	1
S = Potential maximum soil retention	Calculated
CN = Runoff curve number	98.00

Volume = Qrunoff * Area

$V_{RunoffVol}$ = 21,532 ft^3
V = 0.49 ac-ft

V = Total volume of runoff, ft^3	Calculated
A = Project Area, acres	7.50
A = Project Area, square feet	326,700

Estimated Flow to remove stormwater runoff within 24 hrs

Time = 24 hrs
1,440.0 min
86,400.0 sec

Qflowrate = Volume/Time

Qflowrate = 21,532 ft^3
Time = 86,400.0 sec
Qflowrate = 0.2492 ft^3/sec Scenerio 2 - Flowrate needed to remove stormwater event
111.9 gpm

Total Scenario 1 & 2 116.2 gpm (Cell 16 filled and Cell 17 initial open scenario)
0.2588 ft^3/sec

Locklear & Associates

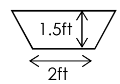
Project Name: Enterprise Toe Drain Capacity Anal
Project Number: 02000-144-14
Designed By: LJB Date: 1/2/2018
Checked By: JHO Date: 1/2/2018

B. TOE DRAIN SWALE (Only) FLOW CAPACITY

Manning's Equation: $Q = VA = (1.49/n)*A(R^{2/3})*S^{1/2}$

where	Q =	peak discharge (cfs)
	V =	velocity (cfs)
	A =	cross-sectional area (sf)
	n =	manning's roughness coef
	R =	hydraulic radius (ft)
	S =	channel slope (ft/ft)

Manning's Coeff. (n)	0.04
Slope (S) (ft/ft)	0.0030
Depth (h) (ft)	1.5
Left Side Slope (Z)	3
Right Side Slope (Z)	3
Bottom Width (b) (ft)	2
Top Width (T) (ft)	11



0.5833333

Calculations

$A_{\text{trench total}} = h(b+T)/2$	$A_{\text{trench total}}$ =	9.75	sf	*Trench + Pipe
A_{pipe} = See pipe calcs	A_{pipe} =	0.30	sf	*Pipe area - conservatively take out
$A_{\text{gravel}} = A_{\text{total trench}} - A_{\text{pipe}}$	A_{gravel} =	9.45	sf	* Area trench filled with gravel
Porosity of Gravel	n =	0.3		*pore volume with fluid
$A_{\text{flow in gravel}} = A_{\text{gravel}}$ * Porosity	$A_{\text{flow in gravel}}$ =	2.83	sf	*Area in gravel conveying flow
$P = b+2(h)*((1+Z^2)^{1/2)}$	P =	11.49	ft	
R = A/P	R =	0.25	ft	

$Q = VA = (1.49/n)*A(R^{2/3})*S^{1/2}$

$R^{2/3}$ =	0.39	
$S^{1/2}$ =	0.05	
Q =	2.27	cfs

Velocity = Q/A	V =	0.80	ft/s

Check to see if proposed SWALE capacity meets or exceeds discharge

Qtrench (Provided) =	2.27	>	0.0096 cfs - Scenario 1
		Yes!	
Qtrench (Provided) =	2.27	>	0.2492 cfs - Scenario 2
		Yes!	
Qtrench (Provided) =	2.27	>	0.2588 cfs - Scenario 1& 2
		Yes!	

Locklear & Associates	**Project Name:** Enterprise Toe Drain Capacity Anal **Project Number:** 02000-144-14 **Designed By:** LJB Date: 1/2/2018 **Checked By:** JHO Date: 1/2/2018

C. TOE DRAIN PIPE (Only) CAPACITY

Manning's Equation: $Q = VA = (1.49/n)*A(R^{2/3})*S^{1/2}$

Discharge (Q) from above	0.0096	cfs				
Pipe Parameters						
Pipe Diameter; D out =	8.6250	in				8.6250
Pipe Diameter, D in =	7.55	in			(HDPE SDR 17 pipe)	7.55
Depth of Flow, y =	0.59	ft	7.10	in	Maximum Pipe Flow Percentage	
(must have $y \geq D/2$)					94.0%	
Full Pipe Manning roughness, n_{full} =	0.011	HDPE				
slope, S =	0.0030	ft/ft				

Calculations

Pipe Diameter (D)	0.63	ft
Pipe Radius,(r)	0.31	ft
Circular Segment Height (h)	0.04	ft
Central Angle (θ)	0.99	radians
Cross Sectional Area (A)	0.30	ft^2
Wetted Perimeter (P)	1.66	ft
Hydraulic Radius (R)	0.18	ft
Pipe Discharge, Q_{full} =	0.72	cfs
Velocity, V_{full} =	2.38	ft/s
Number of Pipes Required for Q_{full}	0.01	Q_{req}/Q_{pipe}
Number of Pipes Provided	1	
Total Q_{full} Discharge	0.72	cfs
Velocity	2.38	ft/s

Check to see if proposed pipe capacity meets or exceeds discharge

Q pipe (Provided) =	0.72	> **Yes!**	0.0096 cfs - Scenario 1
Q pipe (Provided) =	0.72	> **Yes!**	0.2492 cfs - Scenario 2
Qpipe (Provided) =	0.72	> **Yes!**	0.2588 cfs - Scenario 1& 2

Locklear & Associates

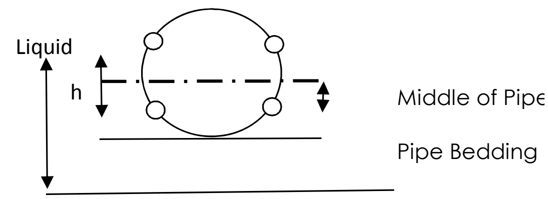
Project Name: Enterprise Toe Drain Capacity Anal
Project Number: 02000-144-14
Designed By: LJB   Date: 1/2/2018
Checked By: JHO   Date: 1/2/2018

D. <u>TOE DRAIN PIPE PERFORATION CAPACITY</u>

Evaluate the perforation sizing and location

<u>Calculations:</u>
Evaluate flow capacity into pipe through orifice(s) with assumed head above orifice

1. Establish Head acting on orifice(s)



Pipe Dia (in) =	8.6250	
Pipe Bedding (in) =	3	
Height of Middle of Pipe (in) =	7.3125	above trench bottom
Office Dia (in) =	0.375	(3/8" dia perf)
Height of Middle of Office (in) =	6.9375	
Leachate Level in Trench (in) =	7	
Head on Orifice (in) =	0.0625	On orifice (below middle of pipe)

2. Determine Perforation Cross-Sectional Area

$A = \pi d^2/4$

where:

A = area of perforation

d = effective perforation diameter (ft)

Office Dia (in) =	0.375	(3/8" dia perf)	
Reduction in perforation diameter due to clogging =	25%		(assumed)
Effective Perforation Diameter =	0.281	in	(Calculated)

A = 0.000431 ft^2

3. Determine Flow Rate per Perforation

$Q_{perf} = Cd*A*(2gh)^{0.5}$

where:

Q_{perf} = flow through perforation [cfs]

Cd = orifice coefficient =	0.5	
g = acceleration due to gravity =	32.2	ft/s^2
h = height of water above orifice =	0.0625	in
	0.005208	ft

Q_{perf} = 1.25E-04 ft^3/sec/perforation

4. Determine the Total Flow into Pipe through Orifice(s)

Perforations Around Diameter of Pipe =	4	
Number of Perforations Above Leachate =	2	
Number of Perforations Flowing with Leachate =	2	(Conservatively only counts lower perforations)
Perforation Lateral Spacing Along Pipe =	6	inches
Perforations per Foot of Pipe =	6	(Calculated)

Qperf =	1.25E-04	ft^3/sec/perforation
Q perf total =	0.00075	ft^3/sec / LF pipe
Length of Pipe =	350	ft
Q total	0.262358	ft^3/sec into Pipe System

5. Check to see if proposed orifice capacity meets or exceeds discharge

Q orifice (Provided) =	0.26	>	0.0096 cfs - Scenario 1
		Yes!	
Q orifice (Provided) =	0.26	>	0.2492 cfs - Scenario 2
		Yes!	
Q orifice (Provided) =	0.26	>	0.2492 cfs - Scenario 1 & 2
		Yes!	

Reference: PPI Polyethylene Design Handbook

PLASTICS·PIPE·INSTITUTE

Underground
Earthloading

Spangler's Modified IOWA Formula for Ring Deflection.
ref. Ch.6, p. 211, eqn. 3-10

$$\frac{\Delta X}{D_M} = \frac{1}{144}\left[\frac{K_{BED}\ L_{DL}\ P_E + K_{BED}\ P_L}{\frac{2E}{3}\left(\frac{1}{DR-1}\right)^3 + 0.061 F_s E'}\right]$$

Information

Date	12-19-2017
Project	Enterprise Cell 16 & 17
Engineer Name	Civil Design Services, Inc
Comments	Pipe Crushing for Toe Collection Drain Cell 16 & 17

Variables

E'	1000	PiModulus of Soil Reaction, psi
D_O	8.625	Pipe Outside Diameter, in
DR	17	Dimension Ratio
D_M	8.087	Mean Pipe Diameter, in
E	18500	Apparent Modulus of Elasticity, psi
w	50	Soil Density, lb/ft³
K_{BED}	0.1	Bedding Factor, typically 0.1
L_{LD}	1	Deflection Lag Factor
F_S	1	Soil Support Factor (refer to Chapter 6, Tables 3-9 and 3-10 for additional factors)
H	50	Height of Soil Cover above pipe, ft
H_W	0	Height of water table above pipe, ft
P_S	0	Total Static Load, psf

Gravel pack around pipe - Conservative - Gravel usually 3,000 psi

Elastic Modulus of pipe - Modified for time (50yr and Temp 110F)

Class III Waste

Final Buildout - Pipe (EL 75) - Landfill - (EL 105 to 120) - Roundup to 50ft

Total Live Load, psi: H-20 Live Load

P_L	7200	Total Live Load, psf

Load of Fully Loaded CAT 740B Off-Road Dump

Result

P_E	2500	Earth Load on Pipe, psf
P_T	9700	Earth Load on Pipe, psf
ΔX	0.851	Vertical Deflection, in
d	10.52	Percent Vertical Defelction, %
P_{WC}	14686	Crictical Collapse Pressure, psf
SF	1.51	Safety Factor against Constrained Buckling

Factor of Safety is "Acceptable"

Note: These calculations are limited to the design of PE pipes buried in trenches or embankments. The load and pipe reaction calculations presented may not apply to pipes installed using trenchless technologies. Reference Chapter 12 of the PPI Design Handbook for additional piping design information.

ENGINEERING REPORT
APPENDIX 3-A

OPERATIONS PLAN

ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY
MAJOR PERMIT MODIFICATION
LANDFILL OPERATIONS PLAN

Prepared for:

ANGELO'S AGGREGATE MATERIALS, LTD
855 28th Street South
St. Petersburg, Florida 33712

Prepared by:

LOCKLEAR & ASSOCIATES, INC.
4140 NW 37th Place, Suite a
Gainesville, Florida 32606

~~SEPTEMBER 2017~~ RAI 1 RESPONSE JANUARY 2018

Performed Under the
Supervision of

Lisa J. Baker, P.E.
Florida PE #74652

LISA J BAKER
LICENSE
No. 74652
STATE OF FLORIDA
PROFESSIONAL ENGINEER

ENTERPRISE RECYCLING AND DISPOSAL FACILITY
OPERATIONS PLAN
TABLE OF CONTENTS

ATTACHMENTS

ATTACHMENT 1	FACILITY ENTRANCE SIGN
ATTACHMENT 2	RANDOM LOAD INSPECTION FORM
ATTACHMENT 3	FACILITY TRAINING LOG
ATTACHMENT 4	GAS MONITORING SURVEY FORM
ATTACHMENT 5	LIST OF APPROVED COURSES
ATTACHMENT 6	TRAINING CERTIFICATES
ATTACHMENT 7	SOURCE-SEPARATED ORGANICS PROCESSING FACILITY REGISTRATION

1.0 DESIGNATION OF RESPONSIBLE PERSON(S) and references

Mr. John Arnold, P.E. is designated by Angelo's Aggregate Materials, LTD. (Applicant) as the individual responsible for operation and maintenance of the Enterprise Road Class III Recycling and Disposal Facility (Facility) in accordance with Rule 62-701.500, F.A.C. All correspondence and inquiries concerning the Facility permits and operation should be addressed to him at:

Mr. John Arnold, P.E.
Angelo's Aggregate Materials, LTD.
855 28th Street South
St. Petersburg, Florida 33712
Telephone: (813) 477-1719

Updated plan sheets and figures are provided in Sections 4 and 3 respectively of the September 2017 permit modification application.

2.0 LANDFILL SITE IMPROVEMENTS

The 160 acre landfill site is also permitted by Pasco County to be a Class I mine (Pasco County Petition #CU04-26, approved 9/23/2004). The following site improvements have been installed to continue operation of the Class III Landfill.

2.1 Facilities

An office trailer (gate house) is located onsite for the gate attendant. This trailer has hand washing and toilet facilities. Bottled potable water is used to provide drinking water for the trailer. Electric and telephone services are available to the trailer office. Site entrance improvements also include an all-weather entrance roadway, scales and perimeter road as shown on the Sheet C0.02 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application.

2.2 Primary Haul Routes

The primary haul routes used to reach the Facility are U.S. 301, S.R. 52, C.R. 35A, U.S. 98, and Clinton Avenue. These routes lead to Enterprise Road, which is used to access the facility.

Enterprise Road was improved by the Applicant to an all-weather, paved access roadway from C.R. 35A to Auton Road. Enterprise Road is a Pasco county owned roadway that is maintained by the county. The Facility has an all-weather, paved access roadway that will be maintained by the Applicant to provide adequate access at all times.

2.3 Effective Barrier

The existing Facility property previously had a five-foot high wire fence along the perimeter of the site. A 6-foot security fence has been constructed along the south and east boundaries. The security fence consists of a 6-foot high galvanized chain link fence, hereafter referred to as the "security fence." The five-foot wire fence still exists along the north and west property boundaries. The chain link fence has been installed in accordance with permit issuance in October, 2001. Three (3) foot square "NO TRESPASSING" signs with five-inch letters has been installed at no less than 500-feet spacing and at all corners to notice unauthorized access. The only point of access into the landfill site will be through the ticket gate at the entrance. This gate will be locked during closed hours.

An 8-foot high landscape berm has been constructed along the frontages of Enterprise and Auton roads as a visual and noise buffer.

3.0 OPERATING HOURS

The landfill will have the following operating hours:

Day	Hours of Operation
Monday through Friday	7:00 am to 6:00 pm
Saturday	7:00 am to 2:00 pm

Operational hours may be extended periodically to meet special requests of customers, but at no time will normal operating hours extend beyond 7:00 A.M. to 7:00 P.M. Monday through Saturday. Waste will not be accepted during non-daylight hours.

4.0 CONTINGENCY OPERATIONS

If a natural disaster occurs at the facility rendering it unusable, the waste accepted at the Facility would be rerouted to another permitted landfill. If a storm occurs within the surrounding community, storm debris waste will also be accepted at the facility, providing additional staff if required. In terms of equipment breakdown, there will be two operating pieces of equipment for all stages of landfill operation. Currently, Angelo's has on-site two compactors [Cat 826 (2)], two loaders (Cat 950, Cat 980), two dozers (Cat D5, Cat D8), four excavators [John Deere 450 (2), Komatsu PC1100, Komatsu PC300], and two articulated dump trucks (Volvo). If both should breakdown, replacements can be rented or substituted from onsite or offsite within 24 hours.

The site access roads will be constructed to allow passage of vehicles under all expected weather conditions. See Appendix 3-B for the Contingency Plan.

5.0 WASTE STREAM QUALITY CONTROL PLAN

5.1 Visual Inspection

An estimated 550 tons of Class III waste material is currently received at the facility daily. Materials brought onto the Enterprise Road Class III RDF site will be inspected three times. The first inspection takes place at the site entrance. The site will only accept Class III debris (which includes construction and demolition debris by definition); therefore, any vehicles hauling unacceptable waste can be turned away by the attendant at the ticket gate. The gate attendant will question all waste carriers as to the character and origination of their wastes. A mirror is installed overhead and angled to allow gate inspection of all loads after they are untarped. A video camera has been installed over the scale location that allows the gate attendant to visually screen all carrier loads prior to disposal, mainly to identify fire or smoking loads. For loads that are not accepted, a Rejected Load Form will be completed.

The second inspection is a visual inspection that will occur at the working face by a certified, trained spotter. The spotter stationed at the working face will be responsible for spotting trucks bringing in disposal loads. The spotter will show the drivers where to unload, and will also inspect the trucks to make sure unacceptable materials are not unloaded. The spotter will have the authority to ensure that unacceptable materials are reloaded on the truck the material was brought in on.

The third inspection will occur as the waste is spread by the equipment operator. Any unacceptable wastes observed will be placed in the appropriate container located at the working face. The equipment operator may also serve as the spotter and will perform both visual inspections - as the waste is unloaded and as the waste is spread.

The facility will deploy and use spotters based on the volume of waste disposed at the working face. No more than two loads will be allowed to dump simultaneously per spotter at the working face.

5.2 Documentation of Waste Received

Documentation includes recording the name of the company disposing of the waste, driver's signature/information, all vehicle identification numbers, quantity of waste (tons), and type of waste (to meet FDEP and Pasco County's requirements). All vehicles entering the landfill will be weighed. The type of material and location from which the waste was generated will be recorded. This provides a record for tracing ownership of individual loads. See Landfill Operating Records, Section 19.2 for more details.

5.3 Contingency for Unacceptable Materials

If unacceptable waste materials are delivered to the landfill, the truck will be refused entry after inspection at the gate. If the unacceptable waste materials are observed by a spotter while unloading, they will be reloaded onto the delivery vehicle. Should the vehicle leave before the unacceptable waste has been discovered, Enterprise Road Class III RDF personnel will place the unacceptable material into an appropriate container located at the working face. A maximum of 20 cubic yards of covered dumpster storage for Class I waste will be provided near the active face of the landfill, as shown on Drawing C0.03 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application. These containers are transported by Central Carting Disposal (or other qualified vendor) to a disposal facility permitted to accept Class I material. The covered storage containers will control vectors and odors and Class I waste will be removed within 30 days of discovery. If the storage containers cannot be secured to control vectors and odors, the putrescible waste will be stored no longer than 48-hours.

Unacceptable nonputrescible, non-hazardous wastes, such as batteries, paint, chemicals or similar items that are inadvertently accepted will be removed when observed and stored in a roll-off container or pile at the working face and removed daily to a lockable storage unit. A maximum of 40 cubic yards of stored unacceptable, nonputrescible, non-hazardous wastes may be provided near the active face of the landfill, as shown on Drawing C0.03 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application. These materials will be removed from the site at least every 30 days (sooner if required) by City Environmental (or other qualified vendor) and taken to their facility for processing and proper disposal. This plan should meet the inspection needs for the site to prevent disposal of unacceptable wastes.

If suspect regulated hazardous wastes are identified by operators or spotters by random load inspection or discovered deposited at the landfill, the FDEP will be notified promptly, as well as the hauler and generator of the wastes, if known. The area where the hazardous wastes are stored will immediately be secured from public access. If the generator or hauler cannot be identified, Enterprise Road Class III RDF will assume the cleanup, transportation and disposal of the waste at a permitted hazardous waste management facility.

5.4 Acceptable and Unacceptable Class III Landfill Waste Materials

The Enterprise Road Class III RDF will accept only those solid wastes as defined in Rule 62-701.200 (14), F.A.C. as Class III wastes, except as allowed otherwise by permit.

Acceptable Class III waste materials include the following:

- Land clearing debris
- Demolition debris
- Glass
- Carpet
- Cardboard
- Asbestos
- Plastic
- Automobiles and parts without visible contamination from petroleum products or other chemicals
- Construction debris
- Non-Treated Wood Pallets
- Unpainted, painted and untreated wood scraps from manufacturing
- Waste Tires (Processed)*
- Paper
- Furniture other than appliances
- Yard trash

* Processed waste tires are acceptable for disposal in the Class III Landfill provided that they have been cut into sufficiently small parts. The processed waste tire parts may be disposed of or used as initial cover at a permitted landfill. For use as initial cover, a sufficiently small part means that 70 percent of the waste tire material is cut into pieces of 4 square inches or less and 100 percent of the waste tire material is 32 square inches or less. For purposes of disposal, a sufficiently small part means that the tire has been cut into at least eight substantially equal pieces. Any processed tire which is disposed of in a landfill and which does not meet the size requirement of subsection (a) above must receive initial cover, as defined in subsection 62-701.200(53), F.A.C., once every week.

The following is a compilation of unacceptable Class III waste materials:

- Putrescible Household Waste
- Paint (liquid)
- Any toxic or hazardous Materials (i.e., batteries, solvents, oils, etc.)
- Refrigerators, freezers, air conditioners (white goods)
- Biomedical waste
- Automobiles or parts that are contaminated with petroleum products or other chemicals.

- Contaminated soils
- Electronics
- Septic tanks and pumping
- Whole waste tires (except at the waste tire processing facility)
- CCA Treated wood

The site has a visible sign at the site entrance on Enterprise Road as provided in Attachment 1. The sign identifies the accepted wastes, hours of operation, landfill classification, and site's 24-hour emergency contact and telephone number. Industrial or excavated waste will be considered for acceptance on a case by case basis, only with prior consent of the Department.

5.5 Random Load Inspection

In accordance with Rule 62-701.500(6)a., F.A.C., the owner or operator will implement a load-checking program to detect and discourage attempts to dispose of unauthorized wastes at the landfill. The load checking program will consist of the following minimum requirements:

1. The landfill operator will examine at least three random loads of solid waste delivered to the landfill per week. The waste collection vehicle drivers selected by the inspector will be directed to discharge their loads at a designated location in the landfill. A detailed inspection of the discharged material will be made for any unauthorized wastes. The landfill operator will assure the random inspections will be distributed between both loads originating from the transfer facility and other private waste haulers delivering waste to the landfill.

2. If unauthorized wastes are found, the facility will contact the generator, hauler, or other party responsible for shipping the waste to the landfill to determine the identity of the waste sources.

The following procedures will be followed when inspecting the load:

A. The load will be "broken apart" by both the spotter and equipment operator to allow for a thorough inspection.

B. The inspectors will be searching and removing de minimis amounts of unauthorized waste contained in the load.

C. If the load contains more than de minimis amounts of unauthorized materials, they will immediately be reloaded onto the customer's vehicle for removal from the site. In the event that the transporter will not remove the unacceptable materials, the materials will be loaded into an appropriate container and removed from the site. The customer/generator will be contacted and notified of the site policies as well as charged for the off-site disposal services.

D. In all cases, if more than minimal unacceptable wastes are found during the inspection, the customer will be notified to assure the prevention of future occurrences.

All inspection will be documented on the site's "Random Load Inspection Form," signed by the inspector, and kept in a current Log Book, see Attachment 2. Log books will be maintained at the landfill for at least 3 years. Inspections will be performed by trained site personnel.

5.6 Asbestos Waste Disposal

Asbestos-containing materials (ACM's) will be accepted for disposal in accordance with 40 CFR Part 61.154. Arrangements for disposal of ACM's between the Facility and the waste generator/hauler will be recorded in the operations record as to the quantity and date of shipment to the landfill. The loads are accepted at pre-arranged times during operational hours.

To ensure that all waste deposited at the Facility meets state and local requirements, all facility personnel will receive training from their supervisor on the identification of unacceptable materials, which is any waste other than properly labeled and bagged ACM. Unregulated, non-friable asbestos containing materials are not required to be bagged, but all other requirements are unchanged.

Each load of ACM arriving at the facility must be accompanied by a completed Waste Shipment Record (WSR) in accordance with 40 CFR 61.150. Each load will be inspected to insure that it is properly bagged, that bags are intact and properly sealed, and that the required warning labels and generator labels are affixed. Bags will not be opened prior to disposal.

ACM arriving at the Facility for disposal will be visually screened by facility personnel a minimum of two times. The first screening will be at the scales, controlling access to the Facility, where the truck drivers will be questioned as to the contents of the load and the shipping documents will be reviewed. The gate attendant will direct the drivers to the appropriate disposal area.

The second screening will be at the working face where a trained inspector/spotter will again question the driver and make a visual examination of the load prior to dumping and as it is dumped. This examination will insure the ACM is properly bagged, the bags are intact and properly sealed, and that the warning labels and generator labels are affixed.

Facility personnel will direct the waste hauler to the designated ACM disposal location in each cell, to be determined by the Operator. The ACM will be covered with 6-inches of soil at the end of any day that ACM is accepted. This designated ACM location will be recorded and updated by the annual topographic survey in accordance with 40 CFR 61.154. ACM disposal records will be maintained for the life of the landfill and disposal locations documented in the Closure Report.

5.7 Incidental Recycling Operations

The Class III landfill does have a separate, dedicated materials recycling area. However, if recyclable wastes are incidentally received, such as metals, concrete rubble, asphalt, and wood wastes, the facility will separate them in stockpiles or in roll-off containers. Concrete and asphalt will be periodically transported to an appropriate location for crushing. Yard and wood wastes may be chipped for use onsite or be placed in roll-off containers for shipment to a wood recycler. These materials will be removed from the site approximately every 6 months. However, if the storage capacity is exceeded, the materials will be removed sooner. Incidental recyclable materials that are identified at the disposal area will be placed in containers located near the working face, as follows and as shown on Drawing C0.03 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application.

TYPE	MAX. QTY	STORAGE
Ferrous Metal	500 CY	Roll-off or pile
Aluminum	300 CY	Roll-off or pile
Stainless Steel	300 CY	Roll-off or pile
Copper	25 CY	Trash pail, roll-off or pile
Asphalt	300 CY	Roll-off or pile
Concrete / Rubble	300 CY	Roll-off or pile
Recyclable electronics	8 CY	Covered dumpster

Trucks identified at the entrance as carrying primarily recyclable products, (i.e., concrete, metal, wood, paper) will be refused entrance into the landfill.

5.7.1 Reports

A Recovered Materials report will be submitted by type of waste recovered and tonnage to the FDEP and Pasco County Solid Waste Department. These reports will also be compiled into an annual report to the FDEP.

5.8 Wood Acceptance Area

The facility is a registered Source-Separated Organics Processing Facility and in compliance with the requirements specified in Rule 62-709.320 and Rule 62-709.330. Initial inspection will be performed at the scalehouse by the attendant. Wood wastes are stockpiled until processing takes place every 180 days. Personnel trained to identify and remove any unacceptable wastes will be present during processing. Unacceptable wastes, if found, will be removed prior to wood processing.

5.9 CCA Treated Wood Management Plan

The following serves as the CCA-treated wood management plan required by 62-701.730(20), F.A.C. Employees will be trained in the proper management of CCA-treated wood. CCA-treated (chromate-copper arsenate) wood must be stored in the temporary storage container for waste destined to go to a lined facility. CCA-treated wood is not allowed to be disposed of in the Enterprise Class III Recycling and Disposal Facility.

The following is strictly prohibited:

- Disposal of CCA-treated wood in any unlined landfill or disposal facility
- Burning of CCA-treated wood in an open burn or an air curtain incinerator
- Mulching of CCA-treated wood or use of CCA-treated wood in other soil amendment products

There are several ways for employees to identify CCA-treated wood: 1) determining the place of origin, 2) identification by shape – typically large, dimensioned pieces of wood and 3) identification by color. CCA-treated wood has been used in a variety of applications including fencing, docks, outdoor decks and stairs, playground equipment and landscaping. The wood is typically large – dimensioned 4-inches or larger.

The most common method for visually identifying treated wood among lumber, timber and plywood is to look at the color of the wood. Untreated wood and borate-treated wood typically have a light yellow color. Wood treated with copper varies in color from a very light green to an intense green color depending on the degree of treatment. A higher degree of treatment is typical for marine applications and for structure with a high load-bearing support. Once the wood treated with copper has been in-service and has weathered, the green color is generally converted to a silver color. It still may be difficult to visually distinguish weathered treated wood from weathered untreated wood.

Employees are cautioned against handling CCA-treated wood. Workers handling wood preserved with CCA should be sure to wash their hands before eating or smoking. CCA-treated wood splinters in the hands and fingers of workers are reported to be very problematic and should be removed as soon as possible. It is important to make sure that the entire splinter is removed. Removal may require medical attention.

The most efficient way to minimize CCA-treated wood disposal in the facility is to communicate with landfill customers. Dedicated, separate suitable temporary container for CCA-treated wood at demolition and construction job sites can be used. At the scale house, personnel will question transporters on the type of wood and direct customers to dispose CCA-treated wood at a Class I landfill. Personnel will also perform a visual inspection at the scale house if necessary especially for loads originating from the construction and demolition of fences and decks.

The facility shall incorporate CCA-treated wood into its spot-checking program. Spotters visually inspect and determine if any dimensioned wood is in the load, such as railroad ties and fence posts or building materials. If CCA-treated wood is found, the load will be diverted to a Class I landfill for disposal. Tipped loads will be spread and inspected for the presence of CCA-treated wood. CCA-treated wood will be adequately protected from rain to prevent leaching of contaminants.

6.0 WEIGHING OR MEASURING INCOMING WASTE

A scale system is used to weigh incoming waste. The scales will be calibrated every six (6) months. Vehicles will be weighed when they enter the disposal site, and based upon the tare weight of the vehicle, the waste tonnage will be determined. Prior to unloading debris, the tonnage or volume of the waste material disposed will be determined and the appropriate fee assessed. Weigh tickets will be kept on-site for a minimum of 5 years.

6.1 Fee Schedule

The fee schedule for disposal varies depending on the client, type of waste and volume received.

Waste Type	Unit	Fee per Unit
Class III	CY	Variable

This fee schedule will be periodically revised according to the prevailing market for waste disposal. The Operator will notify clients immediately in writing of all fee schedule changes.

7.0 VEHICLE TRAFFIC CONTROL AND UNLOADING

Generally, truck traffic will be controlled by first-in, first-out, as directed by the spotter located at the working. There will be adequate space for truck staging at the site's entrance (7-8 trucks) to mitigate any queuing onto Enterprise Road. Enterprise Road Class III RDF will discourage any truck staging prior to landfill opening. Signs will be posted at the entrance gate and on interior roads to guide mining truck traffic vs. landfill truck traffic to their appropriate areas of the site.

8.0 METHOD OF CELL SEQUENCE AND LIFE EXPECTANCY

8.1 Cell Sequence

Angelo's Aggregate Materials is currently filling in Cells 1 – 7 and 15 of the Class III Landfill, while construction of Cell 16 is being completed. The cell construction and filling sequence operations will be as follows:

Phasing Sequence 1	As shown in Drawing Sheets C1.00 and C1.01 Continue filling Cells 1, 2, 3, 4, 5, 6, 6B, 7 and 15 in 10 – 12 foot lifts to waste elevation of 172' Maximum slope is 3H:1V from base grade to waste elevation 167'; 1% to 2% grade from waste elevation 167' to 172' Sideslope berms and stormwater appurtenances are to be constructed at final closure. ~~Construct~~ Construction and filling of Cell 16 in accordance with permitted design
Phasing Sequence 2	As shown in Drawing Sheets C1.10 and C1.11 ~~Begin~~ Continue filling Cell 16 with 4 – 6 feet lift north of the temporary stormwater and leachate diversion swale until cell is floored out. Remove temporary swale and fill with 4 – 6 feet lift. Continue filling Cell 16 in 10 – 12 feet lifts from base grade to waste elevation 137'. Maximum slope is 3H:1V from base grade to waste elevation 137'. A 10-ft wide stormwater bench is to be constructed at elevation 137'. Sideslope berms and stormwater appurtenances are to be constructed at final closure. ~~Construct~~ Construction and filling of Cell 17 (formerly Cells 13 & 14) in accordance with permitted design
Phasing Sequence 3	As shown in Drawing Sheets C2.00 and C2.10 ~~Begin~~ Continue filling Cell 17 with 4 – 6 feet lift north of the

temporary stormwater and leachate diversion swale until cell is floored out. Remove temporary swale and fill with 4 – 6 feet lift.
Continue filling Cell 17 in 10 – 12 feet lifts from base grade to waste elevation 137'. Maximum slope is 3H:1V from base grade to waste elevation 137'.
Sideslope berms and stormwater appurtenances are to be constructed at final closure.
Construct overall landfill vertical expansion to include maximum sideslope of 3H:1V from base grade to waste elevation 137', 187' and 212'; 1% to 2% grade from waste elevation 217' to 212'
10-ft wide stormwater benches to be constructed at waste elevations 137' and 187'.

Phasing Sequence 4 | As shown in Drawing Sheets C3.00 and C3.10
Construct final closure cover system over Cells 1, 2, 3, 4, 5, 6, 6B, 7, 15, 16 and 17 in accordance with the revised overall landfill vertical expansion closure design.
Construct sideslope berms and stormwater appurtenances.
Construct landfill gas vents.

Lift height includes cover material. Due to the landfill bottom elevation, some lifts may not be a full 10 feet in height.

As each sequence is active, the following procedures will be followed.

- The access road to the working face will be constructed and graded as necessary.

- Waste will be compacted as it is placed. General lift height will be 10 feet and will come within three (3) feet of the final elevation to provide for final cover.

- The working face will remain approximately 100 feet in length.

- Avoid channelizing stormwater flows

- Use mulch, grass, and maintain intermediate covers

- Weekly cover of six (6) inches of soil will be placed on the working face.

- Intermediate cover of 12 inches of soil will be placed in areas that will not receive waste within 180 days. The cover may be removed immediately prior to placement of new waste.

- Stormwater runoff from the interior of the excavation and filling area will be diverted to the onsite temporary storage pond using a temporary interior swale and 6-foot berm. Perimeter berms will direct stormwater away from excavation and filling areas. The temporary stormwater pond will receive runoff until Pond 3 is developed.

8.2 Erosion Control

The following engineering controls will be used to minimize erosion at the working face:

- Regrade a maximum of 100 linear feet of the outer edge slopes at a time to 2H:1V. The purpose of this recommendation is that a relatively small area will be subjected to surface erosion at any given time.

- Construct a berm along the top of the slope during the regrading to redirect any rainfall runoff away from the face of the slope. The area along the berm should be graded so as to allow rapid runoff along the top of the slope. Ponding of water near the top of the slope should not be allowed, since seepage through the slope may initiate slope erosion.

- As soon as possible following the construction of the clay layer, begin to fill against the Cell 16 2H:1V slope with the landfill material.

- For Cell 16 construction, filling shall begin immediately north of the east-west trending berm to be located near the southern boundary of Cell 16. The fill sequencing of Cell 16 is described in Section 3.8.

- For Cell 17 construction, filling shall begin immediately north of the east-west trending berm to be located near the southern boundary of Cell 17. The fill sequencing of Cell 17 is described in Section 3.8.

- Avoid channelizing stormwater flows

- Use mulch, grass, and maintain intermediate covers

8.3 Life Expectancy.

The capacity and lifespan estimates are provided in Section 3.8.3 of the Engineering Report.

9.0 WASTE COMPACTION AND APPLICATION OF COVER

Waste received will be segregated based on compatibility. Bulky, incompressible items, such as concrete and tree debris, will be separated and stockpiled for future processing. Tree debris is separated from the waste and periodically mulched for on-site uses. The remaining debris is disposed of in designated "cells" using a CAT 826G Compactor, or equivalent to place, spread the waste daily and compact the debris weekly. Initial cover material is planned to be excavated from onsite areas and placed weekly in approximately 6-inch layers on the compacted lifts to control vectors, reduce rain infiltration and provide a more stable working face area. The facility may also use a 50/50 mixture of mulch and soil as cover in accordance with Policy Memo # SWM-05.4 dated April 25, 2001. An intermediate cover of one (1) foot of compacted soil will be applied if final cover or an additional lift is not to be applied within 180 days of cell completion. Cell closure will occur when all permitted cells are filled. For final buildout grade and closure details, see Drawing Sheets C3.00 and C3.10 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application. The Conceptual Closure Plan includes permitted Cells 1-7 and 15, 16 and proposed Cell 17.

Cell closure will generally conform to the lines and grades specified in the Landfill Conceptual Closure Plan. The grading plan will conform to the rules and regulation specified in 62-701.600, as well as 62-701.400(7) and 62-701.400(8), Florida Administrative Code. Pesticides when deemed necessary to control rodents, insects and other vectors will be used as specified by the Florida Department of Agriculture and Consumer Services. Uncontrolled and unauthorized scavenging will not be permitted at the landfill site. Controlled recycling may be permitted by the Site Manager responsible for the operation of the landfill facility. Temporary storage of soil fill or recycling materials may occur in the closed cell areas.

10.0 OPERATION OF GAS, LEACHATE AND STORMWATER CONTROLS

10.1 Gas Monitoring and Control

The type of materials to be disposed in the Class III Landfill are not expected to generate significant amounts of methane or other toxic gases since the landfill's design prevents groundwater contact therefore, a passive gas control system is proposed. The Landfill Manager will conduct daily and weekly inspections of the landfill and will check for objectionable odors or gas by driving around the perimeter of the site, record the results, and notify the FDEP and County of any positive detection and immediately take corrective actions. Corrective actions will include placement of additional soil cover, or mulch, or lime containing materials such as crushed concrete that is documented to abate the odors. Quarterly gas monitoring is currently conducted.

Within 30 days of being notified by the Department that objectionable odors per Rule 62-701.200(77), F.A.C. have been confirmed off-site, the Facility will submit to the Department for approval an odor remediation plan. The plan will describe the nature and extent of the problem and the proposed long-term solution, which will be implemented within 30 days of approval. The plan will include procedures to implement a routine odor monitoring program to determine the timing and extent of objectionable odors and a means of evaluating the effectiveness of the remedy.

The facility only accepts Class III debris for disposal and accepts no putrescible household wastes. Surface water and groundwater contact with the Class III wastes will be prevented by the approved facility design thus preventing possible odor operation. Other best management practices to prevent odors include: 1) closure of each cell as it is completed; 2) weekly soil cover application; and, 3) immediate corrective actions to abate odors.

A system of passive gas vents will be installed to manage landfill gas. The location of the gas vents is shown on Sheet C3.00 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application. The construction details of the vents are shown on Figure 3-14 (provided in Appendix 3-C of the 2012 permit renewal application submitted by Kelner Engineering). The vents will be installed during the final closure and installation of the final cover over each landfill cell.

A system of 16 gas monitoring points will be installed to monitor gas at the site, see Sheet C0.03 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application. The construction details of a typical gas probe are shown on Figure 3-14 (provided in Appendix 3-C of the 2012 permit renewal application submitted by Kelner Engineering).

10.1.1 Methane Gas Measurement

In accordance with the requirements of the current FDEP permits, methane gas levels are monitored at each of the active gas monitoring points quarterly, with results submitted to the FDEP. A lower explosive limit (LEL) meter will be used to measure methane levels from each of the gas probes. LEL meters, such as the MSA Model 260 or GEM 500 or equivalent, will be used to conduct this monitoring. These meters are capable of measuring percent volume of methane in air and the percent LEL level of the methane by volume. The meter shall be calibrated in accordance with manufacturer's specifications prior to each methane monitoring event. Attachment 4 of the Operations Plan provided in Appendix 3-A of the Engineering Report presents the proposed gas monitoring probe survey form to be used to conduct the quarterly monitoring at the subject site. This form will document at the time of each gas probe reading, air temperature in degrees Fahrenheit, methane levels in percent volume in air and percent LEL. The reporting action level for methane in air will be considered 5 percent by volume in air as measured by the lower explosive limit. The reporting action limit for methane in structures is 25% of the LEL, or 1.25% methane by volume. The results of each quarterly gas probe survey will be submitted to the Department on the presented form within two weeks of each monitoring event. These events are planned to be coordinated with the semi-annual groundwater monitoring at the subject site.

10.1.2 Gas Contingency Plan

The following Contingency Plan will be implemented if any of the measured gas monitoring points methane levels are detected above the 100% LEL of greater than 5 percent methane in air, or if 25% of the LEL or higher is measured in a structure. If this level of methane or greater is detected in any of the probes, the Facility operator will institute measurement of methane in nearby, at, or below grade structures, i.e., stormwater collection points, or any maintenance or office buildings within 100 feet of the subject gas probe on a weekly basis until these levels go below the 100% LEL at the subject probe. If methane levels measured in any on-site building exceed 25% of the LEL, building windows and/or doors will be opened for ventilation and all personnel evacuated until methane readings are maintained below 25% of the LEL for methane. The monitoring report for any event that detects methane above the LEL will also report methane levels from nearby structures, as indicated above, until the levels go below the methane LEL level or until corrective actions are conducted to reduce methane levels. The FDEP will be notified within seven days of any gas monitoring levels that exceed the reporting action levels.

10.2 Leachate Control

Any leachate that may be produced at the landfill will be controlled with the use of a continuous 3-foot thick clay layer ($1x10^{-8}$ cm/s) that will be placed on the bottom of the cells. The clay layer beneath each individual cell will form a continuous barrier layer that will be graded to direct leachate to the remaining portion of the temporary stormwater pond in proposed Cell 17 (formerly Cell 14) during construction of Cell 16 and/or a toe drain extending east to west along the northern perimeter of Cells 16 and 17. The toe drain will slope from west to east and terminate in a manhole between Cell 16 and Pond 3. The toe drain will "daylight" approximately 3 feet above the bottom of the manhole. A dedicated pump with float control system will be used to transfer leachate from the manhole to Pond 3. During Cell 16 construction, leachate will continue to flow along the continuous bottom barrier layer towards the northern landfill boundary, and into the existing stormwater pond in proposed Cell 17 (formerly Cell 14). During excavation of permitted Cell 16, a temporary stormwater and leachate diversion swale shall be constructed along the southern perimeter of Cell 16 to divert leachate generated in Cells 1-7 and 15 to flow west to the temporary stormwater pond. During excavation of proposed Cell 17, a temporary stormwater and leachate diversion swale shall be constructed along the southern perimeter of Cell 17 to divert leachate generated in Cell 17 to flow towards the Cell 16 toe drain.

Under no circumstances will waste be placed in water. In the event that water is present above the clay barrier layer at the time waste is to be placed, the operator will utilize pumps to remove the water to Pond 3. Once Cell 16 and any future Cells that would connect to the leachate collection system have been filled to their final design grades and closed, the pumping of leachate into Pond 3 ~~will be vacated~~ shall continue until leachate is not generated in volumes to be collected in the sump.

The controlled method of screening waste also supplements the leachate control. Because the Applicant privately owns the Enterprise Class III Landfill facility, most of the haulers, waste generators, and sources of waste are known to Angelo's and the scale house attendants. For those haulers that are unfamiliar to the Applicant, the scale house attendants question the haulers more intensely to determine the contents of their loads. The spotters and operators add additional monitoring at the active disposal location. The addition of video surveillance to the monitoring process of incoming wastes helps to identify fires or smoking loads. Combined methods of screening waste is an effective method to reduce any possible threat to public health or the environment.

10.3 Stormwater Control

The approved Stormwater Management Plan for the landfill consists of berms, swales, and ponds constructed within the 200-foot landscape buffer zone to divert, collect and contain stormwater runoff from the completed site. These stormwater facilities are designated to retain the 100-year, 24-hour storm volume as required by Pasco County and the FDEP. During excavation, construction and waste disposal, stormwater will be controlled by a series of berms that direct stormwater to the stormwater pond located along the northeast corner of the site. Stormwater Pond 3 is permitted as an Industrial Wastewater Pond through FDEP. Additional details concerning the stormwater management system are provided in Drawing Sheets C3.00 and C3.10. A 6-foot berm adjacent to active and filled cells retains stormwater from the filling area and diverts stormwater from the excavation area to the stormwater pond. The remaining portion of the temporary stormwater pond will be filled as part of the construction of Cell 17.

The site manager will perform weekly inspections of the storm water management system. Any areas in need of maintenance will be repaired within seven days.

11.0 SIGNS

Signs will be posted at the entrance to the Facility site which will list the following information:

The operating entity;
Hours of operation;
No scavenging allowed;
No hazardous waste accepted;
List of acceptable and unacceptable waste; and,
24-hour phone number of emergency contact.

The scalehouse attendant will direct each driver to the area appropriate to unload wastes. Signs will also be posted to direct trucks to either the borrow pit or the landfill working face.

12.0 DUST ABATEMENT PLAN

The Facility will provide a water tanker to water the landfill access roads if and when dust becomes a problem. This will also be done whenever the County receives complaints about dust or when a dust problem is observed during a County or State inspection.

13.0 DUST, LITTER, AND VECTOR CONTROL PLAN

The nature of the waste to be disposed in the landfill does not typically create litter and vector problems. Daily placement of waste and/or compaction will be the primary means utilized to control litter and vectors. The facility personnel will perform daily inspections of the facility and the access road to assure litter is controlled. As needed, laborers will pick up blowing debris and dispose of it in appropriate containers and/or on site. Temporary fencing to contain litter at the working face of the landfill may be used as needed. These litter controls will also be implemented whenever the County or State receives a complaint from adjacent landowners or a litter problem is observed during an inspection.

If vectors (rodents, insects, and domestic animals) become a nuisance at the Facility, the Operator may obtain the services of a licensed pest management company to review the operations and recommend control measures.

14.0 FIRE PROTECTION AND FIRE FIGHTING FACILITIES

Fires that originate in landfills are primarily extinguished by soil application. Supplemental fire protection will be furnished by the Dade City Fire Department (Station No. 1). The Fire Department will be notified immediately of all landfill fires. An emergency contact list will be posted at the scalehouse with contact phone numbers.

During a fire, incoming trucks will be directed toward another area of the landfill so that a temporary active face can be established. Once the fire is extinguished, appropriate cover will be applied to the waste and operations will continue at the original active face. If the fire is extensive and a temporary active face cannot be established, incoming trucks will be redirected to another landfill.

Onsite fire prevention facilities will include:

- Fire extinguishers mounted in the cab of all heavy equipment and in the office/ scalehouse;
- Telephones to notify personnel of a fire;
- Onsite equipment (dozer) and fill dirt to extinguish fires on working face; and
- Site water truck

Soil for firefighting purposes will be borrowed from the closest unexcavated area of the site to the fire. Details of all firefighting episodes will be recorded in the landfill operating record.

14.1 Hot Loads and Spills

Any hot load (of authorized material) found will be dumped on an area at least 500 feet away from the active working face. The load will immediately be covered with soil if a fire is imminent. Once the fire is extinguished, the load will be pushed and spread using a dozer, allowing for the load to be inspected by a spotter. The waste will not be disposed of until it has cooled completely, and the fire hazard has been mitigated.

In the event of a fire at the working face, waste acceptance will cease until the fire has been completely extinguished and additional cover material compacted in the area of the fire. If the fire is located elsewhere in the landfill, waste acceptance operations may continue at the manager's discretion.

Since liquid disposal is prohibited in a Class III landfill, spills from waste vehicles are not anticipated. In the case of a fuel spill or leak, the contaminated soil will be collected to the extent possible, contained in a drum or roll off container, and taken offsite within thirty (30) days for proper disposal or treatment.

15.0 LANDFILL PERSONNEL

The scalehouse attendant and certified landfill operator will be onsite during all operating hours. In addition, there will be a minimum of one (1) other person (spotter) onsite, for a total of three (3). The state certified landfill operator will be assigned to manage the daily landfill operations. The personnel will be stationed at the landfill ticket gate and active disposal face. Additional personnel will be assigned to the landfill operation as the demand necessitates. Two spotters are generally located at the working face at all times that waste is accepted. However, there are up to eight spotter-trained or in-house trained spotter employees on-site each day and therefore; additional trained employees can be relocated to the working face as necessary to inspect the incoming waste. Certificates for current trained personnel are attached as Attachment 6 to this plan.

At least one (1) spotter will be at the working face at all times the facility is accepting waste. The spotter will direct vehicle traffic around the working face and will direct drivers where to empty their vehicles. The loads will be inspected as described in Section 5.0. If the load is acceptable, the waste will be spread and compacted as necessary. If the load is unacceptable, the spotter will direct the driver to reload the waste into the vehicle, if possible. If the driver is unable to reload the material, on-site personnel will reload the material for the driver using onsite equipment. The spotter will also discourage scavenging by the public.

The equipment operator spreading waste at the working face may also act as a spotter in accordance with the following:

1. The heavy equipment operator must be trained as a spotter;
2. When unauthorized waste is discovered, the heavy equipment operator must either move the unauthorized waste away from the active area for later removal and proper management, or must stop operation and notify another person on the ground or on other equipment who will come to the active area and remove the unauthorized waste before operations are resumed;
3. Each load of waste must be visually inspected for unauthorized waste prior to being compacted or loaded into a transfer vehicle.

A typical work schedule is as follows:

Day	Operating Hours	Scalehouse Attendant	Certified Operator	Spotter(s)	Equipment Operator*
M-F	7 am – 6 pm	1 (7 am – 6 pm)	1 (7 am – 6 pm)	Min. 1 (7 am – 6 pm) For 2 or more (7 am – 4 pm), (12 pm – 6 pm)	Min. 1 (7 am – 6 pm)
S	7 am – 2 pm	1 (7 am – 3pm)	1 (7 am – 3 pm)		Min. 1 (7 am – 2 pm)

* - Equipment Operator may also serve as a spotter

15.1 Training Plan

The Facility will implement an employee training plan to properly train their landfill operators and spotters to operate the landfill in accordance with this Operations Plan, state and local regulations, and accepted disposal practices and to properly manage any hazardous or prohibited materials which are received at the landfill.

A trained operator will be at the site during all times that the landfill receives waste. All facility operators will be trained at an approved FDEP training course. Each operator will submit proof of training and documentation to the FDEP upon receipt of their certificates.

Landfill operators must have at least one year of work experience in landfill operation and a high school diploma; or have at least two (2) years' experience at a Class I, II, or III landfill. Each operator will complete at least 24 hours of initial training in an FDEP-approved training course, and will pass an examination as part of that training. Sixteen (16) hours of continuing training will be completed within three (3) years of each operator's initial training from an approved course documented by the form in Attachment 3. A list of FDEP approved training courses for operators and spotters are included in Attachment 5.

The Facility spotters will complete an initial eight (8) hour FDEP-approved course and four (4) hours of continuing training every three (3) years. Records documenting each employee's training course completion and schedule will be maintained and kept at the landfill office at all times.

Interim operators must become trained operators within one year of employment as an interim operator and interim spotters must become trained spotters within 3 months of employment as an interim spotter

16.0 COMMUNICATIONS FACILITIES

The landfill scalehouse will have both telephone and facsimile facilities. In addition, all landfill operating areas (gate house, working face etc.) will have radio communication or cell phones with the base station at the gate house.

17.0 EQUIPMENT INVENTORY

Equipment currently planned for use at the landfill site includes:

A. D-8 Caterpillar bulldozer, CAT 826 G Compactor; two 2.5 cud loaders, water truck, 590 John Deer backhoe, or equivalent are sufficient for adequate operation of the facility. A wood chipper/grinding machine (Hogzilla), or equivalent, will be moved to the site periodically (approximately once every six months) to process wood wastes as needed. Additional equipment, such as a grader may be rented as needed.

B. Arrangements will be made to provide alternate equipment within 24 hours following an equipment breakdown.

   Equipment rental companies that may be used to obtain reserve equipment include the following:

   Ring Power - Brooksville, Florida
   Contact: 352-796-4978

   Flagler Equipment - Tampa, Florida
   Contact: 813-630-0077

C. There will be safety devices present on equipment to shield and protect the operators from potential hazards during operation.

17.1 Equipment Maintenance

The Facility will conduct routine heavy equipment and vehicle maintenance onsite. Maintenance includes fueling of heavy equipment with diesel fuel, lubrication, oil changes and, antifreeze changes. Tire repairs will be handled by an outside service company.

A permanent equipment fueling facility will be installed and registered in accordance with F.A.C. 62-761. Pasco County will be copied on the registration.

Oil and antifreeze changes will be contained by large drip pans to catch the waste oils. These wastes will then be transferred either to a 250-gallon waste oil skid tank or to a 55-gallon drum for waste antifreeze, which will be located in a containment area. The containment area is a covered metal storage shed. Enterprise RDF plans to enter into contracts with licensed recyclers to periodically pick up the waste oil and antifreeze. Records of these pickups will be maintained by Enterprise RDF. All virgin lubricants will be stored undercover within the gate house building or suitable enclosure.

18.0 SAFETY DEVICES

All operating equipment which will be utilized at the landfill site will be fitted with rollover protection and fire extinguishers. All landfill personnel will be required to wear safety helmets, safety shoes, eye protective glasses, gloves, and safety vests. The onsite heavy equipment will meet OSHA safety requirements. First aid equipment will be kept in the office trailer and in the operating equipment.

19.0 RECORDS, PERMITS AND REPORTS

A copy of any Florida Department of Environmental Protection (FDEP) and Pasco County approved engineering drawings, permits and supporting information will be kept at the facility for reference and inspections. Permits will be posted at site per ordinance. A waste type and quantity intake (in tons) log will be kept daily, compiled monthly and a report will be submitted annually to Pasco County and the FDEP.

An annual estimate of the remaining life and capacity in cubic yards of the landfill will be reported annually to the FDEP.

19.1 Water Quality Monitoring

The Facility will conduct the required initial and semi-annual groundwater monitoring at the sites' monitoring wells as described in the Facility's Groundwater Monitoring Plan. Semi-annual reports of this monitoring will be submitted to Pasco County and FDEP in accordance with this plan. Quarterly monitoring will also be conducted and reported at specific wells per Pasco County conditions.

19.2 Landfill Operating Records

The operating record for the landfill will document daily as a minimum the following activities:

- Self-inspections of landfill conditions, safety equipment and unacceptable waste received, any odor detected;
- Records used to develop permit applications;
- Change in construction, operation or closure permits and supporting designs;
- Water quality sampling events, analytical reports, well installation or repair;

- Employee training;
- Random load checks;
- Facility construction, major maintenance, or demolition;
- Other activities that significantly affect facility operations.

Self-inspections of the landfill conditions are conducted daily, and more extensive inspections are included weekly. Daily inspections include general inspection of site access, site security, and conditions of intermediate cover. Weekly inspections include more detailed inspections of the conditions of the surface water and stormwater management systems and groundwater monitoring wells.

The Operating Record will be kept at the landfill and be accessible to the landfill operators to maintain and for FDEP or Pasco County inspection at reasonable times.

Operational records will be maintained for the design life of the landfill, with the exception of weigh tickets which will be kept at least 5 years. Water quality monitoring information, maintenance records, and permit reports will be maintained for a minimum of 10 years. Background water quality records will be maintained for the design period of the landfill.

20.0 EROSION CONTROL

The site's inherent design as an excavation pit will prevent stormwater from leaving the property. Stabilization by seeding and mulching of the final fill areas will occur as the fill operations progress from cell to cell.

21.0 FINAL GRADE PLAN

Interim grades of the cells are shown on the plans (Drawings C1.00, C1.10, C2.00 and C3.00 of the 2017 Plan Set provided in Section 4 of the September 2017 permit modification application) and in the cross-sections (Drawings C1.01, C1.11, C2.10 and C3.10). Permitted mining activities will continue in accordance with the site's Class I mining permit. The final elevations after construction of future cells is planned to reclaim excavated areas back to the grade which existed prior to the site being opened as a mine with allowance for positive drainage. The Landfill Conceptual Closure Plan is provided in Drawing C3.00 (Section 4 of the September 2017 permit modification application).

22.0 CLOSURE AND LONG TERM CARE

The site's Reclamation and Closure Plan details the procedures to properly close and maintain the landfill during the 30-year post-closure period. A Closure Report will be prepared for the landfill that details the site-specific limitations for land use based on geotechnical stability (settlement), potential gas migration, and site access. Long-term maintenance of erosion controls, storm water controls and monitoring devices is discussed in the Closure Plan (Section 7 of the September 2017 permit modification application).

23.0 CERTIFICATION

Laboratory testing and observation of cell floor conditions during cell construction completion will consist of the following:

- In-place density testing for each 12-inch thick soil lift, based on laboratory proctor test results for the construction material, will be recorded by a properly trained technician. These tests will be conducted in the location of each permeability test.
- Thickness testing of each lift will be recorded at a minimum frequency of two tests per acre, per lift.
- Confirmation hydraulic conductivity testing of Shelby tube or drive cylinder samples of the compacted cell floor material will be performed at a minimum frequency of one test per lift, per acre.
- Observance for unstable areas such as limestone, sinkholes and soft ground will be performed for each cell.

If the test data from a cell floor section does not meet the requirements of the anticipated conditions of the hydrogeological and geotechnical reports and the requirements of the facility construction permit, additional random samples may be tested from that cell section. If the additional testing demonstrates that the hydraulic conductivity meets the requirements, the cell will be considered acceptable. If not, that cell will be reworked or reconstructed so that it will meet these requirements.

Upon completion of construction of any cell (or cell increment) within the disposal facility, the Applicant will provide the FDEP with the necessary reports, documents, and form 62-701.900(2), F.A.C. demonstrating that the approved construction is complete and in accordance with the submitted plans. The operator will provide the completed form to the FDEP in accordance with Rule 62-701.320(9)a., F.A.C., along with the quality assurance test results described above.

24.0 HISTORY OF ENFORCEMENT ACTION

In 2000, OGC Case No. 00-0009 was opened against the applicant for the Frontier Recycling facility (now Angelo's Recycling Facility) in Largo, Florida. A model consent order was used to resolve the issues of the case. The DEP's database did not include information regarding the subject of the enforcement.

In 2004, OGC Case No. 04-0887 (solid waste) and No. 04-0426 (stormwater) were opened against the applicant for Angelo's Recycling facility in Largo, Florida. ARM requested a minor permit modification to resolve the solid waste enforcement case. Formal enforcement was not taken to resolve the stormwater case. Instead, it was handled through submittal of a new permit application.

In 2006, OGC Case No. 06-0783 was opened against the applicant for the Enterprise Class III Landfill and Recycling Facility in Pasco County, Florida. ARM performed the corrective actions that were required to bring the facility into compliance and the assessed civil penalties were paid.

In 2007, OGC Case No. 07-1985 was opened against the applicant for the Angelo’s C&D Recycling Waste Processing Facility in Apopka, Florida. ARM performed the corrective actions that were required to bring the facility into compliance and the assessed civil penalties were paid.

In 2007, Warning Letter #WL07-0019SW51SWD was issued to Angelo’s Aggregate Materials, Ltd. for the Enterprise Class III Landfill. The Warning Letter was settled June 5, 2008 for total fines of $18,397. In the “Proposed Settlement of Warning Letter WL07-0019SW51SWD”, the Department acknowledged that Angelo’s would not be considered “irresponsible” under FDEP Rule 62-701.320, FAC, as a result of the enforcement action.

In 2007, Warning Letter # WL07-0008SW52SWD was issued to Angelo’s Aggregate Materials, Ltd. for the Recycling Waste Processing Facility in Largo, FL. The Warning Letter was settled April, 2009 for total fines of $24,986. In the “Proposed Settlement of Amended Warning Letter WL07-0008SW52SWD”, the Department acknowledged that Angelo’s would not be considered “irresponsible” under FDEP Rule 62-701.320, FAC, as a result of the enforcement action.

ATTACHMENT 1
FACILITY ENTRANCE SIGN

ATTACHMENT 2
RANDOM LOAD INSPECTION FORM

ENTERPRISE RECYCLING AND DISPOSAL FACILITY

RANDOM LOAD INSPECTION FORM

1. DATE:______________________________

2. TIME:______________________________

3. HAULING COMPANY:______________________________

4. VEHICLE INFORMATION: A) TRUCK #______________________________
   B) LICENSE PLATE #______________________________

5. NAME OF DRIVER:______________________________

6. SOURCE OF WASTE MATERIAL:______________________________

7. DESCRIPTION OF WASTE MATERIAL:______________________________
____
____

8. DOES THE LOAD CONTAIN UNACCEPTABLE WASTE MATERIALS? YES: __ NO: __
   IF YES, WHAT MATERIALS WERE FOUND, AND WHAT PROCEDURES WERE FOLLOWED? ______________________________
____
____
____
____

9. OTHER OBSERVATIONS:______________________________
____

10. INSPECTOR SIGNATURE:______________________________
    SIGNED

Note: Forms must be maintained in Inspection Log Book

ENTERPRISE CLASS III LANDFILL — Load Rejection Form

Date:____________________ Time:____________________ am/pm

CUSTOMER/GENERATOR

Name ____

Address ____

City/State/Zip ____

TRANSPORTER/HAULER

☐ Same as Customer/Generator

Name ____

Address ____

City/State/Zip ____

Vehicle License and State ____

REASON FOR REJECTION

☐ Suspected Special Waste
☐ Suspected Hazardous Waste
☐ Suspected Medical Waste
☐ Suspected Asbestos
☐ Non-Processable
☐ Other (Explain below)

Explanation____

____

____

____

ACKNOWLEDGEMENT

☐ Rejected prior to dumping
☐ Rejected After Load was Dumped

Comments____

____

____

____

Driver's Signature____________________ Operator's Signature____________________

Customer/Generator Notified? ☐ YES ☐ NO

If yes, name of person contacted

____

Transporter/Hauler Notified? ☐ YES ☐ NO

If yes, name of person contacted

____

ATTACHMENT 3
FACILITY TRAINING LOG

ENTERPRISE RECYCLING AND DISPOSAL FACILITY

TRAINING LOG

COURSE	TRAINED OPERATOR INSTRUCTOR	HRS. ATTENDED	SIGNATURES/ DATE

ATTACHMENT 4
GAS MONITORING SURVEY FORM

ENTERPRISE RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL
GAS MONITORING SURVEY FORM

Date: ________________
Instrument: ___________________
Sampler: ___________________

GAS PROBE NO.	TIME OF READING	AMBIENT AIR TEMP (°F)	AMBIENT AIR OXYGEN CONTENT (%)	AMBIENT AIR METHANE (%) OF LEL	METHANE LEVEL Pre-Purge Measurement			METHANE LEVEL Post-Purge Measurement		
					% O_2	% by vol.	% of LEL	% O_2	% by vol.	% of LEL
1	Not installed									
2	Not installed									
3	Not installed									
4										
5										
6R										
7R										
8R										
9R										
10R										
11R										
12R										
13R										
14R										
15										
16										
Scale house					N/A	N/A	N/A	N/A	N/A	N/A

NR -Not required, no methane indicated in pre-purge measurement

Notes: (wind direction, weather conditions damage to gas probes, adjacent off-site activity observed, etc.)

ATTACHMENT 5
LIST OF APPROVED COURSES

Track Detail

Class I, III Landfill Operator

Is a solid waste facility that accepts Class I waste that is not hazardous waste and can be disposed in a lined landfill. The landfill may also accept yard trash, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, furniture other than appliances, or other materials approved by the FDEP that are not expected to produce leachate which poses a threat to public health or the environment. Operators required 24 hours initial course and pass exam with 70% proficiency, then 16 hours of continuing education every 3-year period.

Requirements

Initial Courses

- 24-Hour Initial Training Course for Landfill Operators (Class I, II, III and C&D Sites)
- Initial Training Course for Landfill Operators and C&D Sites - 24 Hour
- SWANA - Manager of Landfill Operations [MOLO] & Exam
- SWANA-Management of Landfill Operations
- SWANA-Manager of Landfill Operations (MOLO) Course and Exam

Hours

Hours Required	Effective Date
15	01/01/1800
16	05/27/2001

3900 SW 63rd Blvd.
Gainesville, FL 32608
tel: (352) 392-9570
fax: (352) 392-6910
train@treeo.ufl.edu

Track Detail

Spotter / Waste Screener

Is a person employed at a solid waste management facility whose job it is to inspect incoming waste and to identify and properly manage any hazardous or prohibited materials, which are received at the facility. Spotter required 8 hours initial course, then 4 hours of continuing education every 3-year period.

Requirements

Initial Courses

- 8-Hour Initial Training Course for Spotters at Class I, II, III Facilities, Waste Processing Facilities and C&D Facilities
- 8-hour Initial Training for Spotters
- 8-Hour Spotter Training for Class I II III Landfill C&D Sites and Transfer Facilities
- 8-Hour Training Course for Spotters at Landfills, C&D Sites and Transfer Stations
- Environmental Management Systems: An Introduction
- Spotter Training
- Spotter Training for Solid Waste Facilities
- Spotter Training for Solid Waste Facilities - Spanish
- Spotter Training for Solid Waste Management Staff with Elements of a Solid Waste Operations Plan
- Waste Screening and Identification for Landfill Operators and Spotters
- Waste Screening at MSW Mgmt Facilities [Onsite Delivery]

Hours

Hours Required	Effective Date
4	01/01/1800

3900 SW 63rd Blvd.
Gainesville, FL 32608
tel: (352) 392-9570
fax: (352) 392-6910
train@treeo.ufl.edu

Course Information

Course #	Name	Status
582	16-Hour Initial Training Course for Transfer Station and MRF Operators	Active
575	2010 North American Environmental Field Conference and Expo	Active
516	24 Hour HazMat Techician Level	Active
608	24-Hour Initial Training Course for Landfill Operators (Class I, II, III and C&D Sites)	Active
478	40 Hour HazWoper	Active
507	40-Hour HazWoper	Active
626	40-Hour HazWoper Course in Accordance to 29 CFR 1910.120	Active
646	40-Hour OSHA HazWoper	Active
69	40-hour OSHA HAZWOPER Training Course	Active
450	40hr General Site Worker Hazardous Waste Operations	Active
463	4-Hour Refresher Course for Spotters at Landfills, C&D Sites and Transfer Stations	Active
616	6-Hour DOT Regulations	Active
601	8 Hour General Site Worker Refresher Training	Active
623	8 Hour HazWoper Refresher Training	Active
203	8-Hour Initial Training Course for Spotters at Class I, II, III Facilities, Waste Processing Facilities and C&D Facilities	Active
219	8-hour Initial Training for Spotters	Active
62	8-Hour OSHA HazWoper Annual Refresher	Active
644	8-Hour OSHA HazWoper Refresher	Active
488	8-Hour Spotter Training for Class I II III Landfill C&D Sites and Transfer Facilities	Active
462	8-Hour Training Course for Spotters at Landfills, C&D Sites and Transfer Stations	Active
410	Adult CPR	Active
0	Adult CPR	Active
675	Air Regulations and How They Impact MSW Facilities	Active
624	ANSI/AIHA Z10-2006 Occupational Safety and Health Management Systems Training Course Construction Standard	Active
652	Asbestos: Awareness (Class IV)	Active
630	Basic Life Support	Active
639	Bird and Wildlife Management for Utilities	Active
550	Bloodborne Pathogens	Active
618	Carbon Markets, Offsets & Project Level GHG Accounting	Active
614	Chemical Spill Response Training for Hazardous Materials Operations/OSHA Level II	Active
386	Community Hurricane Preparedness - online	Active
525	Composting Wastewater Residuals (Biosolids) in Charlotte County	Active
656	Confined Space Awareness	Active
657	Confined Space Competent Person Training	Active
436	Confined Space Entry Safety Course	Active
440	Construction and Demolition Debris Workshop	Active
485	Contemporary Techniques of Supervision/Management	Active
357	CPR and First Aid	Active

520	Design of Waste Containment Liners and Closure Systems	Active
457	Disaster Debris Management	Active
544	EIA/NSWMA Safety Seminar	Active
542	Electrical Troubleshooting & Preventive Maintenance	Active
596	Emergency Response and Recovery Training	Active
557	Environmental Quality Training Workshop	Active
563	Environmental Safety Occupational Health [EOSH] 2009 Training Symposium	Active
568	Environmental Sampling Field Course	Active
679	Environmental Studies	Active
500	Excavation and Trenching Safety Procedures	Active
100	Excavation and Trenching: Competent Person Training	Active
228	FDEP 8 Hour HazWoper OSHA Refresher	Active
435	FDEP 8 Hour HazWoper OSHA Refresher [DeHate]	Active
433	FDEP Annuals SQG Workshop [5/3-5/06]	Active
434	FDEP Household Hazardous Waste Workshop [5/1-3/06]	Active
445	FEMA Debris Management Course	Active
678	FEMA Debris Management Course - G202	Active
484	Fires at Landfills and Other Solid Waste Management Facilities	Active
411	First Aid (Standard) Workplace Training	Active
634	Florida Composting Facility Operator Training Course: Introduction to Handling Source Seperated Organics	Active
491	Florida Construction & Demolition Debris & Management Workshop - May 2008	Active
451	Florida Water & Pollution Control Operators Association Short School - Stormwater Section	Active
579	Food Recycling and Composting Workshop	Active
521	Foundations of Project Management	Active
156	Four Hour Spotter Refresher for Class I, II and III Landfills, Waste Processing Facilities and C&D Facilities	Active
591	Fundamentals of Emergency Management	Active
638	General Site Worker 8-hour Refresher Course Hazardous Waste Operations & Emergency Response	Active
423	Geosynthetic Testing and Landfill Design Issues Short Course	Active
629	Getting Back to Basics With Landfill Gas	Active
545	GHG Reporting for Landfill & Wastewater Treatment - Webinar	Active
558	Greenhouse Gas Accounting	Active
0	Greenhouse Gas Accounting- Measuring an Organization's Carbon Footprint	Active
604	Greenhouse Gas Recovery at Solid Waste Landfills	Active
224	Hazardous Materials in Construction and Demolition Waste OnLine	Active
503	Hazardous Materials Incident & Waste Training - 24 Hours	Active
356	Hazardous Materials Incident Response Operations-40hr	Active
469	Hazardous Materials Operations / OSHA Level II	Active
439	Hazardous Materials Training	Active
510	Hazardous Waste Management Course	Active
535	Hazardous Waste Management: The Complete Course - 16 hour	Active
541	Hazardous Waste Management: The Complete Course - 8 hour	Active
540	Hazardous Waste Operations with Emergency Response	Active
63	Hazardous Waste Regulations for Generators	Active
514	Hazardous/Chemical Safety Training	Active
555	HazMat IQ	Active
216	HazWoper 40-Hour Health & Safety Online	Active
421	HazWoper 40-Hour OSHA Course	Active

218	HazWoper 8-Hour Refresher Online	Active
422	HazWoper 8-Hour Refresher OSHA Course	Active
659	HazWoper Refresher	Active
617	HazWoper Training for Escambia County	Active
170	Health & Safety Issues for Solid Waste Management Facilities	Active
498	Health and Safety for Solid Waste Workers-4 Hours	Active
281	Health and Safety for Solid Waste Workers-8 Hours	Active
149	Health and Safety Training for Landfill Operations	Active
495	Heavy Equipment Safety	Active
492	Hurricane Debris Management Workshop	Active
683	Hydraulic Excavator Operator Training	Active
613	Identification of Unknowns	Active
476	Improving Landfill Operations	Active
517	Improving Transfer Station Efficiency	Active
442	Initial Training Course for Landfill Operators and C&D Sites - 24 Hour	Active
443	Initial Training Course for Transfer Station Operators and Material Recovery Facilities - 16 Hour	Active
628	Innovative Recycling Grant Workshop at Polk County Landfill	Active
574	Integrated Waste Management Workshop	Active
645	Introduction to Debris Operations in FEMA Public Assistance Program IS-632	Active
212	Introduction to Electrical Maintenance	Active
527	Introduction to Heavy Equipment and Skill Testing	Active
0	Introduction to Wastescreening for Spotters-Spanish	Active
546	IS-700.a NIMS An Introduction	Active
472	Landfill and Transfer Station Operators: Waste Acceptability and Safety Issues Review	Active
676	Landfill Design and Construction	Active
518	Landfill Gas Collection and Re-Use	Active
686	Landfill Gas Collection System Operations and Compliance Training Course	Active
511	Landfill Gas Control and Compliance Seminar	Active
650	Landfill Operations	Active
399	Landfill Operator and MRF Operator Training	Active
589	Landfill Operator Training - 2007 Certified Operators Class	Active
588	Landfill Operator Training 2008 - Certified Operators Class	Active
553	Landfills and Transfer Stations: Past, Present and Future	Active
552	Landfills: Past, Present and Future	Active
441	Laws and Rules	Active
277	Laws and Rules for Florida Engineers	Active
677	Leachate and Landfill Gas Management System Design	Active
684	Linear Construction - Stormwater Compliance for Road and Utility Construction	Active
538	Maintenance of Traffic Training	Active
654	Mathematics for Landfill Operators	Active
523	Maximizing Beneficial Use of Disaster Debris	Active
674	Measurement and Improvement of Performance at Solid Waste Management Facilities ("If you Can't Measure it, You Can't Manage It")	Active
3	Military Service Active Duty	Active
528	NAHAMMA Conf HHW / SQG Workshop - 2009 - HazMat IQ Training	Active
528	NAHAMMA Conference HHW / SQG Workshop - 2009 - General Session	Active
609	NAHMMA 2010 Annual Conference	Active
653	NAHMMA 2011 Florida Chapter Annual Conference	Active
424	National Incident Management System [NIMS] and Introduction IS-00700	Active

454	North American Hazardous Materials Management Association Conference 2007 - FL Chapter	Active
489	North American Hazardous Materials Management Association Conference 2008- FL Chapter	Active
670	North Carolina Landfill Manager Course	Active
1001	OK per "Current" Class I II III Transcript	Active
621	Online Laws and Rules	Active
438	Operating Considerations for Transfer Stations	Active
655	Operational Techniques and Compliance Inspections for Landfills	Active
412	Operator Certification for Caterpillar Landfill Equipment	Active
0	OSHA 10-Hour General Industry Course	Active
547	OSHA 10-Hour General Industry Outreach Course	Active
619	OSHA 10-Hour Industrial Outreach Safety Training Program	Active
592	OSHA 1910 General Industry 10-Hour Course	Active
0	OSHA 24 Hour Emergency Response Course (Technician Level)	Active
0	OSHA 8-hour HazWoper Refresher Training	Active
561	OSHA Annual Refresher at KSC	Active
515	OSHA Operations Level Course	Active
532	Paint Filter Test - 1 Hour	Active
192	Pedestrian, Vehicles and Equipment Safety at Transfer Stations	Active
494	Permit Required Confined Space Awareness	Active
104	Permit Required Confined Space Entry	Active
0	Permit Required Confined Space Entry Supervisor	Active
497	Personal Protection Equipment (PPE) and Safety Procedures	Active
602	Personal Radiation Detector Course [PRD] PER-243	Active
533	Principles of Landfill Fires E-Course	Active
468	Project Risk Management	Active
603	Recycle Florida Today - 2010 Annual Conference	Active
651	Recycle Florida Today - 2011 Annual Conference	Active
432	Recycle Florida Today 2006 Annual Conf	Active
431	Recycle Florida Today 2006 Issues Forum 1/2006	Active
414	Recycle Florida Today 2006 Issues Forum 1/23-24/06	Active
460	Recycle Florida Today 2007 Annual Confrence - 6/4-7/2007	Active
512	Recycle Florida Today 2008 Annual Conference	Active
554	Recycle Florida Today Conference [June 2009]	Active
479	Recycled Florida Today 2007 Issues Forum 1/2007	Active
0	Recycled Florida Today 2007 Issues Forum 1/2007	Active
661	Refresher Training Course for Experienced Solid Waste Operators-16 Hours	Active
663	Refresher Training Course for Experienced Solid Waste Operators-4 Hours	Active
662	Refresher Training Course for Experienced Solid Waste Operators-8 Hours	Active
627	RFT / SWANA FL Winter Meeting & Issues Forum 2011	Active
687	RFT / SWANA FL Winter Meeting & Issues Forum 2012	Active
581	RFT/SWANA-FL Winter Wonderland in Waste - 2010 Issues Forum	Active
565	Sanitary Landfill Design	Active
690	Sector L: Landfills & Land Application Sites	Active
4811	Solid Waste Operator & Spotter Refresher Training - Spring 2008 a	Active
584	Southeast Recycling 2010 Conference & Trade Show	Active
640	Southeast Recycling 2011 Conference & Trade Show	Active
692	Southeast Recycling 2012 Conference & Trade Show	Active
580	Southwest Partners Meeting	Active

605	SPCC - Spill Prevention Control Act - online	Active
526	Spill Prevention, Control, and Countermeasure Regulation Seminar	Active
400	Spotter Training	Active
0	Spotter Training	Active
214	Spotter Training	Active
437	Spotter Training Course for Waste Processing and Transfer Stations	Active
248	Spotter Training for Solid Waste Facilities	Active
378	Spotter Training for Solid Waste Facilities - Spanish	Active
474	Spotter Training for Solid Waste Management Staff with Elements of a Solid Waste Operations Plan	Active
471	Spotters at Landfills and Transfer Stations: Safety Awareness Review	Active
506	Storage Tank Conference - Central Florida 18th Annual	Active
505	Storage Tank Conference - North Florida 14th Annual	Active
578	Storage Tank Conference -16th Annual Central Florida State Conference	Active
453	Storage Tank Conference 17th Annual	Active
475	Storage Tank Conference Central Florida State 13th Annual	Active
647	Stormwater Erosion And Sedimentation Control Inspector Training Program	Active
202	Stormwater Inspector Certification Course	Active
594	Stormwater Matters	Active
632	Supervisor Safety Training for Solid Waste Operations Staff	Active
586	Sustainability and Recycling	Active
429	SWANA - Compost on Subtitile D Landfills - Webinar	Active
416	SWANA - eCourse - Litter Management at Landfills	Active
567	SWANA – Groundwater Monitoring, Sampling, Analysis and Well Construction	Active
636	SWANA - Integrated Solid Waste Management	Active
693	SWANA - Landfill Gas Basics 1-Day Course	Active
635	SWANA - Landfill Gas Systems Operation and Maintenance	Active
694	SWANA - Landfill Gas Systems Operation and Maintenance - 1 day	Active
537	SWANA - Landfill Operations E- Course	Active
543	SWANA - Landfill Symposium 14th Annual (June 2009)	Active
597	SWANA - Manager of Landfill Operations [MOLO]	Active
598	SWANA - Manager of Landfill Operations [MOLO] & Exam	Active
560	SWANA - Manager of Recycling Course	Active
413	SWANA 2006 Recycling and Special Waste Conference	Active
562	SWANA E-Course Just the Math	Active
556	SWANA e-Course Operation Efficiency at Landfills	Active
599	SWANA e-course: Bioreactor Landfill Research & Development Agencies	Active
577	SWANA e-course: Carbon Credit and Production Tax Credits for LFG Projects	Active
576	SWANA e-course: Financing Solid Waste Facilities: The Roller Coaster to Oblivion?	Active
691	SWANA e-course: Traumatic Injury and Fatality Risks in Solid Waste	Active
564	SWANA- Health & Safety E-Study (Home Study Course)	Active
566	SWANA- Managing Landfill Gas at MSW Landfills	Active
297	SWANA Online - Health & Safety at MSW Landfills	Active
296	SWANA Online - Training Sanitary Landfill Operation Personnel	Active
298	SWANA Online - Wastescreening at MSWS Facilities	Active
345	SWANA-Bioreactor Landfill Course	Active
404	SWANA-Bioreactor Landfill Manager	Active
250	SWANA-Construction and Demolition Debris Course	Active
685	SWANA-e Course: Groundwater Monitoring	Active

643	SWANA-e Course: Landfill Gas & Solid Waste Air Contaminant Hazards	Active
252	SWANA-FEMA's Debris Management	Active
425	SWANA-FL 2006 Spring Tri-State Conference [4/2-5/06]	Active
426	SWANA-FL 2006 Summer Conference [7/23-26/06]	Active
447	SWANA-FL 2007 Summer Conference [7/15-18/07]	Active
480	SWANA-FL 2008 Senior Managers Conference [1/2008]	Active
551	SWANA-FL 2009 Summer Symposium	Active
607	SWANA-FL 2010 Summer Conference	Active
658	SWANA-FL 2011 Summer Conference	Active
534	SWANA-FL Managers Meeting - 2009 Winter	Active
606	SWANA-FL Road-e-o: Heavy Equipment Safety Training	Active
94	SWANA-Health & Safety at MSW Landfills	Active
244	SWANA-Landfill Gas Basics	Active
428	SWANA-Landfill Gas Symposium 29th Annual [3/27-30/06]	Active
446	SWANA-Landfill Gas Symposium 30th Annual [3/4-8/07]	Active
483	SWANA-Landfill Gas Symposium 31st Annual [3/2008]	Active
536	SWANA-Landfill Gas Symposium 32nd	Active
689	SWANA-Landfill Gas Symposium 35th Annual - 2012	Active
231	SWANA-Landfill Gas System Operation and Maintenance	Active
539	SWANA-Landfill Gas System Operations Workshop	Active
93	SWANA-Landfill Operational Issues	Active
681	SWANA-Landfill Symposium (16th Annual - 2011)	Active
427	SWANA-Landfill Symposium 11th Annual [6/5-7/06]	Active
465	SWANA-Landfill Symposium 12th Annual [6/25-28/07]	Active
30	SWANA-Management of Landfill Operations	Active
1	SWANA-Manager of Landfill Operations (MOLO) - Exam Only	Active
1600	SWANA-Manager of Landfill Operations (MOLO) Course	Active
160	SWANA-Manager of Landfill Operations (MOLO) Course and Exam	Active
243	SWANA-Managing Composting Programs	Active
251	SWANA-Managing MSW Collection Systems	Active
234	SWANA-Managing MSW Recycling Systems	Active
222	SWANA-Managing Transfer Station Systems	Active
444	SWANA-Transfer Station Design & Operations	Active
42	SWANA-Transfer Station Design & Operations	Active
448	SWANA-WasteCon 2006 [9/19-21/06]	Active
455	SWANA-WasteCon 2007 [10/16-18/07]	Active
509	SWANA-WasteCon 2008	Active
559	SWANA-WasteCon 2009	Active
660	SWANA-WasteCon 2011	Active
570	The Complete Ground Water Monitoring Field Course	Active
572	The Complete Ground Water Monitoring Well Design, Construction and Development Course	Active
569	The Complete Ground Water Sampling Field Course	Active
116	The Complete Ground-Water Monitoring Course	Active
571	The Complete Surface Water and Sediment Field Course	Active
573	The Florida Stormwater Construction Permit-Contractor's Short Course	Active
530	The Original Environmental Bootcamp	Active
406	The Sense of Smell, Odor, Theory and Odor Control	Active
612	Things That Go Boom	Active

625	Topics in Solid Waste Management for Landfill Operators, MRF Operators and Transfer Station Operators	Active
477	Tractor/Mower Operator Safety Training Program	Active
187	Traffic and Equipment Safety at Landfills	Active
680	Train the Trainer: How to Design & Deliver Effective Training	Active
641	Train-the-Trainer for Operator of Heavy Equipment	Active
642	Trenching Shoring Services Safety in Excavation Course	Active
112	U.S. DOT Hazardous Materials/Waste Transportation	Active
519	Understanding Hazardous Waste in Solid Waste Operations	Active
419	Waste Expo [4/4-6/06]	Active
549	Waste Expo 2007	Active
595	Waste Expo 2010	Active
36	Waste Screening and Identification for Landfill Operators and Spotters	Active
9	Waste Screening at MSW Mgmt Facilities [Onsite Delivery]	Active
51	Waste Screening at Municipal Solid Waste [5/23/94, 12/5/01]	Active
0	Waste Screening Introduction-Spanish	Active
524	Waste Screening Refresher for Supervisors and Managers	Active
418	Waste Tech 2006 [2/27-28/06]	Active
508	Waste Tech 2007	Active
587	Waste-to-Fuels 2010 Conference	Active
622	Wet Weather Operations	Active
449	Wetlands Variance Training	Active
673	Wildlife and Plants at Florida Solid Waste Management Facilities	Active
482	Workzone Safety Training	Active

3900 SW 63rd Blvd.
Gainesville, FL 32608
tel: (352) 392-9570
fax: (352) 392-6910
train@treeo.ufl.edu

UF Division of Continuing Education
UNIVERSITY of FLORIDA

ATTACHMENT 6
TRAINING CERTIFICATES

Kohl Consulting Inc.

Is Proud to Certify That

Alfanso Victor Santos

Has Successfully Completed the 24 Hour Initial Training Course for Solid Waste Management Facility Operators Entitled :

24 Hour Initial Training Course for Landfill Operators (Class I, III and C&D Sites) #608

August 31, September 2 and 4, 2015

And Has Successfully Completed the Required Examination in Accordance with the Training Requirements for Landfill Operators in Florida

Signed this15th day of September, 2015

Melody Kohl

Melody Kohl
President

Kohl Consulting Inc.

Is Proud to Certify That

John Arnold

Has Successfully Completed the
16 Hour Continuing Training Course for
Landfill Operators Entitled :

16-Hour Landfill Operator Refresher Course
#703
August 31 and September 2, 2015

And Has Successfully Completed 16 hours of Continuing Training for Landfill Operators in Florida

Signed this 15th day of September, 2015 Melody Kohl

Melody Kohl
President

Kohl Consulting Inc.

Is Proud to Certify That

Alfredo T. Martinez

Has Successfully Completed the
16 Hour Continuing Training Course for
Landfill Operators Entitled :

16-Hour Landfill Operator Refresher Course
#703
August 31 and September 2, 2015

And Has Successfully Completed 16 hours of Continuing Training
for Landfill Operators in Florida

Signed this 15th day of September, 2015 Melody Kohl

Melody Kohl
President

Kohl Consulting, Inc

Is Proud to Certify That

Saturnino Martinez

Has Successfully Completed the
4 Hour Continuing Training Course for
Landfill Operators Entitled :

4-Hour Spotter Refresher for Class I, III Landfills, Waste Processing Facilities and C&D Facilities #742

And has completed 4 hours of Continuing Training
for Landfill Operators, Transfer Station/MRF Operators
and Spotters in Florida

August 31, 2015

MSW

Signed this 15th day of September, 2015

Melody Kohl

Melody Kohl
President

Kohl Consulting Inc.

Is Proud to Certify That

David Cooner

Has Successfully Completed the
Initial Training Course for
Transfer Station and MRF Operators Entitled :

16-hour Initial Training for Transfer Station and Materials Recovery Facility Operators (with Exam) #582

November 14 and 15, 2013

And Has Successfully Completed the Required Examination in Accordance with the Initial Training Requirements for both Transfer Station and MRF Operators in Florida

Signed the 18th day of November, 2013 Melody Kohl

Melody Kohl

ATTACHMENT 7
SOURCE-SEPARATED ORGANICS PROCESSING FACILITY REGISTRATION

Florida Department of
Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steverson
Secretary

July 10, 2016

John Arnold
Angelo's Aggregate Materials, LTD.
855 28th Street, S.
St. Petersburg, FL 33712

Dear John Arnold:

Your registration application for Angelo's Recycled Materials - Dade City, located at 41111 Enterprise Road, Dade City, in Pasco County has been received. The application indicated this facility is operating as a:

X Yard Trash Transfer Station
X Yard Trash Recycling Facility
__ Manure Blending Operation
__ Vegetative, Animal Byproducts or Manure Composting Facility

And processing the following:

X Yard trash (including clean wood)
__ Manure
__ Animal byproducts (composting)
__ Vegetative wastes (composting)
__ Pre-consumer vegetative (composting)

The registration application is complete, and is valid until August 1, 2017. The WACS identification number for this facility is 00087895. The receipt number for the registration fee you paid is 911551.

You must comply with the requirements specified in Rule 62-709.320, and Rules 62-709.330 or 62-709.350, Florida Administrative Code (F.A.C.), in order to maintain qualification for the registration program. A summary of the operating requirements is enclosed.

If you need further information, please contact the Division of Waste Management, Waste Registration Section at the above address, Mail Station 4550, telephone (850) 245-8707, or email Lauren.OConnor@dep.state.fl.us.

Sincerely,

Lauren O'Connor

Planner I
Waste Registration Section

Enclosure

cc: Melissa Madden, Southwest District
Steven Tafuni, Southwest District

Requirements for source-separated organics facilities qualifying for registration - Chapter 62-709, F.A.C.

Rule/Referenced Rule	Provision
Specific to all	
62-709.300(7)(a)	No person shall cause or allow objectionable odor in violation of Chapter 62-296, F.A.C.
62-709.300(7)(b)	Rule 62-701.300, and subsection 62-701.320(13) apply to facilities regulated under 62-709.
62-701.300(1)(b)	Stored or processed in a way or location that does not violate air quality or water quality standards.
62-701.300(2)(a)	Geological formations or subsurface features must provide support for the facility
62-701.300(2)(c)	Not in a dewatered pit unless permanent leachate containment and special design techniques used.
62-701.300(2)(d)	Not in any natural or artificial water body(e.g., ground water and wetlands within DEP jurisdiction).
62-701.300(2)(f)	Not be placed on the right of way of any public highway, road, or alley.
62-701.300(3)	No open burning in the recycling area of the facility and controlled burning complies with DEP rules.
62-701.300(14)	No CCA treated wood in material applied as a ground cover, soil or soil amendment.
62-701.300(15)	No unconfined emissions of particulate matter in violation of paragraph 62-296.320(4)(c), F.A.C.
62-709.320(2)(a)	Have the necessary operational features and equipment - unless otherwise specified, including
62-709.320(2)(a)1.	effective barrier to prevent unauthorized entry and dumping
62-709.320(2)(a)2.	Dust and litter control methods
62-709.320(2)(a)3.	Fire protection and control provisions to deal with accidental burning of solid waste, including
62-709.320(2)(a)3.a.	20-foot all-weather access road all around the perimeter
62-709.320(2)(a)3.b.	No material shall be mechanically compacted
62-709.320(2)(a)3.c.	No material shall be more than 50 feet from access by motorized firefighting equipment
62-709.320(2)(b)	Operate in a manner to control vectors
62-709.320(2)(c)	Operate in a manner to control objectionable odors per with Rule 62-296.320(2), F.A.C.
62-709.320(2)(d)	Keep any installed drains and leachate or condensate conveyances cleaned
62-709.320(2)(e)	Process received solid waste timely as follows
62-709.320(2)(e)1.	Size-reduce or remove yard trash within 6 months or time needed to receive 3,000 tons or 12,000 cubic yards, whichever is greater. Separated logs with 6 inch diameter or greater can be stored for up to 12 months before being size-reduced or removed.
62-709.320(2)(e)2.	Putrescible waste (e.g., vegetative wastes, animal byproducts or manure) shall be processed and incorporated into the composting material, or removed from the facility, within 48 hours.
62-709.320(2)(f)	Containerized and removed immediately any treated or untreated biomedical waste; hazardous waste; or any materials having (PCB) concentration of 50 ppm or greater.
62-709.320(2)(g)	All residuals, solid waste and recyclable materials removed and recycled or disposed upon ceasing operations. Any remaining processed material shall be properly used or disposed.
62-709.320(4)(a)	Keep monthly records of incoming and outgoing material for at least three years..
62-709.320(4)(b)	If temperature used to show disinfection or vector attraction achieved, keep records for 3 years.

Rule/Referenced Rule	Provision
Specific to yard trash only facilities	
62-709.300(7)(b)	Rule 62-701.300, and subsection 62-701.320(13) apply to facilities regulated under 62-709.
62-701.300(12)(a)	At least 100 feet from off-site potable water well that existed before facility registered.
62-701.300(12)(b)	At least 50 feet from any body of water, including wetlands. Not including parts of permitted stormwater system, or water bodies totally within facility with no discharge to surface waters.
62-709.330(2)	Processed material gone from facility within 18 months, unless longer storage authorized by permit.
62-709.330(3)	Accept only yard trash, and bags used to collect yard trash. Containerized any other material

Rule/Referenced Rule	Provision
Specific to composting of vegetative wastes, animal byproducts or manure, or blending manure	
62-709.300(7)(b)	Rule 62-701.300, and subsection 62-701.320(13) apply to facilities regulated under 62-709.
62-701.300(2)(b)	Be more than 500 feet off-site potable water well that existed before facility registered
62-701.300(2)(e)	Within 200 feet from any body of water, including wetlands. Not including parts of permitted stormwater system, or water bodies totally within facility with no discharge to surface waters.
62-701.320(13)(b)	Not within 10,000 feet of any licensed and operating airport runway used by turbine powered aircraft, or within 5,000 feet of any licensed and operating airport runway used only by piston engine aircraft, unless applicant demonstrates that the facility is designed and will be operated so that it does not pose a bird hazard to aircraft.
62-709.350(2)	Carbon:nitrogen ratio of the blended feedstocks shall be greater than 20.
62-709.350(3)	Piles do not exceed 12 feet in height.
62-709.350(5)	All material removed within 18 months, unless longer storage authorized by permit.
62-709.350(6)	Show that disinfection achieved. not required if made from only pre-consumer vegetative waste
62-709.350(7)	Vector attraction reduction controls shall include either (a) or (b) below:
62-709.350(7)(a)	Composted for at least 14 days, with temperature no lower than 40 degrees Celsius and average temperature of the material being composted higher than 45 degrees Celsius; or
62-709.350(7)(b)	Specific oxygen uptake rate (SOUR) for material being composted or blended shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius

ENGINEERING REPORT
APPENDIX 3-B

CONTINGENCY PLAN

**ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY
MAJOR PERMIT MODIFICATION
EMERGENCY AND CONTINGENCY OPERATIONS**

Prepared for:

ANGELO'S AGGREGATE MATERIALS, LTD
855 28th Street South
St. Petersburg, Florida 33712

Presented to:

**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHWEST DISTRICT – SOLID WASTE DIVISION**
13051 N. Telecom Parkway
Temple Terrace, Florida 33637

Prepared by:

LOCKLEAR & ASSOCIATES, INC.
4140 NW 37 Place, Suite A
Gainesville, Florida 32606
Certificate of Authorization #30066

Project No.: 02000-217-17

~~SEPTEMBER 2017~~ RAI 1 RESPONSE JANUARY 2018

TABLE OF CONTENTS

1.0 EMERGENCY AND CONTIGENCY OPERATIONS

Angelo's Aggregate Materials, LTD (Applicant) is the Owner and Operator of the Enterprise Road Class III Recycling and Disposal Facility (Facility). Emergency conditions that may require a contingency operation plan may be created by a natural disaster (i.e., hurricane, tornado, and/or flooding), or fire. During emergency conditions normal waste acceptance procedures will continue, as feasible. The following procedures are to be initiated at the onset of a site emergency or major storm:

1.1 Communications

The designated emergency coordinator for the Facility is Mr. Fred Martinez, who may be reached at (352) 303-5618. Mr. Martinez is responsible for implementing emergency and contingency operations or designating an alternate coordinator.

As necessary the emergency coordinator will notify the appropriate emergency response personnel including:

- 911 - Fire/Police/Medical
- Dade City Fire Department- (352) 521-1492
- Dade City Police Department- (352) 521-1493
- Pasco County Hospital - Dade City - (352) 521-1100
- Florida Department of Environmental Protection (813) 470-5700 ~~632-7600~~
- Pasco County (727) 847-2411

If needed, the Operator will coordinate with emergency response and Pasco County personnel to notify neighbors and / or local government officials of emergency and contingency conditions that may affect them.

1.2 Major Storm or Disaster

1. All personnel understand their role in an emergency situation. At least one office employee will monitor the telephone. Radio or telephone communication is provided between the office and all operating areas of the landfill at all times.

2. All lightweight signs and equipment are to be collected and stored in a secure area.

3. All depressed and eroded areas are to be protected and the stormwater management system is to be inspected and maintained, as necessary.

4. Work is to begin in dry areas only when operations are resumed; waste materials are not to be deposited in standing water.

5. On-site emergency equipment locations, such as first aid and eye wash stations, are shown on Site Plan.

1.3 Fire

Although open burning is strictly prohibited, several types of fires could occur at the Facility including equipment fires, structure fires, waste fires, buffer zone fires, and receipt of hot loads. The Operator will provide a truck mounted water tank on-site for use in firefighting purposes. A stockpile of soil will be located near the active disposal area at all times for use in smothering waste fires and hot loads. During a fire, incoming trucks will be directed toward another area of the landfill so that a temporary active face can be established. Once the fire is extinguished, appropriate cover will be applied to the waste and operations will continue at the original active face. If the fire is extensive and a temporary active face cannot be established, incoming trucks will be redirected to another landfill.

For all fires, the Florida Department of Environmental Protection (FDEP) and Pasco County will be notified of the fire control plan being implemented if the fire cannot be extinguished or controlled within an hour. If the fire cannot be extinguished or controlled within 48 hours, the emergency coordinator will notify the local Fire Department listed above for assistance and will also notify Pasco County and any neighbors likely to be affected by the fire.

The Operator will take the following procedures if a fire occurs at the Facility:

1.3.1 Equipment and Structural Fires

If the fire is minor in nature, site personnel will attempt to extinguish the fire using available on-site fire fighting equipment. The local Fire Department listed above will be summoned for assistance if site personnel and equipment cannot extinguish the fire.

1.3.2 Waste Fires

Burning waste will be separated from the fill area and immediately covered with soil stockpiled near the disposal area. If necessary, water will also be applied to the burning waste using the on-site truck mounted water tank. The local Fire Department listed above will be summoned for assistance if the site personnel and equipment cannot extinguish the fire.

1.3.3 Buffer Zone Fires

The local Fire Department listed above will be immediately summoned to control and extinguish the fire. Available site personnel will create and maintain fire breaks between the active disposal area and the oncoming fire, and water down areas between the fire and the disposal area using the water tank. Available site personnel will assist the Fire Department as requested.

1.3.4 Hot Load Fires

If a hot load has not been unloaded, the driver will be directed to an isolated area of the Facility and site personnel will use available fire fighting equipment in an attempt to extinguish the load. If a hot load has been unloaded, the load will be spread out and separated from the active disposal area and immediately covered with soil stockpiled near the area. If necessary, water will also be applied to the load using the on-site water tank.

The local Fire Department listed above will be summoned for assistance if site personnel and equipment cannot extinguish the load.

1.3.5 Fire-Fighting Equipment

Fire extinguishers are located in locations indicated below.

- Office / Scale House
- Heavy Equipment Cabs

1.4 Spills

In the event of a spill, the site manager will determine whether on site personnel are capable of the cleanup. For example, if oil is spilled while performing vehicle maintenance, the site manager will direct landfill personnel to use a sorbent material to clean up the spill if spill occurred on an impervious surface. For spills on unpaved areas of the facility, the contaminated soil will be removed and placed in an appropriate container. All cleanup materials will be placed in a drum, stored in the shipping/storage container on-site for proper disposal. If unknown or hazardous chemicals are spilled, the site manager will contact the Department (813-470-5700 ~~632-7600~~) and Pasco County (727-847-2411) for direction.

1.5 Discovery of Hazardous Wastes

The operator will take the following steps if hazardous wastes are discovered at the active disposal area that may pose a serious health and safety risk to site personnel, the public, or the environment. Site personnel will establish a minimum 50-foot perimeter around the suspect waste using pylons and "Caution" and/or "Do Not Enter" tape. The driver and other customers will not be allowed closer than 50 feet to the suspect waste. Site personnel will immediately contact their supervisor. The supervisor will contact a hazardous waste materials response team to coordinate cleanup and disposal of the hazardous materials.

1.6 Equipment Failure

Arrangements with equipment rental companies will be maintained in order to provide for additional equipment during unanticipated breakdowns.

Equipment rental companies that may be used to obtain reserve equipment include the following:

Ring Power - Brooksville, Florida
Contact: 352-796-4978

Flagler Equipment - Tampa, Florida
Contact: 813-630-0077

1.7 Landfill Shutdown

1. If the landfill should need to be shut down, the Department will be notified and haulers will be directed to another properly permitted facility.

2. Initial cover of six (6) inches will be placed on all waste exposed areas.

~~2.~~3. An onsite portable generator will be relocated to the leachate management lift station.

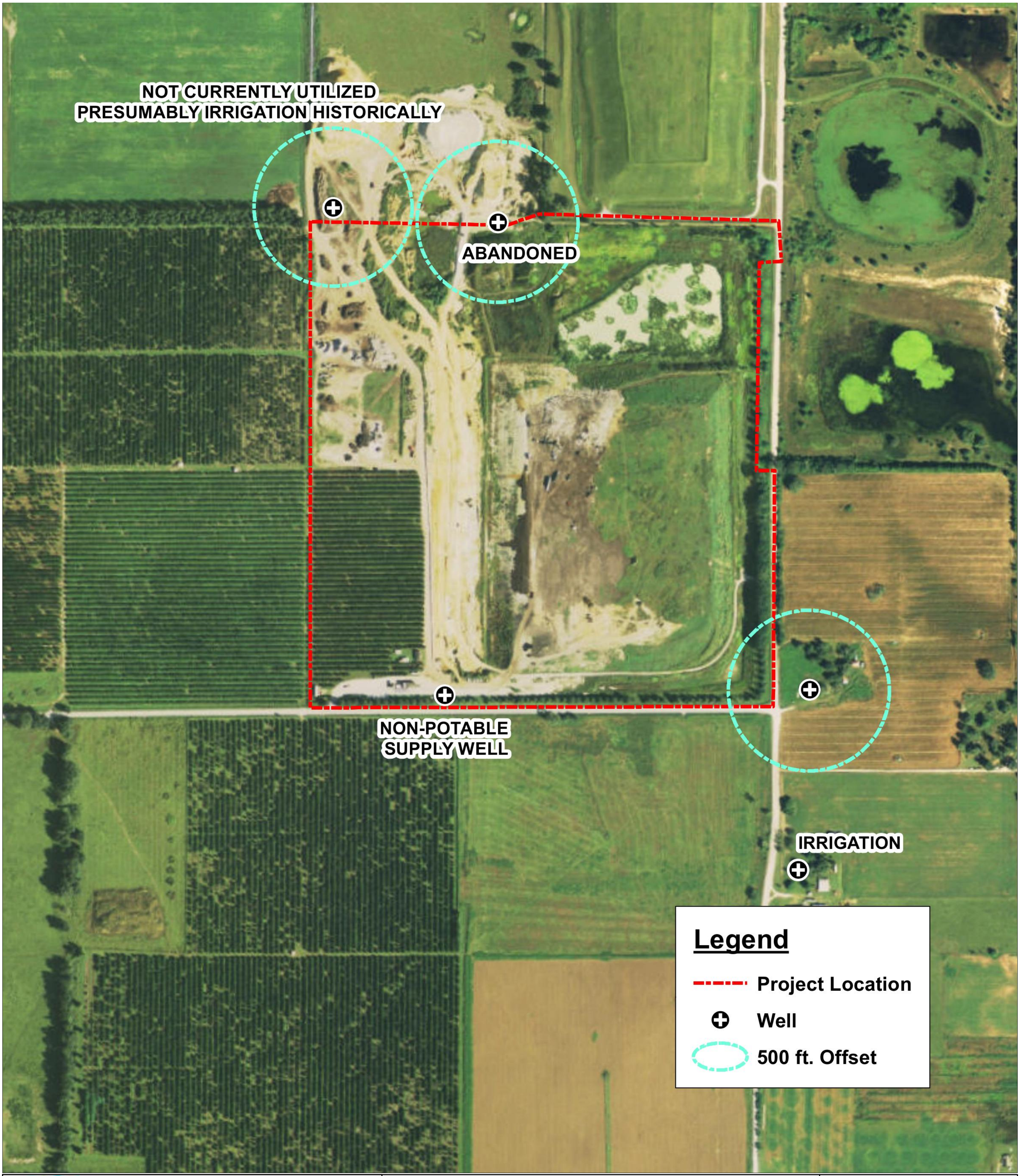
The stormwater management system will allow for disposal operations to continue during periods of inclement weather. Temporary berms, ditches, and grading are to be used to drain stormwater away from the active face of the landfill. The following actions should be taken at the landfill following a severe storm, hurricane, or other natural disaster:

- FDEP and Pasco County are to be notified by telephone immediately should any need for emergency and contingency operations arise. The phone number for the Department's Solid Waste Section is (813) 470-5700. The phone number for Pasco County is (727) 847-2411. The calls are to be confirmed by letter.

- Operational hours of the landfill may be extended at the landfill to meet the needs of the community. Pasco County and the Department will be consulted prior to changes in the hours of operation of the landfill.
- Necessary additional equipment, if required, will be rented. Arrangements are in place between the operator of the Landfill and equipment rental companies to facilitate this activity.
- If required, additional equipment operators and/or other personnel will be contracted. Arrangements are in place between the operator of the Landfill and temporary staffing companies to facilitate this activity.
- Appropriate public notices will be issued, including notification of the landfill's customer's by telephone and other media
- Contacts with local governmental bodies and local emergency agencies such as fire and rescue have been established in order to coordinate emergency activities. Fire and rescue personnel responsible for this district have visited the site in order to discuss emergency procedures.
- Site personnel may be trained in CPR and First Aid.

ENGINEERING REPORT
APPENDIX 3-C

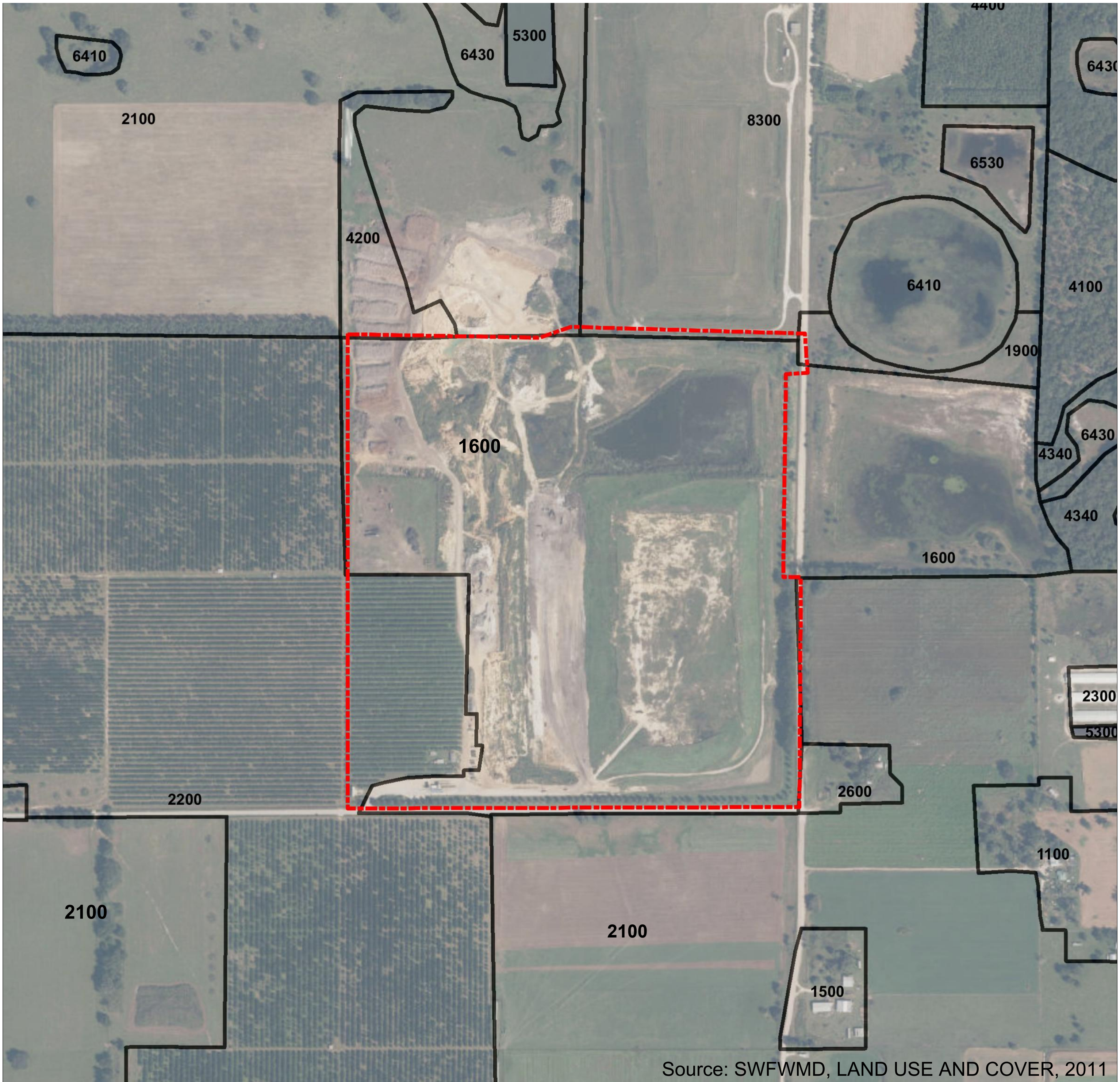
FIGURES



Locklear & Associates

Revised Potable Water Wells
Enterprise Road Class III Recycling and Disposal Facility Permit Modification
Dade City, Pasco County, Florida

REVISED FIGURE S-1



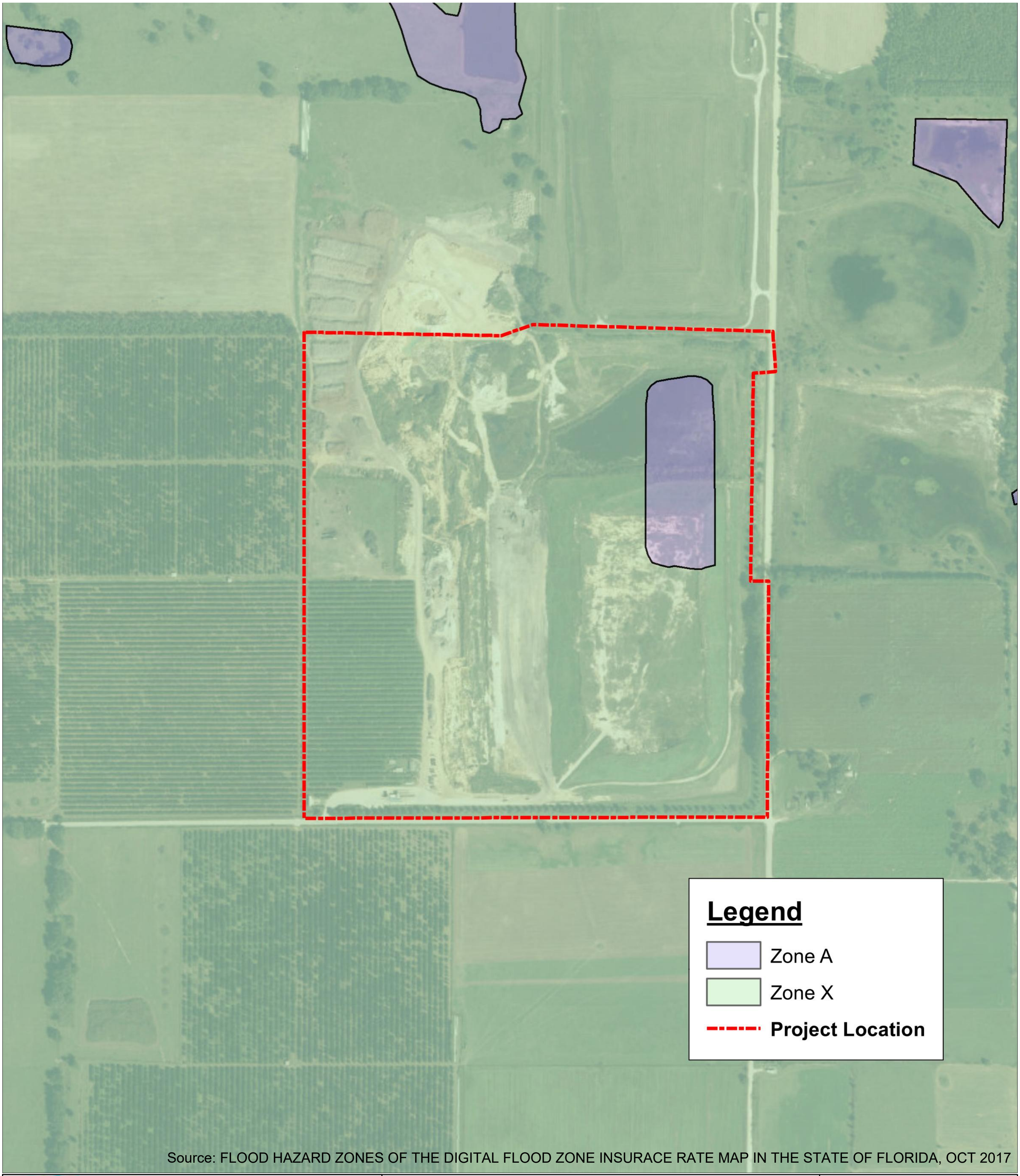
Legend

- Project Location
- 1100 - Residential Low Density <2 Dwelling Units
- 1500 - Industrial
- 1600 - Extractive
- 1900 - Open Land
- 2100 - Cropland and Pastureland
- 2200 - Tree Crops
- 2300 - Feeding Operations
- 2500 - Specialty Farms
- 2600 - Rural
- 4100 - Upland Coniferous Forest
- 4110 - Pine Flatwoods
- 4200 - Upland Hardwood Forests
- 4340 - Hardwood Conifer Mixed
- 4400 - Tree Plantations
- 5300 - Reservoirs
- 6410 - Freshwater Marshes
- 6430 - Wet Prairies
- 6530 - Intermittent Ponds
- 8300 - Utilities

Locklear & Associates

Land Use Map
Enterprise Road Class III Recycling and Disposal Facility Permit Modification
Dade City, Pasco County, Florida

REVISED FIGURE 3-2A



Locklear & Associates

Flood Zone Map
Enterprise Road Class III Recycling and Disposal Facility Permit Modification
Dade City, Pasco County, Florida

REVISED FIGURE S-5

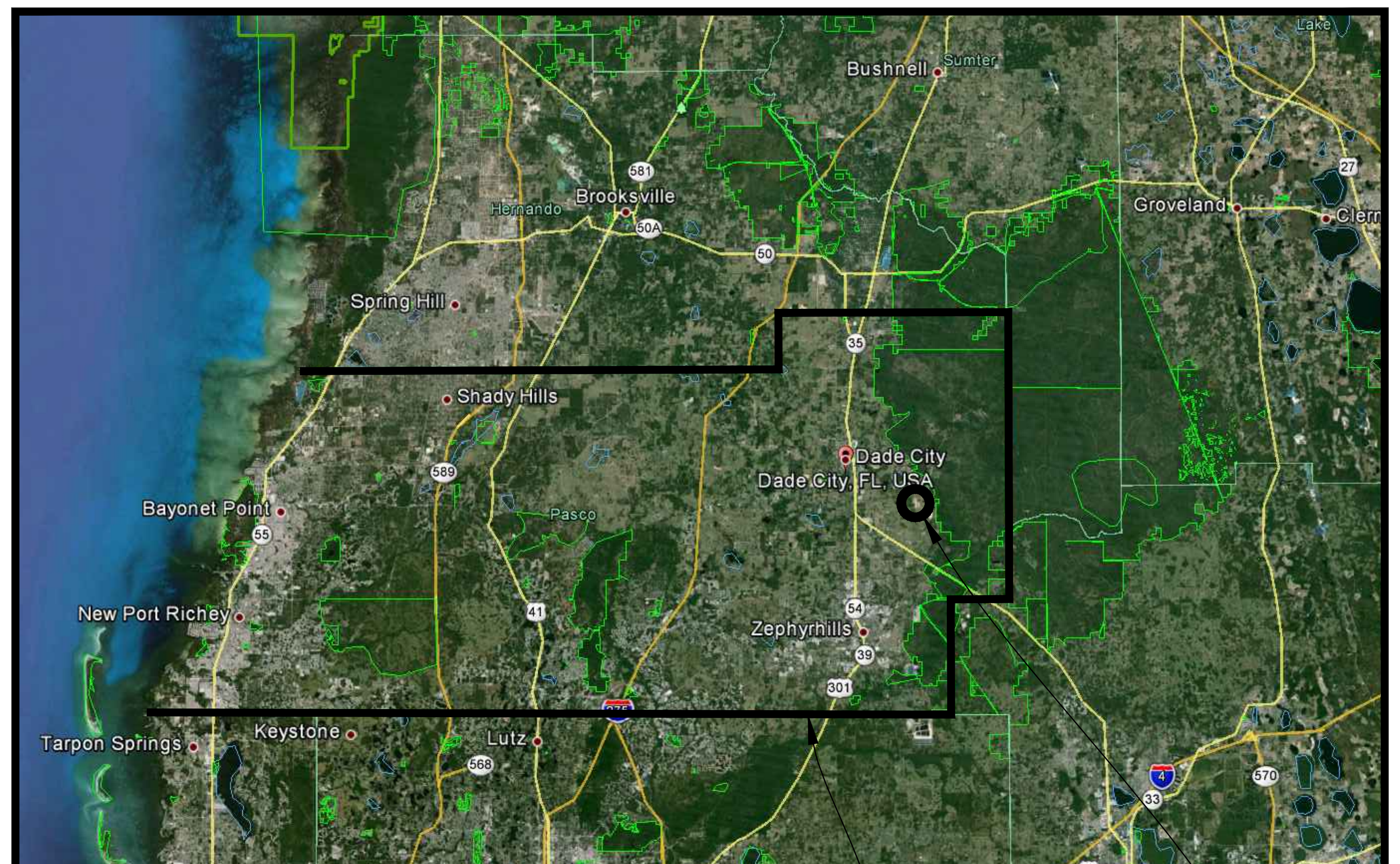
SECTION 4

2018 ~~2017~~ PLAN SET

ENTERPRISE ROAD CLASS III LANDFILL
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION

LOCATED:
DADE CITY, PASCO COUNTY, FLORIDA

SUBMITTED TO:
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



PASCO COUNTY, FLORIDA

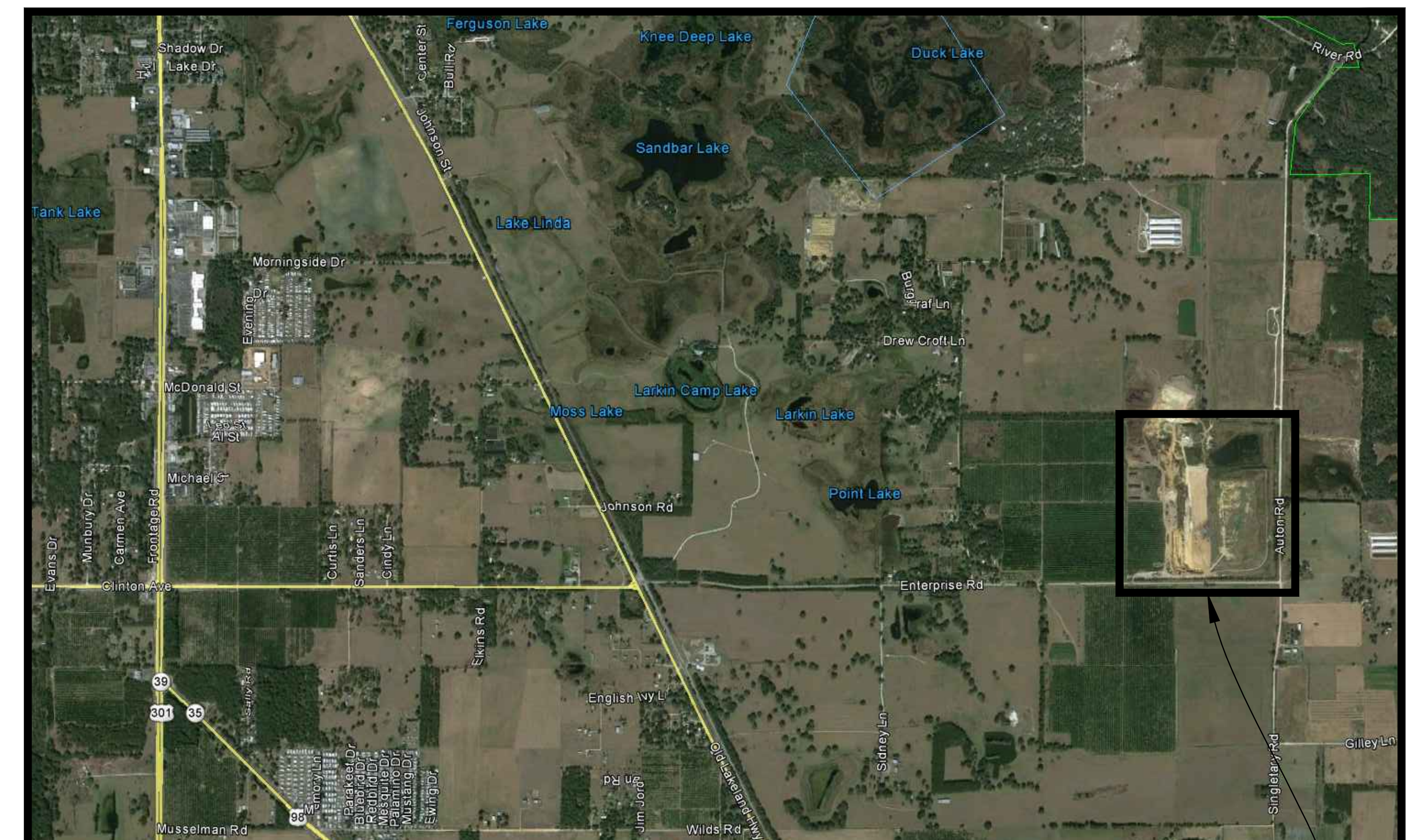
ENTERPRISE ROAD RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL

N

COUNTY LOCATION MAP

Sheet List Table

Sheet Number	Sheet Title
C0.00	COVER SHEET
C0.01	GENERAL NOTES AND ABBREVIATIONS
C0.02	AERIAL SITE PLAN
C0.03	SITE PLAN
C0.04	CELL FLOOR GRADING PLAN
C1.00	PHASING PLAN SEQUENCE NO. 1
C1.01	PHASING PLAN SEQUENCE NO. 1 SECTIONS
C1.10	PHASING PLAN SEQUENCE NO. 2
C1.11	PHASING PLAN SEQUENCE NO. 2 SECTIONS
C2.00	PHASING PLAN SEQUENCE NO. 3 OVERALL LANDFILL VERTICAL EXPANSION
C2.10	PHASING PLAN SEQUENCE NO. 3 OVERALL LANDFILL VERTICAL EXPANSION
C3.00	PHASING PLAN SEQUENCE NO. 4 CONCEPTUAL CLOSURE
C3.10	PHASING PLAN SEQUENCE NO. 4 CONCEPTUAL CLOSURE SECTIONS
C4.00	CLOSURE DETAILS
C4.10	LEACHATE COLLECTION WETWELL SECTIONS AND DETAILS



ENTERPRISE ROAD RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL

N

VICINITY MAP

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:
PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:
COVER SHEET

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C0.00

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GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929, UNLESS OTHERWISE NOTED.
2. THE INFORMATION PROVIDED IN THESE PLANS IS SOLELY TO ASSIST THE PERMITTING AGENCY IN ASSESSING THE NATURE AND EXTENT OF THE CONDITIONS WHICH MAY BE ENCOUNTERED AT THE SITE.
3. CONTRACTOR SHALL CERTIFY IN WRITING TO THE ENGINEER OF RECORD THE ACCURACY OF ALL SURVEY AND OTHER GRADING DATA PRIOR TO BEGINNING WORK.
4. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE PLANS) AFFECTING THE WORK.
5. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PROTECT EXISTING PIPING, MONITORING WELLS/PIEZOMETERS FROM DAMAGE DURING CONSTRUCTION. CONTRACTOR SHALL REPAIR OR REPLACE PIPING, MONITORING WELLS/PIEZOMETERS DAMAGED DURING CONSTRUCTION WITH EQUIVALENT MATERIALS AND CONSTRUCTION METHODS AS APPROVED BY FACILITY OWNER AT NO ADDITIONAL COST TO THE OWNER.
6. FIELD CONDITIONS MAY NECESSITATE SLIGHT ALIGNMENT AND GRADE DEVIATION OF THE PROPOSED CONSTRUCTION TO AVOID OBSTACLES, AS ORDERED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
7. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH EXISTING PASCO COUNTY DESIGN AND CONSTRUCTION STANDARDS UNLESS THOSE STANDARDS CONFLICT WITH THESE CONTRACT DOCUMENTS IN WHICH CASE THESE CONTRACT DOCUMENTS SHALL GOVERN. SUCH CONFLICTS SHALL BE BROUGHT TO THE PROFESSIONAL'S ATTENTION IMMEDIATELY.
8. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH PREVAILING FEDERAL, STATE, LOCAL AND OTHER APPLICABLE REGULATIONS.
9. CONSTRUCTION MONUMENTS FOR VERTICAL AND HORIZONTAL CONTROL HAVE BEEN PROVIDED AT THE PROJECT SITE.
10. PRIOR TO BEGINNING EARTHWORK, THE CONTRACTOR SHALL PROVIDE STORMWATER AND EROSION CONTROL PLANS TO PREVENT PONDING AND CONTROL EROSION AND RUNOFF. NO PONDING OF WATER SHALL BE ALLOWED. THE CONTRACTOR SHALL USE WHATEVER MEANS NECESSARY TO PREVENT EROSION AND SHALL BE RESPONSIBLE FOR ALL WORK, INCLUDING PROVIDING EQUIPMENT, LABOR, FILL, ETC NECESSARY TO REMEDIATE AND/OR RESTORE ALL AREAS IMPACTED BY EROSION.
11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BECOME FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM.
12. THE CONTRACTOR SHALL PROVIDE ALL WARNING SIGNALS, SIGNS, LIGHTS, AND FLAG PERSON AS REQUIRED BY DOT IN THE "MANUAL ON TRAFFIC CONTROL & SAFE PRACTICES."
13. ALL PIPING SHALL HAVE MINIMUM COVER OF 24" UNLESS OTHERWISE NOTED.
14. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE DEFLECTION SHALL NOT EXCEED 75% OF THE MANUFACTURER'S RECOMMENDED DEFLECTION ANGLE. MINIMUM PIPE RADIUS SHALL BE A MINIMUM OF 25% GREATER THAN THE MANUFACTURER'S RECOMMENDED MINIMUM RADIUS.
15. CONTAMINATED STORMWATER, DEWATERING DISCHARGE, LEACHATE, CONTAMINATED SOILS, OR EXCAVATED WASTE SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE LANDFILL OPERATIONS.
16. CONTRACTOR SHALL VERIFY ALL CLEARANCES PRIOR TO CONSTRUCTION.
17. THE CONTRACTOR SHALL MAINTAIN A CLEAR PATH FOR ALL SURFACE WATER DRAINAGE STRUCTURES AND DITCHES DURING ALL PHASES OF CONSTRUCTION AND SHALL UTILIZE WHATEVER MEANS NECESSARY TO MANAGE STORMWATER SUCH THAT IMPACT TO CONSTRUCTION IS MINIMIZED. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF DAMAGE DUE TO STORMWATER.
18. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE AREAS SHOWN ON THE FINAL GRADING PLAN UNLESS APPROVED BY THE ENGINEER, OR SPECIFICALLY NOTED ON THE PLANS.

22. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ENVIRONMENTAL PROTECTION DURING THE LIFE OF THE CONTRACT. THE CONTRACTOR'S OPERATIONS SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS PERTAINING TO WATER, AIR, SOLID WASTE, HAZARDOUS WASTE MATERIALS, OILY SUBSTANCES, AND NOISE POLLUTION. THE CONTRACTOR SHALL IMPLEMENT EROSION AND SEDIMENTATION CONTROL MEASURES AS NECESSARY TO COMPLY WITH THESE REGULATIONS FOR BOTH TEMPORARY AND PERMANENT CONSTRUCTION.
23. THE CONTRACTOR SHALL COMPLY WITH ALL TERMS, CONDITIONS, AND REQUIREMENTS OF ALL APPLICABLE PERMITS, INCLUDING FDEP PERMITS FOR THE SITE.
24. THE CONTRACTOR SHALL REPLACE ALL EXISTING PAVING, LANDFILL COVER MATERIAL, ACCESS ROADS, PIPES, STABILIZED EARTH, FENCES, SIGNS AND OTHER IMPROVEMENTS WITH THE SAME TYPE OF MATERIAL THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION, AS A RESULT OF CONSTRUCTION, OR AS DIRECTED BY THE ENGINEER WITHOUT INCREASE IN THE CONTRACT PRICE OR TIME.
25. THE CONTRACTOR SHALL BE AWARE THAT THERE MAY BE SOME UTILITY CONFLICTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND PROTECT ANY AND ALL EXISTING UTILITIES ON THIS PROJECT WITHOUT INCREASE IN THE CONTRACT PRICE OR TIME.
26. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS BETWEEN DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED.
27. THE CONTRACTOR SHALL COMPLY WITH ALL TERMS, CONDITIONS, AND REQUIREMENTS OF ALL APPLICABLE PERMITS, INCLUDING FDEP AND WATER MANAGEMENT DISTRICT PERMITS FOR THE SITE.

GRADING NOTES

1. ALL AREAS WITHIN AND AROUND THE LIMITS OF CONSTRUCTION SHALL BE MAINTAINED AS NEEDED TO CONTROL EROSION DURING THE LENGTH OF THE PROJECT.
2. FILL ELEVATIONS SHALL BE SUCH THAT INTERMEDIATE AND FINAL COVER DESIGN ELEVATIONS SHALL BE ACHIEVED ON ALL SLOPES.

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NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

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Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER	DESIGNED BY	LJB
	DRAWN BY	MAF
	CHECKED BY	JDL
FL PE NO. 74652	APPROVED BY	LJB

SHEET TITLE:

GENERAL NOTES AND ABBREVIATIONS

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C0.01

REVIEW ONLY-NOT FOR CONSTRUCTION

NORTH

0 150 300
GRAPHIC SCALE

LEGEND

—x—x—x—x—	PERIMETER FENCE
——— — — ———	PROPERTY BOUNDARY
—·—·—·—·—	LANDFILL FOOTPRINT (AT BUILD OUT)
— — — — — —	LANDFILL CELLS

NOTES:

1. PROPERTY BOUNDARY SURVEY CONDUCTED BY SIMMONS & BEALL, INC. 3-30-2001, PROVIDED BY ANGELO'S AGGREGATE MATERIALS.
2. CLASS III LANDFILL PERMITTED AND FUTURE CELL LAYOUT PER NOVEMBER 2006 ANGELO'S RECYCLED MATERIALS ENTERPRISE RECYCLING & DISPOSAL FACILITY (AS AMENDED FEBRUARY 2008 AND JANUARY 2010 BY JONES EDMUNDS, AS AMENDED MARCH 2013 BY KELNER ENGINEERING AND 2015 AND 2016 BY LOCKLEAR & ASSOCIATES).
3. JULY 2017 AERIAL PHOTOGRAPHY PER GOOGLE EARTH PRO WEBSITE.

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
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PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

AERIAL SITE PLAN

PROJECT NO.:	02000-217-17
SCALE:	AS SHOWN
DATE:	AUGUST 2017
DRAWING:	C0.02

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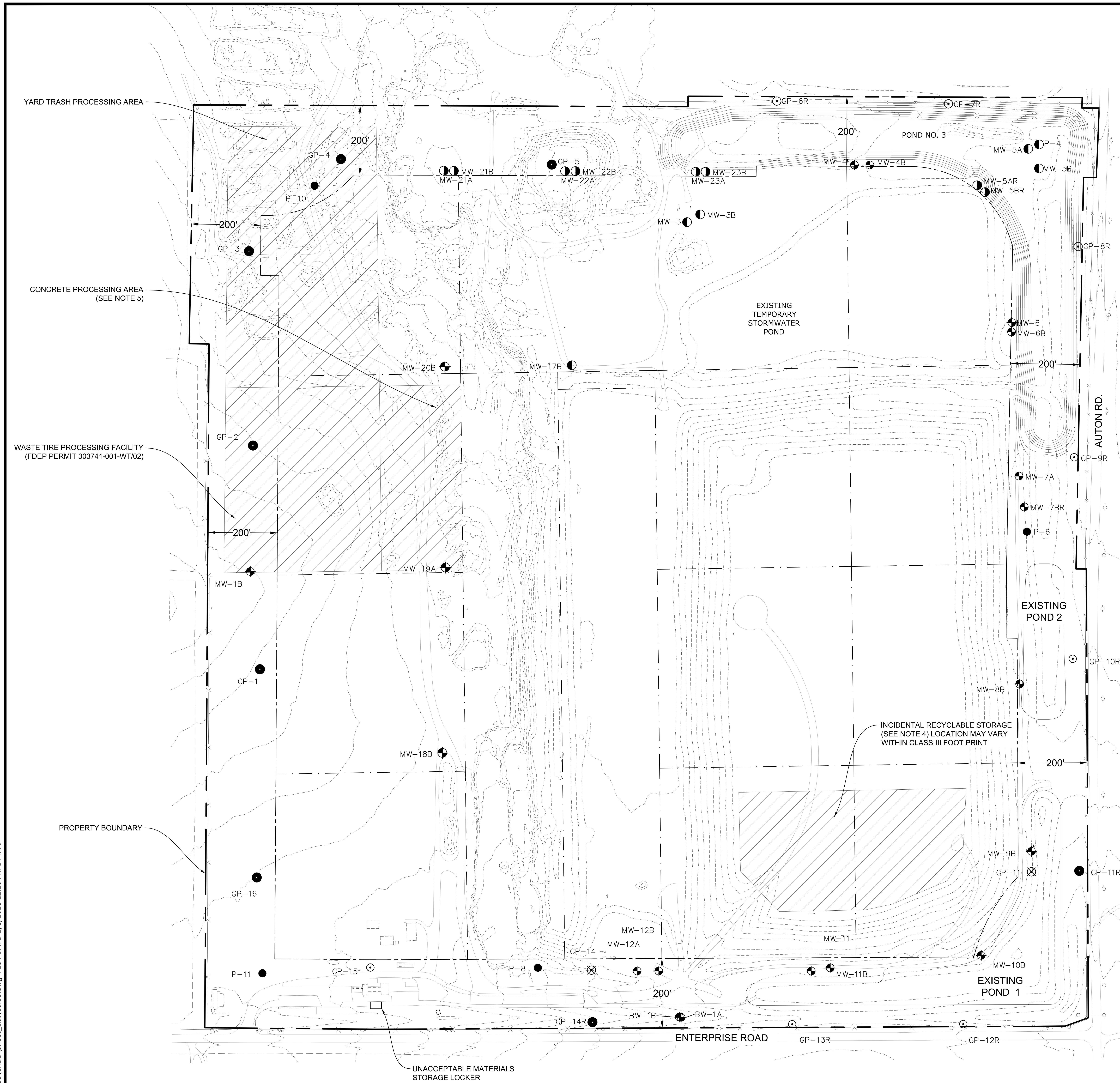

NORTH

0 150 300
GRAPHIC SCALE

LEGEND

PERIMETER FENCE

PROPERTY BOUNDARY

LANDFILL FOOTPRINT (AT BUILD OUT)

LANDFILL CELLS

EXISTING CONTOURS

SPECIAL WASTE MANAGEMENT AREA

LEGEND

MW−4B MONITORING WELL LOCATION

MW−5A MONITORING WELL TO BE ABANDONED

MW−5BR MONITORING WELL TO BE INSTALLED

GP−1 GAS PROBE LOCATION

GP−8 GAS PROBE TO BE ABANDONED

GP−8R FUTURE GAS PROBE LOCATION

P−11 PIEZOMETER WELL LOCATION

MW−18B FUTURE MONITOR WELL LOCATION*

NOTES:

1. PROPERTY BOUNDARY SURVEY CONDUCTED BY SIMMONS & BEALL, INC. 3-30-2001, PROVIDED BY ANGELO'S AGGREGATE MATERIALS.
2. CLASS III LANDFILL PERMITTED AND FUTURE CELL LAYOUT PER NOVEMBER 2006 ANGELO'S RECYCLED MATERIALS ENTERPRISE RECYCLING & DISPOSAL FACILITY (AS AMENDED FEBRUARY 2008 AND JANUARY 2010 BY JONES EDMUNDS, AS AMENDED MARCH 2013 BY KELNER ENGINEERING AND 2015 AND 2016 BY LOCKLEAR & ASSOCIATES).
3. TOPOGRAPHIC SURVEY BY PICKETT SURVEYING & PHOTOGRAMMETRY, DATED 11/11/13, UPDATED ON 12/31/13.
4. TEMPORARY STORAGE OF UNACCEPTABLE MATERIALS AND INCIDENTAL RECYCLABLES WITHIN THE LANDFILL FOOTPRINT AND NEAR WORKING FACE MAY BE PROVIDED AS FOLLOWS:

TYPE	MAX. QTY	STORAGE
INCIDENTAL RECYCLABLES		
FERROUS METAL	500 CY	ROLL-OFF OR PILE
ALUMINUM	300 CY	ROLL-OFF OR PILE
STAINLESS STEEL	300 CY	ROLL-OFF OR PILE
COPPER	25 CY	TRASH PAIL, ROLL-OFF OR PILE
ASPHALT	300 CY	ROLL-OFF OR PILE
CONCRETE / RUBBLE	300 CY	ROLL-OFF OR PILE
ELECTRONICS	8 CY	COVERED DUMPSTER
UNACCEPTABLE MATERIALS		
PAINT, BATTERIES, SOLVENTS, ELECTRONICS, OILS, ETC.	40 CY	ROLL-OFF OR PILE AT WORKING FACE, REMOVED DAILY TO STORAGE LOCKER
CLASS I WASTE	20 CY	COVERED DUMPSTERS

5. CONCRETE PROCESSING AREA WILL BE RELOCATED WHEN EXCAVATION OPERATIONS MOVE TO THIS AREA.

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
4140 NW 37th Place, Suite A
Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:
SITE PLAN

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C0.03

REVIEW ONLY-NOT FOR CONSTRUCTION

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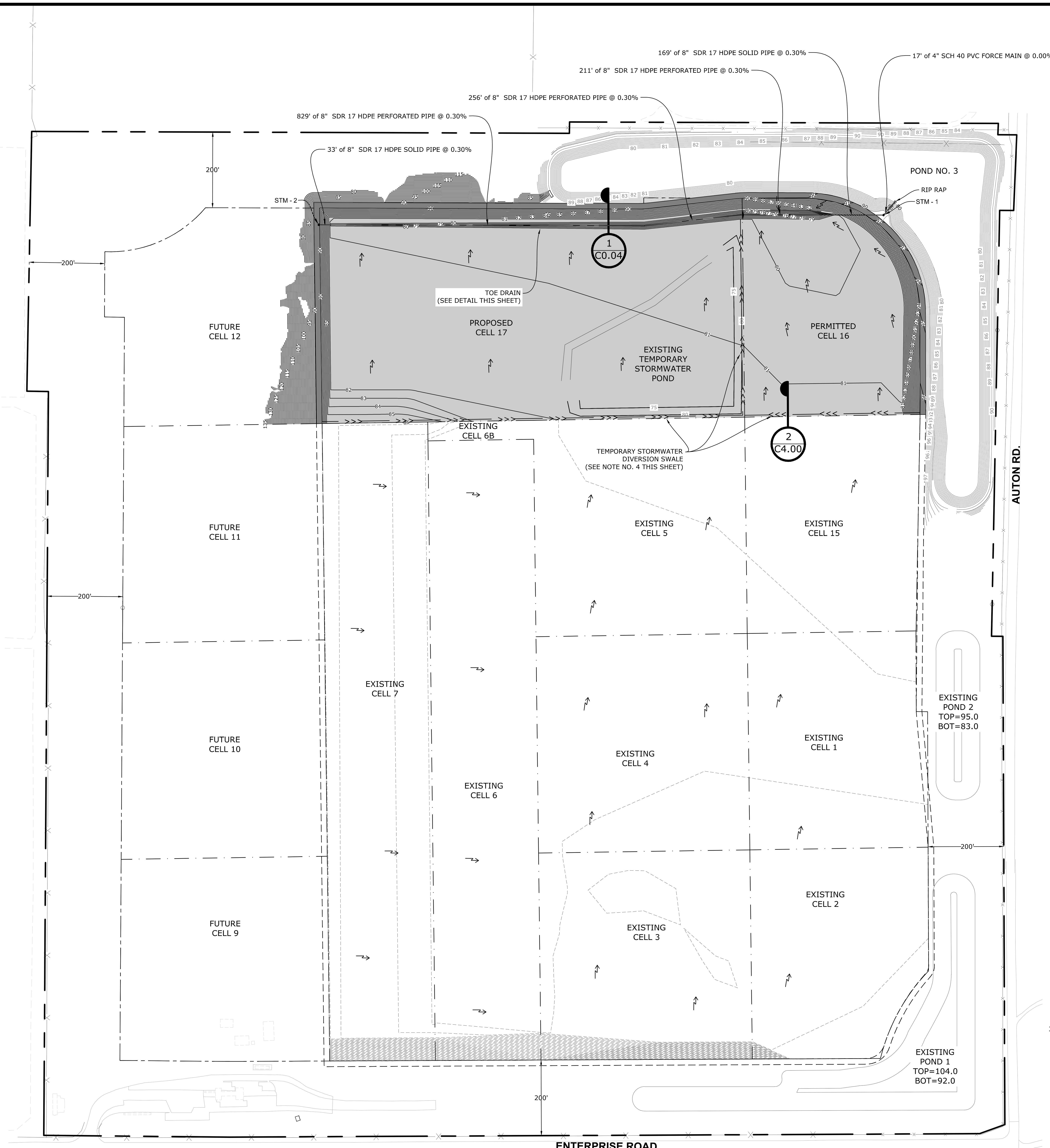
STORM SEWER STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:	NORTHING	EASTING
STORM SEWER STM - 1	LEACHATE COLLECTION WETWELL (SEE DETAIL ON C4.10) FINISH GRADE RIM EL = 91.92' INV IN = 74.98' 8" SDR 17 HDPE SOLID PIPE SUMP EL = 72.00' INV OUT = 88.50' 4" SCH 40 PVC FORCE MAIN	1,454,654.80	613,925.38
STORM SEWER STM - 2	8" PVC CLEANOUT FINISH GRADE RIM EL = 89.95' INV OUT = 79.47' 8" SDR 17 HDPE SOLID PIPE	1,454,629.15	612,432.13

NORTH

0 150 300
GRAPHIC SCALE



LEGEND

PERIMETER FENCE

PROPERTY BOUNDARY

LANDFILL FOOTPRINT (AT BUILD OUT)

LANDFILL CELLS

EXISTING CLAY LAYER CONTOURS

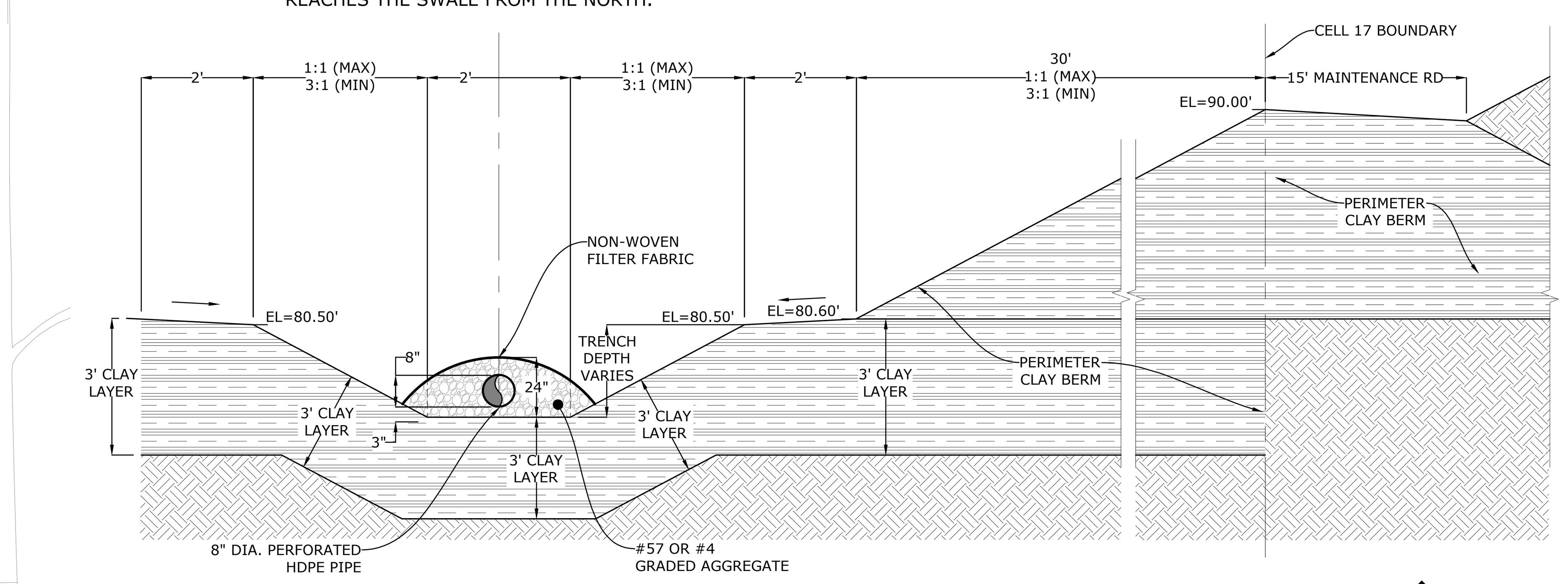
PROPOSED CLAY LAYER CONTOURS

DIRECTIONAL FLOW ARROW

FLOOR GRADING CLAY AREA (SHADED)

NOTES:

1. PROPOSED CONTOURS REPRESENT THE TOP OF CLAY (3' BARRIER LAYER) ELEVATION.
2. TOPOGRAPHIC SURVEY BY PICKETT SURVEYING & PHOTOGRAMMETRY, DATED 11/11/2013.
3. PHASE 1 - CONSTRUCTION AND FILLING OF CELL 16 AND POND NO. 3 (PREVIOUSLY PERMITTED, CONSTRUCTION IN PROGRESS.
4. PHASE 1 - TEMPORARY STORMWATER DIVERSION SWALE. CONTRACTOR SHALL GRADE TEMPORARY SWALE FOR POSITIVE DRAINAGE TOWARD EXISTING TEMPORARY STORMWATER POND. TEMPORARY SWALE SHALL BE REMOVED AND FILLED WITH CLAY ONCE INITIAL WASTE LIFT REACHES THE SWALE FROM THE NORTH.
5. PHASE 2 - CONSTRUCTION AND FILLING OF CELL 17.
6. PHASE 2 - TEMPORARY STORMWATER DIVERSION SWALE. CONTRACTOR SHALL GRADE TEMPORARY SWALE FOR POSITIVE DRAINAGE ALONG THE SOUTHERN CELL BOUNDARY OF CELL 17 AND RUN NORTH ALONG THE WESTERN BOUNDARY OF CELL 16. TEMPORARY SWALE SHALL BE REMOVED AND FILLED WITH CLAY ONCE INITIAL WASTE LIFT REACHES THE SWALE FROM THE NORTH.



TOE DRAIN 1 C0.04

N.T.S.

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

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PROJECT TITLE:

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ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

CELL FLOOR GRADING PLAN

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C0.04

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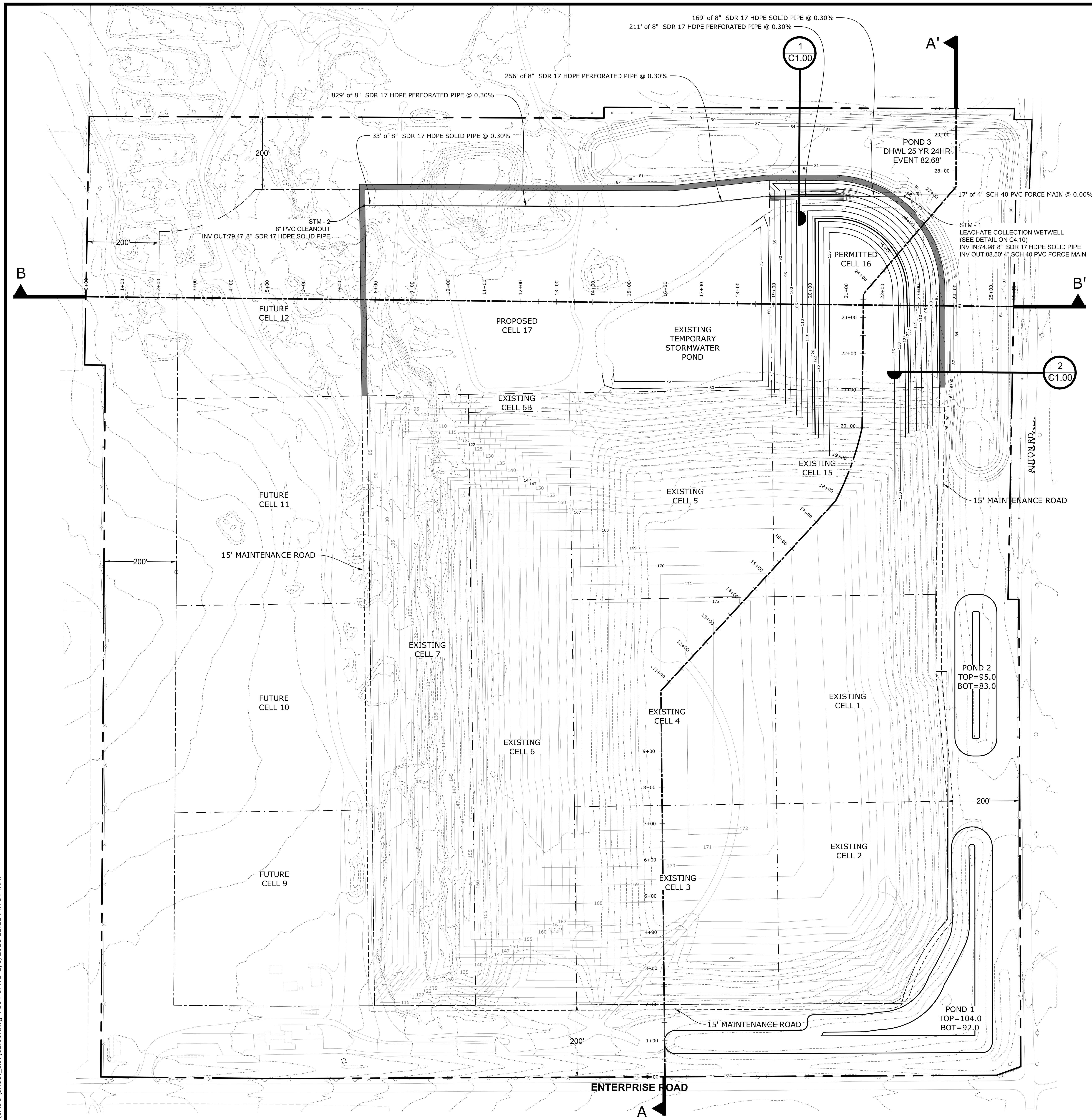
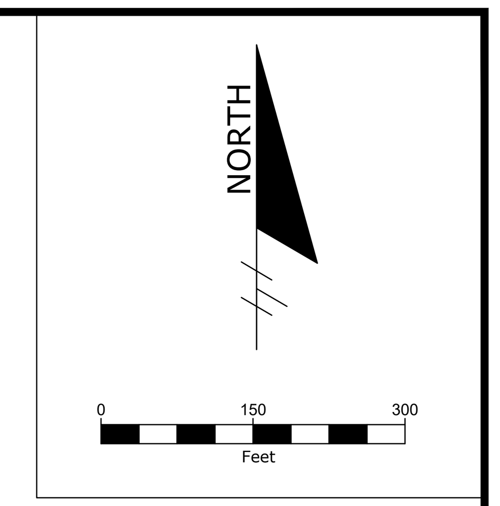


STORM SEWER STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:	NORTHING	EASTING
STORM SEWER STM - 1	LEACHATE COLLECTION WETWELL (SEE DETAIL ON C4.10) FINISH GRADE RIM EL = 91.92' INV IN = 74.98' 8" SDR 17 HDPE SOLID PIPE SUMP EL = 72.00' INV OUT = 88.50' 4" SCH 40 PVC FORCE MAIN	1,454,654.80	613,925.38
STORM SEWER STM - 2	8" PVC CLEANOUT FINISH GRADE RIM EL = 89.95' INV OUT = 79.47' 8" SDR 17 HDPE SOLID PIPE	1,454,629.15	612,432.13

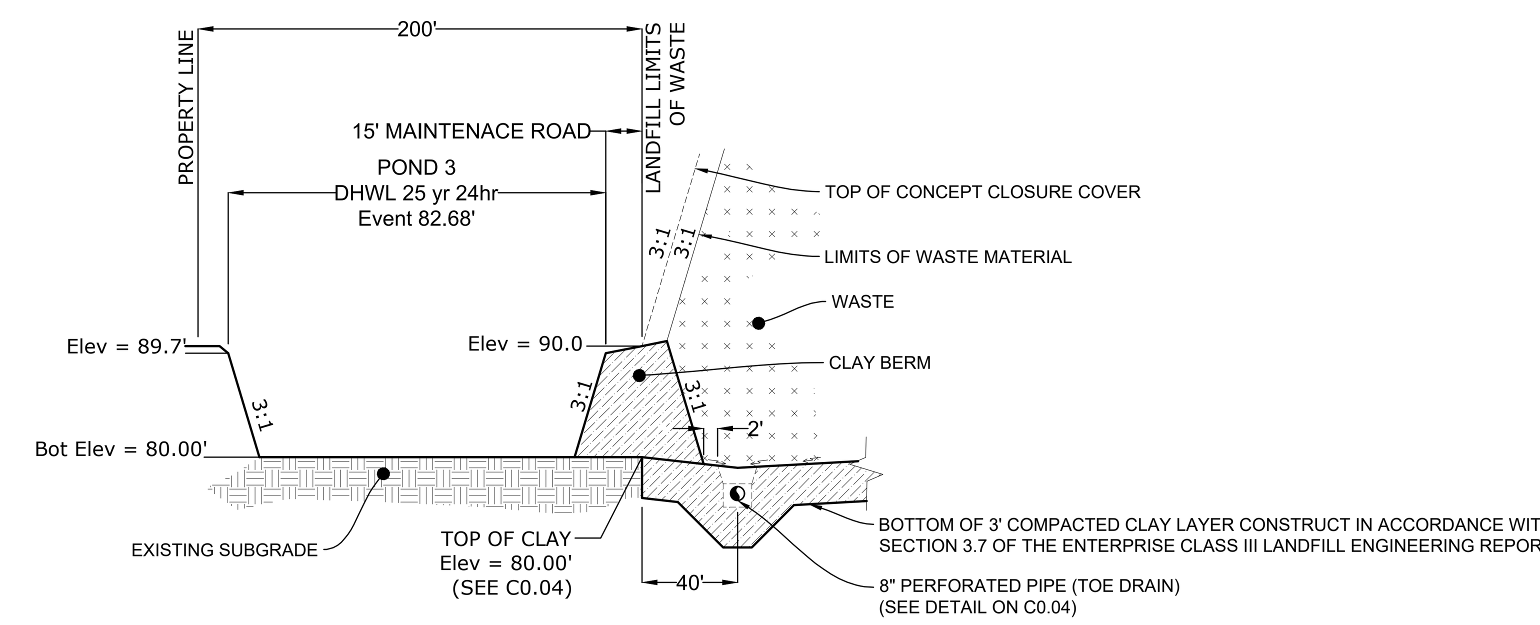


LEGEND

- PERIMETER FENCE
- PROPERTY BOUNDARY
- LANDFILL FOOTPRINT (AT BUILD OUT)
- LANDFILL CELLS
- 90 EXISTING CONTOURS
- 170 PERMITTED CELL 7 CONTOURS
- 10+00 CROSS SECTION STATIONS

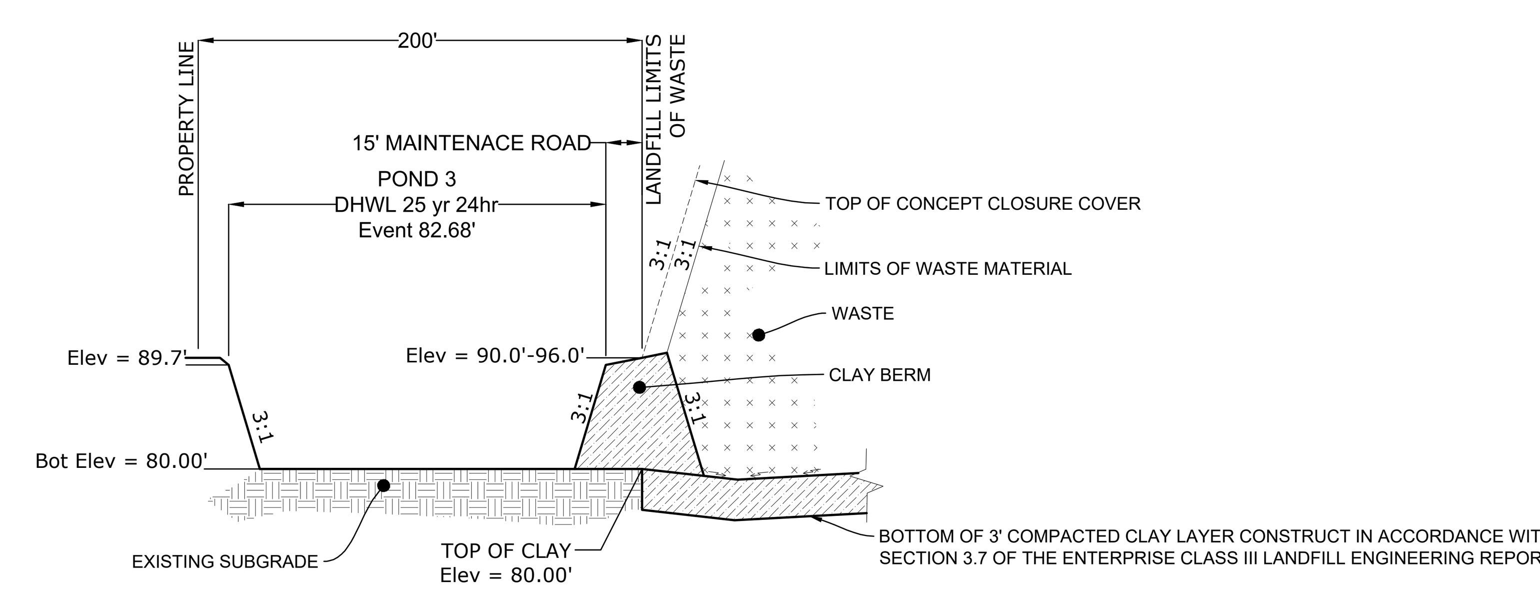
NOTES:

1. CONTOURS REPRESENT TOP OF WASTE. FILL ELEVATIONS SHALL BE SUCH THAT FINAL COVER DESIGN ELEVATIONS SHALL BE ACHIEVED ON ALL SLOPES.
2. TOPOGRAPHIC SURVEY BY PICKETT SURVEYING & PHOTOGRAMMETRY, DATED 11/11/13, UPDATED ON 12/31/13.
3. EXISTING CELL 7 CONTOURS SHOWN PER PHASING PLAN SEQUENCE NO. 1 FROM APPROVED 2016 PERMIT MODIFICATION PLAN SET.



1 C1.00 PROPOSED NORTH BERM DETAIL CELL 16

SCALE: N.T.S.



2 C1.00 PROPOSED EAST BERM DETAIL CELL 16

SCALE: N.T.S.

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NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

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4140 NW 37th Place, Suite A
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PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER	DESIGNED BY	LJB
	DRAWN BY	MAF
	CHECKED BY	JDL
FL PE NO. 74652	APPROVED BY	LJB

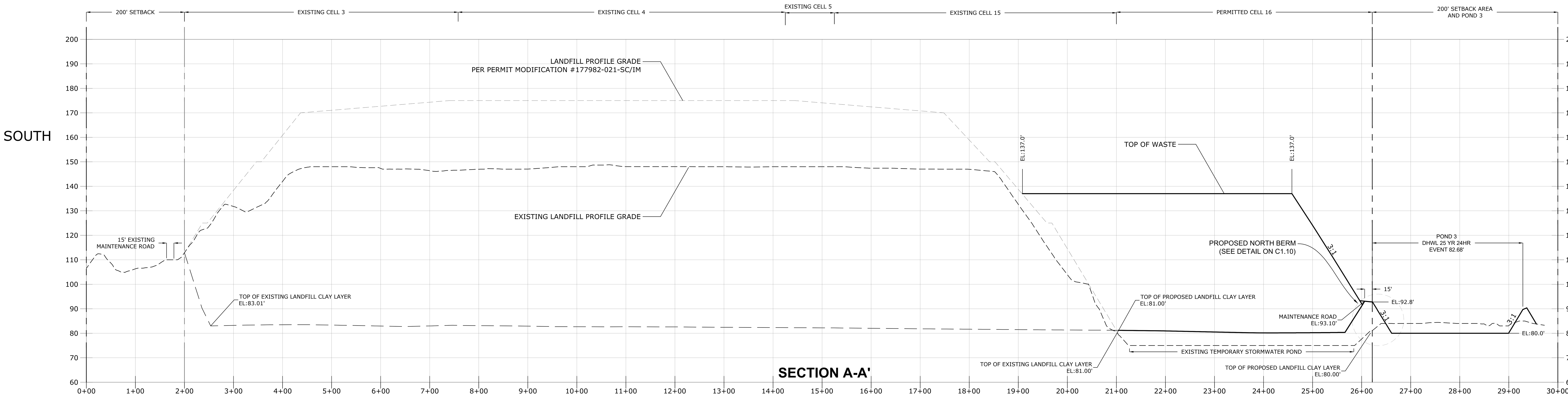
SHEET TITLE:

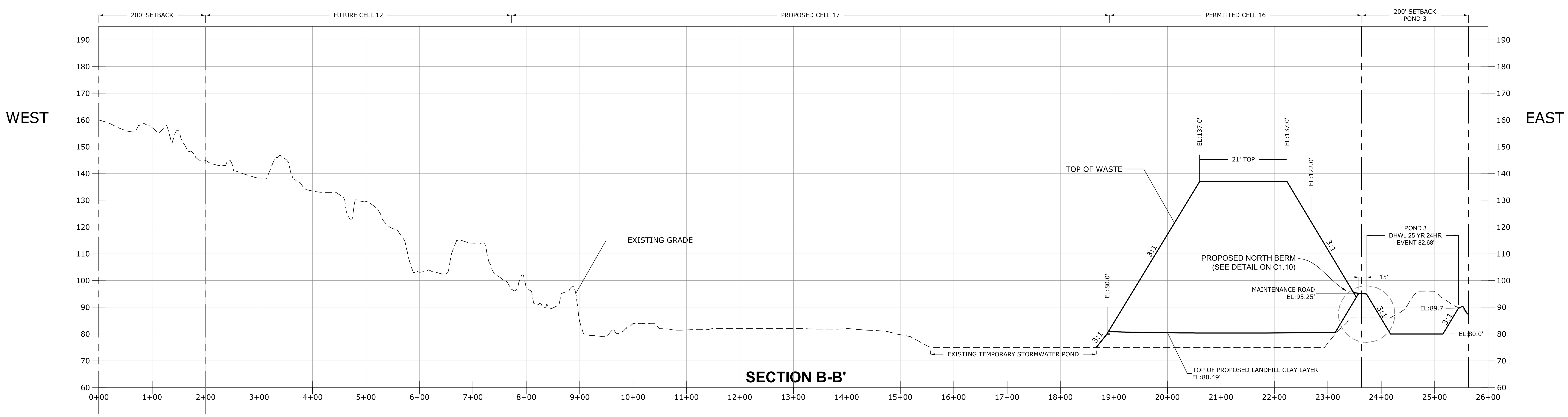
PHASING PLAN SEQUENCE NO. 1

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C1.00

REVIEW ONLY-NOT FOR CONSTRUCTION

SCALES:
HORIZONTAL 1"=100'
VERTICAL 1"= 20'





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NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
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PROJECT TITLE:

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ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

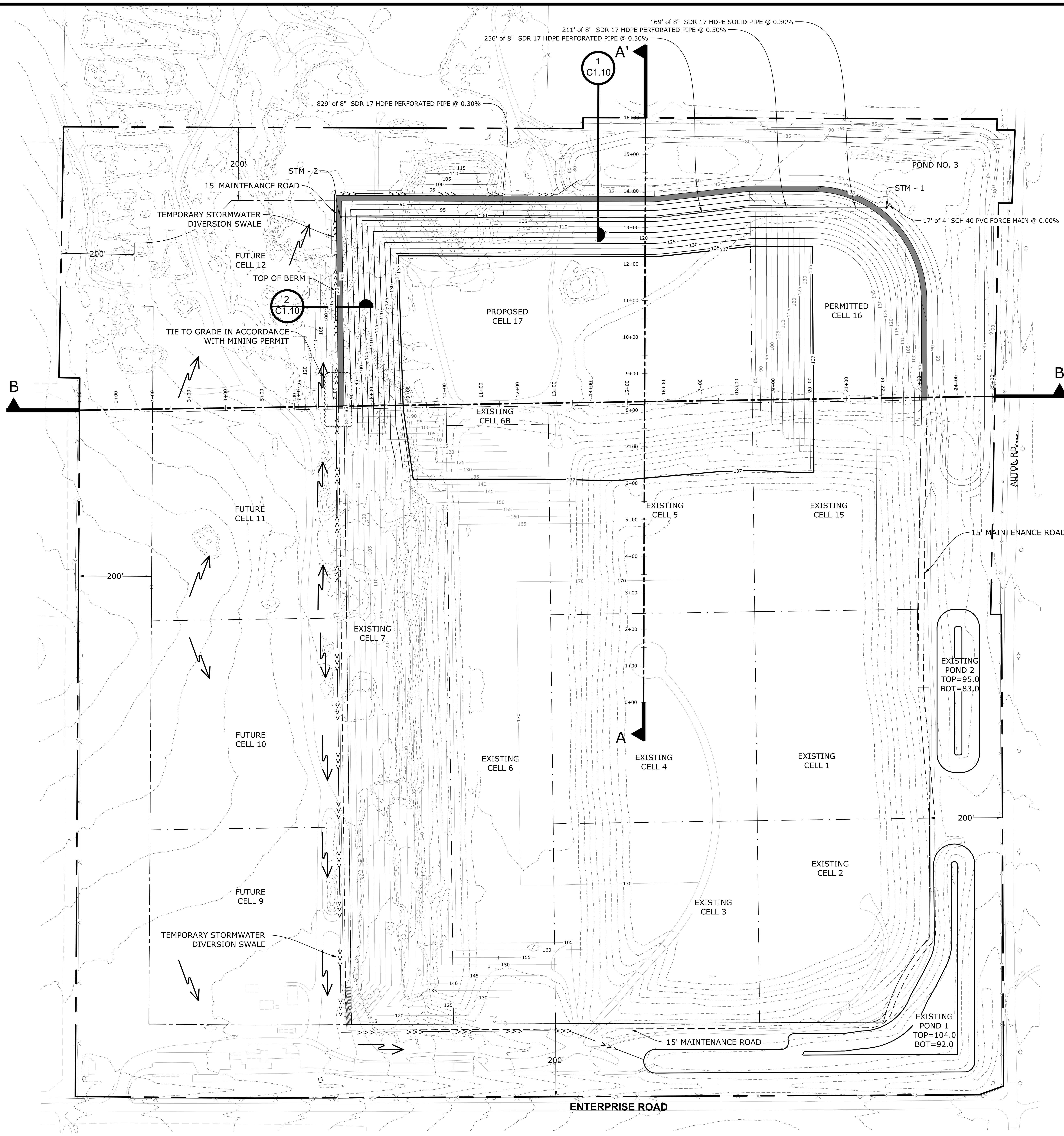
DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

PHASING PLAN SEQUENCE NO. 1 SECTIONS

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C1.01

REVIEW ONLY-NOT FOR CONSTRUCTION



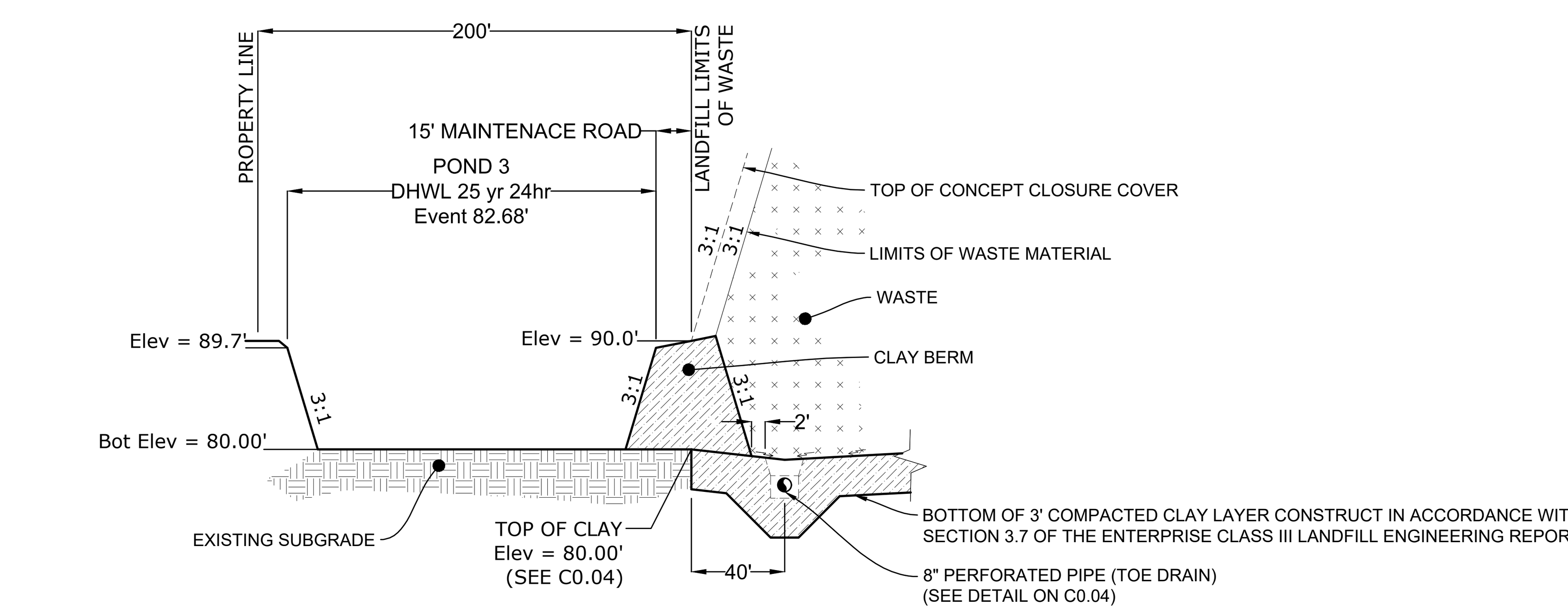
LEGEND

- PERIMETER FENCE
- PROPERTY BOUNDARY
- LANDFILL FOOTPRINT (AT BUILD OUT)
- LANDFILL CELLS
- 90 EXISTING CONTOURS
- 170 PERMITTED CELL 7 CONTOURS
- TEMPORARY STORMWATER DIVERSION SWALE
- DIRECTIONAL FLOW ARROW
- 10+00 CROSS SECTION STATIONS

STORM SEWER STRUCTURE TABLE			
STRUCTURE NAME:	DETAILS:	NORTHING	EASTING
STORM SEWER STM - 1	LEACHATE COLLECTION WETWELL (SEE DETAIL ON C4.10) FINISH GRADE RIM EL = 91.92' INV IN = 74.98' 8" SDR 17 HDPE SOLID PIPE SUMP EL = 72.00' INV OUT = 88.50' 4" SCH 40 PVC FORCE MAIN	1,454,654.80	613,925.38
STORM SEWER STM - 2	8" PVC CLEANOUT FINISH GRADE RIM EL = 89.95' INV OUT = 79.47' 8" SDR 17 HDPE SOLID PIPE	1,454,629.15	612,432.13

NOTES:

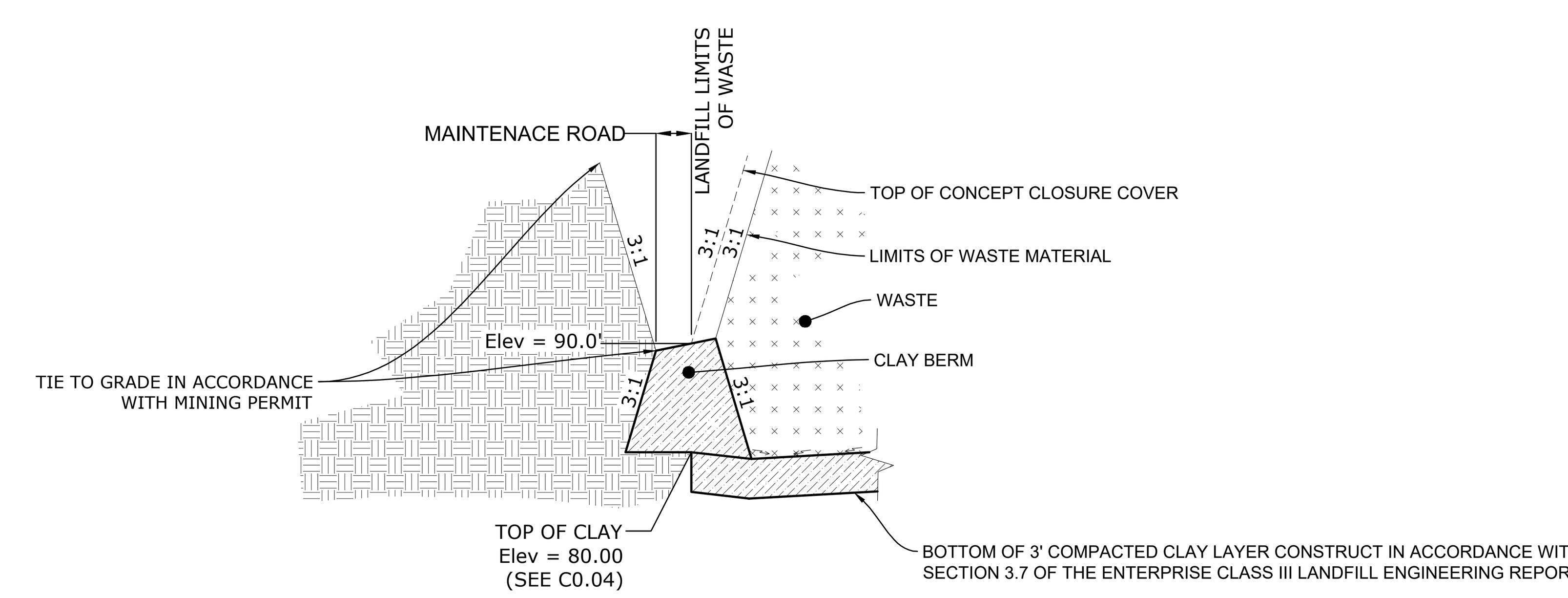
1. CONTOURS REPRESENT TOP OF WASTE. FILL ELEVATIONS SHALL BE SUCH THAT FINAL COVER DESIGN ELEVATIONS SHALL BE ACHIEVED ON ALL SLOPES.
2. TOPOGRAPHIC SURVEY BY PICKETT SURVEYING & PHOTOGRAMMETRY, DATED 11/11/13, UPDATED ON 12/31/13.
3. PRIOR TO WASTE BEING DISPOSED IN CELL 16, BACKFILL THE CELL 17 TEMPORARY DIVERSION SWALE WITH COMPACTED CLAY TO DRAIN TO NORTH.
4. CELL 16 AND 17 CLAY LAYER TO BE CONSTRUCTED IN ACCORDANCE WITH SECTION 3.7 OF ENTERPRISE CLASS III LANDFILL ENGINEERING REPORT.
5. EXISTING CELL 7 CONTOURS SHOWN PER PHASING PLAN SEQUENCE NO. 1 FROM APPROVED 2016 PERMIT MODIFICATION PLAN SET.



1
C1.10

PROPOSED NORTH BERM DETAIL CELL 17

SCALE: N.T.S.



2
C1.10

PROPOSED WEST BERM DETAIL CELL 17

SCALE: N.T.S.

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

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PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER	DESIGNED BY	LJB
	DRAWN BY	MAF
	CHECKED BY	JDL
FL PE NO. 74652	APPROVED BY	LJB

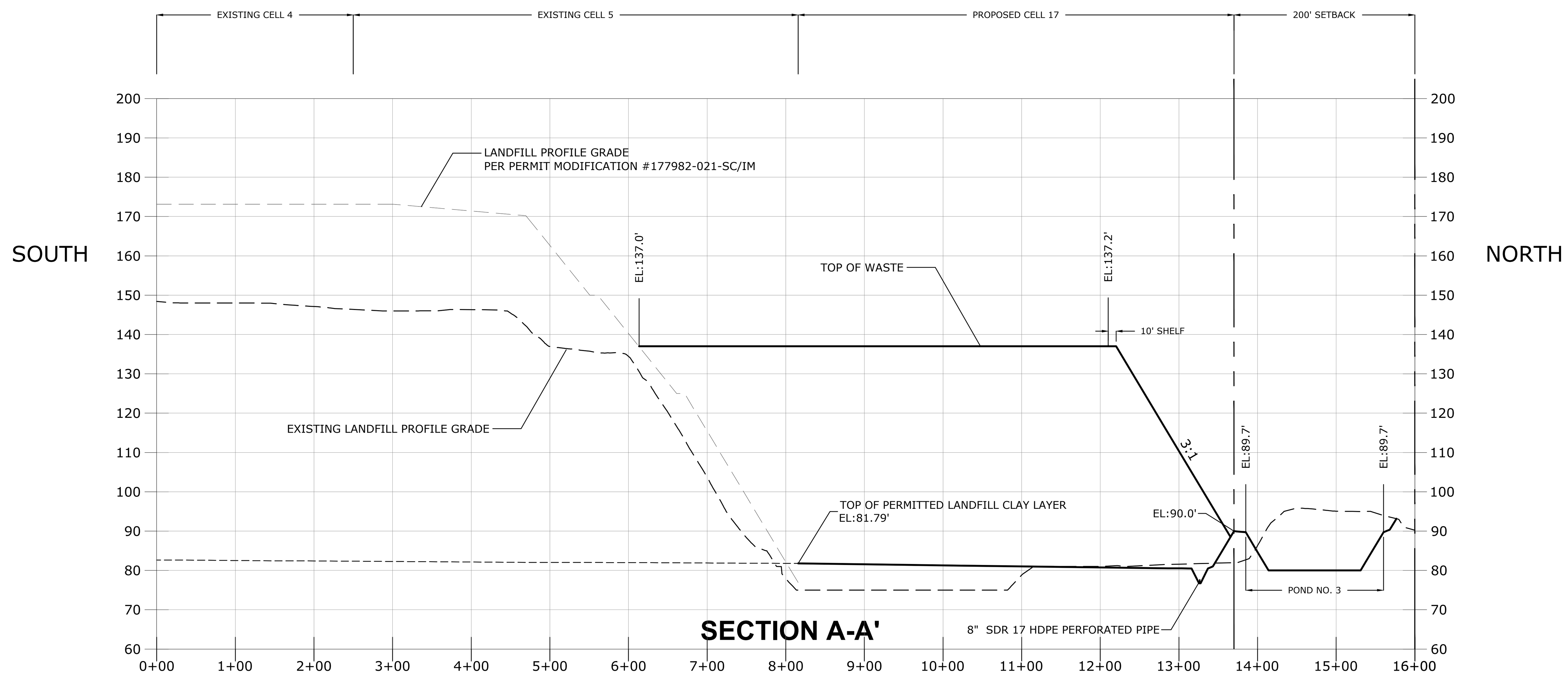
SHEET TITLE:

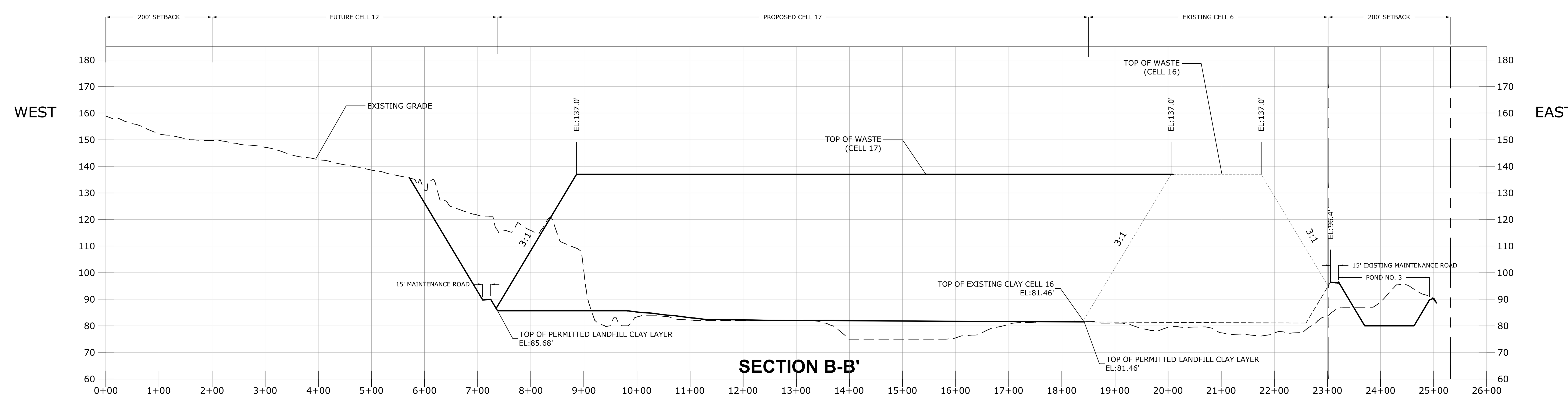
PHASING PLAN SEQUENCE NO. 2

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C1.10

REVIEW ONLY-NOT FOR CONSTRUCTION

SCALES:
HORIZONTAL 1"=100'
VERTICAL 1"= 20'





NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
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PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

PHASING PLAN SEQUENCE NO. 2 SECTIONS

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C1.11

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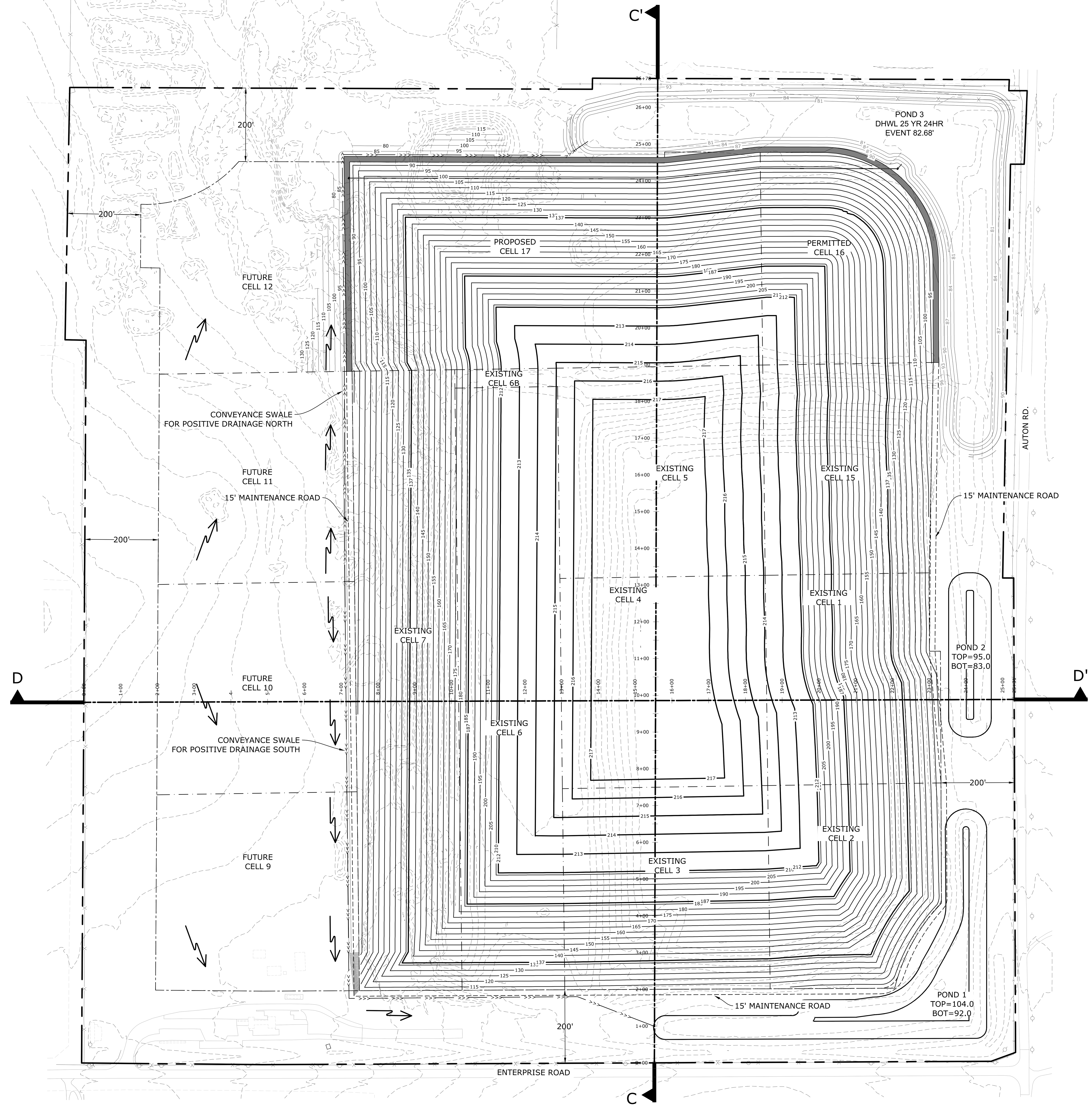

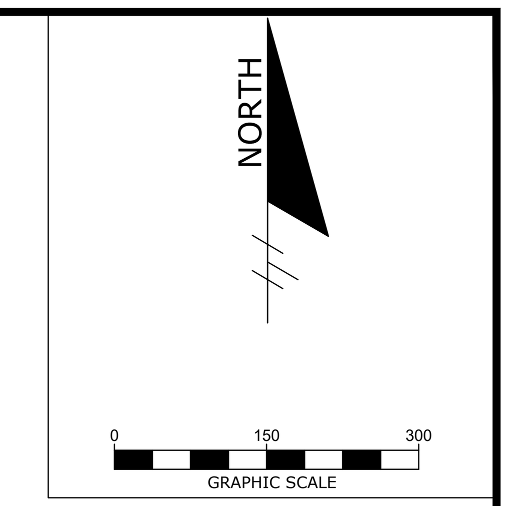

LEGEND

—x—x—	PERIMETER FENCE
— — —	PROPERTY BOUNDARY
—·—·—	LANDFILL FOOTPRINT (AT BUILD OUT)
—·—·—	LANDFILL CELLS
90	EXISTING CONTOURS
>>>	CONVEYANCE SWALE
⟶	DIRECTIONAL FLOW ARROW
10+00	CROSS SECTION STATIONS

NOTES:

1. CONTOURS REPRESENT FINAL COVER. FILL ELEVATIONS SHALL BE SUCH THAT FINAL COVER DESIGN ELEVATIONS SHALL BE ACHIEVED ON ALL SLOPES
2. PRIOR TO WASTE BEING DISPOSED IN PROPOSED CELLS, BACKFILL TEMPORARY DIVERSION SWALE WITH COMPACTED CLAY.
3. LANDFILL FINAL COVER PER DETAIL 3, SHEET C4.00.
4. TOPOGRAPHIC SURVEY BY PICKETT SURVEYING & PHOTOGRAMMETRY, DATED 11/11/13, UPDATED ON 12/31/13.
5. FINAL COVER CONSTRUCTION TO BE IN ACCORDANCE WITH SECTION 7.1 OF THE ENTERPRISE RECYCLING & DISPOSAL FACILITY RECLAMATION & CLOSURE PLAN.
6. THE FACILITY'S OVERALL STORMWATER MANAGEMENT SYSTEM IS GOVERNED BY THE MINING OPERATIONS AND ERP PERMITS. GRADES AND ELEVATION VARY BASED ONGOING MINING OPERATIONS AND TOPOGRAPHY. A DETAILED DESIGN THAT WILL TIE THE CONCEPTUAL CLOSURE PLAN INTO THE FACILITY'S STORMWATER MANAGEMENT SYSTEM WILL BE SUBMITTED AT THE TIME OF CLOSURE.

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NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
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PROJECT TITLE:

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ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

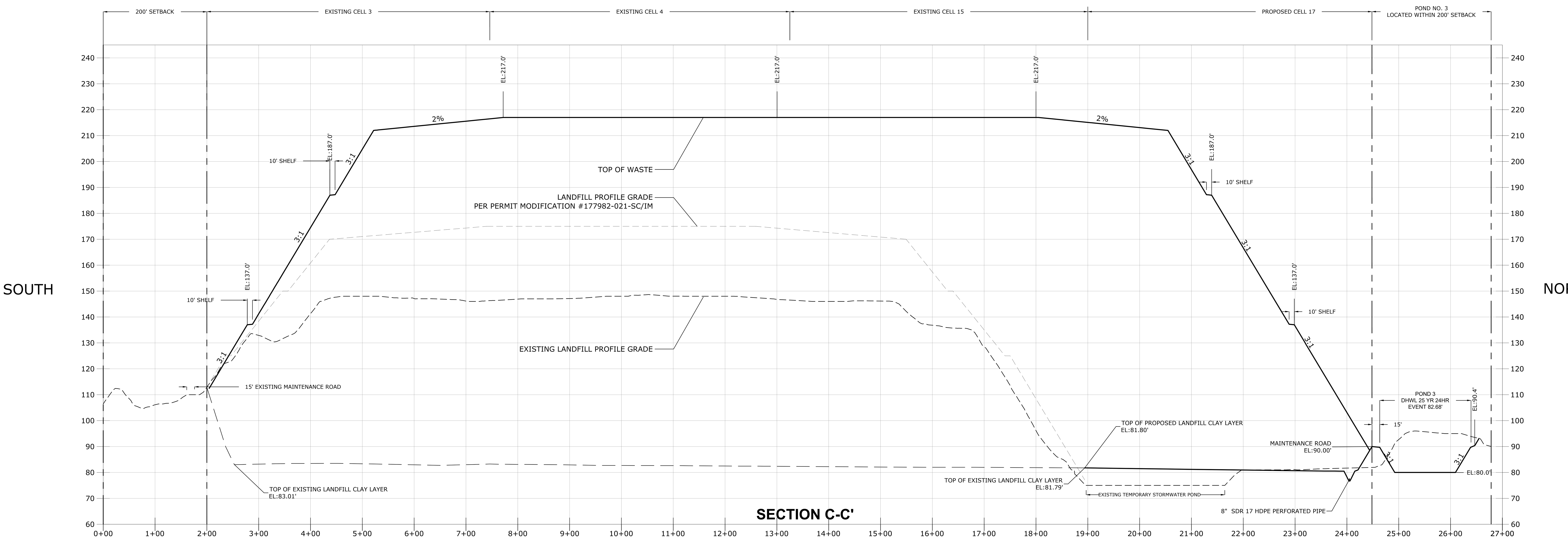
SHEET TITLE:

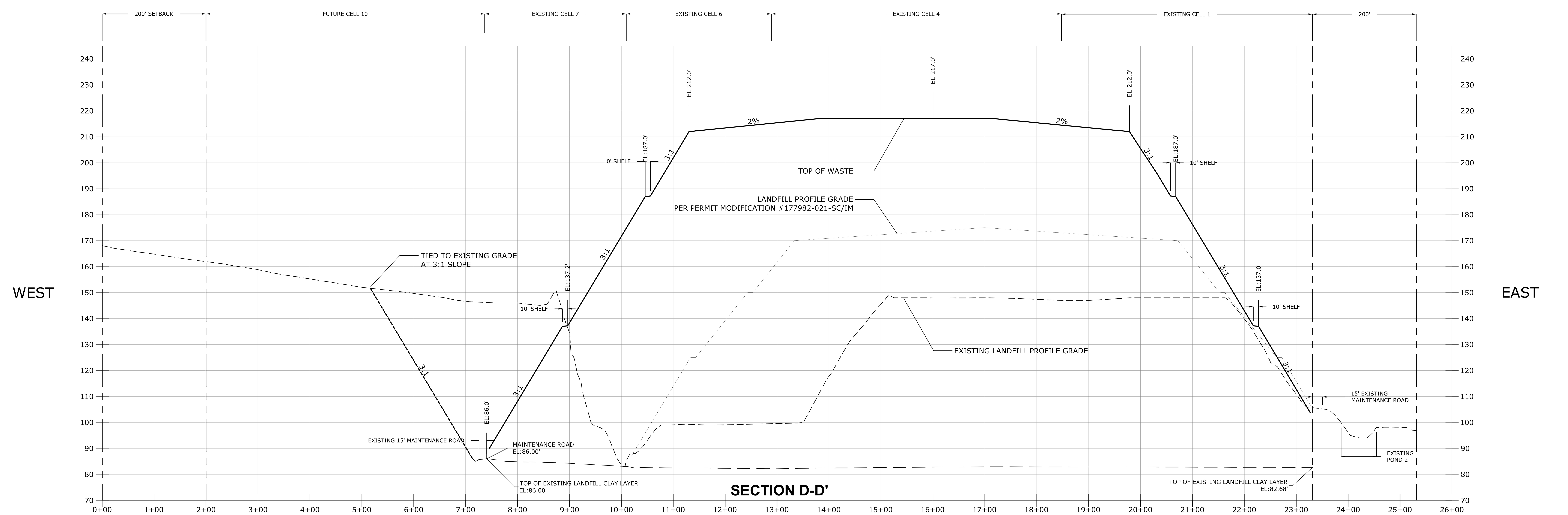
PHASING PLAN SEQUENCE NO. 3 OVERALL LANDFILL VERTICAL EXPANSION

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C2.00

REVIEW ONLY-NOT FOR CONSTRUCTION

SCALES:
HORIZONTAL 1"=100'
VERTICAL 1"= 20'





NO.	DATE	REVISION DESCRIPTION	BY
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PROJECT TITLE:
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2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

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APPROVED BY	LJB

SHEET TITLE:
PHASING PLAN SEQUENCE NO. 3 OVERALL LANDFILL VERTICAL EXPANSION

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C2.10

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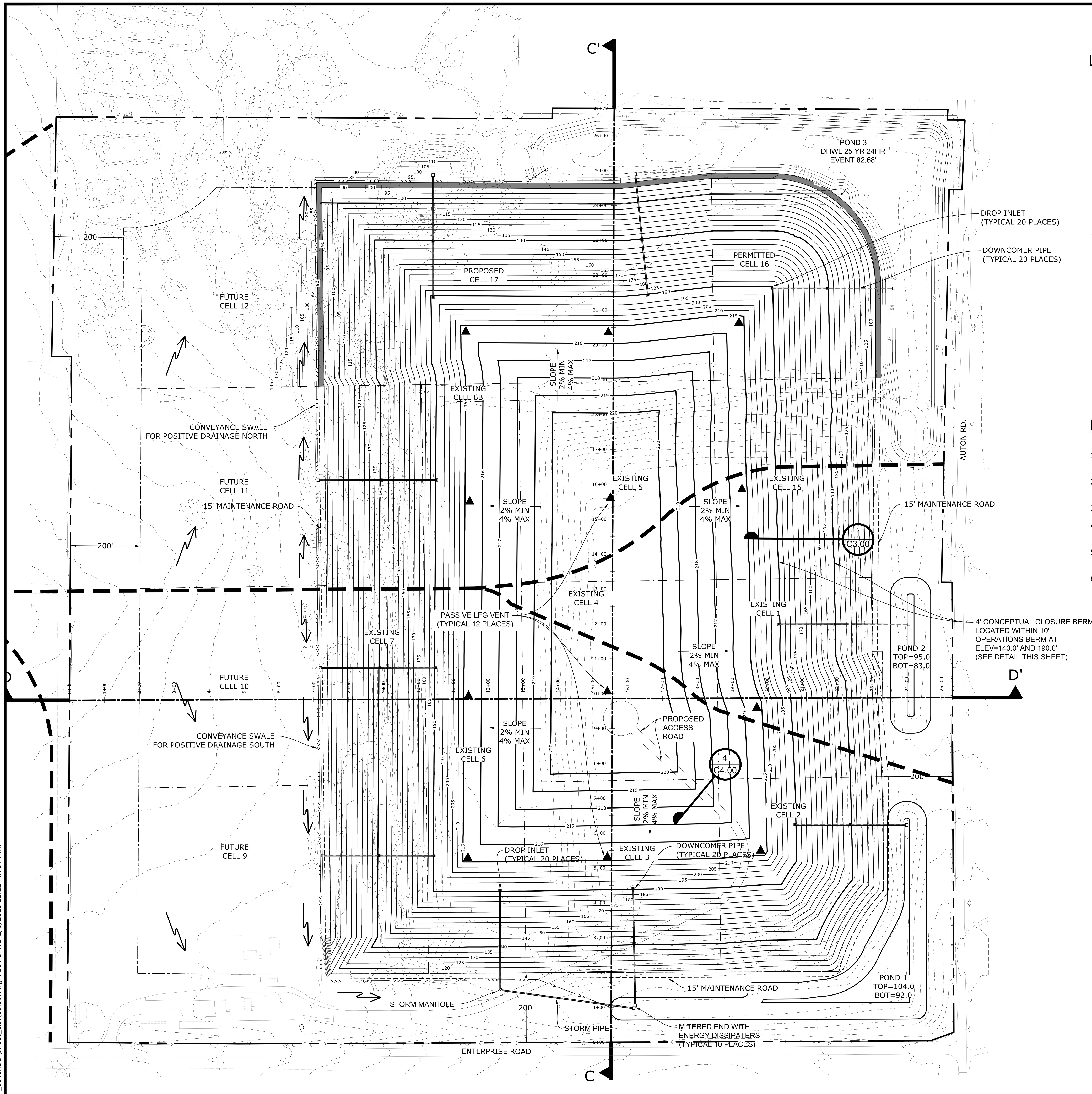


NORTH

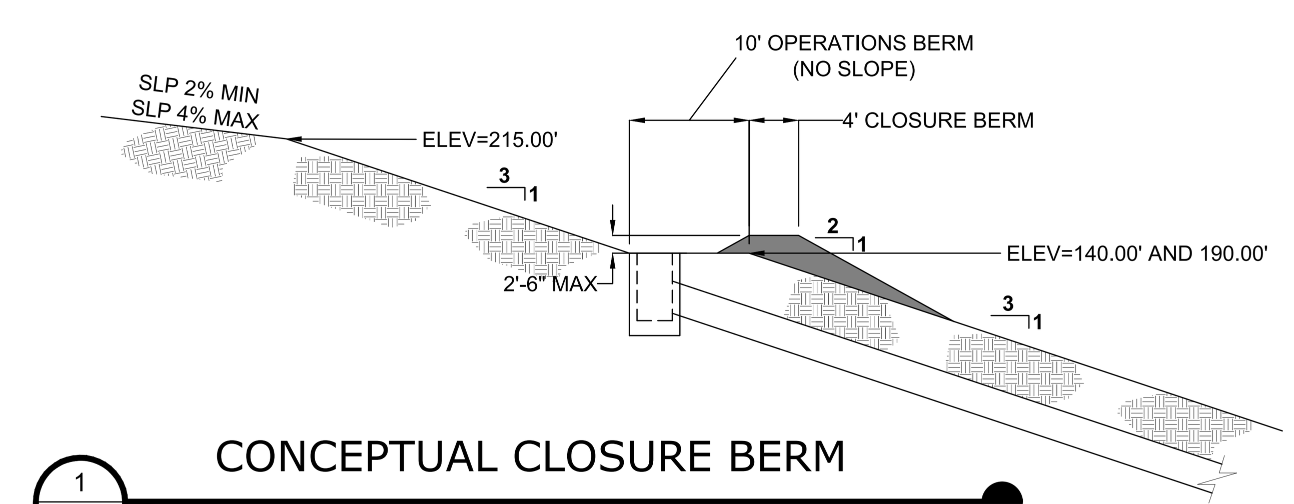
0 150 300
GRAPHIC SCALE

LEGEND

—x—x—	PERIMETER FENCE
— — —	PROPERTY BOUNDARY
—·—·—	LANDFILL FOOTPRINT (AT BUILD OUT)
-·-·-	LANDFILL CELLS
---90---	EXISTING CONTOURS
↝	DIRECTIONAL FLOW ARROW
10+00	CROSS SECTION STATIONS
— >>— >>—	CONVEYANCE SWALE
▬ ▬ ▬	DRAINAGE DIVIDE
▲	PASSIVE LFG VENT
DOWNCOMER PIPE / DROP INLET / MITERED END WITH ENERGY DISSIPATERS	STORMWATER CONVEYANCE SYSTEM

NOTES:

1. CONTOURS REPRESENT FINAL COVER. FILL ELEVATIONS SHALL BE SUCH THAT FINAL COVER DESIGN ELEVATIONS SHALL BE ACHIEVED ON ALL SLOPES
2. PRIOR TO WASTE BEING DISPOSED IN PROPOSED CELLS, BACKFILL TEMPORARY DIVERSION SWALE WITH COMPACTED CLAY.
3. LANDFILL FINAL COVER PER DETAIL 3, SHEET C4.00.
4. TOPOGRAPHIC SURVEY BY PICKETT SURVEYING & PHOTOGRAMMETRY, DATED 11/11/13, UPDATED ON 12/31/13.
5. FINAL COVER CONSTRUCTION TO BE IN ACCORDANCE WITH SECTION 7.1 OF THE ENTERPRISE RECYCLING & DISPOSAL FACILITY RECLAMATION & CLOSURE PLAN.
6. THE FACILITY'S OVERALL STORMWATER MANAGEMENT SYSTEM IS GOVERNED BY THE MINING OPERATIONS AND ERP PERMITS. GRADES AND ELEVATION VARY BASED ONGOING MINING OPERATIONS AND TOPOGRAPHY. A DETAILED DESIGN THAT WILL TIE THE CONCEPTUAL CLOSURE PLAN INTO THE FACILITY'S STORMWATER MANAGEMENT SYSTEM WILL BE SUBMITTED AT THE TIME OF CLOSURE.



1
C3.00
CONCEPTUAL CLOSURE BERM
SCALE: N.T.S.

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

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SHEET TITLE:
PHASING PLAN SEQUENCE NO. 4 CONCEPTUAL CLOSURE

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C3.00

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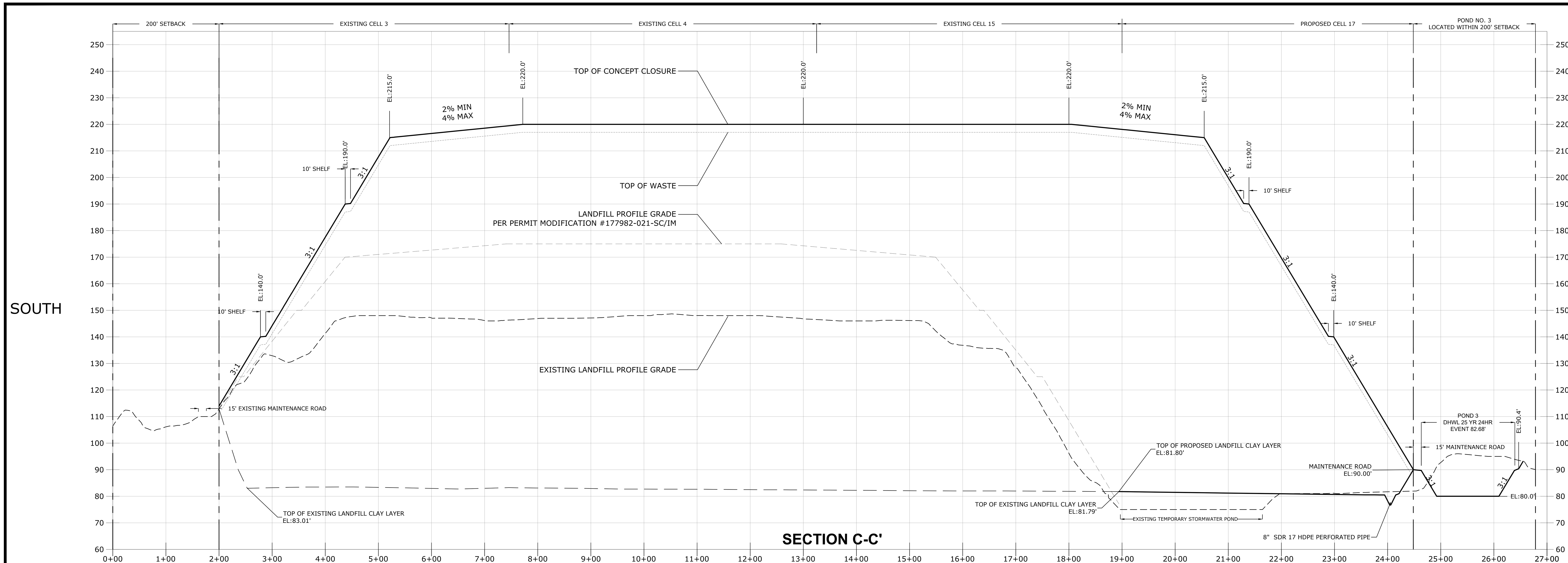
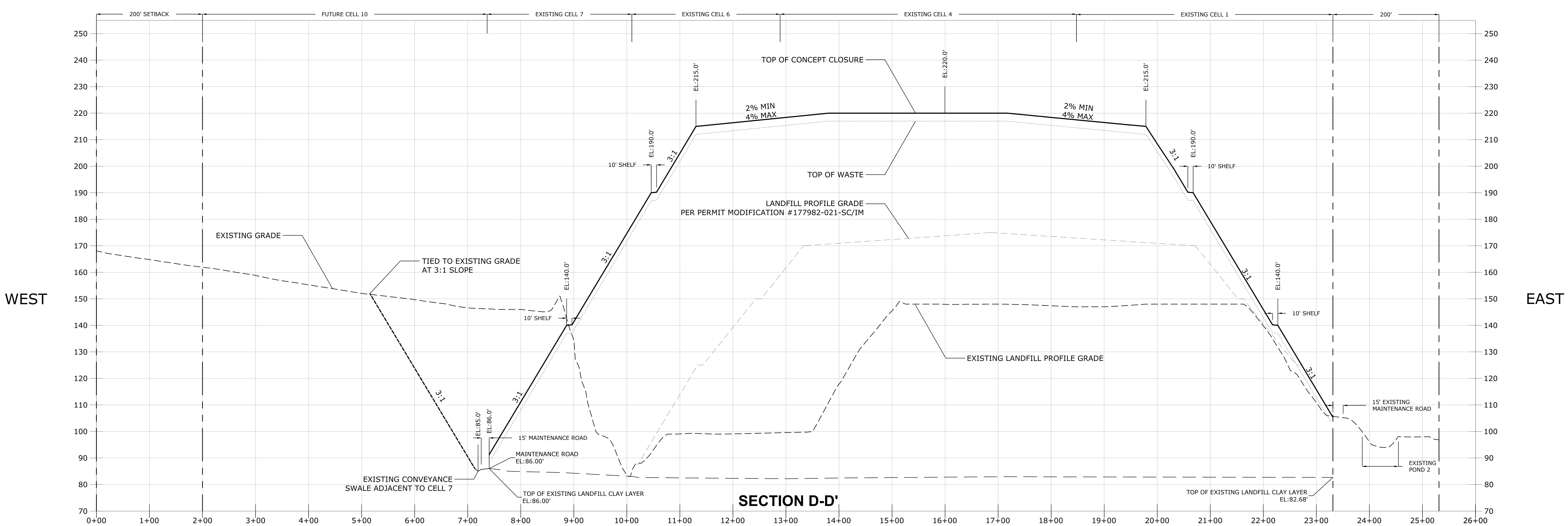
REVIEW ONLY-NOT FOR CONSTRUCTION



SCALES:
HORIZONTAL 1"=100'
VERTICAL 1"= 20'



NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates

4140 NW 37th Place, Suite A
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Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:

PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

PHASING PLAN SEQUENCE NO. 4 CONCEPTUAL CLOSURE SECTIONS

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C3.10

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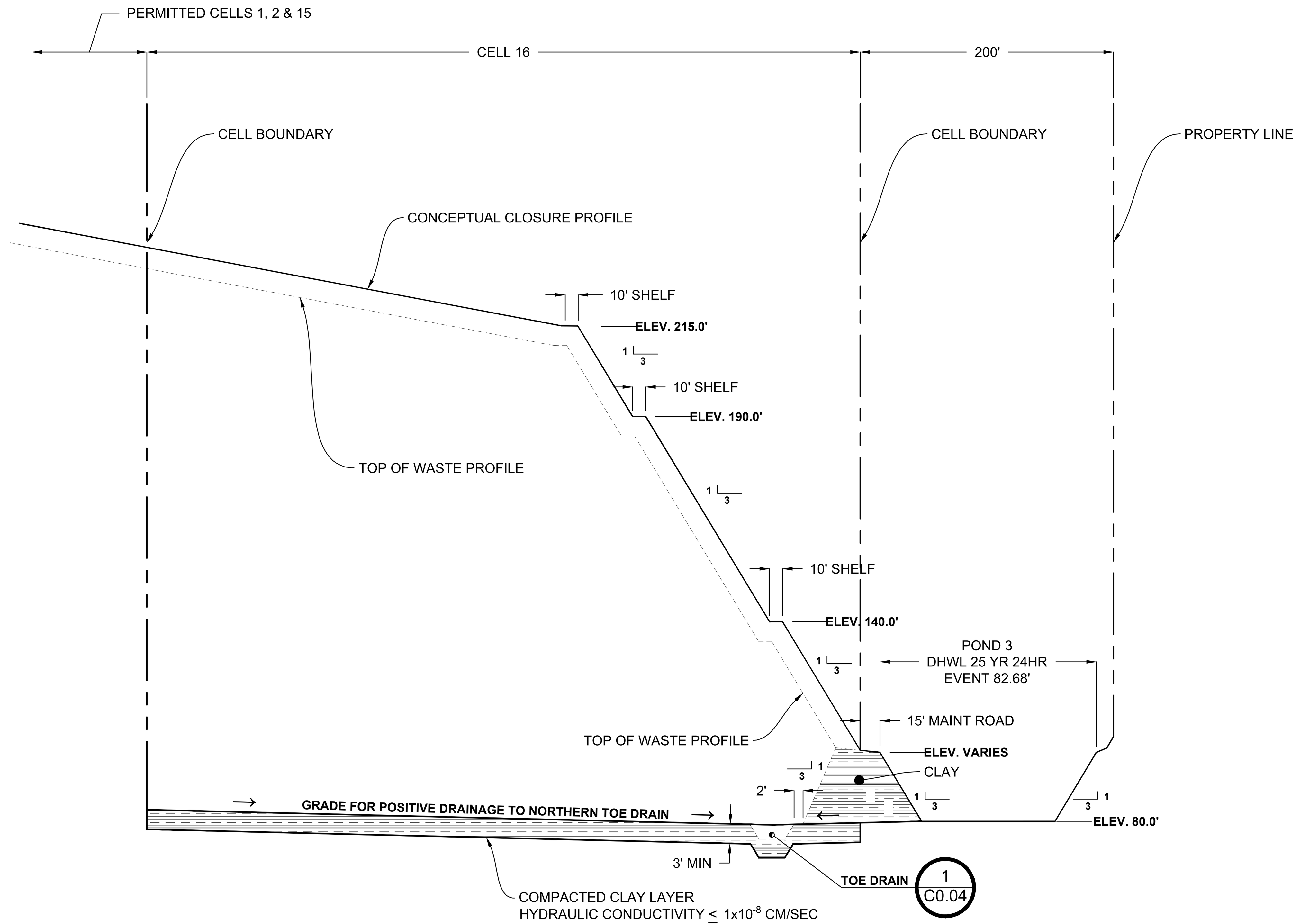
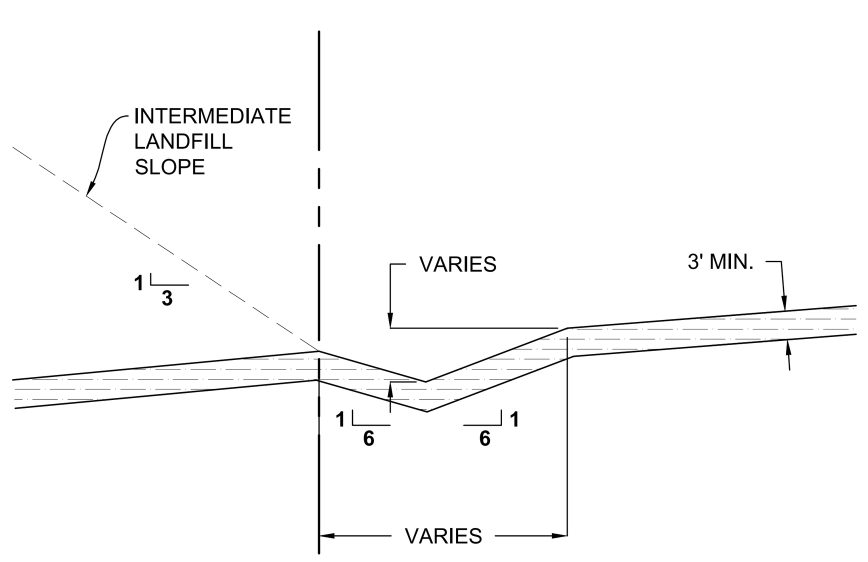


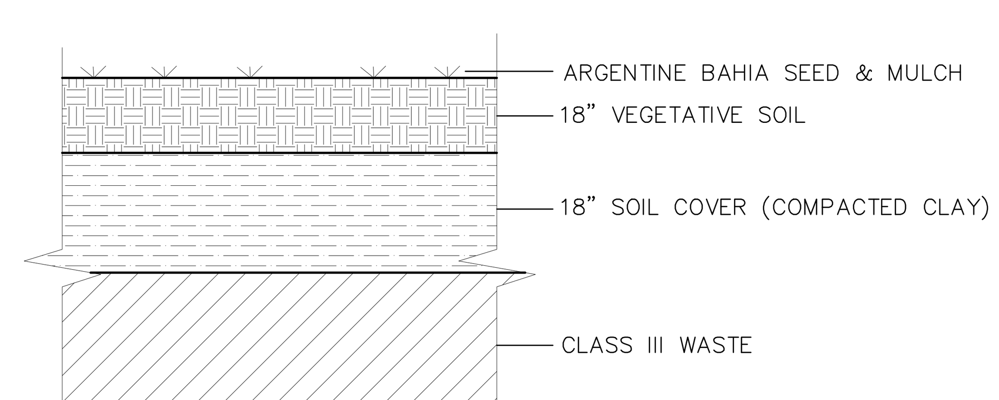
1
C4.00
TYPICAL DISPOSAL AREA DETAIL CELLS 16 & 17
SCALE: N.T.S.



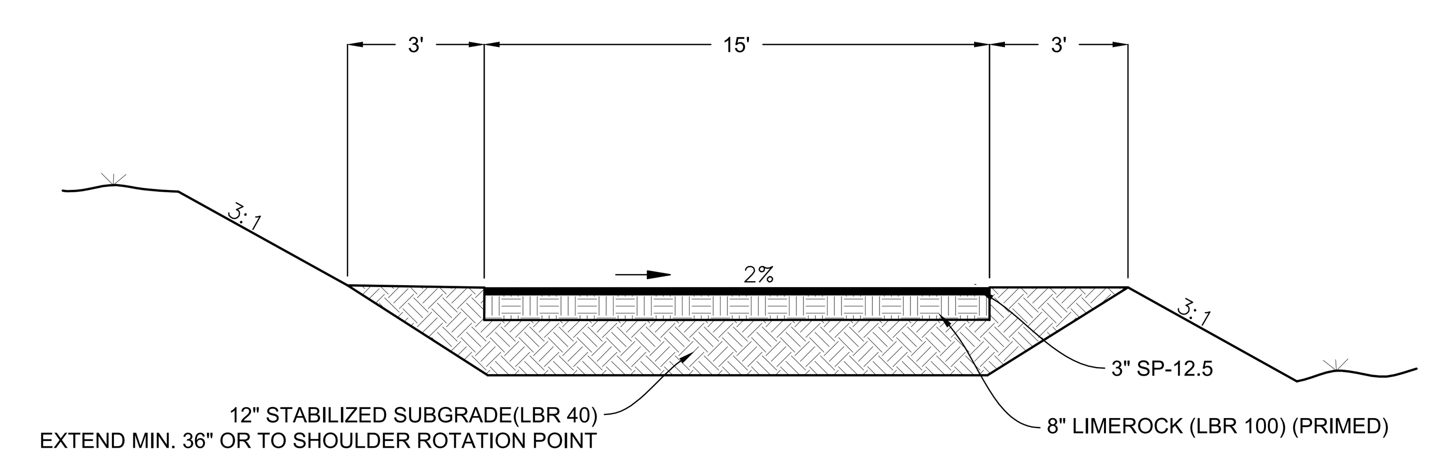
NOTES:

1. FOR CELL 16 THE TEMPORARY DIVERSION SWALE IS CONSTRUCTED PRIOR TO WASTE ACCEPTANCE WITHIN CELL.
2. PRIOR TO WASTE BEING DISPOSED OF ON THE PREVIOUS INTERMEDIATE SLOPE THE TEMPORARY SWALE IS BACKFILLED AND COMPACTED WITH CLAY TO PROVIDE A CONTINUOUS CLAY BARRIER LAYER.
3. CLAY BARRIER LAYER TO BE CONSTRUCTED IN ACCORDANCE WITH SECTION 3.7 OF THE ENTERPRISE CLASS III LANDFILL ENGINEERING REPORT.
4. STEP BACK AND SCARIFY EXISTING CLAY LAYER IN 12" LIFTS PRIOR TO CONSTRUCTION NEW CLAY LAYER ADJACENT TO EXISTING.
5. FINAL COVER CONSTRUCTION TO BE IN ACCORDANCE WITH SECTION 7.1 OF THE ENTERPRISE RECYCLING & DISPOSAL FACILITY RECLAMATION & CLOSURE PLAN.

2
C4.00
TEMPORARY STORMWATER DIVERSION SWALE DETAIL
SCALE: N.T.S.



3
C4.00
TYPICAL FINAL COVER
SCALE: N.T.S.



4
C4.00
ACCESS ROAD TYPICAL SECTION
SCALE: N.T.S.

NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

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PROJECT TITLE:
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ENTERPRISE ROAD CLASS III
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2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
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CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:
CLOSURE DETAILS

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C4.00

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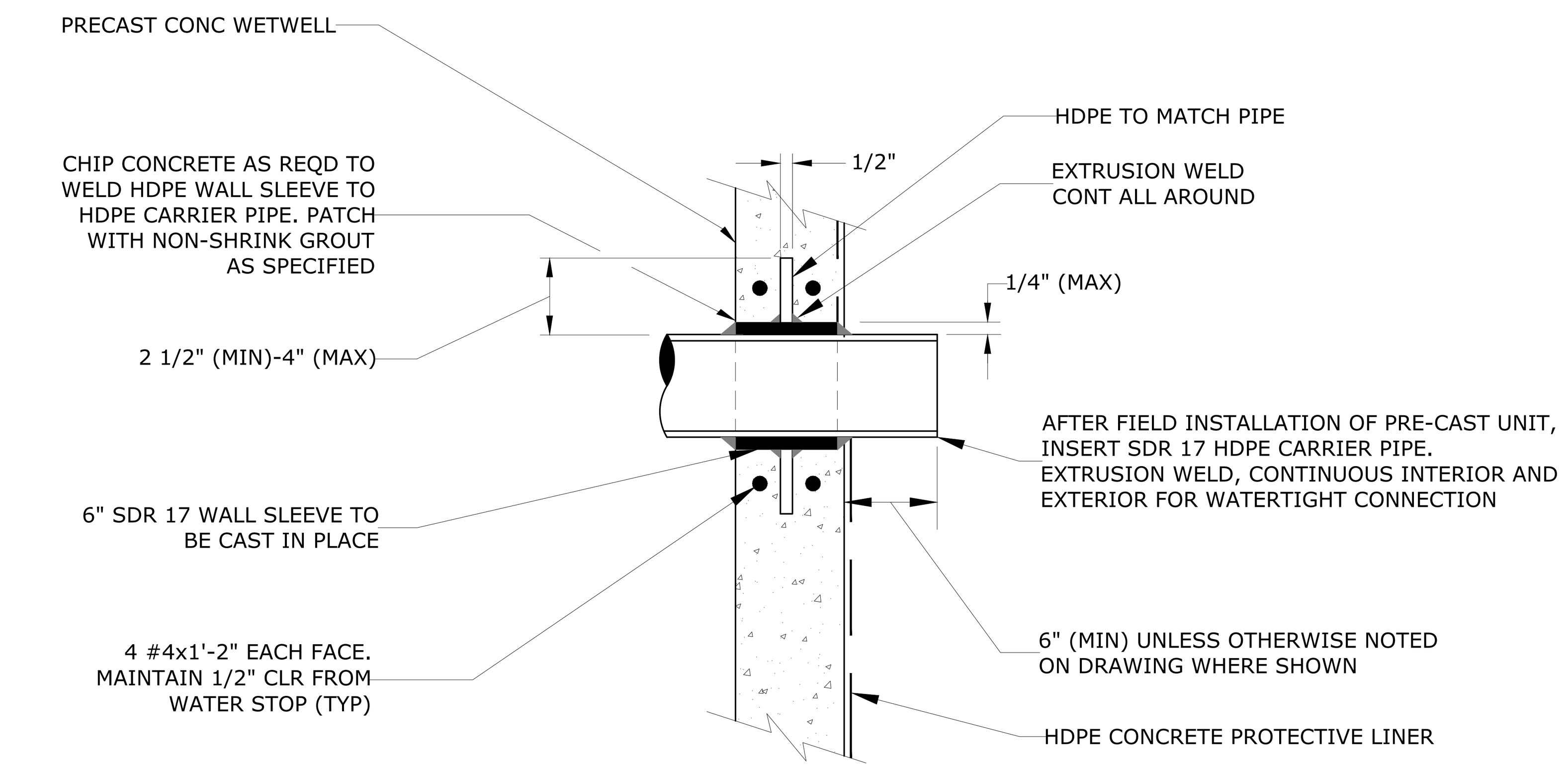
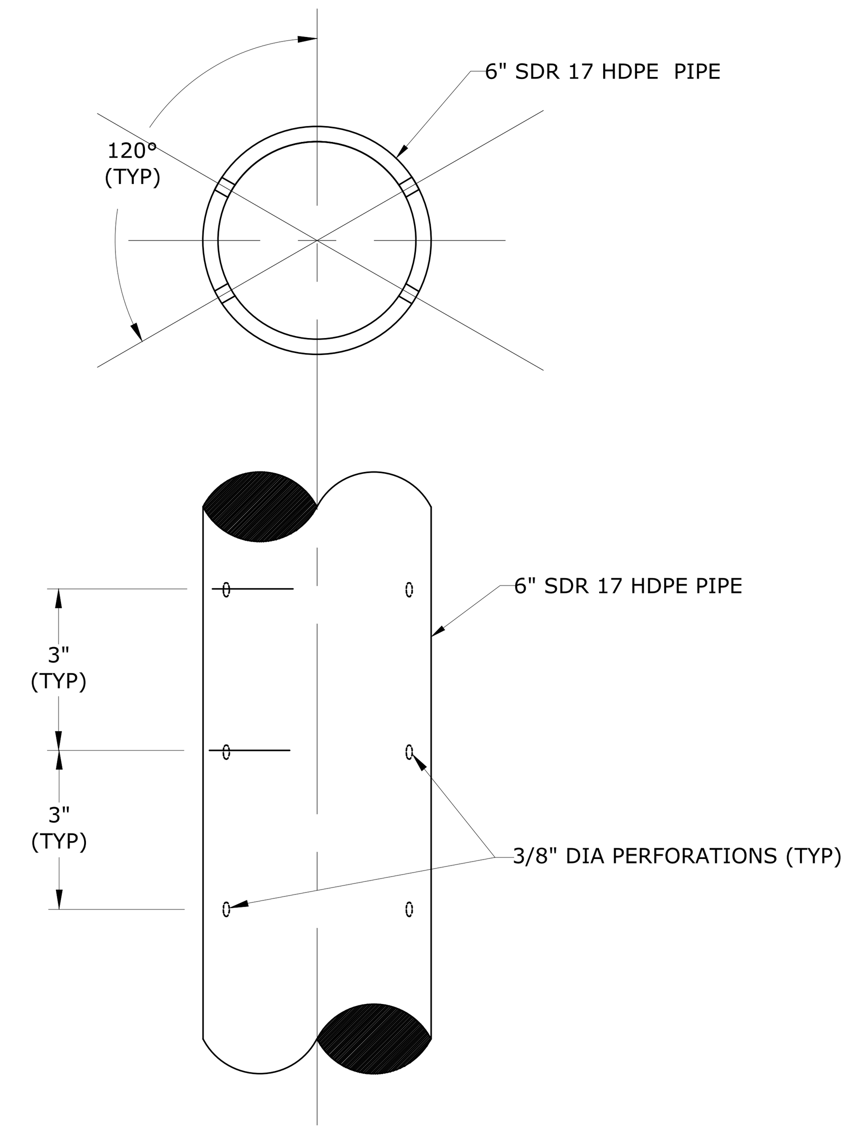


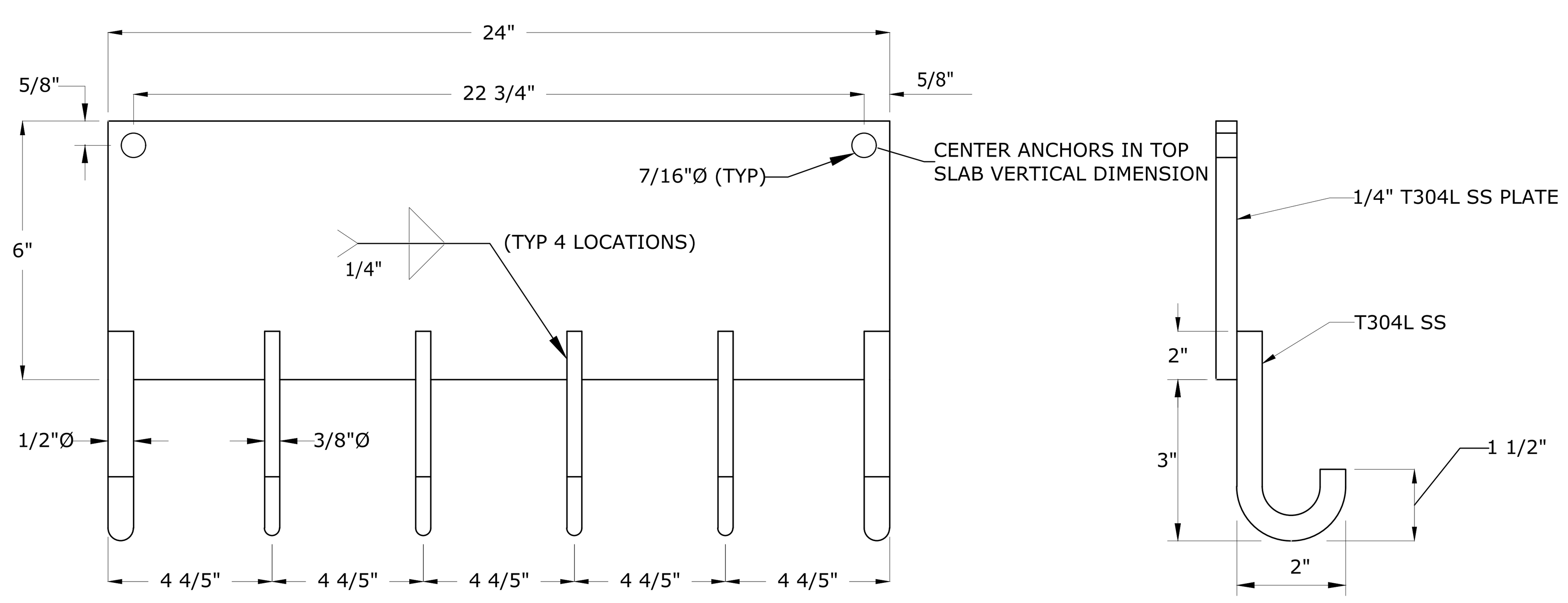
1
C4.00
WALL SLEEVE AND CONNECTION DETAIL

SCALE: N.T.S.



6" PERFORATED SDR 17 HDPE PIPE DETAIL

SCALE: N.T.S.



NOTE:

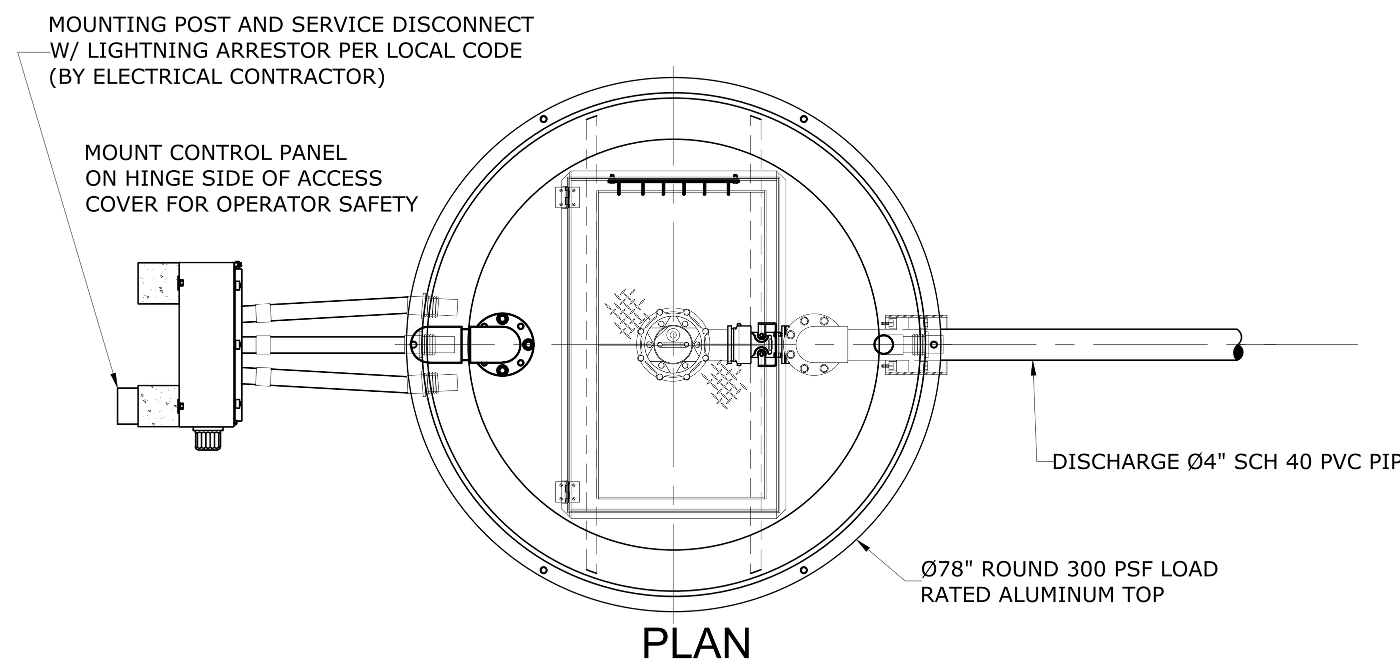
MOUNT RACK TO TOP SLAB WITH 3/8"Øx4" LONG T304 SS EPOXY ANCHORS.

2
C4.00
FLOAT CABLE RACK

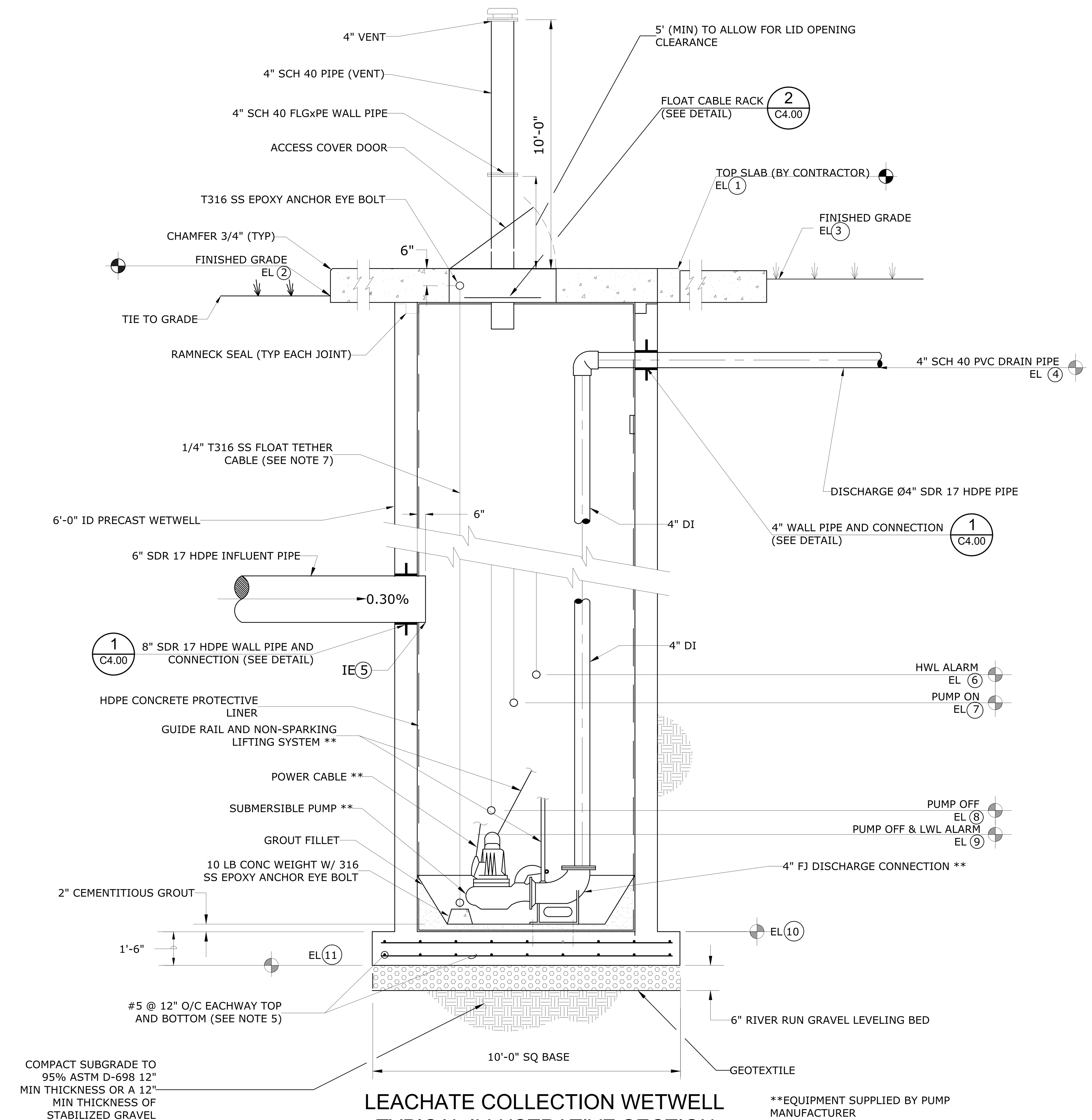
SCALE: N.T.S.

WETWELL ELEVATIONS TABLE

WETWELL LOCATION	IE 1	IE 2	IE 3	IE 4	IE 5	EL 6	EL 7	EL 8	EL 9	EL 10	EL 11
LEACHATE COLLECTION WETWELL	91.50'	91.00'	91.00'	88.50'	74.98'	75.98'	74.98'	74.17'	73.67'	72.00'	70.50'



PLAN



LEACHATE COLLECTION WETWELL
TYPICAL ILLUSTRATIVE SECTION

SCALE: N.T.S.

**EQUIPMENT SUPPLIED BY PUMP MANUFACTURER

NOTES:

1. SEE PLAN VIEW FOR LOCATION OF COMPONENTS.
2. PROVIDE 3" CLEAR COVER FOR REINFORCING ON ALL SIDES IN WETWELL BASE.
3. LEVEL SWITCHES SHALL BE SET TO ACTUATE WITHIN 2"± OF ELEVATION NOTED.
4. EXTERIOR OF WETWELL SHALL BE PAINTED WITH COAL TAR EPOXY AS SPECIFIED.
5. ALL PENETRATIONS SHALL BE SEALED AND WATER TIGHT.
6. THIS PIPE IS ONLY IN THE LEACHATE COLLECTION WETWELL. WELD TO WALL SLEEVE AFTER FIELD INSTALLATION.
7. CONNECT TETHER CABLE TO EYE BOLTS W/2 316 SS "U" CLAMPS AT EACH END. INSTALL CABLE WITHOUT ANY SLACK. ATTACH FLOAT CABLES TO TETHER CABLE W/ 316 SS "U" CLAMPS AT INDICATED ELEVATION.
8. WETWELL SHALL BE PURCHASED, SET AND JOINED BY OWNER. ALL OTHER CONCRETE INSTALLATION BY CONTRACTOR.
9. WETWELL LID SHALL BE PRECAST.
10. CONTRACTOR SHALL COORDINATE ACCESS HATCH (WITH SKIRT AND RETURN) AND WALL PIPE MANUFACTURE AND INSTALLATION CONTRACTOR, AND PUMP MANUFACTURER PRIOR TO WETWELL LID PRECASTING.
11. CONTRACTOR SHALL COORDINATE ALL FINAL WETWELL LINER WELDING WITH MANUFACTURER.

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NO.	DATE	REVISION DESCRIPTION	BY
1	2/7/2018	FDEP RAI NO. 1 RESPONSE	LJB

Locklear & Associates
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Certificate of Authorization No. 30066

PROJECT TITLE:
PERMIT PLANS
ENTERPRISE ROAD CLASS III
RECYCLING & DISPOSAL FACILITY
2017 PERMIT MODIFICATION
DADE CITY, PASCO COUNTY, FLORIDA

LISA J. BAKER
FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	MAF
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:
LEACHATE COLLECTION WETWELL
SECTIONS AND DETAILS

PROJECT NO.: 02000-217-17
SCALE: AS SHOWN
DATE: AUGUST 2017
DRAWING: C4.10

REVIEW ONLY-NOT FOR CONSTRUCTION

SECTION 5

GROUNDWATER MONITORING PLAN

Enterprise Class III Landfill Groundwater Monitoring Plan

September 2017

Prepared for:

ANGELO'S RECYCLED MATERIALS, LTD.
41111 Enterprise Road
Dade City, Florida 33525

Prepared by:

LOCKLEAR & ASSOCIATES, INC.
4140 NW 37th Place, Suite A
Gainesville, FL 32606

2/9/18

John Locklear
FL PG 2467

This Groundwater Monitoring Plan (GWMP) has been prepared in accordance with the provisions of Rule 62-701.510, F.A.C., and any non-conflicting provisions of Chapter 62-520, F.A.C. The GWMP was developed based upon an extensive evaluation of site data provided in the March 2012 (Revised March 2013) Water Quality Monitoring Plan Evaluation Report prepared by Locklear & Associates, Inc. The Water Quality Monitoring Plan Evaluation Report is provided in Section 6 of the March 2012 Operations Permit Renewal Application. Analytical data tables and graphs as well as groundwater contour maps updated since 2012 were recently provided to the Department in the December 2015 Groundwater Technical Report (formerly referred to as a Biennial Report).

1. Water Quality Monitoring Plan

The groundwater monitoring network is shown in Table 1 and in Figure 1.

a. All groundwater monitoring well installations and abandonments shall be performed in accordance with ASTM D 5092-04, Rule 62-532.500(5), F.A.C., and the rules of Southwest Florida Water Management District.

b. Sign and Seal

The reports shall be signed and sealed in accordance with Chapter 471, Florida Statutes and Chapter 61G15, FAC for engineers or with Chapter 492 for professional geologists.

c. Sampling and Analysis

All sampling and analysis shall be performed in accordance with Chapter 62-160, FAC; 62-701.510(2)(b), FAC; the DEP Standard Operating Procedures for Field Activities (DEP-SOP-001/01); and the DEP Standard Operating Procedures for Laboratory Activities (DEP-SOP-002/01).

d. Groundwater Monitoring Requirements

The groundwater monitoring network consists of detection and compliance monitoring wells located downgradient from and within 100 feet of the disposal units. The detection wells are located no more than 500 feet apart. The network also includes background monitoring wells BW-1A and BW-1B screened within the surficial and Floridan aquifers, respectively. Downgradient compliance monitoring wells will be installed if warranted based on the results of detection monitoring results and Evaluation

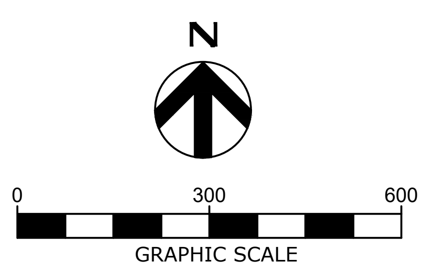
TABLE 1

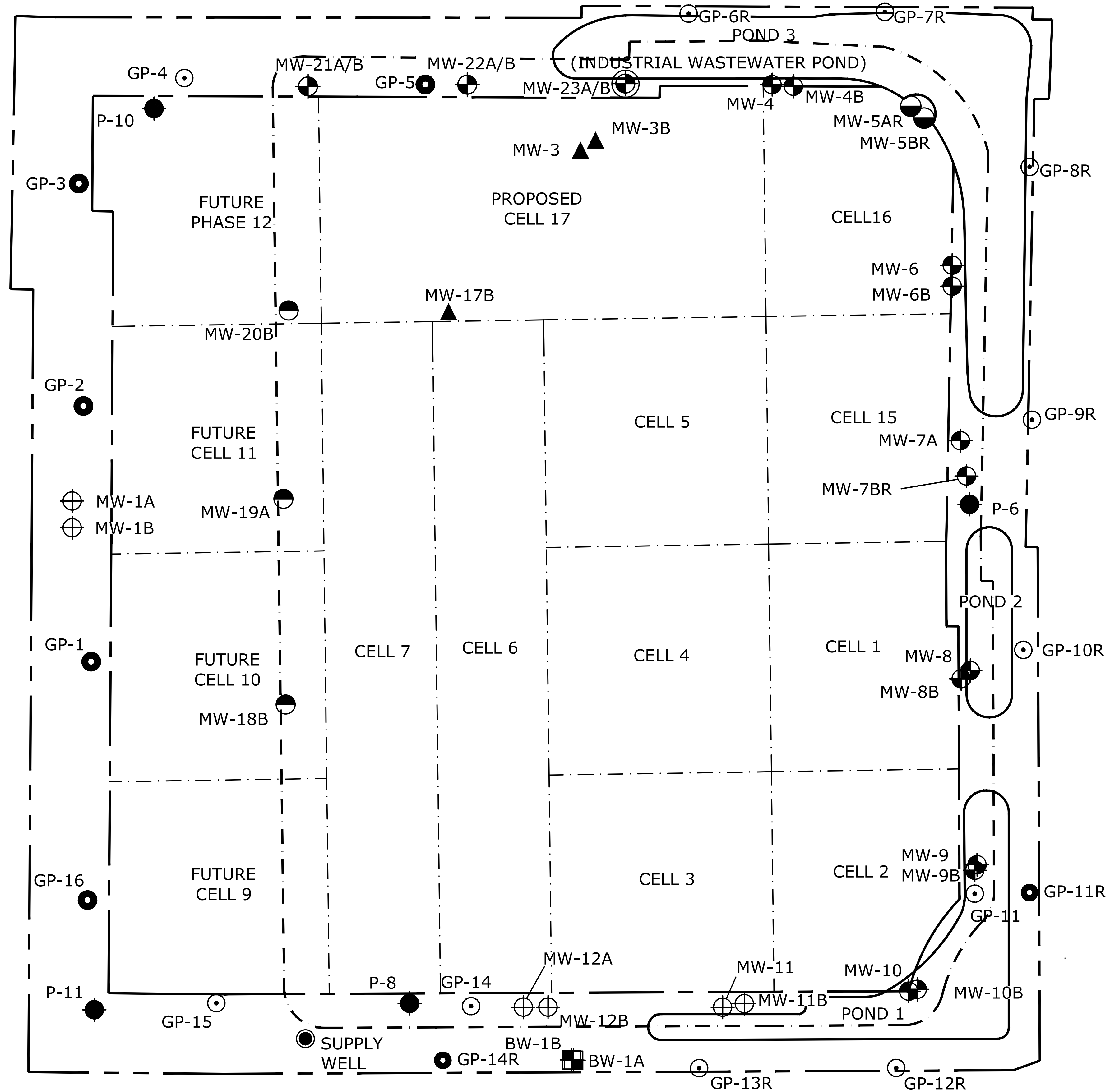
Well ID	Well Type	Aquifer	Existing or Future	Notes
BW-1A	Background	Surficial	Existing	
BW-1B	Background	Floridan	Existing	
MW-1A	Water Level	Surficial	Existing	
MW-1B	Water Level	Floridan	Existing	
MW-3	Detection	Surficial	Existing	To be abandoned in conjunction with Cell 17 construction
MW-3B	Detection	Floridan	Existing	To be abandoned in conjunction with Cell 17 construction
MW-4	Detection	Surficial	Existing	
MW-4B	Detection	Floridan	Existing	
MW-5A	Detection	Surficial	Existing	To be abandoned ~~60~~ 30 days prior to placement of waste in Cell 16
MW-5AR	Compliance	Surficial	~~Existing~~ Future	To be installed ~~60~~ 30 days prior to placement of waste in Cell 16
MW-5B	Detection	Floridan	Existing	To be abandoned ~~60~~ 30 days prior to placement of waste in Cell 16
MW-5BR	Compliance	Floridan	~~Existing~~ Future	To be installed ~~60~~ 30 days prior to placement of waste in Cell 16
MW-6	Detection	Surficial	Existing	
MW-6B	Detection	Floridan	Existing	
MW-7A	Detection	Surficial	Existing	
MW-7BR	Detection	Floridan	Existing	
MW-8	Detection	Surficial	Existing	
MW-8B	Detection	Floridan	Existing	
MW-9	Detection	Surficial	Existing	
MW-9B	Detection	Floridan	Existing	
MW-10	Detection	Surficial	Existing	
MW-10B	Detection	Floridan	Existing	
MW-11	Water Level	Surficial	Existing	
MW-11B	Water Level	Floridan	Existing	
MW-12A	Water Level	Surficial	Existing	
MW-12B	Water Level	Floridan	Existing	
MW-17B	Detection	Floridan	Existing	To be abandoned in conjunction with Cell 17 construction
Water Supply	Supply	Floridan	Existing	
MW-18B	Compliance	Floridan	Existing	
MW-19A	Compliance	Surficial	Existing	
MW-20B	Compliance	Floridan	Existing	
MW-21A*	Detection	Surficial	~~Existing~~ Future	To be installed in conjunction with Cell 17 construction
MW-21B	Detection	Floridan	~~Existing~~ Future	To be installed in conjunction with Cell 17 construction
MW-22A*	Detection	Surficial	~~Existing~~ Future	To be installed in conjunction with Cell 17 construction
MW-22B	Detection	Floridan	~~Existing~~ Future	To be installed in conjunction with Cell 17 construction
MW-23A*	Compliance	Surficial	~~Existing~~ Future	To be installed in conjunction with Cell 17 construction
MW-23B	Compliance	Floridan	~~Existing~~ Future	To be installed in conjunction with Cell 17 construction
P-4	Piezometer	Surficial	Existing	To be abandoned ~~60~~ 30 days prior to placement of waste in Cell 16
P-6	Piezometer	Surficial	Existing	
P-8	Piezometer	Floridan	Existing	
P-10	Piezometer	Floridan	Existing	
P-11	Piezometer	Surficial	Existing	

* To be installed only if water bearing sediments are encountered above the clay units confining the Floridan aquifer system.

LEGEND

	BW-1B	BACKGROUND MONITORING WELL LOCATION
	MW-7A	DETECTION MONITORING WELL LOCATION
	MW-21A	PROPOSED DETECTION MONITORING WELL LOCATION
		SUPPLY WELL LOCATION
	P-11	SOLID WASTE PIEZOMETER WELL LOCATION
	MW-5AR	SCHEDULED COMPLIANCE MONITORING WELL LOCATION
	MW-12A	WATER LEVEL ONLY WELL LOCATION
	MW-3	PROPOSED TO BE ABANDONED
	MW-5B	SCHEDULED TO BE ABANDONED
	MW-19A	COMPLIANCE MONITORING WELL LOCATION
	MW-23B	PROPOSED COMPLIANCE MONITORING WELL LOCATION
	GP–1	GAS PROBE LOCATION
	GP–8R	FUTURE GAS PROBE LOCATION
		PROPERTY BOUNDARY
		LANDFILL LIMITS
		CELL BOUNDARY
		ZONE OF DISCHARGE





NO.	DATE	REVISION DESCRIPTION	BY

Locklear & Associates

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Gainesville, Florida 32606
Phone: 352.672.6867 Fax: 352.692.5390
Certificate of Authorization No. 30066

PROJECT TITLE:

ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY DADE CITY, FLORIDA

LISA J. BAKER

FL PE NO. 74652

DESIGNED BY	LJB
DRAWN BY	LJB
CHECKED BY	JDL
APPROVED BY	LJB

SHEET TITLE:

SITE MONITORING NETWORK

PROJECT NO.: 02000-144-14
SCALE: AS SHOWN
DATE: JANUARY 2018
DRAWING: **FIGURE 1**

P:\P Drive Files\ANGELOS (FLORIDA)\Enterprise Class III\COMPLIANCE MONITORING\Permit Renewal\2017 Major Permit Mod Cell 17\RAI 1\Section 5 - Groundwater Monitoring Plan\Monitoring Network.dwg PLOT DATE 1/12/2018 2:17 PM BY LJB

Monitoring as discussed in Section 1.h. Compliance wells will be located at or immediately adjacent to the compliance line of the zone of discharge.

Monitoring wells shall be constructed to provide representative groundwater samples from the surficial aquifer, where present, and the Floridan aquifer system. Well screen placement will be determined from lithologic information collected at the time of well installation and historic water level elevations as discussed below.

The top and bottom of the screen elevations for proposed surficial aquifer monitoring wells MW-21A, -22A and -23A are based on the top of clay confining unit elevations encountered during the installation of adjacent borings B-101 through B-111. The clay confining layer was encountered at the surface during 10 out of 11 of these borings. However, the lithology will be assessed at the location of each new well and surficial aquifer wells will be installed if water bearing soils exist above the clay confining layer. The historic range of surficial aquifer water elevations in this area is not available.

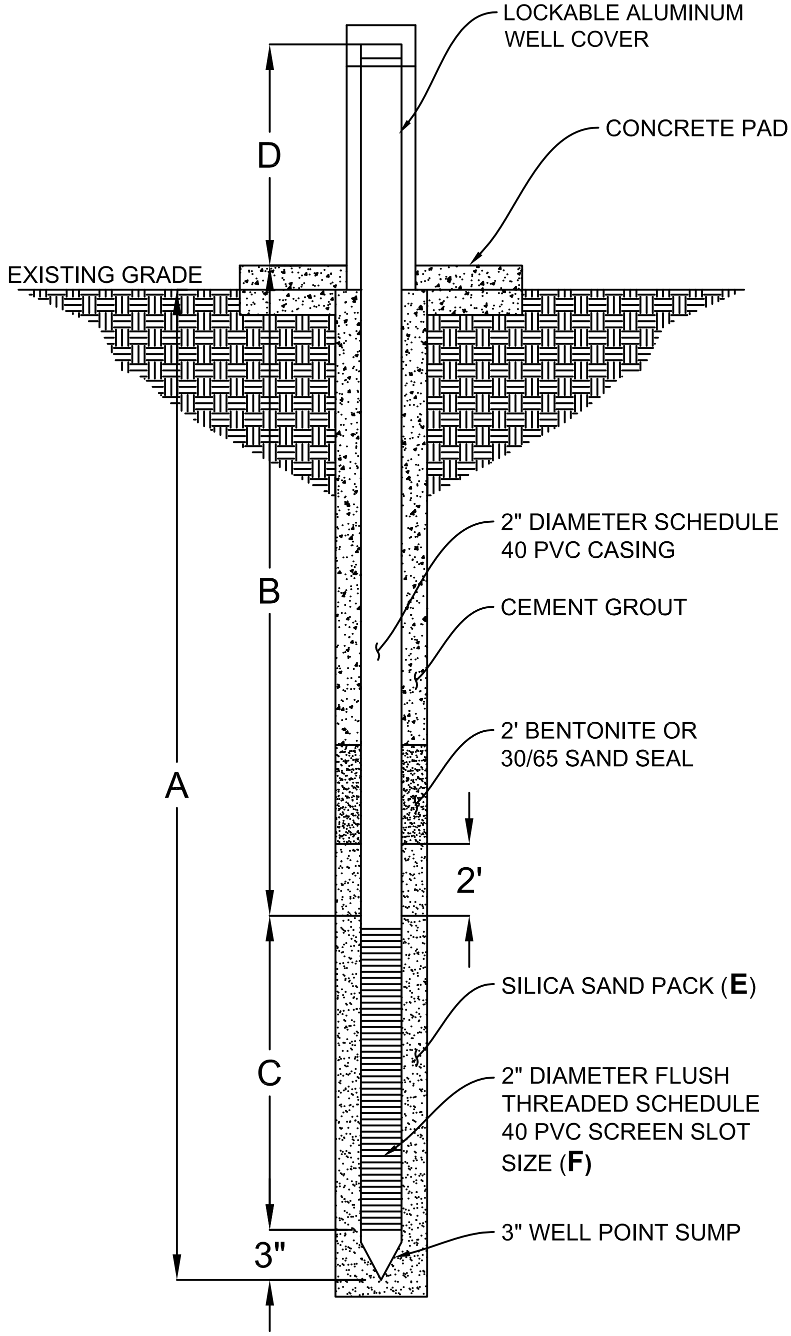
The top and bottom of the screen elevations for proposed Floridan aquifer monitoring wells MW-21B, -22B and -23B are based on the top of limestone elevations encountered during the installation of adjacent borings B-101 through B-111. The top of limestone elevation encountered during these borings was observed from approximately 45 to 65 ft. NGVD. The historical range of Floridan aquifer water elevations in adjacent monitoring wells MW-17B and MW-3B is 66 to 74 ft. NGVD (previous ten sampling events). Proposed top and bottom screen elevations for MW-21B, -22B and -23B are 65 ft. and 45 ft. NGVD, respectively. Screen elevations will be determined based on field findings during well installation.

Wells shall be constructed in accordance with the details provided in Figures 2 and 3. Documentation of well construction shall be submitted within 30 days of installation using Department Form #62-701.900(30).

Wells scheduled to be abandoned during construction of Cell 17, (MW-17B, -3 and -3B), and wells which become damaged, shall be plugged and abandoned in accordance with Rule 62-532.500(5), F.A.C. and the rules of the Southwest Florida Water Management District. Documentation of abandonment shall be submitted to the Department within 30 days of abandonment.

The location(s) of all new monitoring wells, in degrees, minutes and seconds of latitude and longitude, and the elevation of the top of the well casing to the

FIGURE NOT TO SCALE



WELL	A	B	C	D	E	F	TOP OF WELL SCREEN ELEVATION FT, NGVD	BOTTOM OF WELL SCREEN ELEVATION FT, NGVD	ASSUMED GROUND SURFACE ELEVATION FT, NGVD	ASSUMED LIMESTONE SURFACE ELEVATION FT, NGVD
MW-21A	25'	5'	20'	3"	20/30	0.010"	119' (1)	99' (3)	124' (1)	65' (2)
MW-22A	25'	5'	20'	3"	20/30	0.010"	119' (1)	99' (3)	124' (1)	65' (2)
MW-23A	25'	5'	20'	3"	20/30	0.010"	119' (1)	99' (3)	124' (1)	65' (2)

NOTES:

(1) From MW-20 ground elevation

(2) From borings B-101 through B-111 lithology

(3) Based on site-specific lithology and water level data. Subject to change per field findings during well installation.

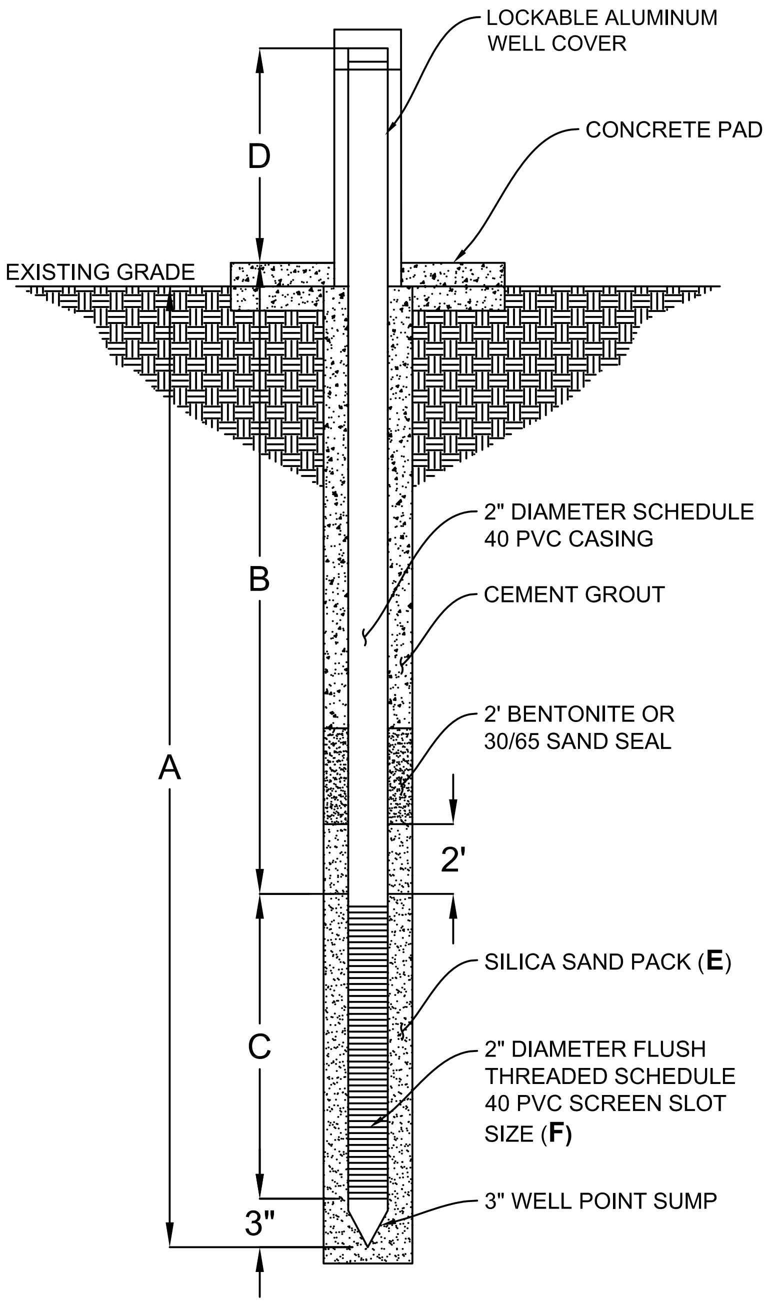
Locklear & Associates

ENTERPRISE ROAD RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

PROPOSED SURFICIAL AQUIFER MONITOR WELL DETAIL

FIGURE 2

FIGURE NOT TO SCALE



WELL	A	B	C	D	E	F	TOP OF SCREEN ELEVATION FT, NGVD	BOTTOM OF SCREEN ELEVATION FT, NGVD	ASSUMED GROUND SURFACE ELEVATION FT, NGVD	ASSUMED LIMESTONE SURFACE ELEVATION FT, NGVD
MW-21B	81'	61'	20'	3"	20/30	0.010"	65' (3)	45' (3)	124' (1)	65' (2)
MW-22B	81'	61'	20'	3"	20/30	0.010"	65' (3)	45' (3)	124' (1)	65' (2)
MW-23B	81'	61'	20'	3"	20/30	0.010"	65' (3)	45' (3)	124' (1)	65' (2)

NOTES:

(1) From MW-20 ground elevation

(2) From borings B-101 through B-111 lithology

(3) Based on site-specific lithology and water level data. Subject to change per field findings during well installation.

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ENTERPRISE ROAD RECYCLING AND DISPOSAL FACILITY DADE CITY, FLORIDA

PROPOSED FLORIDAN AQUIFER MONITOR WELL DETAIL

FIGURE 3

nearest 0.01 foot, using a consistent, nationally recognized datum, shall be determined by a Florida Licensed Professional Surveyor and Mapper. Wells will be marked with their identification label in the field.

e. Surface Water Monitoring Requirements

Ponds 1, 2 and 3 do not have off-site discharge associated with the 100-year flood event. Therefore, surface water sampling is not required as part of the solid waste operating permit. In the unexpected event of a surface water discharge event, surface water monitoring will occur per Appendix 3, Para. 8.a. and Para. 8.b. of #177982-020-SO/T3. However, surface water in Pond 3 will be sampled in accordance with the Industrial Wastewater pond permit being applied for concurrent with the solid waste permit modification application.

f. Leachate Monitoring Requirements

(1) Leachate monitoring is not applicable to this facility.

g. Sampling Frequency and Requirements

(1) Water samples from all newly installed monitoring wells (including new wells associated with those abandoned as part of construction of Cell 17) will be collected to determine background groundwater quality. Groundwater samples from the initial sampling of any new wells will be analyzed for parameters listed in Rule 62-701.510(7)(a) and (7)(c), F.A.C. (Table 2).

Table 2
Initial Groundwater Sampling Parameters

Field Parameters	Laboratory Parameters
Static Water Levels	Total Ammonia – N
Specific Conductivity	Chlorides
pH	Iron
Dissolved Oxygen	Mercury
Turbidity	Nitrate
Temperature	Sodium
Colors and Sheens	Total Dissolved Solids (TDS)
	Those Parameters listed in 40 CFR Part 258, Appendices I and II

(2) Groundwater samples from all monitoring wells (background, detection, and compliance) and the on-site supply well shall be sampled and analyzed semiannually for the parameters listed in Table 3. A semiannual sampling frequency is adequate to detect potential groundwater quality standard exceedances based upon the flow velocities provided in Section III of the 2012 WQMPE. Maximum groundwater flow velocities were less than 50 feet per six months within both the surficial and Floridan aquifers. The first semiannual sampling event shall be performed between January 1 and June 30. The second semiannual sampling event shall be performed between July 1 and December 31.

Table 3
Routine Groundwater Sampling Parameters

Field Parameters	Laboratory Parameters
Static Water Level	Total Ammonia – N
Specific	Chlorides
Conductivity	Iron
pH	Mercury
Dissolved Oxygen	Nitrate
Turbidity	Sodium
Temperature	Total Dissolved Solids (TDS)
Colors, Sheens	Those Parameters listed in 40 CFR Part 258, Appendix I

(3) Surface water sampling shall be conducted at Pond 3 in accordance with the requirements of the separate Industrial Wastewater pond permit.

(4) Leachate sampling is not applicable to this facility.

h. Evaluation Monitoring, Prevention Measures, and Corrective Action

If parameters are detected in detection wells at concentrations that are significantly above background water quality, or that are at concentrations above the FDEP's water quality standards or criteria specified in 62-520, F.A.C., the well will be resampled within 30 days after the initial analytical data are received to confirm the data. If the data are confirmed or the well is not resampled, the FDEP will be notified in writing within 14 days of detection. Evaluation monitoring shall be initiated as follows:

- Routine monitoring of all monitoring wells will continue according to the GWMP.

- Within 90 days of initiating evaluation monitoring and annually thereafter, the background wells and all affected detection wells will be sampled for the parameters listed in 62-701.510(7)(c), F.A.C. Any new parameter detected and confirmed in the downgradient wells will be added to the routine groundwater monitoring parameter list.

- Within 90 days of initiating evaluation monitoring, compliance monitoring wells will be installed at the compliance line of the zone of discharge and downgradient of the affected detection wells. The compliance wells will be installed in accordance with 62-701.510(3)(d), F.A.C. Compliance wells and affected detection wells shall be sampled quarterly for analysis of the parameters listed in Rule 62-701.510(7)(a), F.A.C. and any other parameters detected in the affected detection and downgradient wells sampled in accordance with Rule 62-701.510(6)(a)2, F.A.C. Compliance wells and affected detection wells shall be sampled annually for analysis of the parameters listed in Rule 62-701.510(7)(c), F.A.C.

- Within 180 days of initiating evaluation monitoring, a contamination evaluation plan will be submitted to the FDEP. The contamination evaluation plan will be designed to delineate the extent and cause of contamination, to predict the probability that FDEP water quality standards are not violated outside the zone of discharge, and to evaluate methods to prevent any violations. Upon agreement with the FDEP that the plan is so designed, the plan shall be implemented and a contamination evaluation report will be submitted to the FDEP. All reasonable efforts will be made to prevent further degradation of water quality from the landfill activities.

- If the contamination evaluation report indicates that water quality standards or criteria are likely to be violated outside the zone of discharge, a prevention measures plan shall be submitted to the Department. Upon approval, the prevention measures shall be initiated.

- Evaluation monitoring shall not be discontinued until authorization to return to routine monitoring only is received from the Department.

i. Water Quality Monitoring Report Requirements

(1) All representative water quality monitoring results shall be reported to the Department within 60 days from completion of laboratory analyses. In accordance with subsections 62-160.240(3) and 62-160.340(4), F.A.C., water quality data contained in the report shall be provided to the Department in an electronic format consistent with requirements for importing into Department databases.

At a minimum the semiannual report shall include the following:

- The facility name and identification number, sample collection dates, and analysis dates;
- All analytical results, including all peaks even if below maximum contaminant levels;
- Identification number and designation of all groundwater monitoring points;
- Applicable water quality standards;
- Quality assurance, quality control notations;
- Method detection limits;
- STORET code numbers for all parameters;
- Water levels recorded prior to evaluating wells or sample collection. Elevation reference shall include the top of well casing and the land surface at each well site at a precision of plus or minus 0.01 foot, National Geodetic Vertical Datum (NGVD);
- Department Form 62-701.900(31);
- An updated groundwater table contour map signed and sealed by a professional geologist or professional engineer with experience in hydrogeologic investigations, with contours at no greater than one-foot intervals unless site-specific conditions dictate otherwise, which indicates groundwater elevations and flow directions; and
- A summary of any water quality standards or criteria that are exceeded.

(2) A technical report will be submitted every two and one-half years summarizing and interpreting the water quality monitoring results and water level measurements collected during that period. The report will be in accordance with Rule 62-701.510(8)(b) and signed and sealed by a Florida licensed Professional Geologist or Professional Engineer. The report shall contain, at a minimum, the following:

- Tabular displays of any data which shows that a monitoring parameter has been detected, and graphical displays of any leachate key indicator parameters detected (such as pH, specific conductance, TDS, TOC, sulfate, chloride, sodium and iron), including hydrographs for all monitoring wells;
- Trend analyses of any monitoring parameters consistently detected;
- Comparison among shallow, middle, and deep zone wells;
- Comparisons between background water quality and the water quality in detection and compliance wells;
- Correlations between related parameters such as total dissolved solids and specific conductance;
- Discussion of erratic and/or poorly correlated data;
- An interpretation of the groundwater contour maps, including an evaluation of groundwater flow rates; and
- An evaluation of the adequacy of the water quality monitoring frequency and sampling locations based on site conditions.

SECTION 7

CLOSURE AND RECLAMATION PLAN

ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY
MAJOR PERMIT MODIFICATION
CLOSURE AND RECLAMATION PLAN

Prepared for:

ANGELO'S AGGREGATE MATERIALS, LTD
855 28th Street South
St. Petersburg, Florida 33712

Presented to:

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHWEST DISTRICT – SOLID WASTE DIVISION
13051 N. Telecom Parkway
Temple Terrace, Florida 33637

Prepared by:

LOCKLEAR & ASSOCIATES, INC.
4140 NW 37 Place, Suite A
Gainesville, Florida 32606
Certificate of Authorization #30066

Project No.: 02000-217-17

January 2018

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1.0 RECLAMATION AND CLOSURE STANDARDS

This Closure Plan is designed to comply with the Florida Department of Environmental Protection (FDEP) requirements of Rule 62-701.600, F.A.C. and the Pasco County Land Development Code (LDC) for Class I Mine reclamation and Class III landfill closure. The landfill will be used to reclaim the borrow pit excavation as phases are completed.

1.1 Timing

Mine reclamation and landfill closure will commence when all cells have been filled. Reclamation and closure will be completed within four (4) months of commencement. An intermediate soil cover of at least one (1) foot in depth will be applied and maintained within seven (7) days of lift completion. If the landfill operator (Operator) wishes to deposit additional solid waste in the completed cell, all or part of the intermediate cover may be removed to place the waste or to install the final cover. Intermediate cover will be placed on completed landfill cells and sideslopes as filling progresses. Final cover will be installed upon each completed landfill cell within 180 days after attaining final elevation. The remaining Facility life is provided in Section 3.8.3 of the Engineering Report in Section 3.

1.2 Stormwater Management

The Conceptual Closure Plan (Drawing Sheet C3.00 of the 2017 Plan Set provided in Section 4 includes a site stormwater system comprised of three dry retention ponds. Stormwater runoff will sheetflow down the sideslopes of the landfill into the retention ponds. The Facility's overall stormwater management system is governed by the Mining Operations and ERP Permits. Grades and elevations vary based on the current mining operations and topography. As required by the Florida Department of Environmental Protection (FDEP), a detailed Closure Permit Application with stormwater conveyance systems will be submitted at the time of closure. The stormwater facilities will be constructed in accordance to the approved Closure Permit to prevent the offsite runoff of stormwater.

1.3 Final Cover Specifications

The construction of the final cover will consist of three main operations. First, on-site clayey sand and sandy clay soils will be utilized to construct a barrier layer. Secondly, a layer of soil capable of sustaining vegetation will be constructed. Finally, seeding and mulching, or sodding with "Argentine" Bahia grass, or equivalent, will then be performed to establish a permanent ground cover. Detailed specifications for each of these operations are described as follows:

1.3.1 Final Cover Design

All areas filled with waste will have a final cover of soil designed to minimize infiltration of rainfall. Final cover will be initiated with 30 days of reaching final grade and will be placed and completed over each cell within 180 days after final waste deposit. The final cover will consist of a 3-foot thick layer of soil, of which the bottom 18 inches is barrier layer and the top 18 inches will sustain vegetative growth. A detail is provided on Sheet C4.00 of the 2017 Plan Set provided in Section 4.

1.3.2 Barrier Layer

The 18-inch barrier layer will have a permeability of 1×10^{-8} cm/sec or less. On site clayey sands will be used to construct the barrier layer. Once these soils have been placed and compacted in 6-inch lifts to 95% standard proctor, a series of *insitu* thickness tests and permeability tests will be completed prior to placement to of the vegetative soil layer.

1.3.3 Vegetative Soil Cover

An 18-inch layer of soil from the onsite borrow operation may be used, as the vegetative soil layer. These soils will sustain vegetative growth (grasses).

1.3.4 Grading and Compaction

Grading work will be performed as shown and specified on the construction plans, (Sheet C1.00 through C3.00 of the 2017 Plan Set provided in Section 4). Final slopes will not exceed a 3:1 slope.

The Applicant will be responsible for grading within the landfill limits. All irregularities and low areas will be fine graded with onsite soil material. The Applicant will maintain grades, profiles and contours as indicated on the approved final grading plan. The Applicant will protect and maintain finish graded areas from traffic and erosion. In the event that the site grading is eroded and/or damaged prior to final acceptance, the Applicant will repair and reestablish the grades in accordance with the construction plans.

1.3.5 Construction Quality Assurance Plan

To assure that the landfill's final cover meets the design parameters, the following Construction Quality Assurance Plan (CQA) plan has been developed. This CQA plan will be under the direction of a Florida registered professional engineer experienced in geotechnical engineering or landfill cover construction. The engineer or his designee will be on-site at all times during construction of the cover to monitor construction activities. Field and laboratory testing during final cover construction will be by a qualified soil testing laboratory.

Prior to final cover construction, a suitable borrow source meeting the project specifications for the barrier layer will be determined. The Applicant plans to use on-site soils to meet these specifications. A minimum of three (3) representative samples from on-site soils will be submitted to a laboratory for index testing to quantify the variability of the borrow materials. The index tests will consist of percent fines (ASTM D-1140), Atterburg limits (ASTM D-4318), and moisture content (ASTM D-2216).

In addition, a minimum of three (3) laboratory hydraulic conductivity tests will be conducted on the barrier layer borrow source by ASTM D-5084 under a consolidation stress no greater than 10 pounds per square inch. The borrow source will only be considered suitable if the laboratory reports document a hydraulic conductivity of 1×10^{-8} cm/sec or less at the 95 percent confidence level.

The following field tests will be performed during final cover construction:

1. Density tests at a minimum of two tests per acre per 6-inch lift, of the compacted cover material;
2. Thickness measurements at a minimum of three tests per acre;
3. Index testing as previously discussed at a minimum of one sample per acre;
4. Hydraulic conductivity testing of Shelby tube samples (ASTM D-2937) of compacted barrier layer by laboratory test method ASTM D-5084 at a minimum frequency of one test every two acres. The barrier layers' hydraulic conductivity will be considered acceptable if laboratory reports meet the project specifications of 1×10^{-8} cm/sec or less at the 95 percent confidence level.

If laboratory test data for a cover section does not meet these requirements, additional random sample testing may be conducted to determine if the cover is acceptable to the Project Engineer, the cover section must be reworked or reconstructed to meet these requirements.

CQA reporting requirements will include: daily summary reports during cover construction; observation data sheets; problem identification and corrective actions taken; and final documentation, laboratory reports and construction record drawings. A final report with all such documents will be submitted to the Pasco County and the FDEP.

1.3.6 Seeding and Mulching

Seeding and mulching will consist of establishing a dense stand of grass throughout each closed cell. Included with this task are fertilizing, watering, and periodic maintenance mowing as required to produce a healthy stand of grass. Seeding work will be performed only after planting and other work affecting ground surface has been completed unless the Applicant is specifically requested to do otherwise for purposes of stabilization, etc., prior to project completion. The vegetation species recommended are drought resistant and their roots will not penetrate the final cover to provide a channel for moisture infiltration.

1.3.7 Materials

Seeds and mulch materials will conform to the following:

1. Seed - Fresh, clean new crop mixture composed of the following variety and proportions:

Blend	Parts	Purity	Min. Germination
Argentine Bahia (or equivalent)	100 Percent	80 Percent	90 Percent

   Rate will be 120 pounds per acre (Refer to Index No.104, *Roadway and Traffic Design Standards*, Florida Department of Transportation, 1992).

2. Mulch - Dry mulch, free from mature seed bearings stalks or roots of noxious weeds. Dry mulch will be straw or hay consisting of oat, rye or wheat straw. Approximately two (2) inches of the mulch material will be applied uniformly over the seeded area

3. Fertilizer - Granular, non-burning product containing 6 percent nitrogen, 6 percent phosphoric acid, and 6 percent potash by weight, and spread uniformly at a rate of 220 pounds per acre. Fertilizer will be mixed with the soil to a depth of ± four (4) inches.

4. Watering - The seeded area will be watered so as to provide optimum growth conditions for the establishment of grass. The water used in the grassing operations may be obtained from any approved supply well, like Larkin's well on the adjacent property to the west. The water will be free of excess and harmful chemicals, acids, alkalis, or any substance which might be harmful to plant growth or obnoxious odors to traffic. Salt water will not be used.

The Applicant will provide a uniform dense stand of grass by watering, mowing and maintaining seeded areas for a thirty (30) year period after closure or until final acceptance by FDEP and the County, whichever is less. Sodding may be used as an alternative to seeding and mulching.

1.4 Reclamation Approval

Approval of reclaimed areas (final cover) may be requested at any time by submitting such request to the County and the FDEP. The request will include a map specifying reclamation areas (final cover) for which approval is sought and a general description of how reclamation has been accomplished. The Applicant will coordinate and schedule the review of the reclaimed areas with the appropriate departments, divisions or agencies. Reclamation of the site will be deemed completed upon demonstration and agency approval that the site has been reclaimed in accordance with the approved reclamation plan.

1.5 Inspections

County and FDEP staff will have access to the project to inspect and observe permitted activities in order to determine compliance with the terms of the Closure Permit. The County and FDEP will also have access to the site during the post-closure phase of the project.

1.6 Survey Monuments

Permanent concrete monuments will be installed to mark the boundaries of the landfill property. Where the final grade of the landfill is 20 feet or less above grade, permanent markers will be installed to outline the general waste filled area. The location and elevation of all markers will be tied to boundary markers by the professional performing the final survey and will be submitted on a site plan filed with the "Declaration to the Public."

1.7 Final Survey And As Built Reports

A final topographic survey will be performed by a Florida registered land surveyor to verify the final contours and elevations of the facility are in accordance with the plans as approved in the permit within 180 days after closure. This survey will be submitted to the FDEP along with the Certification of Closure Construction Completion on Form 62-701.900(2), F.A.C..

1.8 Official Date of Closing

Upon receipt and approval of the Certification of Closure Construction Completion and the "Declaration to the Public", FDEP and the County will, within 30 days, acknowledge by letter to the facility operator, that notice of termination of operations and closing of the facility has been completed. The date of the letter will be the official Date of Landfill Closing for purposes of determining the Long Term Care Period.

1.9 Closure Schedule

The schedule for closure activities will be based on the time required to fill each cell to the final grades. Please refer to Sections 1.10 through 1.12 for closure milestones.

1.10 Notice and Advice to Users

At least 90 days prior to the date when wastes will no longer be accepted at the landfill, the owner or operator will submit an application to advise users of the intent to close the facility by posting signs at the entrance of the facility giving the date of closing, the location of alternative disposal facilities and name of the entity responsible for closing the landfill. These signs will be maintained throughout the closing period. If unforeseen circumstances do not allow the 120 day notice to users, notice will be provided as soon as the need to close the facility becomes apparent.

1.11 Notice to the Public

Once closure construction has been completed, a Declaration to the Public will be filed in the deed records in the office of the Pasco County Clerk of Courts. The Declaration to the Public will include a legal description of the Class III Landfill property and a site plan showing the limits of waste. The Declaration to the Public will also include a notice that any future owner or user of the site should consult with the Department prior to planning or initiating any activity involving disturbing the landfill, monitoring system, or control structures. A certified copy of this notice will be filed with the FDEP.

1.12 Closure Permit Application Submittal

A Closure Permit application will be submitted to Pasco County and the FDEP no less than 90 days prior to the scheduled closing day in accordance with the requirements of Rule 62-701.600, F.A.C..

The Closure Permit application will include the following: Closure Design Plan, Closure Operation Plan, Long-Term Care Plan, and proof of financial responsibility for long-term care period.

2.0 FINAL USE AND LONG TERM CARE

The proposed final use of the closed landfill will be as pastureland. The final use for the landfill site will exclude any buildings or other structures, unless such buildings and structures are specifically designed to address gas venting and settlement considerations associated with construction over a landfill. Long term care for the site will include maintaining the landscaping, security facilities, erosion control, filling subsidence areas, and maintaining the stormwater system for a period of thirty (30) years and maintaining the groundwater monitoring plan for a period of time established by the County or the FDEP. The Long-Term Care period may be extended if the closure design or operation plan is found to be ineffective, per Rule 62-701.620 F.A.C..

2.1 Replacement of Monitoring Devices

If the monitoring wells or other devices required by the Groundwater Monitoring Plan are destroyed or fail to operate for any reason, the landfill Owner or Operator will, upon discovery, notify the FDEP and County in writing. All inoperative monitoring devices will be repaired or replaced with functioning devices within 60 days of the discovery of the malfunctioning unit.

2.2 Long Term Monitoring

Once the proposed Landfill facility is closed, groundwater and gas monitoring will continue for a period of up to 30 years with reports submitted to the County and the FDEP. Groundwater reports will be submitted semi-annually and gas monitoring reports will be submitted on a quarterly basis.

A Stabilization Report will be submitted to the Department every 5 years after the long-term care permit is issued. The Stabilization Report will include or address the following:

- Water quality technical report
- Waste subsidence
- Barrier layer effectiveness
- Stormwater management
- Gas production and management

2.3 Final Cover System Maintenance

Regular maintenance of all reclaimed areas will be performed by the Operator or a designated agent in order to assure that the reclamation standards are achieved and the approved reclamation plan is accomplished. The maintenance will include monitoring for a minimum of thirty (30) years after planting, replacement of any planted areas that fail to survive in accordance with the established standards, the removal of non-native species that have not been approved by the County, and the maintenance of all required slopes, final cover, embankments, ponds, fences, gates, signs, monitoring systems and stormwater facilities. The operator will maintain a stockpile on-site of approximately 60,000 cyds of cover material to be used for final cover maintenance.

The Operator will conduct monthly inspections of the facility. The site inspection will include the verification that the final cover system retains its integrity and effectiveness. The final cover will be routinely evaluated and inspected for any evidence of soil erosion, settlement and subsidence, exposed waste, cracks, ponded water, vegetation stress, slope failure, and seeps.

Deficiencies such as cracks, erosion damage, or settlement in the final cover will be evaluated regarding its extent and depth. Repairs and restoration will be consistent with the final cover construction specifications. Location of areas repaired will be identified on a site map for future reference. Areas requiring repeated repairs will be evaluated and considered for special or expanded improvements to retain the integrity and performance of the final cover system. If necessary, temporary berms, ditches, and erosion materials will be used to prevent further erosion damage or ponding on damaged soil cover areas until the site conditions permit the final cover areas and vegetation to be re-established. Preventative maintenance of the final cover should preclude problems arising from potential seeps from infiltration of surface water.

2.4 Revegetation

1. Revegetation of all disturbed areas will be conducted in a manner so as to achieve permanent revegetation which will minimize soil erosion and surface water runoff, conceal the effects of surface mining and recognize the requirements for appropriate habitat for fish and wildlife. Should washes, rills, gullies, or the like, develop after revegetation and before a thirty (30) year maintenance period, such eroded areas will be repaired, the slopes stabilized and revegetated, within thirty (30) days.
2. Good quality topsoil will be applied as the soil cover material for all reclaimed areas. Alternate growing media must be approved by the County prior to commencement of revegetation.
3. Revegetation efforts will commence within thirty (30) days after completion of regrading and will be completed within one hundred and twenty (120) days.

2.5 Landfill Gas Management System

If the gas probes or other devices required by the landfill gas management system are destroyed or fail to operate for any reason, the landfill Operator will, upon discovery, notify the FDEP and County in writing. All inoperative monitoring devices will be repaired or replaced with functioning devices within 60 days of the discovery of the malfunctioning unit.

2.6 Stormwater Drainage Systems

Drainage control system problems can result in accelerated erosion of the final cover system and differential settlement of drainage control structures can limit their usefulness and may result in failure of the drainage structure. It is expected that the drainage facilities at the Facility will require a greater amount of maintenance in the period immediately following construction than in later periods. This is due to greater potential for differential settlement early in the post closure period and the lack of mature vegetation.

The Operator will inspect the drainage facilities for the following:

- Evidence of erosion
- Standing water
- Formation of gullies
- Settlement, blockage, and damage to drainage channels, structures, swales and culverts

Inspection of the drainage facilities will occur prior to and during the rainy season to ensure proper functioning. Surface areas will be inspected during dry periods and necessary repairs made prior to the rainy season. Inspections will include checking for erosional ruts and settlement cracks. In addition, inspections will be made after each major storm to ensure that all swales are functioning properly and that there is no ponding water. All swales, drainage channels, and retention ponds will be inspected on a regular basis for silt or debris build-up. Damage to the drainage system will be addressed immediately after finding a problem. Permanent repairs and restoration will be made consistent with final closure construction specifications. Temporary repairs may be utilized until permanent repairs can be scheduled.

2.7 Reduced Long-term Care Period

The owner of the landfill may apply to Pasco County and FDEP for a permit modification to reduce the long-term care schedule after a 10-year history after closure in accordance with Rule 62-701.620 (2), F.A.C..

2.8 Right of Access and Access Control

The Owner currently poses a right of access to the subject site. Any future owner or operator will maintain this right of access to the access route and the property for the life of the landfill and throughout the long-term care period. All owners/operators will maintain all security barriers (fencing, signage, gates) for the design life and long-term care period of the landfill.

2.9 Contingency Plan for Emergencies

If fires or severe weather events occur, the Operator will follow the procedures discussed in the Contingency Plan, Appendix 3-B of the Engineering Report.

2.10 Successors of Interest

Any person or corporation acquiring rights or ownership, possession or operation of the proposed Class III landfill will be subject to all the requirements of the permit for the proposed facility. Any lease or transfer of property will include the following conditions:

1. The previous owner or operator responsible for closure will maintain proof of financial responsibility with the FDEP and Pasco County.

2. State the party responsible for continuance of monitoring, maintenance, and correction of problems.

3. Mineral rights to any recoverable materials buried at the landfill. Disturbance of a closed landfill will require a Department permit.

2.11 Completion of Long-Term Care

Upon completion of the landfill's long-term care period, the Operator will notify the FDEP and Pasco County that a Professional Engineer certification has been placed in the landfill's operating record verifying that long-term care has been completed in accordance with the approved Closure and Long-term Care Plans.

3.0 FINANCIAL RESPONSIBILITY

Upon approval of the application, the owner or operator will provide financial assurance documentation for closure and post-closure costs. This financial assurance documents will be submitted prior to permit being issued. See Section 7 Appendix 7-A for the Financial Assurance Cost estimates for the Class III landfill. Third party estimates for selected portions of the proposed work were used for the estimates. A financial assurance mechanism will be fully funded prior to the acceptance of any solid wastes at the proposed landfill.

3.1 Annual Cost Adjustments

The Operator of the landfill will submit an annual cost adjustment statement of closure and long-term care costs certified by a Professional Engineer to the FDEP and Pasco County. These cost estimates will be revised for inflation and any changes in closure or corrective action plans.

CLOSURE AND RECLAMATION PLAN
APPENDIX 7-A

FINANCIAL ASSURANCE COST ESTIMATES

Print Form Reset Form

Florida Department of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form # 62-701.900(28), F.A.C.
Form Title: Closure Cost Estimating Form For Solid Waste Facilities
Effective Date: January 6, 2010
Incorporated in Rule 62-701.630(3), F.A.C.

CLOSURE COST ESTIMATING FORM FOR SOLID WASTE FACILITIES

Date of DEP Approval: ______________

I. GENERAL INFORMATION:

Facility Name: Enterprise Class III Recycling and Disposal Facility WACS ID: 87895
Permit Application or Consent Order No.: 177982-020-SO/T3 Expiration Date: 7/9/2018
Facility Address: 41111 Enterprise Road, Dade City, Florida 33525
Permittee or Owner/Operator: Angelo's Aggregate Materials, LTD.
Mailing Address: 855 28th Street, South, St. Petersburg, Florida 33712

Latitude: 28 ° 19 ' 53 " Longitude: 82 ° 08 ' 06 "
Coordinate Method: State Plane Datum: NGVD 29
Collected by: ______________ Company/Affiliation Pickett Surveying

Solid Waste Disposal Units Included in Estimate:

Phase / Cell	Acres	Date Unit Began Accepting Waste	Active Life of Unit From Date of Initial Receipt of Waste	If active: Remaining life of unit	If closed: Date last waste received	If closed: Official date of closing
1-7, 15, 16 and 17	81.4	2004	22	28	N/A	N/A

Total disposal unit acreage included in this estimate: Closure: 81.4 Long-Term Care: 81.4

Facility type: (Check all that apply)
☐ Class I ☒ Class III ☐ C&D Debris Disposal
☐ Other: ______________

II. TYPE OF FINANCIAL ASSURANCE DOCUMENT (Check type)

☒ Letter of Credit* ☐ Insurance Certificate ☐ Escrow Account
☐ Performance Bond* ☐ Financial Test ☐ Form 29 (FA Deferral)
☐ Guarantee Bond* ☐ Trust Fund Agreement

* - Indicates mechanisms that require the use of a Standby Trust Fund Agreement

III. ESTIMATE ADJUSTMENT

40 CFR Part 264 Subpart H as adopted by reference in Rule 62-701.630, Florida Administrative Code, (F.A.C.) sets forth the method of annual cost estimate adjustment. Cost estimates may be adjusted by using an inflation factor or by recalculating the maximum costs of closure in current dollars. Select one of the methods of cost estimate ajustment below.

☐ **(a) Inflation Factor Adjustment** ☐ **(b) Recalculated or New Cost Estimates**

Inflation adjustment using an inflation factor may only be made when a Department approved closure cost estimate exists and no changes have occurred in the facility operation which would necessitate modification to the closure plan. The inflation factor is derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its survey of Current Business. The inflation factor is the result of dividing the latest published annual Deflatory by the Deflator for the previous year. The inflation factor may also be obtained from the Solid Waste website www.dep.state.fl.us/waste/categories/swfr or call the Financial Coordinator at (850) 245-8706.

This adjustment is based on the Department approved closing cost estimate dated: ____________

Latest Department Approved **Closing Cost** Estimate:		Current Year Inflation Factor, ***e.g. 1.02***		Inflation Adjusted Closing Cost Estimate:
____________	×	______	=	____________

This adjustment is based on the Department approved long-term care cost estimate dated: ____________

Latest Department Approved Annual **Long-Term Care** Cost Estimate:		Current Year Inflation Factor, ***e.g. 1.02***		Inflation Adjusted Annual Long-Term Care Cost Estimate:
____________	×	______	=	____________
Number of Years of Long Term Care Remaining:			×	____________
Inflation Adjusted Long-Term Care Cost Estimate:			=	____________

Signature by: ☐ **Owner/Operator** ☐ **Engineer** (check what applies)

Signature	Address
Name & Title	City, State, Zip Code
Date	E-Mail Address
Telephone Number	

IV. ESTIMATED CLOSING COST (check what applies)

☒ **Recalculated Cost Estimate** ☐ **New Facility Cost Estimate**

Notes: 1. Cost estimates for the time period when the extent and manner of landfill operation makes closing most ex

2. Cost estimate must be certified by a professional engineer.

3. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.

4. In some cases, a price quote in support of individual item estimates may be required.

Description	Unit	Number of Units	Cost / Unit	Total Cost
1. Proposed Monitoring Wells	**(Do not include wells already in existence.)**			
	EA	6	$5,000.00	$30,000.00
			Subtotal Proposed Monitoring Wells:	$30,000.00
2. Slope and Fill (bedding layer between waste and barrier layer):				
Excavation	CY			
Placement and Spreading	~~CY~~ AC.	83.8	$1,292.70	$108,328.26
Compaction	CY			
Off-Site Material	CY			
Delivery	CY			
			Subtotal Slope and Fill:	$108,328.26
3. Cover Material (Barrier Layer):				
Off-Site Clay	CY	200,331	$9.70	$1,943,210.70
Synthetics - 40 mil	SY			
Synthetics - GCL	SY			
Synthetics - Geonet	SY			
Synthetics - Other (explain)				
			Subtotal Cover Material:	$1,943,210.70
4. Top Soil Cover:				
Off-Site Material	CY	200,331	$4.58	$917,515.98
Delivery	CY			
Spread	CY			
			Subtotal Top Soil Cover:	$917,515.98
5. Vegetative Layer				
Sodding	SY	20,780	$1.35	$28,053.00
Hydroseeding	AC	83.8	$10.50	$879.90
Fertilizer	AC			
Mulch	AC			
Other (explain) Return trips to irrigate, establish vegetation	EA	4	$538.62	$2,154.48
			Subtotal Vegetative Layer:	$31,087.38
6. Stormwater Control System:				
Earthwork	CY			
Grading	SY			
Piping	LF	3,657	$23.52	$86,012.64
Ditches	LF	2,000	$2.15	$4,300.00
Berms	LF	12,473	$4.20	$52,386.60
Control Structures	EA	10	$2,262.22	$22,622.20
Other (explain) Drop Inlets	EA	20	$2,258.91	$45,178.20
			Subtotal Stormwater Control System:	$210,499.64

Description	Unit	Number of Units	Cost / Unit	Total Cost
7. Passive Gas Control:				
Wells	EA	550	$100.18	$55,099.00
Pipe and Fittings	LF			
Monitoring Probes	EA	6	$1,705.29	$10,231.74
NSPS/Title V requirements	LS	1		
			Subtotal Passive Gas Control:	$65,330.74
8. Active Gas Extraction Control:				
Traps	EA			
Sumps	EA			
Flare Assembly	EA			
Flame Arrestor	EA			
Mist Eliminator	EA			
Flow Meter	EA			
Blowers	EA			
Collection System	LF			
Other (explain)				
			Subtotal Active Gas Extraction Control:	
9. Security System:				
Fencing	LF			
Gate(s)	EA			
Sign(s)	EA			
			Subtotal Security System:	
10. Engineering:				
Closure Plan Report	LS	1	$26,931.24	$26,931.24
Certified Engineering Drawings	LS	1	$16,158.74	$16,158.74
NSPS/Title V Air Permit	LS	1		
Final Survey	LS	1	$5,063.07	$5,063.07
Certification of Closure	LS	1	$19,390.49	$19,390.49
Other (explain)				
			Subtotal Engineering:	$67,543.54

Description	Hours	Cost / Hour	Hours	Cost / Hour	Total Cost
11. Professional Services					
	Contract Management		Quality Assurance		
P.E. Supervisor					
On-Site Engineer					
Office Engineer					
On-Site Technician					
Other (explain) See explanations	1	$145,2[illegible]	1	$254,1[illegible]	$399,388.00

Description	Unit	Number of Units	Cost / Unit	Total Cost
Quality Assurance Testing	LS	1	$31,869.08	$31,869.08
			Subtotal Professional Services:	$431,257.08

Subtotal of 1-11 Above:	$3,804,773.32
12. Contingency 10 % of Subtotal of 1-11 Above	$380,477.33
Subtotal Contingency:	$380,477.33
Estimated Closing Cost Subtotal:	$4,185,250.65

Description	Total Cost
13. Site Specific Costs	
Mobilization	$140,042.43
Waste Tire Facility	
Materials Recovery Facility	
Special Wastes	$19,390.49
Leachate Management System Modification	
Other (explain)	
Subtotal Site Specific Costs:	$159,432.92

TOTAL ESTIMATED CLOSING COSTS ($): $4,344,683.57

V. ANNUAL COST FOR LONG-TERM CARE

See 62-701.600(1)a.1., 62-701.620(1), 62-701.630(3)a. and 62-701.730(11)b. F.A.C. for required term length. For landfills certified closed and Department accepted, enter the remaining long-term care length as "Other" and provide years remaining.

(Check Term Length) ☐ 5 Years ☐ 20 Years ☒ 30 Years ☐ Other, ___ Years

Notes: 1. Cost estimates must be certified by a professional engineer.

2. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.

3. In some cases, a price quote in support of individual item estimates may be required.

All items must be addressed. Attach a detailed explanation for all entries left blank.

Description	Sampling Frequency (Events / Year)	Number of Wells	(Cost / Well) / Event	Annual Cost
1. Groundwater Monitoring [62-701.510(6), and (8)(a)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2	32	$692.51	$44,320.64
Annually	1			
			Subtotal Groundwater Monitoring:	$44,320.64
2. Surface Water Monitoring [62-701.510(4), and (8)(b)]				
Monthly	12			
Quarterly	4			
Semi-Annually	2			
Annually	1			
			Subtotal Surface Water Monitoring:	
3. Gas Monitoring [62-701.400(10)]				
Monthly	12			
Quarterly	4	16	$67.33	$4,309.12
Semi-Annually	2			
Annually	1			
			Subtotal Gas Monitoring:	$4,309.12
4. Leachate Monitoring [62-701.510(5), (6)(b) and 62-701.510(8)c]				
Monthly	12			
Quarterly	4			
Semi-Annually	2			
Annually	1			
Other (explain) ________				
			Subtotal Leachate Monitoring:	

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. Leachate Collection/Treatment Systems Maintenance				
Maintenance				
Collection Pipes	LF			
Sumps, Traps	EA			
Lift Stations	EA			
Cleaning	LS	1		
Tanks	EA			

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
5. (continued)				
Impoundments				
Liner Repair	SY			
Sludge Removal	CY			
Aeration Systems				
Floating Aerators	EA			
Spray Aerators	EA			
Disposal				
Off-site (Includes transportation and disposal)	1000 gallon			
		Subtotal Leachate Collection / Treatment Systems Maintenance:		
6. Groundwater Monitoring Well Maintenance				
Monitoring Wells	LF			
Replacement	EA	0.2	$3,770.37	$754.07
Abandonment	EA			
		Subtotal Groundwater Monitoring Well Maintenance:		$754.07
7. Gas System Maintenance				
Piping, Vents	LF			
Blowers	EA			
Flaring Units	EA			
Meters, Valves	EA			
Compressors	EA			
Flame Arrestors	EA			
Operation	LS	1	$2,693.12	$2,693.12
		Subtotal Gas System Maintenance:		$2,693.12
8. Landscape Maintenance				
Mowing	AC	325.6	$44.26	$14,411.06
Fertilizer	AC			
		Subtotal Landscape Maintenance:		$14,411.06
9. Erosion Control and Cover Maintenance				
Sodding	SY			
Regrading	AC			
Liner Repair	SY	1	$8,079.39	$8,079.39
Clay	CY			
		Subtotal Erosion Control and Cover Maintenance:		$8,079.39
10. Storm Water Management System Maintenance				
Conveyance Maintenance	LS	1	$3,770.37	$3,770.37
		Subtotal Storm Water Management System Maintenance:		$3,770.37
11. Security System Maintenance				
Fences	LS	1	$3,231.75	$3,231.75
Gate(s)	EA			
Sign(s)	EA			
		Subtotal Security System Maintenance:		$3,231.75

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
12. Utilities	LS	1	$1,292.70	$1,292.70
			Subtotal Utilities:	$1,292.70
13. Leachate Collection/Treatment Systems Operation				
Operation				
P.E. Supervisor	HR			
On-Site Engineer	HR			
Office Engineer	HR			
OnSite Technician	HR			
Materials	LS	1		
		Subtotal Leachate Collection/Treatment Systems Operation:		
14. Administrative				
P.E. Supervisor	HR			
On-Site Engineer	HR			
Office Engineer	HR	112	$75.41	$8,445.92
OnSite Technician	HR			
Other 1 - 5 year Report	LS	1	$4,847.62	$4,847.62
			Subtotal Administrative:	$13,293.54
			Subtotal of 1-14 Above:	$96,155.76
15. Contingency	10	% of Subtotal of 1-14 Above		$9,615.58
			Subtotal Contingency:	$9,615.58

Description	Unit	Number of Units / Year	Cost / Unit	Annual Cost
16. Site Specific Costs				
			Subtotal Site Specific Costs:	

ANNUAL LONG-TERM CARE COST ($ / YEAR): $105,771.34

Number of Years of Long-Term Care: 30

TOTAL LONG-TERM CARE COST ($): $3,173,140.08

VI. CERTIFICATION BY ENGINEER

This is to certify that the Cost Estimates pertaining to the engineering features of this solid waste management facility have been examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, the Cost Estimates are a true, correct and complete representation of the financial liabilities for closing and/or long-term care of the facility and comply with the requirements of Rule 62-701.630 F.A.C. and all other Department of Environmental Protection rules, and statutes of the State of Florida. It is understood that the Cost Estimates shall be submitted to the Department annually, revised or adjusted as required by Rule 62-701.630(4), F.A.C.

LISA J. BAKER LICENSE No. 74652 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature

Lisa Baker, P.E.
Name and Title (please type)

2-9-18
Date

74652
Florida Registration Number
(please affix seal)

4140 NW 37th Place, Suite A
Mailing Address

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City, State, Zip Code

lisa@locklearconsulting.com
E-Mail address (if available)

352-672-6867
Telephone Number

VII. SIGNATURE BY OWNER/OPERATOR

Signature of Applicant

John Arnold, P.E.
Name and Title (please type)

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E-Mail address (if available)

855 28th Street South
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